How do users contribute to (energy) transitions?

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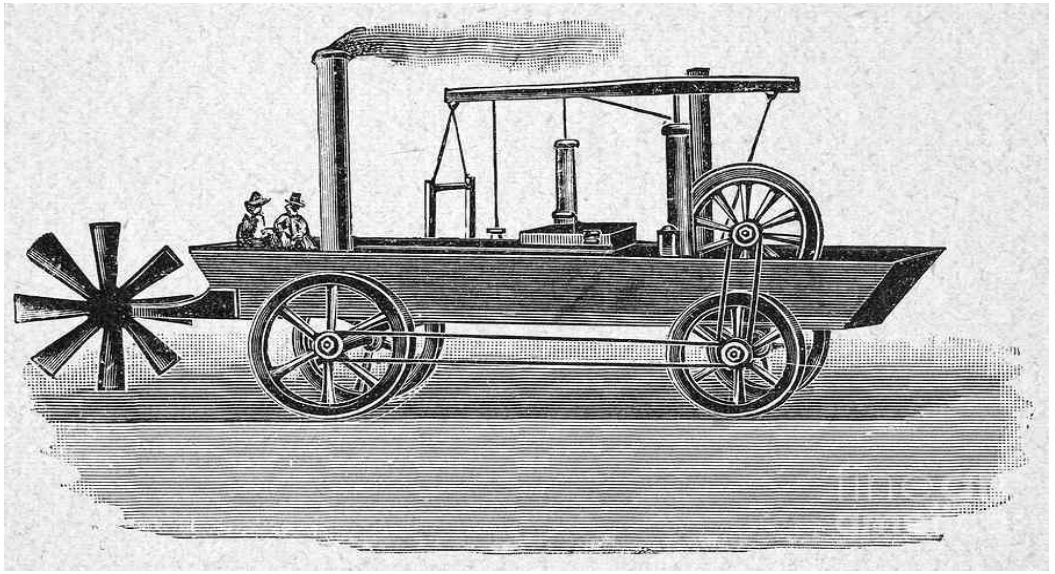
11.10.2016

Brief summary of the agency debate in transitions studies

- **The *Multi-level Perspective* on socio-technical transitions** (Rip & Kemp 1998; Geels, 2002, Geels & Schot 2007): transitions occur through interactions between niches, regimes and landscape events
- **Critics** (Meadowcroft 2005; Smith et al. 2005; Genus & Coles 2008; Hodson & Marvin 2005): there is too little agency in all this!
- **Response** (Geels 2006; Elzen et al. 2011; Penna & Geels, 2012; Baker et al. 2014): there you go!
- **Outcome:** actors are not neglected in sustainability transitions literature but their roles are „erratic“ (**Fischer & Newig, 2016)**
- **Schot et al. (2016):** one step ahead of you there!

Schot et al. 2016: what roles do users play in transitions?

- Let us explore this question through an historical case study: automobile transition in the USA (1891-1964):
  - **Landscape:** suburbanization, individualization, population growth
  - **Regime:** problems with the horse-drawn carriage regime (e.g. manure, speed, cost) cannot be solved
  - **Emerging niches:** bicycles, trams (steam, electric), car (steam, electric, gasoline, diesel)



Source: Fine Art America

Start-up phase (1891-1907)

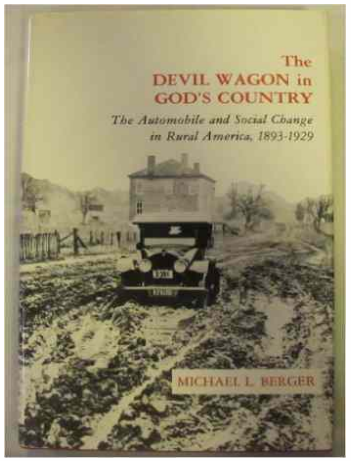
- No clear distinction between user and consumer, no markets, no services: want to ride a car? Build one!
- User experimentation with vastly different designs and solutions (steam, electricity, gasoline, diesel, alcohol), including regulation (Eno and traffic rules)
- **1900:** steam car most popular for personal use, electric car in business use, quick shift to gasoline cars afterwards
- **User-producers** invent, experiment and tinker with radical technologies, creating new technical and organizational solutions, shaping new preferences and enabling user routines to emerge

Start-up phase (1891-1907)

