The benefits of cycling

Contribution to sustainable city development

A report for UN Habitat Governing Council 2013
April 2013
Preface

When he could no longer ride it, my grandfather left me his Dutch-made Fongers bicycle, made in 1928. I have taken it with me throughout my career. As ambassador to Pakistan I used to ride it, followed by a close protection vehicle. As ambassador to Kenya I ride it in Karura Forest and to the fitness centre. Cycling is in the heart of the Dutch people. But cycling is not only a Dutch phenomenon. All over the world people are sharing the benefits of cycling.

Two trends are at play here. Firstly, ever more people are aware that our environment is under pressure and want to do something about it. Secondly, our cities are more and more congested. People discover that a bicycle is the best mode of transport – if the facilities are provided. Here in Nairobi this is not the case (yet). But the good news is that on both counts – environment and urban planning – the Nairobi-based headquarters of UNEP and UN Habitat are doing their share. As the world is moving towards a Green Economy, cycling is a simple, yet integral part of it. The Dutch people realized this long before this phrase was coined. With just about as many bicycles as there are people, we are proud to lead the pack.

This publication on the benefits of cycling is the result of cooperation between the Dutch Cycling Embassy and UN Habitat. It shows how in several countries cycling policies are in progress with involvement of civil society: Brazil, Chile, Ecuador, India, South Africa, Uganda, United Kingdom, the Netherlands. And it presents important principles how to plan not only for cycling but for people-centered cities.

I am happy to offer this publication to the delegates of the Habitat Governing Council in 2013.

Joost Reintjes
Ambassador of the Kingdom of the Netherlands
Introduction

UN Habitat and the Dutch Cycling Embassy are partners in promoting sustainable mobility. The UN Habitat Governing Council in April 2013 is devoted to sustainable cities and will highlight the contribution of cycling to sustainable development. With support by the Representative of Norway to UN Habitat, UN Habitat commissioned the Dutch Cycling Embassy to contribute to the Governing Council with a demonstration of Dutch bikes for a ride on the UN compound, a video showing an exchange on sustainable mobility between UN ambassadors in New York with a lecture by Enrique Peñalosa, and this publication.

The Dutch cycling culture today is an important reference for a vision and strategy on cycling elsewhere notwithstanding a wide variety of the context. In the last 20 years several Dutch institutions brought about exchange and delivered assistance in support of cycling-inclusive city planning. A cycling policy development process, a cycling culture and the conditions for cycling, differ from country to country. But worldwide the popularity of cycling is rising and it will become a main mode of transport. It is a matter of time to bring the spirit and commitments towards implementation.

The contributions in this publication are a selection of what is going on. The people who wrote the contributions were partners in the Bicycle Partnership Program run by the Dutch n.g.o. I-CE Interface for Cycling Expertise with subsidy from the Dutch government. They are experts operating on behalf of a civil society organisation, a private agency or an university engaging with public authorities and all of them combine such kind of positions.

Working towards sustainable mobility is urgent. UN Habitat is at the heart of this process and the governing Council 2013 shows the dedication to better integrate sustainable mobility in human settlements programs. UN Habitat and the Dutch Cycling Embassy cooperate in the partnership on Sustainable Low Carbon Transport SLoCaT (www.slocat.net), an important forum and network that guides the way and synthesises expertise and experiences. The partnership contributes to the Post 2015 Agenda on Sustainable Development.

For this publication, I am very thankful to the cooperation with UN Habitat and for the contributions by Anvita Arora, India, Ze Lobo, Brasil, Amanda Ngabirano, Uganda, Diego Punte, Ecuador, Lake Sagaris, Chile and Andrew Wheeldon, South Africa.

Acknowledgement: The chapter “From car-based to people-centred cities” are derived from Cycling-Inclusive policy development; A Handbook, April 2009, published by GTZ in association with MacMillan on behalf of the Federal ministry for Economic Cooperation and Development, in partnership with Interface for Cycling Expertise I-CE.

Roelof Wittink
Director Dutch Cycling Embassy
(Cycle-) inclusion for Santiago: Four-fold growth in recent years
© Lake Sagaris, 3 March 2013

1. "Buy yourself a car, buddy" and the segregated city

For 20 years, any casual mention of cycling in Chile raised the ghost of a popular advertising campaign from the 1980s: “¡Comprate un auto perico!” The television advertisement for a local bank showed a popular actor, Nissim Sharim, bouquet in hand, cycling through traffic, unaware of the mocking jibes from drivers and school boys, until the object of his journey and his affections joins the general chorus: “Hey buddy, buy yourself a car!”

Thus “automobility” (Sheller and Urry 2000; Beckmann 2001) took over Chilean roads and airwaves, stigmatizing cyclists as old-fashioned, poor and out of step with the new economic model then sweeping the country.

It reinforced a social and political counterrevolution being led by the Chilean military regime (1973-1990), which was experimenting with neo-liberalism and urban reorganization schemes that, based on a new social and economic narrative of competition, technology, and domination, was generating an extremely segregated city (figure 1).

Today, these models and values persist, despite almost 20 years of elected rule. Indeed, by 2005 the government had invested over US$2.3 billion on urban highways, versus just US$66 billion on Transantiago, the public transport system in Santiago, where 40% of the population lives and works. While the government subsidy to the Costanera Norte highway concession was estimated at US$1,641 per person, investment in public transport amounted to just US$15/person (Giesen and Lanfranco 2006).

2. High Costs hit those most vulnerable hardest

This pro-car bias in Santiago’s transport investments, brought with it high costs, in terms of human lives, emissions and quality of life. Table 1 shows the disproportionately high percentage of fatal accidents affecting pedestrians, cyclists and car users, associated with investments that have expanded infrastructure for cars, at the expense of other, more sustainable transport modes.

<table>
<thead>
<tr>
<th>User</th>
<th>Modal share, %</th>
<th>Fatal accidents, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrians</td>
<td>36.5%</td>
<td>45%</td>
</tr>
<tr>
<td>Cyclists</td>
<td>2.9%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Figure 1. Map of Inequality in Santiago: comunas according to the UNDP’s Human Development Index, with levels ranging from the lowest (0.6, palest yellow) to highest (0.95, darkest green) in the comunas of the “barrio alto”, the “high neighbourhoods”, a reference to their location in the foothills of the Andes and their income levels, similar to wealthy suburbs in North America rather

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1 So popular did the advertising campaign remain that it was uploaded to youtube in 2010, where it has had more than 13,000 views (http://www.youtube.com/watch?v=jIVb5LehWHk), accessed 8-Feb-2013.
Table 1 Road users and accidents, Chile

<table>
<thead>
<tr>
<th>Road users, passengers</th>
<th>Bus drivers, passengers</th>
<th>Car drivers, passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33.0%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>4%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Sources:
Modal share, Chilean government SECTRA, 2006; Accidents, National transit safety commission cited in Rizzi et al. 2011;

These conditions cost the country an estimated US$730 million in 2007 (table 2), with the public sector assuming about two-thirds (Oñate 2007).

