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### Transit-oriented development

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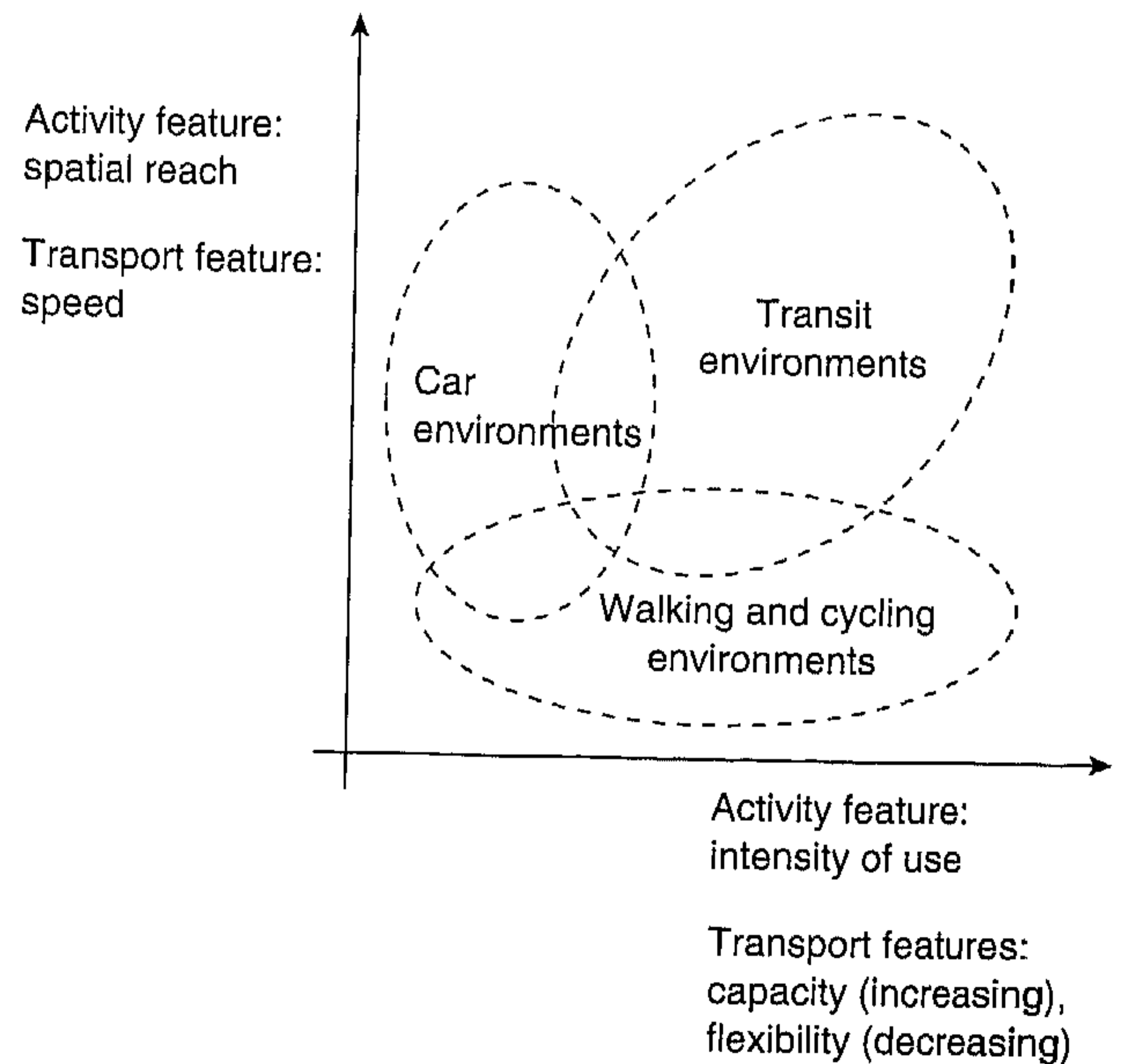
activities around stations. A third factor is the privatization or at least the shift toward greater market orientation of transportation and, most notably, railway companies. One consequence of privatization is that transportation infrastructure and service providers are increasingly seeking ways to recapture the accessibility advantage they help to create.

Characteristically, this implies the development of commercial activities within stations and redevelopment of land above or around stations. Many East Asian cities have a long tradition in this respect, but the trend has been expanding in Europe and North America as well. Fourth is a wish to boost the competitive position of cities as places to live, work, and consume through new large-scale urban projects. Many of these projects, typically showing a dense mix of office, retail, leisure, and housing, are located around highly accessible places such as main railway stations. High-speed railway station areas in European cities in particular have been the theaters of many such initiatives in recent years.

## TRANSIT-ORIENTED DEVELOPMENT

In cities around the world, stations and their surroundings are increasingly the focus of integrated transport and land use development efforts, whether under the label *transit-oriented development* as in North America and Australia, or more plainly, as (re)development of and around railway stations and other public transport interchanges as in Europe, Latin America, East Asia, and elsewhere. A combination of heterogeneous interrelated factors converges in determining this upsurge of station-related urban projects.

