

Publication date: Available online 28 April 2014

**Source:**Futures

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Today's car-based transportation systems require a transition towards sustainability. This is particularly the case in suburban areas, where the cost for introducing a new transportation system are high due to the low population density, while the negative externalities of the current mobility regime—such as health costs and congestions—are increasing rapidly. Based on expert interviews with car manufacturers, transportation authorities, environmental groups, and scientists we identify two visionary characteristics of future, more sustainable transportation systems: automated driving and sharing. Using these two characteristics, we apply the scenario-axes technique to develop four mobility scenarios for a suburban context that range from business-as-usual to a radical and sustainable one. When evaluating these with ten criteria that measure a scenario's performance from a user perspective, the radical scenario performs worst since it does not meet individualistic user requirements. Our findings suggest that lock-ins of users' expectations act as barriers for the diffusion of novel transportation systems. These barriers cannot be overcome by technological innovations and regulation alone. Hence, we call for innovative arenas, wherein technology and user acceptability could co-evolve.

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