LanD use anD TransPorT systems are inextricably linked – if one is to change, the other must respond. Land use planning decisions have a significant impact on transport needs, car ownership and public transport viability. Transport technology and planning has a similar impact on land use, influencing the locational demands of businesses and households.

in many respects, land use planning and transport planning have failed to provide positive urban environments. Increasingly, many cities are faced with serious traffic congestion, declining public transport networks and residential and business environments that are monofunctional and sterile.

Historically, land use planners have attempted to separate different land uses. This thinking has its basis in the unpleasant mixed use areas of cities that grew rapidly during the industrial revolution. The split between residential and industrial areas was originally facilitated by the development of transport technology which allowed people to travel the increased distances necessary to live away from their place of work. This desire to separate different land uses in order to maximise the benefit that each can derive from its location has guided land use planning until fairly recently, particularly in the South African context. In addition to the over-separation of land uses, planners have also been responsible for focusing on planning for cars, which has resulted in urban environments which are built at very low densities with large road reserves and are not at a human scale.

Transport planning in many cities has focused primarily on the facilitation of car transport to the detriment of other modes of transport. The result has often been a decline in public transport systems and degradation of the pedestrian environment to the point that non-motorised means of transport are no longer feasible.

Of late there has been a demand for a change in the style of transport and land use planning resulting from the variety of negative externalities arising from an over dependence on cars. From a transport perspective, the major problem is increasing traffic congestion, often exacerbated by a lack of alternative means of transport and a need to travel due to the separation of land uses.

As our understanding of the environment has developed, it has become apparent that the reliance on the car, with its internal combustion engine, is not sustainable. This unsustainability has two elements: (1) the production of greenhouse gases that are a by-product of the combustion of either petrol or diesel, and (2) the finite nature of these fuel reserves and the increasing demands being placed on these reserves as more fuel is demanded by...
practices

growing economies.

Concerns have developed within the urban planning profession regarding the quality and liveability of many modern urban environments. The claim is made that many of the newer environments are mono-functional and sterile and fail to meet the needs of people who work and live in them. Of particular concern are the effects of urban sprawl, which results in loss of valuable farm and environmental land, increasing travel times, decline in transit ridership, increasing crime levels, decline of CBD areas and a host of other social ills.

These concerns have lead to a reconsideration of the traditional separation of land uses and resulted in the ideas of new urbanism which is focused on the development of mixed use urban environments focused on encouraging transit ridership and non-motorised transport. The primary cause of sprawl and its negative externalities is the low density of many new developments. The need to accommodate cars in large numbers exacerbates the problem of low density, as more land is required for road reserve and parking. Low densities reduce the population in an area, impacting on the viability of public transport and commercial and retail activity. The result is the development of ‘big box’ retail centres to which people have to drive, and the decline of public transport networks as high frequency services are not economically viable with low population thresholds. People are forced to drive more often and further, thereby exacerbating traffic congestion and fuel consumption with its attendant problems.

Apparent from the foregoing is the need for better transport systems that offer a range of transport options without maximising any one. To complement these transport networks, there is a need for better human environments that minimise the distances that people are required to travel in order to access the goods and services, social networks and recreational opportunities that are necessary for everyday life. In addition, these new environments should facilitate the development of all modes of transport, particularly non-motorised modes of transport that have a limited environmental impact.

In order to achieve this end, there is a need for integrated planning that considers both transport and land use together in order to develop urban environments which support a range of transport options and at the same time meet the needs of the people who use them. Such planning is necessary if truly sustainable cities are to be developed.

Transport planning needs to consider solutions to transport problems in an integrated and systemic manner. The basis for this needs to be the integration of different modes of transport and the acceptance that there is not one form of transport that should be dominant, but rather a range of options should be offered. Of particular importance is the need to ensure that car dominance in transport planning no longer prevails and, instead, means are found to make public transport more efficient and convenient and non-motorised forms of transport are planned for and the use of such is encouraged.

In order to produce the types of urban environments that support public transport and non-motorised transport usage, three factors must be improved: density, mix of land use and pedestrian friendliness. Higher-density environments are able to support a range of retail, commercial and transport services. The result is that people live closer to the retailers and service providers that they need to access on a regular basis and can often do so using non-motorised means of transport. Higher density results in more people using an area, which equates to more potential transit users. Increased demand for transit results in more frequent services with attendant increasing efficiency and convenience; thus, encouraging more users. In the United States a general correlation between density and public transport usage has been identified, with a 10% increase in density resulting in a 5% increase in public transport usage.

Mixing of land uses allows people to access all of the goods and services that they require without having to travel long distances. People are often able to access the retail, commercial and service activities that they use on daily basis using non-motorised transport; hence, reducing the number of vehicle kilometres travelled. Mixed land use also encourages people to use public transport. They do not feel the need to have a car at work, as they do not have a sense of being ‘stranded’ when they are able to access all of the goods and services that they require.

When mixed land use and higher density are correctly combined, ensuring that commerce, retail and services are located close to public transport routes and terminals, a further incentive for public transport use is found. In such cases public transport users are able to consolidate trips. It becomes possible to drop the children at a school or crèche on the way to the transit stop, or on the way home it is possible to purchase essential groceries and collect the laundry while walking home. If people are required to use their cars for one leg of their trip, it is likely that they will continue to use the car for the rest of their journey.

If the urban environment is not pedestrian friendly, then all of the above will...
have been wasted. For public transport facilitation measures to work and non-motorised means of transport to be used, the pedestrian environment has to be such that people are prepared to walk. If the pedestrian environment discourages walking, people will not use public transport as all public transport trips have an element of walking and regardless of how close goods and services are to places of work or residence people will still drive.

