

# Re-imagining Process

## implications for transport research and modelling

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# Process in transport research (i)

Process  $\approx$  irreversible, directional change in which past, present and future are implicated

As a topic always **central to transport research** – e.g.:

- ✓ Predict-an-provide approach of the 1950s and 1960s aimed at facilitating growth of automobility
- ✓ Current attempts to contribute to transition to sustainable, equitable and low-energy transport system

But: **little philosophical reflection** on how process itself is thought & practiced within the transport research community



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# This presentation

Has **three aims & parts** – it will:

- ✓ Critically analyse the practices & assumptions regarding process in transport research
- ✓ Propose an alternative based on the philosophy of A N Whitehead and explores some insights this enables
- ✓ Draw some tentative conclusions on the implications for transport modelling

Case study:

Research of links between characteristics of the built environment & travel patterns



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# Key practices and imaginings (i)

- 1) Drawing inferences from data on **single point** in time
  - ⇒ Heroic assumptions regarding development trajectories of individual units
- 2) Drawing inferences from **multiple points** in time
  - ⇒ Time as 'series of salami slices' – misses out on imbrication and co-constitution of past, present and future at any time  $t_x$
  - ⇒ Normative tendency to assume smooth trajectory from  $t_1$  to  $t_2$



# Key practices and imaginings (ii)

- 3) Specify a set of **rules** (formulas, heuristics, etc) to capture relationships between phenomena or things; assume these are more or less stable across space and time; and use these to extrapolate towards, or work backwards from, a time in the future
- ⇒ Change becomes a **derivative** – process is only possible by virtue of anterior forms of permanence
  - ⇒ In keeping with **separation** of stability from change, permanence from flux – and **privileging** of latter over the former – in Plato, Aristotle, Descartes, Newton and many others



# Key practices and imaginings (iii)

These practices and assumptions enact realities in particular ways, **side-lining alternatives** – they are a manifestation of ontological politics (Mol 1999, Law 2004)

They have both **generated** and **constrained** our understandings of processes regarding transport, land use, economic systems, social structures, culture, etc.

⇒ What becomes possible if another set of philosophical premises is used to examine such processes?



# Philosophers of becoming

Henri Bergson (1859–1941)

William James (1842–1910)

Alfred North Whitehead (1861–1947)

Gilles Deleuze (1925–1995)

Isabel Stengers (1949–)

and others



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# Alfred N Whitehead

- ✓ Accomplished mathematician, well versed in the implications of Darwinism and the Einsteinian and quantum revolutions for philosophy – **permanence or stability cannot be assumed but must be explained**
- ✓ Above all a **thinker of abstraction** – perhaps best known for his **fallacy of misplaced concreteness** = the substitution of abstractions for the world's concrete happenings
- ✓ His philosophy – especially his metaphysics – was a necessarily fallible and speculative attempt to **revise the most problematic abstractions** in Western thought





# A few key ideas

The world consists of events – nexuses or societies of **actual occasions** (AOs) – and nothing more

AO is the **process whereby an entity becomes** and can be analysed in two ways:

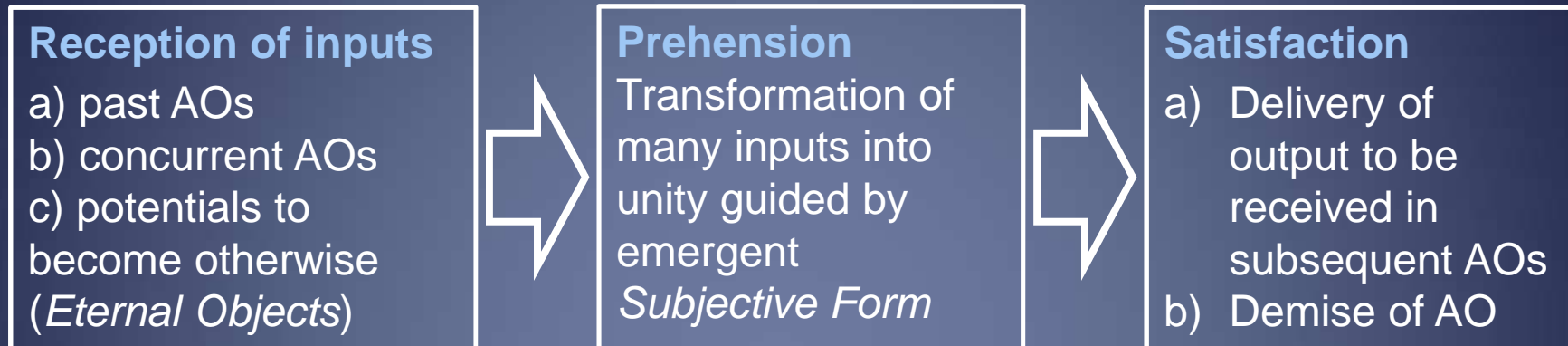
- a) Microscopic as **concrecence**
  - b) Macroscopic as **transmission**
- } Unites two senses of process



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# Phases of concrescence



**Eternal Objects** = universals that are integrated into AOs – they enable novelty/innovation, and keep stability & change in balance

