Solutions Métropolitains

Presentation pour l'ENSP Versailles

11 Avril 2017, Carmen Aalbers, carmen.aalbers@wur.nl

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Table de matières (40’ minutes)

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2. Problèmes Métropolitains
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4. Aspects environnementaux innovation transport
5. Questions?

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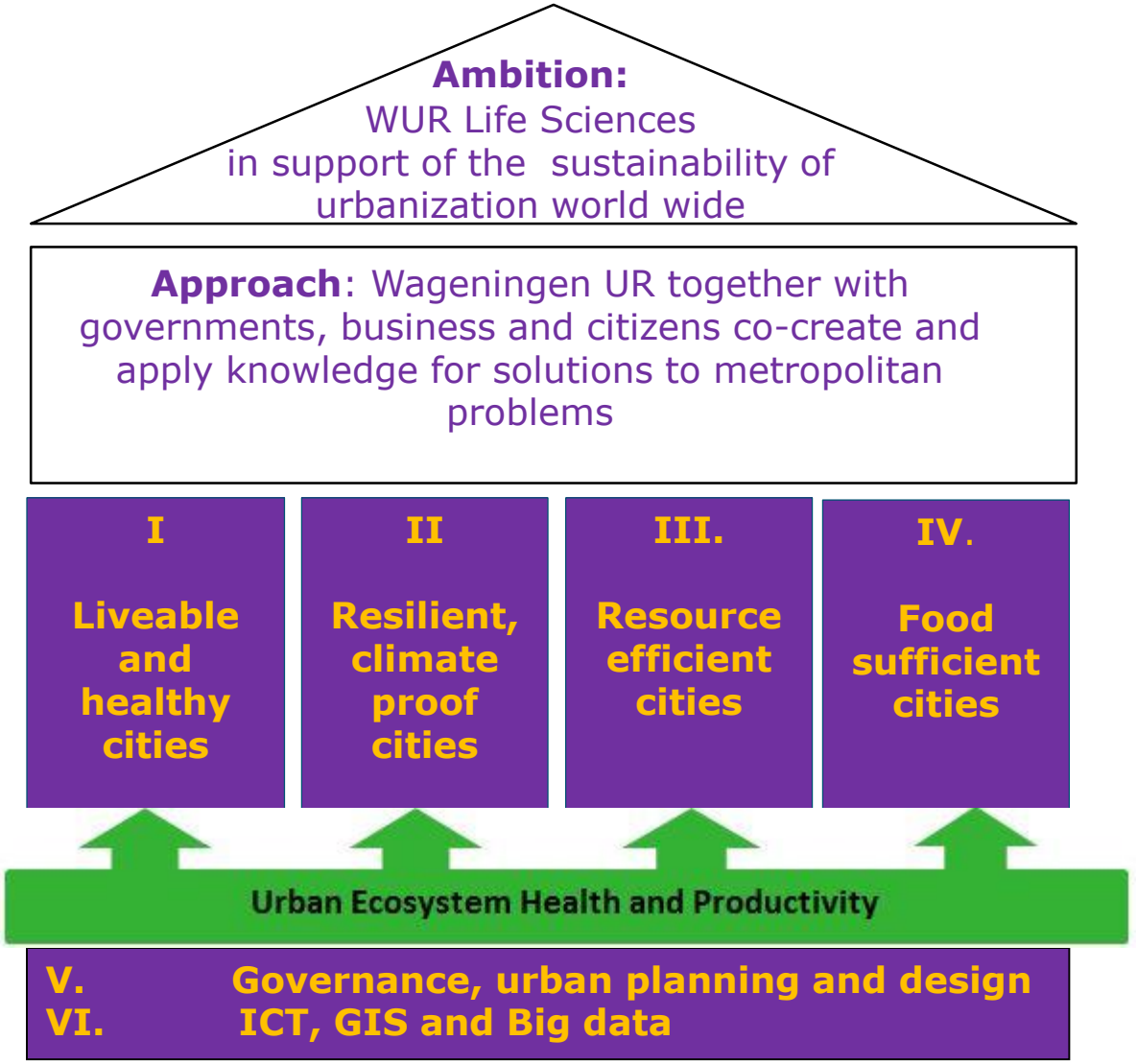
1 Le Program de récherche et d'implémentation conjointe

"Les Solutions Métropolitaines" de WUR



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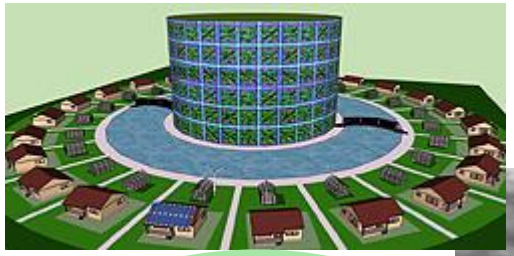
Metropolitan Solutions Wageningen Research



