Unit 4: The FLOW Conceptual Framework

Module 4.1: Overview

flow
eLearning

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Introduction

Even if they are aware of the socio-economic benefits of walking and cycling, decision makers may be reluctant to implement such measures for fear of increasing congestion. FLOW has developed analysis techniques designed to improve the ability to evaluate these impacts using indicators that address both the *performance* of a transport system and the *impacts* arising from walking and cycling measures.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Socio-economic analysis

This unit serves as an introduction to the FLOW socio-economic analysis (impact assessment), which is based on *three key performance indicators* and *17 impact indicators*. It also explains how modelling fits into the FLOW approach and how the FLOW socio-economic analysis supports decision making.

image: Hodge/Bourke (see youtu.be/YEVaP-W4Vs4: how much space does each mode need?)

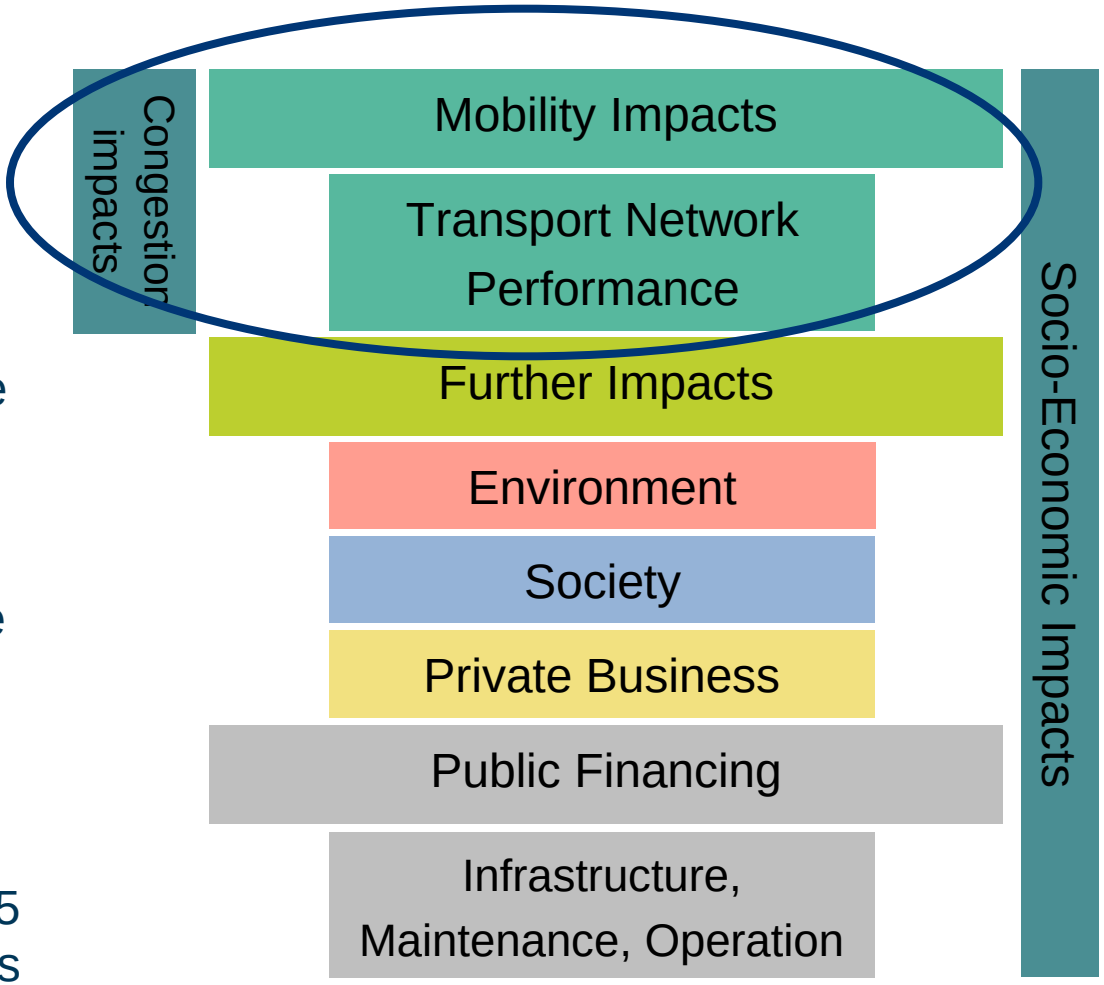
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 636998

Transport network performance

A city should be able to describe the *network performance of its transport system*. Then it can define the status of a junction, segment or corridor as "congested" (or not).

