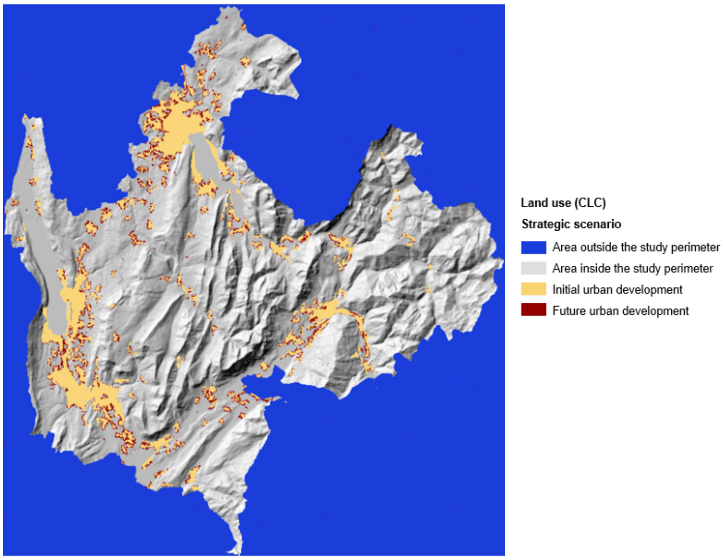
ASTUS TOOLS

FORESIGHT

Thomas Houet (University of Toulouse)



The software can be used to model urban sprawl scenarios by taking into account the attractiveness of territories, the terrain, the transport network, a space consumption envelope and different forms that urban sprawl can adopt (continuous urbanization, linear urbanization, spontaneous urbanization). The software produces annual maps of the evolution of the territory.

PLANNING APPROACHES

Intended user group:	*Community in charge of urban planning in the study context*
Tool benefits:	*Plan for the long-term future of the territory, Measure potential impacts of measures*
Main functions:	*Model urban sprawl scenarios, Produce annual maps of the evolution of the territory, Aggregate results from several simulations within a map of probability of urbanization*
Tool format:	*Software, Interface coded in Java, Modeling engine coded in C and C ++*

TOOL FUNCTIONS

Type of emissions addressed:	*None, the software models urban sprawl*
Type of output:	*Comparison of alternatives, Map-based results, Impact of land consumption*
Output format:	*Maps*
Spatial unit of detail:	*Region, Municipality*
Applicable coverage area:	*State / Province, Metropolitan Area, City*

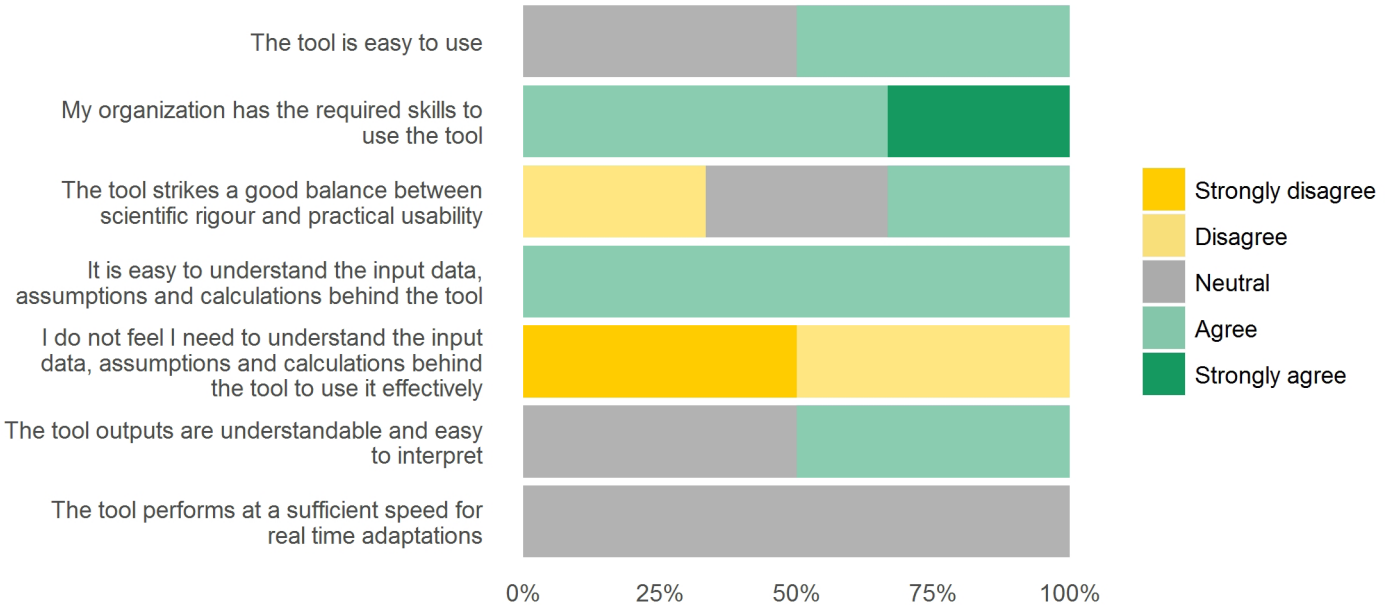
TOOL UTILIZATION

Required skills:	*Expert tool, GIS skills required*
Required hardware, software and operating system:	*Java Runtime Environment 8.0*
Required input data:	*Geographical data from GIS, Corine Land Cover / OpenStreetMap*

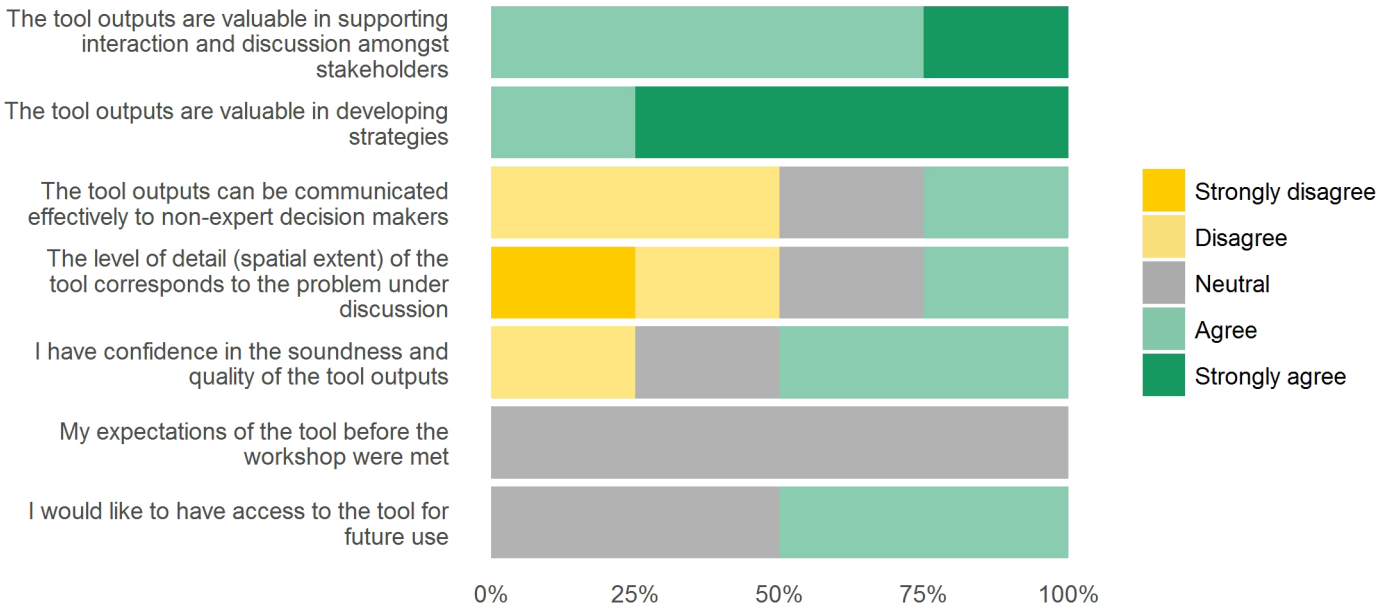
FORESIGHT

Thomas Houet (University of Toulouse)

USER-FRIENDLINESS



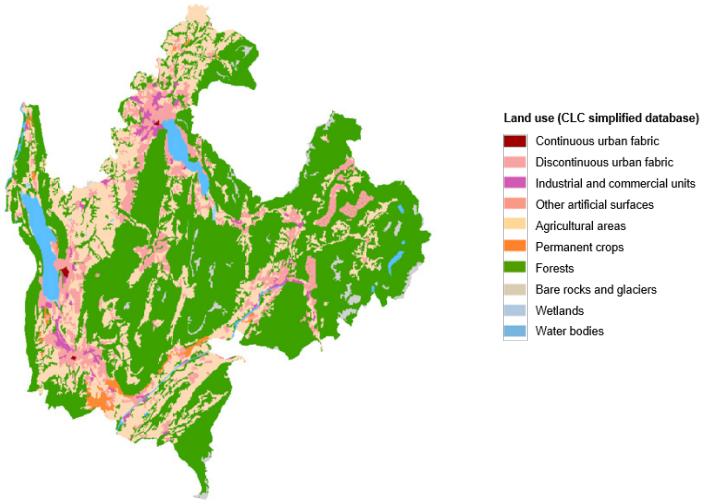
USEFULNESS



ASTUS TOOLS

LUCSIM

Jean-Philippe Antoni & Gilles Vuidel (University of Bourgogne-Franche-Comté)



The tool can be used to model the evolution of the urbanization of a territory taking into account the different types of land use and given transition rules. The transition rules define the geographical conditions that influence urban transformation and expansion. They can be determined automatically or by the user.

