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Cycling in Monrovia – Transport and more

A short survey from Monrovia, Liberia

Case Studies in Sustainable Urban Transport #8

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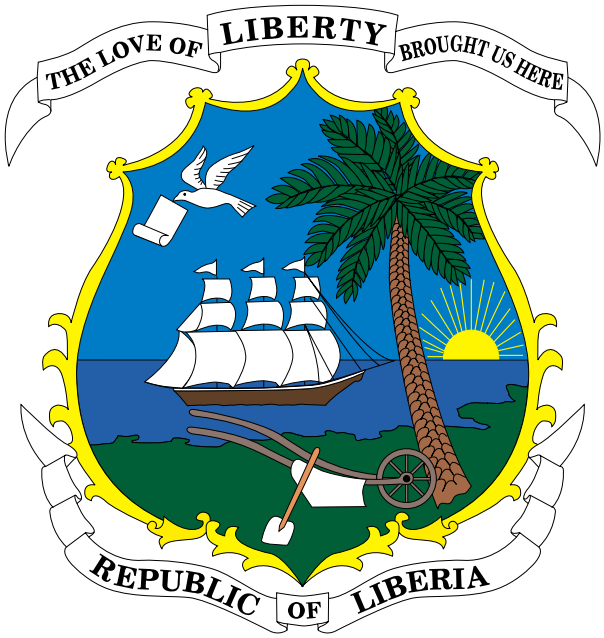

About the author

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1 Introduction

Huge efforts have been made by the Liberians with support from the international community to rebuild Monrovia — the capital city — after fourteen years of civil war. Nevertheless, eleven years after the war, Monrovia remains one of the poorest cities in the world.

Monrovia's extreme poverty hinders the mobility of its citizens. For most people, the acquisition costs of a car exceed their income of years and even decades. Even access to public transport or informal transport services (para-transit) is a huge challenge for many citizens. Either ticket fares are not affordable or the supply of transport services is insufficient.

For many of Monrovia's inhabitants the combination of poverty with a lack of mobility is a negative cycle. On the one hand, a lack of financial resources hinders them from access to transport, while on the other hand, the lack of mobility denies them opportunities to fight their poverty. This reduction of transport availability can affect access to, for instance, health services, education or job opportunities, leading to missed chances to enhance their living conditions.

In recent years, Monrovia's transport sector institutions — backed by international development partners — have been trying to improve Monrovia's infrastructure through projects catering primarily for car traffic. However, experiences from other developing countries show that the urban poor benefit least from this car-oriented development. The neglect of public transit and non-motorised transport, combined with the growing number of cars makes commuting by bus, foot or bike more difficult. As cars occupy urban space and threaten pedestrians and cyclists, access to reliable, affordable and safe transport is becoming more difficult for ordinary citizens.

This disregard shown toward non-motorised forms of transport — cycling in particular — resembles the decades-old transport policy of many cities in high-income countries. Within the last two decades however attitudes have changed, and cycling is now seen as an innovative and essential part of modern urban life in economically advanced cities. Less congestion, less air pollution, less noise, less space consumption and a higher quality of life are motivating the metropolises of Melbourne, Paris, London, New York and Los Angeles — which have neglected cycling for decades — to invest in cycling friendly environments in recent years.

While developed cities invest in cycling as a sustainable alternative to motorised transport, the people of Monrovia stand to benefit even more from cycling advancement. Due to its low cost, cycling can significantly increase the mobility for many of Monrovia's inhabitants, giving them the chance to enhance their living conditions through access to schools, workplaces, hospitals and public services.

This case study, 'Cycling in Monrovia,' underlines why the advantages of cycling are even greater in a city with conditions like Monrovia than in a developed city. Despite the advantages of cycling, bicycles are very rare on Monrovia's streets. Therefore, this case introduces the major obstacles for cycling as identified during stakeholder surveys. They include the inadequate infrastructure, lack of safety and financial access as well as the ability to cycle. The case study also outlines five major intervention areas for making cycling on Monrovia's streets safer and more attractive.

Capacity development in the transport sector

On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and other donors, GIZ is supporting its Liberian partners in several fields, including transport. The project *Capacity development in the transport sector* provides the following services:

- Advisory services for implementing a transport master plan and a modern transport policy;
- Advisory services for implementing a road maintenance system;
- Advisory services to improve dialogue between the public and private sectors and on developing the private sector via the German Desk at the Liberia Chamber of Commerce (LCC);
- Human resources development and training for local experts.

For more information, visit http://www.giz.de/en/worldwide/20010.html.

2 History and socio-economic conditions in Monrovia

2.1 Liberia's history at a glance

Founded in 1847 by freed American slaves on the coast of West Africa, Liberia is one of two countries in Sub-Saharan-Africa not directly influenced by European colonialism. Tensions between the leading former American slaves and the suppressed indigenous population led to a *coup d'État* in 1980 and two civil wars from 1989 to 2003. Approximately a quarter of a million people lost their lives and one million people were displaced.

