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

"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**, CO_2 **emissions** and possible **accident risks** on different selected locations.

Research Background

> *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 a 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*

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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**

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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.

Zuteilungsalgorithmus zur Mobilitäts-Kostenermittlung nach Anzahl der Personen und Pkw im Haushalt sowie deren räumlicher Bezug:

a) Zuteilungsalgorithmus zur Kostenermittlung bei städtischen Lebensstiltypen:
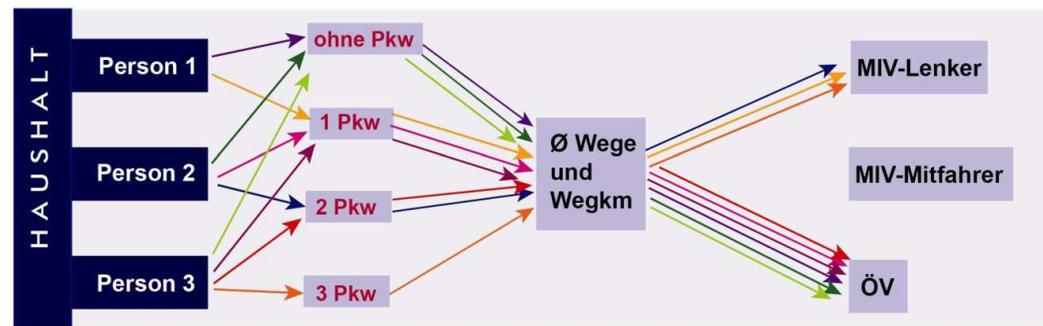
b) Zuteilungsalgorithmus zur Kostenermittlung bei ländlich/ländlich geprägten Lebensstiltypen:

Herry Consult 2011
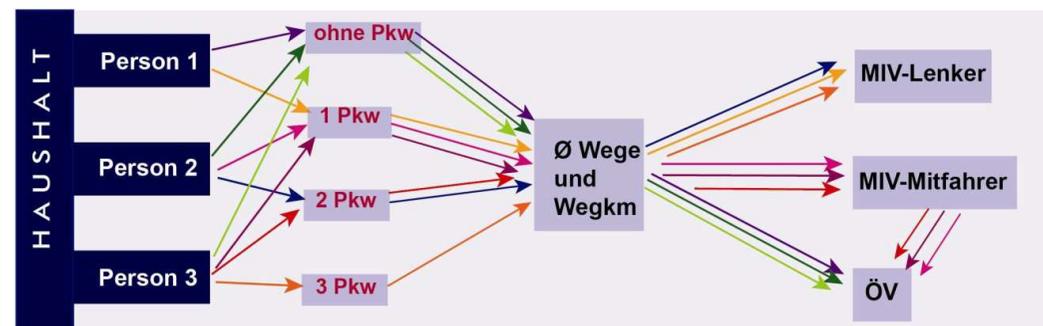
Open Street Map Data

- 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
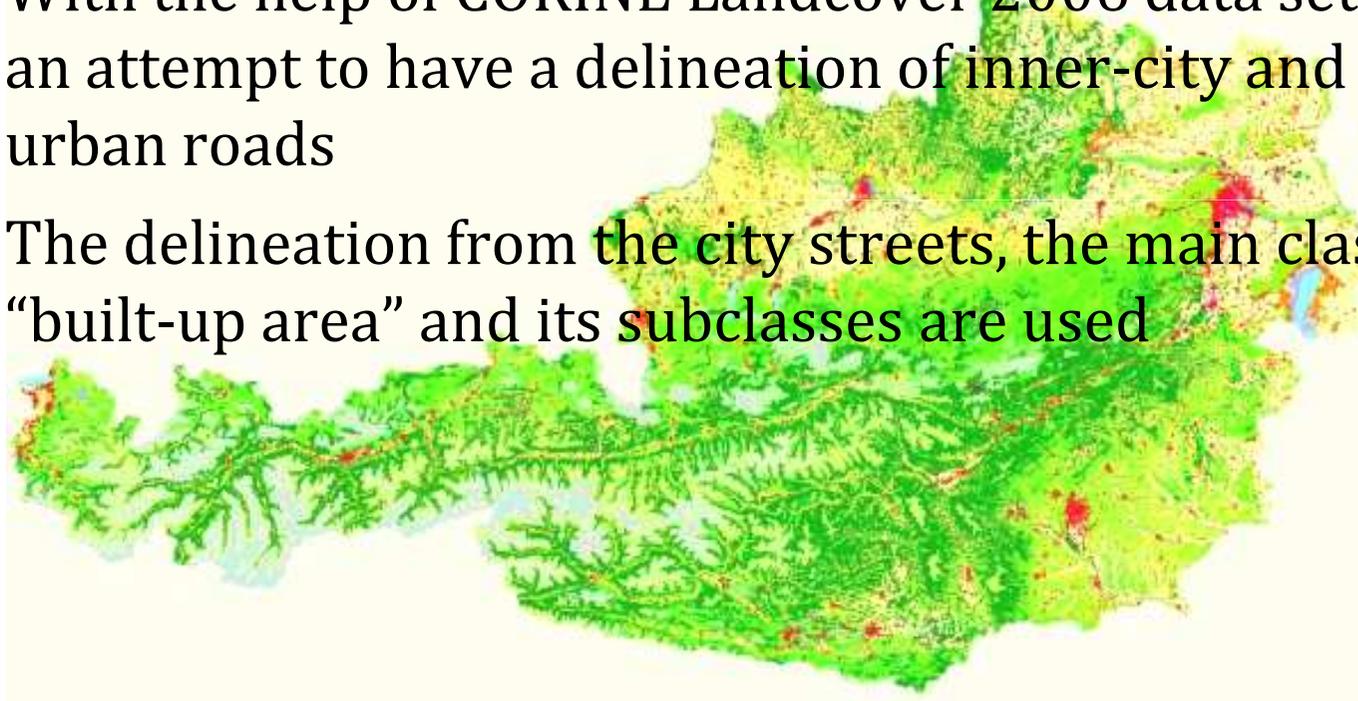
AnachB API