A walking or cycling measure has the potential to offer the direct *mobility benefit* of improving the performance of a city's transport network (or at least keeping congestion stable while improving active mobility).

FLOW has established three key performance indicators to describe transport network performance. Unit 5 provides an explanation of these KPIs and their use.



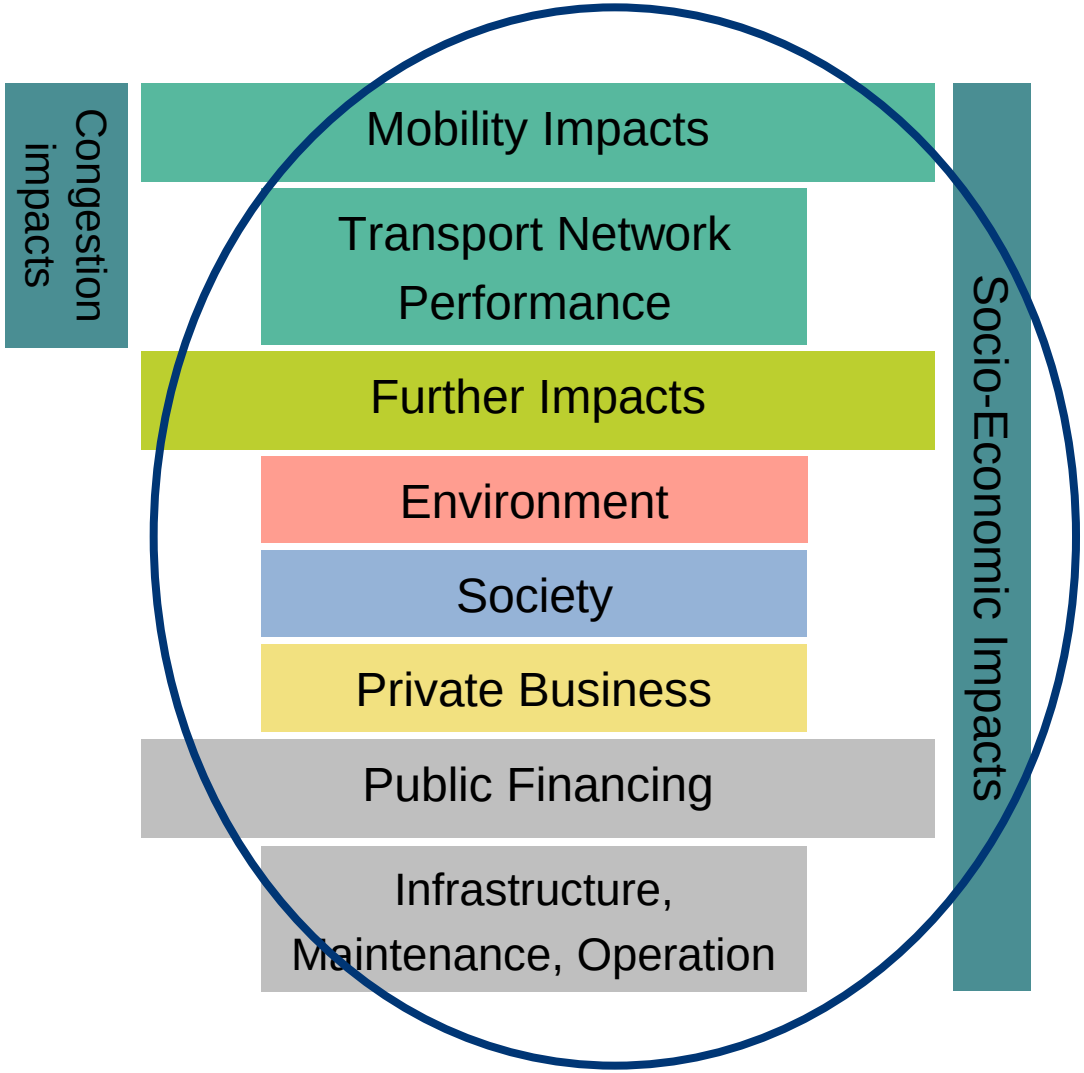
FLOW socio-economic analysis overview

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Socio-economic impacts

Together with transport impacts, any walking or cycling measure will also have *socio-economic impacts*. These include mobility, economic, societal, environmental, and other impacts. These can be described using *impact indicators*.