**INTERNATIONAL SUCCESS STORIES**

The problems identified above have been a concern for transport and land use planners for decades and attempts have been made throughout the world to provide the solutions outlined above. When combined correctly, these solutions have proved to be highly successful in the development of quality urban environments. Below are some examples of interventions and developments which have been highly successful.

In the 1930s and 1960s, Munich in Germany was one of the most congested cities in Europe. In the late 1960s a multimodal transport plan was developed for the city. The plan comprised the development of a regional rail system (S-Bahn) and an underground rapid transit system (U-Bahn). Streets around the city centre were improved and traffic flow in the city centre was impeded, while some of the most congested streets were pedestrianised. By the early 1970s a 12% shift in modal split in favour of transit occurred for travel into the central area. Since the 1970s car ownership in Munich has remained high, but the modal split has continued to change in favour of transit usage.

Melbourne in Australia has been rated as one of the most liveable cities in the world. This is due, in no small part, to the Melbourne Metropolitan Strategy. The strategy set a series of priorities to boost the attractiveness of Melbourne as a place to ‘live, work, invest and do business’. Part of the strategy was an integrated transport plan that ensured that land use and transport planning contributed to produce an urban environment with high levels of accessibility, using a range of modes of transport. Melbourne integrates train, tram, bus and car transport to ensure high levels of public transport access and acceptable levels of car access. Much work has been done on the production of pedestrian areas within central Melbourne and new layouts for suburban residential areas have been developed that focus on producing mixed use areas that facilitate pedestrian and transit trips.

There is no doubt that integrated transport and land use planning can be effective on a city wide scale, but it can also be effective at a smaller area scale, improving the liveability of an area within a city. This can be seen in the effectiveness of a number of new urbanist projects and transit-oriented developments.

In Washington and Portland, in the United States, transit-oriented developments that aggressively promote transit have experienced an average increase in transit ridership of 58%. Not only has ridership increased in these developments, but there has also been a change in car ownership patterns in these developments. Only 35% of households in transit-oriented developments own two cars as opposed to 55% for the city as a whole.

Oreno Station transit-oriented development on the outskirts of Portland has significantly higher transit usage rates than the rest of the region, with 22% of residents regularly using transit as opposed to 5% for the rest of the region.

A comparison of two neighbourhoods in Chapel Hill, North Carolina, US, indicates that residents of the new urbanist neighbourhood made 22% fewer car trips and were three times as likely to walk as residents of a similar neighbourhood (in relation to size, location and demographics).

There is no doubt that integrated land use and transport planning can result in significant changes in travel patterns, with a shift from car dependence to higher levels of transit ridership and non-motorised transport usage. These changes can bring about far-reaching improvements in terms of liveability by reducing time spent commuting and increasing accessibility, while improving the quality of the urban environment.

**THE SOUTH AFRICAN CONTEXT**

In South Africa, specifically the Western Cape, a change in travel patterns is taking place. Increasingly there is a move away from traditional public transport modes such as buses and trains to taxis. The Western Cape has the highest rate of car access in the country, with 45% of households having access to cars.

Nationally, 60% of households that have access to cars spend nothing on public transport. This indicates that these households use the car exclusively as their means of transport. Clearly there is a shift to road-based transport. The effect of this is increasing congestion in the urban areas. South Africa has not reached the same point as the United States, where more than 90% of households have access to cars and transit usage is as low as 5%. It is still possible to encourage people to return to transit, which they have a history of using.

It appears that there is something of a disjunction within government policy between the objectives of government in relation to the promotion of public transport and the requirements for traffic impact assessments. The Manual for Traffic Impact Assessment provided by the Department of Transport requires trip generation rates (for car trips) to be produced through the analysis of existing similar developments or the use of the South African Trip Generation Rates booklet. Modal split is produced by observing existing modal split for similar developments within the area. Essentially, this ensures that the existing situation of car-dominant planning is enforced for future developments by ensuring that the current trip generation rates and modal split, with associated low dependence on public transport, is maintained. This has implications for the road network and parking areas that must be developed to meet the future demand. The problem is exacerbated by the demand that the 75th percentile demand be used, further exaggerating the over design of road infrastructure.

On the other extreme, government policy calls for an increase in public transport usage and a prioritisation of public transport over private vehicle usage, with the aim of shifting modal split. The Western Cape’s Moving Ahead Cape Metropolitan Transport Plan has suggested a policy of staged target modal splits and aimed to achieve a modal split of 66:34 (public/private) by 2005. In addition, Moving Ahead calls for a reduction in trip length.

Clearly, traffic impact assessment policy is at odds with the government’s stated public transport policy. It will be impossible to shift the modal split in favour of public transport if future transport planning is required to cater for private transport demand at the current level. Such planning will produce an environment that is dedicated to providing for private car usage and not for the needs of public and non-motorised transport users. Only when future demand is considered in the light of targeted modal split will transport planners be able to provide for the needs of public transport users.

**CONCLUSION**

The integration of transport and land use planning offers the potential to produce positive environments that are at a human scale while at the same time providing high levels of mobility. Fundamental to this process is the shift in transport planning away from a focus on providing for car users to balancing the needs of all transport users instead. In order to achieve this end, it is necessary to reconsider traditional traffic impact assessment techniques and instead produce a transport impact assessment. Such an assessment will allow the development of a composite understanding of all transport needs and not simply those of car users. With such a composite understanding it is possible to develop an infrastructure plan that can appropriately respond to these needs while producing a high-quality urban environment which does not prioritise any single user to the detriment of other users.