PLANNING APPROACHES

Intended user group:	*Community in charge of urban planning in the study context*
Tool benefits:	*Plan for the long-term future of the territory, Measure potential impacts of measures*
Main functions:	*Model the evolution of the urbanization of the territory, Automatic or manual generation of transition rules based on spatial analysis algorithms and land use imagery*
Tool format:	*Software, Coded in Java*

TOOL FUNCTIONS

Type of emissions addressed:	*None, the software models changes in land use*
Type of output:	*Comparison of alternatives, Map-based results, Impact of land consumption*
Output format:	*Maps*
Spatial unit of detail:	*Region, Municipality*
Applicable coverage area:	*State / Province, Metropolitan Area, City*

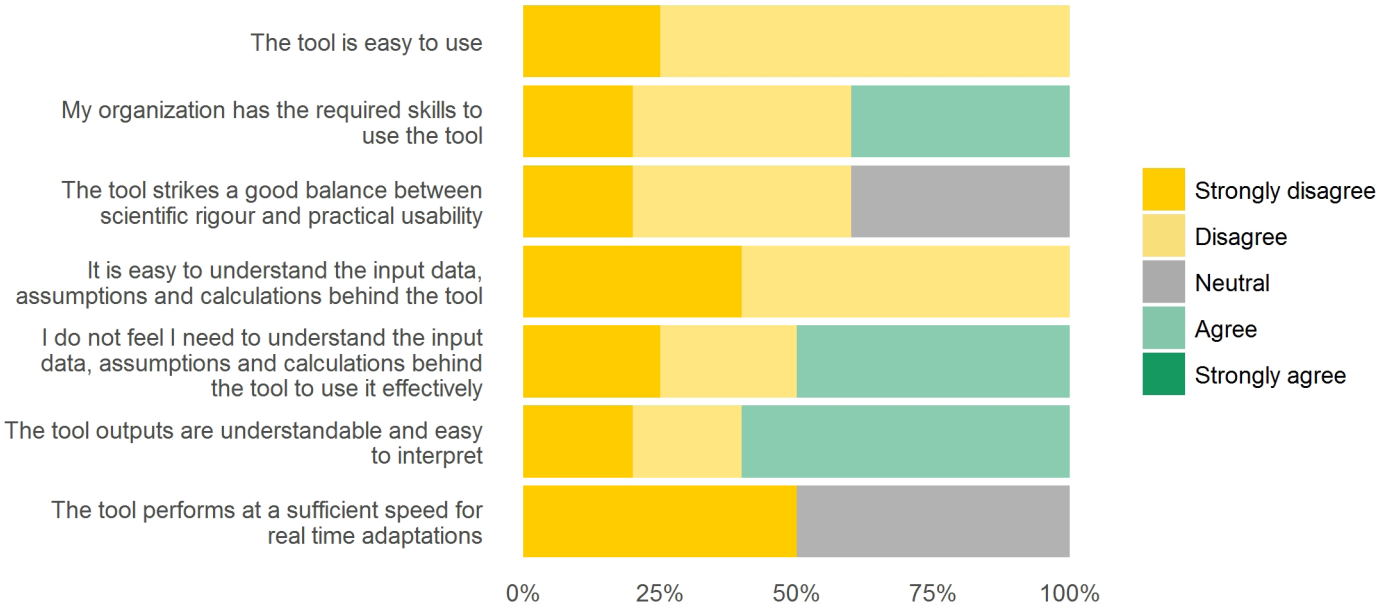
TOOL UTILIZATION

Required skills:	*Expert tool, GIS skills required*
Required hardware, software and operating system:	*Java Runtime Environment 8.0*
Required input data:	*Geographical data from GIS, Corine Land Cover / OpenStreetMap*

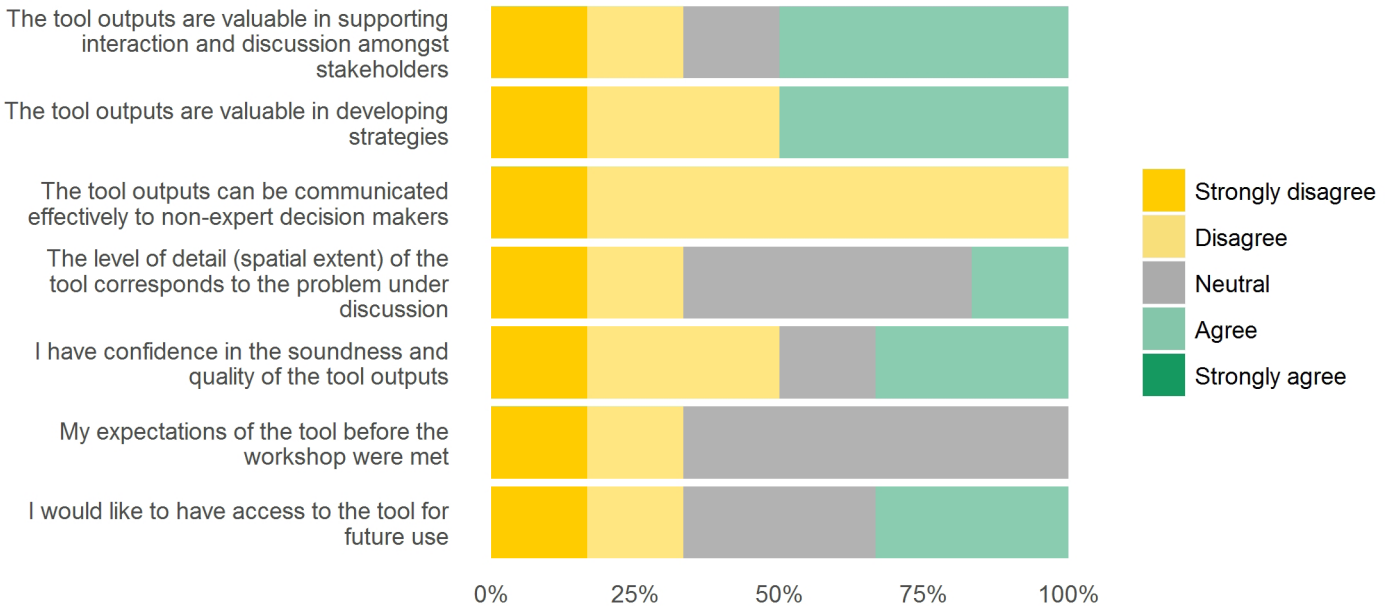
LUCSIM

Jean-Philippe Antoni & Gilles Vuidel (University of Bourgogne-Franche-Comté)

USER-FRIENDLINESS



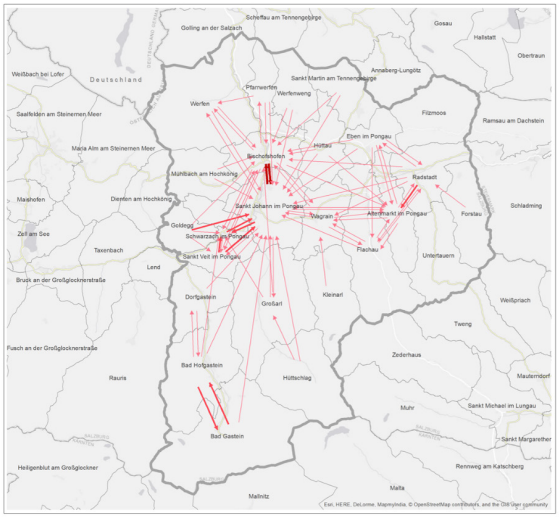
USEFULNESS

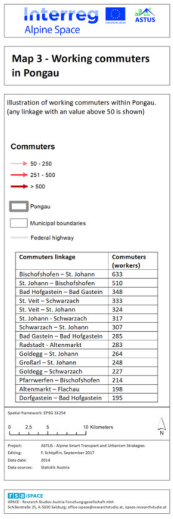


ASTUS TOOLS

Commuter Tool Pongau

Dagmar Lahnsteiner, Anna Butzhammer & Thomas Prinz (RSA iSPACE)





The commuter tool Pongau is a strategic, prototypic instrument for analysis of commuter flows on various spatial scales. The tool is based on a commuter matrix (2014) on a 250m statistical raster grid. Therefore, a detailed analysis of in-, out- and inner-state / municipality commuter flows facilitates transport planning and management. Differentiation between working and education commuters is possible.

