



Smart and Healthy Transport in Cities, Plzen, April 4th, 2017

What is sustainable mobility development - and what does that mean for cities?

- 1) What is sustainable mobility development?
- 2) Do we want mobility or traffic?
- 3) What means climate change in transport?
- 4) What is the core of the EU - White paper?
- 5) What to do in cities - and how to do it?

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1: What is sustainable mobility development?

First: In the past, more roads and more traffic meant
“More development, more money, more happiness”

The city with the most highways, most cars, most traffic is the best!

But: The number of needs covered (trips) stays about constant;
more cars, for longer distances, and more energy needed

More pollution, more noise, more accidents, more damage

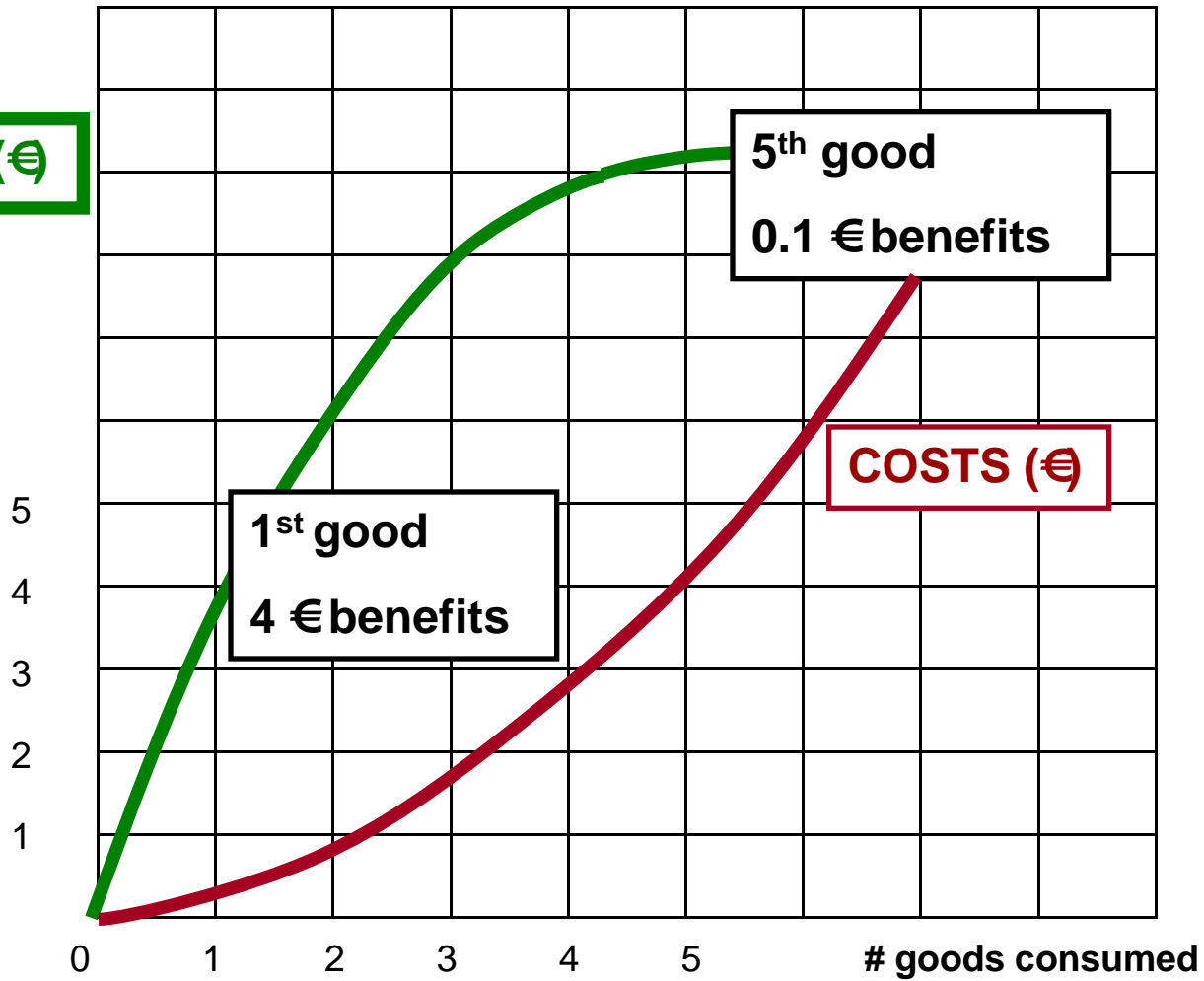
The city with the most noise, pollution, accidents, CO₂ is the best?

