

# Sustainable mobility planning based on backcasting method

Purpose, methods, structure, involvement  
of stakeholders, data collection,

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# What I am going to talk about...



1. Goal of transport policy and policy-making
2. Sustainable Urban Mobility Plans
3. Data needs
4. Involvement of Stakeholders



- 1. Goal of transport policy and policy-making**
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- First questions:
  - ... should the transport system be as fast as possible?
  - ... should the transport system be as “cool” as possible?
  - ... should the transport system be as cheap as possible?
  - ... is congestion a problem?
  - ... is high-tech solving all the problems?

# In the United States.... 26-lane motorway...



# NYC is doing...



# Brussels is doing...



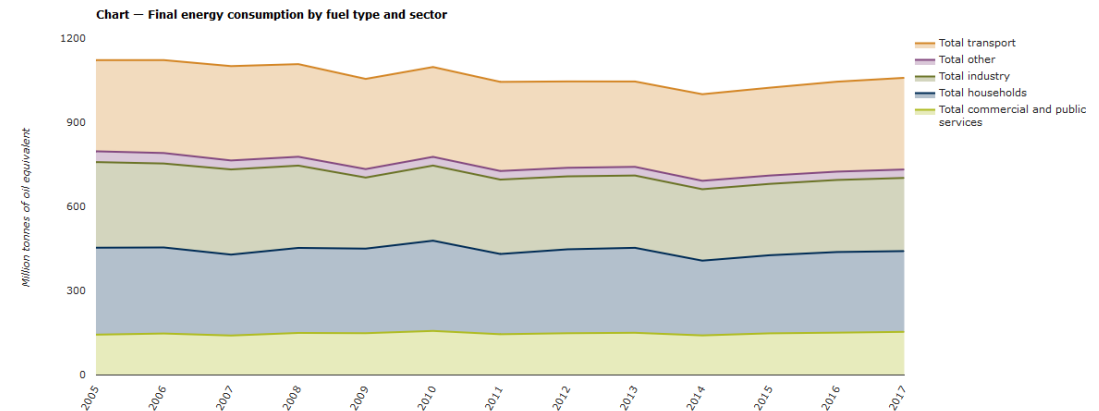
# Paris is doing...