Table 2 Cost of road injuries and fatalities, Chile 2007

<table>
<thead>
<tr>
<th>Consequence</th>
<th>No.</th>
<th>Social cost per unit (US$)</th>
<th>Total social cost (US$)</th>
<th>Social cost per unit (US$)</th>
<th>Total private cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>1,645</td>
<td>113,069</td>
<td>185,998,736</td>
<td>2,317</td>
<td>3,811,119</td>
</tr>
<tr>
<td>Serious injury</td>
<td>7,374</td>
<td>28,206</td>
<td>207,993,535</td>
<td>20,081</td>
<td>148,076,945</td>
</tr>
<tr>
<td>Less serious injury</td>
<td>4,977</td>
<td>7,242</td>
<td>36,041,687</td>
<td>5,095</td>
<td>25,356,030</td>
</tr>
<tr>
<td>Minor injury</td>
<td>41,659</td>
<td>1,769</td>
<td>73,680,582</td>
<td>1,194</td>
<td>49,741,400</td>
</tr>
<tr>
<td>Total social cost</td>
<td>503,714,540</td>
<td>226,985,493</td>
<td>752,695</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Figures in US$ based on Oñate 2007 (1UF=US$40). Social cost per fatality defined as loss of future productivity; social cost per injury defined as daily loss in productivity during injury, administrative (police, legal) costs, and human resources for rehabilitation; private cost per fatality defined as administration and funeral services; private cost per injury defined as treatment (hospitalization), rehabilitation and administration.

Similarly, the health costs of air pollution (particles, ozone and others) have been documented by over a decade’s worth of studies. High air pollution triggers premature mortality, higher hospital admissions, more emergency room visits, and more child medical visits (World Health Organization 2005). Concentrations of pollutants (PM2.5) are highest in Santiago’s poorest areas (Cifuentes 2006).

3. Civil society catalyzes more (cycling-) inclusive transport policies

As occurred elsewhere, since the late 1990s automobility has faced growing opposition, led by neighbourhood groups and civil society organizations, fighting highway projects and high rise development to save heritage neighbourhoods, parks and public spaces. They have often been joined by recyclers and thousands of people who depend on traditional street fairs. For many, the bicycle has become a potent symbol of the city of their desires, a heritage transport mode that will become not less but more vital to sustainable, socially just cities in the 21st century.

In the late 1990s, the first major urban highway concession gave rise to a citizens’ organization Living City (2001). In 2007, Living City teamed up with the Dutch NGO, Interface for Cycling Expertise, and the Santiago Regional Government, creating a three-year, participatory process that brought together citizens, public sector and private sector actors. Results have been significant and continued beyond the culmination of this initial process (2010).
When the Concertación, which had ruled Chile since the end of the Pinochet dictatorship (1990) lost elections to a right-wing coalition headed by Sebastián Piñera (2009), cycling policy remained a high priority. Indeed, Piñera rode a bike in his victory photo (AP 2010). The Santiago network has expanded significantly from under 50 km in 2005 to 197 km (DICTUC-CV 2011), fuelled by civil society leadership, Dutch know-how and US$45 million in funding, the product of an agreement brokered by regional governor of Santiago, Adriana del Piano, in 2007.

Public attitudes have also shifted. While in the 1980s, the media typically covered the bicycle as an antiquated, poor man’s ride that should be eliminated in a modern Chile, today it is covered with enthusiasm and support, given its health, environmental and other benefits.

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Political will, business interest, popular demand in Rio de Janeiro
Ze Lobo, Transporte Ativo, March 2013

1. The need for accessibility for all and the shortcomings of the current transport system

Rio de Janeiro is a city with long distances to be travelled, approximately 55km in the east-west direction and 20km north-south, in an area of approximately 1.100km². Historically the city has a poor quality public transport and the low-income population lives in neighborhoods far from the business and commercial centers. Both factors leads to a perfect recipe for transport problems such as long time waiting and travelling, often making use of different modes and paying different rates. It’s necessary to search solutions to these deficiencies of the current transport system so that people can access their destinations more quickly and at affordable costs and that has become a priority with the approach of the Olympic Games and FIFA World cup. As a part of solution to the problem, four BRTs are now being built with a total of 155km of exclusive lanes. The Transoeste is one of them and currently has 40kms of tracks in operation, with quality articulated buses equipped with air conditioning. A half time reduction in waiting time and travel compared to the current system is being estimated, besides greater comfort. Integrated and automatic ticketing systems has also been implemented and enhanced. With these measures people will be able to move through the city in less time with lower cost, improving quality of life for everyone.

2. External costs of the current transport system in terms of premature death (at least road fatalities).

The transport system in Brazil has a total external cost of $ 15.7 billion per year, about $ 6.8 billion associated with air pollution and R $ 8.9 billion associated with car accidents, which 85% ($ 7.7 billion) is allocated to private vehicles (ANTP, 2009). In ten years there was an increase of 40.3% in the number of fatalities and today we have a rate of 30.1 deaths per 100,000 inhabitants, or 24% more people killed than in the European Union with a fleet four times smaller. The highest rate of traffic accidents are recorded in the smallest cities. Rio de Janeiro has a rate far below the national average with 14.4 deaths per 100,000 inhabitants, numbers that are still high compared to the European Community with an average of approximately 6.4 deaths per 100,000 inhabitants (International Transport Forum. IRTAD, International Road Traffic and Accident Database Edition September 2009).

3. The development of a (modern) cycling culture.

The city of Rio de Janeiro has a Low Carbon Development Program, with a goal of 20% reduction in emissions by 2020. A previous target of reducing emissions by 8% compared to 2005 was achieved in 2012. One of the strategies to achieve the goal is to improve high capacity public transport as BRTs and the expansion of Metro line 4; that links South Zone to Barra da Tijuca. There is also a program called Rio Bicycle Capital that in the past four years has doubled are plans to build 150kms more by
2016, that come with educational campaigns and installment of bicycle racks. Other measures are also being taken to make life easier for cyclists, like reduced speed on some streets and simplified legislation for the installation of bike racks on public spaces. Recently, to alleviate the inconvenience caused by the works of the Metro line 4 in the South Zone, more than 500 parking bicycles places were installed through the neighborhood of Leblon, which became quickly crowded with bicycles. Rio currently has 470mil/day bike trips, something around 3% of all modal trips, or a trip for every 14.3 inhabitants. It is estimated that there was an increase of 93% over the past eight years. The integration of these two strategies will enable the cycle network to feed the high capacity network, making possible the use of multimodal transport system to easily reach the city.

Supervia, a concessionaire operator of commuter rails, recently opened 8 new bicycle parks, some with up to 800 stands, that come with workshops, bathroom, and air pump. The local public bicycles system, called Bike Rio, now has 60 stations, 500 bikes and more than 3000 trips a day. It will be expanded further in 2013 with at least 200 more stations. All these efforts lead to a favorable scenario for a further development of the local cycling culture and reduce the number of car trips.

4. Policy development on sustainable urban transport and city planning.

Rio de Janeiro today has a very favorable situation to the use of bicycles. There is political will, business interest and popular demand. In addition to the efforts of the Municipality, a variety of bicycle subcultures begin to appear further increasing the range of cycling modes in the city. Companies have been interested in the subject, investing in it, and several pro bicycle movements begin to emerge, reinforcing the work that has being done by the organization Transporte Ativo since 2003, to encourage and promote the use and awareness of bicycles by both the population and the government. Transporte Ativo acts as a liaison connecting the citizen, the bicycle user, to the government, looking for satisfying the desires of both. Also provides consulting and advice to the government and companies, always looking for a better quality projects based on international best practices adapted to local culture. Today we can say that, thinking about bicycles, the city is becoming better every day and that the cycling infrastructure is part of city planning. Rio has served as an inspiration and example to other Brazilian cities, because the city is one of Brazil’s leading cities and is far ahead in terms of bicycle mobility. Gradually, Rio walks toward being the Capital of Bicycles in the Southern Hemisphere.
Ecuador, secure and sustainable mobility
Diego Punte, Ciclopolis, March 2013

The population of Ecuador, as it is with the rest of the world, tends to concentrate itself in large cities. Among other consequences, the necessity to better or increment the accessibility and mobility of the population, presents itself as a great challenge for politicians and urban planners alike.