PLANNING APPROACHES

Intended user group:	*Local authorities, Transport associations*
Tool benefits:	*Detailed information on commuter flows, Identify the potential for transport and settlement development actions*
Main functions:	*Origin-destination analysis of commuter matrix on various scales, Analysis of in-, out- and internal commuters, Analysis of working and education commuters*
Tool format:	*ArcGIS tool*

TOOL FUNCTIONS

Type of output:	*Map-based results, Location assessment, Potential mobility demand*
Output format:	*Diagrams, Tables, Numerical, Maps*
Spatial unit of detail:	*Region, Municipality, Specific trip, Specific location*
Applicable coverage area:	*Worldwide*

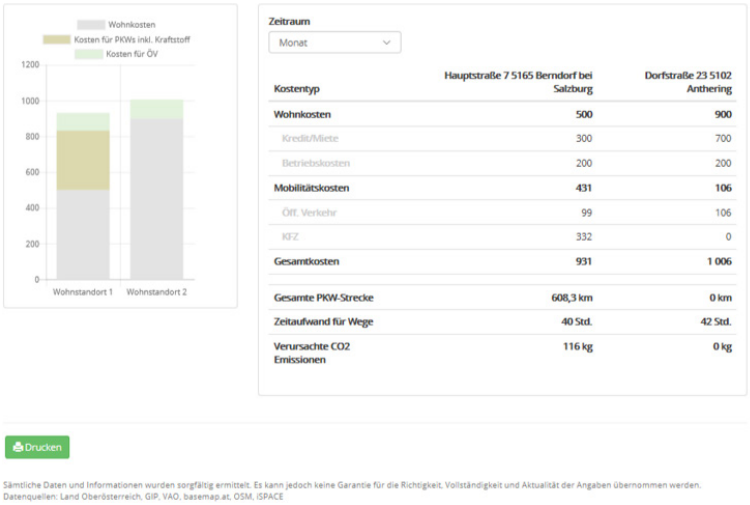
TOOL UTILIZATION

Required skills:	*Expert tool, Expert GIS skills required*
Required hardware, software and operating system:	*ArcGIS*
Required input data:	*Commuter matrix*

ASTUS TOOLS

MORECO Household Calculator

Bernhard Castellazzi, Anna Butzhammer & Thomas Prinz (RSA iSPACE)



The MORECO household calculator is a practical, web-based tool for comparing potential residnetial locations of private households. Housing costs as well as travel costs, distances and times are calculated based on mobility behavior and housing situation. Further information is provided regarding access to daily facilities within walking distance, the access to the next regional center and the individual CO2e emissions based on mobility behavior.

PLANNING APPROACHES

Intended user group:	*Private individuals, Educational sector, Public authorities / companies working in spatial and transport planning*
Tool benefits:	*Raise awareness of mobility costs in terms of money and CO2e, Show interdependence between housing, mobility and costs*
Main functions:	*Location assessment, Public transport assessment, Estimation of individual residential and mobility costs, Estimation of mobility-related CO2e emissions*
Tool format:	*Web application*

TOOL FUNCTIONS

Type of emissions addressed:	*CO2e*
Analyzed transport modes:	*Private car, Cycling, Public transport, Walking*
Type of output:	*Mobility costs, Living costs, Emission estimation, Comparison of alternatives, Map-based results, Location assessment*
Output format:	*Diagrams, Tables, Numerical*
Spatial unit of detail:	*Household, Specific trip, Specific location*
Applicable coverage area:	*State of Salzburg (AUT)*

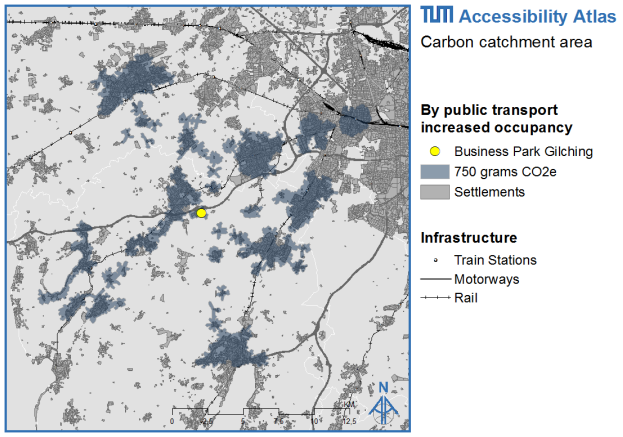
TOOL UTILIZATION

Required skills:	*Familiarity with web tools, Understanding of digital maps*
Required hardware, software and operating system:	*Web browser*
Required input data:	*None*

ASTUS TOOLS

TUM Accessibility Atlas

Benjamin Büttner, Julia Kinigadner & Chenyi Ji (Technical University of Munich)



The TUM Accessibility Atlas is a database of structural and transport supply datasets that cover the European Metropolitan Region of Munich (EMM). The tool facilitates calculation of location-based measures of accessibility and can be used to visualize catchment areas based on a defined travel cost budget. The main objective is to provide a platform for integrated land use and transport planning.

PLANNING APPROACHES

Intended user group:	*Public organizations, Planners working in the field of urban and transport planning*
Tool benefits:	*Understand the joint impacts of the transport system and the land use system, Provide visual outputs for discussion and decision-making*
Main functions:	*Analyze travel costs (distance, time, money, emissions), Visualize catchment areas, Analyze accessibility on multiple scales, Analyze accessibility impacts of land use and transport measures*
Tool format:	*GIS-based tool*

TOOL FUNCTIONS

Type of emissions addressed:	*CO2e*
Analyzed transport modes:	*Private Car, Cycling, Public Transport, Walking*
Type of output:	*Mobility costs, Emission estimation, Comparison of alternatives, Map-based results, Location assessment*
Output format:	*Tables, Numerical, Maps*
Spatial unit of detail:	*Municipality, Specific trip, Specific location*
Applicable coverage area:	*Metropolitan area, City, City borough, Neighborhood*