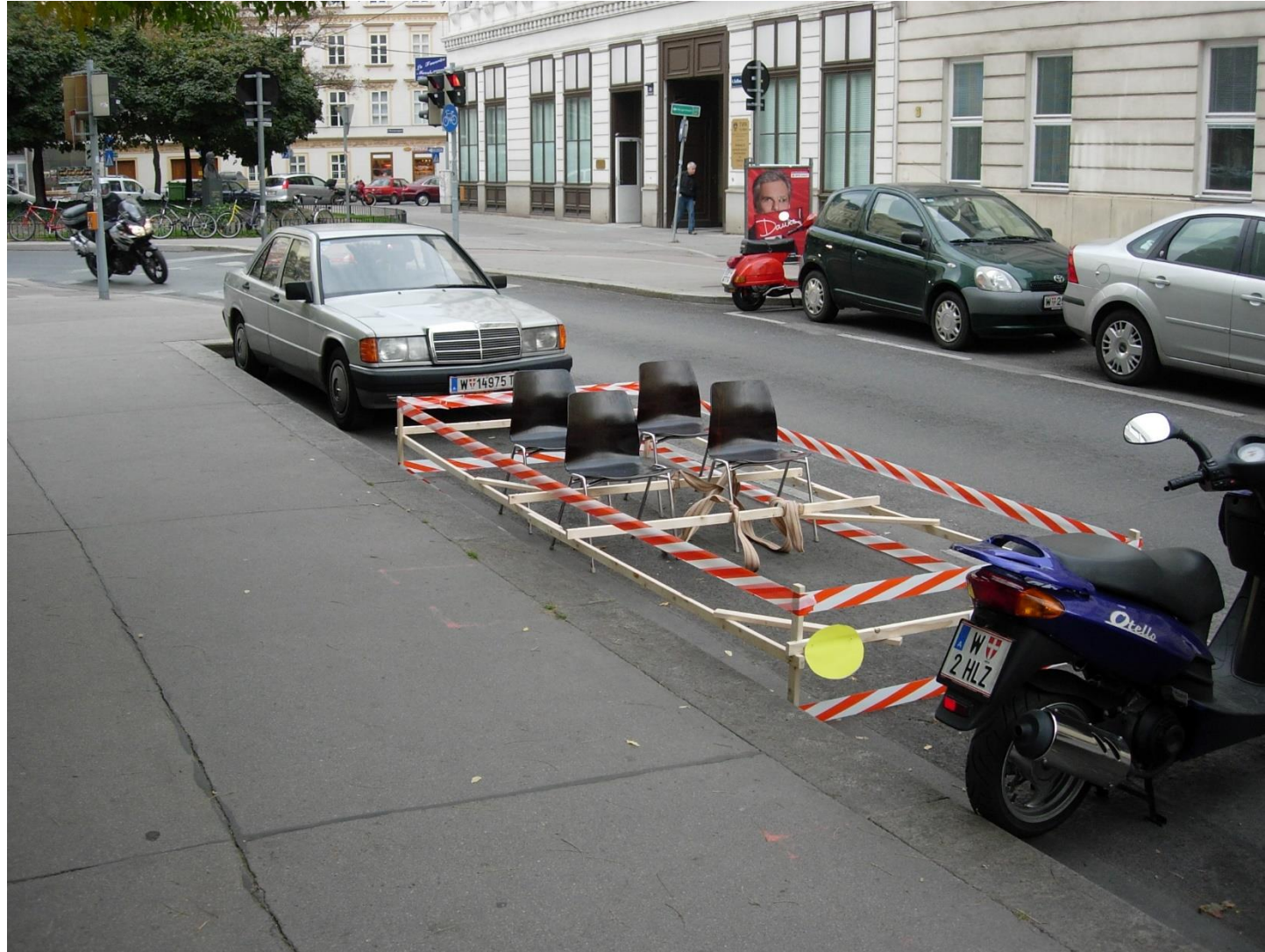
- Health impacts:
  - Traffic accidents (fatality, injury)
  - Emissions on local scale (PM10, PM2.5, NO<sub>x</sub>, SO<sub>x</sub>)
  - Noise, vibration, ...
- Energy consumption and greenhouse gases:
  - In EU-28: about 28% (!! ) of energy consumption is in the transport sector, mostly by private automobiles.
  - CO<sub>2</sub> emission
- Efficiency of urban space
  - Consumption of space
  - Livability of cities
    - How many % of urban surface is dedicated to car traffic & parking?