Ecuadorian cities have suffered lack of dignified mobility of its citizens. This has left us with an inheritance of one of the highest roadway accident rates in Latin America, which in 2012 reached 33 deaths for every 100 thousand residents, turning it into the second highest cause of death after hypertension. Ecuador is facing this challenge with a policy of urban development for transportation and the development of a cyclist culture.

Diagnosis: Reality in opposition.

The average trip in Quito, the Ecuadorian capital, is estimated at 45 minutes; time which has been growing proportionally to the increment of the car fleet which is at 10% annually (2012). And the problem is not only Quito’s as a capital. The excessive use of automobiles – in which generally there is only one travelling person – extends itself to other cities. It is estimated that up until 2011, the total number of personal vehicles in the country was 1 million according to a study presented within the Global Plan for the Decade of Action for Road Safety 2011-2020, a program initiative of United Nations.

Access, low supply, limited hours and also a deplorable public transportation service (managed by private companies) makes it so that the citizens cannot travel in a respectable manner, and to opt for the acquisition of their own vehicle in order to mobilize themselves. At the same time, there is no existence of a vast study at a national level about mobility problems, which are reflected in the statistics or number of impacts.

The costs of deficiencies

The problem that this brings is reflected in the numbers. Road Justice, an organization of the civil society, estimates that only in 2012 these transit problems have cost the country 800 million USD, those which obviously could have been avoided. In total, in 2012 there were 13 799 traffic accidents, according to official data, which represents a decrease of 11% in comparison to 2011. But the number of deaths did not decrease, with 1523 in 2011 and 1588 in 2012.

In the Global Plan for the decade, it is highlighted that the provinces with the highest rate of traffic accidents are the smallest ones such as Santo Domingo, Sucumbios, Orellana and Galapagos.
The light at the end of the tunnel

The authorities have advanced a policy of mobility which includes various concepts and actions. The mobility plans of the cities are now a priority and include a long term perspective in accordance to the growth of urban areas. In the case of Quito, for example, the construction of a subway has commenced; an alternative to alleviate the saturation that has already been observed in the actual systems like the Trolebús, Metrobus and the Ecovía. The advocacy for cycling in Ecuador had its origin in Quito 20 years ago but was defined in 2003 with the first “Ciclopaseo” (Bicycle path), a recreational bike path that today encompasses a route of 30 km and embraces 20 thousand people each Sunday. CiclóPolis is in charge of this initiative, a citizen organization that has also begun to replicate this project on a national level under the name: Ciclopaseos (Bicycle paths) of Ecuador. As a result, Ibarra already counts with its own Ciclopaseo, which until February 2013 reached its sixth edition.

This last decade has been defining for the city of Quito as a leader of this process. 2008 was a key year for the promotion of the bicycle as an alternative mode of transportation. Then, the mayor’s office along with CiclóPolis achieved the implementation of the “Ciclo-Q”, a network of bicycle paths that advances from the north of the city up to the entrance of the Historical Center. And today it is accompanied also by a more ample network because of the recent implementation (2012) of the public bicycle system “Bici-Q”. All of these actions have increased the number of people that ride bicycles and, as a consequence, defend their rights on the roads.

On the other hand, road congestion has made Quito’s authorities act with some measures, such as: “Pico y Placa” (some hours of prohibition from driving according to the last digit of license plates during one day of the week) and the “Blue Zone” (priced parking lots with a maximum of two hours parking in the central north part of the city), a measure that has been in application since 2009 to discourage the use of vehicles, amongst others. Meanwhile in cities like Ibarra or Ambato, the local authorities have had to find a solution to the problem of excessive vehicle use. Because of it, one of the measures taken has been the application of priced parking in the Historical Center, much the same as in Quito, to avoid the massive abundance of vehicles.

Towards a cyclist culture

Measures like the Subway of Quito is framed within the Government Plan 2013-2017 of President Rafael Correa, who has proposed in his second mandate a “secure and sustainable mobility”, which implies among other things that the citizens take over the streets and create a culture that breaks from the dependence of the automobile.
In this same context, already the National Government has proposed the implementation of its strategy of mass bicycle use, whose ambitious objective is “to become one of the countries with the largest use of bicycles in the world”.

The strategy of the mass use of the bicycle of the National Government has as its plans of action the transition from the motorized vehicle to the bicycle, the combined use of the different modes of transportation, cyclist security and interministerial cooperation. It is in this last point where various actions and activities have been registered and that are already in progress, and which concentrates in the immediate future and include, for example, the creation of a bicycle factory, the construction of the state network of bicycle paths (429 km) and the support of the implementation of recreational bicycle paths in 10 cities of the country.
South Africa, dignified urban environments
Andrew M Wheeldon, Bicycling Empowerment Network, March 2013

The need for accessibility for all

South Africa has a total population of 51.7 million. According to the UNDP, 25% of South Africans live on less than US$1.25 per day. However, when exploring the need for accessibility to reach important destinations in South Africa and the challenges thereto, one needs to view this in the context of the second half of 20th century history. Through the strongly enforced Group Areas Act (implemented 1950, abolished 1991) the ruling apartheid (1948-1994) government (the National Party) of the time did much to extend the location and distances to be travelled of so-called black, colored (mixed-race) and Indian communities, and protected the most sought-after and valuable land and areas exclusively for white communities. These areas were provided with oft dangerous, ineffective and unsuitable forms of public transport allied to sever restrictions on travel and access to areas reserved for ‘white’ citizens. This was the reality up until 1990, and one which has only changed slowly and incrementally in the years since - due to social, economic, cultural and status barriers that are slow to break down.

The end of the apartheid system witnessed the political and social landscape beginning to change. Previously disadvantaged communities began to relocate closer to better schools and jobs and into the cities. However, for many the distances remain significant, as space is limited and the economic and social barriers remain intact and a living reality. Public transport to outlying communities has improved to some degree in the past 20 years, but the extent to which ever-increasing populations (of migrant labor from rural and poor provinces to the comparatively wealthy cities of Johannesburg, Cape Town and Durban) can be catered for remains a huge challenge. The still-present high unemployment rate (>40%) and the barriers to low cost access to education and employment remain. Research conducted by BEN in a number of the informal settlement townships surrounding Cape Town showed that many residents spend up to 25% of their income on public transport – on a monthly salary of US$400, US$100 (ZAR3600/ZAR900 respectively) is spent on travel. Car ownership is low, but where cars are used, travel becomes even more costly, but more convenient with the problems surrounding public transport efficiency. BEN determined that by using a good used bicycle costing US$70 (ZAR630) your travel costs are met on less than one months’ public transport cost.

At the Worcester Hospice in South Africa, which provides nursing care to the terminally ill, workers on bicycles were able to cover three times the distance they did on foot, reaching 15 more patients each day.

West Coast Bike track, legacy from World Cup soccer
External costs of the current transport system

South Africa has an extremely high road fatality rate, and is rated one of the highest in the world. There is insufficient and inadequate policing/enforcement (due to a lack of training and resources) of errant drivers, be they private motorists or public transport operators. A high percentage of vehicles and operators/drivers are unlicensed. According to the South African Road Traffic Report of March 2011, there were 33.2 road traffic fatalities per 100,000 of the population per year, 208 per 100,000 motor vehicles and 13802 fatalities in 2010. This needs to be viewed against the UK (population 63.1m in 2011) figures of 3.5, 7 and 2222; and the US (315m, 2012) figures of 12.3, 15 and 33,808 respectively over the same period. This high road accident (crash) rate costs the South African taxpayer ZAR10 million (US$1.1m) for all fatalities and ZAR80 billion (US$9 bn) for all related injuries, insurance claims and other damages per annum.

