



2050
CliMobCity
Interreg Europe



European Union
European Regional
Development Fund

Project Appraisal

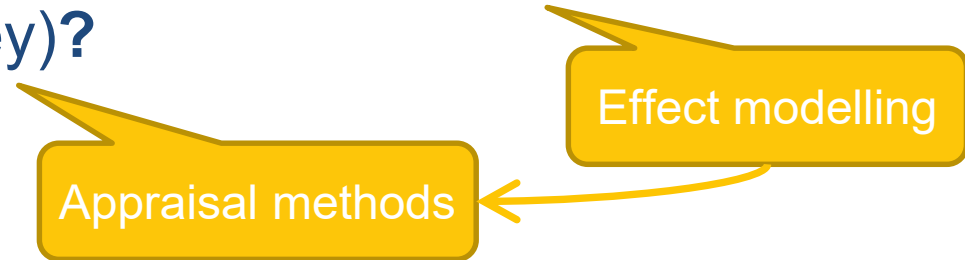
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Appraisal approaches

Are measure packages effective (do they work) and efficient (value for money)?



Monetary approaches

- financial analysis / Cost-Benefit analysis
- cost-effectiveness, cost-utility, total cost analysis
- societal cost benefit analysis

Non-monetary approaches

- Multi Criteria Analysis
- Multi-Actor Multi Criteria Analysis

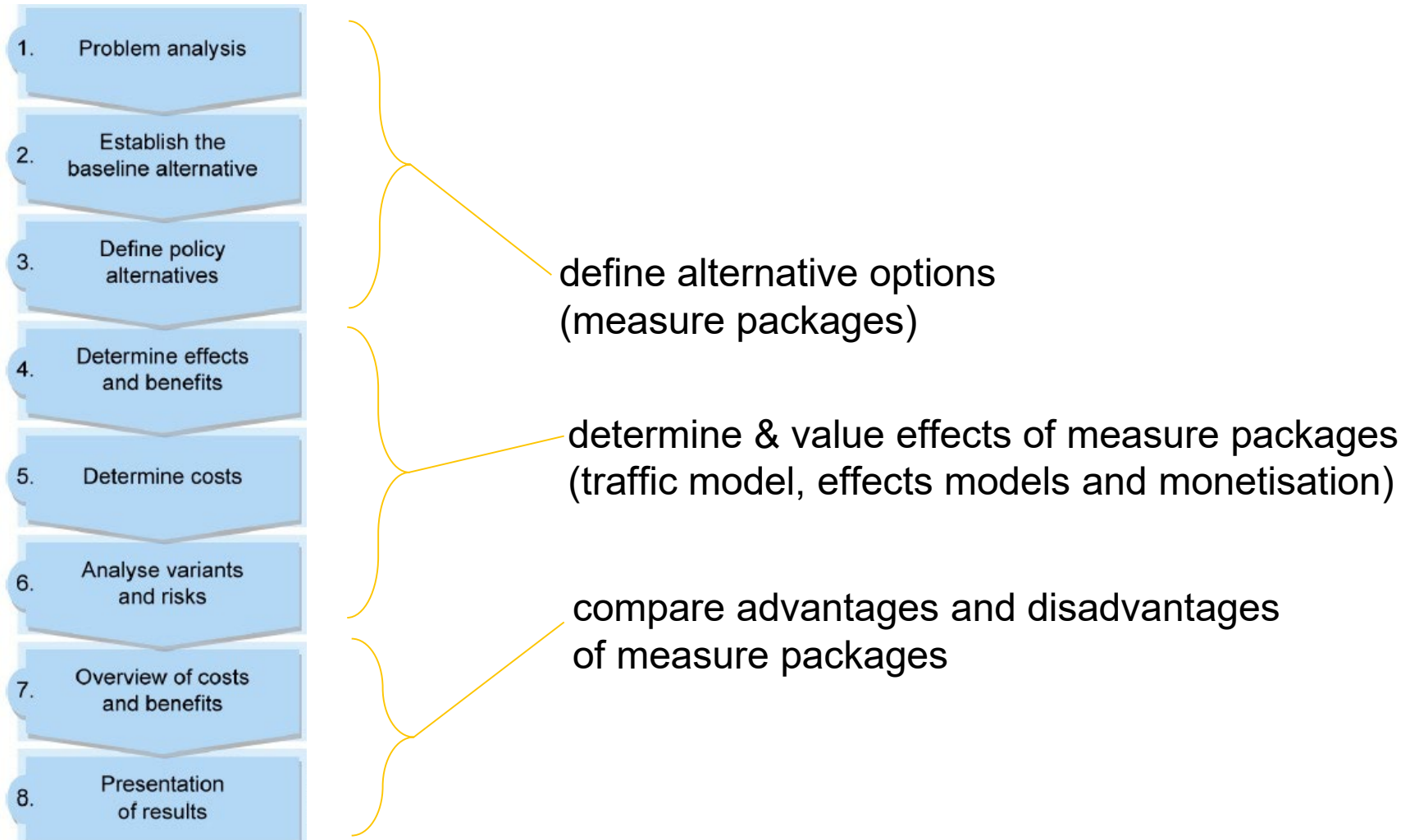