No! Growing marginal costs means sinking marginal benefits!



Sinking marginal benefits

Benefits (€)



1st good
4 € benefits

5th good
0.1 € benefits

COSTS (€)



Today: Sustainable Development SD

Sustainable development is development

- that meets the needs of the present generation
- while allowing future generations to meet their own needs

In Transport:

- ... mobility needs of the present population: **access**/Mobilität
- ... with less money, fewer resources, less waste, less pollution, less separation, fewer climate change ...

satisfying access needs with less traffic



2: Do you want access (mobility) or traffic?

Question: How should this problem be solved? More or less?

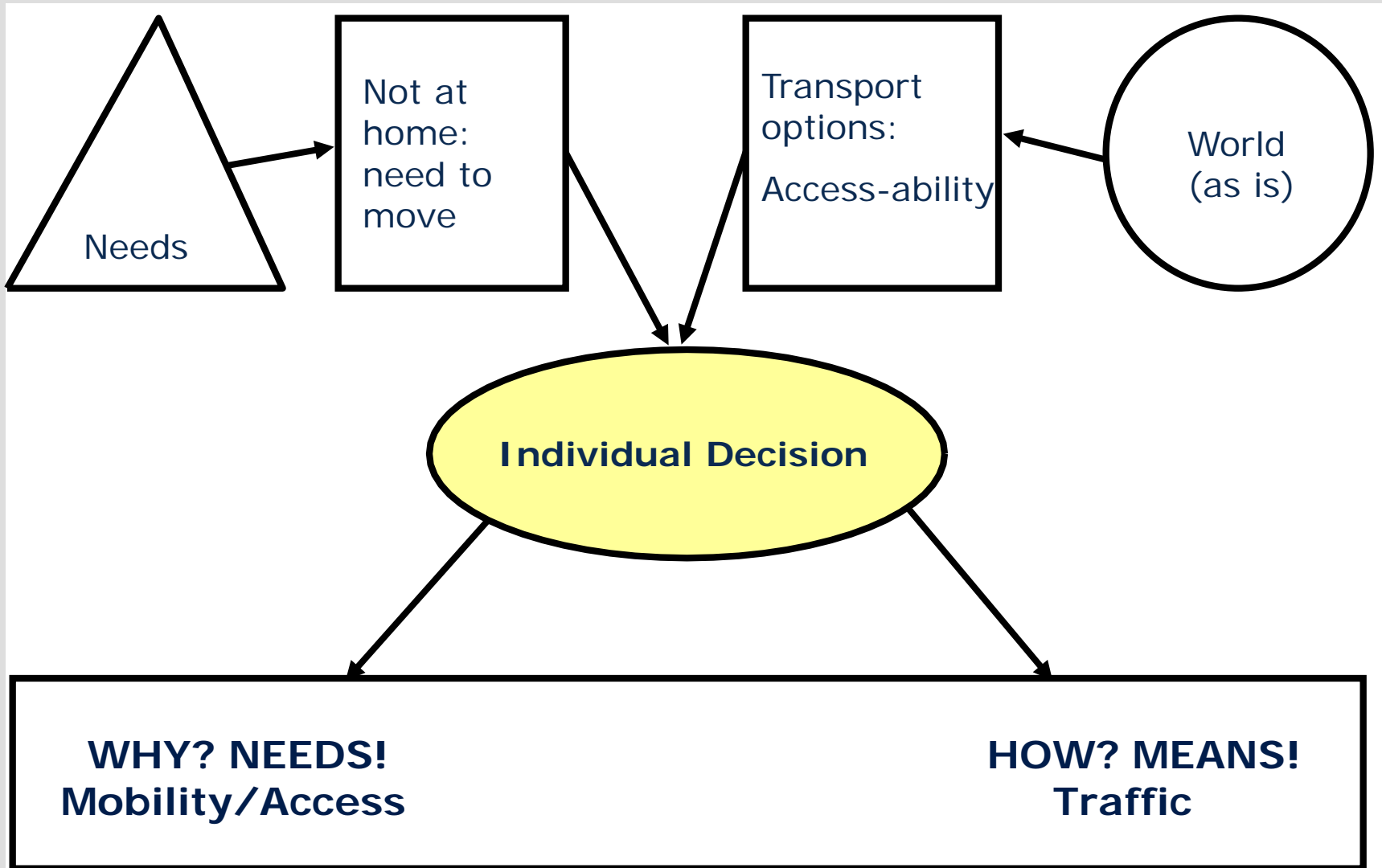
Answer: Make a difference ...
between the good stuff (i.e., what we want)
and the bad stuff (i.e., what we do not want)

economically: output and input / ends and means ... prices!