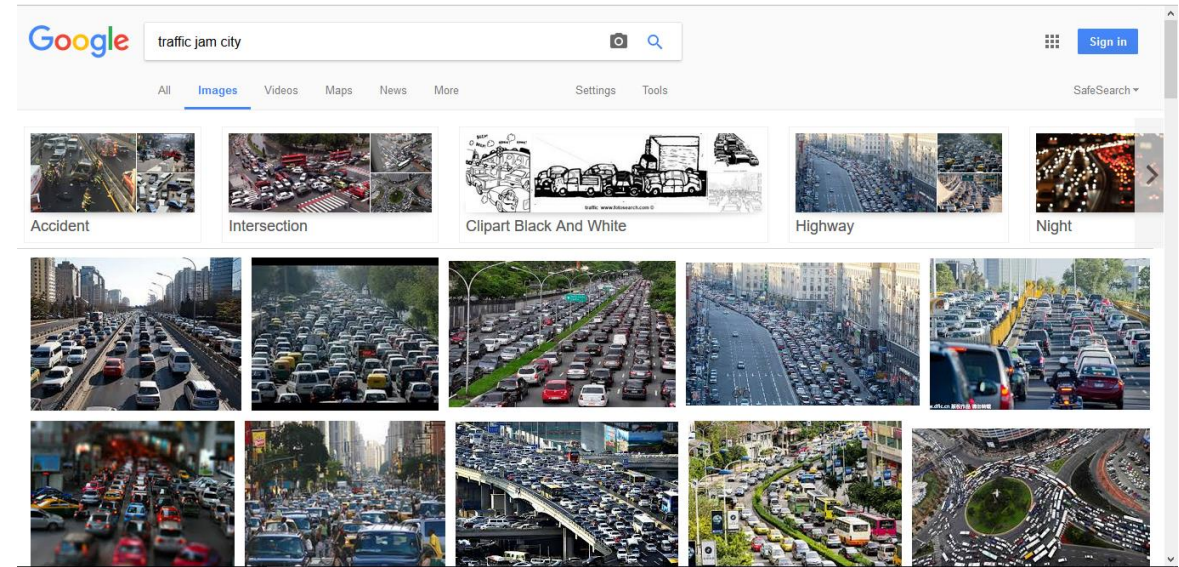


# Spatial resource consumption





- Is congestion a “problem”?



- Congestion is a “symptom”.
  - **Cars increase** → **congestion** → **building new roads** → ...
  - ...after a few years → **cars increase** → ... what comes next?
- **This is the problem of the traditional transport planning!**



- Does electric vehicles solve the problems?
- Does innovative mobility solutions solve the problems?
- Does parking in front of a shop help economy?



- First questions:
  - ... should it be as fast as possible?
  - ... should it be as “cool” as possible?
  - ... should it be as cheap as possible?

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- **Supply-oriented**
  - What do we want/construct?
  - Investment
- **Mono-modal based on type of infrastructure**
  - Railway
  - Road
  - Air
  - Maritime,...
  - (... what about pedestrian and cyclists?)





- **Focus on traffic**
- **Traffic flow capacity and speed:** walking & cycling often overlooked
- **Mode-focused:** separate for railway, road, waterway and air transport
- **Provision of infrastructure: what do we want to build?**
- **Sectoral:** stand-alone plan only for traffic
- **Short and medium-term delivery plan**
- **Covering one administrative area**
- **Domain of traffic engineers**
- **Planning by experts**
- **Limited impact assessment**



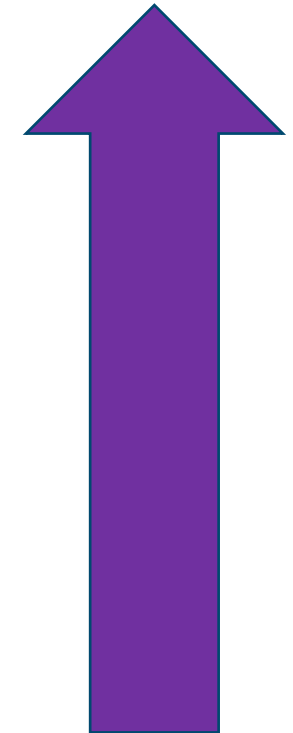
- **Multimodal**: one plan for all available modes
  - Including active modes
- **Desired transport system:**
  - Focus: Desired transport system = Outcome
  - Central question:
    - What do we want?
    - What do we want to achieve?



- Focus on traffic → **Focus on People**
- Traffic flow capacity and speed → **Accessibility & Quality of Life**
- Mode-focused → **Integrated development of all transport modes**
- Provision of infrastructure → **Combination of infrastructure, market, regulation, information and promotion**
- Sectoral → **Consistent with related policy areas**
- Short and medium-term delivery plan → **Long-term vision and strategy**
- Covering one administrative area → **Functional urban area**
- Domain of traffic engineers → **Interdisciplinary planning teams**
- Planning by experts → **Involvement of stakeholders and citizens**
- Limited impact assessment → **Systematic evaluation of impacts**