Appraisal approaches - sCBA

Monetary approaches

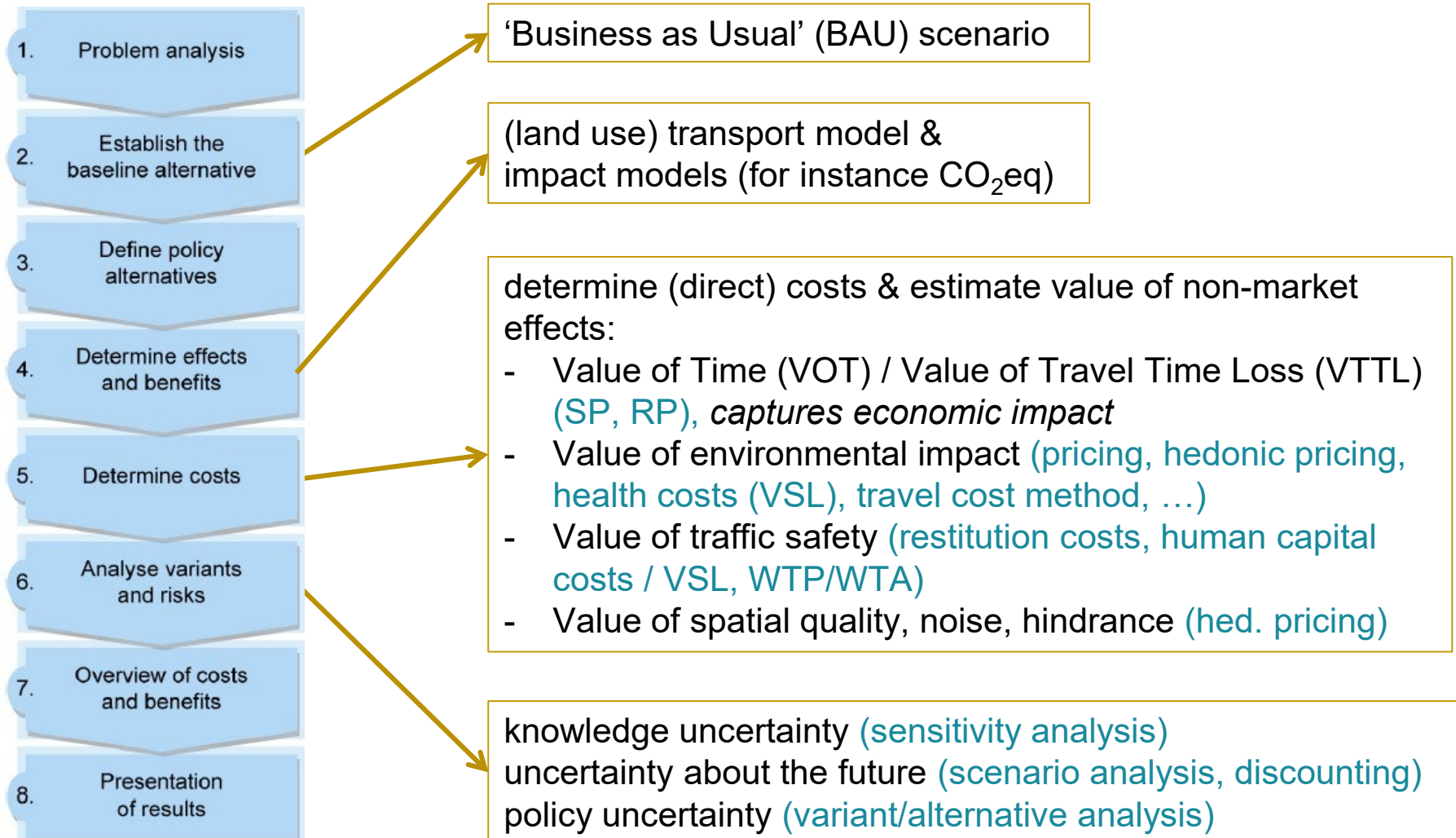
- all positive and negative effects are expressed in *monetary units*
- future costs and benefits are *discounted*
- in a societal cost-benefit analysis - non-market effects are *monetized*
- result expressed in 'net present value' (ideally > 0) or 'benefit-cost ratio' (ideally > 1)
- widely used, often formalized, a lot of experience, (seemingly) clear result
- does not normally take into account 'distribution effects' and differences in value perceptions



