

Flowmap Support Manual – Jan 2024 - Version 10.7

Contents

- Installation Procedure Support..... 3
- Known Errors during Installation 3
- Running Flowmap 3
 - How to get past the Windows Defender 3
 - Locating the Flowmap App on your machine 3
 - Using the mouse to move a Flowmap window inadvertently ‘clears’ the window..... 3
- Compatibility with older Flowmap versions 4
- Flowmap Warning & Error Messages 4
 - Bad Connectivity of the network 4
 - Coordinates in this BNA-file might be expressed in Decimal Degrees 5
 - Dissolve process halted due to topological errors..... 6
 - Duplicate coordinates were found 6
 - Eight shapes were split 6
 - Fatal Topological problems when starting a Transport Network based analysis 6
 - Flow File contains duplicate flows 7
 - Flowmap Reprojection Error: Coordinates are out of range 7
 - Full objects were removed..... 8
 - Invalid SQL statement 8
 - Labels that exceeded the maximum length of 32 characters had the excess at the left hand side cut off to fit 8
 - Multipoint Shape File (Type 8) not supported by Flowmap. 8
 - Nodeneighbors were split..... 8
 - Overflow Error 9
 - Possibly one field ([Nr]) too many in file: [Filename] 9
 - Probable Cause: Error in Input Data 9
 - Query too complex 9
 - Records Unmatched when copying fields across tables..... 9
 - Screen dimensions passed on by Windows seem out of order. 9
 - Shape File Type (Types 11/13/15 and 21/23/25) not supported by Flowmap..... 9
- Batch-file processing warnings and errors..... 10

Screen resolution unit in the batch-file differs considerably from the current unit	10
Wrong Data Type in batch-file for Field.....	10
Warning for Possible Topological Errors during Import	10
A Few Topological Errors reported at intersections when importing transport networks	10
Many Topological Errors reported at intersections when importing transport networks.....	10
Many Topological Errors reported at intermediate points when importing transport networks.....	11
Conversion Problems	12
Non-existent connections showing up when visualizing a network file	12
Otherwise.....	13

Installation Procedure Support

1. Download the latest installation dataset from this Flowmap website
2. Unzip and run setup.exe
3. Click the windows button on the taskbar and type Flowmap
4. Either Left Click the Flowmap App to run directly
5. or Right Click the Flowmap App and add it to your desktop or taskbar or Start menu for easy access

Note: in case you wonder where Windows put the Flowmap App simply go Project / New Project; the full path to the Flowmap App now shows up as the default workspace.

Known Errors during Installation

“Font Arial Narrow missing”. Additional installation needed: See <https://docs.microsoft.com/typography/font-list/arial-narrow> and follow the installation instructions

Running Flowmap

How to get past the Windows Defender

Sometimes after the installation got corrupted the Windows Defender may pop up, to continue first click ‘more info’ (expect the Publisher to be set to Unknown) and then ‘Run Anyway’. In case nothing happens it is time to uninstall/reinstall the Flowmap App.

Locating the Flowmap App on your machine

To find out in what folder the Flowmap App was put during installation click the ‘Start’ button and start typing Flowmap until the full App name is recognized by Windows. Click that name to start Flowmap and chose option Projects / New Project. In the Workspace box you will find the full path to where the App is situated. The App itself is named FlowmapX1.exe where the X1 represents windows 10 version 1.

Using the mouse to move a Flowmap window inadvertently ‘clears’ the window

This only happens with maximized windows (full screen). The mouse click on the window border triggers a resize event in windows, that in turn causes Flowmap to ‘Clear’ the window as it has no automatic redraw functionality

Workarounds: See Views | Clear Screen in the “FAQ” Section

Compatibility with older Flowmap versions

The new Flowmap X1 version can handle all data and log files created with Flowmap 7.4.2. But:

