

Short tutorial to DelftOD Version 2.0

Nanne J. van der Zijpp

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Delft University of Technology
Faculty of Civil Engineering and Geosciences
Transportation Planning and Traffic Engineering Section

Address: P.O. Box 5048
2600 GA Delft
The Netherlands
Tel: +31 15 2785485
Mail: zijpp@ct.tudelft.nl

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This tutorial will guide you through the most important steps of the DelftOD software. It will show you of which graphical interfaces DelftOD consists and enable you to perform an estimation of a Dynamic Origin Destination matrix for an example network.

The tutorial consists of the next steps:

Step 1: Install the software:

- ◆ Download the software from the web site www.trail.tudelft.nl/verkeerskunde/research/delftod
- ◆ Run install.exe.
- ◆ The DelftOD icon should now be visible on your desktop (Figure 1).



Figure 1: *DelftOD icon: by clicking on it the program will start.*

Step 2: Activate DelftOD:

- ◆ Activate the program by clicking on its icon (Figure 1).
- ◆ The main window will now be visible (Figure 2).

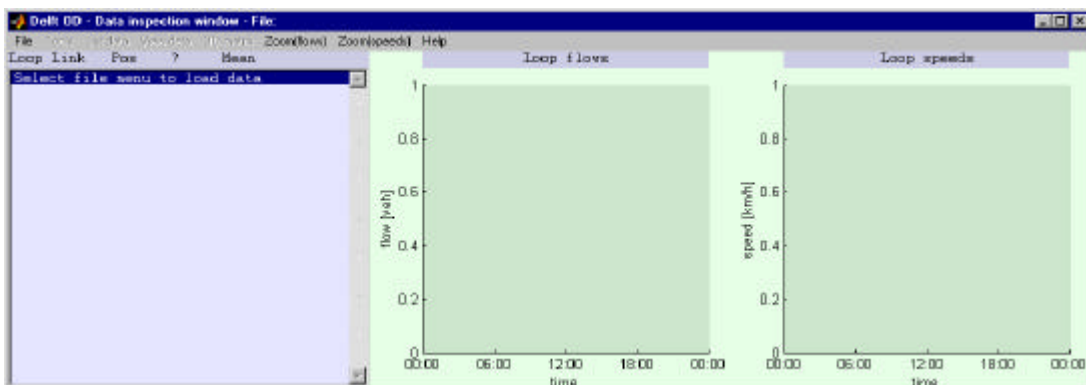


Figure 2: *Main window of the DelftOD software visible after activating the program.*

Step 3: Read the example data:

- ◆ Click on “Read network file” from “File” menu.
- ◆ Select a file with extension “.nw”.
- ◆ Save the network data in a binary file.
- ◆ The main window after loading the input data is shown in Figure 3. The flow data and the speed data for each loop are plotted and plots can be zoomed in by clicking on the plot or by using the “Zoom” menu.

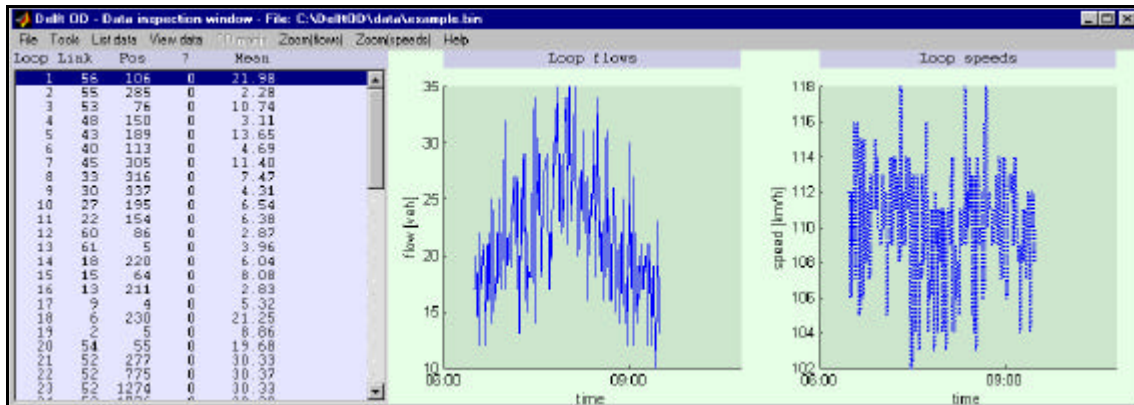


Figure 3: Main window of the DelftOD software after loading input data.