TOOL UTILIZATION

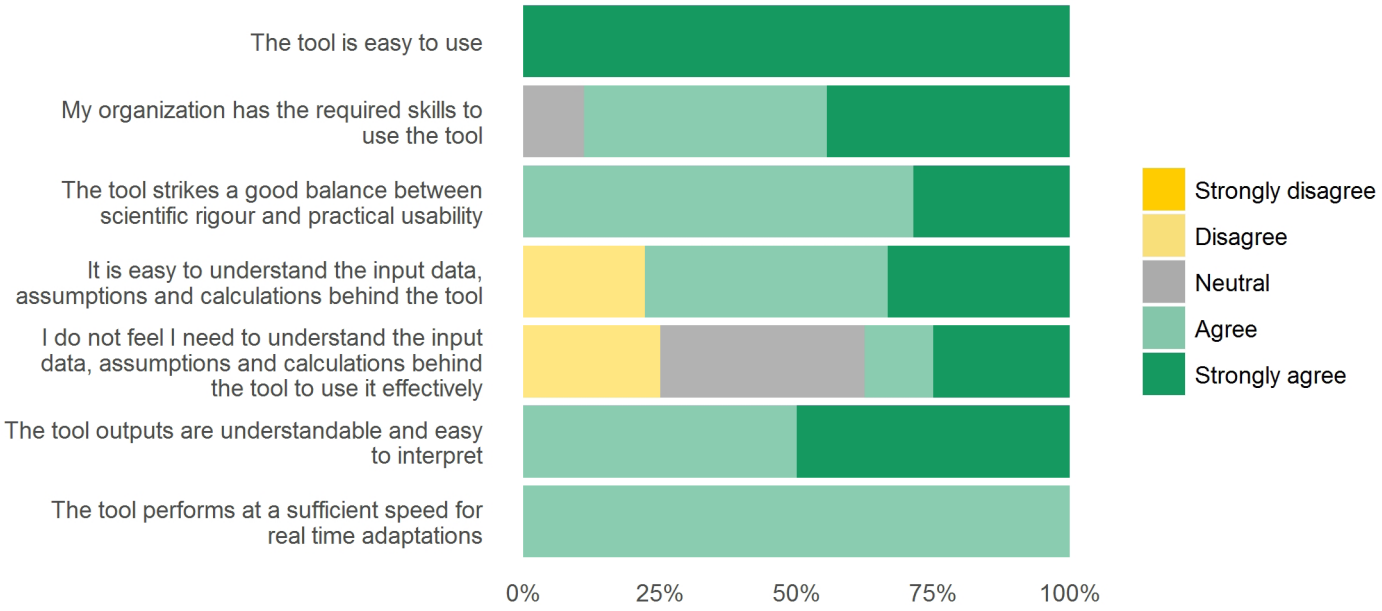
Required skills:	*Expert tool, Knowledge of GIS and additional software required*
Required hardware, software and operating system:	*ArcGIS, PTV Visum, Microsoft Excel, Python, SQL, Visual Basic for Applications*
Required input data:	*Transport networks including travel costs (time, money, fuel and energy consumption), Emission factors, Occupancy rates, Structural land use data, Built-up areas, Points of interest*

EVALUATION OF THE TOOL WITH THE FINAL USER

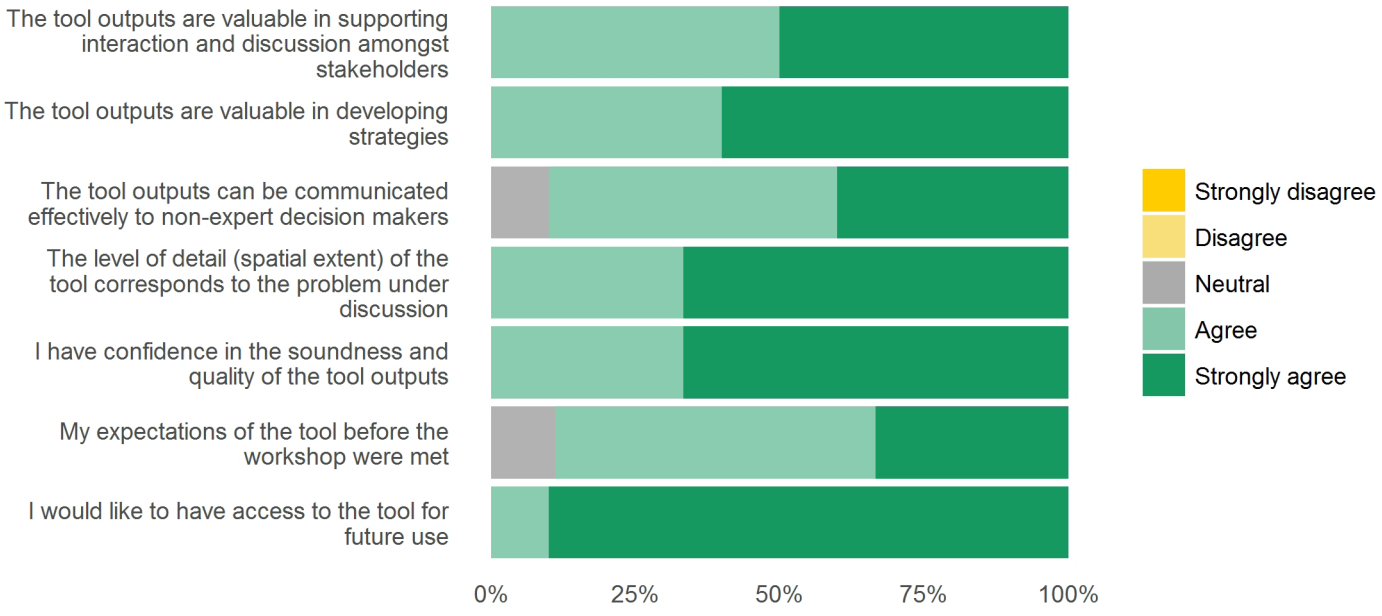
TUM Accessibility Atlas

Benjamin Büttner, Julia Kinigadner & Chenyi Ji (Technical University of Munich)

USER-FRIENDLINESS



USEFULNESS



CO_{2L}

Julia Kinigadner & Benjamin Büttner (Technical University of Munich),
Gesa Volpers (Munich Transport and Tariff Association)

Baseline

Total Emissions	637,8	tons of CO2			
Persons	137421				
Trips / Person	3,4				
	Mode Share	**Trips / person**	**Passenger-km / Trip**	**Vehicle-km / Passenger-km**	**grams of CO2 / Vehicle-km**
Foot	26%	0,884	1,4	1	0
Bicycle	7%	0,238	3,4	1	0
Car	56%	1,904	16	0,8	180
Public transport	11%	0,374	8	0,1	850
Other	0%	0	0	1	0
Total	100%	3,4	10,442		

$$CO_2 = Persons \times \frac{Trips}{Person} \times \sum_m mode\ share \times \frac{Passenger - km}{Trip_m} \times \frac{Vehicle - km}{Passenger - km} \times \frac{CO_2}{Vehicle - km}$$

CO_{2L} calculates the CO2 emissions from transport activities for a given spatial area. The toolkit supports the scenario-building process and consists of three parts. The first part is a calculator of CO2 emissions based on population, mode share, trip rate, trip length, occupancy rate and emission factors. The second part provides sample input data from various countries. The third part provides the user with land use and transport planning measures which can be implemented to reduce CO2 emissions.

PLANNING APPROACHES

Intended user group:	*Local authorities, Decision-makers*
Tool benefits:	*Quantify current and future emission levels, Identify options for intervention, Highlight the emission reduction potential, Raise awareness*
Main functions:	*Provide basic input data on transport parameters, Quantify transport-related emissions for both the baseline and a set of scenarios, Identify measures for producing low carbon scenarios*
Tool format:	*MS Excel calculator*

TOOL FUNCTIONS

Type of emissions addressed:	*CO2, CO2e*
Analyzed transport modes:	*Private Car, Cycling, Public Transport, Walking*
Type of output:	*Emission Estimation*
Output format:	*Numerical*
Spatial unit of detail:	*Region, Municipality*
Applicable coverage area:	*Any given area where suitable data is available*

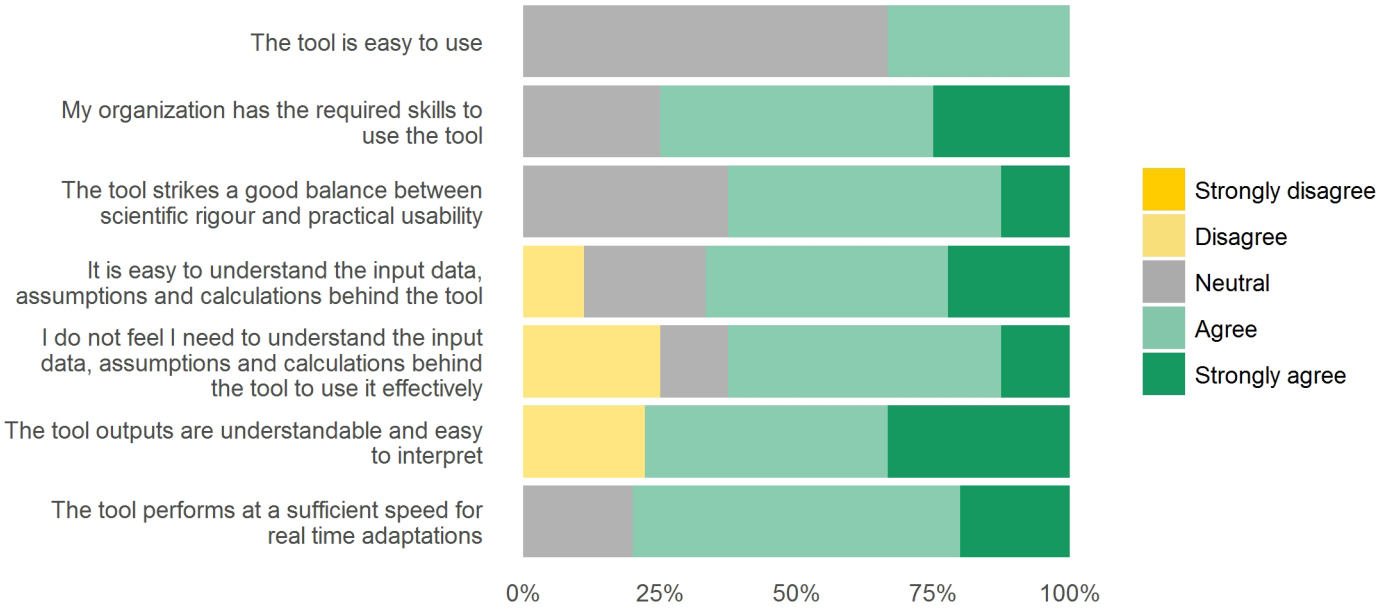
TOOL UTILIZATION

Required skills:	*Basic understanding of MS Excel*
Required hardware, software and operating system:	*MS Excel calculator sheet*
Required input data:	*Population of the study context, Trip Rate, Trip length, Mode Share, Occupancy rates, Emission factors*

