A study on the sustainability of a non-motorised transport CBD in Upington

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To everyone who contributed...

Thank you.

143.

“It always seems impossible until it’s done.”

-Nelson R Mandela-

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ABSTRACT

The introduction of the private vehicle in urban communities (towns and cities) resulted in numerous urban problems experienced in the developed and developing world. These include, inter alia, economic inefficiency due to traffic congestion; a high mortality rate relevant to vehicle users and non-vehicle users; air & noise pollution and overall poor quality of life for residents.

As part of the literature review, it was found that the level of urban problems experienced will intensify and worsen, if sustainable transportation systems were not introduced in urban areas. These predictions were made based on the following three factors:

- The increase of the world population – It was predicated that the world population will increase by 2.3 people billion between 2011 and 2050. The total world population is therefore expected to be 9.3 billion in 2050.
- The urbanisation rate experienced – It was predicated that the entire world population growth, along with an additional 300 million people, will be absorbed by urban areas between 2011 and 2050. Urban communities will therefore accommodate 6.2 billion people, or 67% of the world population, in 2050.
- The level and growth in private vehicle ownership – The developed world consists of a high level of vehicles per 1 000 residents (655 in 2010), but experienced a decline in growth of 0,8% between 2005 and 2010. Contrary to the developed world, the developing world had a low level of vehicle ownership per 1 000 residents (128 in 2010), but experienced an increase of 21.9% between 2005 and 2010.

Apart from the above data, the literature review introduced planning theories and international as well as national policies.

The three planning theories that were researched each revealed ten principles of sustainable alternative transportation measures for an unsustainable private vehicle orientated urban area. These sustainable measures were used to introduce the option of a sustainable non-motorised transportation system to the demarcated study area. The three planning theories researched were:

- The Smart growth theory
- New urbanism, and
- Pedestrian mall developments.

International and national policies were scrutinised to obtain a point-of-view on how different countries, cities, spheres of government and type of documentation addressed non-motorised transportation developments. The examination of the policies also provided insight on how South African spheres of government were addressing non-motorised transportation in South African urban communities, if at all. The international policies include the "Share the road" document compiled by the United Nations in 2010; Mount Rainier Town Centre Urban Renewal Plan (2005) (USA) and Ottawa's Transport Master Plan (2008) (Canada). The South African policies included the National Non-motorised Transportation Policy (2008); National Transport Master Plan (2011); Northern Cape Provincial Spatial Development Framework (2012) and //Khara Hais Spatial Development Framework (2012) (local municipality).

Following the literature review, is an empirical study consisting of 2 sections. Firstly, a pilot study, which consists of international and local examples, was researched. These examples were identified as they consist of vehicle-free areas within the central business district. The success of the vehicle-free developments was measured and the information utilised to guide recommendations for the demarcated study area within the town of Upington (case study). Pilot study examples include Copenhagen, Denmark; Ghent, Belgium; Santa Monica, USA and Cape Town, South Africa.

Secondly, a case study was analysed. A study area within the South African town of Upington, Northern Cape Province was demarcated. The status quo of relevant aspects, including but not limited to; the climate, coverage, parking, road hierarchy and transport modes were obtained and analysed. This analysis was conducted in order to establish a) if the study area experienced urban transport related problems and b) if the implementation of a non-motorised transport system will be more sustainable for the general public of Upington, as opposed to the current private-vehicle dependable system. Inputs from Town Planners were also obtained in order to obtain a multi-dimensional point-of-view.

In the conclusion of the researched study it was found that a) the planning theories have been successfully implemented in the examples of the pilot studies and therefore these principles could apply to the demarcated study area in Upington. b) International policies addressed non-motorisation developments more comprehensively than the South African policies. Shortages especially existed at the provincial and local spheres of government where implementation should take place. c) Through the analysis of the case study it become evident that the demarcated study area within Upington was burdened by private vehicle orientated transport problems. However, the analysis also indicated that the study area has the potential to make a successful transition from being dependable on unsustainable private vehicles to sustainable non-motorised transportation.

Finally, tailor-made recommendations (based on information derived from planning theories, policies, pilot study and case study) were made for the study area situated within Upington. These recommendations include the phased development of a pedestrian-only area, the development of parking garages (outside the pedestrian area), which are linked to the pedestrian-only area and the development of a public transportation system by means of busses.

Key words: Car-free development; Non-motorised transportation; Private vehicle orientated transportation system; Urban problems; Smart growth theory; New Urbanism; Pedestrian mall developments; Vehicle ownership levels; Vehicle ownership growth; Urbanisation.

’n Studie rakende die volhoubaarheid van nie-gemotoriseerde vervoer in die SSK van Upington

UITTREKSEL

Die bekenstelling van die privaat-motor in stedelike-gebiede (stede en dorpe) het ’n verskeidenheid gevolge in ontwikkelde- sowel as ontwikkelende lande gehad. Dit sluit ondermeer in: ekonomiese ondoeltreffendheid as gevolg van verkeersopeenhopings, ’n hoë sterfte-syfer onder motor-gebruikers en nie motor-gebruikers as ’n direkte gevolg van die gebruik van motors, lug- en geraas-besoedeling en in die algemeen ’n laer lewenskwaliteit vir inwoners.