- the default database has been changed from “dBASE III” to “dBASE IV” to accommodate larger datasets. In the rare case that you encounter DBEngine errors when using older data sets of type ‘DBF’, it is recommended to change the default database to “dBASE III” before addressing any of these files. The default database is set in the ‘Project Section’ of the log files or can be changed by using the ‘Option’ button at the bottom of the ‘Project Window’.
- data and log files created with older (before 2012) versions than Flowmap 7.4.2 are no longer automatically updated
- distance tables of version 7 (see first two lines of the matching text file *.010) must be manually updated). In case your origin file is ORIGIN01.DBF and your destination file is DESTIN01.DBF and they are sitting in folder C:\FMDATA then you can simply append the 10 lines below to the bottom of that 010 file using any text editor. Adjust the file and folder names to match your data.
originfile\$
C:\FMDATA\ORIGIN01.DBF
rowfile\$
ORIGIN01.DBF
destinationfile\$
C:\FMDATA\DESTIN01.DBF
colfile\$
DESTIN01.DBF
version
7.32
- Moss type files can no longer be Imported or Exported.
- Background Bitmaps and Activation Assistant were let go.

Flowmap Warning & Error Messages

Bad Connectivity of the network

When creating a distance table, a warning may appear stating that the distance for a certain number of origin to destination combinations could not be calculated due to bad connectivity of the network.



WARNING: For 14 origin destination combinations the distance could NOT be calculated due to bad connectivity of the network. This is likely to affect any further analysis

This is a serious problem that should be addressed before continuing. Most likely some origins or destinations are situated closest to unconnected (or inaccessible due to one way streets) parts of the network. To identify the problematic locations only, use ‘Conversions | Flowmap | Flowmap Distance Table -> CSV’ and restrict the output to negative distances only:

Cut-off range definition

Low-end cut-off value:

High-end cut-off value:

A negative distance (-11) represents a missing connection. The resulting CSV table matching the above warning:

```
File Type: Comma-separated values file
Distance,Origin,Destination
-11,"KTC INFORMAL","George Hospital"
-11,"KTC INFORMAL","Groote Schuur Hospital"
-11,"KTC INFORMAL","New Somerset Hospital"
-11,"KTC INFORMAL","Paarl Hospital"
-11,"KTC INFORMAL","Red Cross War Memorial Children"
-11,"KTC INFORMAL","Tygerberg Hospital"
-11,"KTC INFORMAL","Worcester Hospital"
-11,"NYANGA JUNCTION","George Hospital"
-11,"NYANGA JUNCTION","Groote Schuur Hospital"
-11,"NYANGA JUNCTION","New Somerset Hospital"
-11,"NYANGA JUNCTION","Paarl Hospital"
-11,"NYANGA JUNCTION","Red Cross War Memorial Children"
-11,"NYANGA JUNCTION","Tygerberg Hospital"
-11,"NYANGA JUNCTION","Worcester Hospital"
```

With only 7 different destinations it is clear that two origins named “KTC INFORMAL” and “NYANGA JUNCTION” must be situated closest to a poorly connected part of the network due to “oneway” street restrictions that make it impossible to travel towards any hospital from these locations. In case of totally unconnected network parts the same two names would have also popped up in the ‘Destination’ column. Failing that, these two origins can apparently be reached in the opposite direction (from the hospitals instead of towards the hospitals), hence the cause must be a directionality issue in the network that leads to poor connectivity. To identify the precise problem location, select the origin locations one by one in combination with a single central destination and apply ‘Transport Network Analysis’. See also the ‘Deactivating unconnected network segments’ chapter under ‘Tips and Tricks’ on the website.

Coordinates in this BNA-file might be expressed in Decimal Degrees

Since most analysis in Flowmap is distance related, it is strongly suggested to use coordinate data with some form of equidistant projection. However, a BNA file contains no meta information so the only way to check the projection is look at the range of the XY coordinates. If at least one X is outside the -180 to +180 range or one Y is outside the -90 to +90 range, then the coordinates are projected (or a digitizing error occurred). Unfortunately, the opposite is not necessarily true; when all coordinates are inside the ranges specified above then the coordinates could be in decimal degrees, but also expressed in a large distance unit like Kilometers or Miles. Please continue processing this data set only when you are sure that a large distance unit is involved.

Dissolve process halted due to topological errors

Most likely caused by slivers in the current Map File. This problem must be fixed outside Flowmap. To this end the XY coordinate location of the probable cause is given. But it is recommended to, before fixing the problem at hand, check the entire map file for more sliver occurrences by drawing the topological hull; any line drawing inside the outer boundary points towards a sliver.

