

## Urban Regeneration and Transportation

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### Introduction

The built environment is the stage upon which we live out our daily lives: the built environment comprises urban design, land use, and the transportation system, and the patterns of human activity within this physical environment. Unfortunately, the physical environment often hinders patterns human activity, and none more than transportation systems. This is all the more regrettable as investment in the physical environment, especially in the infrastructure supporting that physical environment, is a significant component of public spending.

Public infrastructure investment has been a key driver of recently improved investment rates (DTI 2010). Public investment of R404 billion was attracted over the 2006/7 – 2008/9 period and rose to R787 billion for the period 2009/10 – 2011/12. Much of this investment was for transportation upgrades and improvements, including Gautrain and national road improvements.

Government invested R25 billion over the last Medium Term Expenditure Framework (MTEF) in passenger rail services in preparation of the World Cup and beyond (DoT 2010). This programme increased to R38 billion in the current MTEF and is also to arrest the decline in infrastructure and address rolling stock availability.

Passenger Rail Agency of South Africa (PRASA) is upgrading key stations and critical infrastructure. In Johannesburg, Cape Town and Nelson Mandela Bay, the construction of the Integrated Rapid Public Transport Networks (IRPTN) infrastructure construction is also underway.

The public transport strategy, approved by Cabinet in March 2007, makes the case for the implementation of a public transport system in South Africa, and recognises that South Africa cannot continue to build more roads and parking in cities as this simply encourages more traffic over the medium term. For example, Rea Vaya Phase 1 A, which operates between Johannesburg and Soweto is currently carrying 20 000 people per day (as at December 2009) up from 11 000 in August of the same year.

However, the impact of South Africa's sprawling low-density cities has detrimental impacts on the viability of public transport. Significant pressures are especially placed on the transport system by the marginalisation of a majority of working class and poor citizens who have to commute over large distances daily to access work and other opportunities.

Switching car users to public transport, walking and cycling will make a major contribution to our global responsibilities of protecting the environment. In addition public transport provides a greater level of safety and stress-free travel than private transport.

### Role of Transportation in Urban Regeneration

The inter-connectivity of transport and quality of life has been recognised in the United States of America through the establishment of an Interagency Partnership for Sustainable Communities to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide (DOT 2009). This Interagency consists of the Department of Transportation, the Department of Housing and Urban Development, and the Environmental Protection Agency. The Interagency has agreed on six guiding 'liveability principles' to guide and coordinate federal transportation, environmental protection and housing investments at their respective agencies. Together the initiative aims to protect the environment,

promote equitable development, and help address some of the challenges associated with climate change.

More critically however is the recognition that the creation of liveable communities will result in improved quality of life and create a more efficient and more accessible transportation network that serves the needs of individual communities. For the first time the US Federal government will speak with one voice on housing, environmental and transportation policy (DOT 2009).

The six liveability principles are:

- 1) Provide more transportation choices to inter alia develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce the nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health;
- 2) Promote equitable and affordable housing to, inter alia, expand location- and energy-efficient housing choices for people of all ages, income, and race to increase mobility and lower the combined cost of housing and transportation;
- 3) Enhance economic competitiveness by, inter alia, improving economic competitiveness through reliable and timely access to employment centres, educational opportunities, services and other basic needs by workers as well as expanded business access to markets;
- 4) Support existing communities by, inter alia, target federal funding toward existing communities through such strategies as transit-oriented, mixed-use development and land recycling and by increasing community revitalisation, improving the efficiency of public works investments and safeguarding rural landscapes;
- 5) Coordinate policies and leverage investment by, inter alia, aligning federal policies and funding with a view to removing barriers to collaboration, leverage funding and increasing the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy; and
- 6) Value communities and neighbourhoods by, inter alia, enhancing the unique characteristics of all communities by investing in healthy, safe and walkable neighbourhoods.

## Transit-Oriented Development

Transit-Oriented Development (TOD) refers to residential and commercial centres designed to maximise access by transit and non-motorised transportation, and supported with other features to encourage transit ridership (VTPI 2010). Typically TOD has a rail and/or bus station at its centre, and is surrounded by relatively high-density development, progressively reducing in density as it moves out from the centre. Transit-Oriented Development includes design features such as (Morris 1996; Renne 2009):

- A neighbourhood designed for cycling and walking and having sufficient facilities and attractive street conditions.
- Streets have good connectivity and traffic calming features to control vehicle traffic speeds.
- The surrounding development is essentially mixed-use that includes shops, schools and other public services, and offers a wide variety of housing types and prices within each neighbourhood.
- Parking is managed to reduce the amount of land devoted to parking compared with conventional development, and to take advantage of parking cost savings associated with reduced automobile use.
- Transit stops and stations are convenient, comfortable and secure with comfortable waiting areas, a variety of convenience shops, and clean ablution facilities.

