Southern Africa Road Federation

Non-motorised Transport Practitioner's Course

Session 10: NMT and Land-use Integration

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Part 1: Introduction

Part 2: Urban Form and Transport planning

Part 3: Transit Orientated Development - International Good Practice and Case studies

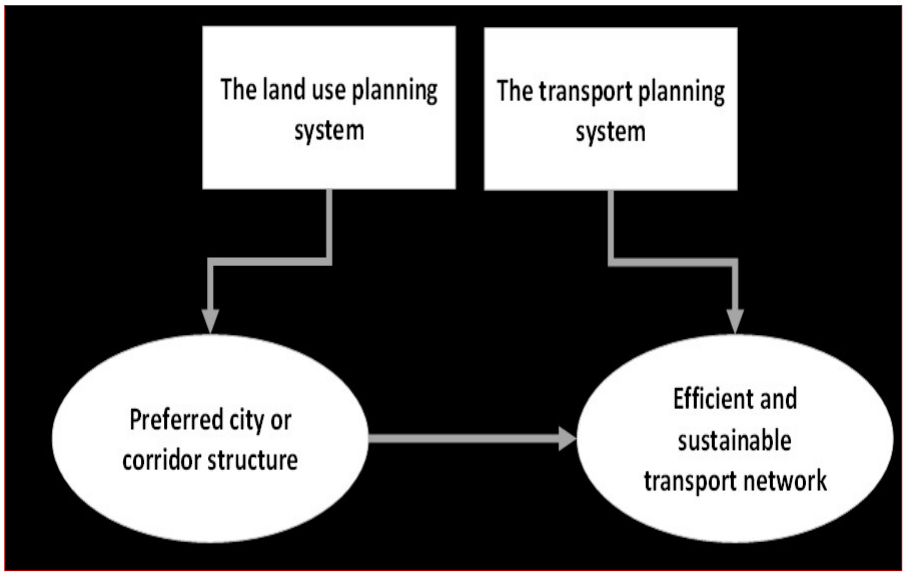
Part 1: Introduction

"*Transport and land use are inextricably linked*. A strong relationship exists between land use and transport whereby transportation infrastructure attracts land use development and, in many respects, land use development is unlocked by the provision of high-quality, integrated transport infrastructure and services".

"The main objective of land use planning is to ensure that economic development is stimulated and that the spatial locations of activities, people and amenities, in turn, have a positive impact on the local, regional and national economy. These objectives can only be achieved with the support of transport services"

NATMAP 2050, Chapter 5: Integrated Spatial Vision

Integrated Transport and Land Use Planning



Integrated Transport and Land Use Planning

Figure 2: Integrated Transport Plan of New Zealand Transport Agency(NZ Transport Agency, 2010)

NMT within an integrated Transport/Land use Approach

An integrated approach to land use and transport planning will benefit NMT by contributing to:

- Reduce the number of conflict points on roads by encouraging frontage roads, service roads, shared pathways.
- Preserve road capacity and reduce traffic congestion on major road corridors by carefully siting developments to facilitate enhanced public transport, cycling and walking.
- Reduce pedestrian traffic on major road corridors by carefully locating pedestrian traffic generating developments away from major road corridors.
- Improve safety on major road corridors by reducing traffic congestion and reducing pedestrian traffic.

NMT within an integrated Transport/Land use Approach

- Land use planning can be applied to improve the functioning of major road corridors in several ways.
  - Can be used to screen and select appropriate developments, compatible with the functioning of roads, to be located near major road corridors or change the location of proposed developments in such a way to have minimum impacts on adjoining roads.
  - At the same time, land use planning can impose conditions on those developments which are required to be located adjoining major road corridors, requiring modifications to reduce impacts due to these roads.