Appraisal approaches - sCBA



Appraisal approaches - sCBA



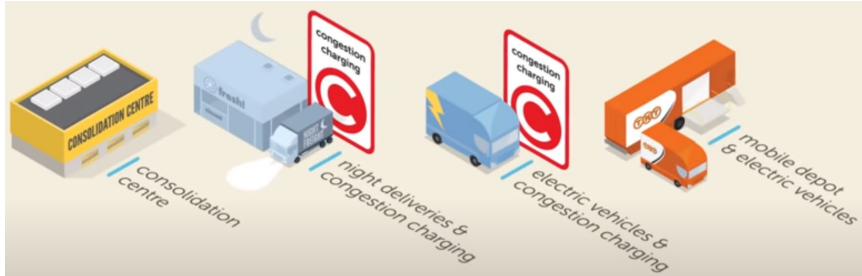
Appraisal approaches - MCA



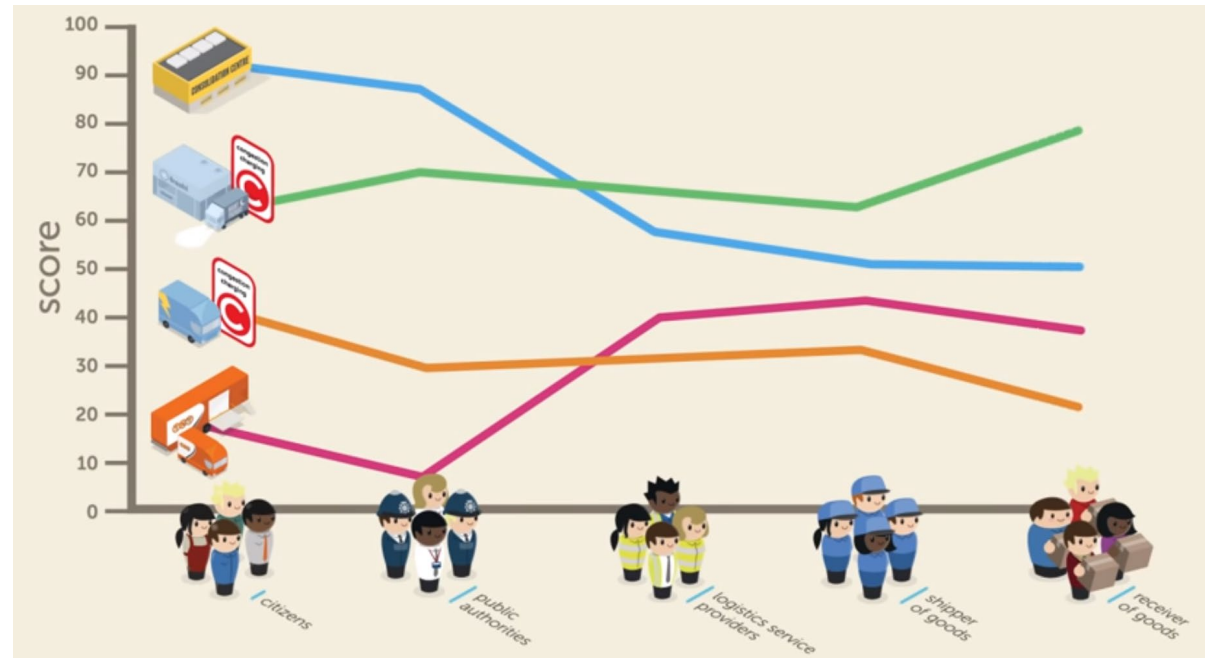
Non-monetary approach – MCA, MAMCA

- all (positive or negative) effects are represented in their native units
- the results are normalised and then weighted – their respective importance is determined
- the sum of the normalised weighted score determines the preference order of alternatives
- weighting can be done with different weighting sets, so representing multiple views (multiple actors)
- method is not standardised and not widely used in formal decision making procedures yet

Appraisal approaches - MCA



Multiple weighting sets



Source: screenshots from Straightsol Evaluation Framework Animation (<https://youtu.be/NsxrTjWt-g>)

