

# 1. Introduction

## 1.1. Problem statement and motivation

Crawford (2002: 40) stated that apart from the direct cost (cost of financing motorised infrastructure) involved, additional impacts such as accidents, deaths, pollution, loss of valuable land, congestion and sickness are direct results of motorised vehicles. Burton (1985: 15) also implies that the vehicle is autocratic by stating “while acknowledging the benefits to be derived from improved accessibility [due to the vehicle], it should be noted that there are social costs involved. Those who are not mobile (the elderly, non-car owners and school children) are often deprived of ready access to services...”

In 2005 there were approximately 982 million private vehicles (Wright, 2005: 3) in the world, compared to a world population of 6.5 billion (Zlotnik, 2005). This number of vehicles is expected to increase to 2.6 billion (Wright, 2005: 3) in the year 2050, compared to an expected world population of 9.3 billion (Zlotnik, 2005) for the same year (2050). This is an expected growth of 562% for vehicles compared to the expected 43% increase in the world population.

Additional to the above the percentage of the world population residing in urban areas was 49.1% in 2005, compared to the expected percentage of 67.2% for the year 2050 (United Nations, 2012: 17). This entails that 3.2 billion people resided in urban areas across the world in 2005. This number is expected to be 6.2 billion in 2050.

From the above-mentioned, the following trends can be derived:

- World cities are burdened directly and indirectly by vehicles.
- The world population is growing.
- Car ownership is increasing.
- People residing in urban areas across the world are increasing.

It is therefore clear that private vehicles in cities and towns across the world will drastically increase annually between 2005 and 2050 if current trends are maintained. This will result in an ever increasing problem for urban areas across the world.

In order to better the life for residents living in cities and towns; theories have been compiled and initiatives implemented to counter private vehicle orientated cities (Crawford, 2009: 18). These solutions include but are not limited to, the following:

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

In order to encourage more sustainable development in cities and towns it is necessary to research and formulate tailor-made alternatives (solution).

This research document endeavours to research such possibilities for the central business district (CBD) of Upington.

## **1.2. Research aims and objectives**

To investigate the urban trends as identified in the above statement, the following aims and objectives were identified:

- To identify and substantiate, with facts, the present problem statement. This is that a private vehicle orientated transport system results in detrimental effects on an urban area.
- To determine the future level of private vehicles within a city (Upington, Northern Cape) by using trends experienced; including population growth, urbanisation and private vehicle ownership.
- To identify and select relevant planning theories that could address the problems in the case study, accordingly. The planning theories which represent non-motorised transport planning as an alternative to motorised transportation include the Smart growth theory, New urbanism and Pedestrian mall developments.
- To evaluate relevant policies with specific focus on non-motorised transportation at an international, national, provincial and local level. These policies include: “Share the road report” by the UN (2010) & Mount Rainier’s town centre urban renewal plan (2005) (International); the National Non-Motorised Transportation Policy (2008) & National Transport Master Plan (2011) (National); the Northern Cape provincial Spatial Development Framework (2012) (provincial) and //Khara Hais Spatial Development Framework (2012) (local).
- To research relevant international and national pilot studies with non-motorised CBD’s (this includes pedestrian mall developments). These developments will be scrutinised and the success evaluated. These pilot studies include Copenhagen, Denmark; Ghent, Belgium; Santa Monica, USA and Cape Town, South Africa.
- To delineate a specific study area to test the findings of the theory, policies and pilot studies scrutinised.

- To identify, determine and analyse the status quo with regards to all relevant aspects (including: road hierarchy, transport modes, parking situation, land uses etc.) of the study area.
- To conclude the study by analysing all aspects dealt with in the research including the literature study, policies and empirical study.
- Make recommendations for the study area.
- To address the hypothesis as formulated.

### **1.3. Basic hypothesis**

A non-motorised transportation (NMT) system, within the central business district (CBD) of Upington would be more sustainable to the larger community of Upington, as opposed to the current private vehicle-dependable system.

#### **1.3.1. Dissection of hypothesis**

The hypothesis is a combination of the following main pillars:

*“A non-motorised transportation system...”*

This phrase indicates that the method of transport scrutinised was a totally private vehicle-free system. Although alternatives and mixed transport systems (for example motorcycles, canals and public transport) and initiatives (for example car-free days) were evaluated and taken into account, the recommendation of the study was ultimately to state whether or not a non-motorised transport network is a better alternative to the current vehicle-dependable one.

*“...within the CBD of Upington...”*

This indicates the study area, a delineated area within Upington, relevant to the research conducted.