- 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 …).
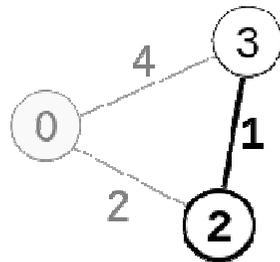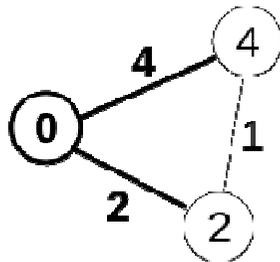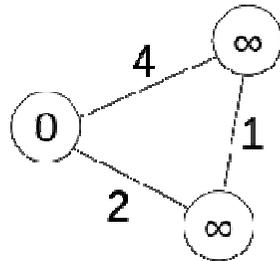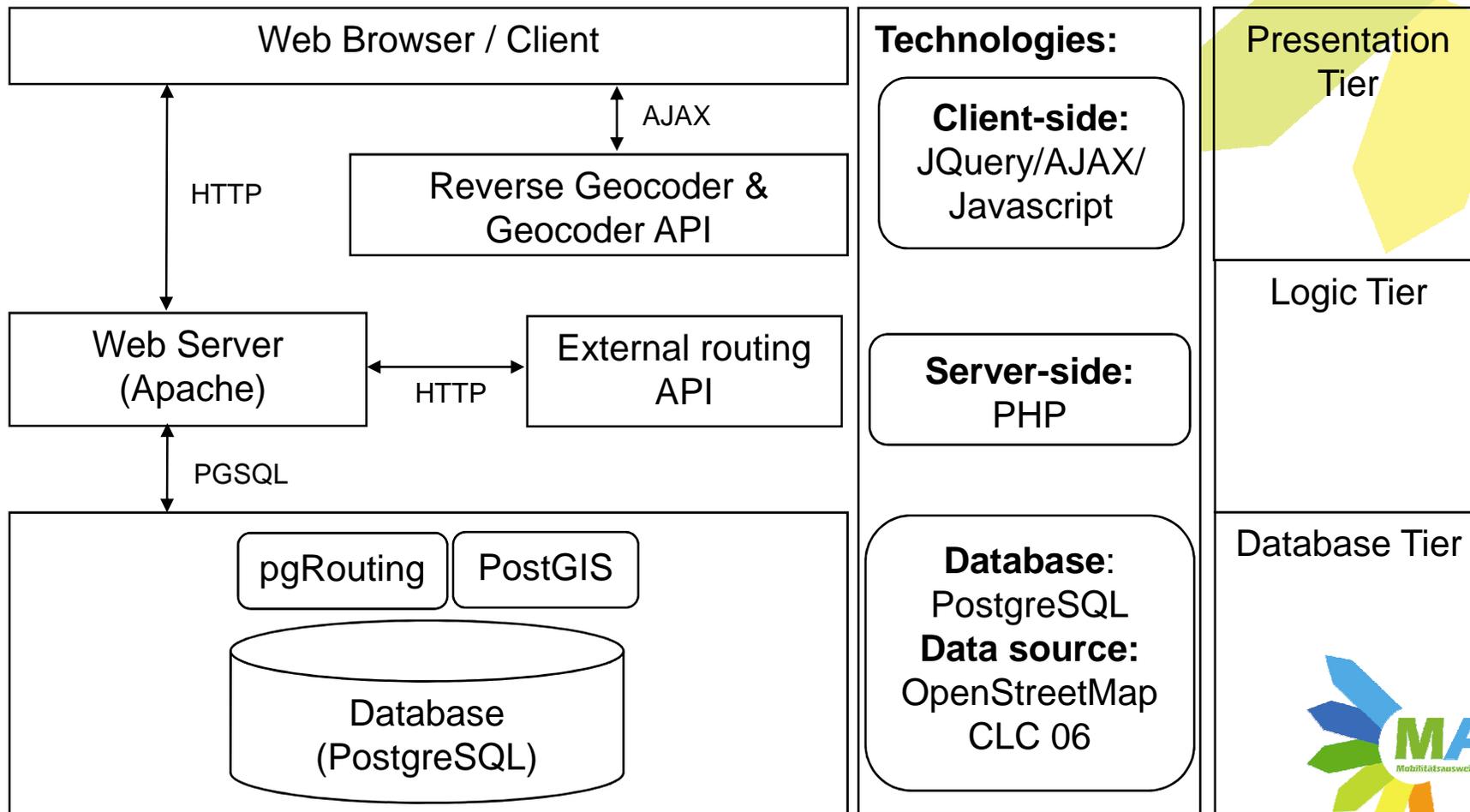
- passenger car routing network
  - weighted graph
  - Time assigned as weigths
- dijkstra algorithm
  - optimal route (fastest path)
- travel time matrix
  - grouped by street categories