Appraisal approaches

(s)CBA

- established method
- often used
- formalised in some countries
- *considerations:* distribution effects, controversial monetising methods, utility theory basis

MCA / MAMCA

- approach helps to get insight in different viewpoints
- not widely used and no standardised approach
- *considerations:* difficult to establish weighting sets

Appraisal Approaches in 2050CliMobCity

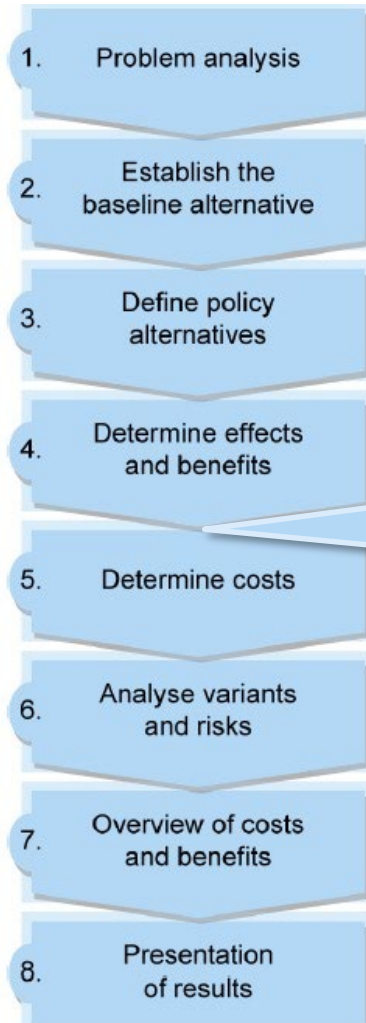
Note:

- sCBA & MCA are 'compensatory' methods
a specific disadvantageous effect can be compensated by another very advantageous effect and so still result in a 'good' project
- In 2050CliMobCity the aim is to reduce CO₂eq to a *certain level* or *the lowest as possible level*
- A package of measures can have a positive sCBA or MCA result, but still *not* comply with the CO₂eq objective!