A first factor triggering station area projects is the new development opportunities provided by transport innovations, such as high-speed railway systems (particularly in Europe and East Asia) or new urban and regional rail-based systems (in most contexts) or bus-based systems (most notably in South America). A second factor is the generalized transfer of distribution and manufacturing activities away from station areas and toward more peripheral urban locations or new dedicated freight interchanges. Space is thus freed up for new



**Figure 1** Basic Transport and Land Use Correlations: Transit-Oriented Development Pursues a Combination of Transit and Walking and Cycling Environments

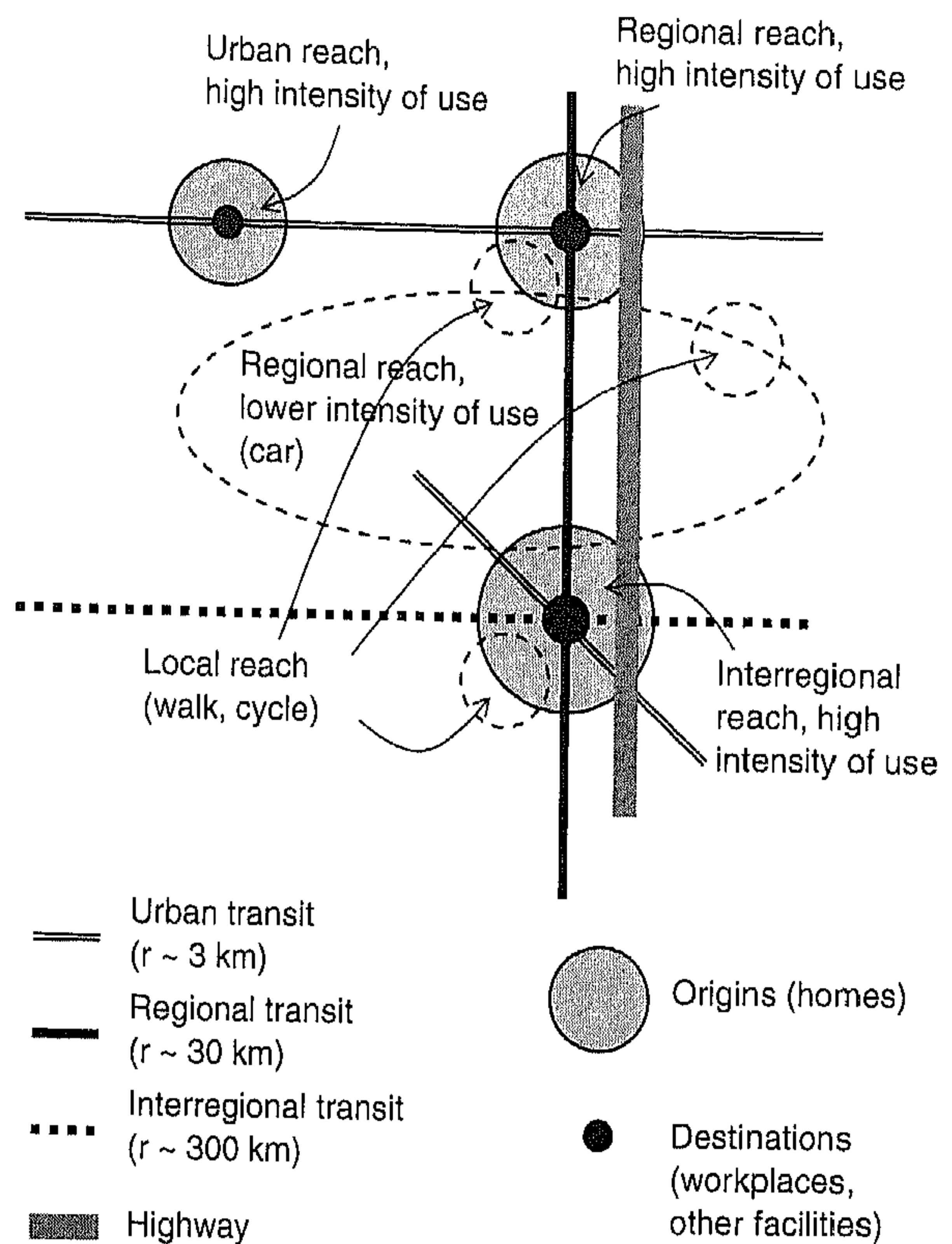
Source: Bertolini, Luca, and Frank le Clercq. "Urban development without more mobility by car? Lessons from Amsterdam, a multimodal urban region." *Environment and Planning A* 35 (2003): 575-89. Reprinted with permission.

A last but not least factor, and most notably in North America and Australia, is mounting concern about the sustainability of sprawling and car-dependent urbanization patterns. The integrated development of railway networks and land around the nodes of those networks is seen as a way toward a more public transport and nonmotorized modes-oriented, concentrated urbanization pattern. The arguments for this shift are not merely environmental (reduction of pollution, greenhouse emissions, land consumption, etc.); many local governments and citizens also see it as a condition for the development of a much needed mobility alternative for metropolises rapidly approaching total traffic gridlock.

