Installation instructions for MARS – ANIMAP

File name: Installation instructions for MARS_v0.doc

Date: Thursday, December 13, 2007

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1 System requirements

- 1) Normal standard PC
- 2) Operating System Windows NT, XP or higher
- 3) Optional 2 screens

To run the MARS – AniMap SW following SW components have to be installed on the PC

- 1) VENSIM Model reader SW
- 2) Microsoft Explorer
- 3) SVG software (Vector Graphic add in for Microsoft Explorer

All these components are free downloadable from the Internet or from our Homepage (<u>www.ivv.tuwien.ac.at</u>).

2 Installation steps

- 1) Download of Vensim Model Reader link: <u>http://www.vensim.com/freedownload.html</u>
- 2) Installation of Vensim Model reader
- 3) Download of SVG SW link: <u>http://www.ivv.tuwien.ac.at/uploads/media/SVGView.exe</u>
- 4) Installation of SVG SW
- 5) Download of the MARS-FS-zip file link: <u>http://128.130.97.5/cms/fileadmin/mediapool-verkehrsplanung/Diverse/Forschung/MARS/Downloads/MARS-FS-Leeds-v7.zip</u>
- 6) Extraction of all files in the zip-file to a folder here it is important that the folder structure remains the same as it is stored in the zip file.

3 How to use MARS – AniMap

3.1 What is MARS

The MARS FS application is designed to support decision makers to assess case study specific transport and land use strategies. The MARS FS is a simple to use push button interface for the MARS land use transport model. The application uses a set of commands to give users simplified access to the model. To the user, the MARS FS appears as a series of buttons, menus, or a sequence of screens allowing him or her to use and analyze the MARS model in a straightforward and meaningful way. Decision makers can themselves tryout their policies and see the consequences immediately. To navigate through MARS FS you have to operate the appropriate buttons, just like in any other Windows[®] application.

3.2 Using MARS-FS

Start of the model reader SW in the Windows "Start" \rightarrow "Programs" \rightarrow "VENSIM" \rightarrow " VENSIM Model Reader"

In the Model Reader click on "File" and select "open" – Select file MARS-FS-city name-version number.vpa" – press enter.

The VENSIM Model Reader opens the model; the model opens also 2 EXCEL files which contain case study specific data. It is possible to look which input data are defined for the case study. To set up the system expect 30 seconds loading time.

Attention: data can be altered in the EXCEL files to define new scenarios, it must be mentioned that this should only be done by experienced MARS users.

Vensim Application Environment _ & × 1 MARS **Metropolitan Activity Relocation Simulator** LEEDS Case Study Software provided under Copyright 2007 license from Ventana Systems, Inc. **Institute for Transport** Copyright 1988-2003 Planning and Traffic Ventana Systems, Inc. ALL Engineering RIGHTS RESERVED. Vienna University of Technology Press any key to continue

The following screen appears (LEEDS Case study) – Introduction screen.

Figure 1: MARS-FS introduction screen

By pressing any button the following screen appears:

| ↓ Vensim Application Environment | MARS | _ax |
|----------------------------------|------------------------|-----|
| | Main Menu | |
| | Review Model Structure | |
| | Simulate the Model | |
| | HELP | |
| • | Exit | |

Figure 2: MARS-FS main menu

Here the user can choose either to

- 1) review the model structure
- 2) simulate the model, or
- 3) read the help text

3.3 Read the help text

Self explaining

3.4 Review Model structure

The button "Review Model Structure" leads the user to a section of MARS FS where he can explore the model inherent cause-effect relations. To be able to do so two different ways are offered:

a) View mode

The model is split up into different views, which in turn depict specific thematic issues within the land use transport system. To review the model structure with the MARS FS application, you can go through every single view, and zoom in and out as necessary.



Figure 3: MARS-FS model structure

b) Causes Tree mode

Another way to review the relationships between the model variables is to use the Causes Tree function. Here a tree-type graphical representation is created showing the causes of the chosen model variable. By clicking on a variable name, the causes tree can be expanded until the final cause is reached.



Figure 4: MARS-FS Causes tree view

3.5 Simulate the model

When selecting "Simulate the Model" a window opens where all implemented policy instruments are shown.

The policy instruments are case study dependent- in Figure 5 the in the Leeds case study available policy instruments are shown - in total there are 19 different policy instruments.

There are different policies for each mode implemented within the MARS model and can be simulated using the MARS FS – The following list will give you an Idea what is possible to test within MARS (attention - the list is not comprehensive and is case study depending):

Slow Modes

If you think of implementing pedestrian zones or bicycle lanes; you can input how much of the zone will be pedestrianized. This will also lengthen the distance to or from the parking place.

Public Transport

Decrease or increase bus speeds, bus fares or the bus frequency.

Charge cars and motorcycles if they enter the cordon, change taxes and costs of a car purchase, offer cars more or less infrastructure, which has influence on the speed, change the fees for car parking and change the prices for fuel.

