Unit 6: Conclusion

Module 6.1: Reviewing

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Course 1 – Congestion and Your City: The FLOW Approach

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

Summing up

We hope you've enjoyed this FLOW e-course and have benefited from the opportunity to learn from and with your colleagues across Europe and beyond.

Just to sum up, the following pages list some of the key points we hope you'll take away from each Unit…

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Unit 2: Why FLOW?

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Creating a link between walking & cycling and congestion

- The transport-related benefits (i.e. potential congestion reduction) of non-motorised modes of transport are often overlooked and rarely quantified.
- FLOW advocates for a paradigm shift in which non-motorised transport is placed on a level field with motorised vehicle travel with regard to its role in the transportation system. FLOW focuses specifically on congestion and transport modelling.
- However, there are several difficulties with modelling non-motorised modes: it's often difficult to analyse cyclists' and pedestrians' movements; data on cycling and walking is difficult to collect; some cities struggle to justify the investment in collecting data and/or modelling walking and cycling because the budgets for non-motorised transport projects are usually quite low.
- To address these challenges, FLOW has developed a methodology, congestion impact assessment tool and improved transport modelling software.

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Unit 2: Why FLOW?

What will change?

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Table 1 **Changing Transport Planning Paradigm** (Litman 2013)

	Old Paradigm	New Paradigm
Definition of *Transportation*	*Mobility* (physical travel)	*Accessibility* (people's overall ability to reach services and activities)
Modes considered	Mainly automobile	Multi-modal: Walking, cycling, public transport, automobile, telework and delivery services
Objectives	Congestion reduction; roadway cost savings; vehicle cost savings; and reduced crash and emission rates per vehicle-kilometer	Congestion reduction; road and parking cost savings; consumer savings and affordability; accessibility for disadvantaged people; safety and security; energy conservation and emission reductions; public fitness and health; efficient land use (reduced sprawl)
Impacts considered	Travel speeds and congestion delays, vehicle operating costs and fares, crash and emission rates.	Various economic, social and environmental impacts, including indirect impacts
Favored transport improvement options	Roadway capacity expansion.	Improve transport options (walking, cycling, public transit, etc.). Transportation demand management. More accessible land development.
Performance indicators	Vehicle traffic speeds, roadway Level-of-Service (LOS), distance-based crash and emission rates	Quality of accessibility for various groups. Multi-modal LOS. Various economic, social and environmental impacts.

The old planning paradigm favored automobile-oriented transportation improvements. The new planning paradigm expands the range of objectives, impacts and options considered.

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Unit 2 : Why FLOW?

The vision: before and after FLOW

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Before FLOW	After FLOW
Politicians fear congestion	Politicians understand congestion
Mono-modal definition	Multi-modal definition
Bias towards vehicles	Balanced focus across modes
Cities only focus on motorised vehicles	Cities able to model motorised and non-motorised transport on the same level of detail
	Macroscopic scale: improved modelling of P+R and bike sharing schemes; improved route choice options by cyclist traffic assignment; etc.
	Microscopic scale: enhanced modelling of interactions between cars, pedestrians and cyclists; shared space; better depicting of walking and cycling behaviour, etc.

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Unit 3: The role of walking and cycling in reducing congestion

Unit 3 illustrated the potential of different types of walking and cycling measures to reduce congestion and introduced the indicators that could be relevant in evaluating a measure's impact on transport network performance.

The five categories of measures presented in FLOW's portfolio of measures are:

Measure type	Example measures	System level(s)	Indicator(s)
Infrastructure for moving traffic	Extending/ reallocating space for NMT, e.g. bike lanes, cycle highways, footpaths	Corridor/ Junction	Delay (including a junction) Density (without a junction)
Infrastructure for non-moving traffic	Bicycle parking, bike & ride facilities, bike sharing, benches and squares	Network	Delay or density, depending on the measure
Traffic management strategies	Cyclist and pedestrian-friendly traffic signals, access restrictions	Corridor/ Junction/ Network	Delay
Mobility Management	Campaigns, congestion charging, travel planning	Corridor/ Junction/ Network	Delay
Measures for more than one mode	Road removal, comprehensive redevelopments	Corridor/ Junction/ Network	Delay (including a junction) Density (without a junction)

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Unit 3: The role of walking and cycling in reducing congestion

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In the past, cities often provided additional road space to motorised traffic, which, in turn, increased demand for cars. The same is possible for non-motorised modes: increasing the space dedicated to them can also increase demand for them.

Lessons learned from the cases in the FLOW portfolio of measures:

- In most cases, cities did not implement walking and cycling measures with the intention of reducing congestion. However, congestion of certain modes can be reduced or at least the measure does increase overall congestion.
- Walking and cycling measures have several environmental, social and economic benefits.
- Analysis of the impacts of walking/cycling measures on the performance of the transport network (i.e. congestion) needs comprehensive data. It is challenging for cities to develop a robust database, but modelling facilitates the analysis.
- To understand the transferability of positive results, it is necessary to look at the context conditions where measures were implemented. The case studies show that it is important to integrate measures into a broader plan.