Transit-Oriented Development is a category of *Smart Growth, New Urbanism* and *Location Efficient Development*. Properly applied it increases accessibility and transportation options through land use grouping and mix, and non-motorised transportation improvements. This reduces the distance required for car trips, encourages a greater portion of trips to be made by walking and cycling, and allows some households to reduce their car ownership which, together, can result in significant reductions in vehicle trips overall.

High-quality transit supports the development of high-density urban centres, resulting in accessibility and agglomeration efficiency benefits. Large scale park & ride facilities tend to conflict with TOD since a rail station surrounded by large parking lots and arterials with heavy traffic is unlikely to encourage the development of a high-quality residential development (VTPI 2010).

Transit-Oriented Development reduces transportation costs and externalities, increases travel choice, and reduces land paved per capita. TOD can increase transit service efficiency, resulting in improved performance and cost effectiveness. TOD can also contribute towards a more liveable community resulting in neighbourhoods that are more desirable to live in physically and socially. These benefits generally result in higher property values and increased commercial activity thereby improving tax revenue (VTPI 2010).

TOD can benefit all population groups and can significantly benefit lower income earners and non-drivers by improving residual income and household affordability. By improving travel options and accessibility TOD improves basic mobility (VTPI 2010).

### **Strategies for integrating transportation and urban generation**

From the above it is possible to prepare seven strategies for integrating transportation and urban regeneration.

- 1) Provide a vision for sustainable growth that promotes infrastructure investments that reduces energy dependence and greenhouse gas emissions, and protects air and water quality;
- 2) Integrate housing, transportation, water and electricity infrastructure, land use planning and investment;
- 3) Develop housing affordability measures that include housing and transportation costs and other expenses that are affected by location choices.
- 4) Redevelop underutilised sites to achieve critical environmental and social justice goals by targeting development to locations that already have infrastructure and offer transportation choices.
- 5) Change zoning requirements and development practices to encourage high density development.
- 6) Lower parking requirements around transit stations.
- 7) Invest in pedestrian and cycling facility improvements.

### **Maximising South Africa's infrastructure investment**

From the above it is clear that infrastructure investment in general, and transportation investment in particular, has and will continue to be a key driver in investment rates in South Africa. Furthermore, strategically considered and applied transportation investment can positively support urban regeneration. TOD in particular will support Government's policy of promoting public transportation and improving mobility, especially for the poor.

Thus the missed opportunity provided by the Gautrain investment is all the more regrettable: planning proposals for the transit stations depict a planning paradigm that conflicts with TOD objectives and goals (Figure 1, 2 & 3).



Figure 1: Gautrain Rhodesfield Station

The five key design principles for TOD are all notably absent, thereby negating the clear benefits to be derived from investment in a transit strategy such as the Gautrain.



Figure 2: Gautrain Midrand Station

The proposed Midrand Station (Figure 2) depicts this oversight more starkly: this station is conceived as a transport node, not as a Transit-Oriented Development. The separation of transport from urban settlement can clearly be seen by the distance between the transport node and the city centre in the background.

Even the Gautrain Hatfield Station, located in an existing urban centre, ignores the design principles of TOD and does little to maximise the benefits on this transportation investment (Figure 3).

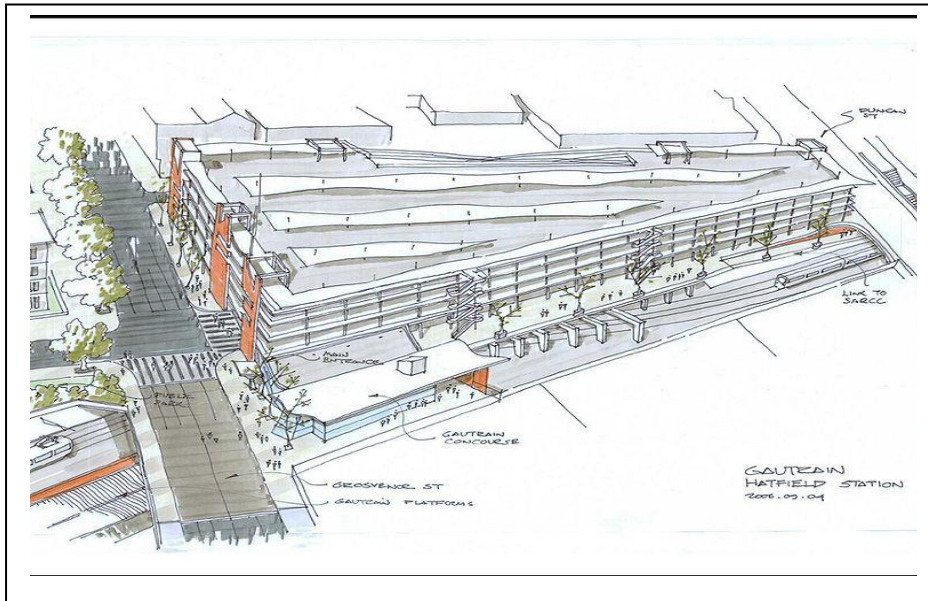


Figure 3: Gautrain Hatfield Station

By contrast, Curitiba provides a useful example of how improved infrastructure investment can be used as a tool of urban regeneration (Figure 4).

