

## Social shaping of technology

The case study article, *Thirty Years of Trends in Transit-Oriented Development across America* by John Luciano Renne was presented at the Transit Oriented Development – Making it Happen, Fremantle WA (July 2005). It is based and expands on a national study conducted by the Transit Cooperative Research Program (TCRP); it was released in 2004 and looked at transit oriented development (TOD<sup>1</sup>) across the United States. The case study examines the trends of travel behaviour and vehicle ownership from the year 1970 to 2000 in 103 TODs located in twelve regions<sup>2</sup> across the United States (Renne 2005). The case outlines the benefits of TODs and how it helps our society by using public transport, walking, cycling and reducing the number of vehicles used. The aim of this examination is to analyse various theories in understanding technology. The three main theories are the *instrumentalist theory*, the *determinist theory* and the *social practice theory* (Davison 2004). The instrumentalist theory represents technology as a tool developed by the society lacking any meaning or purpose, the society being in control over it. Determinist theory sees technology as autonomous, outside human control and either utopian or dystopian. The social practice theory goes beyond both the instrumentals theory and determinist theory; it combines the two to give a broader definition. Technology doesn't control the society but influences it in some way; they are in harmony and support each other. This essay looks at whether Renne's study is comparative to the explanations of technology presented by Davison. It will be argued that the social practice theory of technology is supported by the case study more than the instrumentalist theory or the determinist theory. This will be accomplished by summarising relevant ideas and information from the case study, why the two theories are inadequate, how the third overcomes problems presented in the other two theories and provides a better explanation of the case study, and finally a concluding paragraph.

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<sup>1</sup> TOD characteristics include compact, mixed-use, development with high quality pedestrian urban environment (Renne 2005, p2).

<sup>2</sup> For the twelve regions see Table 2 on page 10 of Renne's report.

Renne's research outlines the effect of transit oriented development (TOD) that is based on a national study conducted by the Transit Cooperative Research Program (TCRP) in the United States. It is argued that "TODs encourage sustainable transport use for commuting and maintain lower rates of vehicle ownership" (Renne 2005, p24). This illustrates the social practice theory; we see technology and society supporting each other for a better sustainable future. Others have claimed the same outcome, "TOD leads to more sustainable outcomes and reduced car dependence" (Bernick and Cervero 1997; Dittmar and Ohland 2004; Dunphy et al. 2004; Newman and Kenworthy 1999 as cited in Renne 2005, p1). However having a good system such as the TOD doesn't help towards a better future if it's not adopted by the society. This is evident from places such as Atlanta where "data revealed a decline in the share of transit use to work for the TODs" (Renne 2005, p8), where as places such as Washington D.C., Portland and San Francisco have promoted and embraced TOD with aggressive policies (Renne 2005). This is a prime example in the report of technology being used as a tool – instrumentalist theory. On the contrary regions have become more auto-dependent – implying a determinist theory (Renne 2005). Furthermore, "Census reveals that the percentage of commuting on transit continued to diminish across the regions" (Renne 2005, p8). Despite those results more than twice as many residents of TODs used transit commuting compared to the regional average in 2000 (Renne 2005).

The instrumentalist theory is inadequate in properly explaining the case study in a sufficient amount of depth or precision. The instrumentalist theory represents technology as a neutral tool developed by the society lacking any inherent meanings or purpose used to advance their interests in life, the society being in control over it (Davison 2004). If Renne's report (July 2005) is to be an example of this theory there would be clear evidence to support the theory. However this is not the case. Renne reports on the decline of transit use across the regions (Renne 2005).

Furthermore “aggregate statistics for the United States report that the transit share of work travel has been on the decline for the past 40 years. The percentage of transit commute trips has steadily declined from 12.6 percent in 1960 to 4.7 percent in 2000 (Pucher and Renne 2003 cited in Renne 2005, p7). Additionally “walking and cycling have been constantly decreasing across regions” (Renne 2005, p13). Although this particular technology isn’t used widely by the society there are places such as Portland that have “the most aggressive TOD program in the United States” (Cervero et al. 2004, p363 as cited in Renne 2005, p15). This is one example of the instrumentalist theory where technology is being used as a tool to help the society. From the above points it can be seen that this particular theory is insufficient in explaining the case study.