Part 2: Urban Form and Transport Planning

Urban form and Transport Planning (1)

- A *key issue in land use and transport planning in South Africa* is to *reverse effects of previous planning processes* through the use of planning guidelines and performance criteria such as the '*Guidelines for Human Settlement Planning and Design*' (CSIR, 2009).
- Result of *improper land use planning in the past* led to *urban sprawl and formlessness* and *land use development*, which contradicts some key principles of urban design and transport planning.
- Consequently, especially the poor, have to *commute over long distances, many by foot or bicycle, having to cross major roads, or use roads with no or limited NMT infrastructure, which leads to increased risk and road casualties (worldwide phenomenon among the poor).*

Urban form and Transport Planning (2)

The 'Compact City' concept and Corridor Development

- Models strive to minimise the effects of urban sprawl by controlling the extent of horizontal expansion.
- Aim to *reduce inefficiencies and inconvenience associated with low-density urban development* through *densification, corridor development & NMT infrastructure improvements*, e.g. BRT & Gautrain stations.
- Many towns/cities in South Africa originally developed with low-density residential and other developments around a central core of denser economic activity.
- Residential areas devoted to housing, comprising of detached dwelling units. *Low-density residential areas, vehicular travel demand and travel by private vehicles*, lead to high levels of congestion.

Urban form and Transport Planning (3)

- ***What is the solution?*** *Shift to walking, cycling and public transport with densification and mixed land-use* development address many of these challenges.
- *Transit Orientated Development* - Bringing higher density homes, offices, shops and recreational amenities closer together, walking and cycling would become easier, public transport services more viable, and car dependence reduced.
- Many *international good practice examples* of such schemes, e.g. in North and South America.
- *Higher densities support higher levels of public transport* and greater range of social and economic opportunities and facilities.

Urban form and Transport Planning (4)

- Higher densities reduce walking distances, which is important to the poorer sectors of society.
- Nearby low density residential areas, connected to public transport corridors by means of cycle lanes and footways.
- Viability of public transport can be improved if densification is orientated to public transport corridors (many international examples, e.g. Curitiba, Bogota, Washington).
- Mixed land uses allow access to a range of activities within easy walking distance. A blend of residential and non-residential land uses place trip attractions within walking distance of homes.

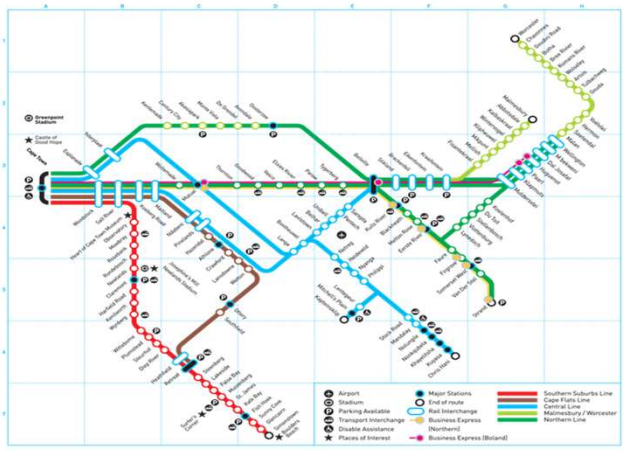
TOD Opportunities in South Africa

BRT systems

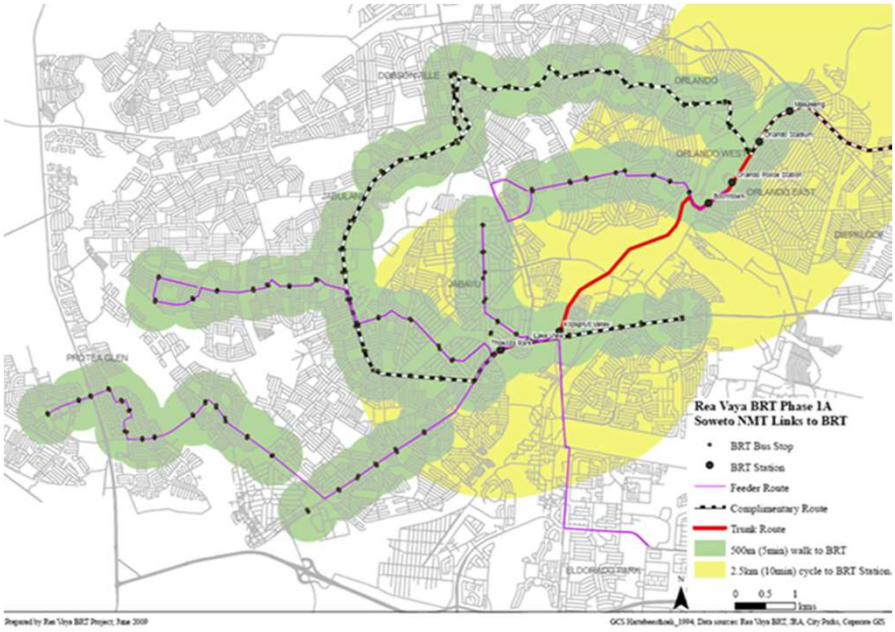
- Buffalo City
- Cape Town
- Ekurhuleni
- eThekwini
- Johannesburg
- Mangaung
- Nelson Mandela
- Tshwane
- George
- Mbombela
- Msunduzi
- Polokwane
- Rustenburg