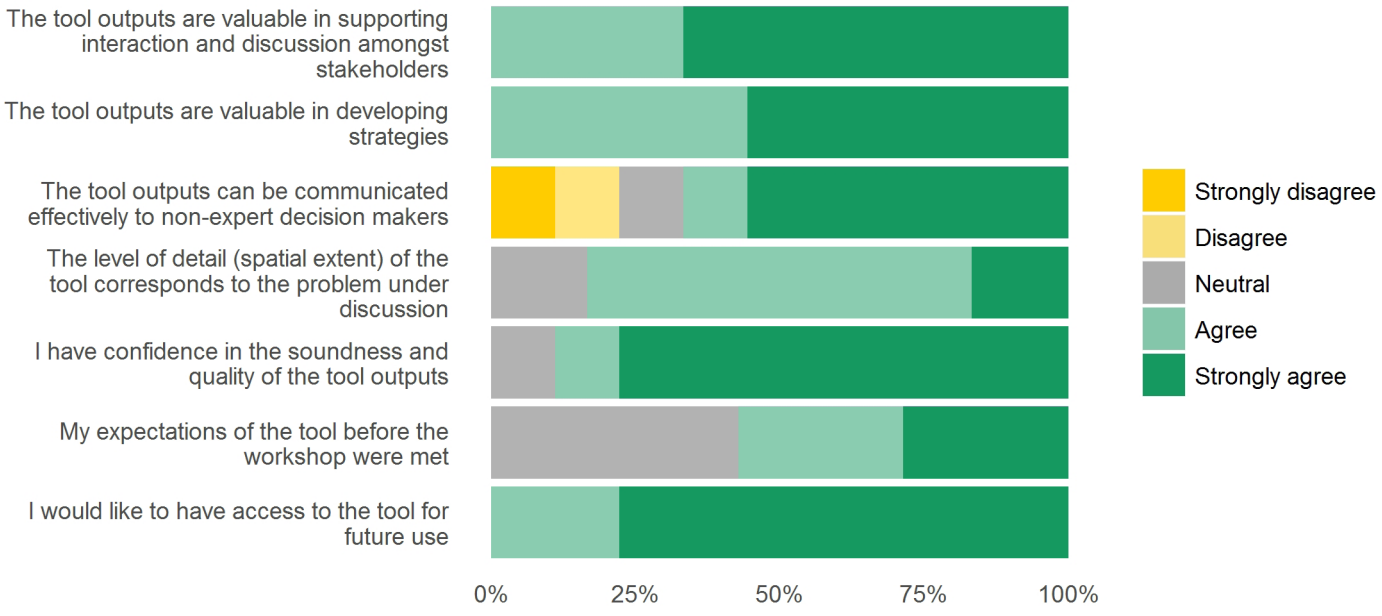
CO_{2L}

Julia Kinigadner & Benjamin Büttner (Technical University of Munich),
Gesa Volpers (Munich Transport and Tariff Association)

USER-FRIENDLINESS



USEFULNESS



ASTUS TOOLS

Google Earth

Grégoire Feyt & Valentin Ravier (University Grenoble-Alpes)

This case outlines a methodology more than a tool itself, describing the potential use of satellite imagery software such as Google Earth in planning applications. The approach can be used to highlight interesting mobility flows, as well as what is capable in data integration (e.g. Shapefiles, 3D imagery, PNGs). The key features include the ease of use and ease of communication.

PLANNING APPROACHES

Intended user group:	*Everyone*
Tool benefits:	*Understand the joint impacts of the transport system and the land use system, Visual outputs for discussion and decision-making*
Main functions:	*Visualize all data available (e.g. catchment area, traffic jam, commuter flow), Add notes from participants in real time*
Tool format:	*Freely available desktop application*

TOOL FUNCTIONS

Type of emissions addressed:	*Any if data is available*
Analyzed transport modes:	*Private Car, Cycling, Public Transport*
Type of output:	*Mobility costs, Living costs, Specific recommendations, Improvement measures*
Output format:	*Pictures, Maps*
Spatial unit of detail:	*Region, Municipality, Corridor, Household, Specific trip, Specific location*
Applicable coverage area:	*Worldwide*

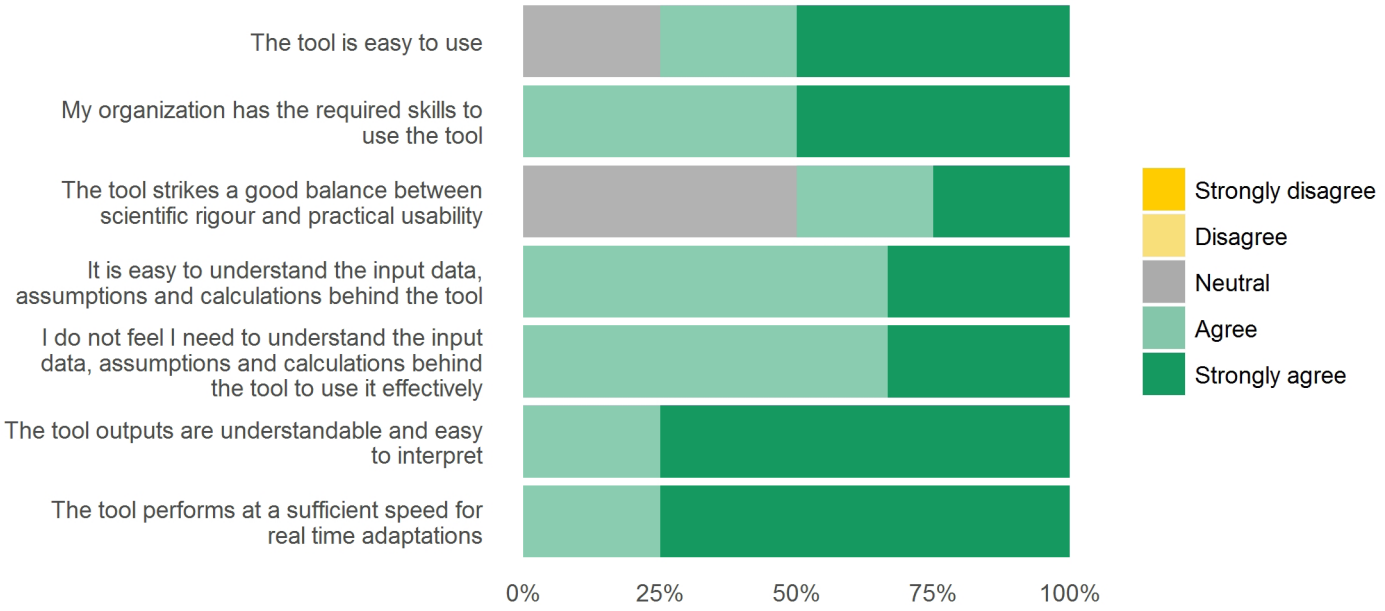
TOOL UTILIZATION

Required skills:	*No specific knowledge*
Required hardware, software and operating system:	*QGIS, SketchUp, Inkscape (as needed)*
Required input data:	*KML or PNG files*