What are we really wanting? What are our cities needing?



What is the objective of all movement?



Result: Separate between access and traffic

mobility/access: need, cause, reason, purpose („end“)

traffic: instrument to allow for access („means“)

What would you like to have in your city? Pick a wish:

1. Guarantee needs satisfaction for all: Access (mobility)
2. ... with less resources, less money, less time, less pollution, less accidents, less climate change, less area consumption, less noise, less waste ...

satisfying access needs with less traffic



3. What means climate change for transport?

1. Transport depends heavily on fossil fuels

2. Fossil fuels are limited (source side)

3. All carbon in fossil fuels is burnt to CO₂:

$$\text{CO}_2 \text{ [kg]} = x \text{ [l]} * \rho \text{ [kg/l]} * \text{Carbon-content [\%]} * 44/12$$

4. The atmosphere can not absorb all this CO₂ (sink side):

Damages/costs will be severe, difficult to estimate today

5. To sustain this planet: Fossil fuels need to be eliminated



How much CO₂?

nature

Vol 458 | 30 April 2009 | doi:10.1038/nature08017

LETTERS

Greenhouse-gas emission targets for limiting global warming to 2 °C

Malte Meinshausen¹, Nicolai Meinshausen², William Hare^{1,3}, Sarah C. B. Raper⁴, Katja Frieler¹, Reto Knutti⁵, David J. Frame^{6,7} & Myles R. Allen⁷

More than 100 countries have adopted a global warming limit of 2 °C or below (relative to pre-industrial levels) as a guiding principle for mitigation efforts to reduce climate change risks, impacts and damages^{1,2}. However, the greenhouse gas (GHG) emissions

Using a reduced complexity coupled carbon cycle–climate model^{15,16}, we constrain future climate projections, building on the Fourth IPCC Assessment Report (AR4) and more recent research. In particular, multiple uncertainties in the historical temperature obser-



Consequences

COP 21 Paris: Please not more than 2°C (1,5°C)

From today to 2050 max. 600 Gt CO₂ altogether: This translates to about 1 t CO₂ (= 400 litres of fuel) per person per year

What would you do, how much for transport? Suggestion: About 100 litres of Petrol/Diesel/Kerosine per year for transport