Farmers: „Devil wagon!“

Car advocates: „Harbinger of modernity!“

Car advocates: „Democratic technology!“



Symbolic meaning of the car

Woodrow Wilson: „Best advertisement to socialism!“

Car opponents: „Plaything for the rich!“

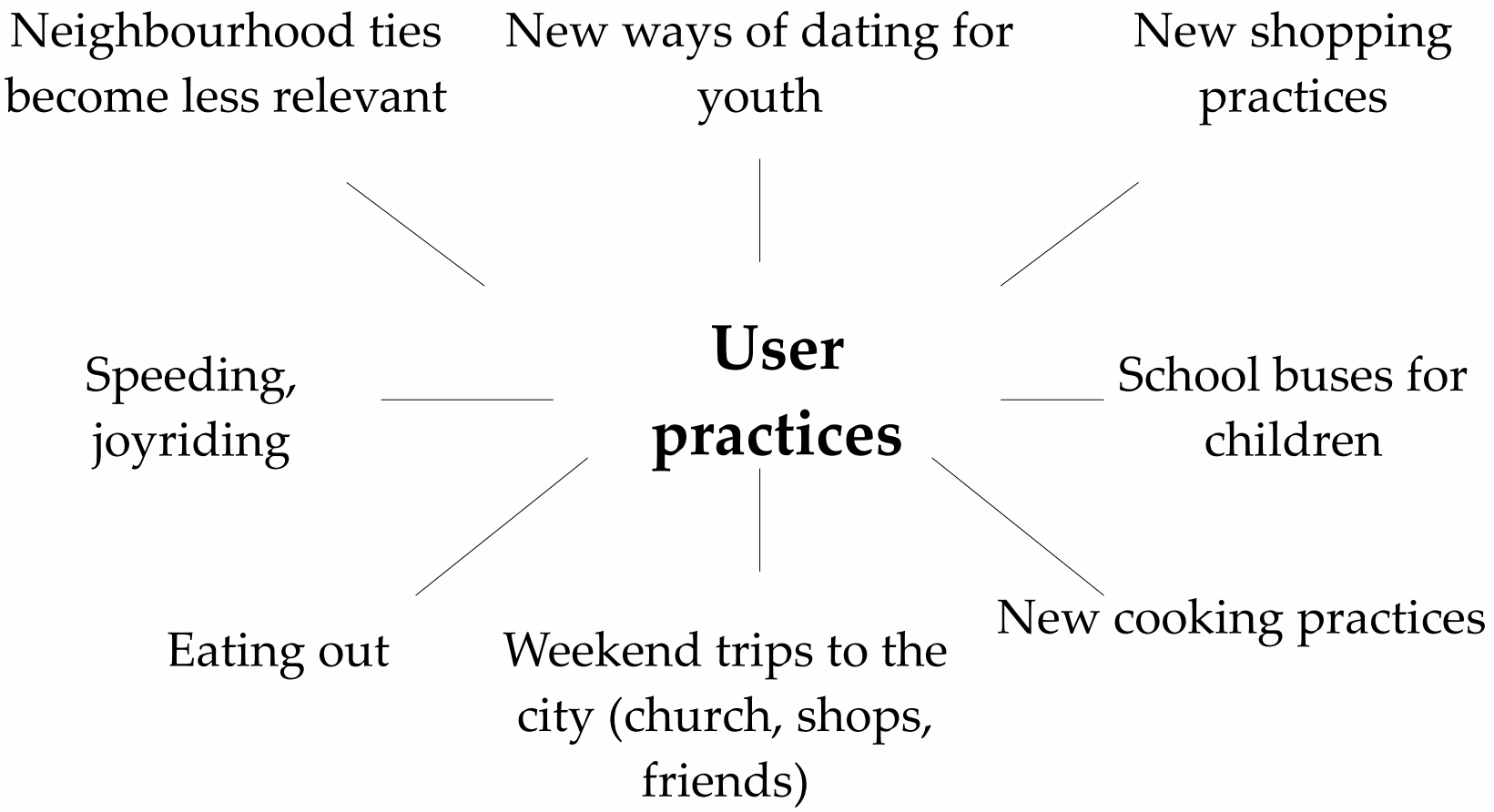
- **User legitimators** shape the values and worldviews of niche actors, providing rationale and justification for their actions and thereby shaping actors' future expectations

Acceleration phase (1908-1945)

- **From niche to mass market:** Ford T released in 1908, by 1914 sales amount to 300 000
- **Technologically:** dominant design, innovations in subsystems (from electric starter in 1912 to automatic transmission in 1940)
- **System building:** fuel, service and maintenance infrastructure, regulation and taxation, road-building, traffic regulations
- **Regimes:** public transport pushed aside in the city, railway becomes less important in long-distance transport