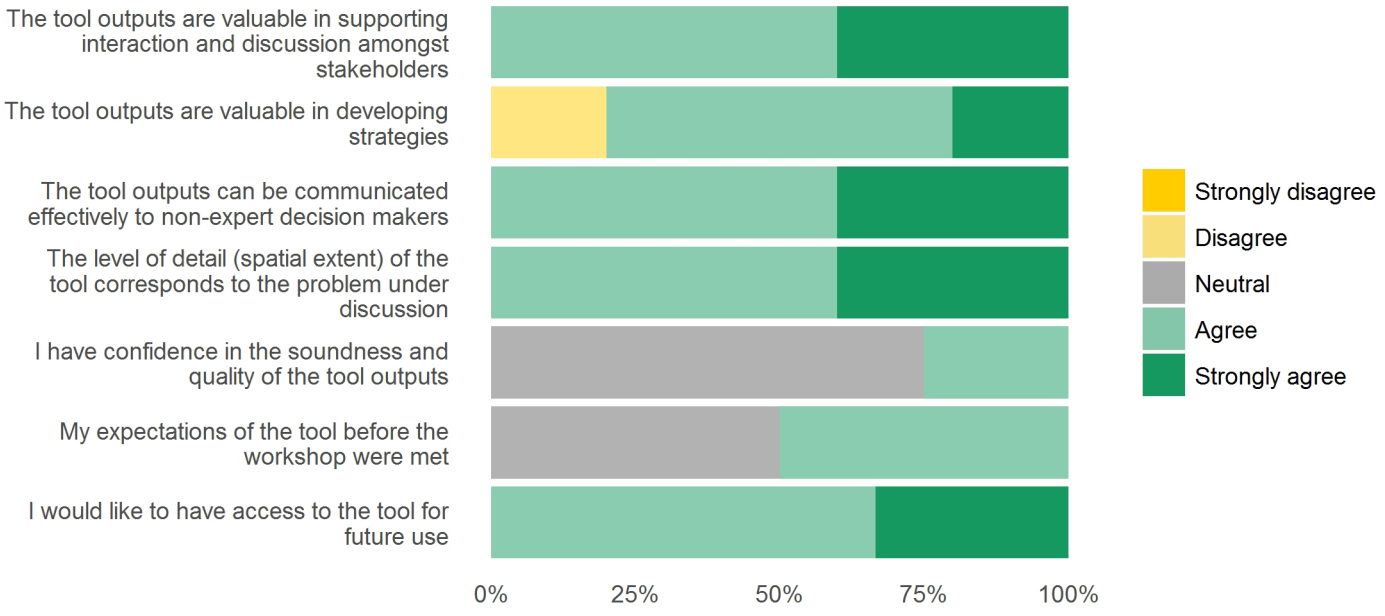
Google Earth

Grégoire Feyt & Valentin Ravier (University Grenoble-Alpes)

USER-FRIENDLINESS



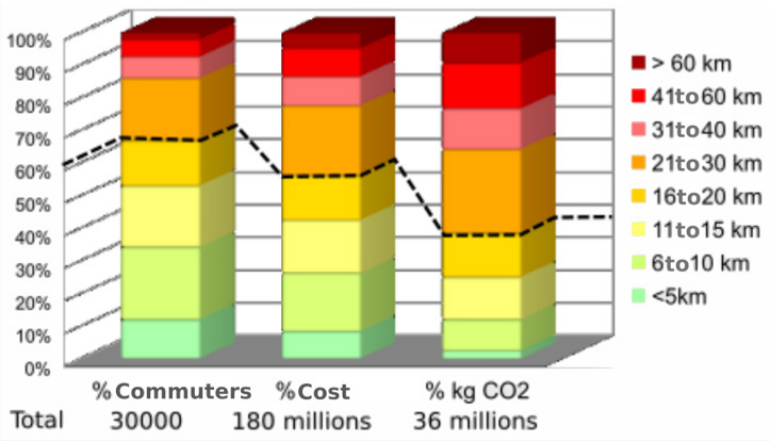
USEFULNESS



ASTUS TOOLS

MobicosTER

Grégoire Feyt & Valentin Ravier (University Grenoble-Alpes)



MobicosTER is an adaptation of the Mobicost tool developed in the MO-RECO project framework. MobicosTer uses the Mobicost computation core with a statistical approach in order to estimate household cost and CO2 emissions cost for all the commuters of a given area, depending on the current or foreseen mobility behavior.

PLANNING APPROACHES

Intended user group:	*Transportation and land planners, Local stakeholders*
Tool benefits:	*Awareness raising on the cost of mobility / commuting, leading to new perspectives of the cost of public transport versus the cost of owning a car*
Main functions:	*Analysis of commuters' travel structure by distance, zone, CO2 emissions or mobility costs, Simulation of the savings of a measure in real time*
Tool format:	*Spreadsheet (e.g. MS Excel)*

TOOL FUNCTIONS

Type of emissions addressed:	*CO2*
Analyzed transport modes:	*Private Car*
Type of output:	*Mobility costs, Emission estimation, Comparison of alternatives, Map-based results, Specific recommendations*
Output format:	*Pictures, Diagrams, Tables, Numerical, Maps*
Spatial unit of detail:	*Region, Municipality, Corridor*
Applicable coverage area:	*State / Province, Metropolitan area*

TOOL UTILIZATION

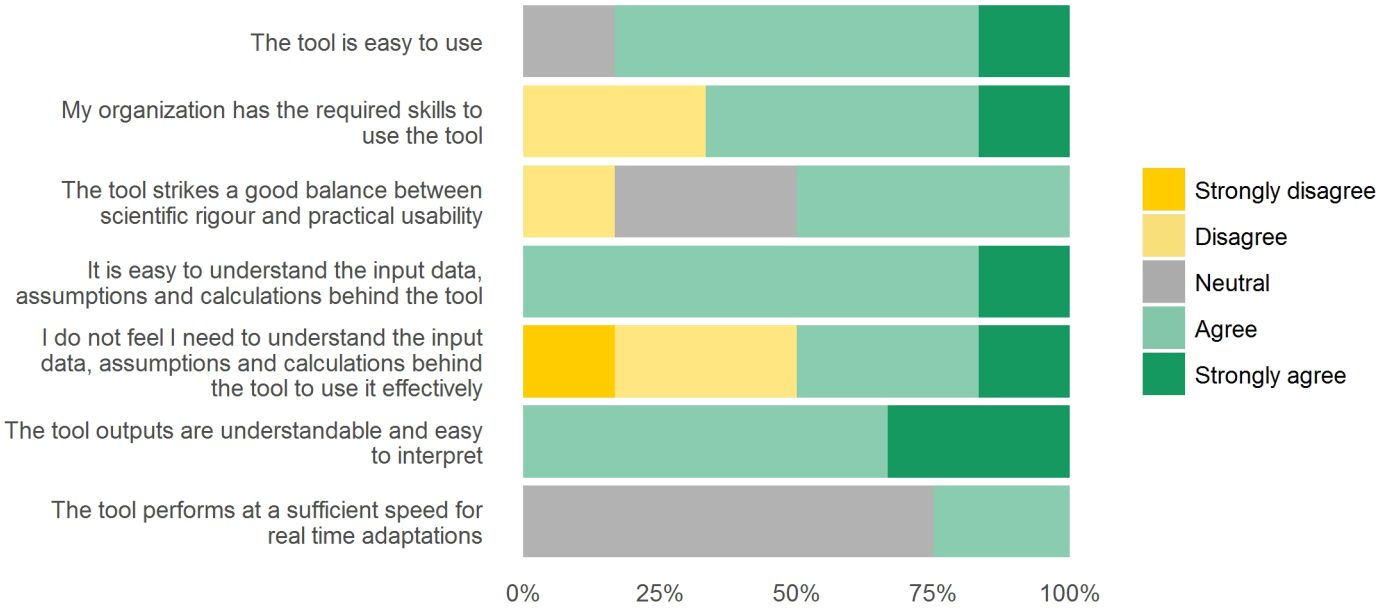
Required skills:	*Cost estimation: High knowledge in programming,* *Data analysis: Good knowledge of statictics and GIS*
Required hardware, software and operating system:	*Spreadsheet (e.g. MS Excel)*
Required input data:	*Road network and travel costs, Cf diapo 8 (only for simulation-oriented use)*