FLOW has developed 17 impact indicators to address potential impacts ranging from mobility impacts to infrastructure, etc., as well as a method to evaluate these socio-economic impacts. The second course (May 2017) will detail FLOW's 17 socio-economic impact indicators and how to assess them.



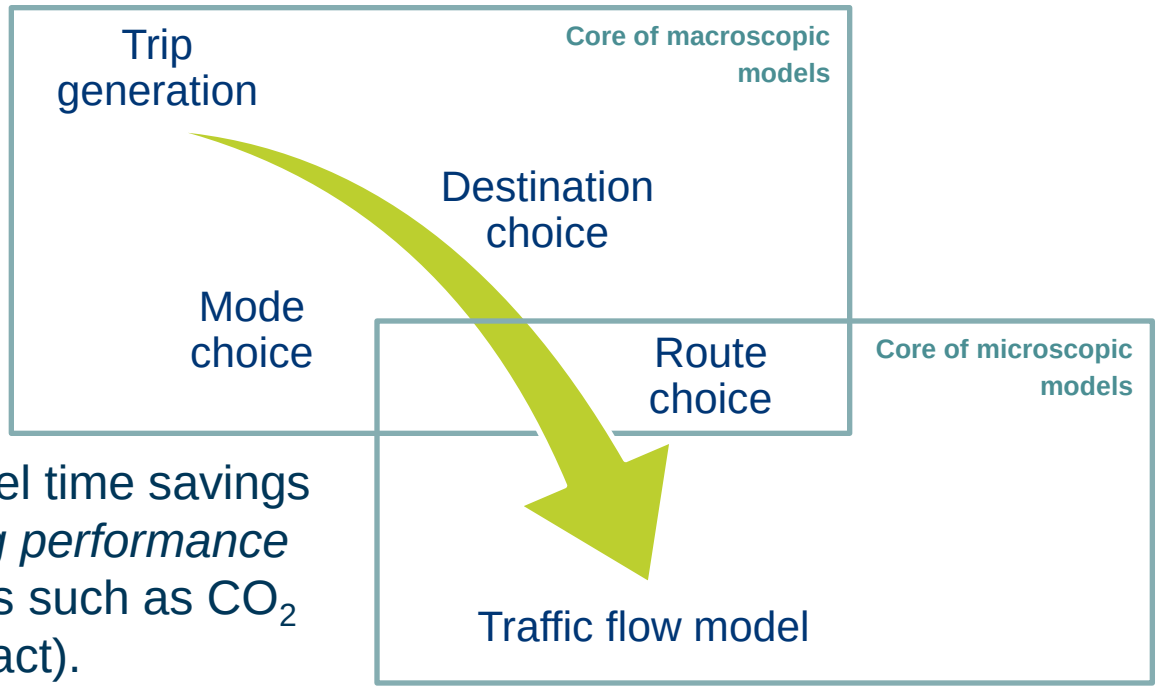
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

How does modelling fit in?

The role of transport modelling in the context of FLOW is to provide input to the two aspects of FLOW socio-economic analysis: 1) the key performance indicator analysis and 2) the impact indicator analysis. Depending on the scale of the measure, microscopic and/or macroscopic modelling facilitates the assessment (see figure).

Transport models can calculate different transport system performance indicators. These indicators also provide a basis for analysing other impacts.

