# INTREPID – WG2

## Achieving critical mass of attention and focused action to improve the practice of inter- and trans-disciplinary research

# Goals

- **COST TD 1408**: To better understand how to achieve more efficient and effective interdisciplinary research in Europe as to strengthen our ability to address contemporary global (urban) challenges characterised by increasing complexity and uncertainty

- **WG2** – Building networks and cooperation:
  - **GAPG 7**: Drawing together researchers who have worked on EU, national and private funded research (on urban issues), so as to build on past investments and experience, deriving new insights.
  - **GAPG 8**: Connect research and funding communities using different languages and methods, overcoming common obstacles to the operationalisation of interdisciplinarity and sustainability – focusing on the key theme urban development.
  - **GAPG 9**: Build an interdisciplinary group of scientists that will promote self reflection, shared learning, stimulate discussion, with the aim of deepening understanding of the opportunities and obstacles affecting access to funding and research practice.

# CONCEPTS

(from WG1 and other sources)

- Foresight
- Sustainability, co-creation, engagement
- Inter- and trans-disciplinarity
- Responsible Research & Innovation (RRI)

# Key characteristics of issue-driven foresight studies

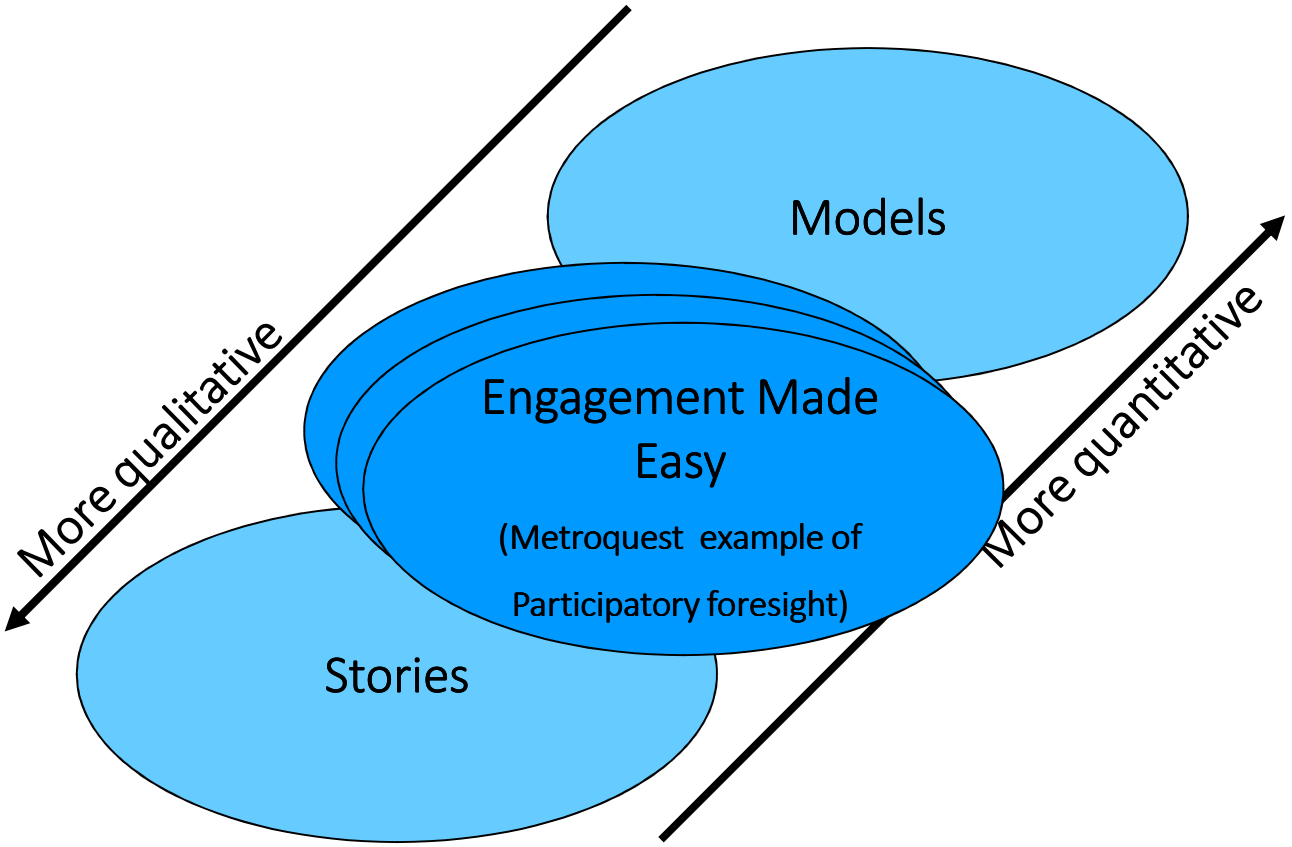
A. Problem-focused

B. Reflexive (systemic integration of disciplinary perspectives)

C. Open and inclusive (mutual understanding and co-creation of knowledge with end-users, stakeholders)

D. Future Oriented (anticipatory)

# Models, stories and scenarios



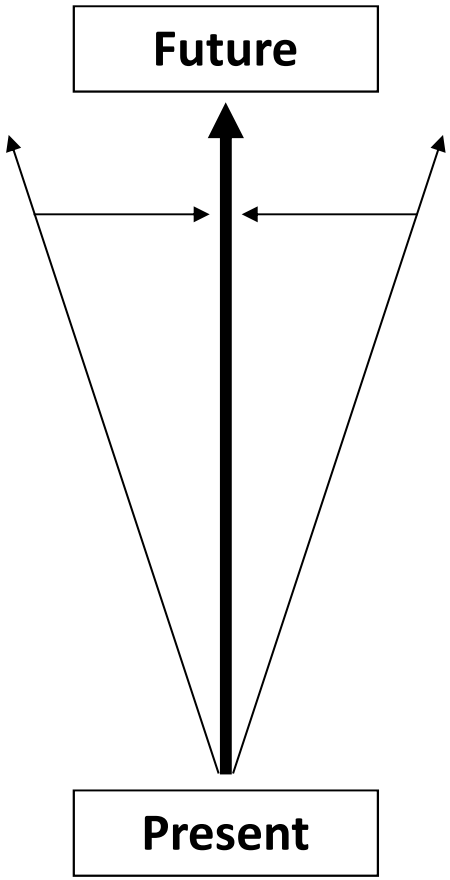

*(adapted from Robinson, 2015)*

*Foresight is ..*

- Beyond predictive forecasting
- Exploring a plurality of possible scenarios
- Can be complemented with backcasting to deliver policy advice and roadmaps to desirable futures