EVALUATION OF THE TOOL WITH THE FINAL USER

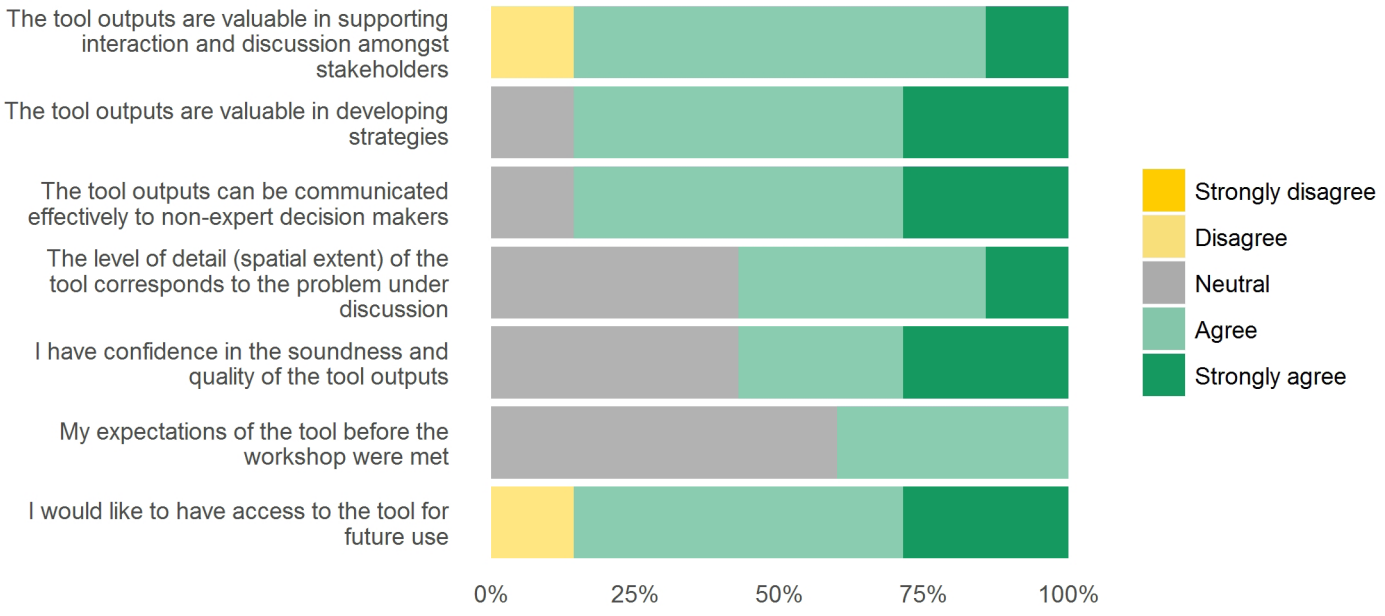
MobicosTER

Grégoire Feyt & Valentin Ravier (University Grenoble-Alpes)

USER-FRIENDLINESS



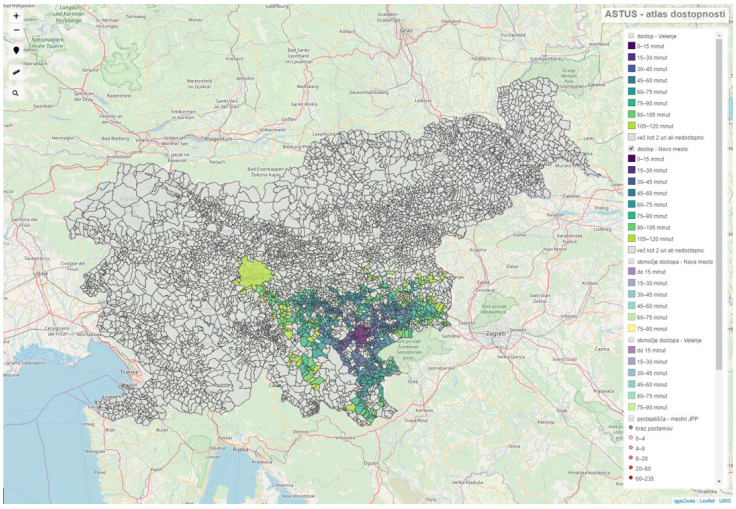
USEFULNESS



ASTUS TOOLS

UIRS Accessibility Atlas

Simon Koblar (Urban Planning Institute of the Republic of Slovenia)



UIRS Accessibility Atlas is an online tool designed for transport and spatial planners. The tool consists of two elements. The first enables users to choose any location in Slovenia and calculate time-based isochrones or plan a trip between selected origins and destinations. The second is an online map displaying accessibility information for different locations. The accessibility metrics are calculated in advance, which enables more complex calculations than real time.

PLANNING APPROACHES

Intended user group:	*Traffic and spatial planners in municipalities, Ministry of the environment and spatial planning, Ministry of infrastructure*
Tool benefits:	*Gain an understanding of accessibility with different modes of transport, Identify options for public transport improvements or new land developments*
Main functions:	*Backend: Batch analyses without a graphical user interface, which can be exported to GIS or SQL databases, Online tool: Calculate isochrones for selected locations and modes / List of accessibility indicators*
Tool format:	*Backend based on OpenTripPlanner, Online tool / Batch analyses on a PC*

TOOL FUNCTIONS

Analyzed transport modes:	*Private Car, Cycling, Public Transport, Walking*
Type of output:	*Comparison of alternatives, Map-based results, Location assessment*
Output format:	*Tables, Numerical, Maps*
Spatial unit of detail:	*From local to national level*
Applicable coverage area:	*Country*

TOOL UTILIZATION

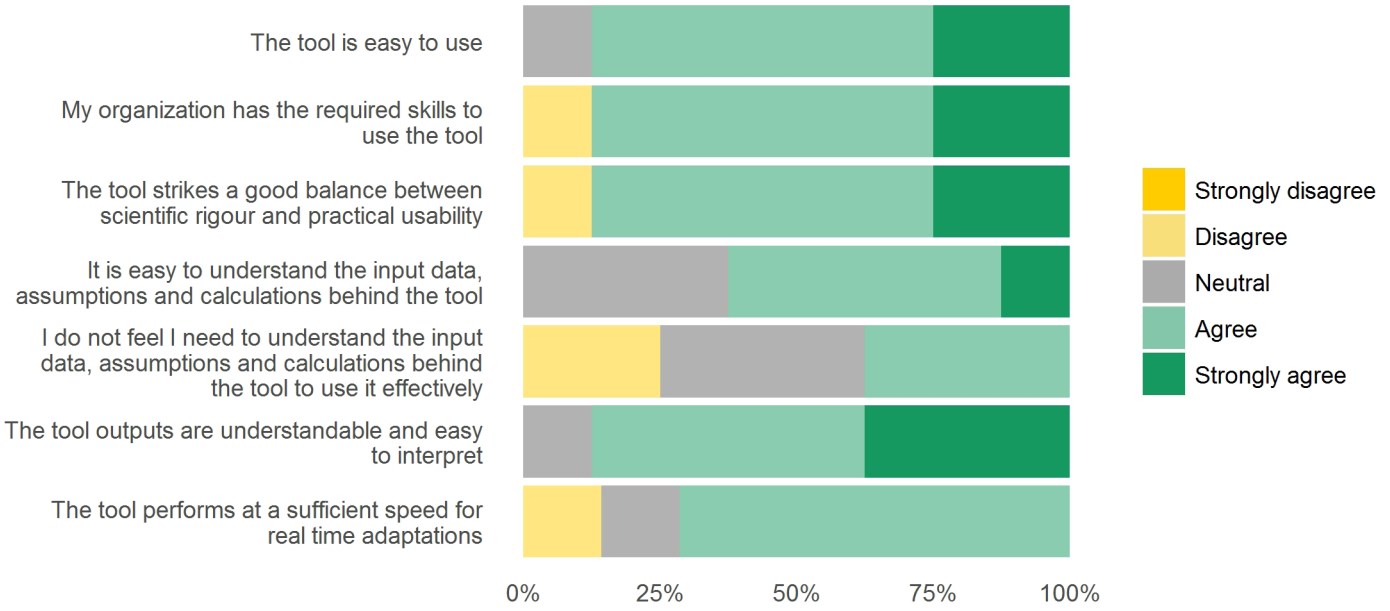
Required skills:	*Online tool: easy to use, Batch analyses: expert knowledge required*
Required hardware, software and operating system:	*Internet browser*
Required input data:	*Online tool: no data needed*