Duplicate coordinates were found

This error may occur when creating Thiessen/Voronoi Polygons based on the point locations from the Origin or Destination file; two or more origins/destination share the same location. This may happen for instance with multilevel address data. In case of identical locations two or more exactly overlapping polygons will result that may cause topological and visualization problems. Choose 'Continue any way' incase these problems are not an issue. All collisions will be registered with labels and coordinates in file "Voronoi_Duplicates.csv", ready for easy display.

Eight shapes were split

See paragraph "Nodeneighbors were split".

Fatal Topological problems when starting a Transport Network based analysis

When using a transport network for transport network analysis, distance table creation, flow assignment to network or the creation of feed-links Flowmap may report:

FlowMap 10.1 Report >

 FlowMap regrets: Topological problem(s) in network file E:\DATA\MAMELODI\IMPORT\ROADS.006

Each error is narrowed down to two or three locations (see below). A line edge beginning or ending in either one of these locations fully or partially retraces itself. Repair these edges manually in your originally imported (Shape) file and reimport the updated file...

Error(s) occur at location:
3158204, -2946707 or 3158203, -2947761
3162066, -2943125 or 3162062, -2943613 or 3162047, -2943623

The best solution approach is to inspect the BNA-file, that matches the involved network file, in a text editor for the multiple occurrence¹ in the same line definition of one of the coordinate pairs mentioned in the error list.

```
"06133", -6  
3162047, -2943623  
3162062, -2943613  
3162090, -2943602  
3162062, -2943613  
3162047, -2943623  
3162005, -2943655
```



In this case line definition "06133" scores a double hit as coordinate pairs 4 and 5 exactly retrace pairs 2 & 1. Retracing in a line definition makes no sense and is also not allowed in a BNA-file definition or rather it leads automatically to skipping any display of retraced sections. So the most likely repair would

¹ Note that the occurrence of the same coordinate pair as first and last pair in a line definition could be correct (and is therefore always treated as such), for instance when defining a turning loop at the end of a dead end street.

be a new line definition in which the retracing coordinate pairs have been removed, but the correct order was retained:

```
"06133", -4  
3162090, -2943602  
3162062, -2943613  
3162047, -2943623  
3162005, -2943655
```

Please note that the header line is the first line in a BNA object definition always containing a primary label between double quotes, possibly a secondary label and finally the number of coordinate pairs that make up the object definition. A positive number indicates a (closed) polygon object and a negative number indicates a (mostly non closed) line object. The negative sign has no further meaning. So as part of the repair also the coordinate counter in the header line must be adjusted, in this case from -6 to -4.

When all errors listed have been repaired this way (or in a regular GIS) the BNA file can be reimported or reconverted first.

Flow File contains duplicate flows

Each record in a Flow File must have a unique origin – destination combination. Duplications may occur when spatial data was aggregated to a higher level.

For instance, at the suburb level shopping flows could be correctly defined as:

```
10,SuburbA,Shop1  
25,SuburbB,Shop1  
15,SuburbA,Shop2  
12,SuburbB,Shop2
```

But when the suburbs are aggregated to the municipal level the flows become:

```
10,Municip1,Shop1  
25,Municip1,Shop1  
15,Municip1,Shop2  
12,Municip1,Shop2
```

This definition contains duplicate origin – destination combinations and is not accepted, but rather should be further aggregated to:

```
35,Municip1,Shop1  
27,Municip1,Shop2
```

Now all origin – destination combinations are unique

Flowmap Reprojection Error: Coordinates are out of range

Flowmap can only project coordinate data (from a Geographic Coordinate System to a Projected Coordinate System) when the source coordinates are expressed in decimal degrees (a.k.a. earth coordinates). So all X-coordinates should be Longitudes on a scale from -180 to +180 and all Y-coordinates should be Latitudes on a scale from -90 to +90. Any X or Y value outside this range will trigger this reprojection error and halt execution. Most likely this BNA file contains XY coordinates that are already projected. If not open a Flowmap Project, make the BNA your Import File and Set the View exclusively to this Import File. The Upper Right and Lower Left Corner Coordinates should give you an idea of what's going on.

