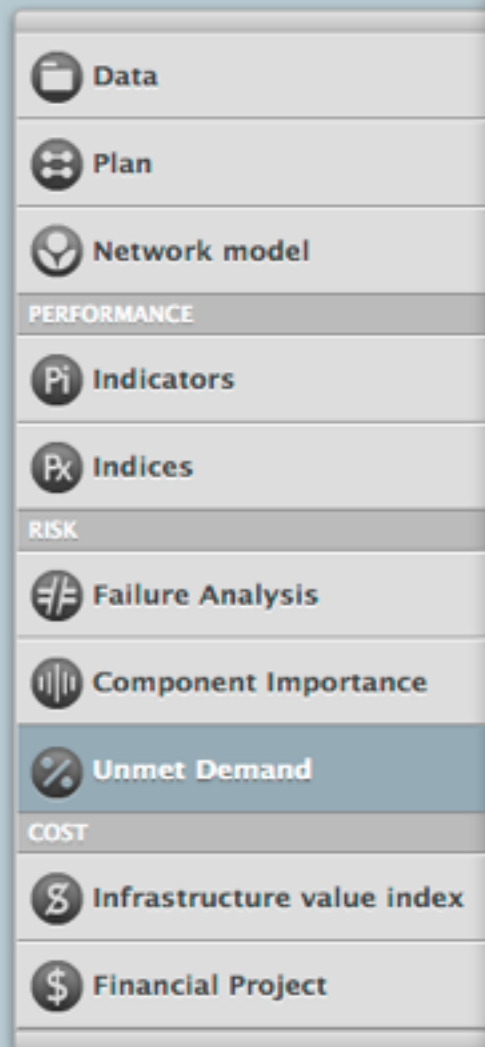




## **Unmet demand**

Quick start guide



Unmet Dema

Tool examples ☒ Search everywhere

i Unmet Demand calculates a service interruption risk metric, expressed as

single user/Example 1/Alternative 0 Statu quo/Alternative 0 Risk



Failure analysis: Pipe Failure analysis  
Component importance: Alternative 0 Comp Imp  
Network: Alternative 0  
Average downtime: 6.0  
Total expected unmet demand: 35.51

single user/Example 1/Alternative 1 (like for like)/Alternative 1 Risk



Failure analysis: Alternative 1 Failure analysis  
Component importance: Alternative 1 Comp Imp  
Network: Alternative 1  
Average downtime: 6.0  
Total expected unmet demand: 22.42

single user/Example 1/Alternative 2/Alternative 2 Risk



Failure analysis: Alternative 2 Failure analysis  
Component importance: Alternative 2 Comp imp  
Network: Alternative 2  
Average downtime: 6.0  
Total expected unmet demand: 20.79



## Unmet demand

Unmet calculates a service interruption risk metric, expressed as the expected volume of demand that the system will be unable to satisfy over one year, caused by the failure of each individual pipe.

The model combines results from Failure Analysis and Component Importance.

Input files required:

- a Failure Analysis file.
- a Component Importance Analysis file for the same network.

## Where to start?

To start an Unmet Demand analysis, click on an existing file from the list, or hit the **Create New** button (top right).

Folder: Tool examples

Tool examples NEW FOLDER

Name	Type	Modified
My component importance example	Component Importance analysis	2014/06/08 1
My network model example.inp	Epanet model	2014/06/08 1
My Failure Analysis example	Failure analysis	2014/06/08 1
Failures database	Failure analysis failure data	2014/06/08 1
Pipes database	Failure analysis pipe data	2014/06/08 1
Financial project example	Financial analysis	2014/06/08 1
Users Manual 1102e.doc	Generic Binary File	2014/06/08 1
photo 3.JPG	Image File	2014/06/08 1
Screen Shot 20140521.png	Image File	2014/06/08 1
My IVI analysis example	IVI analysis	2014/06/08 2
IVI Asset Data sewers full list	IVI asset data	2014/06/08 1

My Component Importance example	Component Importance analysis	2014/06/08 17:14:10	459 rows
My Unmet Demand example	Unmet analysis	2014/06/08 17:14:14	457 rows
My Failure Analysis example	Failure analysis	2014/06/08 17:14:21	11481 rows

My Unmet Demand example Unmet analysis 2014/06/08 1



## A word on file types

Unmet uses its own file type to store the analysis: the **Unmet Analysis** file.

Additionally, it links to a Failure Analysis file and to a Component Importance Analysis file in order to retrieve probability and consequence of failure results for the network under evaluation.

## Dependencies

Each **Unmet analysis** file has a formal **dependency** on the two files mentioned above.

Baseform Core keeps track of file dependencies even when individual files are renamed or moved.



Create a new Unmet Demand file in "Tool ex

**i** To create a new Unmet Demand analysis, type in a file name, and select a Failure Analysis file and [+]

File name

My Unmet Demand example

Failure analysis file

Tool examples

My Failure Analysis example

Component importance file

Tool examples

My component importance example

CREATE



## Start a new analysis

Type a name for your new file.

Then, select a Failure Analysis file:  
navigate to the appropriate folder and  
make sure to click on the desired file .