Source: Wikipedia

Acceleration phase (1908-1945)



- **User-consumers** not only make decisions about whether to buy a product but also devise new practices and routines („domestication“)

Acceleration phase (1908-1945)

- Mobilization of „Motordom“ and the emergence of collective identities (Pedestrian vs. Driver)
- **1915-1930:** gradual re-definition of urban space, highway projects, lobbying against the supremacy of railways
- **Outcome:** railway miles to car miles – 4:1 in 1922, 1:4 in 1929, while total traffic grew fivefold
- **User-citizens** lobby against prevailing regimes but also against other niches

Acceleration phase (1908-1945)

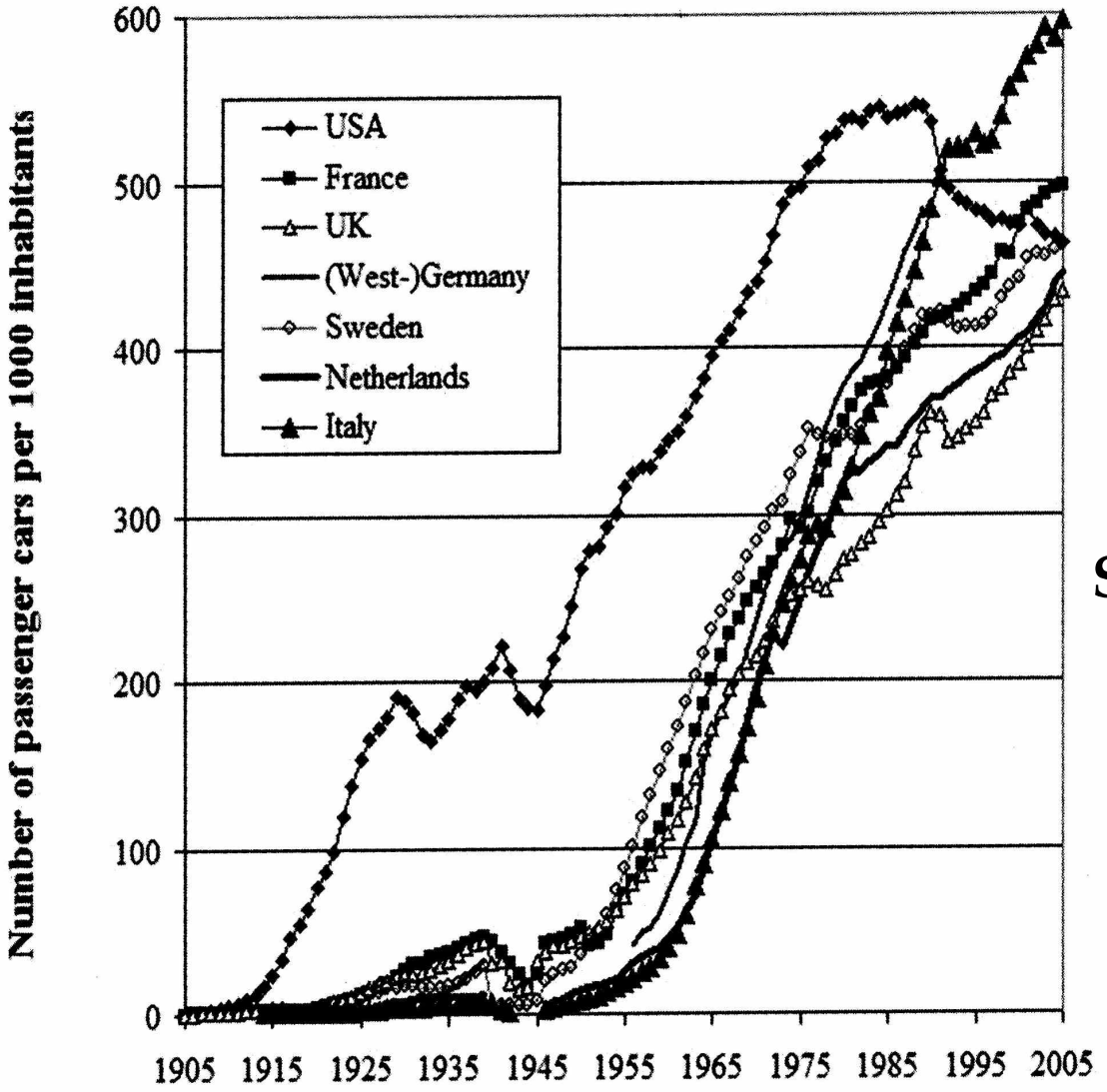
- The role of car clubs in system-building:
  - Creating and standardizing traffic regulations
  - Collecting and disseminating traffic statistics
  - Provision of traffic education

User-intermediaries create space to shape and align the differing elements of the emerging system (e.g. standards, bringing together and representing different stakeholders, brokering contacts, socializing users etc.)