At present, Africa's first female president and 2011 Nobel Peace Prize winner, Ellen Johnson Sirleaf, governs the 4.2 million Liberians (World Bank, 2012). Despite all efforts to improve living conditions, United Nations peacekeeping forces have to remain in Liberia until today in order to stabilise the country. Furthermore, extreme poverty remains widespread, with 84 % of Liberia's population living on less than USD 1.25 a day (UNDP, 2013).

2.2 Monrovia today

The population of Greater Monrovia[1] is growing fast: an increase from 1 million to 1.5 million inhabitants between 2008 and 2019 is forecasted (JICA, 2009). As in many other regions of the developing world, this is especially driven by migration into the city and high birth rates.

[1] For the purposes of this report, the Greater Monrovia region will simply be referred to as Monrovia.

Figure 1: *Monrovia's city centre.* © Ursula Hein, GIZ

For nearly half of all households in Greater Monrovia, monthly income is less than USD 80 or LRD 6 000.

JICA, 2009

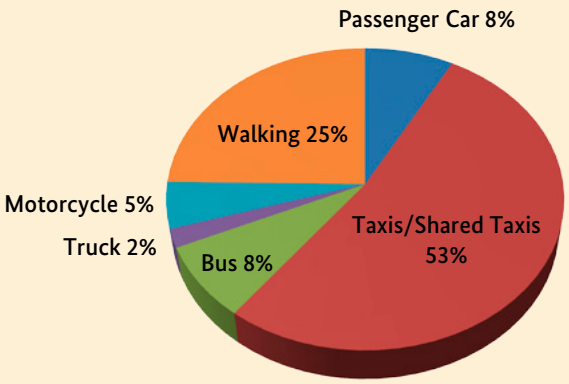
Monrovia is a flat and compact urban area with a population density of about 7 000 inhabitants per square kilometre. Within Monrovia the employment rate is only 50 % — with most jobs in the informal sector (JICA, 2009).

However, the economy has grown over the last few years, due to an abundance of natural resources in the country and support from the international community. It is likely that high economic growth rates will continue in the foreseeable future. Therefore, the demand for transport services will rise with economic growth (JICA, 2009).

3 Transport in Monrovia

Despite low car-ownership rates, Monrovia is already suffering from congestion, air pollution and traffic accidents. Due to Liberia's economic situation, the public budget to improve Monrovia's transport facilities is very limited. In the 2012/2013 financial year the budget for road infrastructure investment was USD 41 million (Liberia, Ministry of Finance, 2012). As a result, transportation infrastructure often relies on help from international donors. Currently the transport system consists only of road and non-motorised transport. No rail or bus rapid transit systems exist, nor are any planned for the future. According to a traffic census by the Japanese International Cooperation Agency (JICA) the most common forms of transport in Monrovia are taxi (53 % of all journeys) and walking (25 %). The split of buses and private passenger cars is about 8 % each.

Figure 2: *Modal split in Greater Monrovia per trip.* © JICA



Figures 3a,b: *Despite all efforts, many of Monrovia's roads remain in a state of disrepair.* © Ursula Hein, GIZ; Paul Fremer

3.1 Public transport and paratransit

Buses run by the National Transit Authority (NTA) are the only form of official public transport. Compared to other forms of transport, bus fares are relatively cheap. However, only 15–16 buses run on a daily basis in all of Monrovia. The amount of buses required to meet demand is estimated to be at least 500 (National Transport Master Plan Liberia, 2012). Therefore, only a fraction of Monrovia's inhabitants can make use of the buses.

The predominant form of transport is paratransit, primarily run by shared taxis. They operate on a private basis, but a state led commission sets fares. In comparison to other countries, shared taxis run efficiently with occupancy rates of 4–5 persons per trip. To assure high occupancy rates, the shared taxis prefer routes within the city centre. The urban poor who are increasingly forced to live on the periphery of the city are often not connected to the bus network or to the stops of these shared taxis and minibuses. To reach minibus, taxi or bus stops with connection to the inner city, they must first walk long distances or hire a motorcycle.

Within the last years the number of motorcycles has increased significantly in Monrovia. However, taking the so-called Phen-Phen motorcycle taxis is dangerous and unaffordable to the vast majority of society. Women avoid them in particular, due to reported assaults. Furthermore, many people are afraid of reckless motorcycle drivers, since most do not have a drivers licence (see also SUTP factsheet "Challenges of informal motorcycle transport in Liberia" on http://www.sutp.org).

For many families in Monrovia, daily access to public transport and paratransit is not affordable. Costs for access to buses and shared-taxis can be half of an individual's total income, burdening household income significantly. For motorcycle-transport (even when used only as feeder transport to shared taxis or buses), the expenses can be several times higher than income. Table 3.1 compares the costs of Monrovia's various transport systems.