Step 3a: View the example data:

- ◆ Click on the menu “List data” to have a list of network data such as nodes, links, origins, destinations and loop detectors.

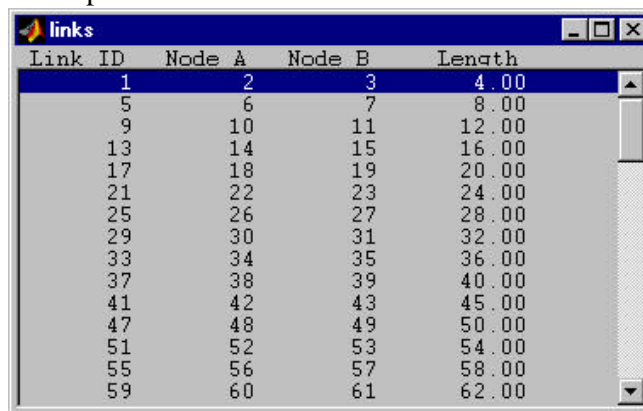


Figure 4: Display network data

Step 3b: Show a graphical image of the network / select loop detector by clicking on the network:

- ◆ Click on “Show network” from the “View data” menu to obtain a plot of the network of the study area.
 - Click on links of the network to select them (Figure 5).
 - Click on the network with the left mouse button depressed zooms in the network data.

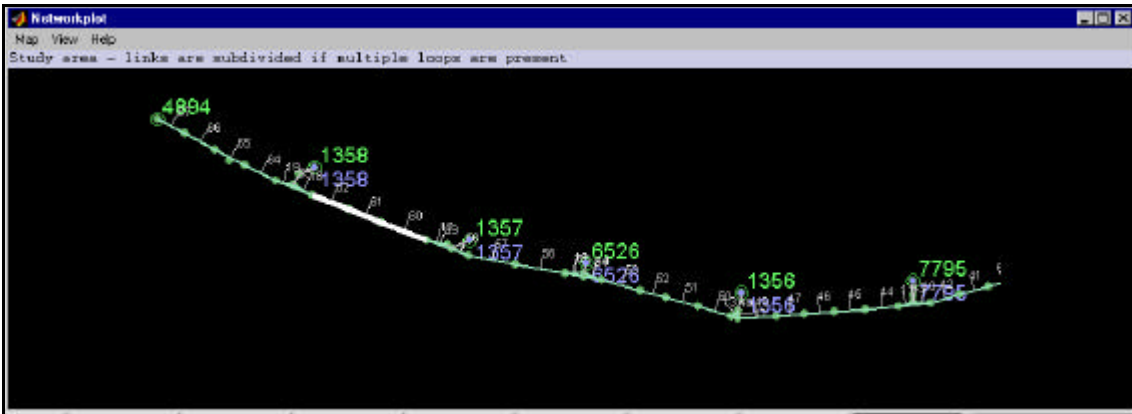



Figure 5: Network data of the study area by selecting the “Show network” from the “View data” menu.

Step 3c: Get context sensitive help:

- ◆ More information about any displayed data can be obtained by selecting the “? Context sensitive help” from the menu “Help” and click on any element of the interface.
- The help window can be deleted by clicking the  icon that is displayed in the left corner of the window.