Rail network

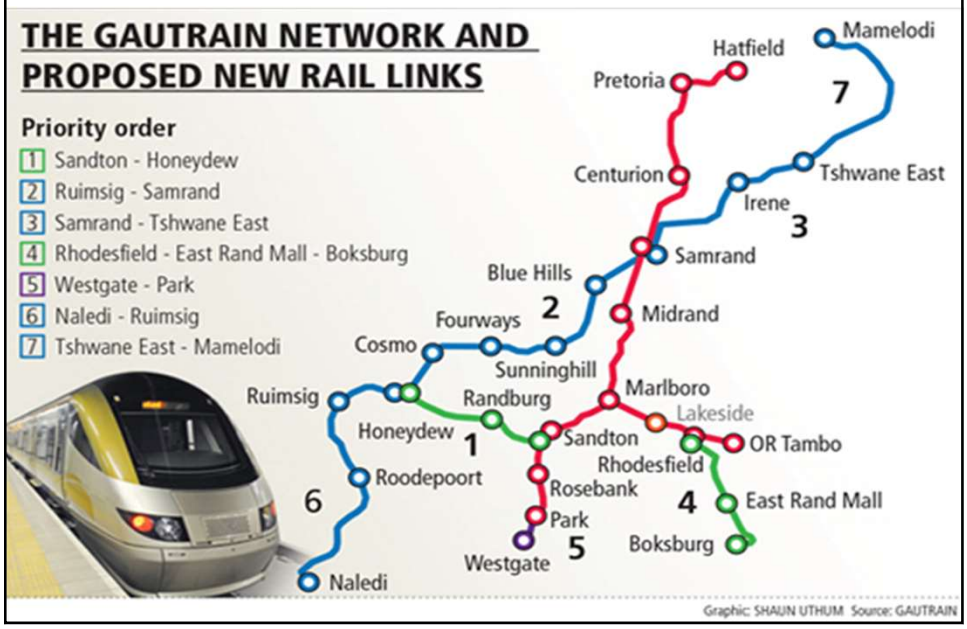
- Gautrain
- Metrorail



BRT NMT Catchment Areas



Densification at Gautrain stations - Rosebank, Sandton, Midrand, Centurion (and future stations). Need for NMT feeder systems?



Part 3: Transit Orientated Development International practice & Case studies

Transit Orientated Development - Introduction

The Seven Principles of TOD - Peter Calthorpe, an American planner, who coined the phrase in 1993

1. Organize growth on a regional level to be compact and transit-supportive.
2. Place commercial, housing, jobs, parks, and civic uses within walking distance of transit stops.
3. Create pedestrian-friendly street networks which directly connect to local destinations.
4. Provide a mix of housing types, densities, and costs.
5. Preserve sensitive habitat, riparian zones, and high quality open space.
6. Make public spaces the focus of building orientation and neighbourhood activity.
7. Encourage infill and redevelopment along transit corridors within existing neighbourhoods.