Figure 4: *Autorickshaws have recently been introduced as new paratransit mode.* © Ursula Hein, GIZ

Table 1: Comparison of public transport and paratransit costs (calculated using figures from JICA, 2009 and own research)

Mode of Transport	Modal-Share (without non-motor. tp)	Average occupancy rate	Routing	Price in LRD/ km, per person	Monthly Costs (22 days return, 5 km) in LRD	Share of average HH-Income (LRD 6 000/ USD 80)	Share of average Income per person (LRD 1 275/USD 17)
Bus	11 %	28.57	fix	15.00	660	11 %	52 %
Shared-Taxi	71 %	4.94	fix	3.25	715	12 %	56 %
Motorcycle-Taxi	6 %	1.94	flexible	40.00	8 800	147 %	690 %
Combination Motorcycle-Shared Taxi (each over an assumed distance of 2.5 km)	–	–	flex./fix	40.00 /3.25	4 758	79 %	373 %

3.2 Non-motorised transport

Around a quarter of all journeys in Monrovia are made entirely on foot. The modal share of cycling is less than one per cent. The situation is often very challenging for pedestrians. In the case where footpaths exist, they often end abruptly, are occupied by cars, in a bad state-of-repair or crowded with merchants. Figure 5 shows how dangerous the conditions for pedestrians and cyclists can be on Monrovia's streets; in this case a pedestrian crossing has an uncovered drain hole.

Figure 5: *Hole at crossing on Tubman Boulevard in Monrovia.* © Alexander Czeh

Figure 6: *Even if signage exists, pedestrian crossings are often not respected by car drivers.* © Paul Fremer

3.3 Private cars

5.2 % of Monrovia's households own a car, which is significantly higher than in rural Liberia. Taking into account an average household of 4.7 persons, 1.1 out of 100 Monrovians owns a car. Generally, private cars play a minor role in the modal split (see Figure 2).

Figure 7: *Even though the majority of Liberians cannot afford a car, traffic jams are already increasingly common during rush hour in Monrovia.* © Paul Fremer

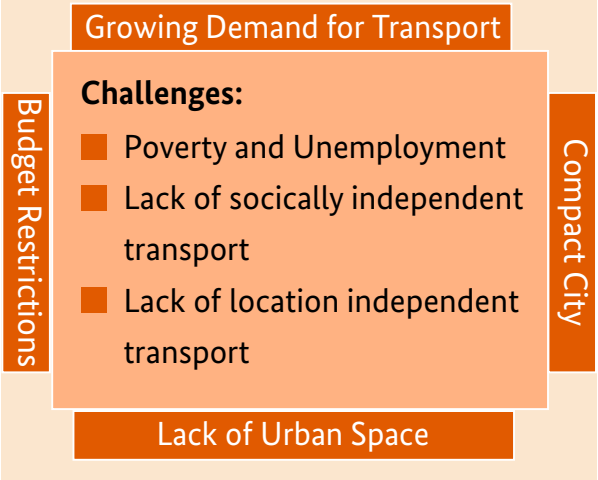
3.4 Outlook

Due to economic and population growth the demand for transport services will increase significantly within the next years. The number of car trips alone is projected to grow by 108 % from 2008 to 2019 (JICA, 2009). As a consequence, more pedestrians, cyclists and cars will have to share Monrovia's limited urban space.

Figure 8: *Construction work at SKD-Boulevard, Monrovia.* © Alexander Czeh

Many infrastructure projects are already in progress to rebuild Liberia. Currently, all road infrastructure projects lack space for cyclists. Figure 9 summarises Monrovia's major challenges in relation to its socio-economic and transport conditions.

Figure 9: *Monrovia's challenges and constraints.*



4 Cycling in Monrovia: existing conditions

4.1 Socio-economic characteristics

As shown in the previous chapter, few in Monrovia have access to adequate transport, due to a lack of quality, quantity, and overly high prices of transportation. The bicycle as a mode of transport has the characteristics to give the excluded majority of the population access to transport and along with that, access to education, work and public services. In comparison to private cars and motorcycles, bicycles are cheap and do not have the burden of a drivers licence. In contrast to public transport, cycling is relatively network-independent and solves the problem of the last mile connectivity.

Figure 10: *Bicycle Garage, Somalia Drive, Monrovia.*
© Alexander Czeh

Cycling not only supports the working sector indirectly, it also creates direct job opportunities. The bicycle sector does not require huge investments or very high technological standards — attributes that are suited to the environment of low developed areas such as Monrovia. Jobs could be created within retail, maintenance, rental and the production sector. Within recent years, the number of cycling retail stores has been growing.

Figure 11: *Bicycle retailer on Somalia Drive, Monrovia.*
© Alexander Czeh

Examples from Tanzania show that cycling as a means of transport can also create direct job opportunities. For instance, in the East African country around 10 000 cargo tricycles are in use for small freight distribution and deliveries (Ministry of Works and Transport Uganda, 2012). In the city Dar es Salaam some cyclists earn a living as bike couriers (Fasta Cycle Messengers Cooperative). Especially in Monrovia, where many goods are still transported by wheelbarrows, such cargo bicycles could be used for the distribution of goods. This idea is not new to Monrovia. The local waste management enterprise uses transport bicycles to collect waste (see Figure 12).

Figure 12: *Transport Bicycle of the local waste management enterprise.* © Alexander Czeh

4.2 Why cycling could meet Monrovia's transport needs

Like in Western cities, cycling could help Monrovia to fight the negative impacts of car-traffic. Taking up 1/12 the space of a car, bicycles save space and avoid congestion. In a poor country like Liberia, cars are often very old, lacking environmental standards. Bicycles can easily help reduce this pollution.