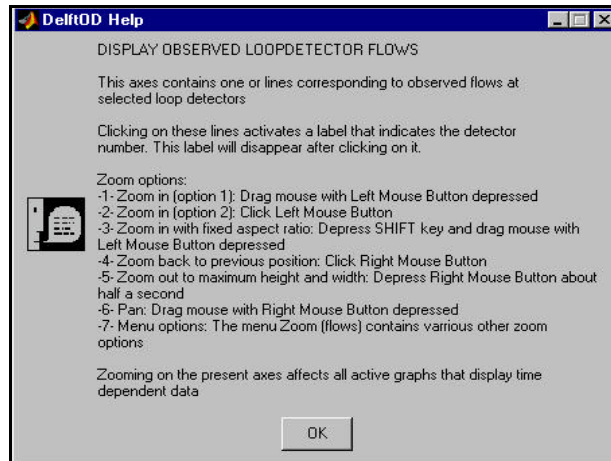


Figure 6: Context sensitive help window.

Step 3d: Plot the flows on the network:

- ◆ Click on “Show flows on the network” from the “View data” menu to visualise the flows on the network see Figure 7. Try the following:
 - Set the “Aggregate” field to 5 to aggregate the data for an aggregation factor of 5 periods.
 - Select the periods from 7:10 to 8:10 to aggregate and display the data over this period.
 - Click on the yellow polygonal with the left mouse button to show the value of the aggregated flows.
 - Click on the “Movie” button to display the time dependent flow data as a movie until the “Stop Movie” button is clicked.

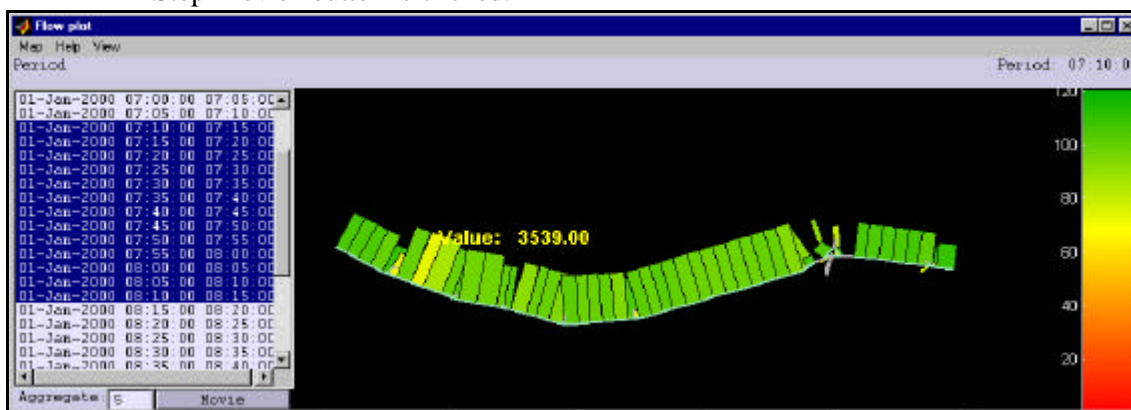


Figure 7: Flow data of the network by selecting the “Show network” from the “View data” menu.

Step 3e: Show a contour plot of speeds and flows

- ◆ Click on “Show space-time representation of speeds and flows” from the “View data” menu to obtain the space-time diagram for the link speeds (Figure 8).