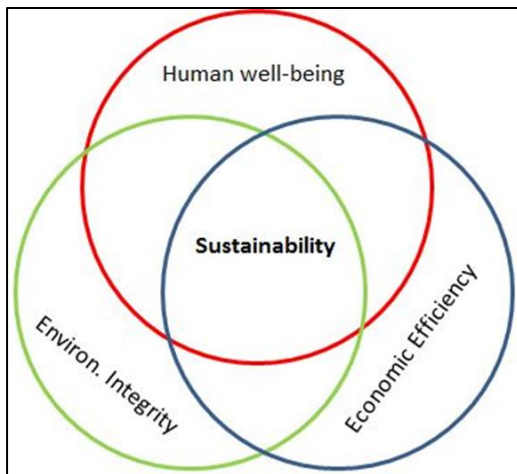
*“...would be more sustainable to the larger community of Upington...”*

The International Institute for Sustainable Development states that sustainable development occurs at the intersection of three global imperatives, namely environmental integrity, human well-being and economic efficiency (DMP, 2012a: 22).

- Human well-being  
Human well-being refers to both material and spiritual well-being. Material well-being refers to the absence of poverty, whereas spiritual well-being refers to, inter alia; equality and opportunities for all (DMP, 2012a: 23).

- Environmental integrity  
Environmental integrity includes both the natural and human-made environment. The natural environment requires that biodiversity is protected and essential ecological processes and services are maintained. The human-made environment entails that proper planning, design and development take place (DMP, 2012a:23).
- Economic efficiency  
This is understood as the optimisation of benefit at the lowest cost. It includes the innovative and efficient use of available resources (DMP, 2012a:23).

The figure below illustrates the three elements of sustainability and consequently, sustainable development.



**Figure 1: Sustainability model**

Source: Northern Cape Provincial Spatial Development Framework (NCPSPDF) First Draft (2012)

*“...as opposed to the current private vehicle-dependable system.”*

The private vehicle refers to the transportation system in the study area. It is centrally located in planning, design and development within the study area.

## **1.4. Method of research**

### **1.4.1. Literature study**

A wide variety of sources were used to obtain information and conduct comprehensive research. These include, but are not limited to, books, journals, articles, policies, plans and frameworks at an international as well as national, provincial and local level. Applicable to the theme of research, the

emphasis was placed on issues regarding a private vehicle orientated system and as an alternative non-motorised transportation represented by the Smart growth theory, New urbanism and Pedestrian mall developments.

### 1.4.2. Empirical research

The empirical study was divided into two sections namely the pilot studies and the case study. The pilot studies consist of international and national examples where planning theory (Smart growth theory, New urbanism or Pedestrian mall development), or part thereof, was implemented. The following table summarises reasons for pilot studies being included and how the success was evaluated:

**Table 1: Pilot studies**

Pilot studies	Reason for inclusion	Evaluation method
Copenhagen, Denmark	<ul style="list-style-type: none"> <li>• Before and after pedestrianisation retail data exists.</li> <li>• The reasons behind a car-free area are due to problems experienced from private vehicles.</li> </ul>	<p>The development's success was substantiated by:</p> <ul style="list-style-type: none"> <li>• The positive post pedestrianisation retail data measured.</li> <li>• The fact that Strøget (Pedestrian) Street accommodates the same pedestrian traffic than the major highways in Denmark over a 24 hour period.</li> </ul>
Ghent, Belgium	<ul style="list-style-type: none"> <li>• Ghent is a large city with less than 300 000 residents. It is therefore more relevant to the case study, than a city accommodating millions. Uppington accommodates less than 100 000 residents.</li> <li>• The reasons behind a car-free area are due to problems experienced from private vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>• The city received a European Ashden award for the development.</li> <li>• Positive statements from city officials.</li> <li>• The positive results experienced by residents.</li> </ul>
Santa Monica, USA	<ul style="list-style-type: none"> <li>• The development remained in a country (USA) where numerous developments failed.</li> </ul>	<ul style="list-style-type: none"> <li>• The development is regarded as one of the most successful developments in the USA.</li> <li>• 1053 people rated the development via an internet website.</li> </ul>
Cape Town, South Africa	<ul style="list-style-type: none"> <li>• Local development</li> </ul>	<ul style="list-style-type: none"> <li>• One of few developments of its kind in South Africa</li> </ul>

Source: Own construction (2013)

In order to research and compile the case study the main source used was a socio-economic study conducted in 2008. As part of the study 15 592 residents or 20% of Uppington's population (78 000 population in 2008) participated, providing valuable insights. Where data did not exist or was insufficient, previous relevant planning documentation such as the Public transport analysis document (1993), Uppington's CBD master plan (1983) and Uppington's urban structure plan (1987) were utilised. Additionally, internet resources, articles and books were utilised and a field study conducted to ensure that all relevant data was obtained.