EVALUATION OF THE TOOL WITH THE FINAL USER

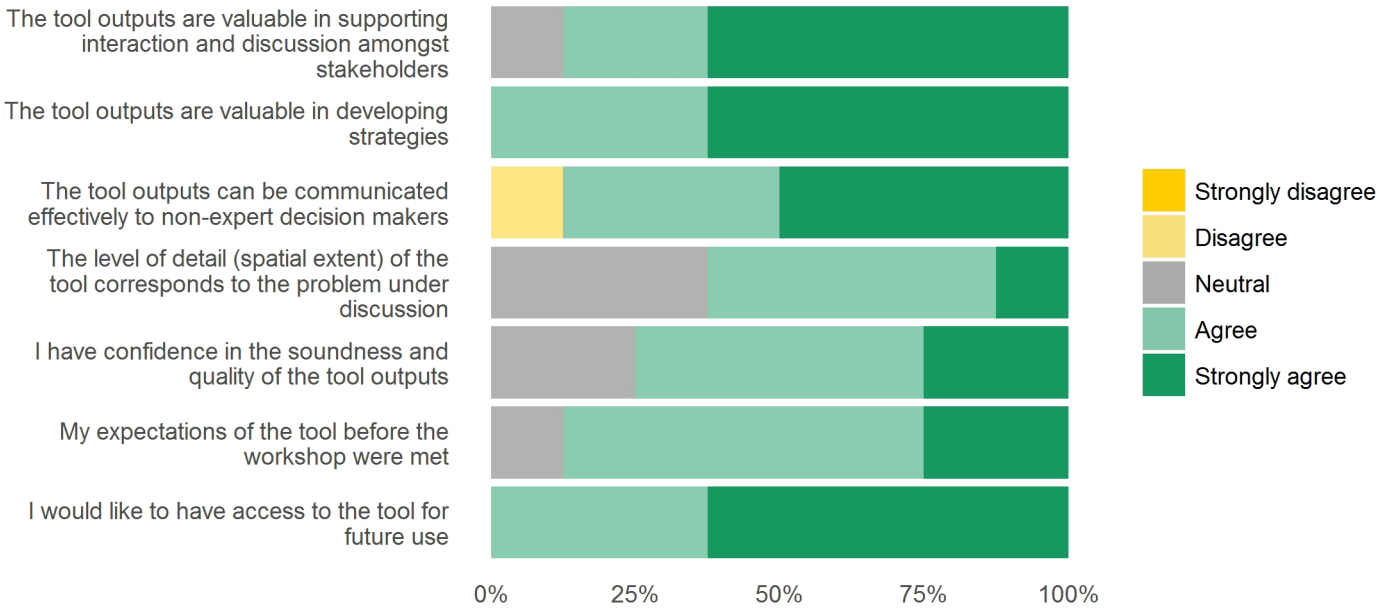
UIRS Accessibility Atlas

Simon Koblar (Urban Planning Institute of the Republic of Slovenia)

USER-FRIENDLINESS



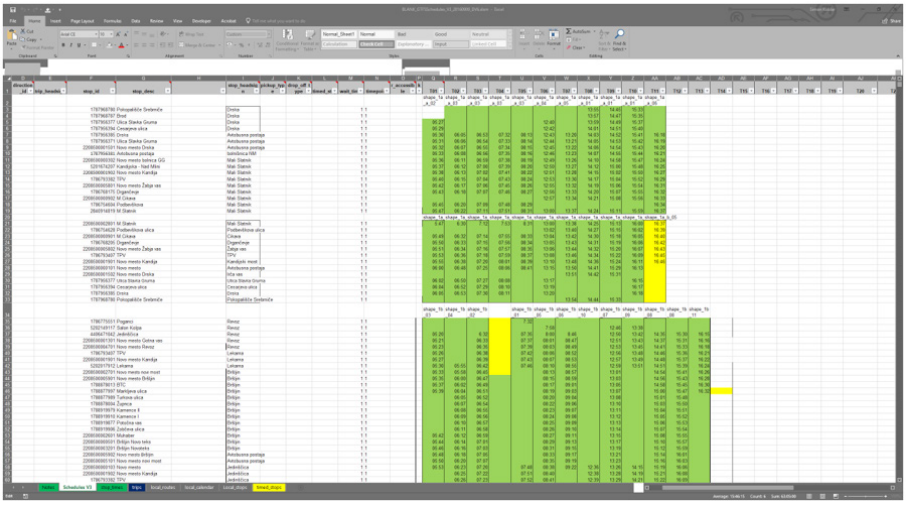
USEFULNESS



ASTUS TOOLS

Google Maps – GTFS Timetables

Simon Koblar (Urban Planning Institute of the Republic of Slovenia)



In order to publish public transport schedules on Google Maps, timetables need to be prepared in an appropriate strucure, the GTFS format.

Publishing transit information enables users to plan their trips using the Google Maps website or smartphone app.

PLANNING APPROACHES

Intended user group:	*GTFS tools: Public transport operators, Municipalities* *Google Maps: General public, (Potential) public transport users*
Tool benefits:	*GTFS tools: Enable easy production of GTFS timetables* *Google Maps: Improve trip planning with public transport*
Main functions:	*GTFS tools: Production of GTFS timetables* *Google Maps: Trip planning using different modes of public transport*
Tool format:	*GTFS tools: Excel spreadsheet and GIS software for timetable creation* *Google Maps: Online tool with mobile app (Android and iOS)*

TOOL FUNCTIONS

Analyzed transport modes:	*Public transport*
Type of output:	*Comparison of alternatives, Map-based results, Trip plans*
Output format:	*Written explanations, Maps*
Spatial unit of detail:	*Municipality, Specific trip, Specific location*
Applicable coverage area:	*Country, Metropolitan area, City, City borough, Neighborhood, Specific address*

TOOL UTILIZATION

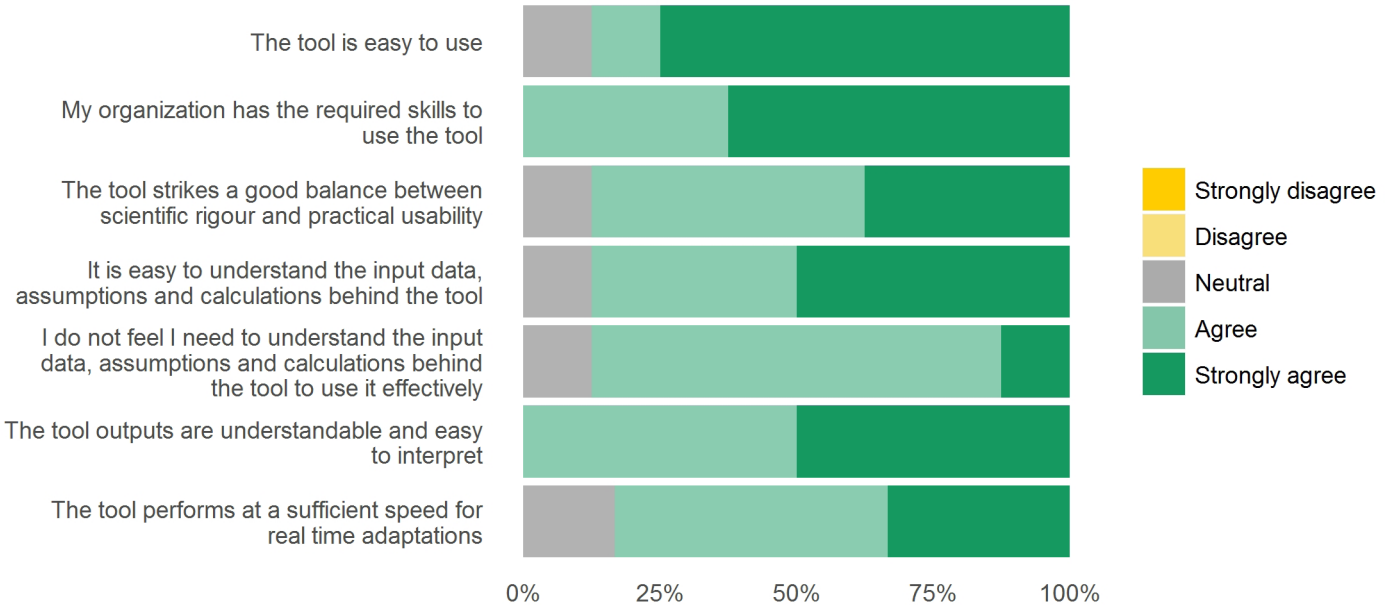
Required skills:	*Manipulating and generating GTFS files: Special skills in GIS and database management required, Google Maps: Easy to use*
Required hardware, software and operating system:	*GTFS tools: Excel and GIS software for generating GTFS timetables* *Google Maps: Internet browser or app*
Required input data:	*Public transport timetables in any format to generate GTFS timetables*

EVALUATION OF THE TOOL WITH THE FINAL USER

Google Maps – GTFS Timetables

Simon Koblar (Urban Planning Institute of the Republic of Slovenia)

USER-FRIENDLINESS



USEFULNESS