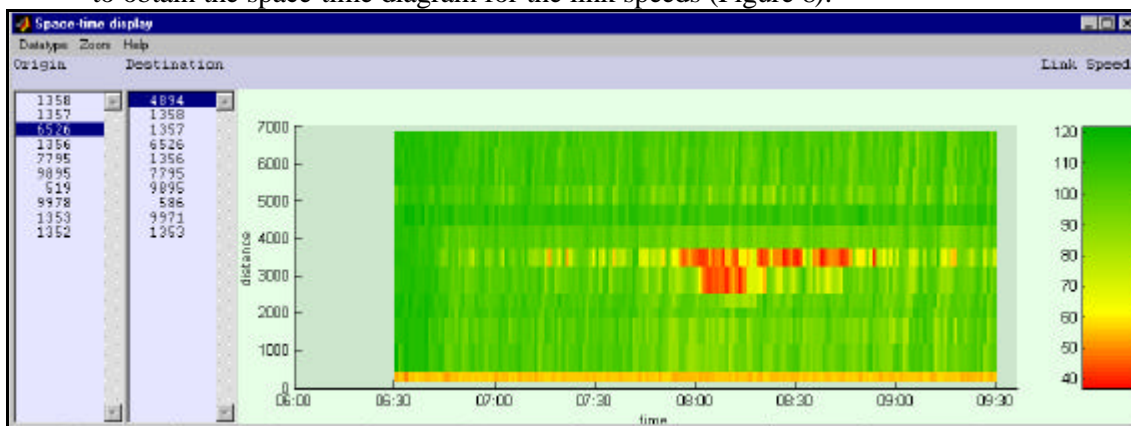


Figure 8: Space-time diagram for the link speeds.

Step 4: Perform the travel time estimation (synchronise data):

- ◆ Click on the “Synchronise data” from the “Tools” menu.
- ◆ Select the desired aggregation level (e.g. 5 minutes), the travel times will be computed and shown in the main window (see Figure 9).
- ◆ The data will be aggregated and saved in a new file

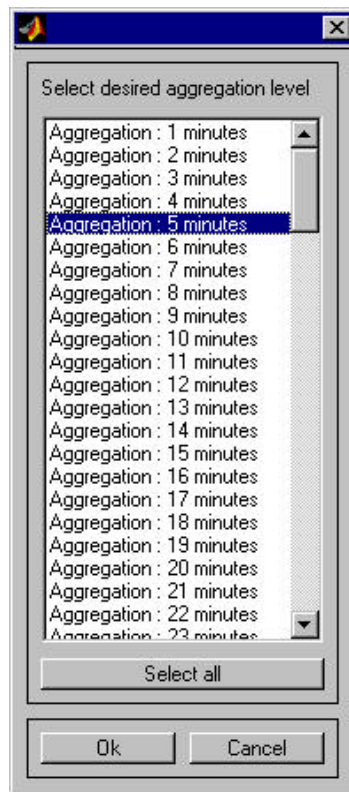


Figure 9: *Select the required aggregation level when synchronising the data*

Step 4a: Inspect the travel delays that have been computed

- ◆ Click on “Show shifts” from the “View data” menu to show a plot of the travel time to each loop detector as a function of departure (or arrival) at the pivot loop (Figure 10).

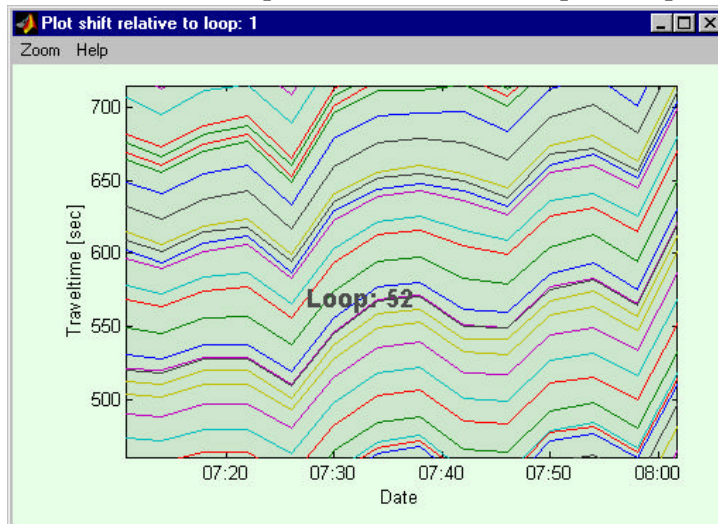


Figure 10: *Show the computed travel times*

Step 5: Perform the estimation of the O/D matrix:

- ◆ Click on “Estimate OD matrix” from the “Tools” menu.
- ◆ Specify an estimation option (a file with extension “.opt”).
- ◆ Specify a file name (with extension “.res”) for storing the results of the estimation.
- ◆ The O/D estimation will be performed and a waiting window will show its progress. At the end of the estimation process the results are shown in the main window.