Source: Norton (2008)

Stabilization phase (1946-1964)

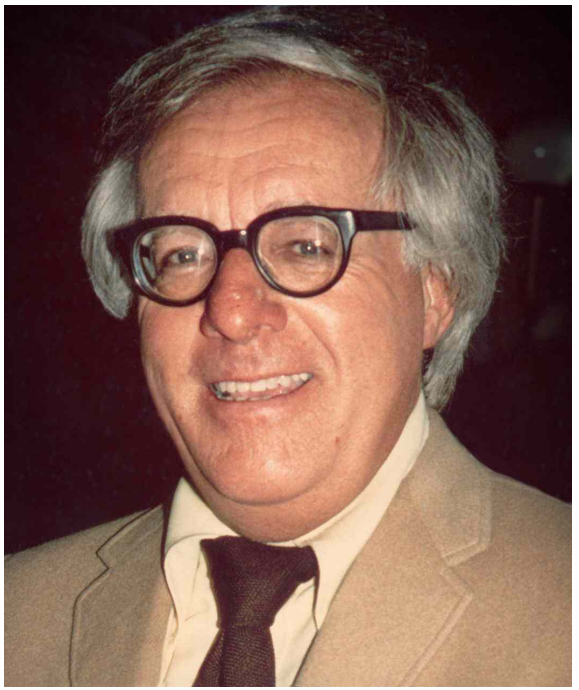
- Total victory of the automobile regime: car has become a rational choice in the city and the countryside, in short- and long-distance transport

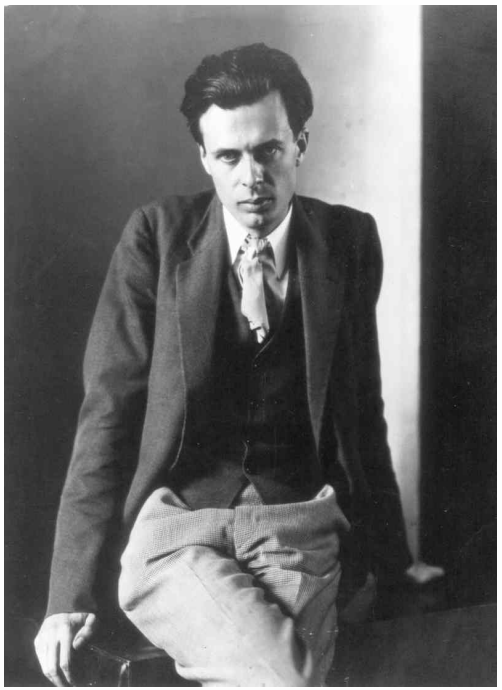


Source: Mom 2015

Car as a new normal

- **1950s:** police stops Aldous Huxley ja Ray Bradbury for engaging in suspicious activity
- **1954:** Ford tries to enter the market with a safety package but the users reject it
- **Life (1962):** *„In California, the car is like an extra, highly essential part of human anatomy.“*





Source: Wikipedia

The roles of users in different transition phases: A comparison

	Start-up	Acceleration	Stabilization
User-producer	Experimentation with different designs	Additions to the dominant design	Tinkering as a hobby
User-legitimator	Many conflicting meanings	Crystallization of a dominant meaning	Technology as a necessity
User-intermediary	Creation of a learning space	Regime-building	Consulting, informing users
User-citizen	Niche protection	Lobbying against other niches/regimes	Lobbying for the regime
User-consumer	Expressing one's status	Developing new routines and practices	Adopting existing routines and practices
Non-user	Technology as a moral hazard to current way of life	Technology as an actual hazard to current way of life	Technology as an opportunity to re-define one's life

More detail can be found in...

- Schot, J., Kanger, L. And Verbong, G. 2016. The roles of users in shaping transitions to new energy systems. *Nature Energy* 1(5): 16054
- Kanger, L., and Schot, J. 2016. User-made Immobilities: A Transitions Perspective. SPRU Working Paper Series (SWPS), 2016-13: 1-14. ISSN 2057-6668