The development of a (modern) cycling culture

In light of the above, it is clear that South Africa requires innovative and creative thinking when it comes to addressing mobility with bicycles. Large percentages of the population, unlike Western European cities, live many kilometers from their places of work and education. Consequently, strategies attempting to address this need to combine the improvement of design and the extension of public transport routes, and the linking of this with increased bicycle use. This starts with the availability of low cost, durable and appropriate bicycles, the establishment of bicycle stations at public transport interchanges, the education of all road users as to safe and responsible travel on all trips, the improved planning and implementation of bicycle facilities at the destination points, and the ongoing assessment and targeted education, enforcement, engineering, and encouragement. In Cape Town, Johannesburg and Durban, efforts are being made to improve the safety of all road users and introduce more cycling and walking, coupled to public transport and at the expense of private motor vehicle access, to the respective city centres. The Non-Motorised Transport (NMT) Forum, also known as the Active Mobility Forum, was established in Cape Town in 2004. The committee consisted of representatives of the City of Cape Town, the Provincial Government, as well as transportation planning practitioners, BEN Directors, Cycling Advocates and other interested parties. Moves are afoot to extend variants of the forum to the cities of Johannesburg, Durban and other major metropolitan areas.

The vision is that Cape Town will grow into a city with a general sense of well-being through the development of a quality dignified urban environments where people feel free to walk and cycle; space is shared and everyone has access to urban opportunities and mobility. The
goal is to increase the use of bicycles and encourage walking by creating a safe and robust bicycle and pedestrian network of paths to serve all the citizens in the Cape Town Metropolitan Area.

In the period since the establishment of the NMT Forum the City of Cape Town has overseen the planning and implementation of between 250 and 280 kms of bicycle lanes in both poor and affluent areas – some to directly address pro-poor mobility and others to enhance recreational routes. All told, this will allow all a safe, low-cost and environmentally sound mode of travel to places of education and employment.

**Policy development on sustainable urban transport and city planning**

The Bicycling Empowerment Network (BEN) based in Cape Town, has been consulting on bike supply, bicycle policy and rights of cyclists, design of bicycle routes with the City of Cape Town, Western Cape Provincial Government and the National Department of Transport since 2002. This has been linked with an examining of international best practice and the planning of expert exchange visits to the major SA cities. For more information, please see the BEN website at [www.benbikes.org.za](http://www.benbikes.org.za) and video at [www.youtube.com/watch?v=tVgBCXrNai4&feature=colike](http://www.youtube.com/watch?v=tVgBCXrNai4&feature=colike)
A Ugandan story to share
Amanda Ngabirano, Goudappel Africa, Makerere university

Introduction

Uganda, regarded as the pearl of Africa is located in the Eastern part of Africa. It is part of the East African Community. Kampala is the capital and the fastest growing city of Uganda.

Kampala has seen ongoing rapid growth of 4.5% to 5.0% per annum over the past generation. Such a rapid rate has overwhelmed the City. Just like it is grappling with employment, housing and provision of services challenges, it is faced with major transportation demands and gaps.

The city has a huge representation of NMT use. For instance, walking is the most dominant mode of transport and accounts for half of the trips performed in the metropolitan area. However, it is experiencing and increased private car use rate. The low quality of the existing NMT facilities deters others from walking to their destination and induces the use of other modes (primary Boda-boda or minibus taxis). With the NMT policy, Pilot Project, BRT (Bus Rapid Transit), plus the coalition of the existing civil societies and consultancies,(as hinted on later in this document), there is a big likelihood that this current pedestrian population will be maintained and a new one attracted to the use of Non-Motorized modes of transport; particularly walking and cycling. Therefore Kampala is likely to be a future great cycling city.

Kampala Transport Study Mission-2008

In 2008, Interface for Cycling Expertise, (ICE), a Dutch organization initiated and sponsored a fact finding mission on cycling and the general transport facts in Kampala. The main objectives of the mission were:

- To identify the existing sustainable transport planning process
- To identify policy gaps for the promotion of cycling in Kampala
- To determine who should be involved in the process
- To identify the cycling status and perception in Kampala city
- To find out the reasons why there is less cycling and problems faced by cyclists
- To assess the possibility of incorporating cycling in the BRT plan in process
- To select a pilot project for cycling from an integrated planning perspective for Kampala
Immediately after the establishment of KCCA (Kampala Capital City Authority) in late 2010, a workshop was held on the Sustainable Urban Transport for the City in April 2011, with the main theme; “what city do you want?” This workshop was organized and sponsored by KCCA in partnership with Goudappel Coffeng Netherlands and Goudappel Africa, with an aim of enlightening the technical personnel, the policy makers and the general public about the urgent need for consideration of integrated transport planning taking into account the pedestrians and cyclists in the city. The workshop was a major success and a step towards the selection of the pilot area and the acceptance of the pilot project. IGANGA Foundation, based in the Netherlands facilitated and funded the presenters at the workshop.

Pilot Project Kampala: Returning the space to the people

The biggest achievement of the 2011 workshop was the selection of a pilot project that is supposed to lead to the overall production of a cycling network for Kampala. The Kampala Capital City Authority (KCCA) assigned Namirembe Road and part of Luwum Street as the pilot project area. Both streets are situated in the Central Business District (CBD) of Kampala Central Division and the total distance is approximately 3.5 KM. The streets are close to the Old and New taxi park, which are the city’s largest and most important public transport hubs. In addition, several bus terminals are located in and close to the pilot project area. Meanwhile, there is a lot of commercial activity because of the many markets, shopping arcades and restaurants in the area.

Due to the location of the public transport facilities and the commercial importance of the city center, many people are attracted to this part of the CBD. As a result there a many flows of both motorized traffic and pedestrian traffic concentrated in the CBD and thus also on the pilot project streets. In most hours of most days, the “vehicular traffic is stuck but the people are moving” but with great inconvenience. So why shouldn’t they move conveniently and in greater numbers anyway?

KCCA envisaged that if this pilot project proves to be successful here, then similar projects will probably be successful anywhere in Kampala. In addition, it is obvious that the transport problems in Kampala are severe in this area and therefore a change in this part of the city will be most significant and visible to a large part of the population. The pilot project proposes an inclusion of cycling lanes and pedestrianization of that section of the down of Kampala city.
This is the first Non-Motorized Transport pilot project in Kampala city and it is in the proximity of the BRT corridor in the city center as well as on the southern line (Entebbe Road).

**Policy Development towards sustainable transport-National NMT POLICY**

In October 2011, the Ministry of Works and Transport agreed there was a need to develop a policy for Non-Motorized Transport in Uganda. The intention of the policy would be to raise the profile of NMT within planning and programming for transport in general, to provide guidelines for the inclusion of NMT needs within transport projects, and to provide an over-arching advocacy document for the Government both to consider and approve.

In December 2012, the Non-Motorized Transport Policy was officially launched and this is seen as a milestone for the advocates, users and intending users of Non-Motorized Transport not only in Kampala but also in the other parts of the country, especially the neighboring towns in the Greater Kampala Metropolitan Area. It also symbolizes the importance that is currently attached to this particular mode of transport in the country. In the policy, infrastructural, institutional and administrative issues are clearly stipulated and guidelines set for the encouragement of use of NMT in a safe manner.