Large-scale public transport systems like bus rapid transit or rail based transport systems are not likely to be built within the next decades. Compared to existing modes of transport in Monrovia, cycling has the highest system capacity to transport a given number of people per hour per direction (Kaltheier 2002). Investments in cycling infrastructure and supporting measurements are inexpensive compared to road or rail bound investments. As a result, the return on investment is high. A study on the economic value of investments in cycling in the cities of Amsterdam, Bogotá, Delhi and Morogoro revealed very positive cost-benefit ratios for investments in cycling. The cost-benefit ratio in cities with a lower standard of development is significantly higher: Morogoro 1:5, Bogotá 1:7, Delhi 1:20, while the cost-benefit ratio of more developed cities, such as Amsterdam (1:1.5), are lower in comparison (Buis, 2000).

Therefore, due to its characteristics the potential benefits of cycling are high in Monrovia–higher than for moste cities in high-income countries. Cities of the Western world support cycling in order to reduce the negative effects of car-related transport and to relieve their transport systems. In Monrovia, cycling has a much greater social component. Cycling can provide mobility for people who are geographically and/or financially excluded from access to transport. Furthermore, Monrovia's conditions require smart solutions to solve the challenges shown in Figure 9. Cycling is an economical and space saving mode of transport which does not require high technical standards or drivers licences. Despite these clear benefits, cycling remains uncommon in Monrovia. To understand why this is, factors that have hindered cycling in Monrovia are examined in the following chapter.

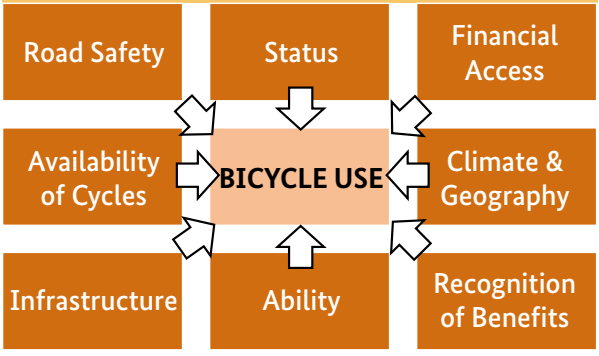
5 Reasons for Monrovia's low modal split of cycling

To understand the factors behind the low usage of bicycles in Monrovia, direct and institutional factors were examined. To find out which factors are directly hindering the use of bicycles, three groups were interviewed: 25 active cyclists, 100 non-cyclists and 17 institutional stakeholders in the transport sector. Along with direct factors, institutional factors are blocking the development of cycling as a mode of transport on a longer-term basis. In Chapter 5.2 the institutional situation for cycling in Monrovia is summarised.

5.1 Direct factors

Figure 13 shows the survey categories that can hinder cycling; each group had to select and rank three major obstacles out of eight. The eight parameters were selected based on the work of the cycling network CoopAfrica (visit http://coop-africa.org for more information). Four common obstacles to cycling in Monrovia were identified in the survey: Road safety, infrastructure, financial access and the ability to cycle.

Figure 13: *Factors influencing cycle use.*



Four major obstacles to cycling in Monrovia

Road safety and ***infrastructure*** are the two biggest obstacles to cycling according to the survey results, as shown in Figure 15. All groups identified these factors as two of the three most important problems for cycling in Monrovia. ***Financial access*** was tied with road safety as the most important obstacle among non-cyclists, but was overlooked by the other groups. In particular, institutional stakeholders appear to underestimate financial access to cycling as a problem in Liberia's capital. To better understand the problem of financial access, the cyclists were asked about their bicycling costs. Additionally, bicycle retailers were surveyed about their average bicycle prices.