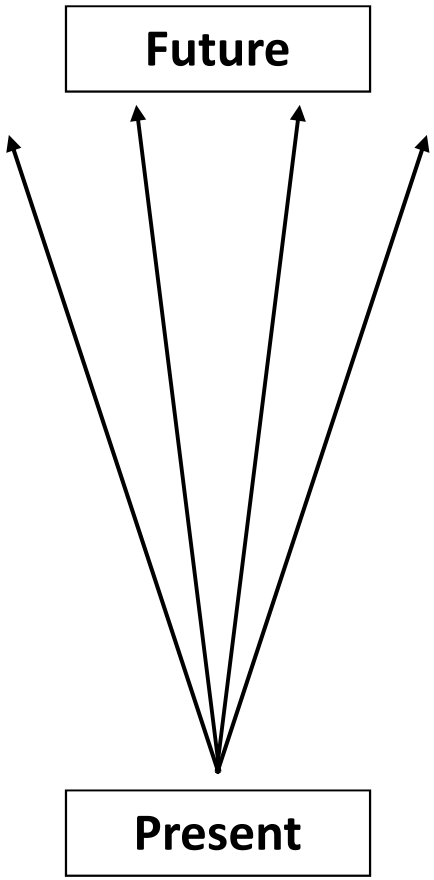
## Forecasting

**Predict most likely future**



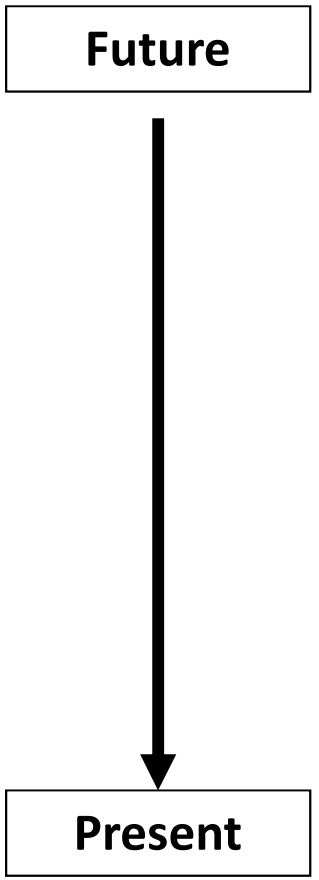

## Scenarios

**Explore alternative futures**



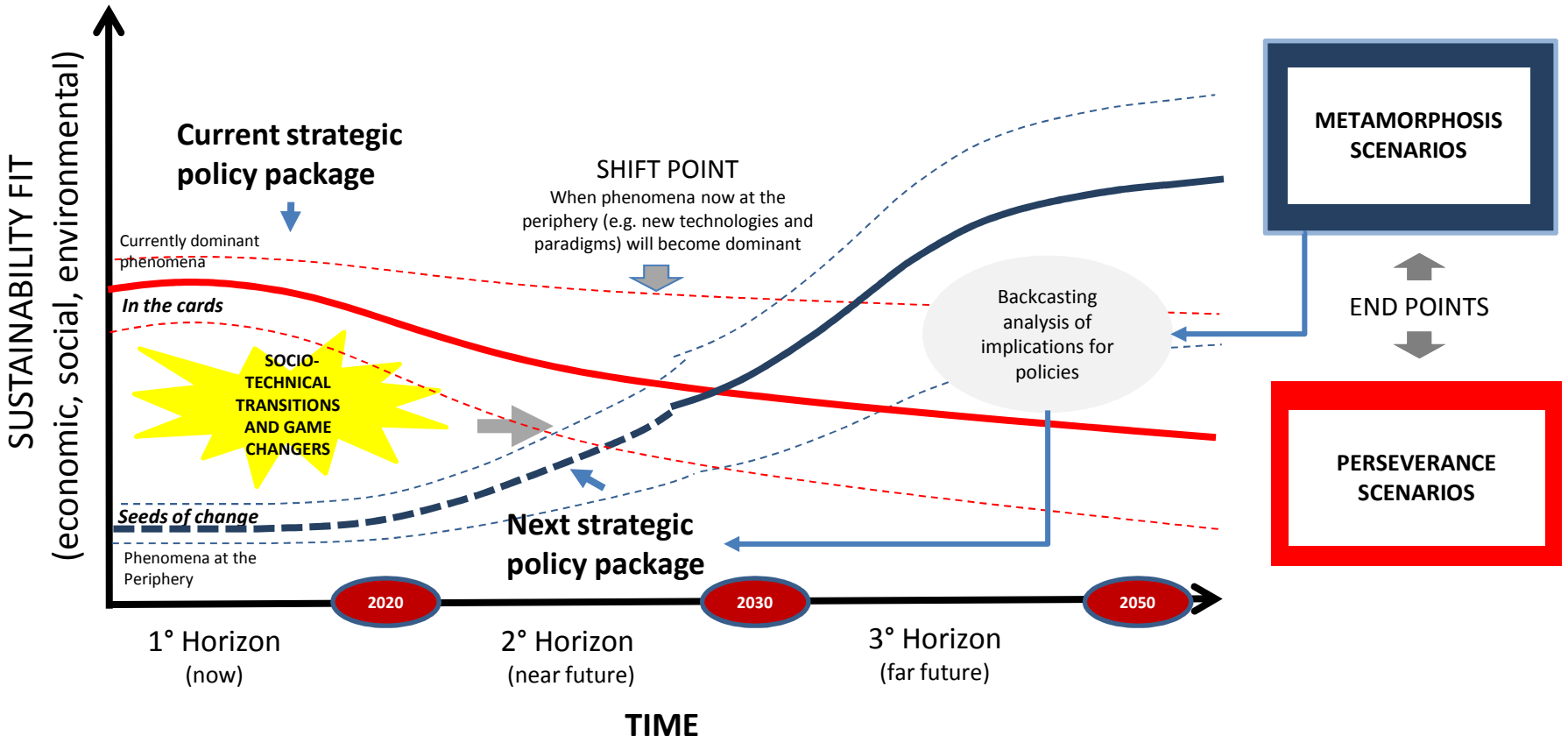

## Backcasting

**Assess feasibility of desirable future**

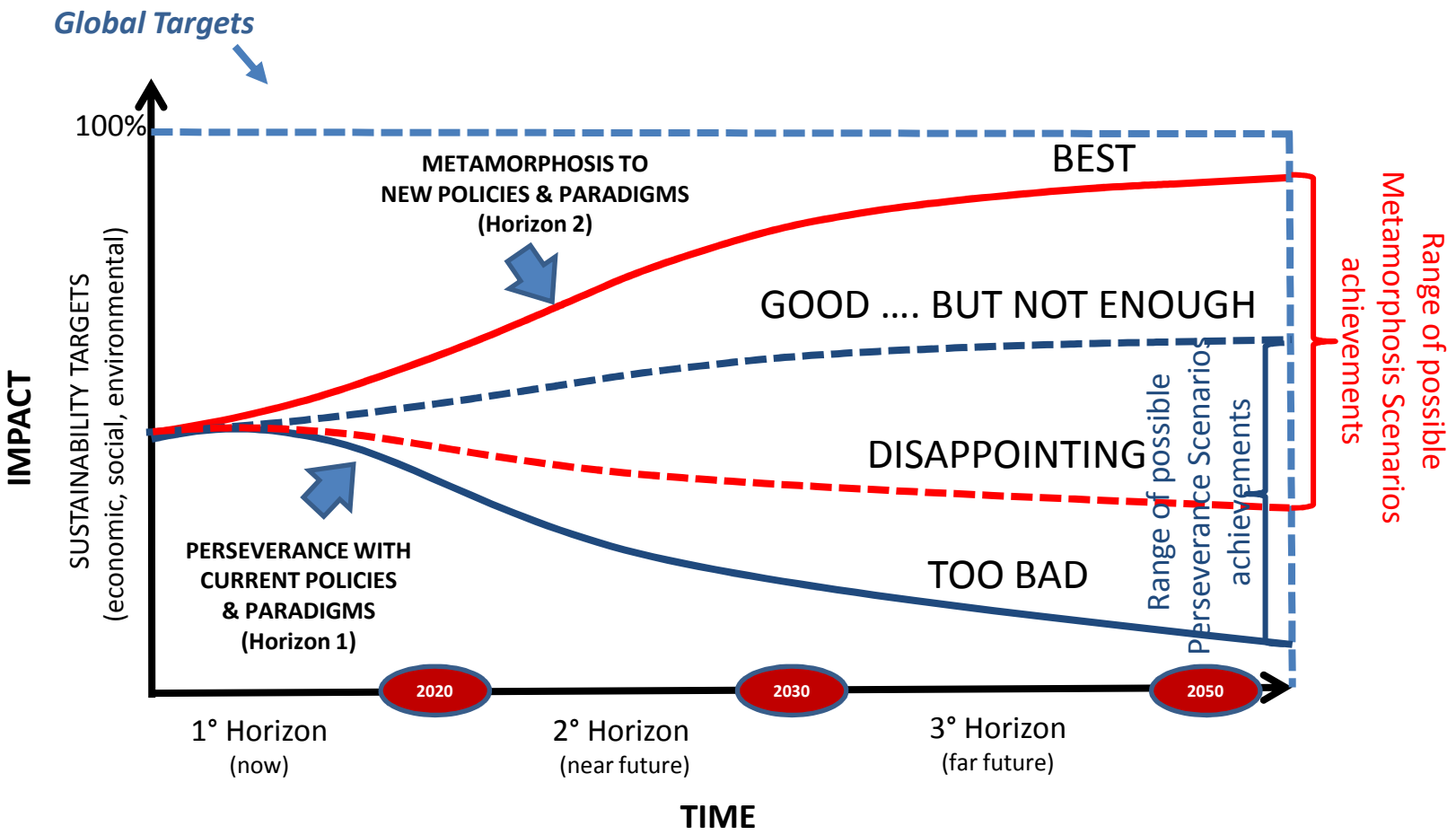



*(Robinson, 2015)*

# FORWARD LOOKING FRAMEWORK – THREE HORIZONS MODEL PLOT

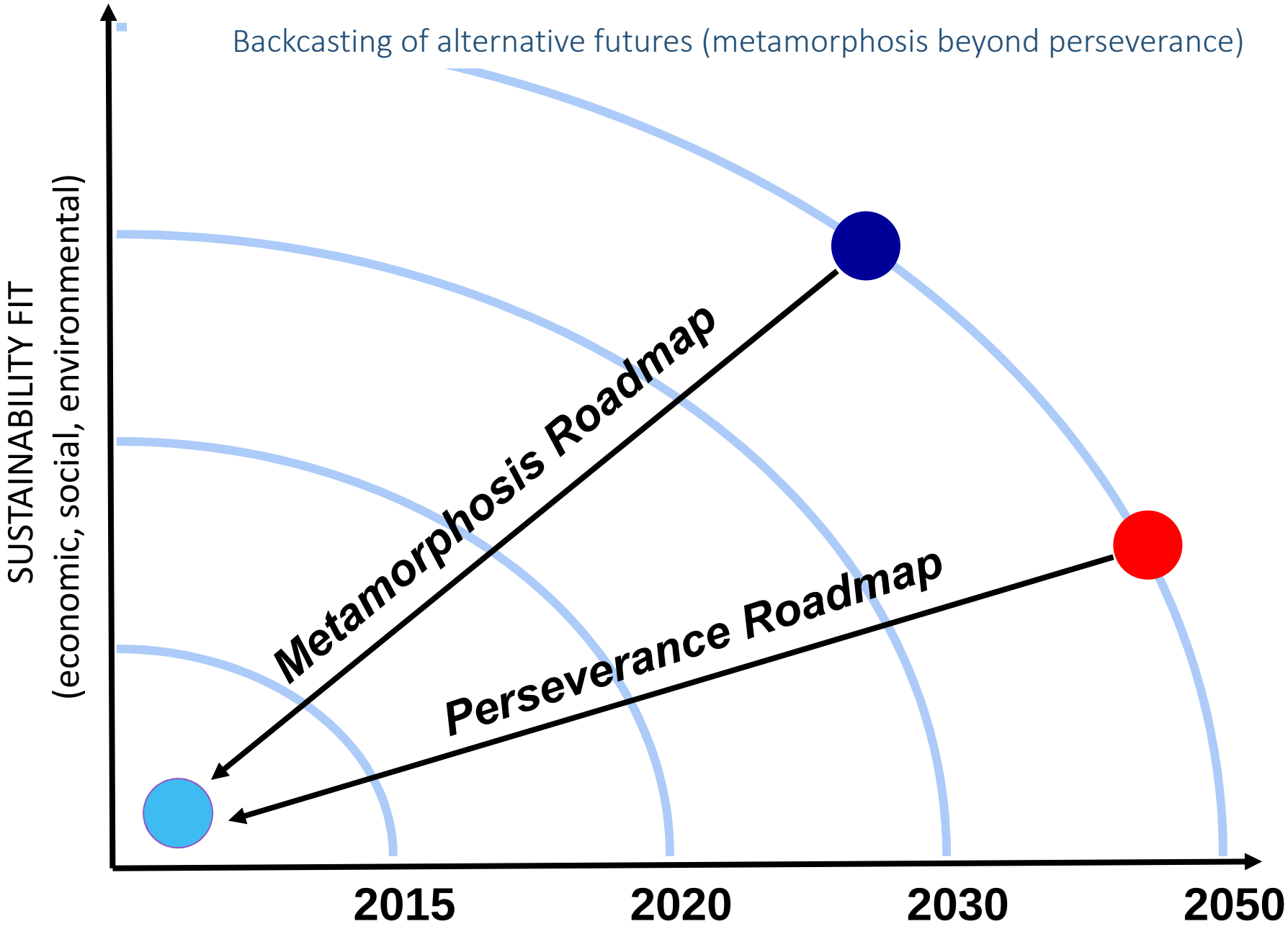


## SCENARIOS IMPACT PLOT (global targets achievement)



# SCENARIO BUILDING STEPS

| STEP 1 – The current picture of dominant trends and seeds of change at the periphery (DO NOTHING SCENARIO) | STEP 3 – Stepping back to describe the key drivers and policies conducive to the alternative futures (ROADMAPS) | STEP 2 – Envisioning alternative far futures (ALTERNATIVE SCENARIOS) |
|---|---|---|
| **HORIZON 1 – UNTIL 2020** | **HORIZON 2 – UNTIL 2030** | **HORIZON 3 – UNTIL 2050** |
| STATEMENTS ABOUT CURRENT: | KEY DRIVERS & POLICIES TO ACHIEVE: | ALTERNATIVE VISIONS: |
| Unfolding trends<br>……<br>…… | Perseverance scenarios<br>……<br>…… | Perseverance scenarios<br>……<br>…… |
| Seeds of change<br>……<br>…… | Metamorphosis scenarios<br>……<br>…… | Metamorphosis scenarios<br>……<br>…… |


Backcasting of alternative futures (metamorphosis beyond perseverance)
SUSTAINABILITY FIT
(economic, social, environmental)
Metamorphosis Roadmap
Perseverance Roadmap
2015
2020
2030
2050

# Challenges of the foresight approach

- User control of scenarios
  - Who educates whom? (“wrong choices”)
- Tools vs. processes
  - From tool → interface → processes of use
- Addressing larger context vs. local issues
  - Users want local applicability
- Visioning vs. planning uses
- Accessibility (availability of time and technology)
- Limits of purely cognitive approaches
- Time and cost

*(Robinson, 2015)*

# Move towards a Transdisciplinary Foresight Agenda

- Explore the implications for **sustainability** of strong forms of inter/transdisciplinarity

- Based on **knowledge co-creation** and the **engagement** of all actors in a participatory process

# Sustainability as . . .

- a normative ethical principle
  - Strong political and moral dimensions
- an essentially contested concept
  - Like beauty, truth, justice, democracy . . .
- a world-making process
  - Choice of futures and roadmaps to implement those futures

*(Robinson, 2015)*

# Sustainability

"[Sustainability] must be constructed through an essentially social process whereby scientific and other "expert" information is combined with the values, preferences, and beliefs of affected communities, to give rise to an emergent "co-produced" understanding of possibilities and preferred outcomes."