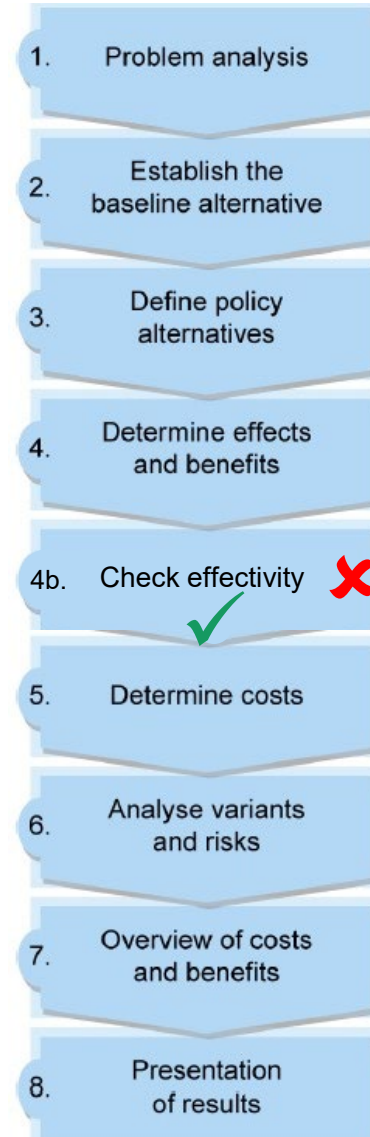
Therefore: *(if we want to do it the right way...)*

- first, a check must be made if the measure package (alternatives) reduces CO₂eq emissions sufficiently
- then evaluate only the successful packages in a sCBA or MCA

Appraisal Approaches in 2050CliMobCity



Check on CO₂eq *effectivity* of measure packages.
Proceed only if package is sufficiently effective.



Effects: value of time (VoT, VTTS)

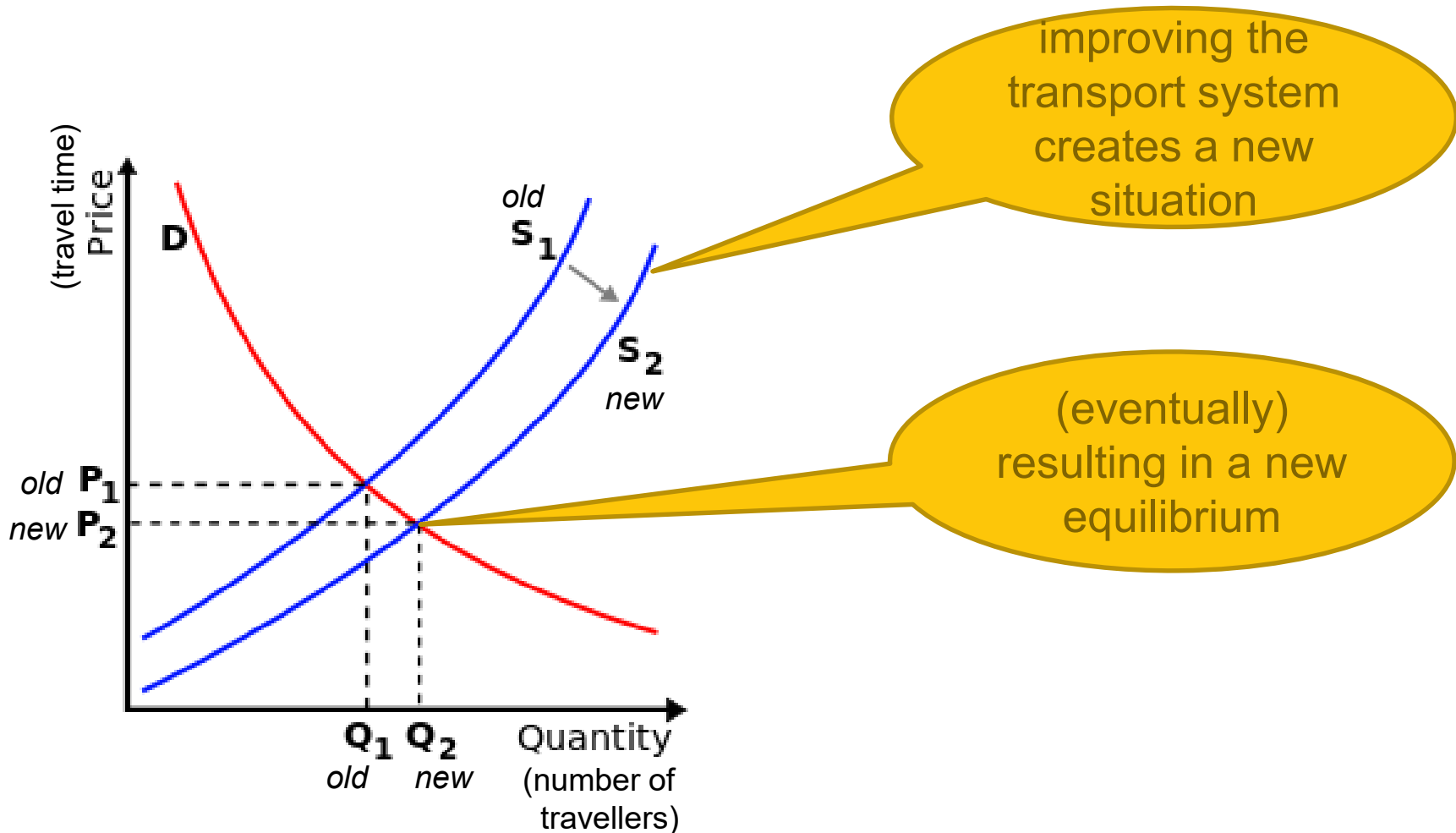
Value of Time / Value of Travel Time Loss