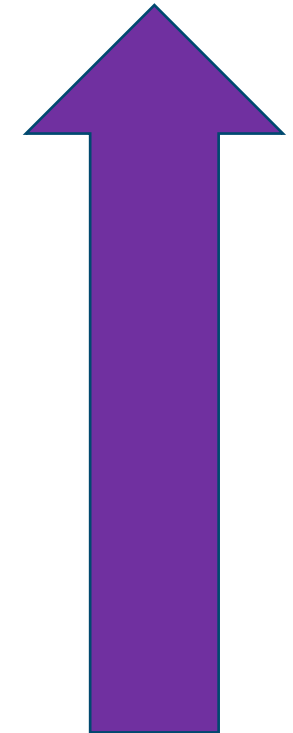
- **Input** = Your action, your work
  - E.g. 30 km/h **speed limit** on all streets
- **Output** = Immediate result of your action
  - **People drive slowly**: better safety, less emission (exhaust, noise), less energy consumption, easy-to-cross road, ...
- **Outcome** = Change in transport system as a result of input + output
  - **Less exhausts** → people live healthier
  - **Slower vehicles** → Smaller risk of traffic accidents, urban environment getting better, less noise from cars
  - **Better energy-efficiency**
  - **People can cross the road easily** → Local economy is supported



