Features of (socio-technical) transformations

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Future Earth
Defining what we mean

Transformation
Transition
Threshold
Tipping point
How much change?

Incremental
Radical
Making paper

1850

2010
Moving about

1913

2013
Messaging
What changes?

Structures
Performance/Functions
Actors/Relationships
Rules
Norms
What changes?

SOCIOTECHNICAL CONFIGURATION IN PERSONAL TRANSPORTATION

- Culture and symbolic meanings (e.g. freedom, individuality)
- Industry structure (car manufacturers, suppliers)
- Finance rules, interest rates, insurance premiums
- Maintenance and distribution networks (e.g. repair shops, car sales & show rooms)
- Regulations and policies (e.g. traffic rules, environmental standards, car taxes, parking fees)
- Markets and user practices (mobility patterns, driver preferences)

Vehicle/artefact

- Road infrastructure and traffic systems
- Fuel infrastructure (e.g. petrol stations, oil refineries)
- Control systems
- Drive train
- Suspension
- Body
- Accessories
- Control systems
- Engine
- Transmission
- Wheels
- Material
- Structural configuration
- Brake system
- Steering system

Source: Geels, 2002
What changes?

Performance
Moore's Law
What changes?

Actors/Relationships

Incumbents/newcomers
What changes?

Rules/Orders

Deep/shallow
What changes?

Norms
How quick is change?

Slow/Gradual
Fast/Abrupt
Maize yields

Figure 1. The U.S. national corn yield average data from the USDA (blue line) and "fitted yield" line (pink line) using SSA.
Internet traffic

Lycos 1996
How broad is the change

Narrow
Wide
Scope
Intentionality?

Emergent
Purposive
Emergent/Purposive

Steam power

Nuclear power
Theories of transformation

Evolutionary – continuities
Revolutionary – discontinuities
Cyclical – adaptive cycle
Narratives of transformation

Growth/development
Creative destruction
Growth/conservation/release/reorganisation
Disordering/ordering

....
Features of transformation

- Scale
- Nature
- Speed/momentum
- Scope
- Intentionality
- ‘theory of change’