*(Robinson, 2004)*

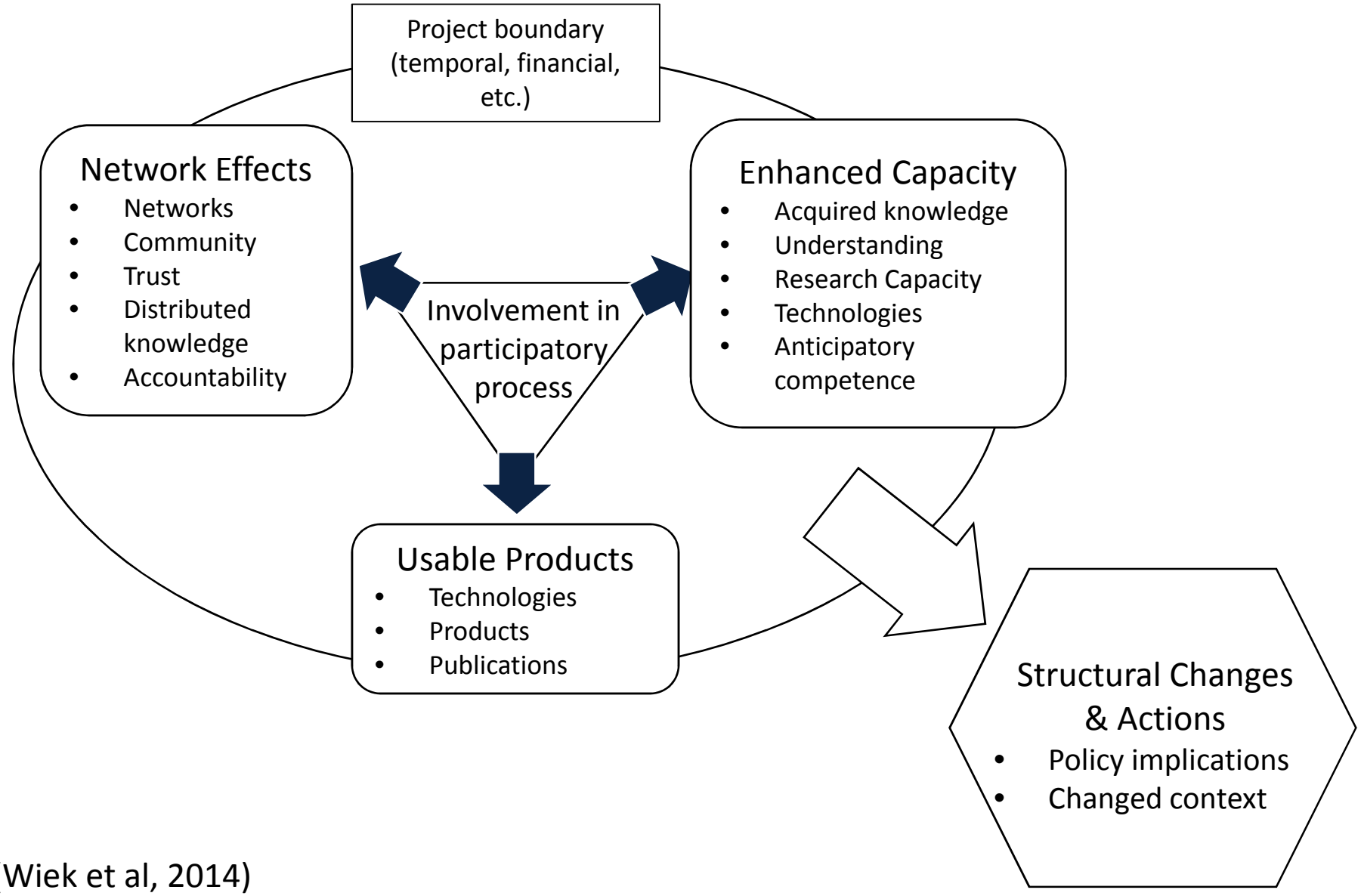
# Co-creation

"Co-creation is an umbrella term that refers to collaborative approaches to knowledge production that draw upon interactive and participatory research methods for societal problem-solving.

. . . [It] focuses on bringing together research and practice, and creating joint processes and arenas for social learning between academic researchers, practicing professionals, end-users"

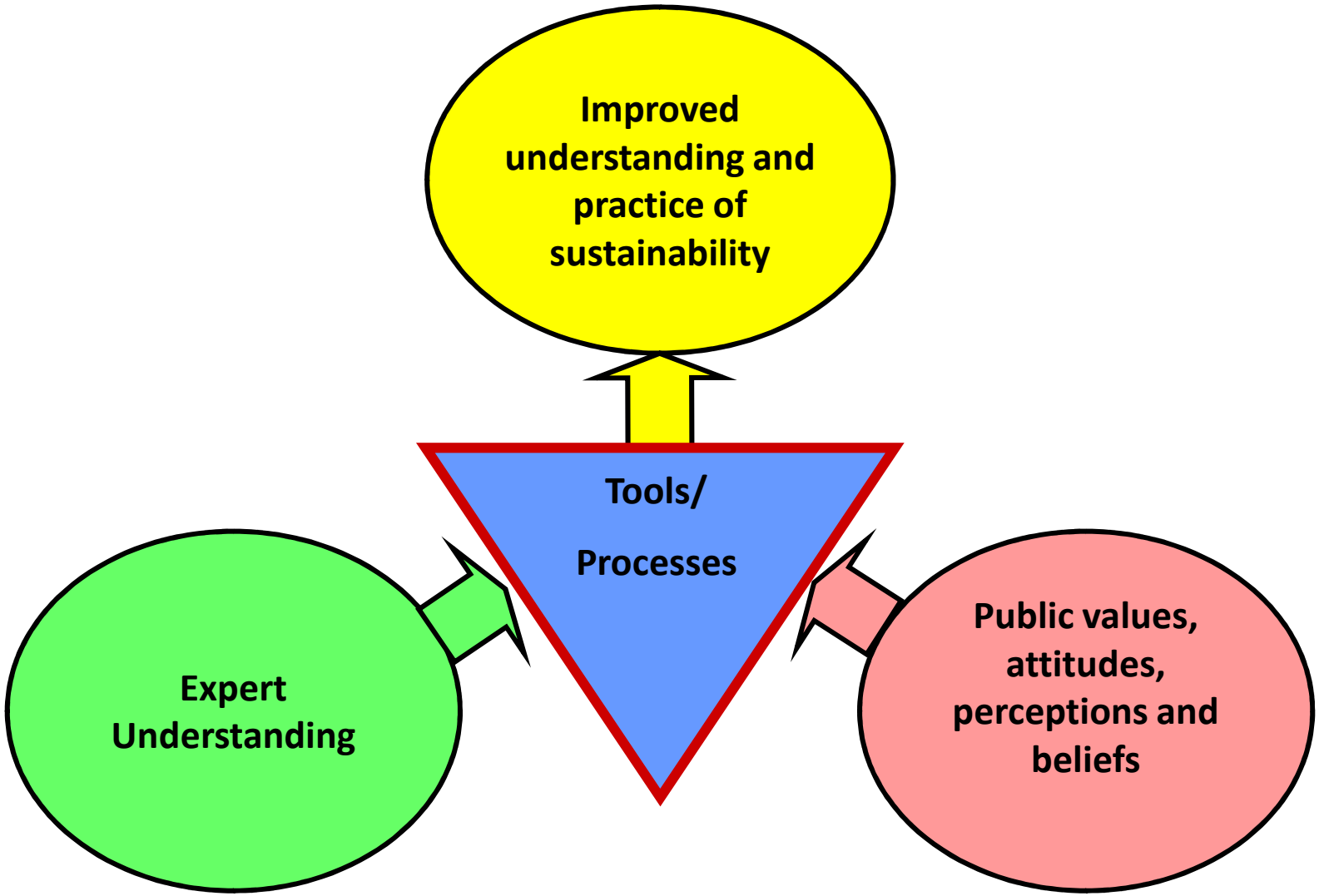
*(adapted from Mistra Urban Futures, 2015, p. 35)*