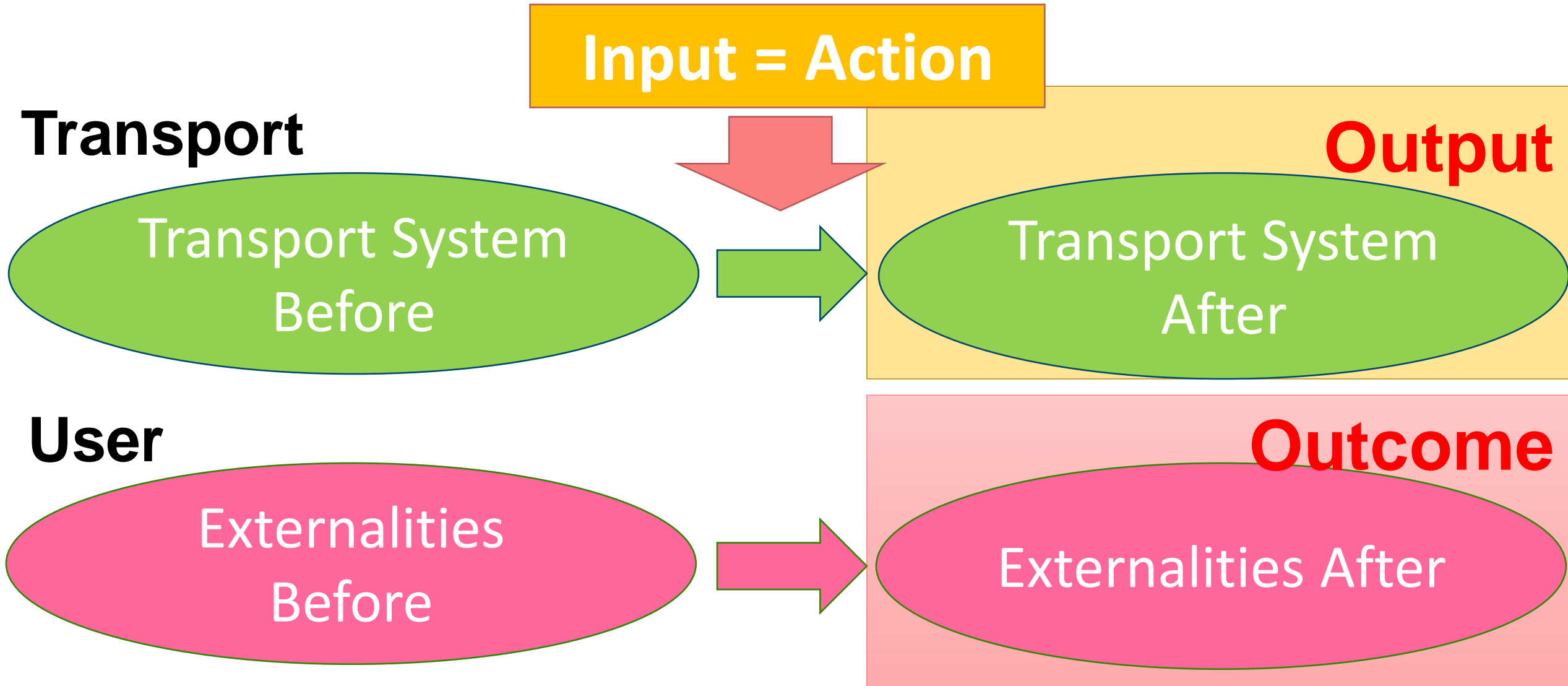
**Backcasting**



- **Input** = Your action, your work
  - E.g. Improvement of bus stop with bench, roof and information board
- **Output** = Immediate result of your action
  - Waiting condition gets better, better information provision
- **Outcome** = Change in transport system as a result of input + output
  - Easy to use public transport
  - Comfort of public transport travel improved
  - More bus passengers
  - Higher modal share of public transport
  - Better safety at bus stop



**Backcasting**



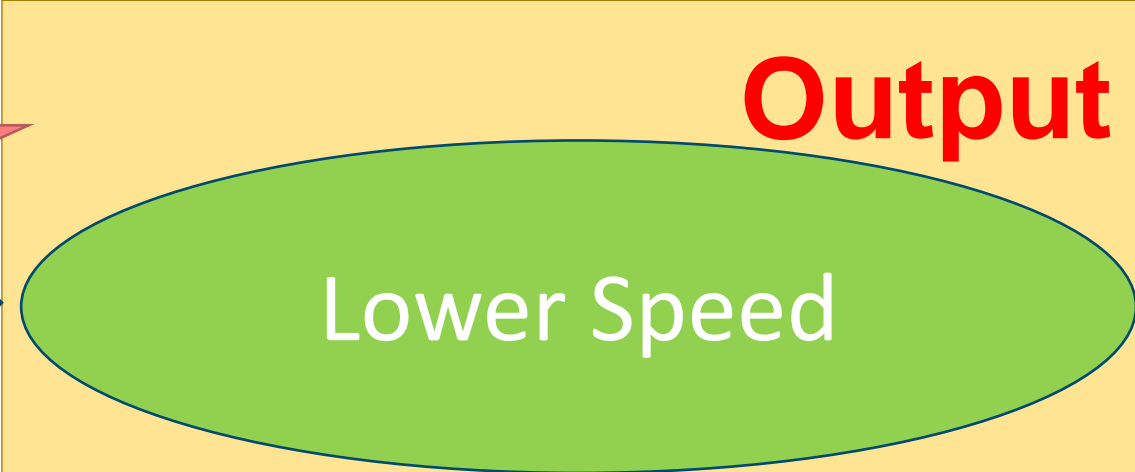
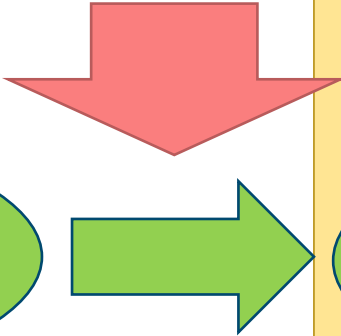


- **Indicators for externalities**
  - **Environmental aspects**
    - Global-scale: **Energy Consumption, CO2 emission, ...**
    - Local-scale emission: **NOx, SOx, PM2.5, PM10, Noise, ...**
    - **Fatalities, injuries, traffic accidents**
  - **Urban structure & quality**
    - **% of road surface** in urban area
    - Population within **accessible areas from public transport**
    - **Public space for pedestrians**, children, elderly, ...
  - ...