**Kampala Pilot BRT-NMT face uplifted further**

The on-going pilot Bus Rapid Transit for Kampala is another project where sustainable urban transport in relation to “moving people” is given a deserving platform. Realistically so, the guiding design principle for the consultant is: “Urban transport demand cannot be satisfied by individual vehicles or the construction of more road space; Scarce urban transport space must be used most effectively to enhance mobility of people (not autos) by providing space for pedestrians, bicycles, and mass transit”.

Among many other proposed design components in relation to an efficient BRT system, the following aspects regarding NMT are being taken into consideration:

- Pedestrian footways on one or both sides of the BRT corridor
- Pedestrian crossing islands
- Proposed NMT facilities along major feeder roads to the BRT corridor
- Cycle parking facilities at all BRT Stops along the corridor

**Complementary Social activities; Car Free Day 2011, Car Free Day 2012**

With the advantage of a coalition of several organizations involved in the promotion of sustainable transport, another historical day was yet to come; the Kampala Car Free Day in December 2011. This was preceded by numerous cycle-for-fun activities, (which are still going on) at Makerere University and some neighboring city suburbs. The Car Free Day attracted international and local media attention. (see, [http://www.rnw.nl/africa/article/a-car-free-kampala](http://www.rnw.nl/africa/article/a-car-free-kampala), [http://www.ecf.com/news/four-fear-free-hours/](http://www.ecf.com/news/four-fear-free-hours/), [http://worldstreets.wordpress.com/category/car-free-days](http://worldstreets.wordpress.com/category/car-free-days), among others). This was so because even without the infrastructure, the huge number of participants and support of Uganda Police and KCCA indicated that the will to use bicycle transport in Kampala can be counted on and therefore the need for taking further steps to make it more friendly and safe.
The Executive Director of KCCA, Ms Jennifer Musisi, represented by Mr Agaba George, the then Director of Physical planning for KCCA, started the participants off while the mayor, Mr Erias Lukwago, closed the day’s event. This did not only exhibit the political support for the improvement and encouragement of the use of bicycle transport but also the availability of potential role models for the city. This historical day’s events were proudly sponsored by IGANGA Foundation, Netherlands. The organizations that were involved in most of the organizational work for the day’s success included; TAFMOD-Uganda, TEENS Uganda, and Kampala Cycling, co-ordinated by Goudappel Africa in collaboration with Uganda Police and KCCA.

In 2012, another Car Free Day was organized through the Ministry of Works and Transport, and the same coalition of the Car Free Day 2011 provided guidance based on the previous experience.

**Cycle for Fun**

On a weekly basis, there are cycle-for-fun activities that have seen several students and others from the general public participate with great enthusiasm and success. These parallel activities compliment the general efforts by KCCA, Ministry of Works and Transport and other organizations promoting sustainable transport. These activities are a great basis to build onto greater heights for a cycling friendly Kampala.

Furthermore, each of the mentioned organizations mentioned is carrying out different activities that are linked to transport sustainability; for instance climate change initiates, Youth training, cycling as a sport and green spaces for all.

**Conclusion**

Although Kampala’s current transport status may seem quite critical, Kampala City has taken major strides towards promoting sustainable urban transport and in a very short period of time in its informal kind of state. The on-going projects, once completed, could bring Kampala to the world map for best and practical sustainable transport solutions within the existing informal situation, and basing on experiences elsewhere through co-operation of various stakeholders and organizations, locally and internationally. The approach is integrated; from infrastructural changes, to mass transit options, institutional reforms and social activities. This could be such a great success and also trigger similar progress for the rest of the country for social, economic and environmental development.
India

Anvita Arora
United Kingdom, The Mayor’s Vision for Cycling in London

Boris Johnson, the Mayor of London, announced a 913 million pound cycling plan for London in March 2013. He stated: “I want cycling to be normal, a part of everyday life. I want it to be something you feel comfortable doing in your ordinary clothes. I want more women cycling, more older people cycling, more black and minority ethnic Londoners cycling, more cyclists of all social backgrounds. I want more of the kind of cyclists you see in Holland, going at a leisurely pace.

Cycling will create better places for everyone. It means less traffic, more trees, more places to sit and eat a sandwich. It means new life, new vitality and lower crime on underused streets. It means more seats on the tube, less competition for a parking place and fewer cars in front of yours at the lights.”

Speaking to the London Cycling Campaign that organised the Love London, Go Dutch campaign, the Mayor’s Cycling Commissioner Andrew Gilligan said: “With multiple commitments to adopt Dutch style infrastructure and international best practice – as well as commitments on better cycle routes, motor traffic restriction in residential areas and ‘mini-Holland’ town centre developments – mayor Johnson has made his strongest statement to date that he means to keep the promises he made to LCC’s Love London, Go Dutch campaign.
All Dutch people have at least one good reason to use a bicycle
Roelof Wittink, director Dutch Cycling Embassy

The Netherlands has 17 million inhabitants, who own 18 million bikes and do on average one bike ride per day. Why? Traditionally because the ride for which they take the bike, is more efficient than by any other mode. The Dutch are very pragmatic. Biking is cost saving.

When you ask them why, the majority says I enjoy it, I feel myself relaxed, have time to think things through, start daydreaming. A Dutch bike stands for quality and the variety is huge, for every age and lifestyle. Strange enough, the most popular bike with youngsters is a Grandma bike, on which they can sit straight up and ride at a calm speed. They do not care that they are being overtaken by multi-tasked young adults who cannot miss any minute of their day or by elderly people who started a new bike career with an e bike. Dutch bikes are famous because they are robust and can be used for all kind of purposes carrying 30 kilo from the supermarket or three kids instead of that. The wide variety of trendy bikes include cargo bikes, e bikes, three wheelers, even a folding cargo bike. Our designers go from one bike concept to the next one. We also struggle a bit with all these different formats of bikes since our bike parking lots have been designed very efficient to save space when they have to host thousands of bikes. Now we have to create separate places in our bike parking hubs for the odd sized bicycles. Still much more efficient than car parking.

Bicycles instead of cars are saving public space, avoiding congestion, avoiding emissions. The Dutch care about global public goods but that does not promote cycling further. They are motivated by their own cycling experience, such as feeling in a good shape. The fact that someone who regularly bikes has the same fitness level as someone 5 years younger who does not use a bike, counts; you feel it. The level of obesity in the Netherlands is lower than in other countries, because of cycling. When a chef de mission of the Dutch Olympic team was asked how come the Dutch win so many gold medals, his best clarification was cycling. My mother still used to cycle with friends every week when she was 80 years old. When I asked her where she had been, she always mentioned another café where they enjoyed a good cup of coffee with a pastry. On your bike you face the wind, but do not worry, the wind clears your mind, refreshes your brain and you gain self confidence. This has all been researched well, no question about that. A cyclist also experiences that he or she can estimate travel time very well. In a car or bus and train, you are that less sure. More than 1% of our daily broadcasting is spent to keep car drivers updated on their loss of time they encounter due to different circumstances.
And society also benefits from cycling. An employee in the Netherlands who takes the bike to work, saves on average € 368 per year on sickness absence. The noise cyclists would add when they would change over to a car, might make the difference for others between a relaxed or disturbed getting-together in public space. The presence of many cyclists might calm traffic in such a way that elderly pedestrians and children have a good chance to cross a street. Road safety improves with more cycling instead of cars, and the same amount of life years are saved by less pollution. The health savings of active transport are even manifold of those life years lost. Regularly cycling saves the risk of some main diseases by 20-50%: coronary heart and vascular diseases, a stroke, breast cancer, diabetes. Cycling might replace medicines with their potential side-effects. Cycling is benefiting everyone, claims London Mayor Boris Johnson, even the car drivers and tube passengers that have more space. Politicians are serious about it. President Correa of Ecuador bikes a lot, also during his successful campaign for another term to lead the country.

