TRONDHEIM KOMMUNE

Measuring integration and urban sustainability with indicators

Roundtable paper # 4 - Zsuzsanna Olofsson and Karin Brundell Freij

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Sources: left picture UITP; right picture: WSP David Sailors

The team

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Content

- The project
- Integrated public transport
- Monitoring progress with indicators
- A case study (Transport Sustainability Barometer)
- Transferability
- Monitoring integrated public transport
- Discussion

The project

- Aim

  to *monitor progress* towards integrated public transport

- Method

  1) definition and structure of integration
  2) transferability
  3) suggested structure and indicators for monitoring integration

- Delimitation

  ! not a complete tool – only the first steps;
  ! use conventional types of public transport

Public transport and integration

Fragmented public transport

(lines, modes, companies)

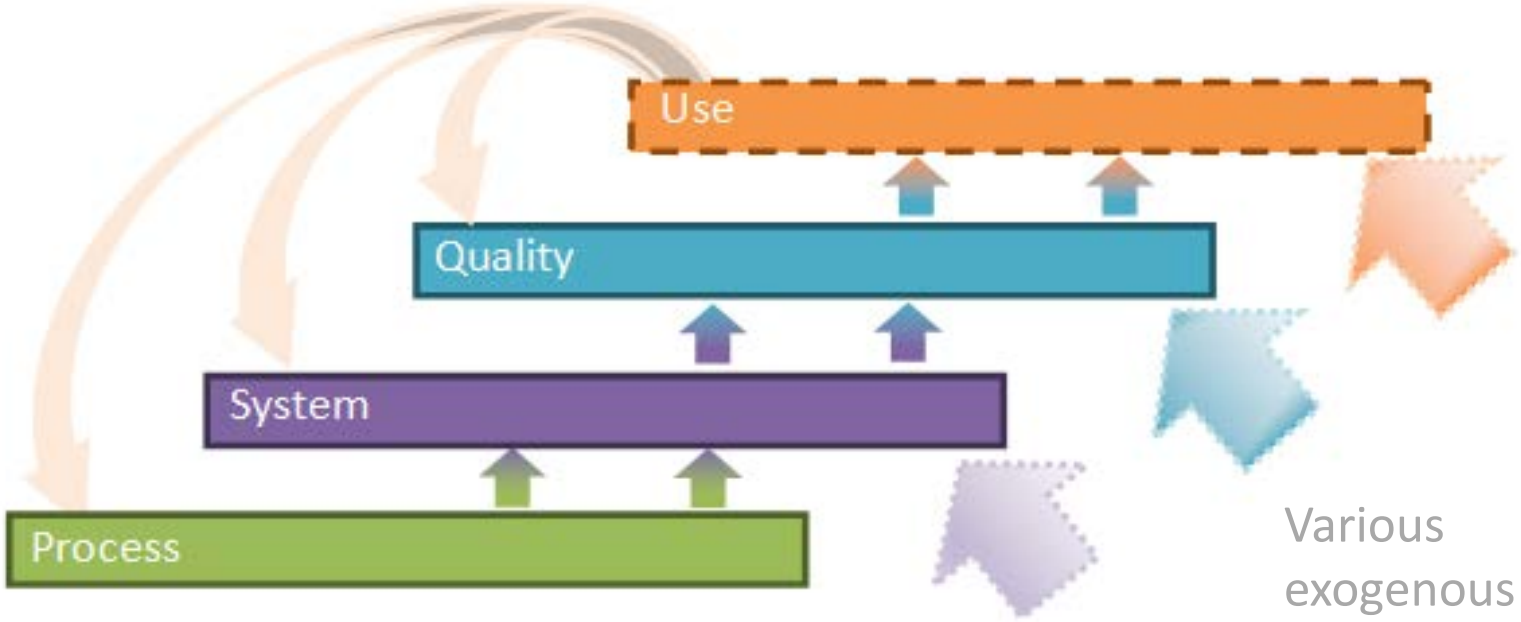
Barriers

Potential synergies

Integration between parts can reduce

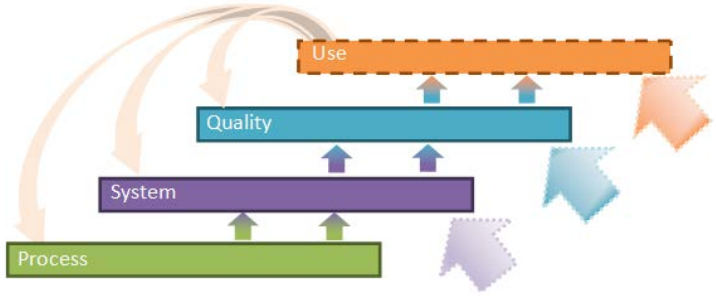
- ✓ “disbenefits” on demand side
- ✓ costs on supply side