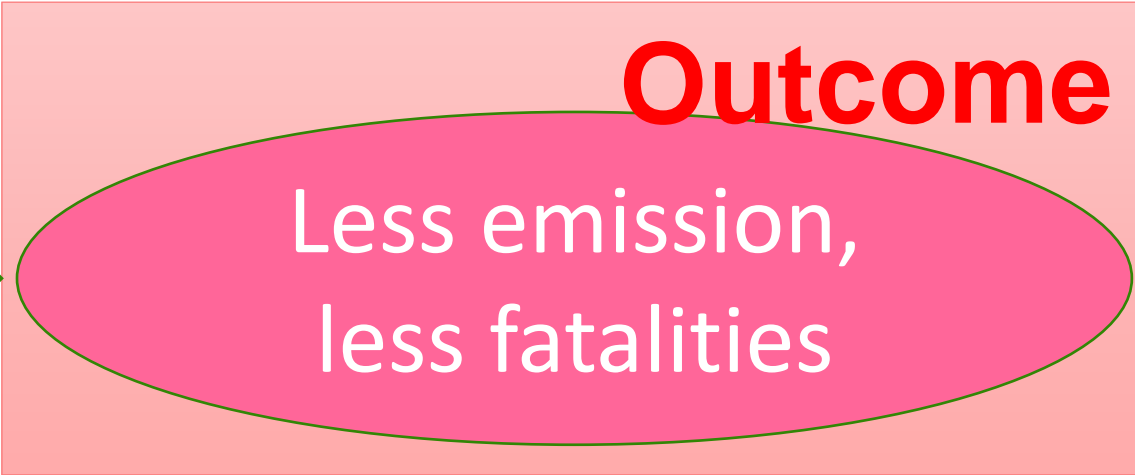
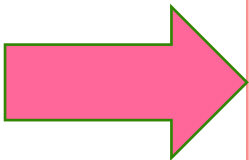