# Societal Effect of Engagement




(Wiek et al, 2014)

# Knowledge Synthesis




*(Robinson, 2015)*

# INTER- AND TRANS-DISCIPLINARITY:
## OPERATIONAL DEFINITIONS FOR WG2 NETWORKING

**INTERDISCIPLINARY RESEARCH** is any study or group of studies undertaken by scholars from two or more distinct scientific disciplines. The research is based upon a conceptual model that links or integrates theoretical frameworks from those disciplines, uses study design and methodology that is not limited to any one field, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process.

**TRANSDISCIPLINARY RESEARCH** is defined as research efforts conducted by investigators from different disciplines working jointly to create new conceptual, theoretical, methodological, and **translational innovations** that integrate and move beyond discipline-specific approaches to address a common problem.

*Harvard, Mass. – School of Public Health*

http://www.hsph.harvard.edu/trec/about-us/definitions/

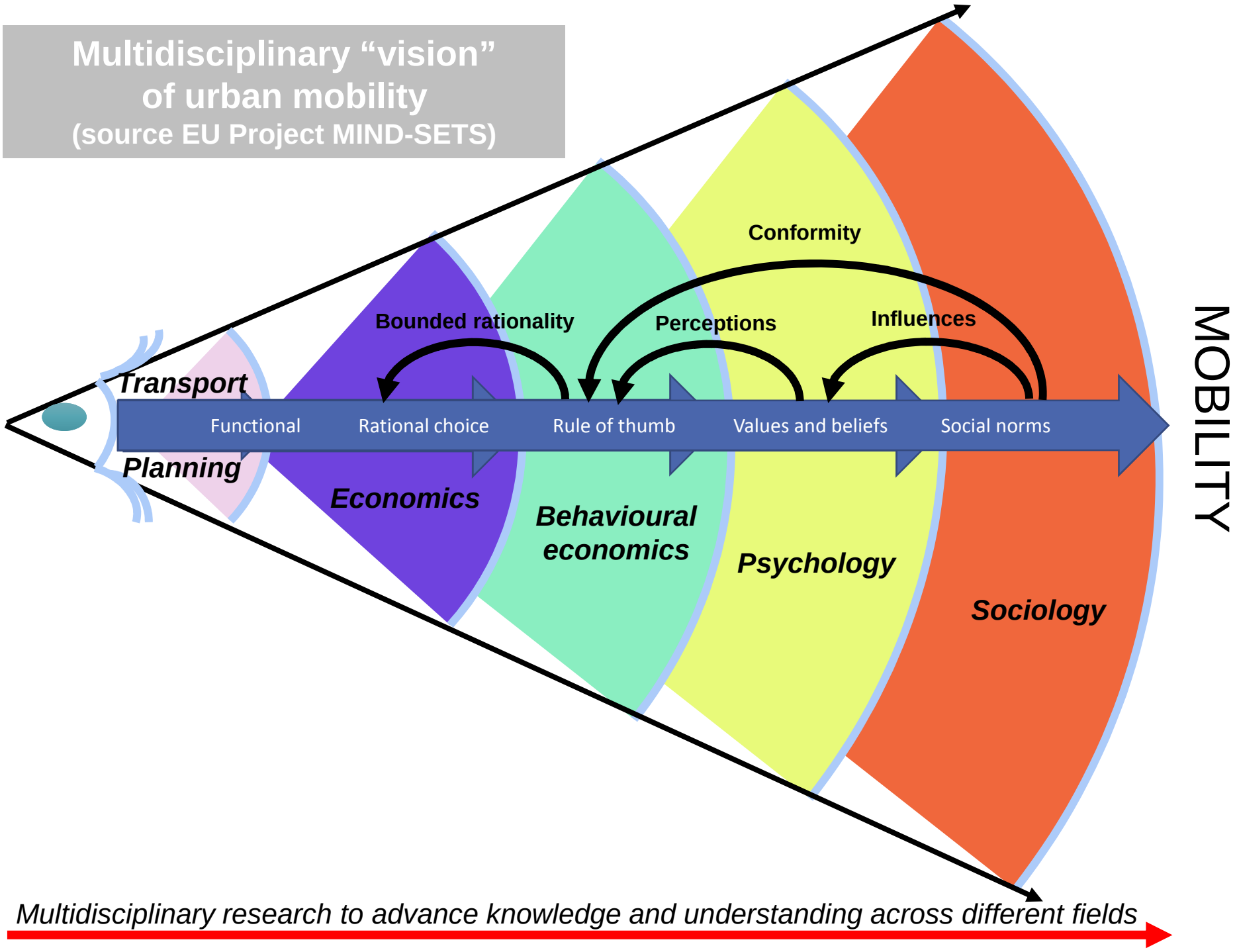
## TRANSLATIONAL RESEARCH: A CONCEPT BORN IN THE HEALTH SECTOR …

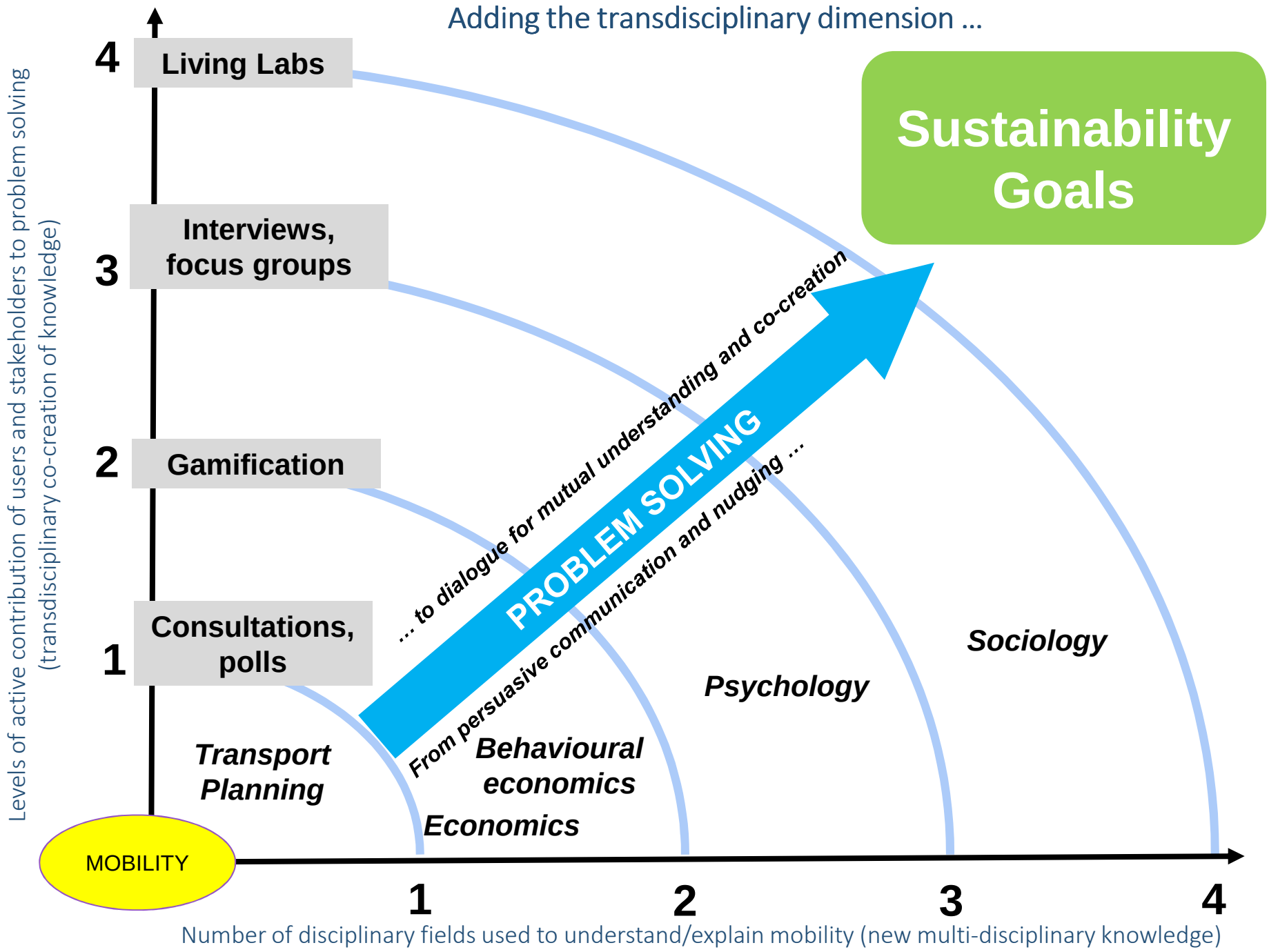
WIKIPEDIA: https://en.wikipedia.org/wiki/Translational_research