Step 5a: Check how well the estimated O/D matrix fits the observed flows:

- ◆ Select from the menu “OD matrix”:
 - Click on “Plot estimated versus observed flows”. The interface shown in Figure 11 will be visible and the estimated flows are plotted versus the observed flows for all selected periods. By clicking on the plotted points the loop number will be shown.

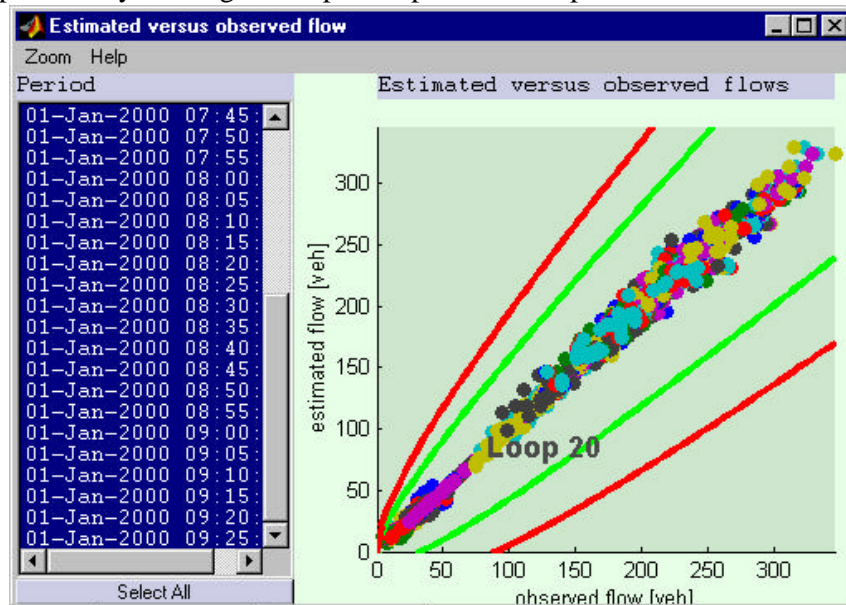


Figure 11: Plot of the estimated flow versus the observed flow for all periods.

Step 6: Perform the inverse travel time estimation (de-synchronise data):

- ◆ Click on “De-synchronise data” from the “Tools” menu.
- ◆ Specify a file name (with extension “.des”) for storing the results of the desynchronised estimation.
- ◆ The desynchronised dataset will be shown in the main window.

Step 6a: Plot the O/D flows as a function of time:

- ◆ Select “Plot OD flows and OD splits” from the menu “OD matrix”. This activates the interface shown in Figure 12. The cumulative O/D splits are plotted from a given origin (e.g. 7795) to its destinations. By clicking on the plotted lines the O/D pair will be shown.
 - Experiment with the menu options ‘Datatype’ and ‘Graphtype’.

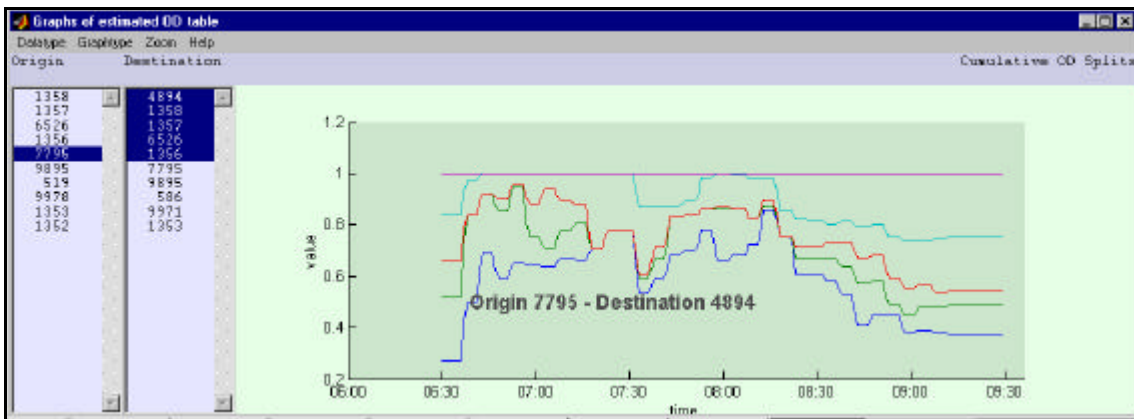


Figure 12: Plot of O/D flow and split proportions.