Cycling is creating jobs and enhances equity. When I heard the stories from India where a family is making a living by catching and delivering clothes for ironing I thought about my youth. My father employed 4 persons to bring along bread and pastries with cargo bikes. In Rio de Janeiro cargo bikes are becoming a new service industry and everywhere in the world bike couriers cannot be overlooked. TNT is using new three wheeler cargo bikes to avoid the use of vans in West-European cities. In Cape Town home nurses could service twice as much clients when they got on a bike to visit patients. It is about smart mobility and about equity. Enrique Peñalosa who brought sustainable mobility in Bogotá, says that progress is not being marked by poor people who start to drive a car but by rich people who take a bicycle. A society that creates safe cycling and walking is a much more egalitarian society.

Biking is the only mode of transport in the Netherlands for everyone. Many people never use public transport, a very small minority is addicted to a car, but a bike is common. Our next King Willem Alexander does it, with his wife Maxima and their kids, as Willem Alexander’s mother Beatrix did it, as her mother Juliana did it as her mother Wilhelmina did it. They were all cyclists. Long time ago we started to construct bike facilities. The first ones more than a century ago when our cyclists, some million, obstructed too much the flow of our first 1000 car drivers. We developed local and national cycling plans when we learned how much we had to spend when we would not promote cycling. The Dutch have a tradition in finding a way through. The Netherlands is ranking within the world top 20 of economies and in the top 5 in the list of exporting countries. The Netherlands is an ambitious country. Ranking number 1 in cycling.
From car-based to people-centred cities


A car oriented transport system conflict with social progress, economic effectiveness and the environment

Cities today face more and more problems: congestion, pollution, social inequity, and other challenges. Many are related to traffic and transport. Car traffic is still on the rise worldwide, particularly in developing countries. Combined with massive infrastructure and sprawled development, this has hurt people’s health and increased road hazards. Traffic no longer flows freely and time losses due to congestion increase every year, inner city traffic speeds drop year by year. Since the car is the most inefficient mode of transport in terms of the use of space (see figure), increased use has led to severe congestion, particularly in city centres.

Figure 1. Persons per hour on a 3.5 m road width.

Congestion leads to long delays, unpredictable travel times and severe pollution. It is compounded by the fact that in most cities, even large ones, at least half of all trips are less than 5 kilometres in length. This means the potential for reducing congestion by favouring walking and cycling is enormous. Cycle-friendly planning not only benefits cyclists, but also creates more humane, sustainable and democratic cities, which particularly benefit the poor or marginalized.

Motorized traffic has a substantial impact on physical and mental health. Emissions pollute the air and produce smog. Every year, 3 million people worldwide die prematurely due to air pollution, of which 40% is traffic related.

Moreover, the health risks to drivers, largely due to the sedentary habits associated with driving, are substantial, and can be effectively reduced through use of more sustainable transport modes. One of the most significant health problems of our times, obesity, is increasingly in the spotlight as a major factor in serious and growing health problems.

Aside from health problems and air pollution, growing motorization also drives up the number of traffic accidents. Worldwide every year 1.2 million people die in traffic accidents. Unless effective action is taken, this will rise to 1.8 million in 2020. The WHO forecasts that by 2020, traffic accidents will be the third leading cause of premature death worldwide, killing more people than respiratory diseases, diarrhoea and prenatal conditions. An annual investment of 0.25% of gross domestic product in traffic calming and facilities for cyclists and pedestrians could cut the number of fatalities by 80% over a 20-year period.
Equity should be a key indicator for mobility policies

In many cities, soaring car use has pushed pedestrians and cyclists off streets and sidewalks, as cars – in motion or parked – take over every available inch of public space, even public squares, parks and other areas normally reserved for people, even though in most places more trips are done on foot than in vehicles. This means that a minority of car drivers are using a disproportionate amount of scarce urban space, raising the issue of social equality. Furthermore, many of the public spaces where people used to meet, play and interact socially have been sacrificed to create more room for traffic. This has a negative effect on the liveability and attractiveness of cities. Wide streets intensively used by fast-moving vehicles create barriers, dividing the city into sections with poor communication between each other, making human-powered trips difficult or even impossible, and fragmenting public spaces. Freedom of movement for human-powered road users (especially children) is reduced.

The three population groups most affected by a car-centred transportation system are: low-income people, women and children. The first group suffers because they generally cannot afford to own and use a car. Since high-quality facilities for human-powered transport and public transport are often not available in car-oriented cities, this group finds it increasingly difficult to access the cities’ goods and services. Lack of transportation makes it difficult to access employment and obtain food, education and other basics, which drastically reduces their ability to participate in society. The particular needs and travel patterns of women, which typically involve trip chains to multiple destinations rather than a straightforward home-work commute, differ from those of men, but transportation planning often does not take this into account. Women also have more explicit personal safety concerns and physical needs. Over-dependency on motorized transport modes also deprives children of their ability to move independently within their living area.

Mobility, spatial planning and local economy are inextricably linked

With motorization, cities expand more, because people can travel over longer distances. One of the effects of car-based urban expansion, often referred to as sprawl, is that services and businesses tend to concentrate along key nodes, often accessible solely by car or, with difficulty, public transport. Small shops can’t compete and disappear, forcing customers to travel over longer distances to the larger shops. All these tendencies are harmful not only from a transport point of view, but also because the small shops forced out of business once provided vital services to the poor and because small businesses typically provide the majority of jobs. Their disappearance means that many, particularly low-income people, lose their jobs or must travel further and spend more to reach employment centres. In many cities this has resulted in the decline of whole city centres and the loss of important heritage as well.

In 1970, only 30% of the world’s population lived in cities. By 2006, this had risen to 50%, and in 2040 it will reach 70%. This shift brings with it enormous consequences and challenges, compelling us to think about how to steer future urban development. The main question is: What kind of city do we want to live in? And what kind of development will get us there?

The role of transport in any vision for a sustainable city of the future is essential. The problems in most big cities in developing countries can be described as follows: half the world’s population lives in cities, the majority are poor or very poor, many people have difficulties affording the necessary transportation to find
work, generate income, get to school, or go to a hospital. Aside from walking, the bicycle is often the only means of transport available to the poor. Yet in some countries even the purchase of a bicycle remains beyond the reach of a significant part of the population and there are often no proper cycling facilities.

However, particularly in Latin-American and Asian cities more and more people do have access to a car or motorcycle, but excessive dependency on the car for all transport needs produces problems for all, including car-owners.

**Optimal use of cycling creates the best business case for mobility**

The challenge for traffic planners is to meet the transport needs of individuals and society in a way that the positive characteristics of each mode can contribute optimally to social and economic well being, and that quality alternatives are being offered to reduce the problematic use of transport modes.

The key question is what will it take to provide good quality, affordable transport to the poor and to avoid or undo the negative effects of disproportional dependency on the private car. One answer that comes to mind is low-cost public transport systems. Compared to cycling, however, a public transport-based strategy generally requires much higher investment per person/km. Moreover, public transport trips tend to be less efficient for shorter distances (up to 15 km) because it can take as much time to reach the bus stop or train station (or get to one’s final destination) as it does for the ride itself. For short distances, including feeder trips, people must still walk. Giving them the option of cycling would therefore expand their options and the catchment area for the transport system, attracting trips from the area from 0-15 km (instead of 0-5 km) around entry and exit points. In countries with less bicycle use, free-choice cycling (that is, where people with more travel options and cycle by choice) is mainly significant for trips up to 5 km. This rises as users become more adept and accustomed to cycling as a transport mode.

