Making liveable and sustainable major urban streets: a renaissance for multiway boulevards
Yodan Rofè

In an effort to adapt cities to automobiles and trucks, traffic engineers introduced the notion of the functional analysis of streets. Duplicated in many street design manuals, it takes the form of a graph analysing streets as having two functions: mobility or the movement of traffic through an area, and access to land uses along them. The more a street is dedicated to through traffic, the less it should allow access to adjacent land uses.

The development of hierarchical functional analysis was not an arbitrary notion. It had two key aims. The first was to expedite through traffic from getting bogged down in congestion caused by frequent intersections, or by cars pulling out of parking and private lots. The second was to improve safety by reducing the number of possible conflict points between cars, and between cars and pedestrians. This entailed a reduction in the frequency of intersections, and limiting free access to major roads, where many cars were expected.

With hindsight, it is possible to say that these efforts may have succeeded in reducing conflicts, but in the process created urban areas devoid of life, poor in orientation, unfriendly for pedestrians, and lacking in character (Murrain 2002). This is because the functional analysis of streets misses the social function of the street as a place for human encounter. As shown by Hillier (1996, pp. 149-182), the street fulfils a social function as a result of the potential for encounter between passers-by and between them and the inhabitants of the street. This potential is a product of the movement function and

the access function of the street. Traditional major urban streets were places where both movement and access were maximised. As streets converged on the center, the distance between intersections became shorter, entrances more frequent, and ground floors were aligned with shops. Within modern practice however, the opposite holds: the distance between intersections becomes longer along major streets, and buildings are turned away from them and accessed in a circuitous way. The result is the destruction of the city's social space. As Marshall (2005, pp. 1-19) concludes, where there is movement there is no accessibility, where there is accessibility, usually, there isn't enough movement to sustain economic and social life.

To resolve the inherent conflict between through movement of vehicles, and the need to provide accessibility on major urban streets two types of solutions have recently been proposed. The first is the separation of vehicular traffic, as it enters the city, and particularly on reaching urban centres, into two parallel streets. Thus allowing streets of smaller width to carry more traffic, and reducing the complexity of intersections without sacrificing turn movements nor reducing the number of intersections. This solution has been proposed by Alexander and his colleagues (1977, pp. 123-130), and recently by Peter Calthorpe (2005) in his Urban network concept. It has been implemented in the structural axes of Curitiba, where a central street carries the public transit system, with access roads flanking it, and a pair of streets one block away from it on each side, carry fast moving traffic, one in the direction of the city's centre, and one away from it.

This solution, however, still

embodies the principle of separation between vehicular traffic and transit, pedestrian oriented streets. Although the parallel streets on which traffic flows allow frequent intersections, and do not necessarily inhibit immediate access to land uses along them, they do not form by themselves pleasant urban environments, and do not necessarily welcome pedestrian activity.

Boulevards have evolved in the 19th century from their origins in the late Renaissance and Baroque periods into complex streets that allow a diversity of traffic flows and activities, and help resolve the conflicts between them. They are characterized by containing within them strong rows of trees that delineate between different realms of movement. Jacobs, Macdonald and Rofè (2002, p. 4) describe essentially three types of boulevards: the 'street boulevard', which has a similar cross section to an ordinary street, but is somewhat wider, and has a wider sidewalk, the 'centre median boulevard' which has a wide pedestrian median in its centre, and the 'multiway boulevard', which has a central roadway, flanked by tree lined medians of variable width, and with access lanes allowing vehicular access to landuses.

The following examples show several of the contexts where multiway boulevards can become the structuring elements of an 'urbanizing' suburban or ex urban area. They also show, how boulevards, by their size, clear form and presence allow mixed uses to coexist together, as well as for gradual change and improvement to occur from marginal uses to more intensive and profitable ones.

The first proposal is part of the new general plan for the city of Villabate, a suburb of Palermo. The city's territory

is bisected by three major infrastructure lines. The areas between the corridors are disconnected from each other and from the existing city, a condition which inhibits their development and integration to their surroundings. By replacing the separated grade highway with a multiway boulevard, unlimited access from buildings, and side streets to the access lanes will become possible, and at grade intersections with the city's major streets, will provide easier access to the existing city, and proposed expansion areas to its North.

The story of Octavia Boulevard goes back to the famous 'freeway revolt' in San Francisco. The boulevard replaces a spur of the central freeway on which construction was stopped in the 1960's, and which was later damaged in the earthquake. The removal of the freeway allowed for a 40 meter wide boulevard, as well as area for new residential and commercial development that will help remake the neighbourhood severed previously by the freeway. As told by Boland (2006), the removal of the freeway, and the construction of boulevard instead, were put to a citizens' vote three times, and the boulevard finally approved in 1999, and completed in 2005. The completion of the design depended on close cooperation between planners, urban designers and transportation planners to resolve the differences in professional cultures and outlook (Macdonald 2006).

Begin Road, previously named Petah-Tikva Road, is a thoroughfare in the heart of the Metropolitan CBD. The construction of the Ayalon Freeway in the early 1970's relocated much of the inter-urban movement from Begin Road. Begin Road's role began to change to that of a distributor road, to the many commercial uses now

attracted to the area because of its increased accessibility by road and rail. It contains major bus traffic: inter-urban, metropolitan and local. The land uses around the street are changing from light industrial into business, services, commercial and residential. The thoroughgoing traffic lanes have a designated righthand side bus lane, and two lanes for private vehicles. As Begin road approaches the older centre of Tel Aviv, its right of way is constrained to 35 meters from the previous 44. To resolve this problem, while maintaining the character of the street, the boulevard is split into a couplet of parallel boulevards, each with access and thoroughgoing ways in one direction, while busways are continuous in both directions.

In recent years there has been a reappraisal of urban major road design in cities. Cities like Milwaukee, Portland, Boston, Seoul and Barcelona have transformed some of their major road infrastructure into more liveable and pedestrian friendly boulevards. Furthermore, the whole approach to urban transportation planning, and the hierarchical paradigm of streets is in the process of change, a sign of this change is the recently published report, prepared jointly by the Institute for Transportation Engineers, and the Congress for New Urbanism (ITE 2006), proposing new methods and standards for the design of major urban streets. Working on some of these projects and during discussions of design alternatives, we have found that the most difficult idea to convey is the sense of the wholeness of the street. Streets in general, and boulevards in particular, succeed or fail as entire wholes. While not providing the best solution to any one of the requirements of a major urban street, the multiway boulevard is able to provide for all of them in a balanced way; and while there may be conflicts between uses and movements, if the environment accommodates them, and provides clear information, people are able to resolve these conflicts with ease. This is one of the points that is hardest to get across to engineers and public officials who often tend to insist on 'fool proof' and "conflict free" designs. Boulevards are an excellent solution where many competing and conflicting uses need to be accommodated on the street, and where there is sufficient right of way. When right of ways are limited, one can separate them into a couplet of parallel one way boulevards to create streets with a sizable traffic capacity, but which maintain liveability. Multiway boulevards are flexible and adaptable, and will be successful as long as the principle of the 'pedestrian realm' is maintained. They serve as one possible solution for the design of major urban streets, for which solutions must be found if we are to make our cities more liveable and sustainable.