Full objects were removed

When cleaning a BNA-file the report may list a number of full objects that were removed. No reason for panic, apart from obvious slivers this most often concerns lines of zero length or polygons of zero size that may remain after some overlay procedure. Or simply be caused by Flowmap using a slightly coarser coordinate precision than your original data source. These 'zero' objects are removed as they serve no useful purpose in any Flowmap analysis.

Invalid SQL statement

Most likely Flowmap tries to open a DBF attribute table that contains more fields/columns than the "Microsoft.Jet.OLEDB.4.0" database driver can handle (255 at max). Reduce the number fields/columns outside Flowmap.

Labels that exceeded the maximum length of 32 characters had the excess at the left hand side cut off to fit

Each spatial object in Flowmap has a unique 'Label' field appointed during the first conversion step. The Maximum Length of that unique 'Label' field was long ago set to 32 characters and still is today to be compliant with older Flowmap datasets. In case a proposed label value exceeds that length the excess part at the left hand side will be chopped off just enough to make it fit. So the rightmost 32 characters should be unique to allow discriminating between objects.

Unique labels are required to copy the relevant attribute data back and forth, so in case the rightmost chopping action does not result in unique values a more suitable unique label field must be chosen or generated in your regular GIS before (re-)starting the conversion. Usually with labels based on names the leftmost part is the most discriminative and with labels based on hierarchical codes the rightmost part is most likely to be unique.

In case data is copied back from the Flowmap attribute table to the Original GIS attribute table and the "LABEL" field is used on the Flowmap side, values of eventual matching fields in the target file will if necessary automatically be adjusted to meet the 32-character requirement. See also "Records Unmatched when copying fields across tables"

Multipoint Shape File (Type 8) not supported by Flowmap.

1. In ArcMap (10.0 or later) start Data Management Tool in ArcToolbox
2. Go to 'Features'
3. Go to 'Multipart To Singlepart'
4. Select Input and Output Files and click 'OK'
5. Import the Output File in Flowmap

Nodeneighbors were split

Nodeneighbors are polygons that touch in single point which is by definition a node. For topological reasons this can't be in a single polygon definition as it would create an "eight" shape. To overcome this problem, the single polygon definition is split in two definitions with the same "LABEL" similar to the handling of island shapes. It does not affect any display or analysis but like with islands make sure that the center point ends up in a workable location.

Overflow Error

When occurring in routine Edge_draw at location 600 most likely the view is set to longitude/latitude coordinates and an attempt is made to display a dataset with projected coordinates (meters/yards). The scaling then results in too small fractions, hence the overflow error.

Possibly one field ([Nr]) too many in file: [Filename]

Attribute tables with extension "DBF" (dBASE IV) can only contain a limited number of data columns / fields. Most likely the indicated number [Nr] exceeds the maximum capacity which also depends on the type of variables stored. Solution: Make a backup copy of current file [Filename]. Use the "Table | Delete Fields" option to remove some fields that are not essential to the Flowmap operation(s) at hand. Rerun the Flowmap operations.

Probable Cause: Error in Input Data

See also Overflow Error

Query too complex

See Invalid SQL statement

Records Unmatched when copying fields across tables

Make sure that source and target file count the same number of records and that the proper key field was selected. See also the "Labels that exceeded the maximum length" paragraph. Note that, unlike in ArcGIS, a difference in data type of the key fields is of no issue when copying fields across tables in Flowmap. But avoid using numeric key fields based on real numbers as the precision shown in the attribute table might differ from the actual precision stored in the database; avoid this problem by copying real numbers to a text field first.

Screen dimensions passed on by Windows seem out of order.

Flowmap expects your screen(s) to be setup in 'landscape' fashion (width > height). Unless your screen is setup in 'portrait' fashion probably a system reboot is in order.