Transit Orientated Development - Introduction

- TOD creates vibrant, liveable, sustainable communities through creation of compact, walkable, pedestrian-oriented, mixed-use communities centred around high quality transport systems.
- TOD is regional planning, city revitalization, suburban renewal, and walkable neighbourhoods combined.
- TOD a major solution to the serious and growing problems of climate change and global energy security by creating dense, walkable communities that greatly reduce the need for driving and energy consumption.
- This type of living arrangement can reduce driving by up to 85%.

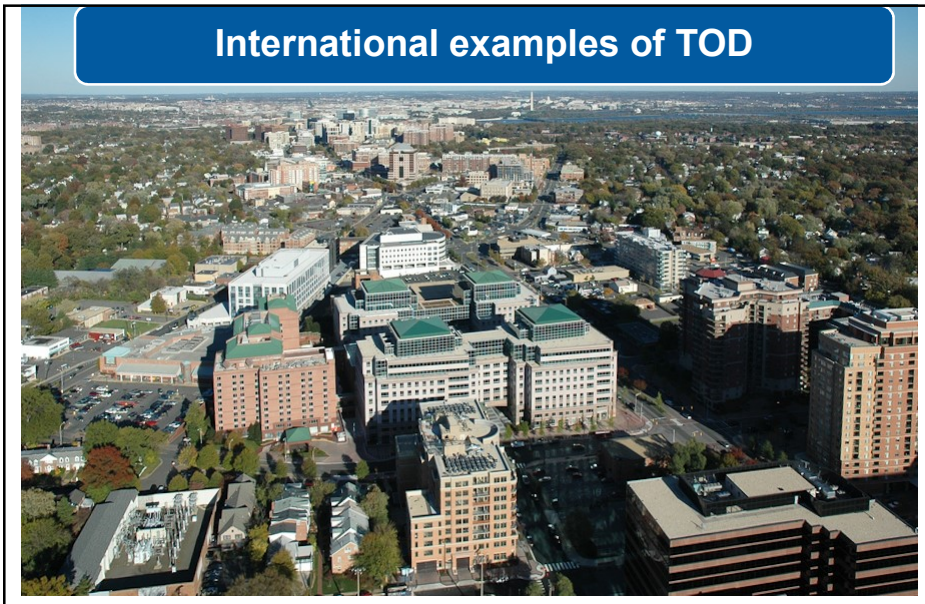
Typical Components of Transit Orientated Development

- Designed to include the easy use of bicycles and scooters as daily support transport.
- Large ride-in bicycle parking areas within stations.
- Bike share rental system and bikeway network integrated into stations.
- Reduced and managed parking inside 10-minute walk circle around town centre / train station.
- Specialized retail at stations serving commuters and locals including cafes, grocery, dry cleaners.
- Walkable design with pedestrian as the highest priority.
- Train station as prominent feature of town centre.
- Public square fronting train station.
- A regional node containing a mixture of uses in close proximity (office, residential, retail, civic).
- High density, walkable district within 10-minute walk circle surrounding train station.
- Collector support transit systems including streetcar, light rail, and buses, etc.

7 Benefits of TOD

- Quality Public Transport
- “Active” Transport
- Car Use Management
- Mixed-Use Neighbourhood's with Efficient Buildings
- Neighbourhood Centres and Vibrant Ground Floors
- Living Public Spaces
- Community Participation and Collective Identity

International examples of TOD



Arlington County, Virginia: **Transit Oriented Development** within 400 to 800 m from the County's Washington DC Metro rapid transit stations, with mixed-use development, bike sharing and walkability.

TOD in Arlington, Virginia

- Case study deals with a (TOD) initiative carried out over 3 decades in a low density commercial corridor in Arlington County, Virginia, just outside Washington, D.C.
- The government of Arlington County became an early proponent of TOD as a strategy that could be used to retrofit the 5km long street section in order to reverse major declines in both population and commercial activity.
- The way the county succeeded in retrofitting its low density commercial corridor, is instructive for other jurisdictions involved in planning for station area development.