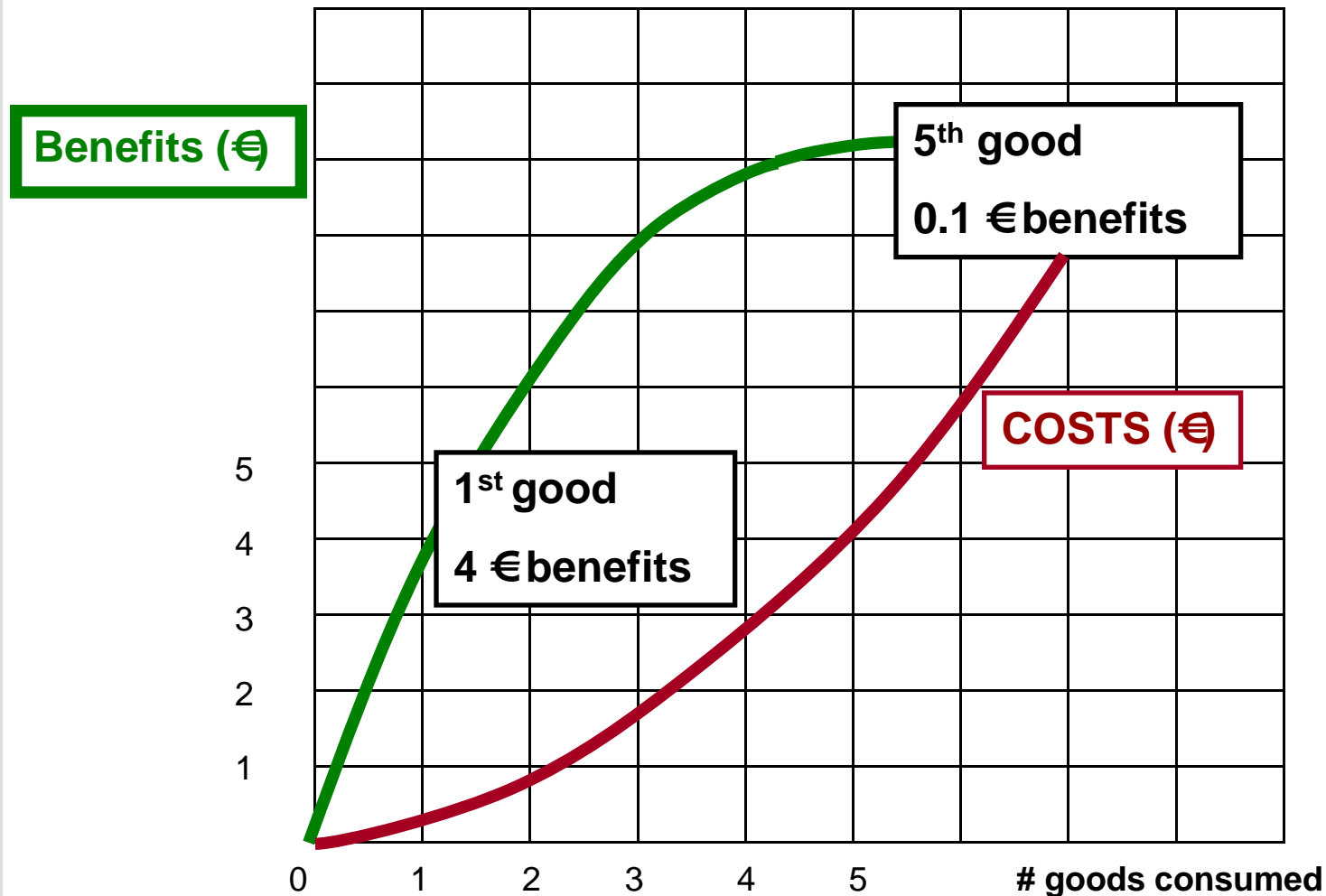
How to manage transport in your city, assuming all people need to reach their destinations with 100 litres of fuel per year?

What will you need in long term perspective?

- 800 km SUV, or 1 flight, or 10 000 km bus/rail per year?
- 6-lane highway, or bike path? Density, diversity, design?



4. What is the core of the EU-White paper?



... Agenda I of Mankind: "More is Better"

(Or: How can I increase my own personal benefits?)

A. Benefits should be only for me	Privatisation
B. Costs should be paid by others	Externalisation
B1. By other people/societies	Taxes, noise, pollution ...
B2. By other regions (space)	NO _x , O ₃ trop., junk, ...
B3. By other generations (time)	Loans, CO ₂ , O ₃ stat. ...

If other people, areas, generations pay for our benefits,
then all decisions are inefficient: We waste resources!



Perspective of society:

In individual decisions, **external effects** are not included:

- part of infrastructure costs, some accident costs
- noise and pollution costs, costs of climate change
- up- and downstream effects
- other costs (soil, water, habitat losses ...)

Those costs are externalized onto

a) other people, b) other regions c) other generations

Our market place economies are completely distorted

Prices today are not giving the right signals

Arthur Cecil Pigou: *Wealth and Welfare* (1912), *Economics of Welfare* (1920)



EU White Paper 2011 (p. 29):

3.3. Getting prices right and avoiding distortions

Phase I (up to 2016)

Transport charges and taxes should be restructured. They should underpin transport's role in promoting European competitiveness, while the overall burden for the sector should reflect the total costs of transport in terms of infrastructure and external costs.

...

Proceed with the internalisation of external costs for all modes of transport applying common principles while taking into account the specificity of each mode.