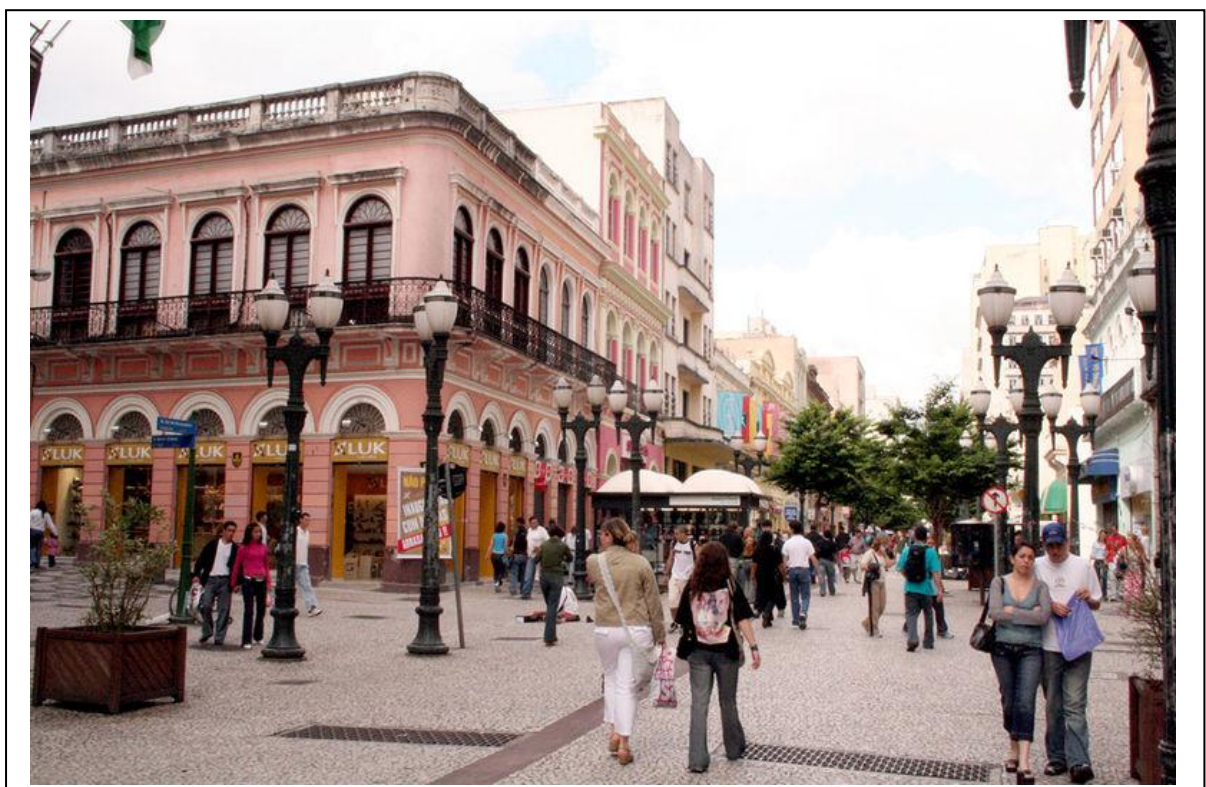


Figure 4: November 15 Street, Curitiba.

Curitiba in Brazil is one of the earliest and best examples of TOD: the city was organised into transport corridors as part of its regeneration programme with high density development integrated into its zoning and transportation development plan. Curitiba has focused on working with economical forms of infrastructure such as bus routes (on which the Rea Vaya Phase 1a is modelled) through a unique public planning participation process.

## Conclusion

Public transit has become an economic imperative as the costs for constructing and maintaining roads for private vehicle use becomes increasingly unsustainable. Fortunately, South Africa continues to invest in infrastructure, and recognises that the continued investment in private transit options is beyond the country's means. Thus the focus on investment in public transportation is strategically correct: what is required now is that the ability of infrastructure investment to regenerate urban development needs to be recognised and acted upon.

Fortunately, the opportunity is still there: the proposed stations illustrated above have the scope to be re-developed in a manner that, provided the design principles of TOD are followed, could act as growth catalysts for sustainable human settlements that especially benefit the poor. The formation of a similar Interagency for Sustainable Communities between the departments of Transport, Human Settlements, Environmental Affairs and Treasury could well see improved access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in our communities.

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