The determinist theory is also insufficient in explaining the case study by John Renne (July 2005). The determinist theory sees technology as an “autonomous master” (Davison 2004, p134) this implies that the inventions became the masters of makers. The only reference in the case study article that suggests this theory is the auto-dependency. This is evident from comments such as “The United States is the most auto-dependent country in the world” (Newman and Kenworthy 1999; Pucher and Lefevre 1996 as cited in Renne 2005, p1). If the case study article leaned towards the determinist theory there would have been no need for Renne to produce the report to encourage transit oriented development because the society would already be using/depend on the technology on a large scale. Another example that shows the article doesn’t support this particular theory is the decline of transit transport. “Overall, results confirmed that the transit mode share for commuting has fallen, on average, by 63 percent across the twelve regions over 30 years (from 19.0 percent in 1970 to 7.1 percent in 2000)” (Renne 2005, p7). Consequently walking and cycling declined across the United States which increased the levels of obesity (Renne 2005). This clearly illustrates that the case study doesn’t lean towards determinism.

The social practice theory of technological change goes beyond both the instrumentalist theory and determinist theory; it combines the two to give a broader definition. The technology doesn't control the society but influences it in some way. As Aidan Davison said, "we are being made as we make our world" (2004, p144). This theory best describes Renne's report. He provides substantial evidence to support the social practice theory and is evident throughout the report. For example "a recent study by Reconnecting America's Centre for Transit Oriented Development found lower vehicle ownership rates, on average, within a half-mile of rail stations" (Renne 2005, p18). This is based on "3,341 fixed guides way transit stations across the United States for the year 2000" (Renne 2005, p18). It can be seen that TODs influence the society by having fewer vehicles and at the same time not controlling the society. Places that introduced transit oriented development showed promising results. Not only does transit oriented development help the environment by reducing the number of vehicles used (by the society) it also helps the society directly by encouraging an active life; on a daily walking bases and cycling. It is known that an active life will improve the quality of life, this is supported by the comment "some researchers even have linked increasing levels of obesity with corresponding decreases in walking, cycling and use of public transport" (Renne 2005, p11). Furthermore "many have claimed that transit-oriented development (TOD) leads to more sustainable outcomes and reduces car dependence" (Bernick and Cervero 1996; Calthrope 1999; Dittmar and Ohland 2004; Dunphy et al. 2004; Newman and Kenworthy 1999 as cited in Renne 2005, p1). This shows that TOD is the way to go in creating a more sustainable future. Transit-oriented development has been able to maintain high levels of transit usage over the past 30 years although "Census data reveals that the percentage of commuting on transport continued to diminish across the regions" (Renne 2005, p8). This may sound like a bad thing, the society abandoning the TOD system, however it supports the theory. It shows that the society needs this system to create a

more sustainable world but at the same time it shows that it doesn't depend on it. With this evidence John Renne's (July 2005) case study is clearly illustrative of the social practice theory.

The theoretical ideas of technology argued by Davison (2004) have been explored in the context of a case study of John Luciano Renne (July 2005). The evidence presented in the case study has been analysed and it has been concluded that it supports a social practice theory more than either an instrumentalist theory or determinist theory. Aidan Davison also highlights the importance of social practice by saying these theories "ignore the many ways in which technological means and human ends interact" (2004, p134). Davison is referring to determinism and instrumentalism being separate theories and needing to be combined in order to create an overall understanding of technology.

## References

Davison, Aidan 2004, 'Chapter Eight Sustainable Technology: Beyond Fix and Fixation' in White, Rob (ed) *Controversies in Environmental Sociology*, Cambridge University Press, Cambridge, UK, pp. 132-149.

Renne, J. L. 'Thirty Years of Trends in Transit-Oriented Development Across America', pp1-27 PATREC (Planning and Transport Research Centre) Conference Paper presented at *Transit Oriented Development – Making it Happen*, Fremantle WA, 5-8 July 2005.