To optimize bicycle use and its contribution to a city’s social, economic and environmental performance requires a better balance between cycling, walking, private and public transport. This is essentially a political choice. Just as building for cars has brought these vehicles flooding into every nook and cranny of our beleaguered cities, planning and integrating cycling can increase its modal share. Where this is carefully done, by reducing space available to cars and enhancing and increasing space for walking, public transport and cycling, some car trips may be eliminated altogether, through more judicious planning of routes, and some will actually shift to other, more sustainable and city-friendly modes. This will have additional impacts on other transport modes, since the quality of cycle and walking trips, in terms of safety, directness and comfort, tends to rise as the volume of cars using the same road space falls. A conscious bias in favour of integration and more balanced distribution of scarce road and public space is essential to counteract the strong bias among traffic engineers and some politicians today, in favour of cars. Restoring a better balance is vital to quality of life.

**Learning**

We can learn as much from our failures as from our successes. In the case of urban and transport planning many mistakes have been made, above all the tendency to facilitate unbridled use of the car, which has brought many unforeseen difficulties, particularly in terms of road safety and the harm it has done to quality of life.
Learning from the mistakes made by European and North American cities gives planners everywhere the chance to avoid problems that often block further changes today, allowing them to leapfrog beyond the so-called developed cities to address recent problems (heterogeneous mix of traffic, availability of motorized two wheelers and low marginal cost of using a two wheeler, plus contemporary issues such as climate change) more effectively.

Throughout the 1960s, cities responded consciously or unconsciously by facilitating motorized traffic, above all, cars. In some cities, highways invaded old city centres, with politicians, engineers and citizens treating this almost as a ‘natural’ development. Moreover, people assumed that as walking and cycling were replaced by cars and mopeds, road safety would improve. Instead, although the number of cyclists decreased, the number of fatal accidents amongst cyclists and pedestrians soared.

So city traffic and transport became increasingly car-centred. We began to create cities for cars, rather than people. Awareness grew that road fatalities, environmental impacts and poor liveability of cities were too high a price for this so-called “progress”.

The response was a conscious search for innovative policies that could meet these new challenges. Perhaps the most striking example was the Dutch “**woonerf**” or “home zone”: a residential street designed to keep cars moving at a walking pace, thus giving priority to these places as habitat, rather than corridors. The Dutch, the Danes and other pioneers learned that the best approach was to pay attention to all modes when developing transport policies and planning access in their cities. Planners moved toward a more holistic and integrated approach to traffic and transport, treating cycling as an important ingredient in the mix. Since the 1970s, the generally accepted policy has been to develop traffic circulation plans that give priority to all road users and strive to improve road safety. By 1975, the Dutch had begun to create Traffic Circulation Plans for cities, which pay equal attention to all transport modes, particularly where improving road safety is crucial. Redesigning urban space policy in this sense is a regularly recurring subject, particularly since these plans strive to integrate all transport modes. Cities began to attract people again, while figures for road accidents fell 75% and cycling’s share of trips rose steadily, to average 27% of all trips. In the 1990s, the national government applied a Bicycle Master Plan within the National Mobility Plan, targeting local authorities as key players and putting a lot of effort into facilitating pro-cycling policies. Nowadays, virtually all city governments have their own bicycle contact person.

During this period, the Netherlands invested €400 million to improve cycling conditions. With experience came greater integration and cycling projects began to fit seamlessly into municipalities’ overall traffic and transport policies. Increasingly they involved more than infrastructure, including cycling promotion within company and organizations’ travel plans (cycling to work campaigns) and public transport combined with cycling.

Nationally, a Project Team implemented the Bicycle Master Plan, in cooperation with a national bicycle taskforce involving representatives from the government, the bicycle industry, and user groups, such as the **Fietsersbond** (the Dutch cyclists’ union). Seminars were organized along with post-graduate and diploma programs. The Project Team’s main role has been to develop, exchange and ensure knowledge circulates.

Locally and regionally, politicians, engineers, bicycle companies and user groups organized meetings and seminars to exchange knowledge, with support from civil servants of the national government. Consultants were also hired to support this process: Everyone learned from best practises and failures. This effort achieved its goal: cycling policy and projects became an integral part of mainstream urban transport planning. Studies generated vital data. Cyclists became part of analyzing need, proposing solutions and testing measures and designs, strengthening both their quality and the likelihood of their success. Facilitating cycle-inclusive policy development and implementation is vital to success. Involving politicians, from the Minister of Transport through local municipal politicians, is essential. Participation from politicians, engineers, citizens, current and potential bicycle users is equally important.
Applications should be context specific

Officials, politicians and civil society organizations wanting to introduce and/or promote cycling as a transport mode have to be aware of the context in which they operate. Nice examples from small, compact cities in the Netherlands or Denmark may not be directly transferable to the reality of, for example, a developing country mega city. The city size and city structure may encourage or discourage bicycle use. Large urban densities imply that many destinations are within cycling distance, but if destinations are spread far apart, a campaign to promote cycling will be less effective.

Bogotá

It is also important to realize that there are many factors that can influence the success of policy transfers from one time or place to another. Studies have shown that these tend to be more successful when there is plenty of room for local players to change the imported policy, adapting it to their own idiosyncrasies. Flexible, open-ended proposals tend to be better received than rigid attempts to photocopy the original initiative in all its details. Civil society participation helps, because these organizations tend to build horizontal relationships based on cooperation, rather than hierarchy, which some actors may perceive as imposition.

Shaping the urban form

Understanding how land use patterns (activities, locations, densities) and the transport system interact is crucial in assessing (possible) impacts of transport policies. The transport problems in developing cities can be characterized for the most part by their rapid transition from walking city to automobile city without simultaneously developing high-capacity public transport systems and policies to cater for pedestrians and cyclists, as generally occurred in cities in developed countries.

Smart land use planning and design of (sustainable) urban form become instruments to:

- Reduce the need to travel;
- Change travel modes in favour of more sustainable modes;
- Reduce trip distances;
- Reduce energy consumption.

Distances between activity locations should be shortened to reduce travel. The main tools to achieve this are increasing density and improving the land use mix. Theoretical discussions also underline the need to make alternative travel modes such as walking, cycling and transit more attractive. Other measures include transit access and better urban design (particularly more interconnected networks and attractive streets).
**Habitat areas**

Urban cohesion requires the presence of cyclists, pedestrians and other ‘ordinary’ (human-powered) road-users. This in turn calls for public space that is thriving, safe, and attractive. Neighbourhoods are not self-contained entities, and they shouldn’t be. As Jane Jacobs explained, the essence of city life is that its people have many contacts for all sorts of purposes, and in all directions. The more, the merrier. These contacts produce cohesion. A well-designed public space can offer good conditions to make and renew contacts. This is why it is so important to treat public space as a network of continuous routes tying neighbourhoods together, while being useful and attractive to cyclists, pedestrians and other ‘ordinary’ (human-powered) road-users.

Only a minimal number of roads should be designated as main roads or highways, while the remaining public space should be designated as habitat areas.

As initially conceived, major roads and highways were meant to absorb large flows of cars, freeing up other streets from excess volumes. Notwithstanding, although cars may travel at reasonable speeds, there should be many crossings where pedestrians and cyclists can cross easily, safely, and without much delay. Otherwise both the number and gravity of accidents soars where these projects are developed.