Next, do the same for the Component  
Importance file.

Press the **Create** button when you are  
ready to proceed.



Summary

Results by pipe

Failure Rates

Component importance

## Simulation

View simulation log

Average  
downtime  (hours)

RUN SIMULATION

File info

Model file

Total expected unmet demand 29.09 m<sup>3</sup> /year

## Running an analysis

In order to run an analysis, it is necessary to specify a value for the average downtime caused by an individual pipe outage. The default value is 6 hours.

Next, press **Run Simulation**.

When the analysis completes, the aggregated network result is shown as the total expected unmet demand, in volume per year.

This is a service interruption metric that can be used to quantify the risk of pipe failure.

**Unmet Demand: My Unmet Demand example**

Summary Results by pipe Failure Rates Component Importance

457 rows (100 per page) 1 2 3 4 5

**Simulation**

View simulation log

Average downtime  (hours)

**RUN SIMULATION**

File info

Model file

**DOWNLOAD XLSX**

Sort by Risk Descending

Pipe ID	Unmet demand/year	Risk
14478	4.2403	1.1%
1111888	2.3367	0.7%
1055057	2.1779	0.6%
1055023	1.7320	0.4%
1055055	1.1302	0.3%
14408	1.0918	0.3%
14400	0.9600	0.3%
1113742	0.6946	0.2%
14522	0.6775	0.2%
1111895	0.6303	0.2%
14479	0.6024	0.2%
14477	0.5235	0.2%
1113120	0.5245	0.1%
1103894	0.5891	0.1%
14402	0.4860	0.1%
1113745	0.4577	0.1%
1113119	0.4671	0.1%
1113749	0.4034	0.1%



## Results by pipe

The **Results by pipe** tab (top) gives access to a full list of pipes and the expected unmet demand associated to each individual pipe's outage, in volume per year.

This is the result of multiplying the pipe's expected number of failures in 1 year, by the average downtime, and by the average

reduced service caused by its failure.

The list can be sorted by any of the columns, using the selector on the right.

The table may be downloaded to an MS<sup>®</sup>Excel<sup>®</sup> spreadsheet format.





Summary

Results by pipe

Failure Rates

Component importance

## Simulation

DOWNLOAD XLSX

View simulation log

Average  
downtime 5.0 (hours)

RUN SIMULATION

File info

Model file

Model	My network model example.inp
Pipes	458
Junctions	568
Simulation	24:00:00 hours
Hydraulic time step	00:15:00 hours
Units	SI

OPEN MODEL



Pipe ID	Unmet demand/year	Risk
14478	4.2403	1.1%
1111888	2.3367	0.7%
1055057	2.1779	0.6%
1055023	1.7320	0.4%
1055055	1.1302	0.3%
14408	1.0918	0.3%
14400	0.9600	0.3%
1113742	0.6946	0.2%
14522	0.6775	0.2%
1111895	0.6303	0.2%
14479	0.6024	0.2%
14477	0.5235	0.2%
1113120	0.5245	0.1%
1103894	0.5891	0.1%
14402	0.4860	0.1%
1113745	0.4577	0.1%
1113119	0.4671	0.1%
1113749	0.4034	0.1%
905055	0.3655	0.1%
14532	0.3762	0.1%
1113748	0.3252	0.1%
1055847	0.3200	0.1%
14291	0.3197	0.1%
14335	0.3127	0.1%
14092	0.3327	0.1%
14403	0.3312	0.1%
1055878	0.2957	0.1%
14383	0.3210	0.1%
14375	0.3024	0.1%
1055857	0.2748	0.1%
14405	0.2616	0.1%
1113962	0.2395	0.1%
1113961	0.2395	0.1%



## Results on a map

The pipe-by-pipe results are also graphically displayed on the map shown in the **Network info** area on the left.

Click on the **Open Model** button to open the model file in the **Network Model** tool.

This makes available the component importance analysis results in a full 2D and 3D mapping visualization environment, alongside all hydraulic analysis results.



Table: My Unmet Demand example

Info Data

Type	Unmet analysis
Name	My Unmet Demand example
Description	
Folder	Tool examples
Owner	single user
Created	2014/05/12 12:38
Modified	2014/05/12 12:38
Size	3 cols. X 457 rows
Depends On	<a href="#">My component importance example</a> <a href="#">My network model example.inp</a> <a href="#">My Failure Analysis example</a>

RENAME MOVE/COPY TO... DUPLICATE AS... DOWNLOAD AS BACKUP DELETE

#### OPEN UNMET DEMAND ANALYSIS

Failure analysis	My Failure Analysis example
Component importance	My component importance example
Network	My network model example.inp
Average downtime	5.0
Total expected unmet demand 29.09	



## Managing your file

Hitting the **Manage File** button in the **File Info** area of any tool brings up the File Info viewer of the **Data Manager**.

Here, a file may be renamed, moved, copied, duplicated or downloaded in a backup format.

If you wish to save your current analysis file with a different name ('Save As'), use the **Duplicate As** option.







For more details and technical background on this or any other tool of the AWARE-P Suite, please refer to [baseform.org](http://baseform.org)

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