**Subjective Form** = the affective tone (emotion, valuation, aversion, consciousness, etc) whose character emerges during the prehension phase, as a function of among others the AO's own history and the character of co-present AOs

# Transmission

- ✓ *Subjective Form* is decisive as regards the extent to which transmission occurs – it introduces **non-determinism** in Whitehead's scheme
- ✓ The character of prehension depends on the **grade of coordinated complexity of the society of AOs**:
  - (almost) perfect transmission and (almost) nil transformation in *e.g.* a stone
  - Greatest hick-ups in transmission and hence most innovation in humans



# Human subjectivity

The human is qualitatively different from the non-human,  
BUT:

a) Person is a **temporal chain of AOs without clear spatial boundaries** – there is some level of **continuity of world, body and psyche** ⇒ human subject is both distinct from and intimately entwined with the material world, other humans and wider society

b) Conscious perception and reflective thought are **exceptions** – they are *not* the default conditions that define humanity



# Location and causality

Whitehead dispenses with the **fallacy of simple location**: a 'thing' – a person, car, piece of infrastructure, etc. – cannot be assigned a specifiable point in space and time

**Causality** cannot be understood in the post-Humean manner of co-variation of antecedent **x** with posterior **y**

It is based on **mutual immanence** – only if it is accepted that the whole antecedent world is active in a given AO can innovation and/or the transmission of social order be understood



# Why Whitehead?

His ambitious philosophy:

- ✓ Offers a **comprehensive** yet **fallible** alternative to the contradictory premises on which most transport research is based
- ✓ Keeps **stability and change in balance** in ways that few if any philosophers of becoming have been able to do
- ⇒ Necessarily **partial** but **precise** and **inclusive**



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# Built environment & travel (i)

Majority of researchers accept that BE shapes travel behaviour – but:

- ✓ A small number of ‘skeptics’ dispute BE effects
- ✓ There is no consensus on magnitude of effects

Virtually all evidence in the form of co-variations of ( $\Delta$  in) travel behaviour indicators ( $=y$ ) with ( $\Delta$  in) one or more of the ‘7Ds’ ( $=x$ ) – *i.e.* Density, Diversity, Design, Destination accessibility, Destination to transit, Demand management and Demographics (Ewing and Cervero 2010)



# Built environment & travel (ii)

A Whiteheadian thought experiment:

- ✓ The negation of any BE effect is incomprehensible: **there will always be some effect**
- ✓ ( $\Delta$  in) 7Ds **cannot be a direct cause** of ( $\Delta$  in) travel behaviour – 7Ds refer to eternal objects which cannot explain anything on their own – everything depends on how they are integrated into AOs
- ✓ The literature excels in **misplaced concreteness**: the 7Ds stifle the events in which neighbourhoods & urban areas consist  $\Rightarrow$  new abstractions are required (cf Kwan 2012; Andrews et al. 2012)





# Built environment & travel (iii)

## Reception of inputs

**a) Past & co-present AOs** – *technical artefacts, socio-cultural & -political dimensions of the environment, skills, knowledge, behaviours of others, etc.*

**b) EOs** – *density, efficiency, comfort, social status, joy, environmental awareness, etc.*



## Prehension

Appropriation, transformation, exclusion and synthesis into unity guided by emergent Subjective Form



## Satisfaction

- a) New subject
- b) Behaviour
- c) Actual world

Concrescence is **unique** at each instant:

- a) Inputs are never exactly the same
- b) Subjective Form is never exactly the same – different integration of EOs



# Built environment & travel (iv)

Three conclusions follow from this:

- a) Transmission of stable interrelations of BE & travel patterns is **by no means given** – insofar as they exist, they are precarious achievements that can always become otherwise
- b) Subjective Form is the key agent, and hence the **human body** and its capacities to be affected and affect ⇒ the importance of conscious thought and attitudes (incl. ‘residential self-selection’) is significantly overrated in current thinking in transport research



# Built environment & travel (iv)

- c) We lose ( $\Delta$  in) 7Ds & attitudes as direct causes of ( $\Delta$  in) travel behaviour, yet gain appreciation for:
- The relevance of **modes of abstraction**
  - The centrality of the body, or rather **body/mind/world**
  - The changeability of the **rules** (formulas, heuristics, etc) that capture relationships between 'things'

*'All things change, the activities and their interrelations'*  
(*Modes of Thought*: 140, emphasis added)



# Modelling and Whitehead (i)

From a Whiteheadian take on process:

- ✓ The **strength** of models-as-we-in-transport-know-them is to highlight the consequences of hereditary transmission of stability
- ✓ Their **critical weakness** lies in the structural/genetic inadequacy to account for self-organisation and creativity in concrescence ⇒ can only be overcome by finding **a new balance between change and stability**, flux and permanence



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# Modelling and Whitehead (ii)

This requires a **sustained research program** focused on **rules** that capture the relationships between 'things' – the focus should not be on what the rules are but on **what they can become**

Use ethnographic methods to grasp what **Subjective Forms** may emerge in research using:

- ✓ Reconfigured versions of existing simulation techniques like driving simulators and HATS (Jones 1979)
- ✓ Natural experiments



# Thank you

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