Figure 14: *Cyclist within Monrovia's traffic.* © Alexander Czeh

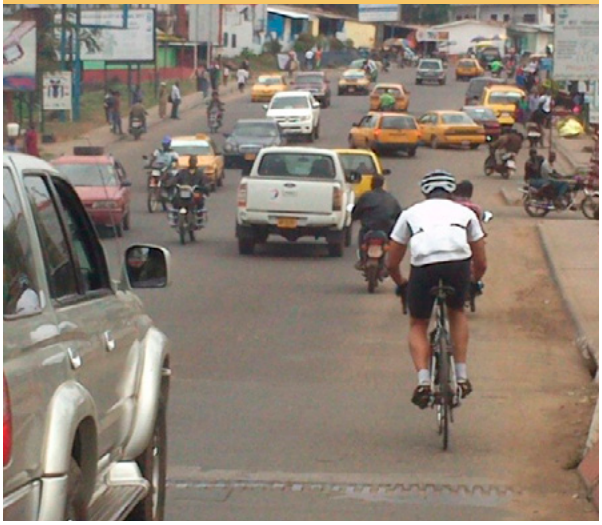
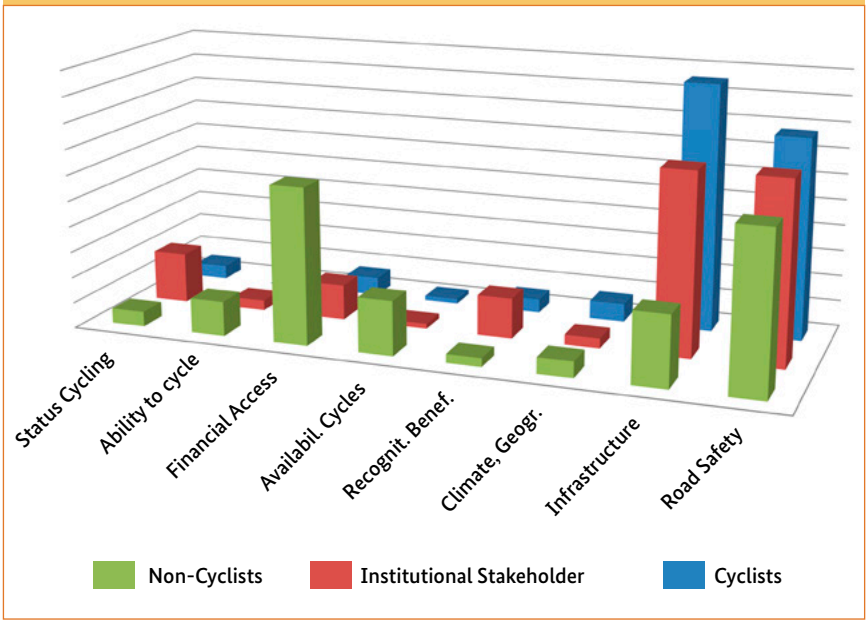


Figure 15: *Cycling obstacles in Monrovia.* © Own survey & analysis



The results showed that the average bicycle price in Monrovia is approximately USD 70, which equals or exceeds the monthly household income of around half of Monrovia's residents.

The fourth major problem is ***Ability*** to cycle. As Figure 15 shows, this issue is initially not considered a major problem by the various groups interviewed. However, when questioned further, it turns out that 16 % of all non-cyclists questioned don't know how to ride a bike. This ratio is much higher among women — 47 % of the women interviewed lack the ability to cycle (men: 11 %).

Figure 16: *Only few children are lucky enough to have an own bicycle available.* © Ursula Hein, GIZ

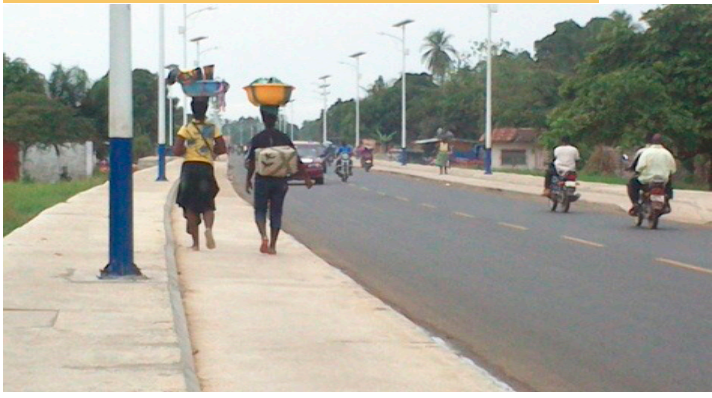
5.2 Institutional factors

Developing a cycling friendly environment is challenging in Monrovia, given the institutional situation. For instance, local authorities lack human resources and sometimes even a pen to write with. International donors working within the transport sector in Liberia do not give any priority to cycling. Liberia's National Transport Master Plan and the Urban Master Plan Study for Monrovia do not consider cycling as a future mode of transport.

Monrovia's current state of development offers many opportunities to build cycling friendly infrastructure. Due to the lack of transport infrastructure many road projects are ongoing and will be planned within the next years and decades.

Currently, government or donors are not compelled to consider cycle infrastructure by any current law or regulation when planning and building roads. In fact, Liberia's laws actually prevent cycle use. Following the 'Vehicle and Traffic Law' from 1972, bicycles have to be registered like cars or motorcycles with a fee-based license plate (Judical Institute Liberia, 2011). Although enforcement levels of this law are unknown, the arbitrary application of fees and licenses can be a significant hindrance.

The little cycling infrastructure that exists often goes unused due to a lack of signage and education. Liberia's first cycling path on Caldwell Road is an example of this (Figure 17). The street lacks signs or road paint to clearly indicate that the newly built infrastructure is a cycle path. Most Liberians have never seen cycling infrastructure before, which is why most cyclists still use the street, while pedestrians walk on the cycle path.