Na aanleiding van die literatuurstudie is gevind dat die vlak van stedelike-probleme sal vererger, indien volhoubare vervoer sisteme nie in stedelike-gebiede geïmplementeer word nie. Die voorspellings was baseer op die volgende drie faktore:

- Die groei van die wêreldbevolking – Daar was bepaal dat die wêreldbevolking met 2.3 miljard sal toeneem tussen 2011 en 2050. Die toename sal dus die wêreldbevolking op 9.3 miljard tot stand laat kom in 2050.
- Die verstedelikingskoers ervaar – Daar word voorspel dat die totale wêreldbevolkingsgroei (tussen 2011 en 2050), tesame met ’n addisionele 300 miljoen mense absorbeer sal word deur stedelike-gebiede tussen 2011 en 2050. Stedelike-gemeenskappe sal dus 6.2 miljard mense, of 67% van die wêreldbevolking huisves in 2050.
- Die vlak en groeikoers van privaat-motor-eienaarskap – Die ontwikkelde lande het ’n hoë vlak van privaat-motor-eienaarskap per 1 000 inwoners (655 in 2010), maar het ’n afname van 0,8% tussen 2005 en 2010 ondervind. Kontrasterend met ontwikkelde lande, het ontwikkelende lande ’n lae privaat-motor-eienaarskap vlak per 1 000 inwoners (128 in 2010), maar het hewige groei ondervind van 21,9% tussen 2005 en 2010.

Addisioneel tot die bogenoemde data, behartig die literatuurstudie beplannings-teorieë en internasionale, sowel as nasionale beleide.

Die drie beplanningsbeleide wat nagevors is, het elk tien beginsels blootgestel wat gesien kan word as volhoubare alternatiewe vervoer maatstawwe vir ’n onvolhoubare privaat-motor georiënteerde stedelike-gebied. Die maatstawwe was gebruik om die moontlikheid van ’n volhoubare nie-gemotoriseerde vervoer netwerk voor te stel vir die afgebakende studie-gebied. Die drie beplanningsbeleide wat nagevors is, is:

- Die “Smart growth” teorie
- “New urbanism”, en
- “Pedestrian mall developments”.

Internasionale en nasionale beleide was ontleed om ’n duidelike siening te verkry oor hoe lande, stede, verskillende sfere van die regering en verskillende dokumente nie-gemotoriseerde vervoer benader en aanspreek. Die ontleding het ook blootgestel hoe verskillende sfere van die regering in Suid-Afrika nie-gemotoriseerde vervoer aanspreek en of dit enigsins wel aangespreek word. Die internasionale beleide wat ontleed was sluit in: “Share the road” dokument soos saamgestel deur die Verenigde Nasies in 2010; Mount Rainier (VSA) se “Town Centre Urban Renewal Plan” van 2005 en Ottawa (Kanada) se “Transport Master Plan” van 2008. Die Suid-Afrikaanse beleide sluit die volgende in: die “National Non-motorised Transport Policy” van 2008; “National Transport Master Plan (2011)”; “Northern Cape Provincial Spatial Development Framework (2012)” en die “//Khara Hais Spatial Development Framework” van 2012.

Die literatuurstudie is gevolg deur die empiriese studie wat in twee gedeeltes verdeel is. Eerstens is die “pilot study”, bestaande uit internasionale en nasionale voorbeelde, ondersoek. Die voorbeelde is geïdentifiseer omrede hulle motorvrye-gebiede in die sentrale sakekern van stedelike-gebiede

akkommodeer. Die sukses van die motorvrye voorbeelde is bepaal en die inligting is gebruik in die voorstelle wat vir die afgebakende gebied in die sentrale sakekern van Upington gemaak is (studiegebied). “Pilot study” voorbeelde sluit in: Kopenhagen, Denemarkte; Gent, België; Santa Monica, VSA en Kaapstad, Suid-Afrika.

Tweedens is die gevallestudie ontleed. ’n Studiegebied binne die Suid-Afrikaanse dorp Upington, Noord-Kaap Provinsie is afgebaken. Daarna is die huidige stand van sake van relevante aspekte bereken en ontleed. Die relevante aspekte sluit in, maar is nie beperk tot; klimaat, dekking, parkering, pad-hiërargie en vervoer-middele nie. Die berekeninge en analise was gedoen om te bepaal of a) die studiegebied vervoer-georiënteerde probleme ondervind en b) of die implementering van ’n nie-gemotoriseerde vervoer-netwerk meer volhoubaar vir die algemene publiek van Upington sal wees, gemeet teenoor die huidige privaatmotor-afhanklike netwerk. Insette van Stad- en Streeksbeplanners was ook ingewin om ’n meer multidimensionele siening te ontwikkel.