Design with metropolitan nature

Metropolitan Resource engineering

Motivations économiques

Food system design

Offer integrated solutions for sustainable urbanization

Unlocking potential by innovation in interaction

Data and diagnosis

Transition and scenarios

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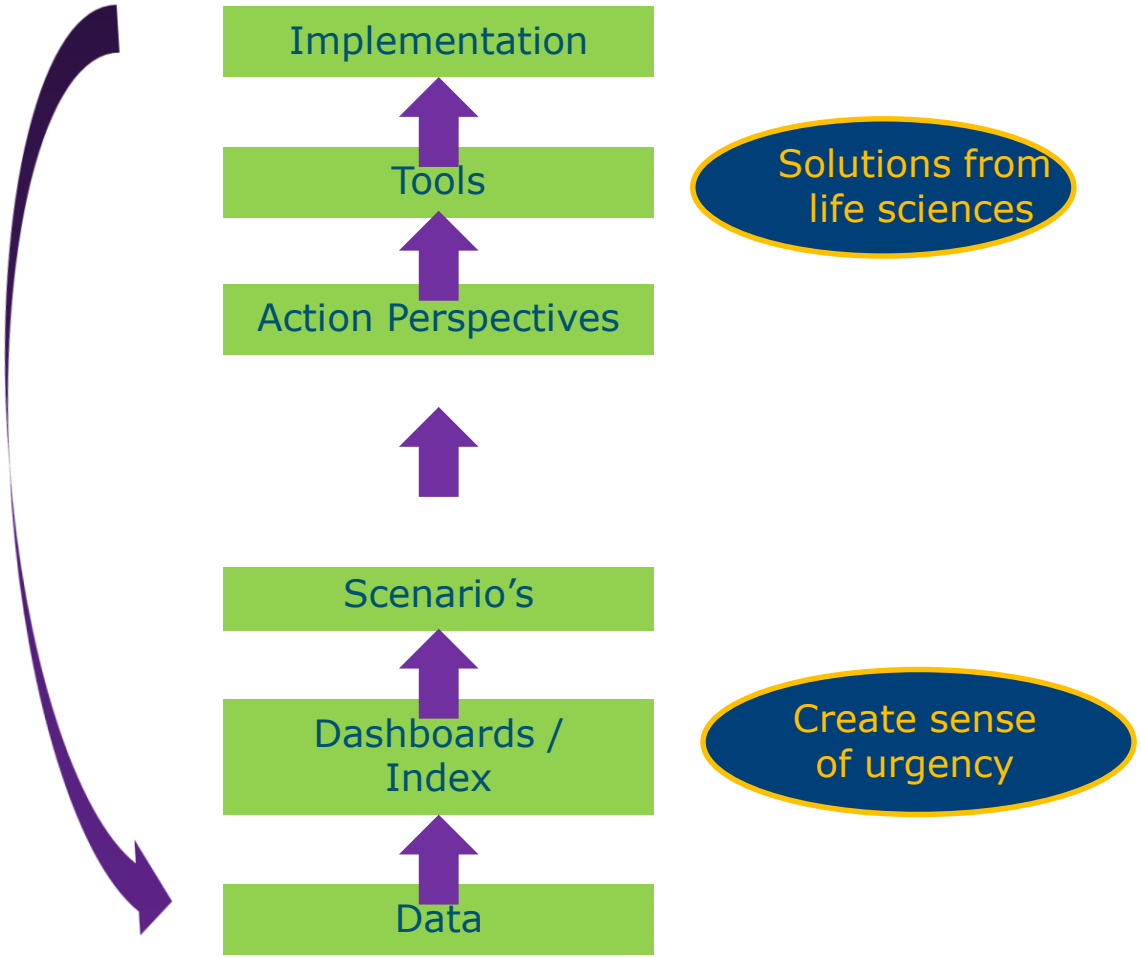
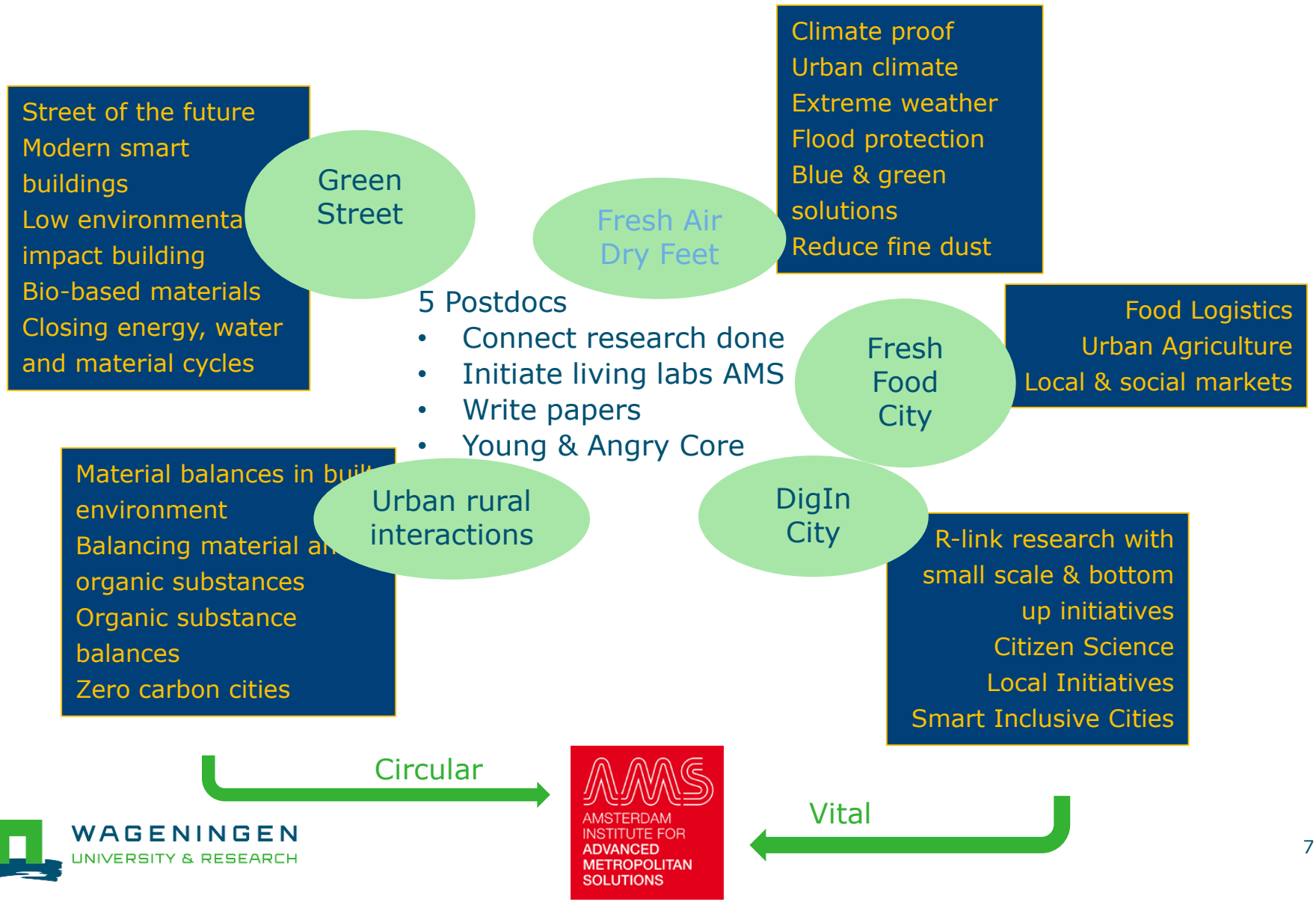
La logique derrière les grands composantes



Metropolitan Solutions

Metropolitan Solutions Wageningen University



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Cooperation

- Areas and Countries
  - China, Mozambique, Colombia, ...
  - Practically all European countries and capitals
  - Amsterdam, Rotterdam-the Hague, Eindhoven, etc. in NL
- Business: Heineken, AKZO, Liander, Doppelmayr, Rockwool, ...
- European and international programs, bilateral cooperations, ...
- Echanges et coopérations académiques et de recherche

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2. **Problèmes Métropolitains**
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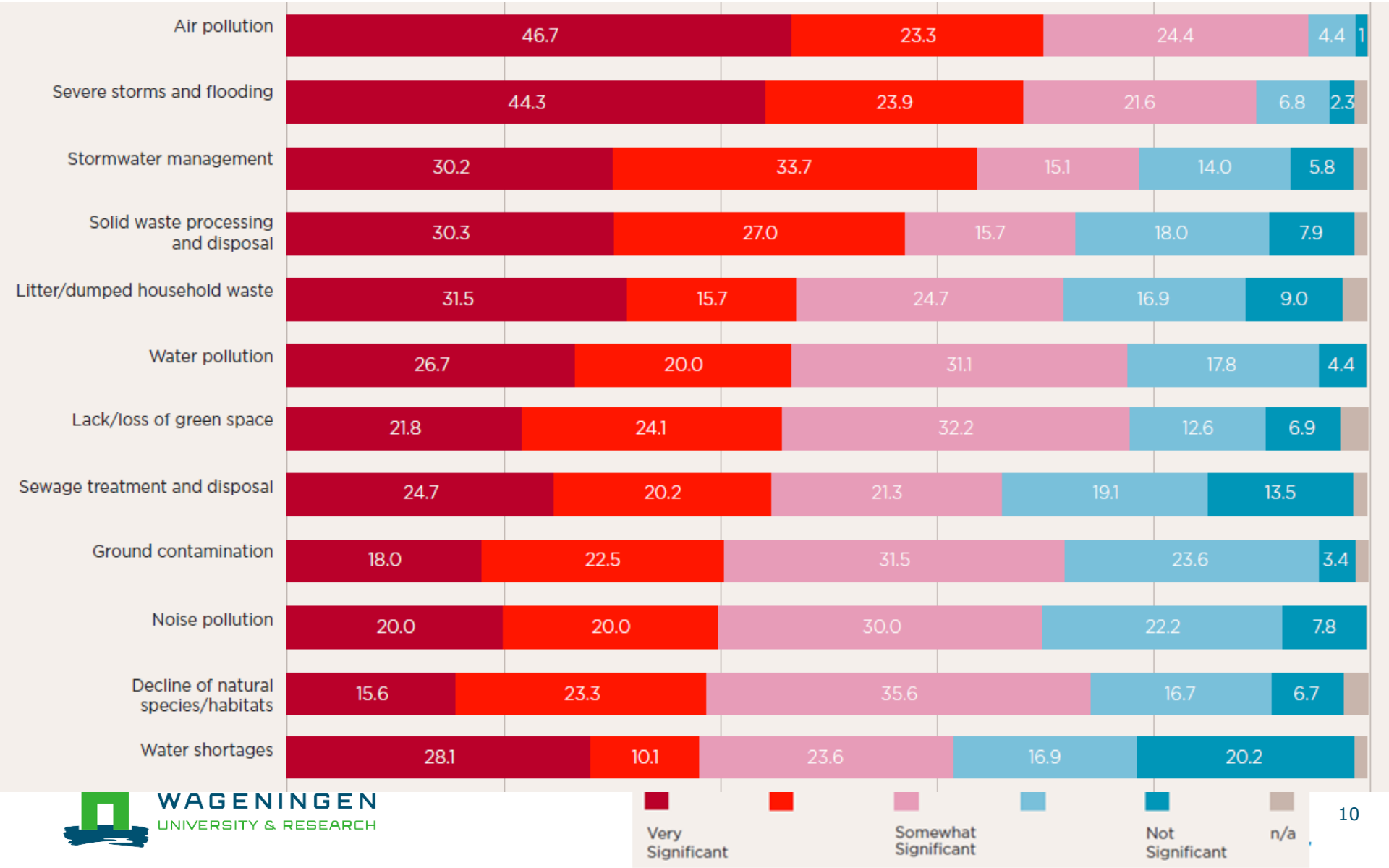
Problèmes Métropolitains