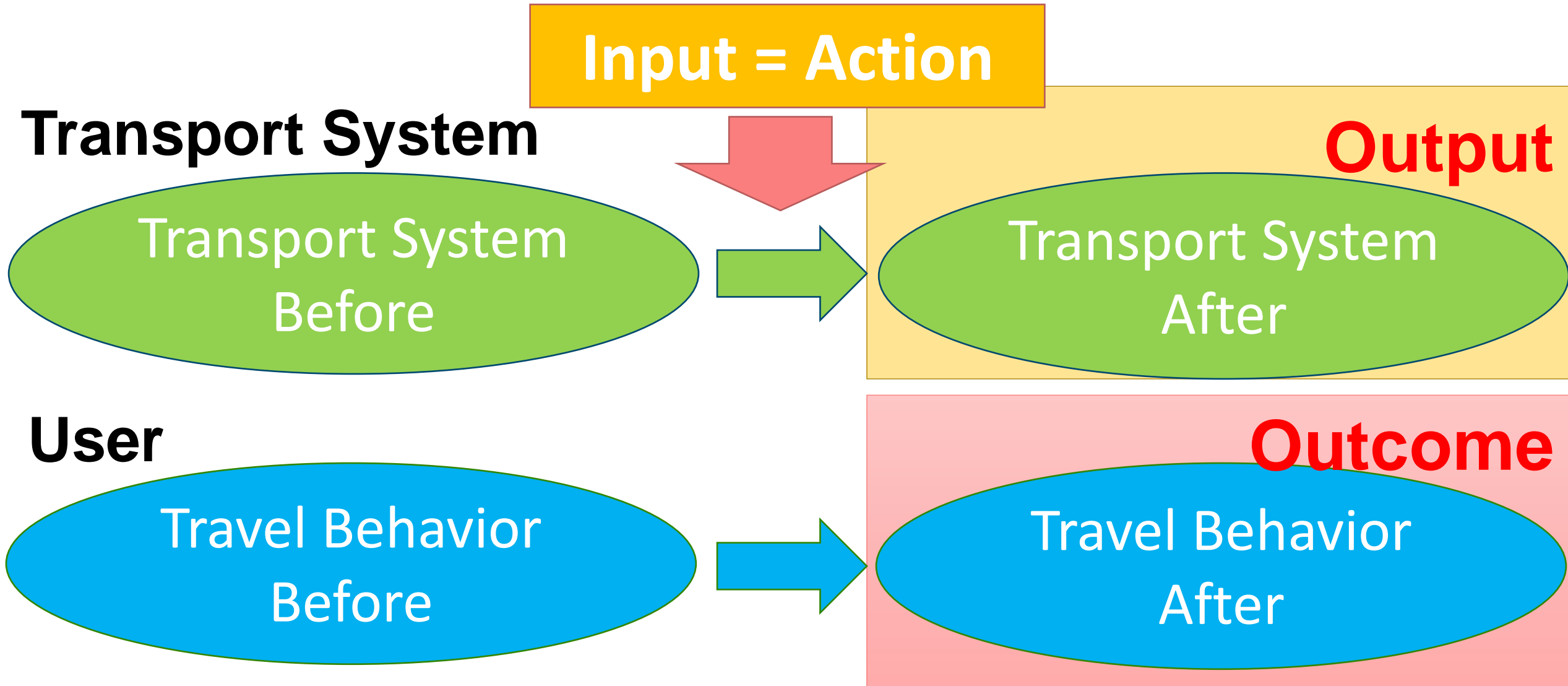
Input = 30km/h Zone

## Transport System



## User







**Transport**

With

**User**

Low

**Output**  
ke

**come**  
of



- **Outcome: Changes in Travel Behaviour**
- **Indicators to understand aggregated travel behaviour in the urban area!**
  - Modal share (Modal split)
  - Travel distance (the shorter, the better)
  - ...



- Conceptualization and experiences since 1980s
  - PDU (France, mandatory for  $\geq 100k$  inh.);
  - Local Transport Plans (UK);
  - Mobility Concepts (Germany, Austria, ...)...

→ Guidance by the EU:

## “Sustainable Urban Mobility Plan”

- 1<sup>st</sup> Edition: 2013
- 2<sup>nd</sup> Edition: 2019
- Available at <https://www.eltis.org/mobility-plans/sump-guidelines>



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- ... is diverse.
  - Speed? Traffic count? Length of congestion...?
  - Satisfaction of people...?
  - Money invested...?
- Why do we have to collect data?
  - Data itself does not tell much. E.g. “ABC city has 1,854 traffic accidents.”
  - Data → **Interpreted as “Indicators”**
    - To understand the current situation
    - To monitor the progress
  - **Outcome goals = Outcome Indicators**
  - **Data → To monitor outcome indicators**



- Outcome goals = Outcome Indicators
  - Data → To monitor outcome indicators
- Data to calculate outcome indicators is needed!
- What can be outcome indicators?





- **Modal Share** as the primary outcome goals
  - **London:** By 2041, 80% of the trip in London is carried out on foot, by biking or by public transport.
  - **Paris (Ile-de-France):** -3.5% car, +2.5% public transport, +1% walking & cycling by 2020 (in comparison to 2010)
  - **Vienna:** By 2025, 80% of the trip is carried out on foot, by biking or by public transport.
  - **Budapest:** in 2030, 50% PT, 20% car, 20% walking and 10% cycling
- **To calculate modal share** → **Household Travel Survey**
  - Questionnaire-based survey about inhabitants **travel behavior** including main modes used, trip duration, trip purpose, luggage, etc.
  - Every 5-10 years



- **Only work with what you have**
  - Often modal share data is not available.
- **To mix outcome indicators and supply (input) indicators!**
  - Number of traffic accidents, fatalities
  - Length of constructed bicycle lanes
  - Noise level at 10 noise-monitoring stations
  - Energy consumption by the transport sector
  - % of electric bus in the fleet
  - % of drivers wearing seat belt
  - % of inhabitants living within 300m of public transport stops
  - % of people walking or cycling more than 30 minutes a day



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- **What you can change as public authority → Input**
  - Length of constructed bicycle lanes
  - % of electric bus in the fleet
- **What you cannot change directly but you can encourage people to do so: **outcome indicators****
  - Number of traffic accidents, fatalities
  - Noise level at 10 noise-monitoring stations
  - % of drivers wearing seat belt
  - % of inhabitants living within 300m of public transport stops
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  - Energy consumption by the transport sector

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# Why? When? How?