### A Spatial Challenge

Basic characteristics of the transport and land use systems determine the competitive position of transit relative to the car, and thus set the backdrop to the spatial challenge of transit-oriented development. There are two basic correlations (Figure 1). The first is between the speed of a transportation system and the scale at which an urban system works (or its reach), for instance, expressed in terms of distances between places of residence and places of work. The second basic correlation is that between the capacity and flexibility of a transportation system and the degree of spatial concentration of activities, as for instance identified by residential and employment densities. The car—a low-capacity (but high-flexibility), high-speed transportation means—is best fit to high-reach, low-density urban environments. Transit matches the speed of the car but has higher capacity (and lower flexibility). Nonmotorized modes combine high capacity and high flexibility but miss speed. To provide a competitive alternative to the car (i.e., both fast and flexible transport), the strengths of transit and slow modes need to be combined. However, this combination can be successful only in the presence of short-distance and/or high-density spatial patterns. This is the central idea of transit-oriented development.

This brief discussion points at the fundamental aspects of the spatial challenge of transit-oriented development. In terms of land use change, it is above all a matter of increasing densities and functional mix, particularly around stations. In terms of transport change, it is a matter of improving the competitiveness of alternatives to the car by increasing



**Figure 2** Schematic Representation of a Spatial Development Strategy Exploiting the Synergy Between Transport and Land Use Features

Source: Adapted from Bertolini, Luca, and Frank le Clercq. "Urban development without more mobility by car? Lessons from Amsterdam, a multimodal urban region." *Environment and Planning A* 35 (2003): 575–89. Reprinted with permission.

their flexibility (most notably of transit) and their effective door-to-door speed (especially of nonmotorized modes). This need not be the case in absolute terms but relative to the car, implying that policies aimed at either reducing the flexibility of the car (think carpool-only lanes or parking restrictions) or its speed (think speed limits) are also favorable. A more general conclusion is that coordination between transport and land use choices and conditions is essential for transit-oriented development to be successful. Figure 2 schematically visualizes the spatial implications of these conclusions.

### A Governance Challenge

For all of its perceived potential, the integration of transport and urban development at stations is also a very complex undertaking. The growing flows of people passing through stations are a

direct result of the increasingly open nature of the urban system: (1) of people living in one place, working in a second, and spending their free time in yet a third; (2) of business relationships requiring exchanges of people based in distant locations; or (3) of equally extensive spatial patterns of movement generated by different types of consumption. The coincidence of different spatial scales (in the most extreme case from the global scale of high-speed train destinations to the locale of the station neighborhood) is mirrored by the presence of a broad range of users (from the cosmopolitan businessperson to the drifting homeless).

Station areas are, ambivalently, both nodes and places. They are (or may become) important nodes in both transport and nontransport (e.g., business, consumption) networks. Conversely, station areas also identify a place, a permanently and temporarily inhabited area of the city, a dense and diverse conglomeration of uses and forms accumulated over time, which may or may not share in the life of the node. Accordingly, a multifarious array of both node- and place-based actors crowd station area development processes, of which the local government and the railway company are two characteristic ones. Depending on the local context, other actors will also have a decisive role. These include different levels of public administration, different transportation companies, and market actors: developers, investors, and end users.

Furthermore, and particularly at station areas set in dense, historically stratified urban districts, local residents and businesses also have a significant stake in the transformation. The objectives of this heterogeneous array of actors are often conflicting and at best uncoordinated. Realizing the opportunities for synergy and managing the threats of conflict among all these actors and domains is the essence of the governance challenge of transit-oriented development.

### Can Transit-Oriented Development Deliver?

The complexities of both the spatial and the governance challenges are also a reminder of all that transit-oriented development might *not* be able to achieve. Especially in countries like the United States or Australia, where the dominance of car environments is extreme, transit-oriented development might be limited to a marginal impact on overall land use and

transport development patterns. In the short term, this will almost certainly be the case. The implication is that addressing the pressing sustainability issues to which transit-oriented development is expected to respond will inevitably require also a focus on other solutions, aimed at making existing car environments more sustainable rather than at eliminating them (e.g., through improvements in car technology and transport demand management measures). The complexity of the governance challenge is high in all contexts: because of the intricate tangle of actors and interests sketched above, but in many instances also because of its relative novelty and still extraordinary nature. It means that transit-oriented development can easily become a very resource-intensive endeavor, both in financial and organizational terms.

The potential rewards are also high, but the implication is that the affordability and innovativeness of property in transit-oriented development might become limited, as investors opt for goals that are financially rewarding in the short term and for low-risk functions, activities, and users. It is not just an equity issue. The very ambition of making transit-oriented development into lively, diverse urban centers would be thus jeopardized, as a handful of uses and users would dominate.

*Luca Bertolini*

*See also* Railroad Station; Transportation; Urban Planning

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