In die samevatting-hoofstuk van die navorsingstudie was gevind dat a) die beplanningsteorieë wat geïmplementeer is in die “pilot study” voorbeelde, suksesvol was en dat die beginsels (van die beplanningsteorieë) moontlik kan geld vir die studiegebied in Upington. b) Internasionale beleide bespreek nie-gemotoriseerde ontwikkelings meer volledig as Suid-Afrikaanse beleide. Tekortkominge is spesifiek by provinsiale en plaaslike regering-sfere, waar die implementering van projekte moet geskied, gevind. c) Met die analise wat op die studiegebied gedoen is, is bevind dat die studiegebied, soos afgebaken in die sentrale sakekern van Upington, lamgelê word deur vervoer problem, wat veroorsaak word deur die privaat-motor-georiënteerde-vervoernetwerk. Desnieteenstaande, het die analise ook bevind dat die studiegebied die vermoeë het om ’n suksesvolle oorgang van die onvolhoubare privaat-motor-georiënteerde-netwerk na ’n volhoubare nie-gemotoriseerde netwerk te kan maak.

Laastens is spesifieke voorstelle (gegrond op bevindings uit beplanningsteorieë, beleide, “pilot study” voorbeelde en die gevallestudie) as deel van die Voorstelle-hoofstuk vir die afgebakende studiegebied in Upington gemaak. Dit sluit onder andere in dat ’n voetganger-gebied in fases geïmplementeer word, die ontwikkeling van parkeer-garages op die periferie van die voetganger-gebied en die ontwikkeling van ’n publieke-vervoernetwerk deur gebruik te maak van busroetes.

Sleutelterme: Motorvrye ontwikkeling; Nie-gemotoriseerde vervoer; Privaatvoertuig georiënteerde netwerke; Stedelike-probleem; Smart growth teorie; New urbanism; Pedestrian mall developments; Motoreienaarskapvlakke; Motoreienaarskapgroei; Verstedeliking.

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List of Acronyms

CBD:	Central Business District
CNU:	Congress for the New Urbanism
DoT:	Department of Transport
GDP:	Gross Domestic Product
IDP:	Integrated Development Plan
ITP:	Integrated Transport Plan
MDP:	Maryland Department of Planning
N10:	National Road Number 10
N14:	National Road Number 14
NATMAP 2050:	National Transport Master Plan
NC:	Northern Cape
NCPSDF:	Northern Cape Provincial Spatial Development Framework
NMT:	Non-motorised Transportation
SDF:	Spatial Development Framework
UK:	United Kingdom
UN:	United Nations
USA:	United States of America

List of Definitions

Car:	*See* Private Vehicle.
Central Business District:	The Central Business District is an area in a city in where a concentration of certain retail and business activities takes place. It is also the commercial, and often geographical, heart of a city *Synonym: Downtown.*
Concept City	The concept of the compact city is a key strategy to limit suburban sprawl and to obtain sustainable urban development. The three key characteristics of a compact city are: dense and proximate development patterns, urban areas linked by public transport systems and the accessibility to local services and work areas.
Downtown:	*See* Central Business District.
Integrated Development Plan:	An Integrated Development Plan is a master plan for an area that gives an overall framework for development. It aims to co-ordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area. It takes into account the existing conditions, and problems and resources, available for development. It looks at economic and social development for the area as a whole. It is used by municipalities as a tool to plan short and long term future development.
Motorised Vehicles :	All vehicles that utilise an engine as a source of power to gain momentum.
Non-motorised transportation:	Non-Motorised Transport (NMT) includes all means of transport that are "human powered". This includes but is not limited to walking, bicycle, roller-skates, skateboards, push shooters, hand carts and wheelchair travel.
Pedestrian Mall:	A pedestrian mall is characterised as a number of blocks of public downtown streets designated for pedestrian-only use and closed to vehicular traffic.
Pedestrianisation	An area within an urban area which accommodated motorised transportation and is transformed into a pedestrian (non-motorised transportation) area.
Private Vehicle:	A light vehicle such as a passenger car, minivan, pickup truck, van and other types of light trucks or utility vehicles used for personal use, regardless of ownership status. *Synonyms: Car.*
Public Transportation:	A system of vehicles such as buses and trains that operate at regular times on fixed routes and are used by the public.
Spatial Development Framework:	A Spatial Development Framework (SDF) is a core component of a Municipality's vision. It is a tool to achieve the desired future spatial

	form. Furthermore, it is a document that guides overall spatial distribution of current and desired land uses and forms part of the Integrated Development Plan (IDP). SDF's are compiled for local and district municipalities as well as on a provincial sphere.
Study Area:	The study area forms part of Upington's CBD between Schröder, Koöperasie, Le Roux and Short Street. The extent of the area is 24.8ha and accommodates 100 erven.
Sustainable Development:	Sustainable Development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations.
Urban Area:	Urban areas can be defined as places where population densities are greater than 150 people/km², dwelling unit densities greater than 1du/ha and settlements contained within an urban edge.
Urban Sprawl:	The unplanned, uncontrolled spreading of urban development into areas adjoining the edge of a city.
Urbanisation:	Urbanisation is the permanent migration of people from rural areas to urban areas.