Figures 17a, b: *Cycle tracks on Caldwell Road, Monrovia.*
© Alexander Czeh

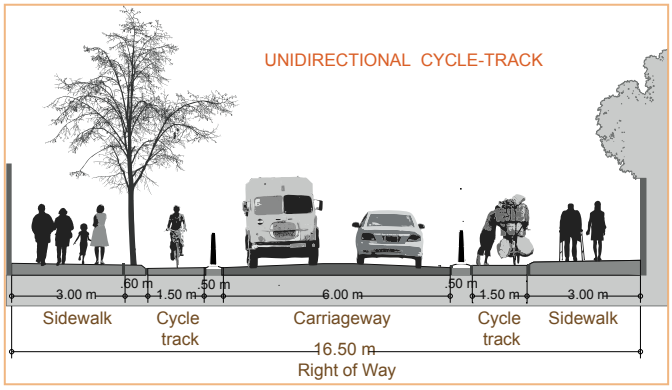
6 Approaches to increase bicycle use in Monrovia

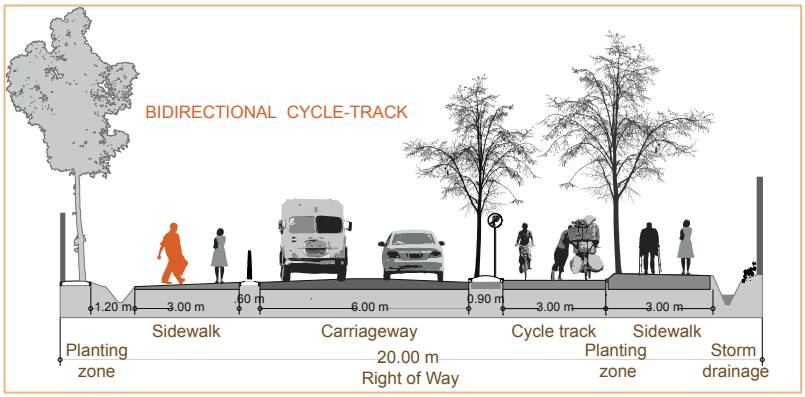
To sustainably improve cycling conditions in Monrovia, a range of measures must follow a holistic approach. For example, better access to bicycles has to be accompanied by measures to improve safety, which then relates to cycling infrastructure. Holistic also implies that all stakeholders from the transport sector and the current and potential users of transport systems are informed of and participate in the process.

6.1 Improving infrastructure

The traffic conditions in Sub-Saharan Africa cities are often chaotic, and require appropriate cycling infrastructure. Instead of integrated cycle lanes, separated and protected cycle paths are better suited to protect cyclists from motorised traffic.[2] Other means of protection include bollards, raised curbs or vegetation (see Best Practice Box Kenya). Experiences from Kenya and Tanzania show that automobile drivers do not always respect cycling infrastructure. Therefore, means of traffic separation should reach a certain height and be stable enough to avoid misuse and vandalism of the cycling infrastructure (UNEP, 2013).

[2] Separation is needed when a road carries over 20 000 cars a day or when speeds are higher than 50 km/h.





Figures 18a, b: *Examples for a modern street design catering for cyclists and pedestrians.* © UNEP 2013

The minimum cycle path width of 1.50 m should be exceeded where possible, since cycle paths can become crowded with freight tricycles, tricycle-wheelchairs, carts, bicycle-taxis, carriages and other types of non-motorised vehicles. Furthermore, a footpath should always be provided next to the cycle path to prevent pedestrians from using it. The design of cycle paths should address the poor conditions of bicycles in Monrovia. Therefore, the design speed has to be higher, including a wider radius of curves and less steep slopes (UNEP, 2013). An example of cycling friendly infrastructure in Sub-Saharan Africa is a separated and protected lane project for non-motorised transport in Kenya's capital of Nairobi (see Box 'Best Practice Kenya').

A vision for the future: Cycling ring Monrovia

The central swamp and the sea in the south of the city are natural barriers for Monrovia's traffic infrastructure. Despite the barriers, a cycle path ring could connect the majority of Greater Monrovia's districts due to the city's compactness. Only 35 km of cycle paths are needed to connect 16 districts with 719 000 inhabitants and 438 000 places of work and education. Monrovia's inhabitants could reach the furthest point along the ring within a maximum travel time of 70 minutes, pedalling with a modest average speed of 15 km/h.

Building a pedestrian and cycling bridge over Monrovia's swamp, which covers the inner circle of the ring, could cut the maximum travel time significantly.

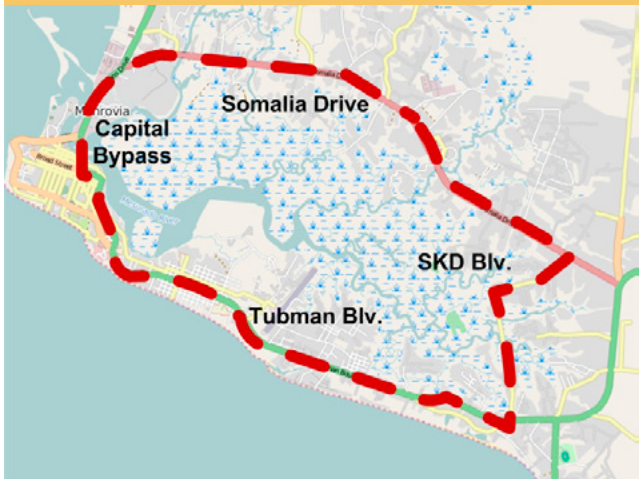
Best Practice Kenya

Figure 19: *NMT-Infrastructure Thika highway Kenya.*
© Armin Wagner, GIZ

The Thika highway links Nairobi and Thika to the Ethopian boarder. Figure 18 shows how the infrastructure for pedestrians and cyclists is separated from the road. Bollards and curbs assure that motorised vehicles do not enter this part, and a seperated foothpath prevents conflicts between cyclists and pedestrians. This enables cyclists to ride comfortably on their path.