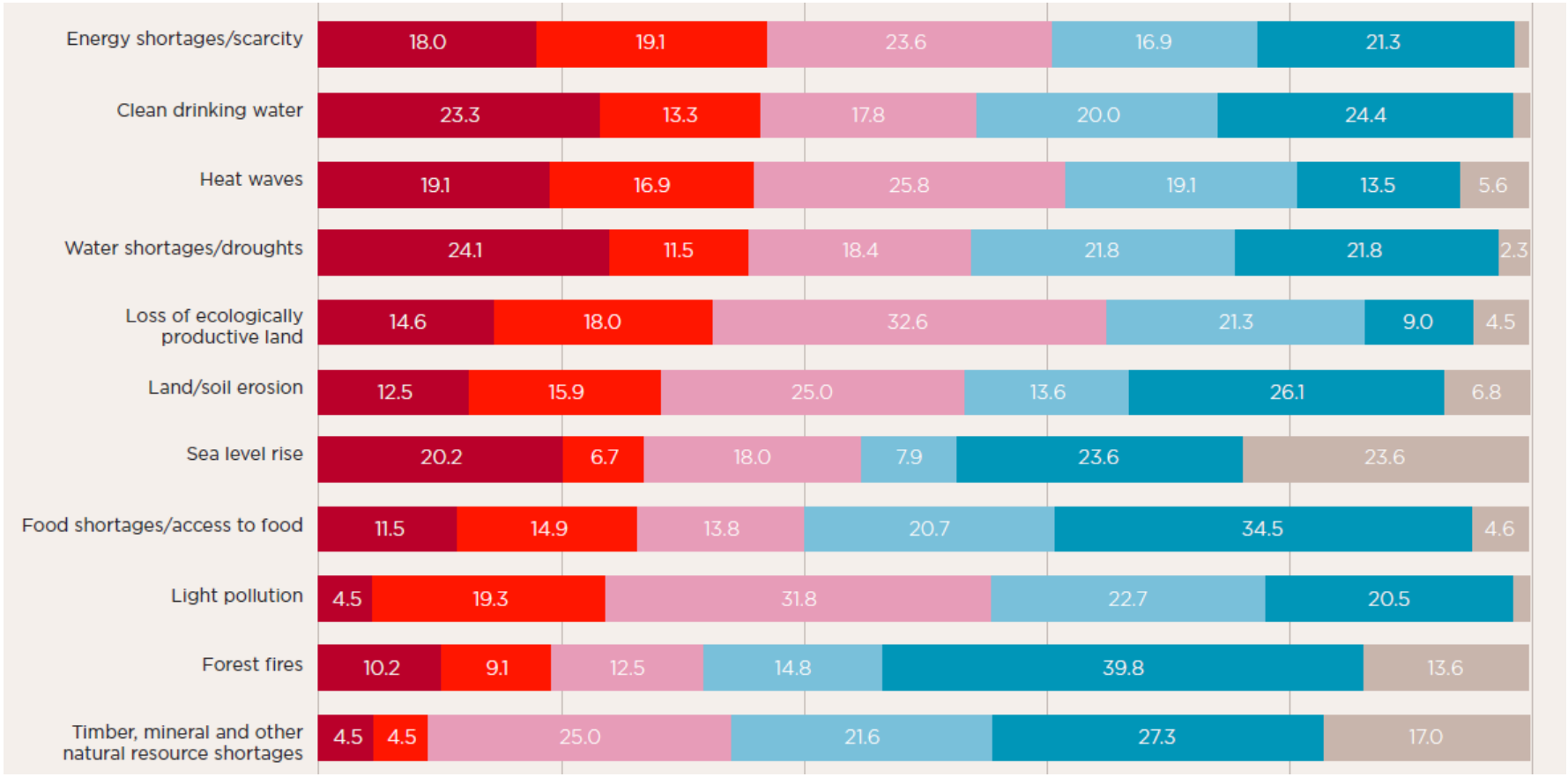
mainly Western or high to medium income countries.

source: London School of Economics



Problèmes Métropolitains

source: London School of Economics



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Problématique Metropolitaine en grandes lignes

- Pollution d'air
- Les aléas climatiques (innondations, sécheresse, chaleur extrème
- Déchets
- Pollution des sols
- Réduction des espaces vertes
- Manque de ressources: alimentation, phosphates énérgie, eau/eau potable, sols urbaines propres..),

- Attraction des villes et inégalité dans les aires métropolitaines.
- Problèmes de bruits
- Sécurité alimentaire, logistiques, l'abordabilité

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The greenest characteristics of a city

(source London School of Economics)