Step 6b: Plot the O/D flows on a map:

- ◆ Select “Plot O/D flows and O/D splits on map” from the menu “O/D matrix”. This activates the interface shown in Figure 13. You can try the following:
 - Experiment with the menu options ‘Datatype’, ‘Show’ and ‘Map’
 - Select different periods
 - Change the aggregation factor
 - Select different origins
 - Click on the polygons to display their exact value
 - Try the ‘Movie’ button (make sure you aggregate the data first, otherwise the movie will take a long time to process)

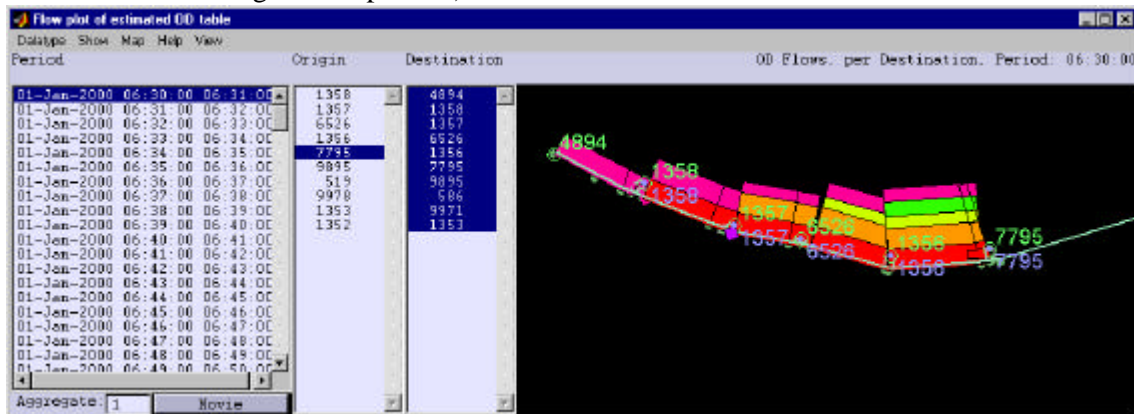


Figure 13: Plot O/D flows on the map

Step 6c: Plot the O/D flows in a pie diagram:

- ◆ Select “Plot OD flows and OD splits” from the menu “OD matrix”. This activates the interface shown in Figure 14. The OD matrix will be plotted as a pie diagram for the selected periods, origins and destinations . You can try the following:
 - Experiment with the menu options ‘Datatype’, ‘Show’ and ‘Map’
 - Select different periods
 - Change the aggregation factor
 - Select different origins
 - Try the ‘Movie’ button (make sure you aggregate the data first, otherwise the movie will take a long time to process)