The following table illustrates the fields researched as part of the status quo analysis, as well as substantiating information of its relevance.

**Table 2: Fields researched**

Fields researched	Reason for being included
Road hierarchy	To determine which roads were travelled most by private vehicles. These roads would be excluded from transportation development recommendations as far as possible to minimise disruption for residents and visitors travelling through the town.
Transport modes	The utilisation of different transport modes was determined in order to obtain an idea of how residents travelled to the CBD and where more sustainable modes could be realistically recommended.
Parking situation	The demand and supply of parking bays is a direct result of a private vehicle orientated transportation system. Therefore it is necessary to determine the demand and supply figures as well as the space occupied by the already supplied bays. These figures will illustrate the current problem experienced and if it will intensify in future.
Population	Population figures and the expected growth thereof have a direct influence on transportation problems experienced, and whether problems will intensify in future.
Labour force: CBD	The labour force working in the CBD and the way they travelled to the CBD is very important. This figure (how many parking bays are occupied by workers) is constant and indicated the minimum parking bays necessary in the CBD.
Land uses	Mixed land use development is a principle highlighted in all the planning theories discussed. It forms an integral part of developing more sustainable cities.
Coverage	Coverage was evaluated in order to determine the areas occupied by different uses and the implications it could have if more sustainable transport modes are implemented.
Climate	Climate forms an integral part of new developments. Non-motorised transportation modes are exposed to the elements. It was therefore necessary to evaluate the climate, especially as the study area is located in a semi-desert town (Upington).
Professionals' inputs	In order to make realistic and implementable recommendations it is crucial to obtain a multi-dimensional point of view from professionals who have experience working in the study area.

Source: Own construction (2013)

## 1.5. The study area

An area demarcated within the central business district of Upington, a town of approximately 93 494 residents and located in the Northern Cape Province of South Africa, was chosen to represent the study area. The study area was chosen based on transportation problems and inequalities experienced in the town and central business district, the knowledge and availability of relevant resources and awareness of the existing social-economic environment (Macroplan, 2008).

The extent of the study area is 24,8 ha and accommodates 100 erven used as businesses and offices. All roads accommodate motorised vehicles and prioritise it as superior to non-motorised transportation modes. An aerial view of the town can be seen as Figure 2.

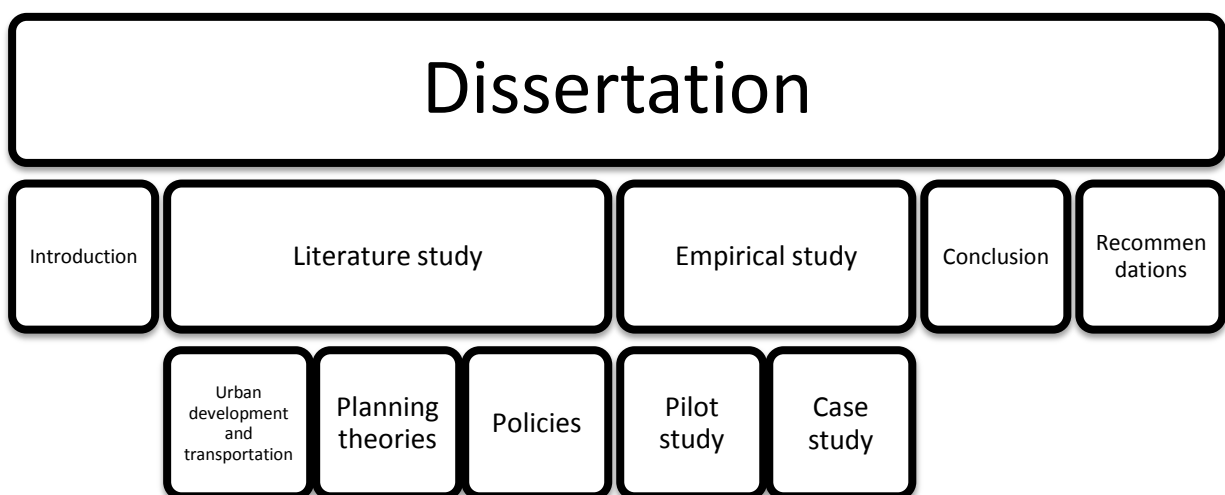


**Figure 2: The town of Uppington, Northern Cape Province**

Source: Image © 2013 DigitalGlobe

### 1.6. Dissertation structure

The structure of this research document is illustrated in the figure below:



**Figure 3: Dissertation layout**

Source: Own construction (2013)