Natural environment

A city covered by forest

A clean harbour where you can swim

Parks and open space

Good access to green and blue surfaces

Preserving and enhancing wetlands

Biodiversity

Gardens

Energy

Over 75% renewable energy base

Energy efficiency standards for buildings

Progress towards a zero energy district

District heating

Smart grid

Biogas emission reduction project

Transport

Growing green public transport

Transit-oriented development

35% of commutes by bike

Excellent public bus service

Bike lanes

Water

Good access to drinking water

Clean water supply

Water conservation

Green stormwater infrastructure

Sewage treatment

Waste

Comprehensive recycling programme

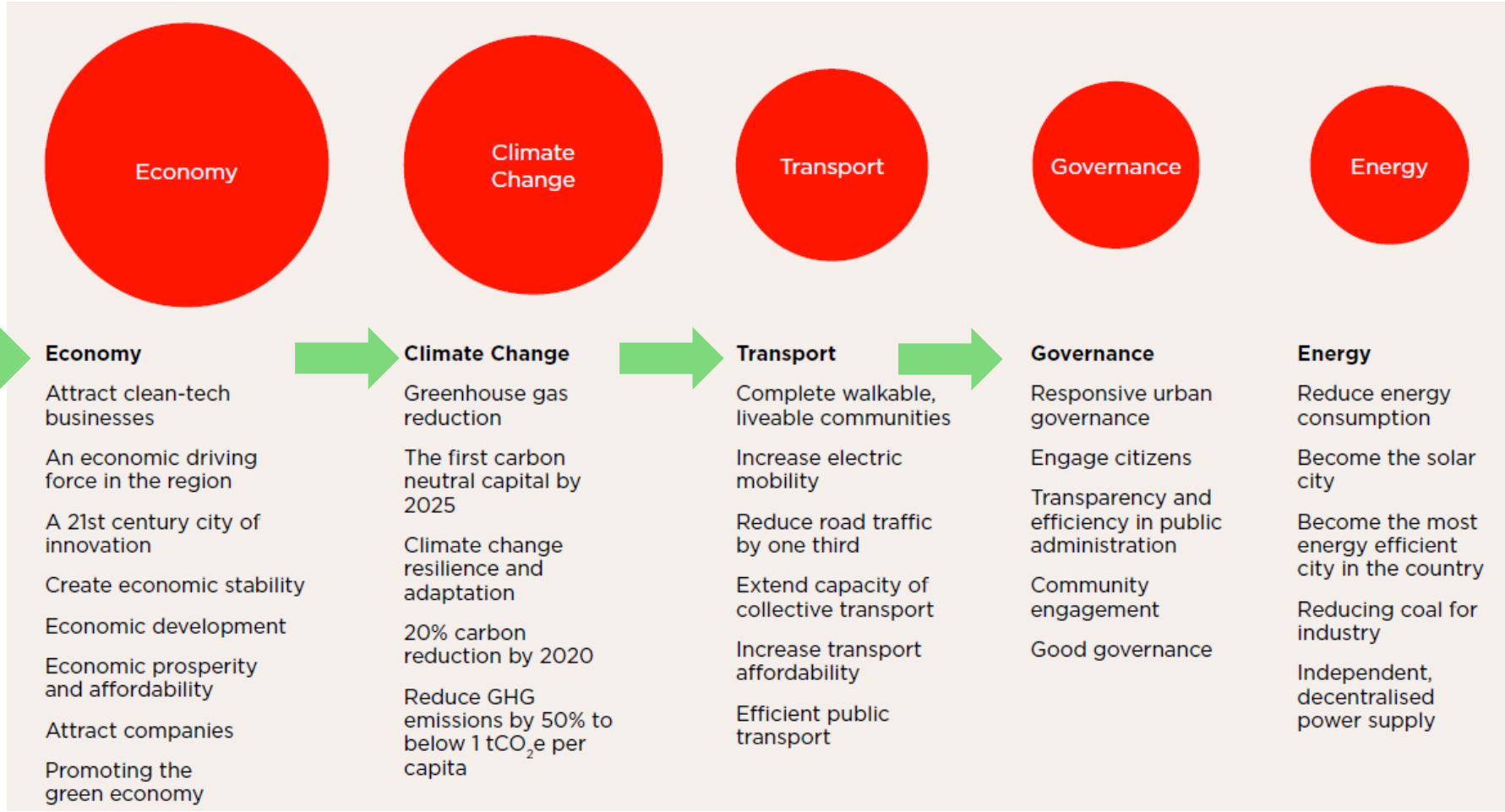
Strong waste diversion programme

Composting infrastructure

Banning plastic bags

Extended producer responsibility programmes

Top general city aspirations



Grande écart entre caractéristiques d'une ville verte et les ambitions des villes

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Relier le développement des villes à l ’environnement naturel

- Processus géomorphologiques, les-characterisez en connection avec l’humaine, les dynamiques des systèmes socio-écologiques des métropoles.
- Ecosystem Services (=services écologiques), investir et bénéficier
- Brussaard 2016: a healthy soil is essential for the circular economy, to deliver renewable green bio energy
- Capacité d’atténuation et détoxification des pollutions des sols (Wang et al. 2016, urban soils Beijing)) decimated by urbanization, highest in parks compared to residential and traffic areas. Can recover.

Brussaard

- Pour réaliser une économie circulaire, sans perte de ressources
- Nous devons recuperer les materiaux que nous obtenons maintenant des sources fossiles, des sources *biobased* et recyclable. Là il s'agirait surtout de cultures agricoles.
- Pas seulement pour l'alimentation, fourrage, fibres, mais aussi des ressources pour combustion, des agents aromatisants, des parfums, etc.
- Pour pouvoir satisfaire à ces bésoins, les capacités de production des terres doit être maintenu.

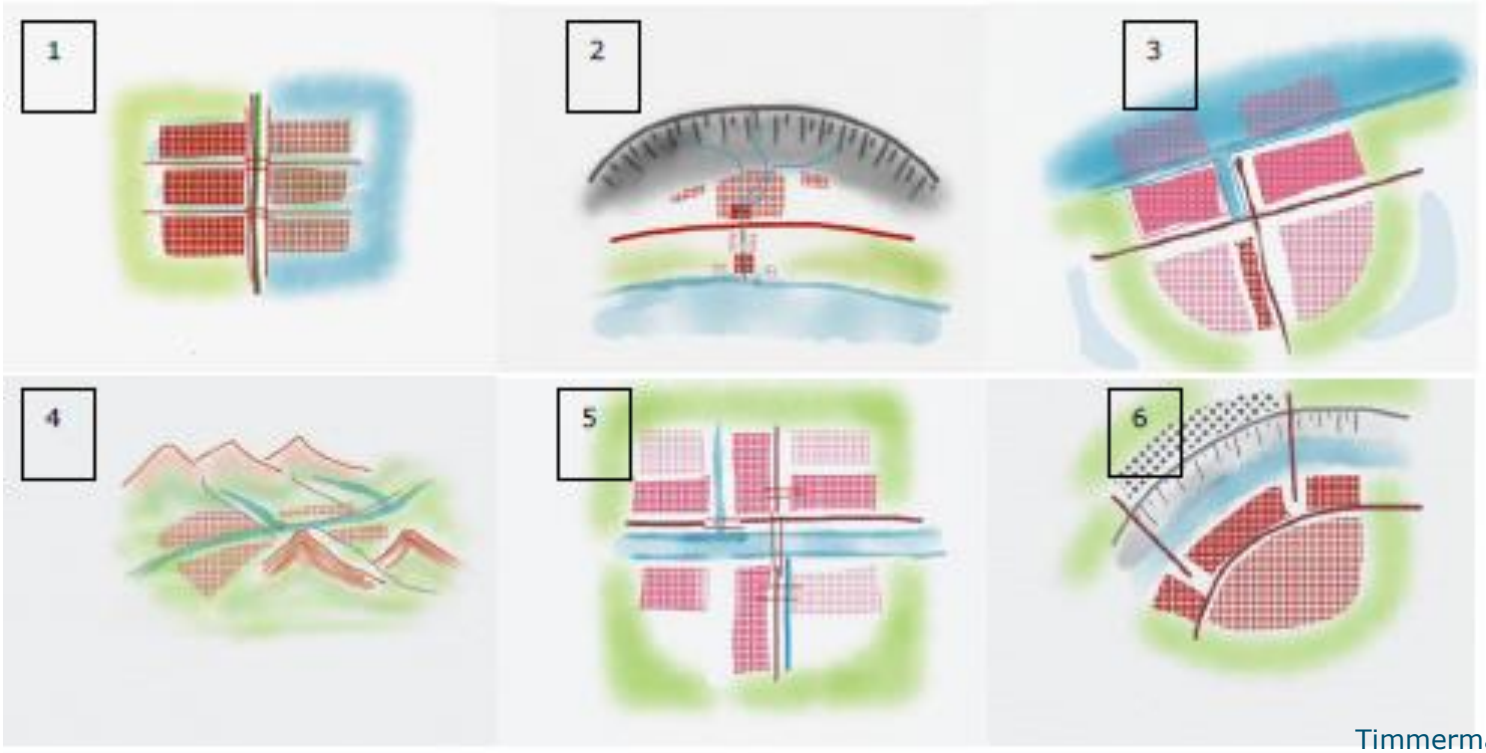
Designing with Nature, Ian Mc Harg 1969

- La première reconnaissance publique que la vie humaine, en bonne ou mauvaise santé est étroitement liée aux forces de la nature.

