

A broader vision for transport optimisation: towards an efficient and fair allocation of urban road space

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This presentation discusses optimization of urban road space in the context of broader transport policy objectives, drawing from insights from past and present research projects at the UCL Centre for Transport Studies and on plans for future projects. The starting point is the observation that many cities tend to follow a common trajectory¹ as they urbanize and get richer: in a first stage, car ownership and use grow fast and city planners respond to that growth by increasing road capacity and optimizing motorised vehicle flows. In a second stage, as the problems of excessive car use appear, such as congestion, the focus shifts to the provision of public transport and other alternatives to private car use. In a third stage, cities use transport planning as a means to pursue broad societal objectives, such as urban liveability, safety, health, wellbeing, and equity. Large European cities such as London, Paris, and Berlin are currently at this stage.

Transport optimization in this third stage aims at providing minimum standards of service for all users, while attending to specific needs of vulnerable users such as the elderly and people with disabilities. In this stage, a high priority is given to the mobility of pedestrians, sometimes even when this reduces the efficiency of roads for motorised transport. It is also recognized that roads are not only conduits for movement but also places where people shop, wait, rest, and socialize. Measures towards these objectives are supported by methods for optimizing the mobility of pedestrians, considering "micro-scale" design elements² and assessments of road crossing facilities³ and by guidelines for optimizing the place function, based on aspects such as the optimal placement of street furniture, or minimum requirements for personal space⁴.

As cities continue to grow during the third stage of evolution, there is now an increasing pressure on road space. But at the same time, technological developments create opportunities to increase the efficiency of the available road space. For example, LED-based signs and road markings can be used to create flexible road designs that allow for a dynamic optimization of road space throughout the day, in response to changes in demand for different road uses, which can be assessed by monitoring real-time information from GPS and mobile phone data. Efficiency can also be achieved through innovations such as 'self-healing' road surfaces and trenchless technologies for utilities.

However, optimization of road space is more than a technical exercise to produce efficient road designs - it also means resolving trade-offs between the requirements of different road uses (different passenger transport modes, freight transport, parking and loading, and people spending time). This requires the integration of road design guidelines that in most cases are still mode and function-specific. There are guidelines for linking designs to the importance of the "movement" and "place" functions of the road⁵ and methods to enhance public participation at the level of option generation and design evaluation⁶. But more research is needed to reconcile operational and economic optimization, by developing methods to measure the economic value of different road designs and to support business cases for policy interventions that reallocate road space among different users.

Given the rapid technological and economic changes, we can envisage a fourth stage of evolution, when transport becomes intrinsically linked with land use and business models, which requires an even broader view of optimisation, one that aims at efficiency across multiple policy domains, such as transport, health, environment, energy, housing, and urban planning¹.

¹CREATE project, <http://www.create-mobility.eu>; ²AUNT -SUE project, www.aunt-sue.org.uk; ³Street Mobility project, <http://www.ucl.ac.uk/street-mobility>; ⁴Gehl, J. (2010) *Cities for People*; ⁵Jones, P. et al. (2007) *Link and Place*; ⁶DISTILLATE project, <http://www.distillate.ac.uk>