Phase II (2016 to 2020)

Building on Phase I, proceed to the full and mandatory internalisation of external costs



There is a lot of literature:



Huib van Essen, Arno Schroten, Matthijs Otten (CE Delft), Daniel Sutter, Christoph Schreyer, Remo Zandonella, Markus Maibach (INFRAS Zürich), Claus Doll (ISI Karlsruhe)

External Costs of Transport in Europe, Update for 2008

results: 514 billion € (transport), 314 billion € (cars)

http://www.cedelft.eu/publicatie/external_costs_of_transport_in_europe/1258

RICARDO-AEA

Update of the Handbook on External Costs of Transport



Report for the European Commission:

DG MOVE

Ricardo-AEA/R/ ED57769

Issue Number 1

8th January 2014

Final Report



Some Results for the EU (high estimate)

- 1) Uncovered external costs of transport are ranging around 500 billion € to 600 billion €, maybe more
- 2) External costs of cars: From 350 billion to 400 billion €
- 3) That corresponds to uncovered external costs per car and year of about 1600 € (EU-27, 2008 prices)
- 4) If we manage to save 25% of these costs, we save money: 250 € per person per year in your city
- 5) Plzen, 170 000 people: more than 1.000.000.000 CZK



Internalising external effects

- is **not** to „punish people“ or to generate revenues
- is setting price signals instead of prohibitive laws
- is in the long term interest of the industry
- is in the interest of the people (damage is avoided)
- is stimulating innovation and competitiveness
- is supporting the poorer parts of the population

The earlier we start with internalization,
the more we support the economy,
the more we reduce environmental damage,
the more we help poorer parts of the society!



5. What to do in cities - and how to do it?

I: Think of people satisfying needs instead of car parks

II: Think of nearness and diversity

III: Think of reducing external costs of transport

IV: Always think of “push & pull – packages”

Or: Just think of a fair, efficient, social, sustainable world with true prices. Then ask yourself:

“Would everybody welcome my project, or would people think my project is unnecessary, damaging, worthless?”



Which city is less un-sustainable?



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Welcome to Era-net Transport

What is ENT

Era-net Transport (ENT) has evolved since 2004 into a service platform for Programme Owners and Managers, providing the required framework for initiating and implementing transnational research and innovation funding collaborations.

Our mission

At Era-net Transport we work together on the basis of trust and we aim to benefit from each other's strong points. We proactively bring together different European research parties involved in transport industry. Our collaborative cross-border consortium brings together a range of knowledge and viewpoints to create a sustainable transport (r)evolution.

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News

The latest from the world of Era-net Transport

Results Steppings Stones Conference Online!

During the Stepping Stones Final Conference in Krakow September 17th and 18th, transport



<http://transport-era.net/>

Stepping Stones: Final Conference

Era-net Transport and the Research Consortia of: SHAPE-IT, Step-by-Step and GPS, in collaboration with The National Centre for Research and Development and Krakow University of Technology organised the final conference of Stepping Stones.

Stepping Stones: How to make Mobility Patterns More Sustainable 18th-19th September Krakow (Poland)

Recommendations

[Recommendations Step by Step \(doc, 40 kB\)](#) 

[Recommendations GPS \(docx, 4.1 MB\)](#) 

[Recommendations Shape-It \(docx, 44 kB\)](#) 

Presentations

[Presentation Step by Step \(ppt, 2.1 MB\)](#) 

[Presentation GPS \(pptx, 3.3 MB\)](#) 

[Presentation Shape-It \(pptx, 1.7 MB\)](#) 

[Presentation Policy Integration \(Shape-it\) \(pptx, 190 kB\)](#) 

[Presentation Era-net \(RWS\) \(ppt, 3.2 MB\)](#) 

[Presentation Polish National Centre for Research & Development \(ppt, 2.6 MB\)](#) 

[Presentation Munich \(Martin Schreiner\) \(ppt, 15 MB\)](#) 

[Presentation Recommendations Parking \(GPS\) \(pptx, 1.1 MB\)](#) 

[Images European Mobility Week Cracow \(ppt, 5.6 MB\)](#) 