- La nature comme allié, et pas comme adversaire

- Planification spatiale avec le système naturel (Bijhouwer, Mc Harg: 'feeling for the land and its properties')

Caractérisez les structures et les dynamiques



Source:

Timmermans et al. 2016

Lange termijn kwetsbaarheid potentiele gevaren, per type stad

	delta			mountain		
	1	2	3	4	5	6
	delta	bergkust	laaglandkust	bergen	vlak land	heuvelland
zeespiegelstijging	5	3	3	0	0	0
rivier overstroming	5	2	4	3	4	1
wolkbreuk	2	5	2	5	3	4
hitte	1	1	1	3	5	4
tekort drinkwater	1	5	1	4	3	4
tekort voedsel	1	5	1	4	1	2

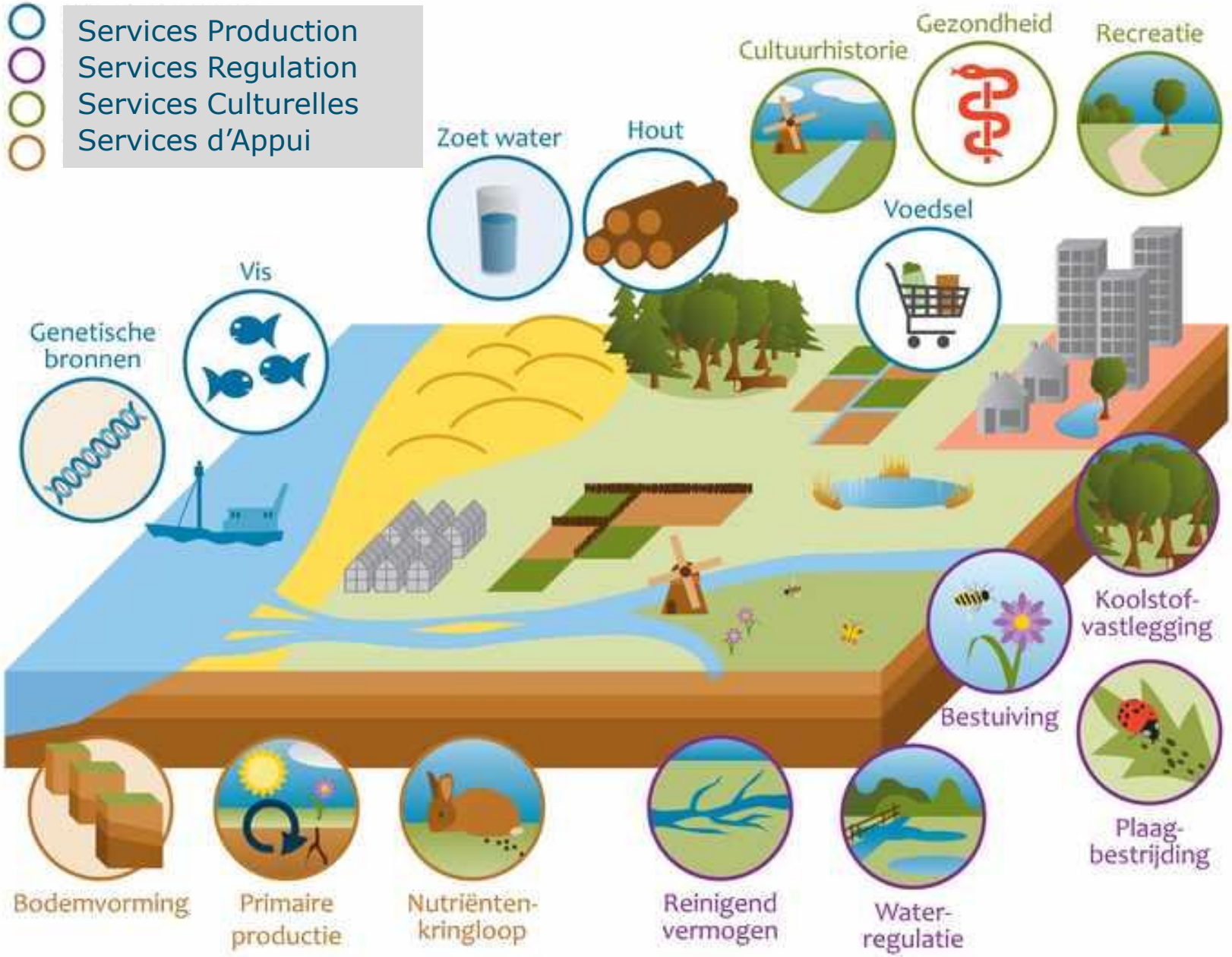
Ordinale rangorde, scores gebaseerd op:

- Temporeel (in de tijd)
- Spatieel (in de ruimte)
- Kwantiteit (hoeveelheid)

alle 3 → score 4 of 5 (kwetsbaar)
2 van de 3 → score 2, 3 of 4
1 van de 3→ score 1 of 2
0 van de 3→ score 0 (niet kwetsbaar)

Source:

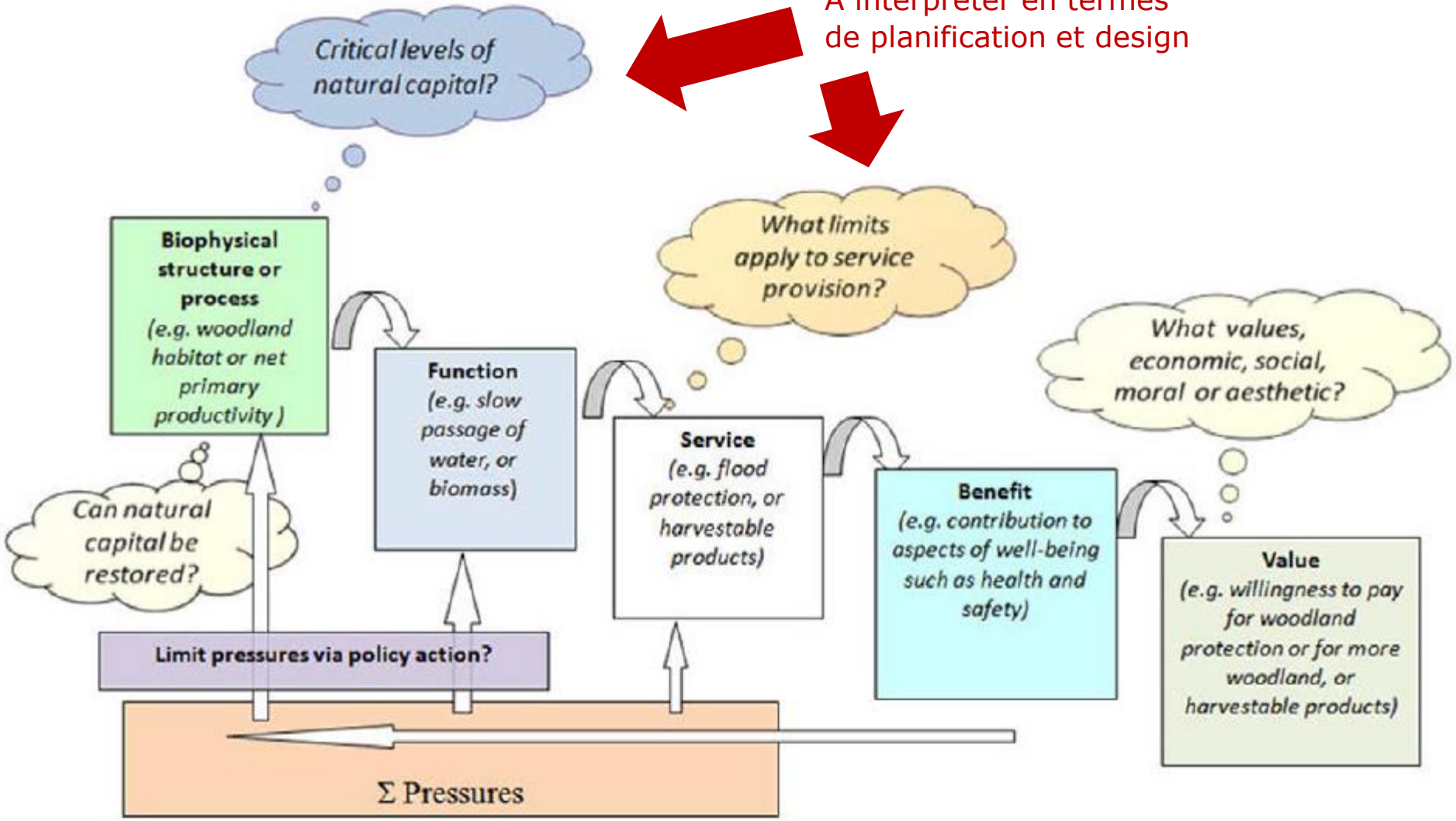
Agricola et al. 2016



source: Planbureau voor de

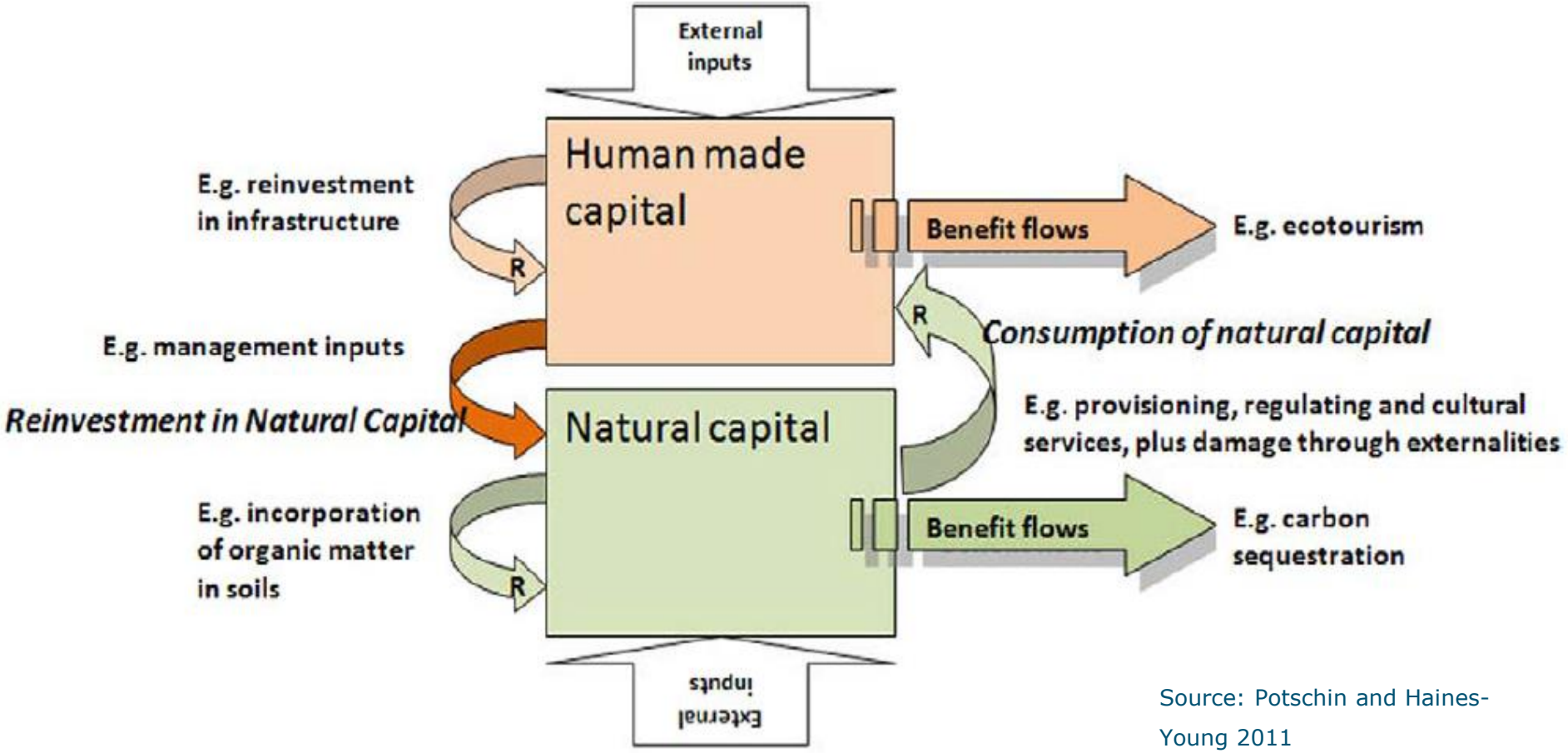
Du système bio-physique vers la valorisation

A interpréter en termes de planification et design



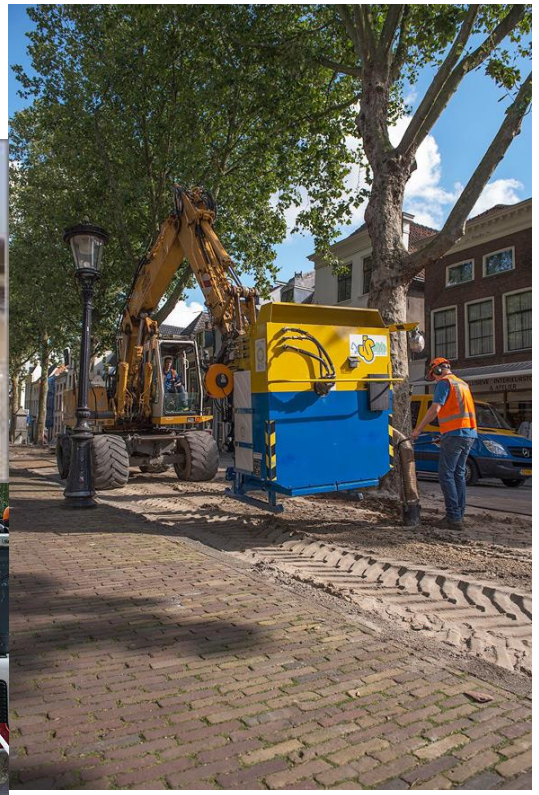
Source: De Groot et al. 2010

Les investissement humaines et leur ajout aux bénéfices et leur valorisation



Source: Potschin and Haines-Young 2011

Pratiques actuelles: haute impact sur l'environnement écologique, en terme de manque de valorisation pour l'homme



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Congestion, air pollution, ...

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...biased use of space...

... sealing and urban heat stress...

...expensive use of space...

Space for cars only:

> quarter of London
> half of Los Angeles

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...pressure on wildlife and biodiversity...

... noise stress, use of resources...

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...so much to win!

transport- + infrastructure costs

Overzicht van vervoerswijzen en kostenposten

	Klimaat	Luchtkwaliteit	Geluid	Ongevallen	Congestie	Infrastructuur	Ruimtebeslag	Emissies van elektriciteits- en brandstofproductie	Natuur en landschap	Bodem- en grondwater-vervuiling
Transport de personnes:										
Voiture	X	X	X	X	X	X	X	X	X	X
Moto	X	X	X	X	X	X	X	X	X	X
Mobylette	X	X	X	X	X[a]	X	X	X	X	X
Vélo	-	-	-	X	-	X	X	X	X	X
Autobus/tourincar	X	X	X	X	X	X	X	X	X	X
Tramway	-	X	X	X	-	X	X	X	X	X
Métro	-	X	X	X	-	X	X	X	X	X
Train	X	X	X	X	-	X	X	X	X	X
Avions	X	X	X	X	-	X	X	X	X	X
Transport cargaison:										
Cammionette	X	X	X	X	X	X	X	X	X	X
Cammion	X	X	X	X	X	X	X	X	X	X
Train cargo	X	X	X	X	-	X	X	X	X	X
Transport fluvial	X	X	-	X	-	X	X	X	X	-
Transport maritime	X	X	-	X	-	X	X	X	X	-
Transport'aérienne	X	X	X	X	-	X	X	X	X	X

[a] Alleen de marginale externe congestiekosten voor bromfietsen zijn ingeschat.