Further reading:

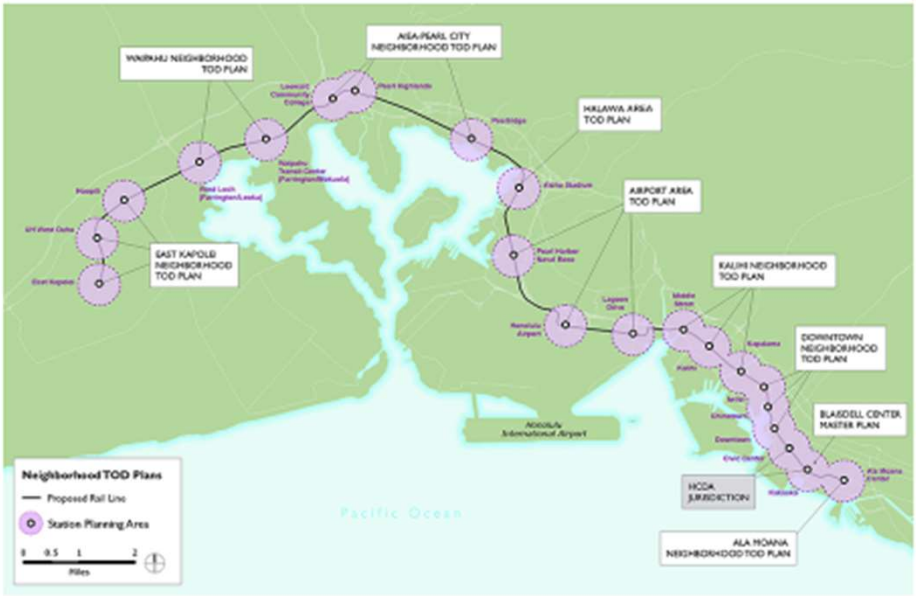
The Arlington County Case Study: Rosslyn-Ballston Corridor.

In: **The New Transit Town: Best Practices in Transit-Orientated Development**

http://www.worldcat.org/title/new-transit-town-best-practices-in-transit-oriented-development/oclc/188195905

Green Fields TOD Planning - Honolulu

Densification (TODs) along Honolulu Rapid Rail



Green Fields TOD Planning - Honolulu

- In conjunction with the Honolulu Rail Transit project, the City and County of Honolulu is planning for transit-oriented development (TOD) around the future rail transit stations.
- Neighbourhood TOD plans have been developed to guide new development and plan for orderly growth and improved accessibility around the stations. These plans are each unique to their context.
- The TOD Plans, and the projects that grew out of them, developed through extensive community engagement, including public workshops, stakeholder meetings, community surveys, business and student outreach, and more.

Further reading:

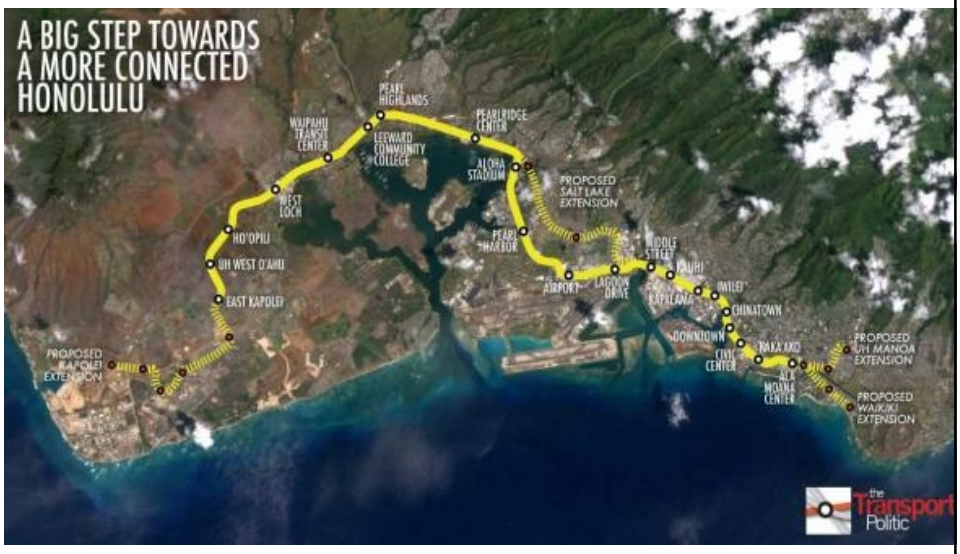
City and County of Honolulu

Department of Planning and Permitting

808.768.8012

www.honolulu.gov/tod

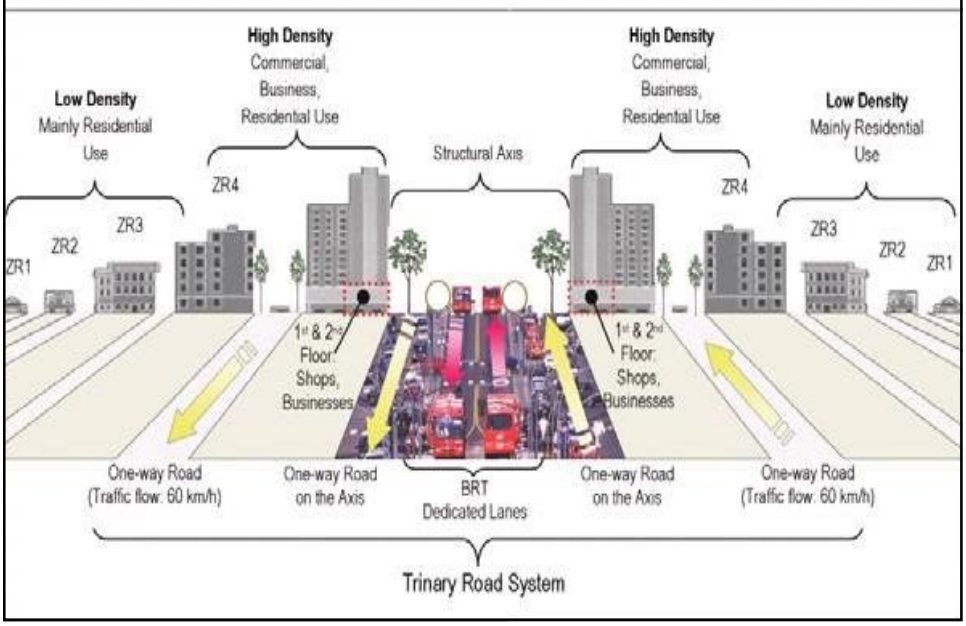
Honolulu Rapid Rail Network and Extensions



Curitiba's Rapid Bus System and TOD

- Curitiba has integrated zoning and transport planning to place high-density development alongside its BRT corridors.
- The system has directed the growth of the city along five transport corridors with increased densities along the corridors.
- In the 1970s, about 7% of Curitibans commuted by public transport. In 2006, almost 75% used public transport to get to work. This is equal to 23 000 passengers per hour.

Curitiba's Rapid Bus System and TOD



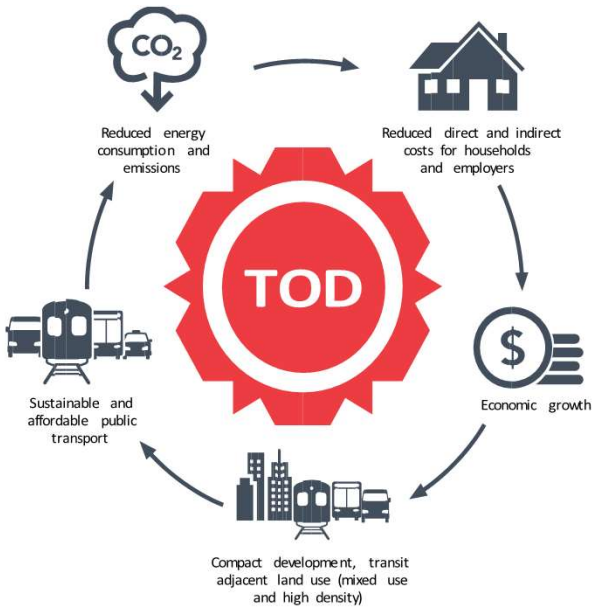
Curitiba's Rapid Bus System and TOD

Cape Town Transit Orientated Development

Introduction:
"Transit Oriented Development (TOD) represents the intricate relationship between "Transit" (the operational/ access imperative of an urban environment) and "Development" (the spatial manifestation of those that are within the urban economy). TOD is about changing, developing and stimulating the built form of the city in such a way that the movement patterns of people and goods are optimised to create urban efficiencies and enable social equality and economic development".