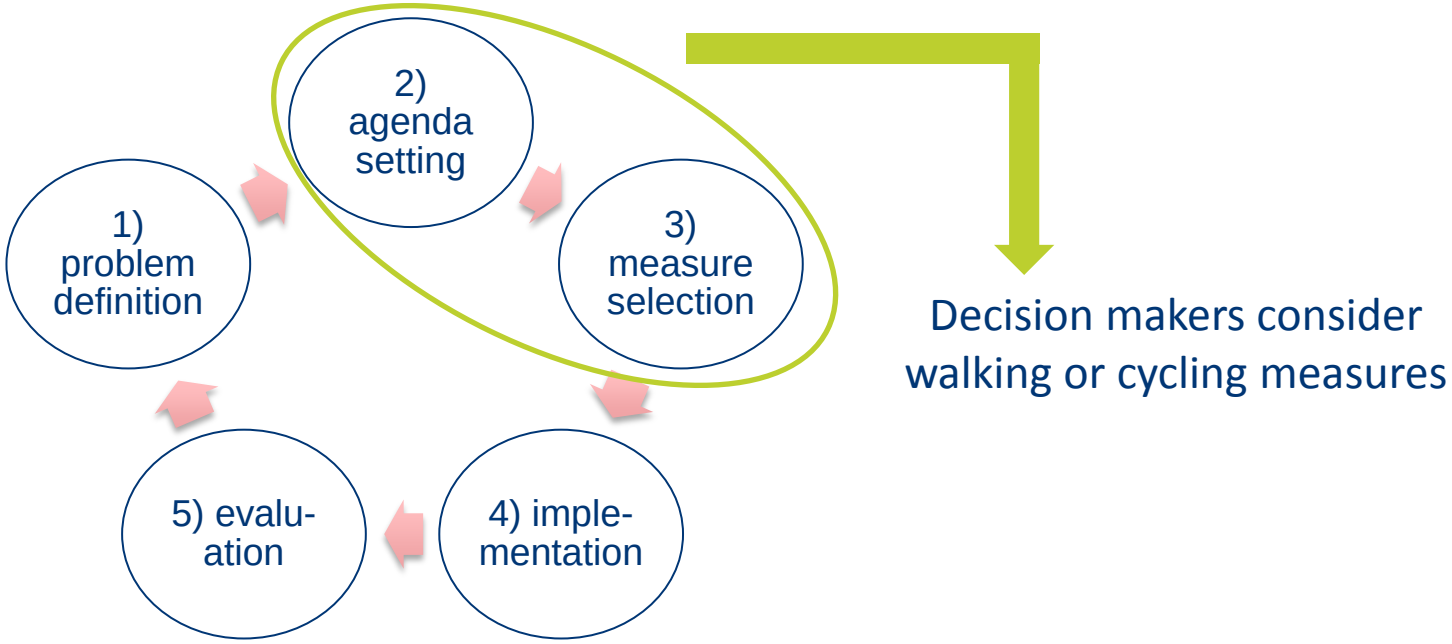
For example information on *travel time* is needed to calculate delay (performance) and to monetise travel time savings (impact), while *motor vehicle driving performance* determines environmental indicators such as CO_2 emissions and local pollutants (impact).



Source: Szabo/Schlaich/Kretz 2016

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Support for decision making



The figure shows the policy cycle of urban transport measures. The FLOW approach enters the process at the stages of 2) agenda setting and 3) measure selection, i.e. when decision makers consider implementing a walking or cycling measure, but fear congestion or do not understand potential benefits.

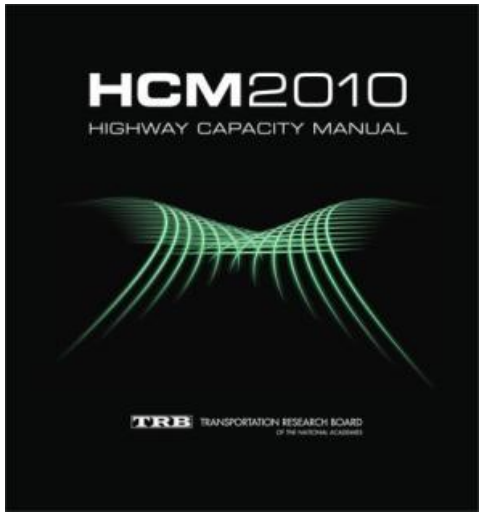
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Decision making: performance indicators

The analysis of transport network performance uses three key performance indicators:

- density
- delay
- level of service

FLOW established these KPIs based on a literature review, the highway capacity manuals referenced by most engineers and planning professionals and a survey of 60+ experts.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Decision making: impact indicators

The analysis of wider socio-economic impacts includes 17 impact indicators. The decision about which of these should be selected, depends on different considerations and circumstances (subject of course 2).

Scope of target	performance indicators	impact indicators
mobility impacts	delay density level of service	total travel time
environmental impacts		GHG emissions NOx emissions PM emissions noise pollution land consumption
social impacts		traffic safety: killed persons traffic safety: injured persons health benefits increased access social interaction
economic impacts		vehicle operation energy consumption commercial attractiveness residential attractiveness
cost avoidance		investments operation and maintenance

and innovation programme under grant agreement No 636998

Support for decision making

Of the three KPIs, two must be selected. The criterion for the selection of the two is the scope of the measure:

- If a *single junction or a corridor* is to be analysed, *delay* and *level of service* are used.
- If a *segment* is analysed, *density* and *level of service* are used.

The figure below summarises the FLOW indicators and how they support decision making:

Decision makers consider walking/cycling measure

Congestion likely?