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Source: Schroten et al. CE Delft 2014

The present search for solutions: confirms the system

'lock in' and
'path dependency' (Urry, 2004)

Economic turnover : 115 billion euros 2010
Consumers 61 billion
Companies 54 billion

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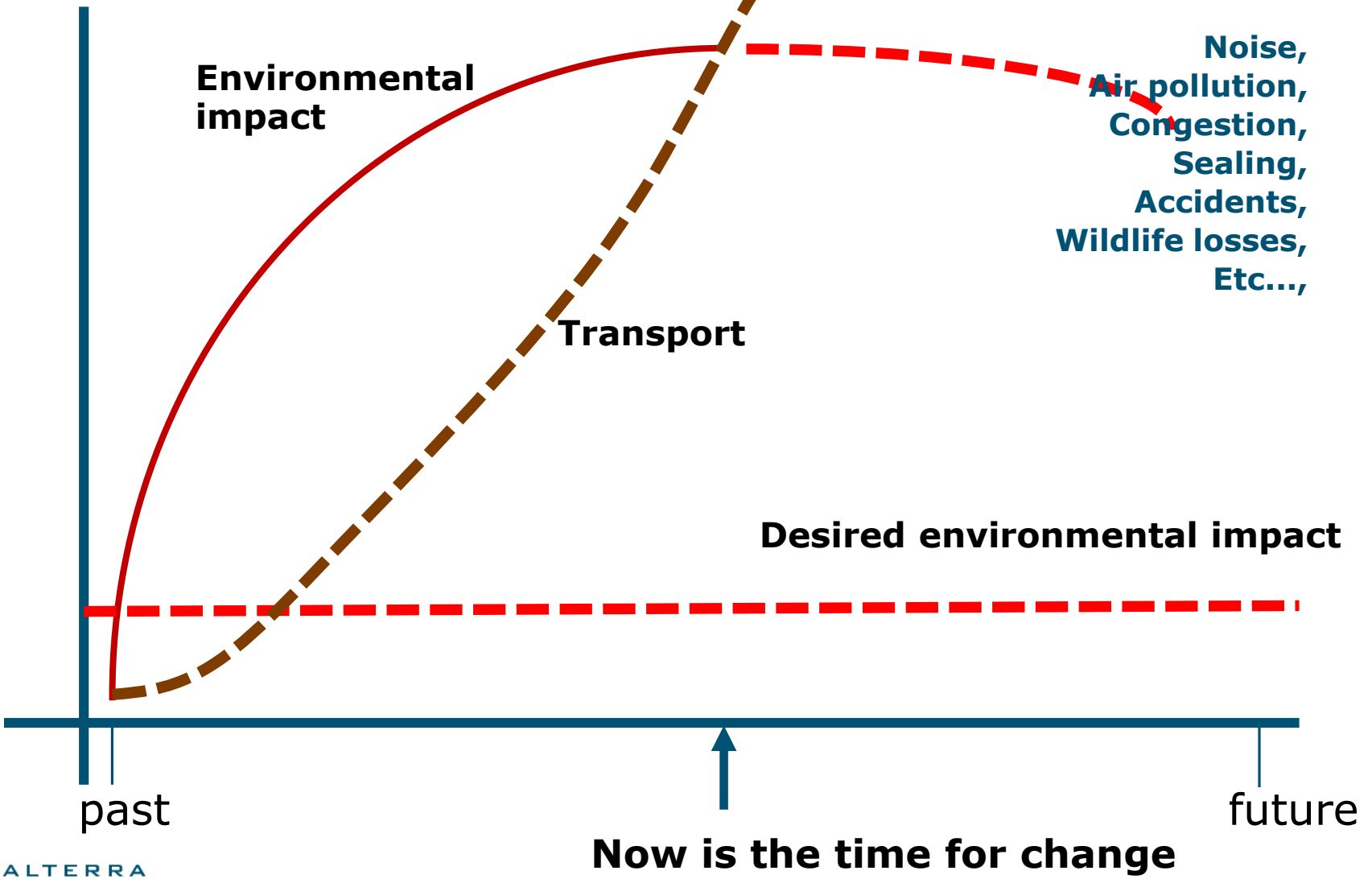
..and brings limited improvement in the environmental impact of transport



Time for a change

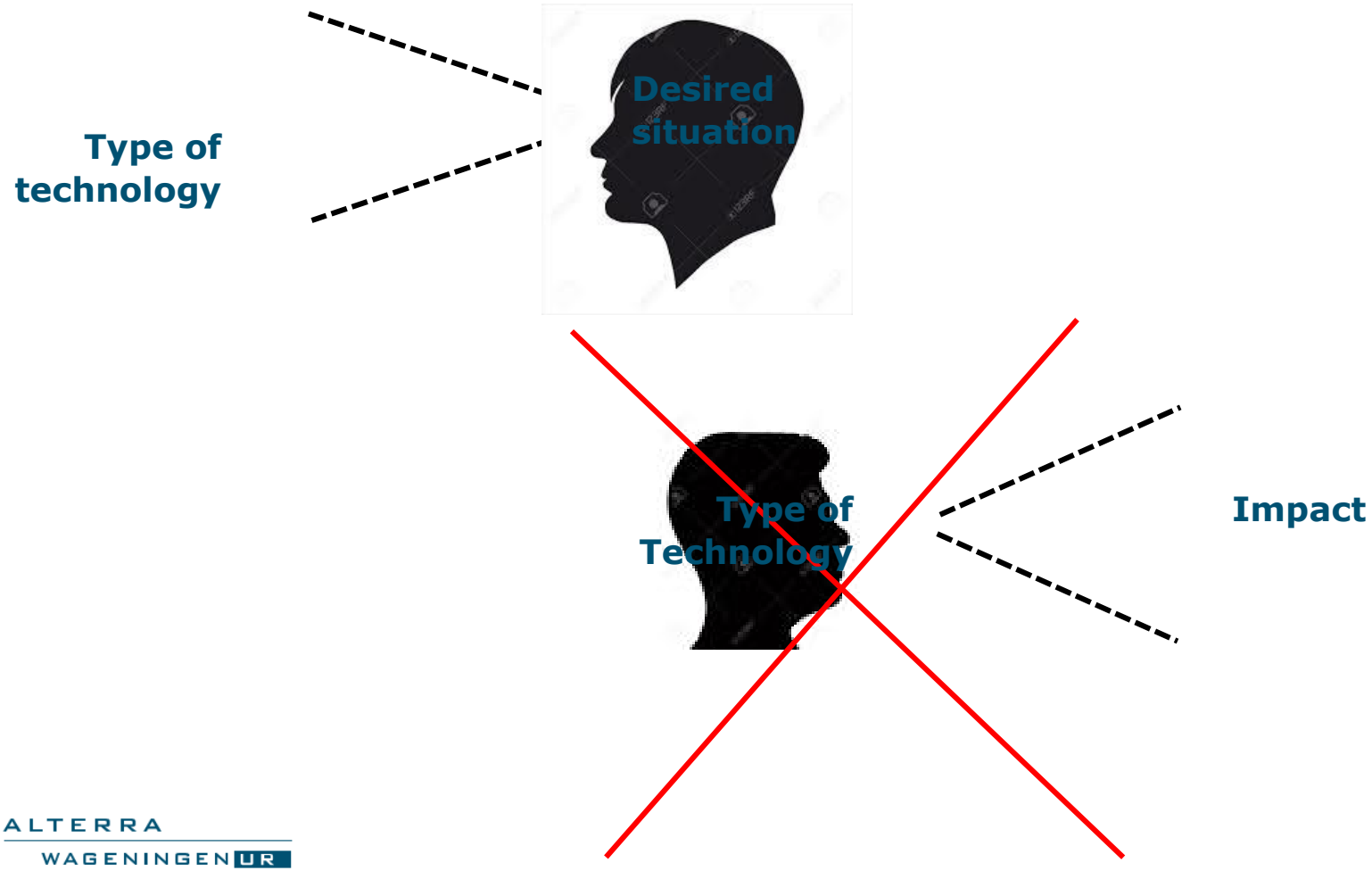
Time for a different perspective

radical (adj.)