- traditionally, main benefit of transport system investments (infra, services), via travel time reductions
- transport-economic theory: VTTS captures all direct economic effects of investments

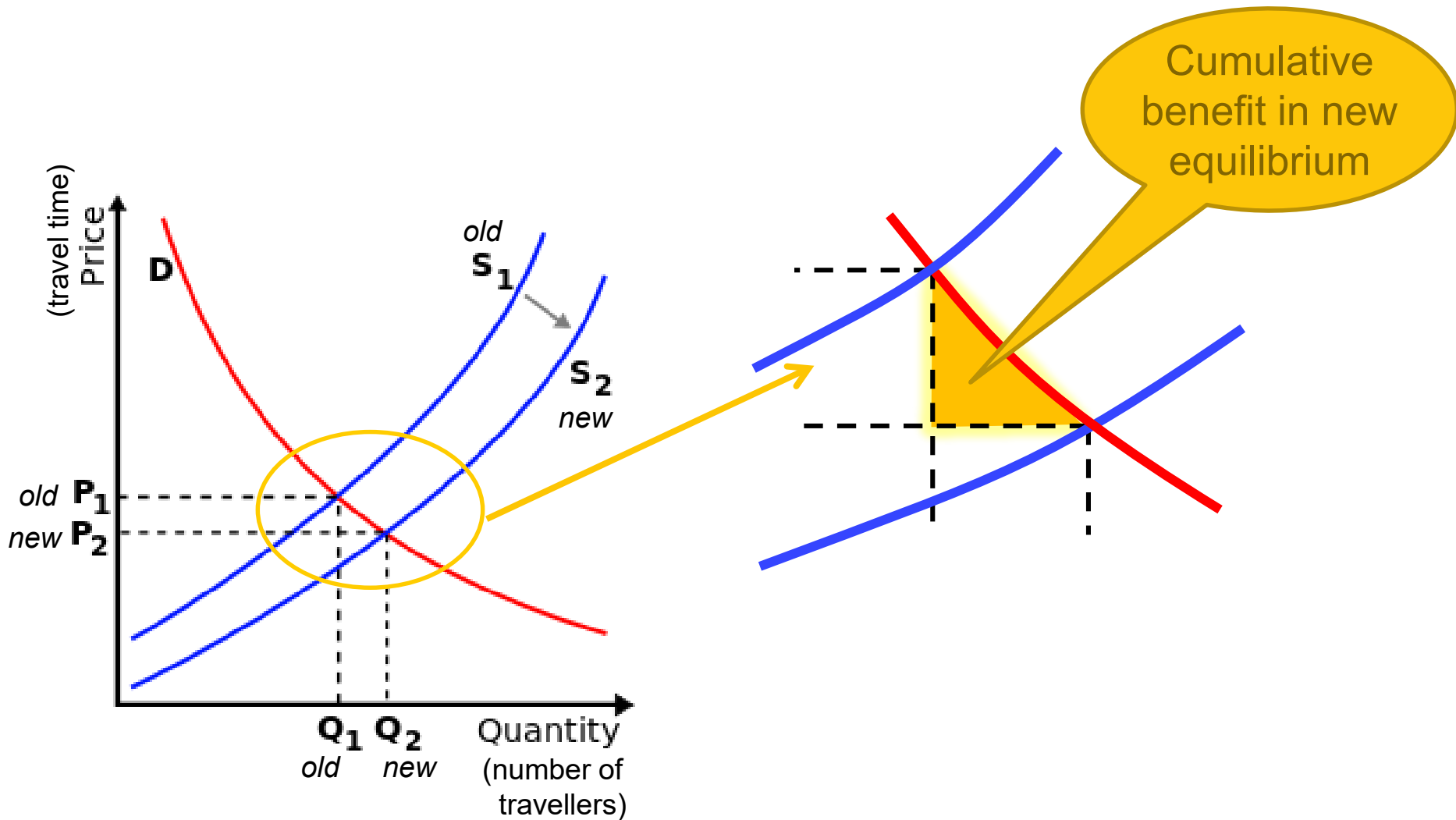
Note:

- not only current travellers, but also additional / new travellers will profit from the travel time reductions, although benefits will decrease with increasing demand

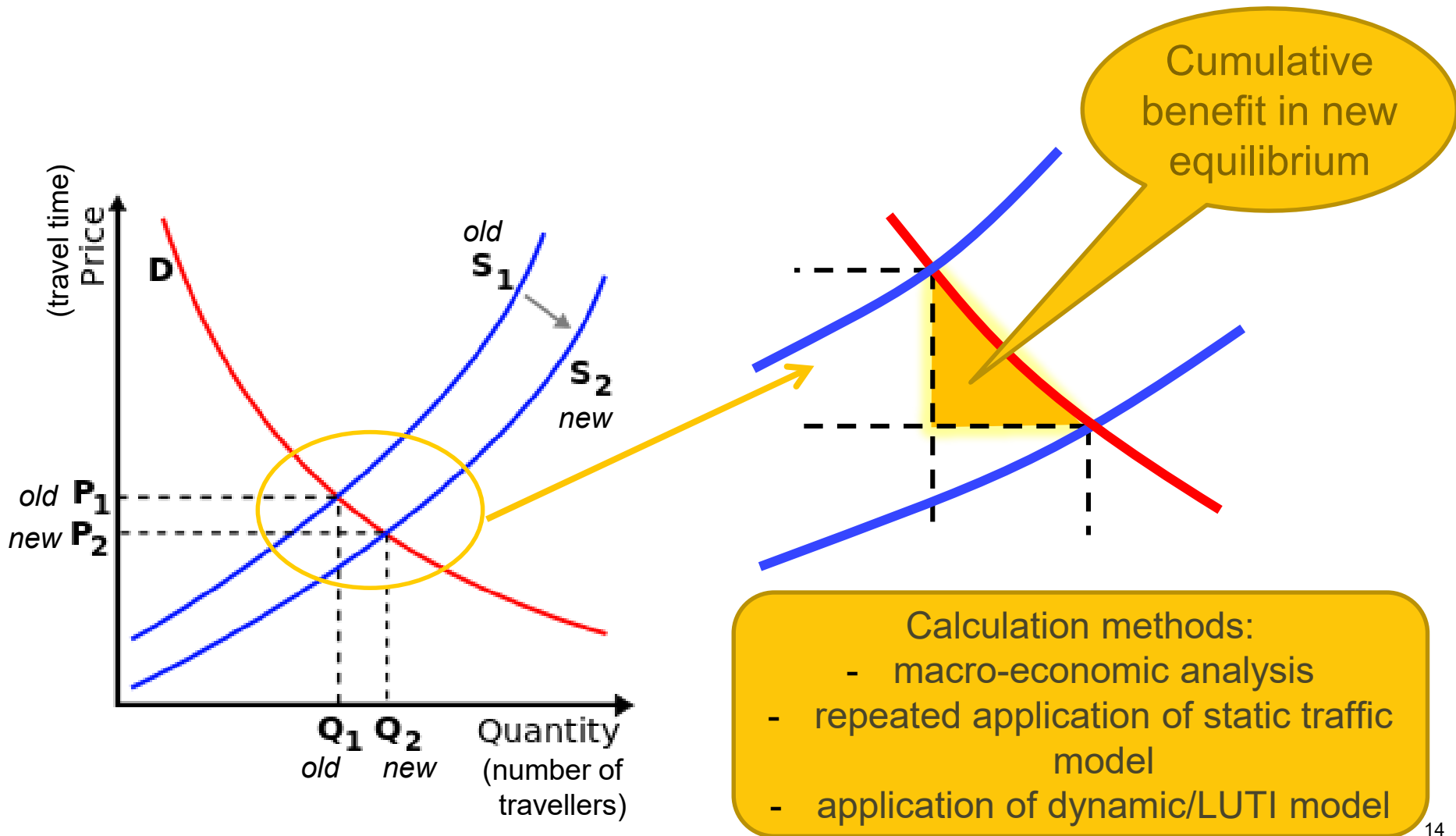
Effects: value of time (VoT, VTTS)