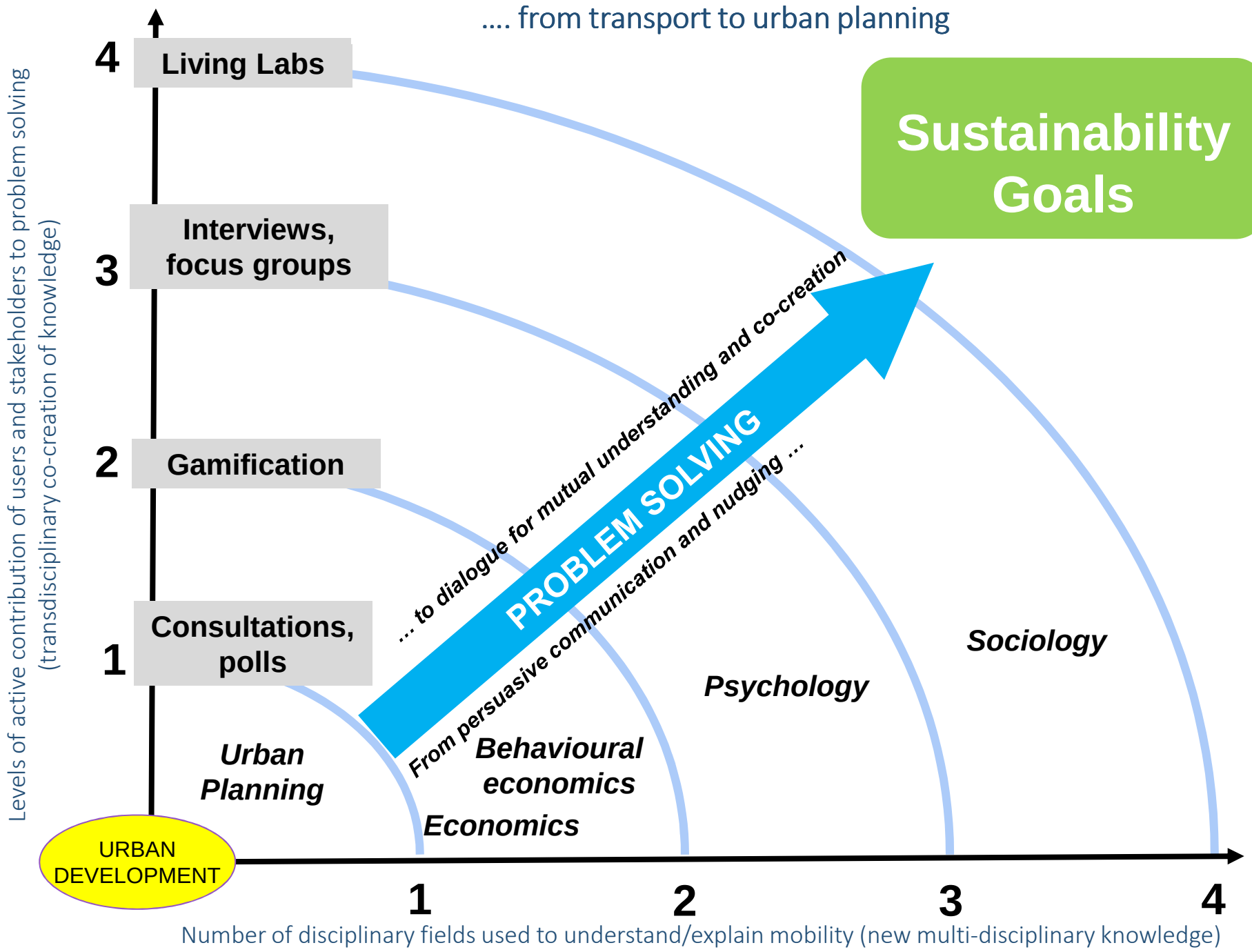
**Translational research** applies findings from basic science to enhance human health and well-being. In a medical research context, it aims to "translate" findings in fundamental research into medical and nursing practice and meaningful health outcomes. Translational research implements a “bench-to-bedside”, from laboratory experiments through clinical trials to point-of-care patient applications, model, harnessing knowledge from basic sciences to produce new drugs, devices, and treatment options for patients. The end point of translational research is the production of a promising new treatment that can be used with practical applications, that can then be used clinically or are able to be commercialized.

## TRANSPOSE THE "TRANSLATIONAL BLOCKS" CONCEPT TO URBAN STUDIES …

| Health Studies | Urban Studies |
| --- | --- |
| • T1: Transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention and their first testing in humans. | • T1: Transfer of new understandings about urban systems and policy outcomes gained in demonstration projects into the development of new urban management methods. |
| • T2: Translation of results from critical studies into everyday clinical practice and health decision making. | • T2: Translation of results from critical studies into everyday planning practice and city decision making. |


Multidisciplinary "vision"
of urban mobility
(source EU Project MIND-SETS)
Conformity
Bounded rationality
Perceptions
Influences
Transport
Functional
Rational choice
Rule of thumb
Values and beliefs
Social norms
Planning
Economics
Behavioural economics
Psychology
Sociology
MOBILITY
Multidisciplinary research to advance knowledge and understanding across different fields


Adding the transdisciplinary dimension …
Sustainability Goals
4
Living Labs
3
Interviews, focus groups
2
Gamification
1
Consultations, polls
… to dialogue for mutual understanding and co-creation
PROBLEM SOLVING
From persuasive communication and nudging …
Transport Planning
Behavioural economics
Economics
Psychology
Sociology
MOBILITY
1
2
3
4
Levels of active contribution of users and stakeholders to problem solving (transdisciplinary co-creation of knowledge)
Number of disciplinary fields used to understand/explain mobility (new multi-disciplinary knowledge)