Calculate transport network performance

	delay	LoS	density
junction	X	X	
corridor/network	X	X	
segment		X	X

Positive or negative wider impacts?

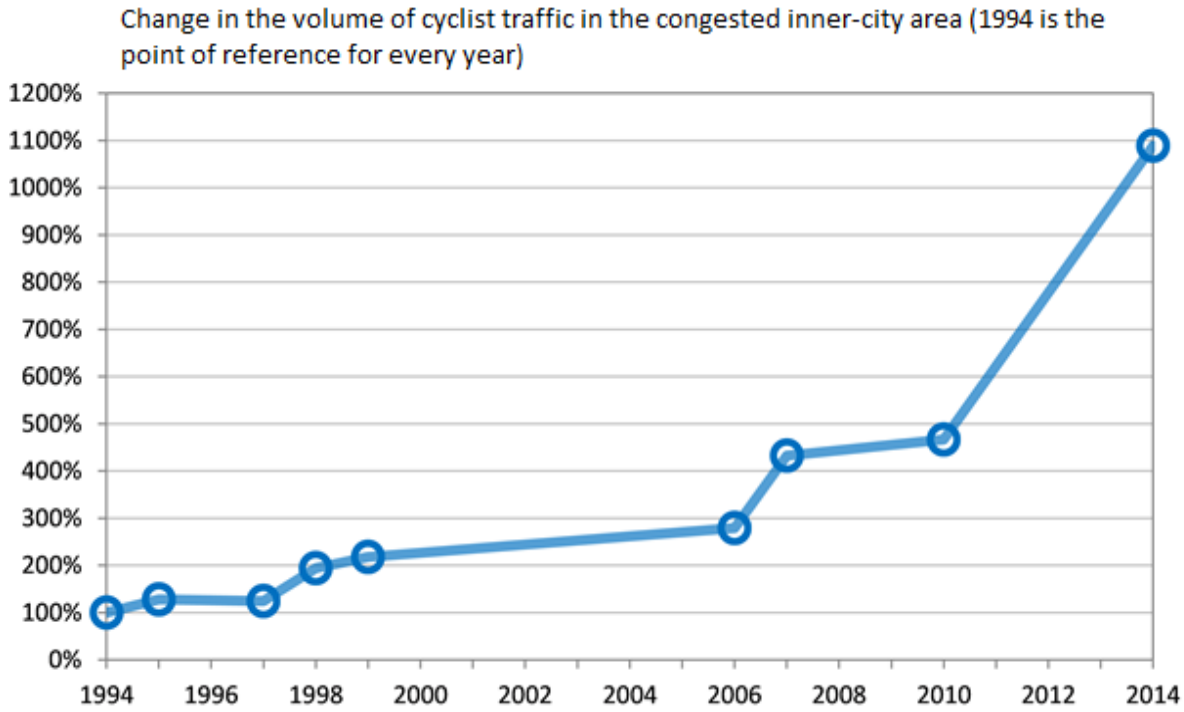
Calculate wider costs and benefits through the analysis of up to 17 impact indicators

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Data requirements

Data can sometimes be a major challenge when it comes to walking or cycling measures as it simply does not exist – or requires time-consuming or expensive analysis before it can be used. Some of the sources that data can be gathered from for walking and cycling include:

- Transport models
- Local statistics, including traffic counts and household surveys
- Official statistics from other private and public bodies
- Scientific studies and research projects
- National and international databases



Budapest cycling data (BKK)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Summary

The key performance indicators (as developed and described in the *FLOW Multimodal Transport Network Performance Analysis Methodology*) supports an assessment of the extent of the impact a (proposed) walking/cycling measure will have on the performance of the transport network (i.e. will it cause/increase congestion?).

The impact indicators (as developed and described in the *FLOW Impact Assessment Tool*) support the assessment of further *mobility, environmental, social and economic impacts* of proposed walking and/or cycling measures.

In practice, decisions for or against walking or cycling measures depend on many different factors – of which congestion is only one. Module 4.2 introduces the decision making in the run-up to a walking/cycling scheme in Dublin and presents the role of congestion and modelling in this process.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998

Task 4.1

Please post your responses to the following question in the Forum.

1. List the sources of data currently available in your city related to non-motorised transport modes.
2. To what extent do you think they can provide input to analyse:
    - the impact of walking or cycling measures on transport network performance
    - other environmental/social/economic impacts

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635998