Shape File Type (Types 11/13/15 and 21/23/25) not supported by Flowmap

1. In ArcMap (10.0 or later) start Data Management Tool in ArcToolbox
2. Go to 'Features'
3. Go to 'Copy Features'
4. Select Input and Output Files and go to 'Environments'
5. Go to 'M Values'
6. Set 'Output has M values' to 'Disabled'
7. Go to 'Z Values'
8. Set 'Output has Z values' to 'Disabled'
9. Copy the file and import the copy in Flowmap

Batch-file processing warnings and errors

Screen resolution unit in the batch-file differs considerably from the current unit

In case X or Y offsets have no effect or a too extreme effect you should consider to adjust this unit. The screen resolution unit governs cartographic offsets of symbols and labels that are not expressed in map units (meters etc.) but rather in screen units (pixel etc.). The purpose is to handle differences between screen resolutions like VGA, XVGA, HD & FHD that may occur when the same batch file is applied on a different computer. However, it may give not produce the desired effect in case a (section of a) batch file is somehow applied at a very different map scale, like from municipal to provincial or national. In that case it is advisable to manually replace all screen resolution unit references. A more correct value can easily be found by creating a temporary log files with any label of symbol drawing function.

Wrong Data Type in batch-file for Field

Restricted choice between 'Double' (for any numeric field) or 'Text' (non-numeric fields), try swapping the one for the other.

Warning for Possible Topological Errors during Import

In any case it is suggested to run Edit | Clean first to remove possible duplications of coordinate pairs which may have a special meaning in BNA files.

A Few Topological Errors reported at intersections when importing transport networks

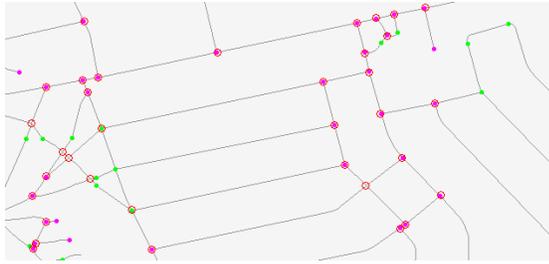
Should the problem persist after the 'Clean' operation and the import file contains line-objects, most likely identical XY coordinate pairs are shared at multilevel crossings. Since coordinate pairs only consist of XY-values without a Z-value these coordinate pairs look the same on the outside. When done, draw the error BNA-file on top of your transport network and check the location:



Flowmap just warns that, although the XY coordinates are identical, these locations will NOT function as an intersection. So in case it indeed concerns a multilevel crossing no action needs to be taken, otherwise check the next two paragraphs.

Many Topological Errors reported at intersections when importing transport networks

Importing transport network files directly harvested from Open Street Map as GeoJSON files may result in many overpass and bypass topological errors as OSM downgrades intersections that will not be explicitly shown as such. When import is done, draw the error BNA-file on top of your transport network. Typical sections containing this problem resemble:



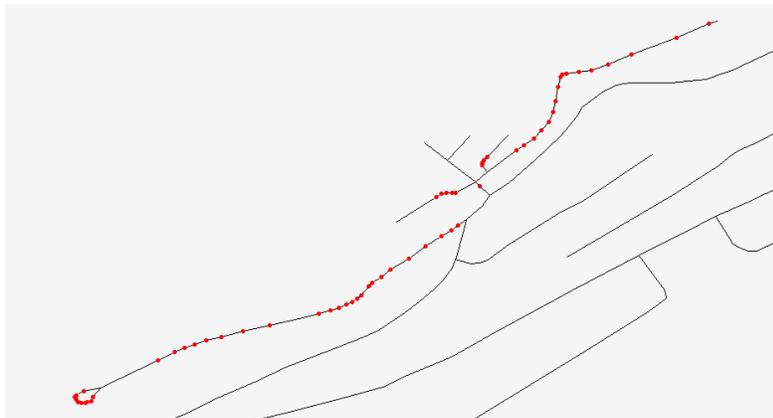
Green dots indicate network nodes intersections where more than one street come together, purple dots indicate so called 'dangling' nodes; start or end point of a single street. The red circles indicate the topological problems that are reported by Flowmap. A circle around a purple dot highlights a bypass error, usually occurs at a T-junction where only one roads stops and the other passes by without stopping at the intersection. An open circle highlights an overpass error, usually occurs at a 4-way intersection in case neither road makes a stop so it effectively becomes a multilevel crossing. Note that all problems occur at intersections (or rather where intersections are supposed to be)

Solution:

1. Flowmap Convert menu: Convert GeoJSON format to BNA format
2. Flowmap Edit menu: Clean BNA file to remove any coordinate duplication
3. Flowmap Edit menu: Split cleaned BNA file to reinstall full node properties at overpass and bypass locations
4. Flowmap Import menu: Import split BNA file to add full network topology