Cycling Ring Monrovia

Figure 20: *Sketch for a potential cycling ring Monrovia.*
© Own work



- Length: 35 km
- Connects: 16 districts
  719 000 inhabitants
  438 000 working/education places

6.2 Improving road safety

Training and safety courses, benchmarking, interdependencies with other cycling use influencing factors

In many cities in Sub-Saharan Africa, traffic conditions are more chaotic than in most high-income countries (Kaltheier, 2002). Road safety is strongly interdependent with other cycling use factors, so a range of measures adapted to the specific problems of Monrovia is needed. In this city, measures relating to ability (see 6.4), infrastructure (see 6.1) and institutional framework and awareness (see 6.5) could positively affect road safety.

Monrovia lacks adequate accident statistics, which makes it difficult to understand the safety situation. An interview with Monrovia's traffic police brought to light that cycling accidents are not separated from other accident statistics, so no information exists on how many cyclists are involved in road accidents or where they happen. A separated statistic for cyclists could raise the transparency regarding accidents with cyclists and help to identify dangerous areas for cyclists.

It is also important to train cyclists in safe cycling practices (see Box Best Practice Ghana). In addition, better speed limit enforcement can help protect cyclists from motorised traffic.

Another way to improve safety for cyclists is to increase the modal share of cycling. Research — primarily from European countries — shows that accident risk for existing cycling trips drops as cycling becomes more common (Godefrooij *et al.*, 2009). However, this effect is less likely to be achieved without adequate cycling infrastructure and enforcement of traffic rules.

Best Practice Ghana

Figure 21: *Bicycles training in Ghana; Pro-Link Ghana 2012.*
© Clemens Rudolf, www.afrikafahrrad.de

The Ghanaian NGO Pro-Link teaches cyclist safety, including safe traffic behaviour and about bicycle mechanics. For instance, Pro Link explains how brakes and ball bearings function as well as the necessity of adequate footwear while riding a bicycle.

6.3 Improving financial access

Public bicycle rental systems

Public rental systems can give access to people who do not own a bicycle. Furthermore, rental systems help to raise awareness about cycling and to increase its modal share. In Monrovia, where the purchase cost of a bicycle is more than monthly household income for half the population, a rental system could give many people the opportunity to experience cycling. In contrast to sophisticated rental systems like in London or Paris, a rental system in Monrovia should target job creation and reliability. Morogoro's rental system is a successful example of an African bike hire program (see Box 'Best Practice Tanzania').

Best Practice Tanzania

Approximately 200 micro-entrepreneurs offer 1 500 bicycles for rent in Morogoro. The bicycles can be hired on an hourly, daily or weekly basis, and with a 6 % modal split, they capture a significant share of all daily trips in Morogoro. The local 'Bicycle Hire Association' came up with the idea to offer dedicated women bicycles which enjoyed huge popularity by Morogoro's women.

Saving plans and microcredit systems

Micro enterprises are widespread throughout Monrovia, and many of them use wheelbarrows to transport their goods, which is time consuming and limits their range. Microcredits could help entrepreneurs obtain access to transport bicycles in order to increase travel speed and delivery radius.

Saving plans organised by employers help lower the burden of a bicycle purchase. The best practice example from Eldoret in Kenya shows how companies can help their employees to accumulate enough money for the purchase.

Best Practice Kenya

In Eldoret a textile factory—together with a credit cooperative organisation—developed a saving plan for its employees. The credit organisation offered bicycles for sale on credit and arranged a micro saving plan and a loan system with the employer. Within a short period all 300 offered bicycles had an owner (Pendakur, 2005).

Best Practice: World Bicycle Relief in Zambia

World Bicycle Relief (WBR) works primarily in sub-Saharan Africa to provide comprehensive bicycle programs for poverty relief. After finding that most available bicycles would break down quickly due to heavy wear from rough cycling conditions, they worked with leaders in the American bicycle industry to design a bicycle to withstand tough terrain, carry up to 200 lbs of cargo, and be locally assembled and maintained. One of their largest and most successful programs is in Zambia. Over 23 000 bicycles have been distributed in Zambia, and over 350 mechanics have been trained.

Contract-to-own programs

WBR works with students, healthcare workers and local mechanics in contract-to-own programs designed to help improve educational and health outcomes. By signing a contract agreeing to stay in school, to continue serving patients or to continue servicing bicycles, beneficiaries gain ownership of the bicycle outright after two years in the program.

Community development workers (CDW) are trained by WBR and their partners to work with schools and surrounding communities to form bicycle supervisory committees (BSC) composed of up to 12 members from different backgrounds from within a community. These include school officials, students, members of the parent teacher association, local NGOs, community and church leaders, and traditional leaders. The committees are given sensitisation training, including education on the importance of empowering girls.