Effects: value of time (VoT, VTTS)



Effects: value of time (VoT, VTTS)



Effects: emissions to the air

Monetary value of emissions (emission reduction)

1. **Calculate emission effects**, related to:
 - Fuel mix
 - Engine characteristics / emission factors*
2. **Monetary value per emission type**
 - Amount of emission (reduced) x monetary value,
for all emission separately

Note: monetisation includes the costs of the effects of these emissions on health, acidification etc.

Effects: emissions to the air

Monetary valuation of emissions (the Netherlands)

€ ₂₀₁₅ /kg emission	compound	lower (for sCBA)	central (for LCA)	upper (for sCBA)
CO ₂ *	carbon dioxide	€ 0,014	€ 0,057	€ 0,057
CFC ₁₁ *	chlorofluorocarbons	€ 99,6	€ 313	€ 336
(PM 2,5)	ultrafine particles	€56,8	€79,5	€122
(PM 10)	particulate matter	€ 31,8	€ 44,6	€ 69,1
NO _x	nitrogen oxides	€ 24,1	€ 34,7	€ 53,7
SO ₂	sulphur dioxide	€ 17,7	€ 24,9	€ 38,7
NH ₃	ammonia	€ 19,7	€ 30,5	€ 48,8
(NMVOS)	volatile organic compounds	€ 1,61	€ 2,1	€ 3,15
CO	carbon monoxide	€ 0,0736	€ 0,0958	€ 0,152
CH ₄ *	methane	€ 0,448	€ 1,75	€ 1,77

* the value for greenhouse gas emissions includes VAT and increases by 3.5% per annum relative to the indicated 2015 values

Effects: safety, noise, hindrance

Other traffic effects include:

- **traffic safety:**

- estimated on basis of transport mode, traffic situation;
- monetised on basis of value of statistical life

- **noise:**

- estimated on basis of (rather complex) models
- monetised on basis of property values

- **physical and visual hindrance:**

- detailed analysis of local setting
- monetised on basis of property values, travel cost method



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Thank you!

Questions welcome



Project smedia