Many Topological Errors reported at intermediate points when importing transport networks

Importing transport network files originating from car navigation sources may result in many topological errors at intermediate points in between intersections. When import is done, draw the error BNA-file on top of your transport network. Typical sections from this problem resemble:



Note that the error points stretch along the full length of the line objects involved, but do not occur at intersections. Cause is likely a difference in topological data model used. Flowmap expects any connection between two intersections/nodes to be a single line/arc with two different attributes that contain the impedance/length/travel time in either direction (with and against the geometric direction). A negative value implies no connections in the involved direction. Car navigation sources may not worry

about redundancy and occurrence of slivers and simply go for a separate line with the geometric direction in each active direction, thereby duplicating each line in case of a two-way street.

Solution:

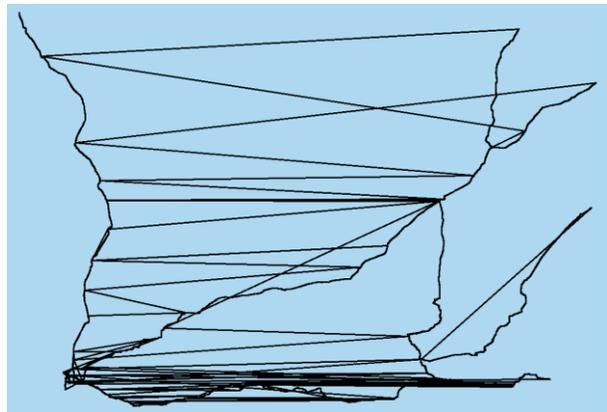
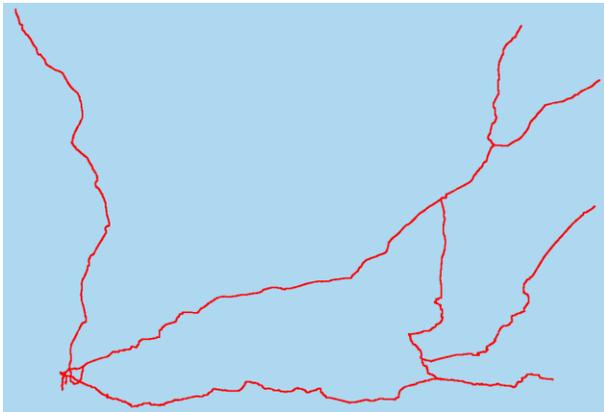
This can't be solved in Flowmap completely but in case matching lines can be identified (for instance when they have the same ID but a negative sign precedes the duplicates in opposite direction) then the dataset must be split two separate shape files outside Flowmap. Remove the negative sign (or equivalent) from the ID in the smaller of the two datasets

1. First import the larger of the two datasets that will contain a single direction of the two way streets and also all one way streets
2. Copy the impedance field(s) across from the larger shape file (IMPAlong))
3. Add (a) second impedance field(s) (IMPback)
4. Add a negative value to all second impedance fields (IMPback)
5. Copy the impedance fields(s) across from the smaller shape file that contains only the other direction of two way streets (IMPtwo-way)
6. Select all line objects that have a positive value for the latest added impedance field (IMPtwo-way)
7. For the selected objects overwrite the negative values in IMPback with the positive values from IMPtwo-way

Conversion Problems

Non-existent connections showing up when visualizing a network file

Your original road map looks in GIS as the picture on the left, but after conversion shows up in Flowmap as the picture on the right.



Solution: Before conversion apply the 'Multipart To Singlepart' tool in GIS to split the network into separate segments.

Otherwise

Before contacting Flowmap HQ please try the following:

1. Make and save a screen dump of the error message.
2. Restart Flowmap
3. Open your most current project (Projects | 1. ---)
4. Open a full log file (Logs | Full Log File)
5. Try to reproduce the problem.

In case you succeed to reproduce the problem please send log file and screen dump to the e-mail address listed in the error message.

In case you can't reproduce the problem close log file and carry on working as usual. But save log file and screen dump in case the problem reoccurs. If so either follow the five steps above again to see if you can now reproduce the problem or simply send us the 'old' log file and screen dumps and mention that it's a reoccurring problem that you can't quickly reproduce.