Moreover, this concept should be complemented by the creation of habitat areas that give priority to pedestrians, cyclists and social activities. Cars may be allowed, at reduced speeds. Houten shows in practice that a habitat area can be fairly large. People can walk or cycle from one end to the other (over 3.500 m) without ever crossing a road with busy car traffic and/or vehicles moving at speeds of over 30 km/hr. In many countries today, this concept informs targets, such as that of the Netherlands, where a national policy has established the goal of making 50% of all existing urban areas 30 km/hr zones.

**Child-friendly**

Schepel, Kips, Zomervrucht and Schouten devised a list of criteria for child-friendly public space, on the occasion of the Child Street 2005 conference in Delft, called *KiSS, Kid Street Scan* (see [http://urban.nl/CHILDSTREET2005/downloads/KISSintroduction-handout.pdf](http://urban.nl/CHILDSTREET2005/downloads/KISSintroduction-handout.pdf)). Although originally conceived to ensure child-friendliness, the criteria actually apply to other ‘ordinary’ (human-powered) road users as well.

The six aspects for quality public space include:

1. Protection
   - Social safety;
   - Traffic safety.
2. Walkability
   - Easy crossing;
   - Ample room for walking;
   - Connections to other neighbourhoods.
3. Cyclability
   - Easy crossing;
- Amenities for cycling;
- Connections in all directions.

4. Criss-Crossability
- Freedom of movement all along the street.

5. Attractiveness (Enjoyability)
- Interesting, and attractive streetscape;
- Possibilities for initiatives on, and next to, the public space.

6. Usability
- Suitability of the street surface for many sorts of social activities;
- Space for special purposes (like playgrounds) within reach, along safe routes.

All of these aspects should be treated together in any plan for (re) arranging public space. Many measures influence more than one aspect, for instance limiting speeds or volumes of motorized traffic, providing ample room for walking and cycling, drawing extra attention to points where pedestrians and cyclists are crossing, restricting parking to places where it is least bothersome, and giving room to private initiative all along the routes created for ordinary human-powered road users.

Five main requirements for cycling-inclusive infrastructure

To design for cycling one needs a basic understanding of the characteristics of bicycle, cyclist and cycling.

These characteristics can be summarized in 7 points:

- the bicycle is powered by muscles: a bicycle friendly road design keeps energy-loss to a minimum.
- the bicycle requires balancing from its rider: the cyclist will sway forward to stay upright and needs some width to do so. Turbulence caused by cars, involuntary low speed means the use of more space.
- the bicycle has no crumple zone: cyclists are vulnerable and everything had to be applied to give them a spatial crumple zone to make anticipation possible.
- the (average) bicycle has hardly any suspension: cyclists prefer a smooth road surface.
- the cyclist rides in the open air: designers should take note of possibilities for keeping away wind and rain and sometimes the sun.
- cycling is mostly a social activity: cyclist want to ride side by side; riding side by side is a must for parents to escort their children safely.
- people are the key-factor: cycling is a multitasking activity; designers should respect this, avoiding complex situations overcharging the mental capacity of human being

These quality preferences can be translated into 5 main requirements for bicycle infrastructure. In short:

- perception and being able to ride side by side create requirements in the area of attractiveness and comfort;
- the minimisation of resistance creates requirements in the area of comfort and directness;
the optimisation of mental capacity and the section of free space create requirements in the area of comfort and safety;

- the vulnerability of cyclists creates requirements in the area of safety;

- the need for a complete, comprehensible bicycle infrastructure creates requirements in the area of cohesion.

Generally speaking, if the minimum level of one or more of the 5 requirements cannot be met, the infrastructure must be modified.

The five main requirements explained

First main requirement: Coherence
As the word suggests, coherence means that the bicycle infrastructure forms a coherent whole. Furthermore the network has to provide connections between the all origins and destinations for cyclists, especially the most important ones. So coherence is about giving people the opportunity of going somewhere by bicycle, with integration with other means of transport, Metro, Bus, as well as making the whole journey by bike.

Elements that play a role in this regard include ease of way finding, consistency of quality and the freedom to choose different routes. And at the begin and end of the journey a possibility to park the bike safely.

Second main requirement: Directness
Directness means that the cyclist is always offered a route as direct as possible, thus keeping detour to an minimum. If the travelling time by bicycle is longer than by car, this is the major reason for people to use cars. On the other hand many motorists are willing to use the bicycle for short trips if it is quicker and more convenient. And cycling is healthy. For people without a car, the bicycle gives, compared with walking, the possibility to lengthen the journey within the same time, so they save time to do other things. Using the bike is less expensive and mostly there are not the problems and losing time in case of looking for a parking place.

Sometimes there are possibilities to create short cuts between roads; sometimes to admit two way bicycle traffic in one way roads; or to create two way cycle path at both sides of main roads to avoid crossing.

Third Main requirement: Safety
This requirement entails the bicycle infrastructure guaranteeing the safety of cyclists and other road users in traffic. Cyclists are vulnerable because they are in the same space as motorised traffic, with the consistency of major differences in mass and speed. The cyclist does not have the benefit of external technical provisions such as cave constructions or crumple zones.

Designers are unable to exert any influence on this inherent vulnerability, but they are able to influence the conditions in which cyclists travel. One of the key points of this aspect is that encounters with fast motorised traffic should be avoided as much as possible by means of a separation in time or space. The importance of this requirement is confirmed by the
accident figures. In towns and cities with a large number of busy intersections there are relatively more serious accidents involving bicycles than in urban environments with fewer busy intersections.

Safety is relevant on many different levels and can be influenced in a variety of ways. The requirements formulated as part of a sustainable safe traffic can play a leading role in the designing process. Some points of major interest:

- construction of extensive residential areas with mixed traffic and low speeds, maximum 30 km/h
- a minimum part of the journey on relative dangerous roads;
- combine the shortest and safest routes;
- avoid situations in which cyclists have to search to find their way;
- limit the number of traffic solutions and give them an plain design;
- separate different types of vehicles in case of higher speed differences;
- reduce speed of motorised traffic at potential conflict locations.

Finally, cyclists are more vulnerable in dark or rainy weather: visibility in those conditions is a major important thing. Designers can prevent this problem by creating situations where the different road users can see each other long before they met.

Fourth main requirement: Comfort
This main requirement comprises factors that concern nuisance and delay caused by bottlenecks and shortcomings in the bicycle infrastructure These leads to additional physical effort on the part of the cyclist. We know that not only extreme exertion but also interrupted journeys make cycling less enjoyable. Also does nuisance caused by vibrations because of a bad surface.

The main message is to make a smooth pavement, to minimize the chance of stopping and nuisance caused by other traffic and weather.

The possibility to share the street but in this case the car is guest and have to give way

Fifth main requirement: Attractiveness
Attractiveness means that the bicycle infrastructure fits into the surroundings in such a way that cycling becomes easy and relaxed. Cycling behaviour, however, is determined by a wide range of factors. For each individual these can be of different importance when it comes to deciding whether to go by bicycle and what route to take. The perception of cycling is highly personalized. But complains made by cyclists should receive serious attention, even they are hard to verify objectively.

Attractiveness includes the criterion “social safety”. Social insecurity is indisputable linked to the layout and the context of the surrounding. People feel safer in busy places and more important, potential offenders are deterred by the present of people. But even the busiest cycle route in a city can feel deserted and isolated in the evening or at night. For the designer this all means:
the greatest yield in terms of social safety can be achieved at the level of network formation by ensuring that there is supervision and social control.

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