…. from transport to urban planning
Sustainability Goals
4
Living Labs
3
Interviews, focus groups
2
Gamification
1
Consultations, polls
… to dialogue for mutual understanding and co-creation
PROBLEM SOLVING
From persuasive communication and nudging …
Urban Planning
Behavioural economics
Economics
Psychology
Sociology
URBAN DEVELOPMENT
Levels of active contribution of users and stakeholders to problem solving
(transdisciplinary co-creation of knowledge)
1
2
3
4
Number of disciplinary fields used to understand/explain mobility (new multi-disciplinary knowledge)

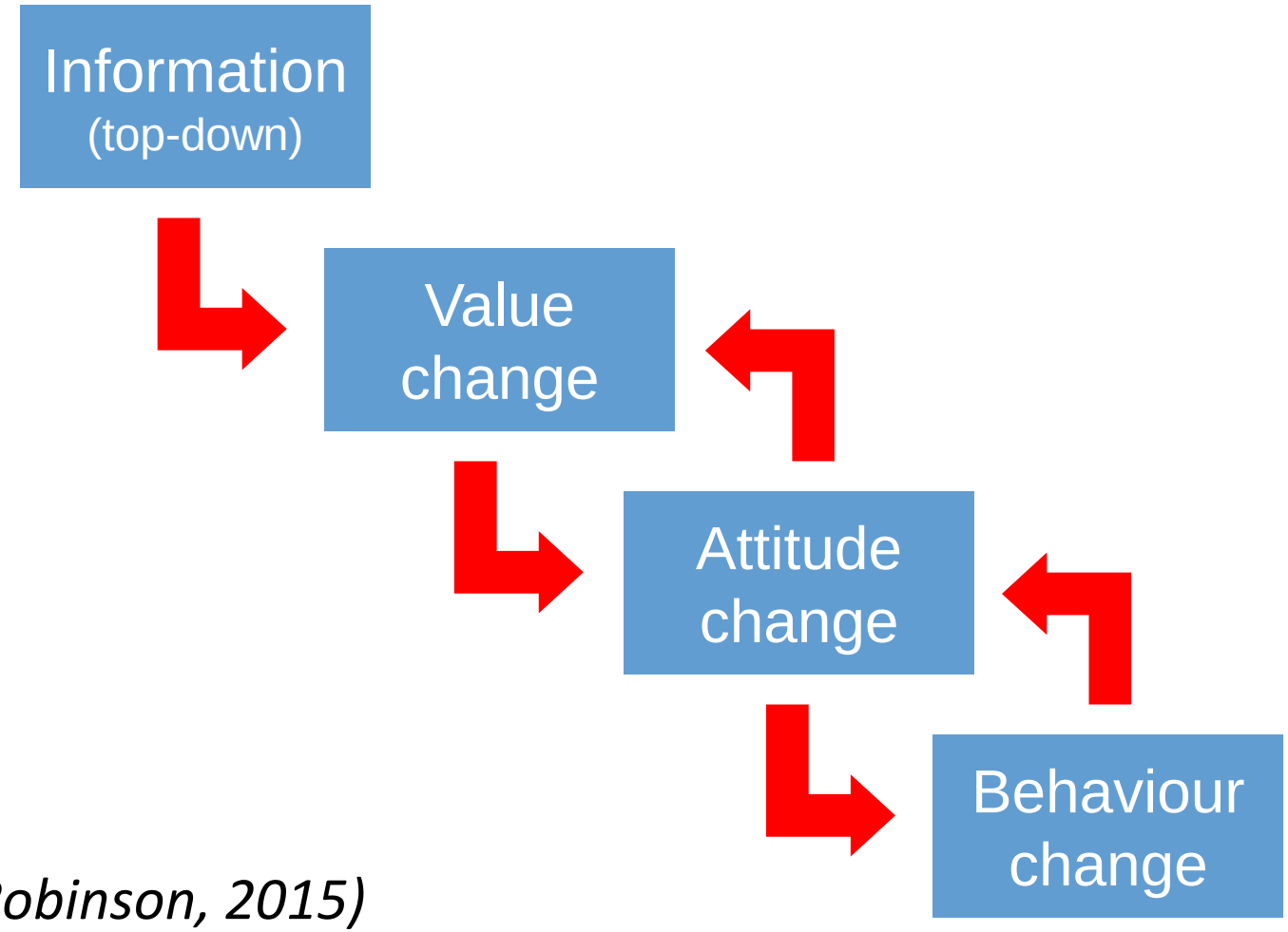
# Persuasive Communication

- We know the story
  - The goal is to replace your (wrong) story with our (right) story

- Information deficit model of behaviour change

*(Robinson, 2015)*

# Information Deficit Model




*(Robinson, 2015)*

# Emergent Dialogue

- We don’t know the story: need to collectively co-create it
- Focus is cultural change and changes in social practices and institutional rules

*(Robinson, 2015)*

# Different Purposes

| Persuasive Communication | Emergent Dialogue |
| --- | --- |
| How to convey the correct story in ways that change individual or policy behaviour<br>• Digital/new media, and art, seen as exciting new tools for this | Support innovation, creativity and adaptive response<br>• Focus on possibility/ opportunity (not crisis)<br>• Allow participants to explore preferred outcomes and strategies for change, informed by understanding of the consequences of choices |

Collective Consensus No Collective Consensus

*(Robinson, 2015)*

# Inter/Transdisciplinarity and Sustainability

- Both qualitative and quantitative focus
- Reach horizontally across disciplines but also vertically to society: co-creation of knowledge
- Recognize barriers: slower; less prestigious journals; more non-academic publications; dangers for junior faculty/grad students
- Need to institutionalize this type of work
- Connect to emerging inter-disciplines

*(Robinson, 2015)*

# Interactive Sustainability Frontiers

## Tools frontiers

- Landscape visualization
- Gamification
- Adaptive interface design (IFDM)
- …..

## Process Frontiers

- Multiple channels: apps, games, social media, workshops, art
- Very large-scale engagement
- Windows of opportunity in political processes
- ….

*(Robinson, 2015)*

# RRI CONCEPT – THE ESRI UK VISION

**RESPONSIBLE RESEARCH INNOVATION IS (SHOULD BE):**

✓ ANTICIPATORY (forward looking to societal and ethical implications)

✓ INCLUSIVE (engaging stakeholders and users)

✓ REFLEXIVE (primarily for the researchers to open their minds!)

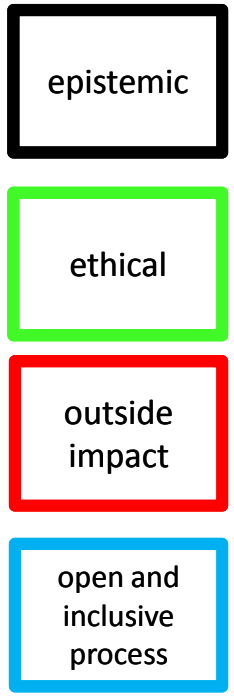
✓ RESPONSIVE (to societal needs)

# RRI DIMENSIONS

## COMPARISON WITH THE CURRENT EC **SCIENCE WITH AND FOR SOCIETY RRI** FRAMEWORK

- **Public engagement:** engaging society more broadly with research and innovation.
- **Gender equality:** ensuring gender equality in both the research process and research content
- **Science Education:** promoting formal and informal science education
- **Ethics:** taking account of the ethical dimension
- **Open access:** In order to be responsible, research and innovation must be both transparent and accessible.

- **Methodologic/epistemic**. Proper use of the scientific method and sources of knowledge.
- **Axiologic/ethica**l. Connects research to system of values (e.g. Haidt, Moral foundations theory).
- **Societal impact**. Takes into account the impacts it will have on nature and society.
- **Inclusiveness**. Procedural (including citizens, women, being open etc.)