31 CASES

15 CITIES

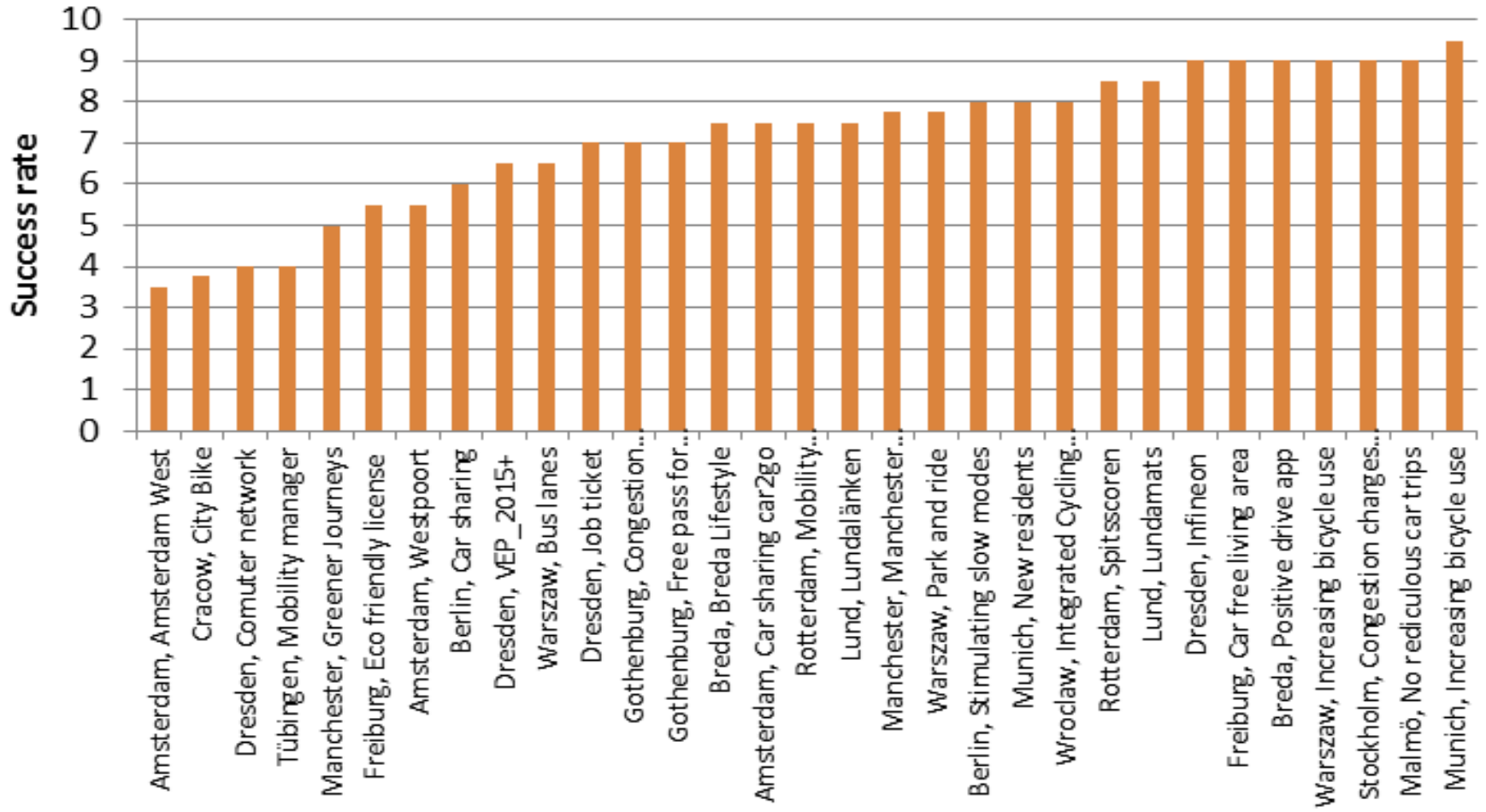


How to measure „less un-sustainable“ ?

- ... depends on whom you ask ...
- „Success“ has many ingredients: We selected five of those
 1. Creating a process?
 2. Overcoming barriers?
 3. Monitoring and evaluation?
 4. Reaching the objectives?
 5. Continuing the process?
- In-depth interviews with city experts, plus reports plus data
- Five degrees of success: 2 or 1.5 or 1 or 0.5 or 0 points (A-F)



„success“ from 3,5 to 9,5



WHAT to do – and HOW to do it?

Result: All cities are different from one another!

WHAT to do in a city depends on the situation there at that time

- Maybe „success“ in Plzen is „no success“ in Brno
- Maybe „success“ in Plzen today is „no success“ tomorrow

HOW to do it is more important: Create and sustain a process:

- Each city needs some convinced, connected people
- These need some political support and many contacts (Public Transport, Journalists, Universities, Politicians ...)
- These need some power/budget and some responsibility
- These people know the situation best – and know what to do!
- Always include „Monitoring and Evaluation“

Sustain the process - good luck – and thank you!