Integrated Public Transport (IPT)



Impacts	Elements	Measures

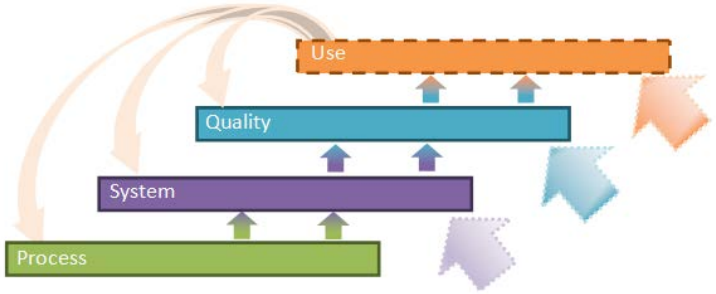
Structure of IPT



Impacts	Elements	Measures

- Impacts
  - Ridership (→ Use)
  - Connectivity (→ System)
  - Accessibility (→ Quality)
  - Cooperation (→ Process)
- Elements
- Measures

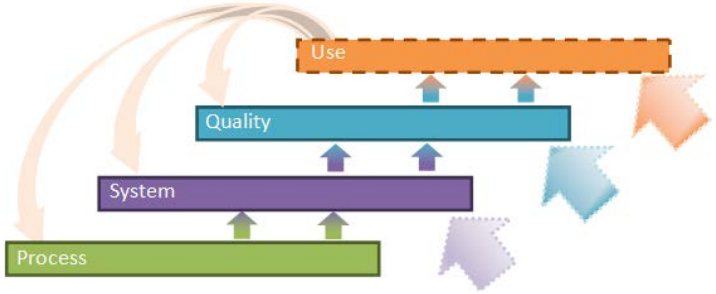
Structure of IPT



Layers	Impacts	Elements	Measures
Use	Ridership	Ridership	?
Quality	Accessibility	Destination Relation	land use, attractiveness, variation of modes…
System	Connectivity	Network Traffic Service	Integrated passenger information, coordinated time tables, seamless travel …
Process	Cooperation	Organization Information flow	user friendly ticketing, integrated tariff ...

Example:

Integration PT and bike



Layers	Impacts	Bicycle
Use	Ridership	e.g. campaigns
Quality	Accessibility	Spatial planning with consideration to bike+PT accessibility
System	Connectivity	Payment of bike rental with PT smart cards Bicycle parking close to subway entrances
Process	Cooperation	Cooperation between bike planners and PT providers