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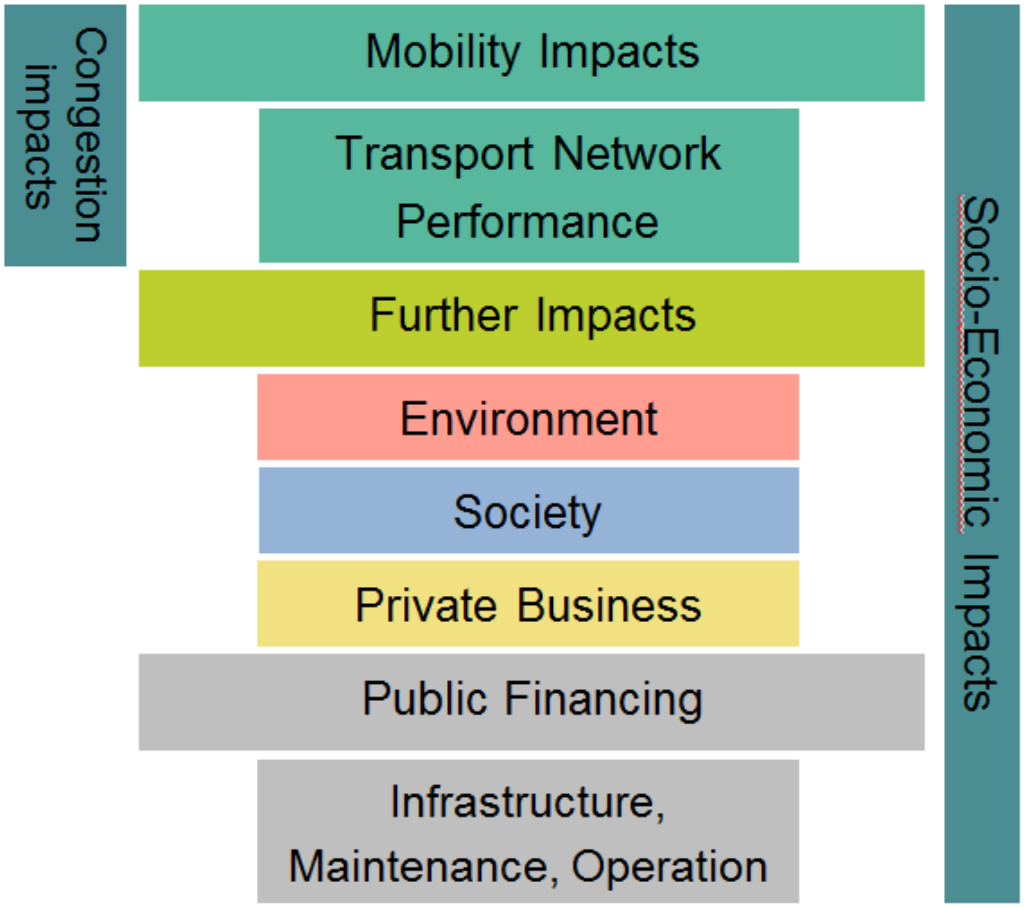
Unit 4: FLOW's conceptual framework

FLOW has developed an **impact assessment tool** designed to improve the ability to evaluate the socio-economic benefits of walking and cycling measures using indicators that address the **network performance** of a transport system and the **impacts** arising from walking and cycling measures.