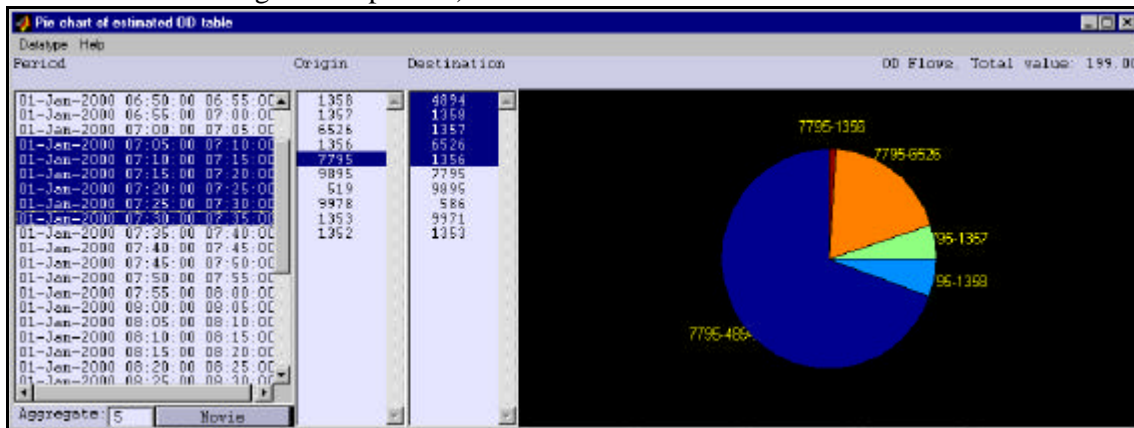


Figure 14: Pie chart of O/D flow and split proportions for the selected periods.

Step 6d: Export the estimated O/D flows:

- ◆ Select “Export OD-flows and splits” from the menu “OD matrix”. This activates the interface shown in Figure 16. From this interface it is possible to save the estimated OD matrix in different formats. Try the following:
 - Aggregate over multiple periods by selecting them in the period list.
 - Change the datatype from ‘flows’ to ‘splits’ and back
 - Change the dataformat from matrix to table and back
 - Print the selected periods, and the view the resulting file.
 - Print all periods, and the view the resulting file.

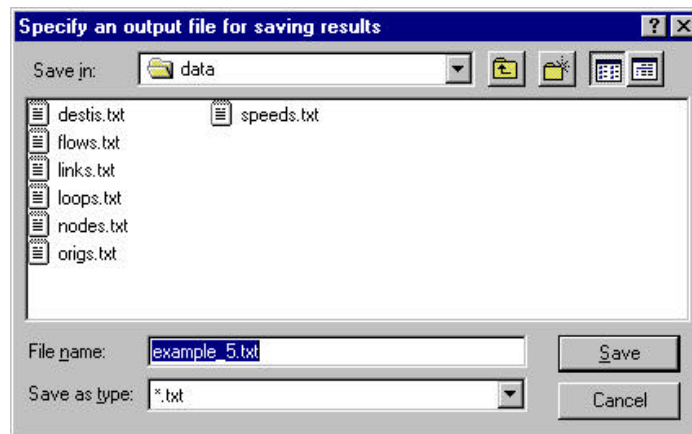


Figure 15: Specify a filename for saving the ASCII output.

Period	DATE	START	END	FROM	TO										
01-Jan-2000	06:30:00	06:35:00				4894	1358	1357	6526	1356	7795	9995	586	9471	
01-Jan-2000	06:35:00	06:40:00		20000101	71000	1358	551	0	0	0	0	0	0	0	0
01-Jan-2000	06:40:00	06:45:00		20000101	71000	80500	1357	52	268	0	0	0	0	0	0
01-Jan-2000	06:45:00	06:50:00		20000101	71000	80500	6526	54	285	153	0	0	0	0	0
01-Jan-2000	06:50:00	06:55:00		20000101	71000	80500	1356	4	64	0	176	0	0	0	0
01-Jan-2000	06:55:00	07:00:00		20000101	71000	80500	7795	252	35	6	56	15	0	0	0
01-Jan-2000	07:00:00	07:05:00		20000101	71000	80500	9895	38	8	0	77	132	2	0	0
01-Jan-2000	07:05:00	07:10:00		20000101	71000	80500	519	263	311	1	8	0	112	23	0
01-Jan-2000	07:10:00	07:15:00		20000101	71000	80500	9978	19	31	0	0	3	249	382	0
01-Jan-2000	07:15:00	07:20:00		20000101	71000	80500	1353	234	261	2	44	11	16	2	112
01-Jan-2000	07:20:00	07:25:00		20000101	71000	80500	1352	766	106	0	0	15	33	67	116

Figure 16: O/D table from each origin and destination pair and for all selected periods.