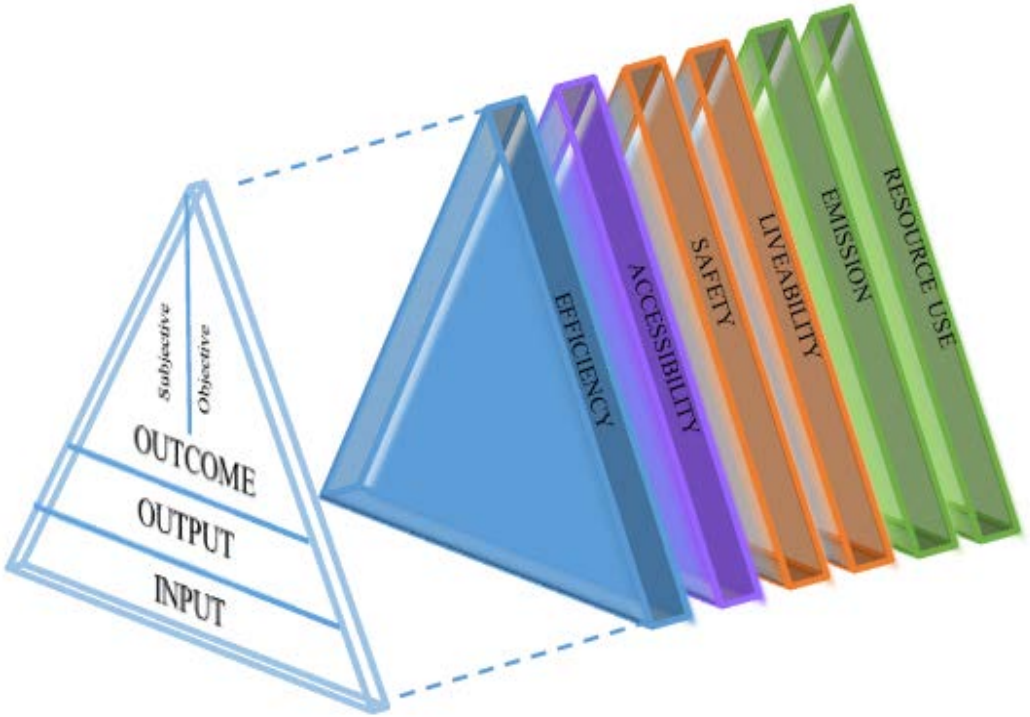
Bicycle strategies

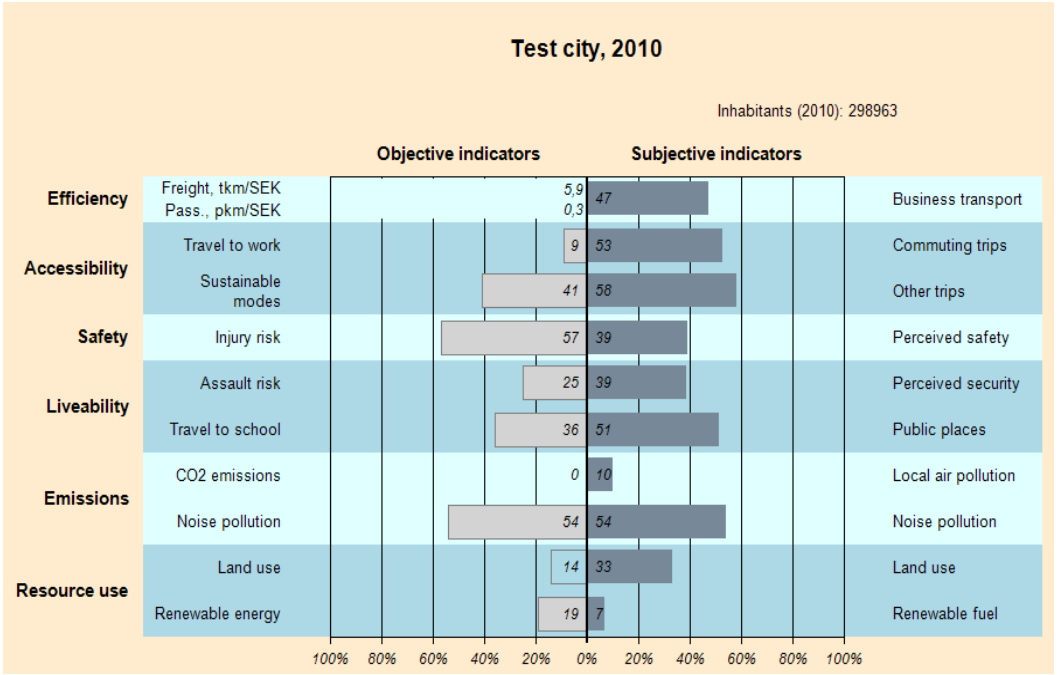
Monitoring with indicators

- First steps:
  - ✓ Definition of the process
    (what to measure)
  - ? Definition of the target group
    (for whom we measure)
  - ? Decide the limits of monitoring
    (available data and resources for data gathering)
- Further work:
  - definition, function, types, requirements and hierarchy of indicators

Case study

Transport Sustainability Barometer





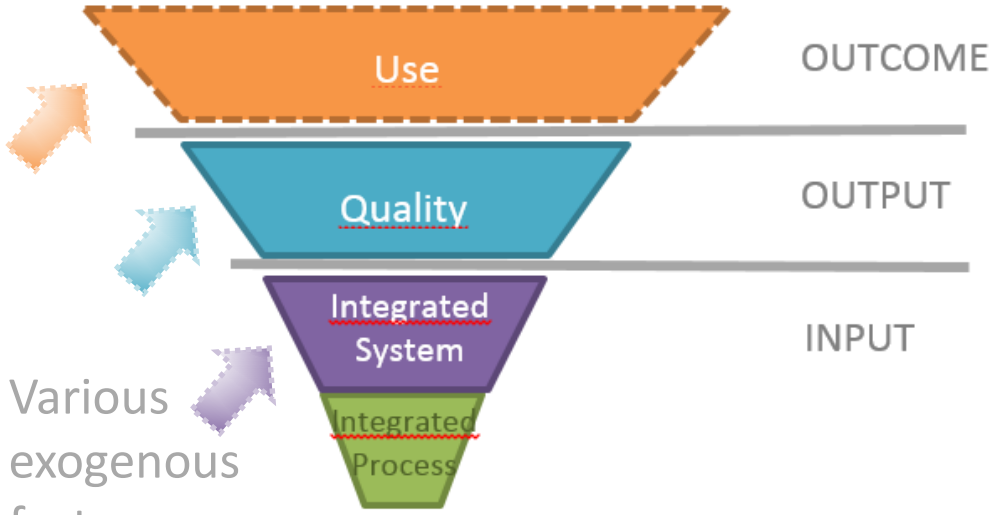
Transferability

- ✓ measuring philosophy
  (vision = target)
- ✓ progress indicators
- ✓ hierarchy of indicators
  (outcome-output-input)
- ✓ duality
  objectively measured versus subjectively perceived