FLOW socio-economic analysis overview

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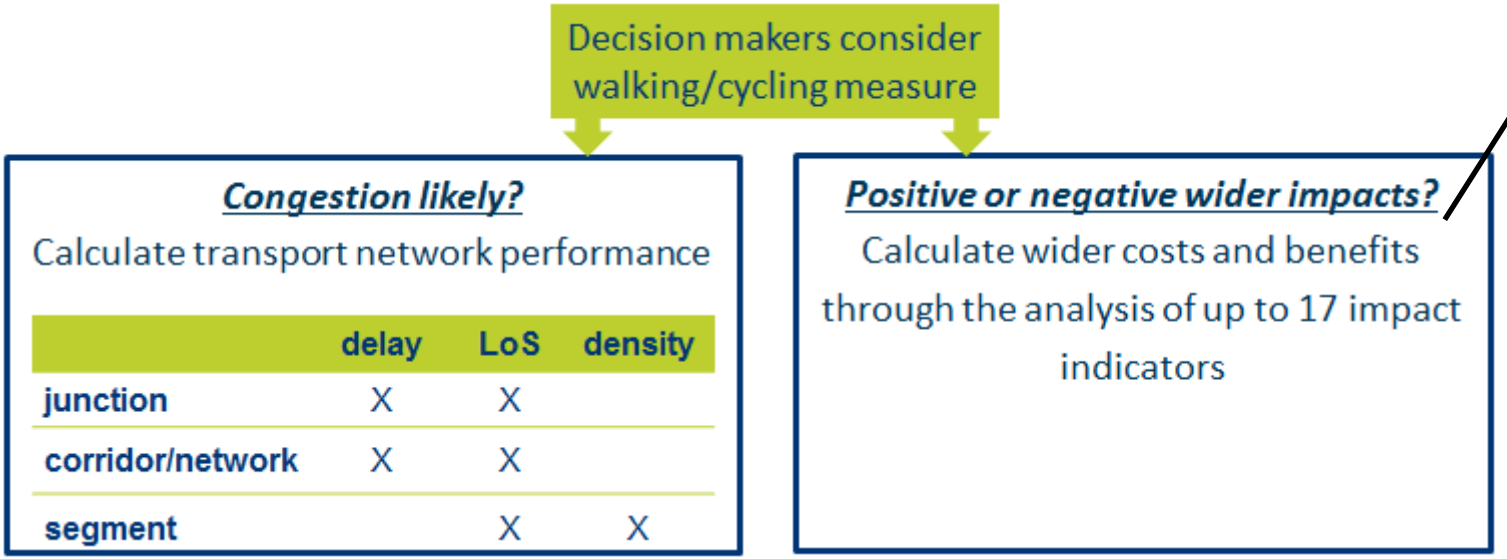
Unit 4: FLOW's conceptual framework

Impact assessment:

- **3 KPIs** describe transport network performance: **density**, **delay** and **level of service (LOS)** (see figure below)
- **17 impact indicators** (see figure to right; to be discussed in more detail in the 2nd FLOW course, starting in May 2017).
- **Data requirements** for using FLOW's impact assessment tool depend on the scope of the measure and targets of analysis



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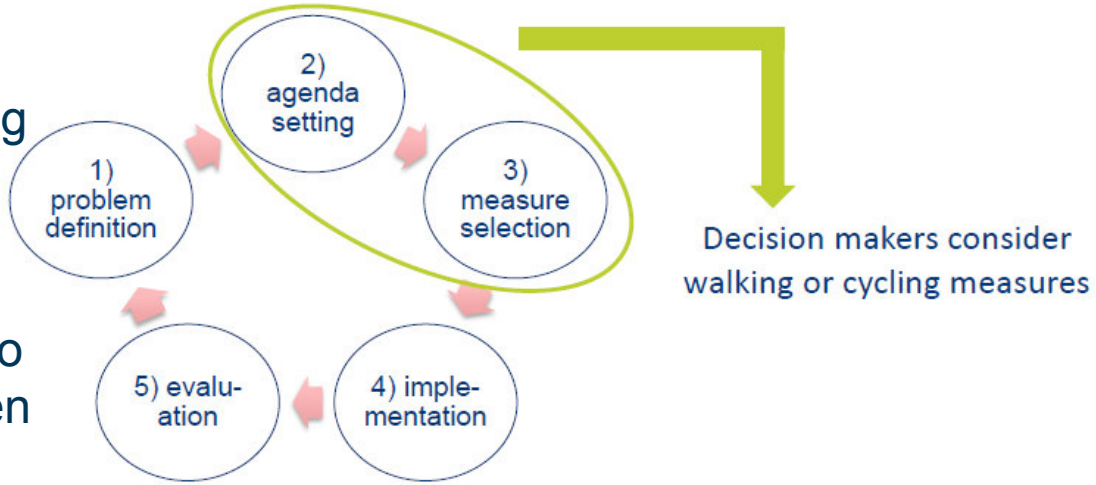
Unit 4: FLOW's conceptual framework

How modelling fits in:
Multimodal transport modelling facilitates impact assessment by calculating transport system performance indicators that provide input to 1) the analysis of KPIs and 2) the analysis of impact indicators.

Supporting decision making:
FLOW's impact assessment tool and improved multimodal transport modelling provide quantitative and qualitative analysis results that demonstrate the socio-economic impacts of walking and cycling measures. These can be used to combat the 'fear of congestion' that often arises when decision makers have reached the point of considering implementing a walking or cycling measure.



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Unit 5: Multimodal Transport Network Performance Analysis Methodology

- In a multimodal understanding of congestion:
  - one or some modes may be congested (e.g. the bicycle and/or the car)

  or
  - the sum of all modes may be congested (i.e. an aggregated measurement indicates that there is congestion).

- The KPIs to measure transport network performance and congestion are: Delay, density and level of service (LOS)

- The user perspective is an integral part of a multimodal understanding of congestion: a traffic participant regards a certain state of traffic flow as congested if his/her accepted/minimum travel time is exceeded.

- The FLOW methodology provides the option to apply a weighting in the aggregation process so that the index can be adjusted to reflect the strategic priorities of a city.

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