Strategic Intent:
"The Cape Town City Council in its unanimous approval of the Integrated Public Transport Network (IPTN) Plan in 2014, took the decision to investigate a TOD approach to addressing urban inefficiencies in Cape Town through the development of a Transit Oriented Development Comprehensive land use scenario and to use the IPTN Plan as a "guideline for the alignment of all City plans and projects for community development along the identified corridors". The intent of the TOD Strategic Framework is to establish an implementation plan for TOD to be adopted by the City both politically and administratively".

Virtuous Cycle of TOD



Key transport objectives and associated land use interventions

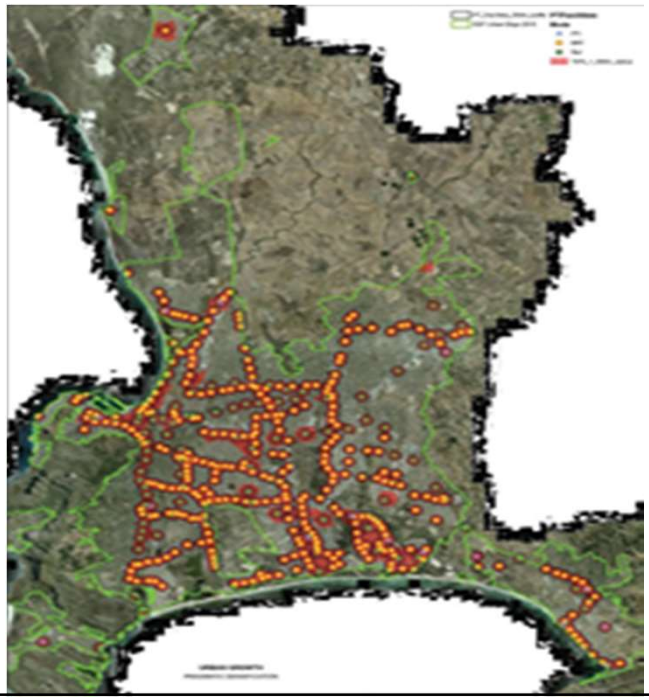
Transport Objectives	Land Use Interventions
1. Reduce travel distances: to reduces the cost of commuter travel and improve operational viability of public transport	1. Intensify and diversify urban development in close proximity to public transport stations.
2. Optimise bi-directional flows.	2. Promote an appropriate mix and form of residential, social and economic activity between urban nodes along higher-order public transport corridors
3. Generate a greater level of seat renewal (balancing trip attractions and productions)	3. Promote an appropriate mix and form of residential, social and economic activity between district and local nodes along higher-order public transport corridors.

Cape Town Transit Orientated Development

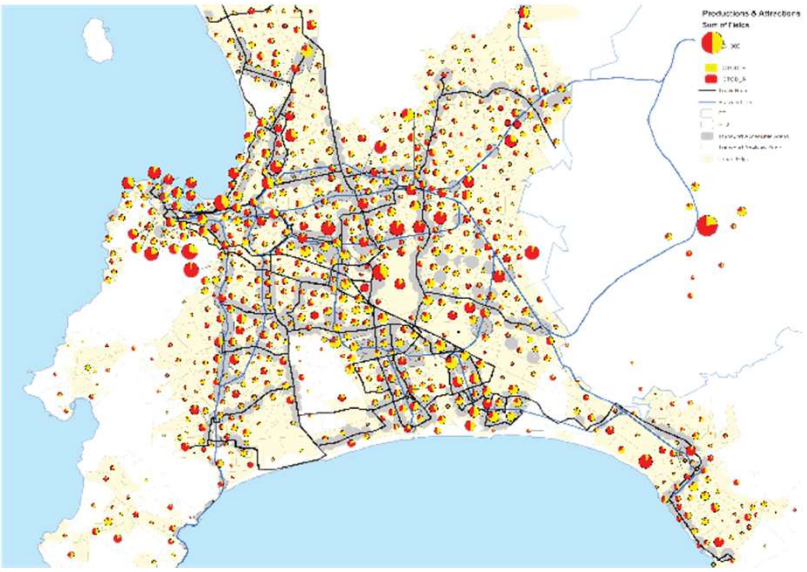
TOD is an investment and performance driven approach for the City of Cape Town to deliver the following outputs:

- Increase “location efficiency” so that people can walk, cycle and use public transport. This can be achieved through a comprehensive approach to land use density, mix and intensity, as well as a focus on prioritised public transport
- Boost ridership and minimize congestion thereby ensuring that the public transport system becomes more viable
- Provide a rich mix of housing, shopping and transportation choices
- Deliver efficiencies in urban infrastructure
- Drive down the cost of the User Access Priority for both new and existing residents
- Create a sense of place”.

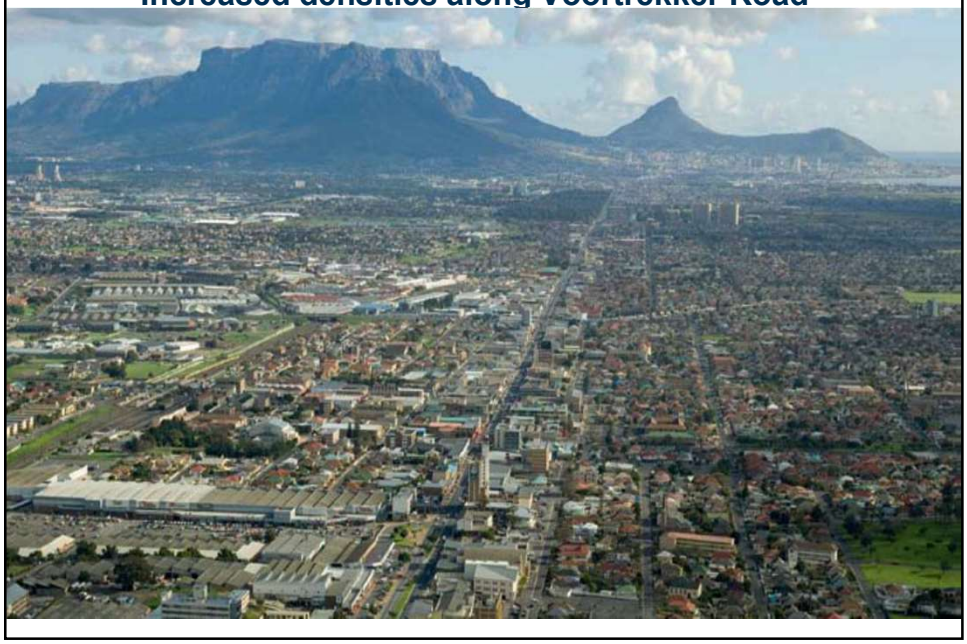
Transit Accessible Precincts (500m radius around rail and BRT stations)



Spatial Allocation of New Trips following Transport Optimisation Process



Comprehensive TOD scenario development - Cape Town - Increased densities along Voortrekker Road



Comprehensive TOD scenario development - Cape Town - TOD along Voortrekker Road in Cape Town

Need more guidance on TOD?

- The TOD Standard (V3), a powerful tool to shape and assess urban development. Maximizing benefits of public transit and non-motorised mobility.
- Outlines eight core principles of urban design and land use, each supported by performance objectives and easily measurable indicators, or metrics.
- They promote safe, balanced and vibrant neighbourhoods around stations; short and well-connected pedestrian and cycling networks; densities for strong customer bases for local services and public transport; and minimal car traffic and parking interference.

Website for TOD Standard - Version 3 (June 2017):

https://collaboration.worldbank.org/content/sites/collaboration-for-development/en/groups/tod-cop/documents.entry.html/2017/11/06/itdp_tod_standard3-kbVA.html