Monitoring Integrated Public Transport

hierarchy

”subjective” aspects



Suggested indicator framework

layer	indicators
Use	Ridership
Quality	Accessibility
System	Connectivity
Process	Cooperation

Suggested indicator framework

”level”	layer	indicators
Outcome	Use	Ridership
Output	Quality	Accessibility
Input	System	Connectivity
Input	Process	Cooperation

Suggested indicator framework

”level”	layer	indicators
	objective	subjective (survey)
Outcome	Use	Ridership
Output	Quality	Accessibility
Input	System	Connectivity
Input	Process	Cooperation

Suggested indicator framework

"level"	layer	indicators	
		objective	subjective (survey)
Outcome	Use	Ridership	
Output	Quality	Accessibility	
Input	System	Connectivity	
Input	Process	Cooperation	
		e.g. *collaboration across departments* as measured by Carreno et al (2013)	e.g. Do you perceive the public transport system as consisting of separate modes and operators, or as one entity

Suggested indicator framework

"level"	layer	indicators	
		objective	subjective (survey)
Outcome	Use	Ridership	
Output	Quality	Accessibility	
Input	System	Connectivity	
		e.g. *aggregate generalized cost* as measured by Chowdhury et al (2014)	e.g. Do you perceive barriers when you transfer between lines and modes in the public transport system?
Input	Process	Cooperation	
		e.g. *collaboration across departments* as measured by Carreno et al (2013)	e.g. Do you perceive the public transport system as consisting of separate modes and operators, or as one entity

Suggested indicator framework

"level"	layer	indicators	
		objective	subjective (survey)
Outcome	Use	Ridership	
Output	Quality	Accessibility	
		e.g. *Logsum* as measured by Niemeir (1997)	e.g. Do you think that public transport provides feasible travel options in your city?
Input	System	Connectivity	
		e.g. *aggregate generalized cost* as measured by Chowdhury et al (2014)	e.g. Do you perceive barriers when you transfer between lines and modes in the public transport system?
Input	Process	Cooperation	
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Suggested indicator framework

"level"	layer	indicators	
		objective	subjective (survey)
Outcome	Use	Ridership	
		e.g. *Passenger-km*	e.g. How large is the percentage of your trips for which you consider public transport as an alternative
Output	Quality	Accessibility	
		e.g. *Logsum* as measured by Niemeir (1997)	e.g. Do you think that public transport provides feasible travel options in your city?
Input	System	Connectivity	
		e.g. *aggregate generalized cost* as measured by Chowdhury et al (2014)	e.g. Do you perceive barriers when you transfer between lines and modes in the public transport system?
Input	Process	Cooperation	
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Discussion

Advantages

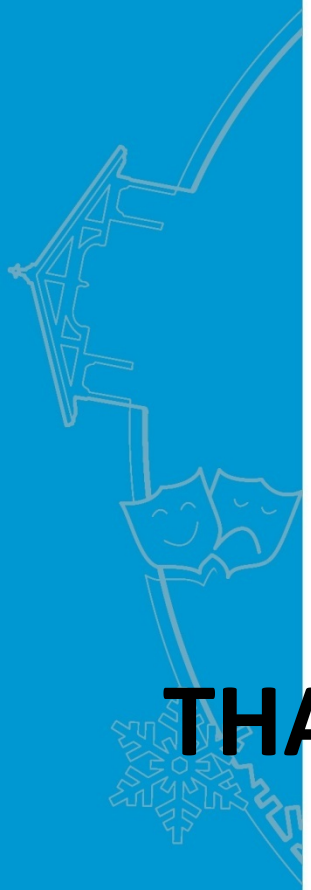
- ☺ Simplicity
- ☺ Terminology
- ☺ Subjective and objective side of progress indicators

Challenges

- ☹ Lack of target group
- ☹ The ”vision” problem
- ☹ Limited monitoring scope
- ☹ Standard vs. Efficiency

Recommendations

- Identify a target group
- Complete the framework with indicators
- Visualisation
- Monitoring plan



THANK YOU FOR YOUR ATTENTION!

Connectivity

- Suggested starting point: Chowdhury et al (2014)
  - based on public network data
  - “softer” properties (fares, travel planners)?
- Generalized cost aggregated over OD relations
- Sensitive to reduction of barriers
- Supply oriented

Accessibility

- Indicator of *Quality* (demand side)
- Overall effort required to reach attractive destinations
- Accessibility indices differ in how they measure and combine
  - travel effort to each destination
  - the attractiveness of reaching destinations
- The “logsum” (Niemeier 1997) - reflects
  - consumer welfare
  - Sensitive to the availability of other travel options