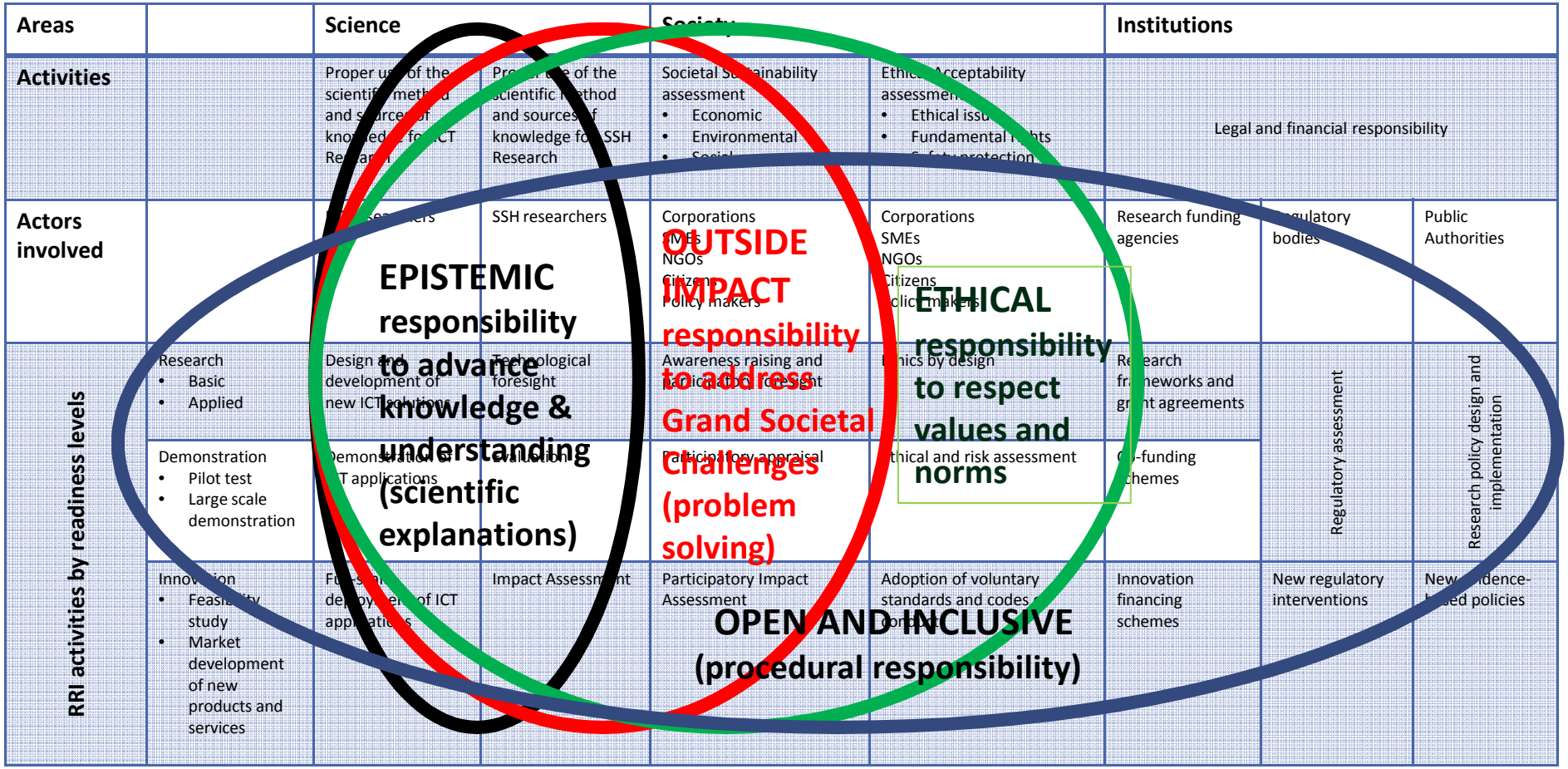


# MAPPING RESPONSIBILITY FOR ICT RESEARCH

| **Areas** | | **Science** | | **Society** | | **Institutions** | | |
|---|---|---|---|---|---|---|---|---|
| **Activities** | | Proper use of the scientific method and sources of knowledge for ICT Research | Proper use of the scientific method and sources of knowledge for SSH Research | Societal Sustainability assessment<br>• Economic<br>• Environmental<br>• Social | Ethical Acceptability assessment<br>• Ethical issues<br>• Fundamental rights<br>• Safety protection | Legal and financial responsibility | | |
| **Actors involved** | | ICT researchers | SSH researchers | Corporations<br>SMEs<br>NGOs<br>Citizens<br>Policy makers | Corporations<br>SMEs<br>NGOs<br>Citizens<br>Policy makers | Research funding agencies | Regulatory bodies | Public Authorities |
| **RRI activities by readiness levels** | Research<br>• Basic<br>• Applied | Design and development of new ICT solutions | Technological foresight | Awareness raising and participatory foresight | Ethics by design | Research frameworks and grant agreements | Regulatory assessment | Research policy design and implementation |
| | Demonstration<br>• Pilot test<br>• Large scale demonstration | Demonstration of ICT applications | Evaluation | Participatory appraisal | Ethical and risk assessment | Co-funding schemes | | |
| | Innovation<br>• Feasibility study<br>• Market development of new products and services | Full-scale deployment of ICT applications | Impact Assessment | Participatory Impact Assessment | Adoption of voluntary standards and codes of conduct | Innovation financing schemes | New regulatory interventions | New evidence-based policies |

*Source: RRI-ICT Forum project*

# MAPPING RESPONSIBILITY FOR ICT RESEARCH




*Source: RRI-ICT Forum project*

# MAPPING RESPONSIBILITY FOR URBAN RESEARCH

| Areas | | Science | | Society | | Institutions | | |
|---|---|---|---|---|---|---|---|---|
| **Activities** | | Proper use of the scientific method and sources of knowledge for Urban Development | Proper use of the scientific method and sources of knowledge for SSH Research | assessment<br>• Economic<br>• Environmental<br>• Social | assessment<br>• Ethical issues<br>• Fundamental rights<br>• Safety protection | Legal and financial responsibility | | |
| **Actors involved** | | IST researchers | SSH researchers | Corporations<br>SMEs<br>NGOs<br>Citizens<br>Policy makers | Corporations<br>SMEs<br>NGOs<br>Citizens<br>Policy makers | Research funding agencies | Regulatory bodies | Public Authorities |
| **RRI activities by readiness levels** | Research<br>• Basic<br>• Applied | Design and development of new urban development solutions | Technological foresight | Awareness raising and participatory foresight | Ethics bodies set | Research frameworks and grant agreements | Regulatory assessment | Research policy design and implementation |
| | Demonstration<br>• Pilot test<br>• Large scale demonstration | Demonstration of urban development solutions | Evaluation | Participatory appraisal | Ethical and risk assessment | Co-funding schemes | | |
| | Innovation<br>• Feasibility study<br>• Market development of new products and services | Full-scale deployment of urban development solutions | Impact Assessment | Participatory Impact Assessment | Adoption of voluntary standards and codes of conduct | Innovation financing schemes | New regulatory interventions | New evidence-based policies |

MULTI-DISCIPLINARITY AS A WAY TO ENHANCE THE QUALITY OF RESEACH (Epistemic Responsibility)

TRANSDISCIPLINARY RESEARCH AND TRASLATIONAL INNOVATION AS A WAY TO TACKLE THE GLOBAL (URBAN) CHALLENGES (Outside impact, Ethical and Procedural Responsibility)