- You've made a perfect plan....
- You've made a perfect procurement....
- Inhabitants are informed now about construction...

**I can't trust the city!**



**No!**

What? I haven't heard about it!



Why didn't the City tell us earlier?

# Why? When? How?



- ~~You've made a perfect plan....~~ You understand the problem perfectly.
- ~~You've made a perfect procurement....~~ You made perfect engineering and administration.
- ~~Inhabitants are informed now about construction...~~ Still I don't want it and thus I am against it!
  
- ... what shall we do to avoid this?

# What SUMP Guideline Recommends





- Earlier phases...
  - To understand the **needs of sustainable urban mobility planning**.
  - To understand the **planning context**.
  - To understand current **problems and opportunities**.
  - To make a consensus on **what kind of city is wanted**.
  - To make an agreement on **vision, objectives and targets**.
  
- In the later phase...
  - To agree on **who will do what**.
  - To agree on **who will finance** each measure.

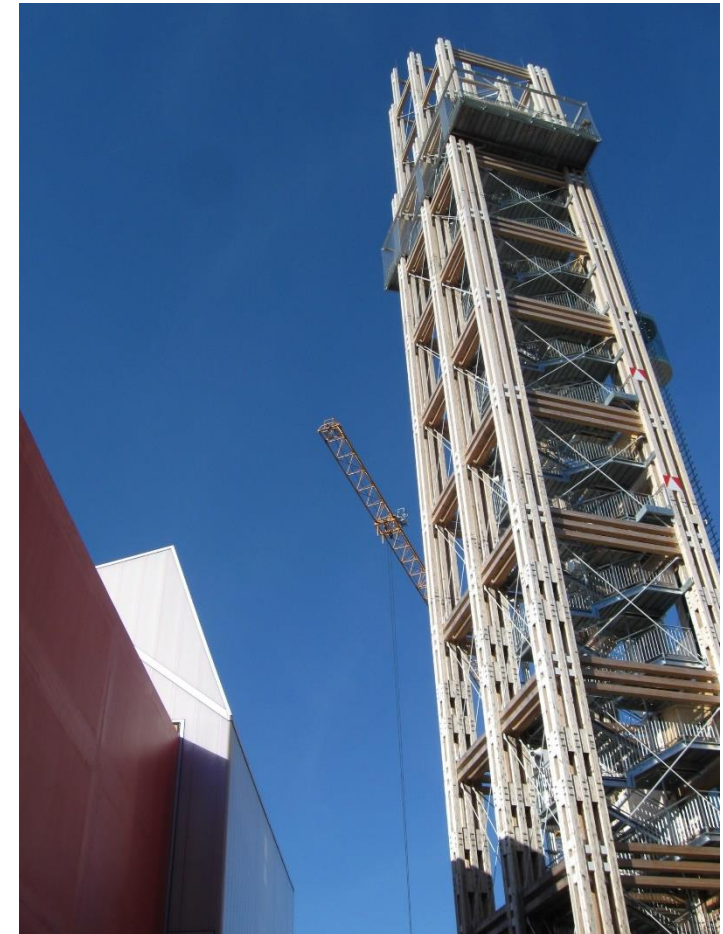




- **Questionnaire** to inhabitants, commuters, visitors, ...
- Citizen's **workshops**
- **Exhibition**
- **Idea competition**
- **Online forum**
- **Schoolchildren's workshop**
- **Focus group interview** with **vulnerable user groups, PRMs**
- **Experimental phase** before construction



# Even on a project scale....



End