of or going to the root or origin;
fundamental: a radical difference

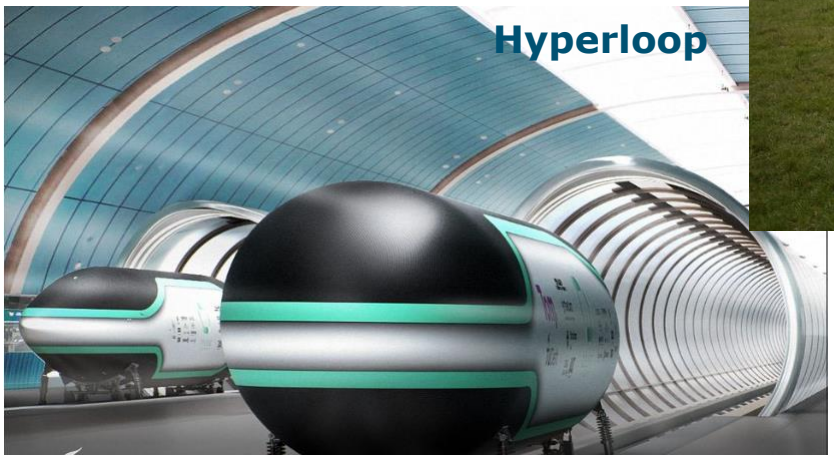
Source: Merriam-Webster

Life sciences to support radical technological innovation: the desired situation comes first



SkyTran

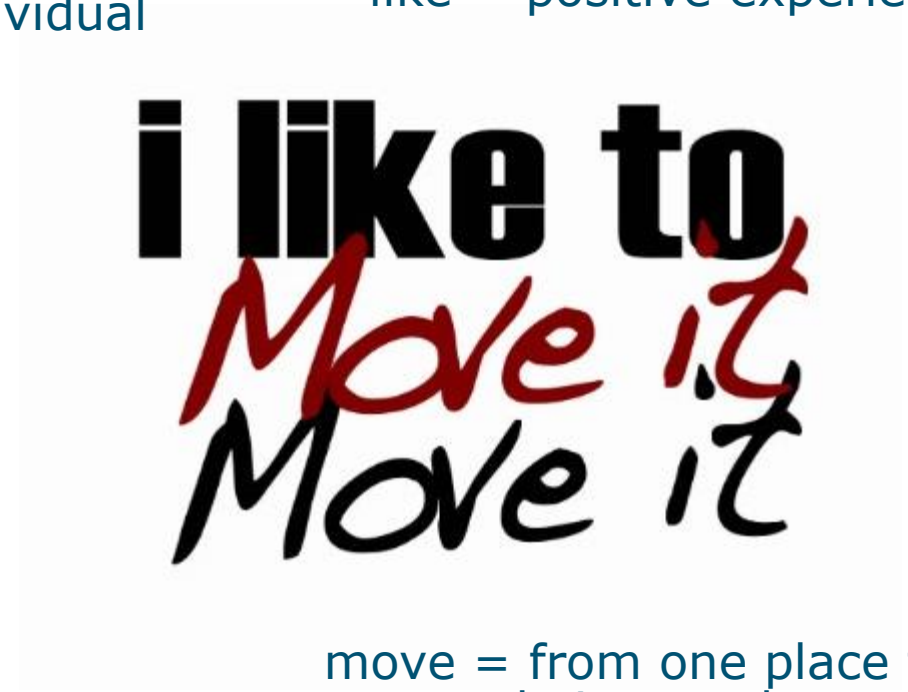
Hyperloop



...but keeping the values.

i = individual

like = positive experience



move = from one place to another place
being on the move

Options to support decision making

- Scenarios, impacts and costs alternative mode of transport and infrastructure for an area, a city

- Embed, argument and develop cases of transport innovation together with partners, companies, authorities...

- Back-casting: from a vision of the future towards the changes needed to get there. Transition studies, behaviour, framing and regulations.

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Partners

- cities, provinces, ministries
- companies
- NGOs, citizen groups
- universities
- artists and CSOs

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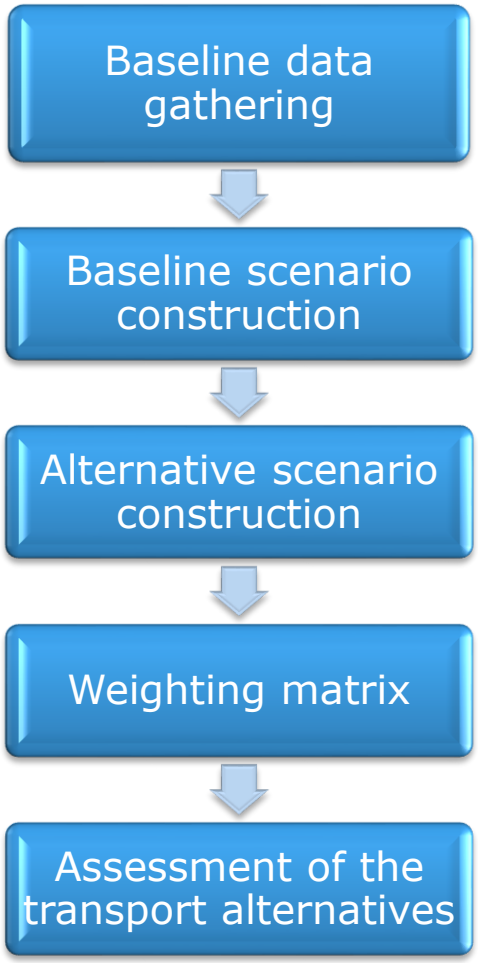
“Transport and options for innovation”

by Theofilos Anastaciou



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Three Cities

Source: http://www.viralnova.com/cities-from-birds-eye-view/

Source: http://www.holland.com/be_nl/toerisme/article/rotterdam-nl-1.htm

Source: http://iheartphotos.co.za/2016/01/04/magical-prague/

Results – Amsterdam and water transport (canals)

Ranking transport scenarios for Amsterdam and weighting matrix

Criteria	Baseline / No interventions scenario	Water transport (electric vessels) implementation scenario	Moderate car use in the center scenario – such as implementing policies discouraging extensive car use in the center and encouraging public transport
Environmental / Spatial			
Air quality	2	4	3
Noise levels	2	4	3
Traffic congestion	2	4	3
Use of urban space	2	3	2

1	High negative influence
2	Low negative influence
3	Neutral
4	Low positive influence
5	High positive influence

Environmental / Spatial component	Percentage (a)	Baseline/ No intervening scenario (s1)	a * s1	Water transport. Implementing electric vessels scenario (s2)	a * s2	Moderate car use scenario (s3)	a * s3
Air quality	30	2	60	4	120	3	90
Noise levels	20	2	40	4	80	3	60
Traffic congestion	25	2	50	4	100	3	75
Use of urban space	25	2	50	3	75	2	50
Total	**100**		**200**		**375**		**275**

Results –Amsterdam and water transport

Assessment of the scenarios

Impact Assessment	Baseline/ No intervening scenario [(s1) *a]	Water transport. Implementing electric vessels scenario [(s2)*a]	Moderate car use in the center scenario [(s3)*a]
Environmental and spatial component/criteria	200	375	275

	This alternative scenario would deteriorate the present situation and it is not recommended
	This alternative scenario has neutral or uncertain effect
	This alternative scenario has to be modified in order to have a positive effect
	This alternative scenario is expected to improve the present situation and it is actively suggested

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Impacts of transport solutions in the three cases

1. Reflection on water transport

- Minor positive impact on air quality and noise levels.
- Potential in relieving traffic congestion and avoiding built infrastructure.
- Can be hosted without obstructing other water transport activities (Van Duin et. al. 2014).

Continued..

2. Reflection on electric transport

- Can benefit congestion in the case it is widely used.
- Vehicles can be versatile.
- Can improve air quality in the case it is widely used.
- Potential once equipped with ICTs (Information and Communications Technologies) in congestion and convenience .

3. Reflection on cable transport

- Small positive impact on air quality and on noise levels.
- Does not share space infrastructure with other means of transport.

Source: http://www.its.dot.gov/infographs/forward_collision_warning.htm

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