Architecture
3-tier architectur

Web Browser / Client		

AJAX

Reverse Geocoder & Geocoder API

HTTP

Web Server (Apache) ←HTTP→ External routing API

PGSQL

pgRouting   PostGIS

Database (PostgreSQL)

Technologies:

Client-side:
JQuery/AJAX/ Javascript

Server-side:
PHP

Database:
PostgreSQL
Data source:
OpenStreetMap
CLC 06

Presentation Tier

Logic Tier

Database Tier

User Interface
Advanced Tool

- 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

Result Mask
Advanced Tool

- The result of these tools creates a summary of the annual mobility costs, and accident costs and CO_2 emission and travel times for the entire household.

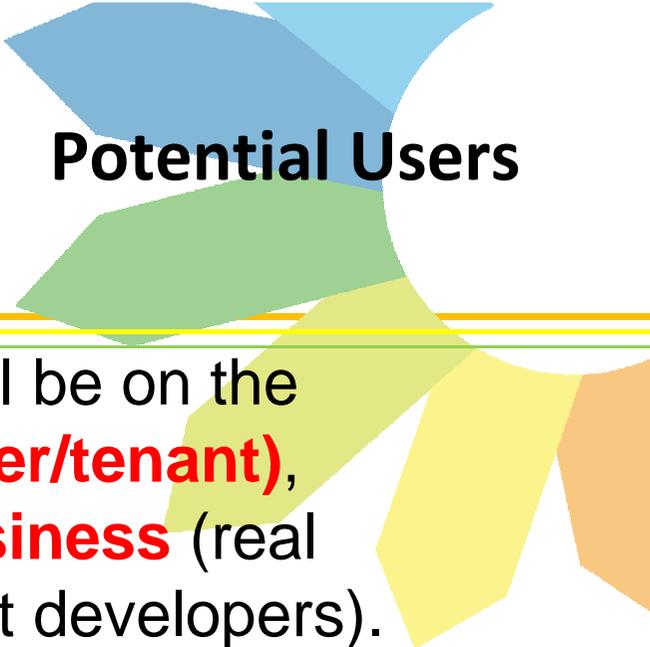- Division in tabular form for each person in the household and their modes of transportation.
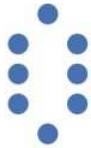
Comparison of variants
Advanced Tool

- Comparison of two variants by entering different parameters

- The annual mobility costs can be compared with costs of real estate

- 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 administra-tion for modification of the rules of subsidized housing

Resumee and perspective

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

Next potential steps

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, CO_2 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** .

Project consortium

The research project „Mobility Pass for Residential Real Estate" is funded within the IV2splus programme (ways2go initiative) of the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT). The programme management lies at the Austrian Research Promotion Agency (FFG).

Project Consortium of "Mobility Pass for Residential Real Estate":

CEIT Alanova – Institute for Urbanism, Transport, Environment and Information Society, Schwechat/Austria

Austrian Road Safety Board (Kuratorium für Verkehrssicherheit – KfV), Vienna/Austria

University of Applied Science of WKW – Institute for Real Estate Management (FH Wien-Studiengänge der WKW – Institut für Immobilienwirtschaft), Vienna/Austria

Herry Consult GmbH, Consulting in Transportation Planning, Vienna/Austria

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Thank you for your attention!