As soon as the desired policy levers are set, the simulation of the model can be invoked by pressing the "SIMULATE" button.

| 🛓 Vensim Application Environment | | X |
|---|---|--|
| Transport Policies | | |
| Start Value / Start Year — End Value / End Year | Start Value / Start Year — End Value / End Year | Start Value / Start Year — End Value / End Year |
| Public Transport | Rail -50 Rail Fares peak +100 [%] -50 Rail Fares opeak +100 [%] -50 Rail Fares opeak +100 [%] -50 Rail Freq peak +100 [%] | Car <u>0</u> <u>5</u> <u>0</u> <u>30</u> -20 Change Capacity +20 [%] <u>0</u> <u>5</u> <u>0</u> <u>30</u> +0 Rise Parking fees (City) peak +20 [Euro] +0 Rise Parking fees (City) off peak +20 [Euro] |
| -50 Change Bus Fares peak +50 [%] 0 30 -50 Change Bus Fares opeak +50 [%] 0 -50 Change Bus Freq peak +100[%] | -50 Rail Freq opeak +100 [%] Car 10 5 0 30 +0 Cordon charges peak +20 [Euro] | Tele Work 5 60 Ø +0 Tele Work +100 [%] 60 |
| 0 5 0 30 -50 Change Bus Freq off peak +100 [%] 0 5 0 30 -30 Change Bus Quality +30[cents] | 0 5 0 30 +0 Cordon charges off peak +20 [Euro] 0 5 0 30 -50 Fuel Tax +300 [%] | HELP Policy Graph |
| Clear Runs | SIMULATE | Main Menu |

Figure 5: MARS-FS policy setup screen

The structure to in put a policy instrument is always the same – as shown here for the policy instrument "Tele Work" (left column).

A user can define the start value (= percentage change) of the share of tele-workers for a start year by dragging the slider to the desired value or by keying in a numeric value in the box below the slider tool. Additional an user can define a start year in which the policy instrument start to work by keying in a value in the box on the right hand side of the slider tool.

The same can be done for an end year in which the policy instruments stays constant for the rest of the simulation time.

Car

Figure 6: MARS-FS policy input slider tool

A typical policy profile looks like

Figure 7: MARS-FS policy profile view

This graphic can be obtained by clicking on the "Policy Graph" Button. It shows the tele-working policy profile where till year 5 the share of tele-workers is 0, in year five the share goes up to 10% and increases till the end year 20 to 60% and stays then constant for the rest of the simulation.

The user can define any combination of policy instruments. After finishing this process the user has to click on the "SIMULATE" button and the simulation starts. In the case the run already exists, the user will be asked either to overwrite the existing run or to create a new one. The user should name the run in that way that he later can remember which policy combination he has tested. Important is here that the user should not override the "Do-Nothing" run since this run is used to compare the new created run with the Do-Nothing scenario.

The duration of the simulation depends on the computer system and will be somewhere around 45 seconds. After the simulation is finished a dialog window pops up and asks the user if he wants to create an AniMap output file. By clicking the "yes"-button or after some seconds the AniMap input file will be created and stored in the right subdirectory (...\AniMapMARS\Leeds\anidata\runname.js).

After the simulation is finished the user can navigate through the different output windows to explore the behavior of the model over time regarding the tested policy combination. Several output windows are available, where the development of different indicators over time is shown. All these graphs or tables can be copied into the clipboard by clicking the "Export to Clipboard" button and can so imported in any other application (such as Word, Excel, etc...).

Since it is not possible to prepare pre defined graphs for all model variables a special tool is implemented within the MARS-FS software. This tool allows the user to select any variable used within the model and to display the development of these variables over time, either as a graph or as a table. This feature also enables the user to display and export information for a certain range of zones, for specific modes, or for specific trip purposes, etc.

Figure 8: MARS-FS Individual output screen tool

By pressing the button "Return to Main Menu" a new simulation can be set up.

4 AniMap

AniMap is a piece of software which can be used to view movies regarding the spatial development of certain indicators over time.

To start AniMap the user has to double click on the file "Index.html" which is located in the directory ..\AniMapMARS\casestudyname, in our case ..\AniMapMARS\Leeds. By doing this normally the Windows Explorer should open and load the AniMap SW. Important is here that the security setting of the explorer must be set in that way that ActiveX controls can be executed.

By ticking all the checkboxes below "show" on the right hand menu three graphs of the case study area are displayed. By pressing the "step+" – button it is possible to move forward in time year by year. By pressing the "run+" button the development over time for the selected variables is shown as a movie. By double clicking on any zone in the map a detailed list for this specific zone can be obtained.

Figure 9: AniMap 3 variables output view

By clicking on the "Load" tab a second run can be loaded into the system to carry out comparisons. In our case the run teleworker was loaded and a comparison of the model split figures between these two runs (Do-Nothing versus Teleworker) was carried out.

Figure 10: AniMap comparison mode

As it can be seen at the moment 7 different indicators can be compared (residents, worplaces service sector, workplaces production sector, modal split car, modal split public transport bus, modal split slow and modal split public transport rail).

In future a bigger set of indicators can be displayed.