The committees then pick bicycle beneficiaries. In schools, they are required to distribute at least 85 % of the bicycles to students, and 15 % to teachers and community supporters. 70 % of bicycles must be given to female students. At the same time, WBR trains bicycle field mechanics within the community in technical and business skills to ensure that bicycles can be repaired locally, and empower entrepreneurs. Working with HIV/AIDs NGOs, volunteer health workers are also chosen for the program.

In order to fulfil the program requirements, students must be attending school regularly and improving their marks, mechanics must continue to service bicycles, and health workers must visit patients regularly. The local committees oversee compliance; in the case of non-compliance, the committee can redistribute bicycles.

27 months after the program began, in the 15 schools evaluated, nearly all of the students met their attendance obligations. 74 % were still using the bicycles to reach school regularly; for many who weren't, the bicycle was being used at home for other purposes. Through the program, attendance increased 28 %, academic performance improved 59 %, and most students now traveled less than one hour to reach school and felt safer on their journey.

Caregivers were able to serve four times as many patients in a day on a bicycle, and the caregiver retention rate was 97 %, compared to 50 % for most volunteer health worker programs. Caregivers also were able to visit their clients more often, with the number of visits in a six-month period increasing from 2.3 visits to 10.9 visits.

For more information see:
http://www.worldbicyclerelief.org

6.4 Improving ability to cycle

The survey in Monrovia revealed that 11 % of male and 47 % of female non-cyclists interviewed never learned how to cycle. Those who did learned at an average age of eleven.

Cycling courses at schools, training and racing events especially for women

Like in many other cities of Sub-Saharan African countries female cyclists are extremely few in number (Pendakur, 2011). Beside the lack of ability to cycle many women lack awareness about cycling, as the local women's group pointed out within the stakeholder discussion as part of the survey: 'Most women are simply not aware about the opportunity to use a bicycle as a mode of transport or to transport their goods since they have never seen a female cyclist in Monrovia. Therefore, they never consider the use of a cycle.'

To raise public awareness about female cycling, training courses and racing events could be used. In Monrovia, where leisure activities are rare (there are no cinemas, and TV access is limited), a public racing event could attract plenty of spectators.

Children's bikes are the most often sold type in Monrovia and help kids gain access to education. Research in other countries has shown that the risk of being involved in accidents with very strong injuries is between four and eight times higher for children (Wittink, 2009). Training courses could prepare and educate children in cycling safety, and also provide more females with early cycling experience.

Best Practice Sierra Leone

Figure 22: *Woman learning to ride a bicycle in Port Loco.*
© www.villagebicycleproject.org

The 'village bicycle project' trained women at schools in Port Loco and Lunsar in northern Sierra Leone. Mostly aged between 14 and 20, cycling skills varied significantly among the young women. The trainers report that cycling used to be an exclusively male activity but that this attitude is changing rapidly.

6.5 Improving institutional framework and raising public awareness

14 out of 18 stakeholders from the Liberian transport sector interviewed could imagine supporting cycling within their work. However, Liberia's institutions and international donors are not currently supporting cycling in any way. The development of an institutional network, including Liberia's cycling federation, cycling entrepreneurs, cycling activists and interested stakeholders from the transport sector could bundle and activate existing potential.

Perhaps due to a lack of awareness or coordination, non-motorised transport is neglected within Liberia's Transport Master Plan, and cycling is only mentioned briefly in the Urban Master Plan Study for Monrovia. Ghana provides an example of how cycling can be integrated into national and regional transport policy (see Box 'Best Practice Ghana').

Best Practice Ghana

Figure 23: *Two Cyclists in Accra, Ghana.* © Alexander Czeh

Ghana's National Transport Master Plan from 2008 (available here for download) dedicates one sub-chapter to non-motorised transport. Regulations cover issues like bicycle parking facilities, micro credits for bicycle-purchase and the protection of cycling infrastructure. Beyond that, a non-motorised transport master plan in Greater Accra was launched in 2012 in the Tema Metropolitan Assembly and Ashaiman Municipal Assembly.

Best Practice Uganda

Figure 24: *Car-Free-Day in Kampala.* © Marlies Pilon

In 2011 Uganda's capital Kampala held the first car free day in East-Africa. More than 350 cyclists pedalled freely through blocked-off streets in the city centre and raised public awareness about the benefits of sustainable modes of urban transport.

The interviews with Monrovia's public also brought to light a lack of awareness about the advantages of cycling as a mode of transport. Awareness campaigns like car-free-days can share knowledge on the advantages of cycling, both to stakeholders and to the public. The Box 'Best practice Uganda' gives a successful example from Kampala.

The research in Monrovia found that many of the stakeholders (71 %) in the transport sector had never discussed cycling in the course of their career. Training in sustainable transport for those in the sector could raise awareness about the needs and benefits of cycling as a future mode of transport.

7 Lessons learned

The socio-economic and traffic conditions in Monrovia are similar to other cities in developing countries. The demand for transport is growing rapidly, but expensive fares and inadequate public transport are excluding many of Monrovia's citizens from access to schools, public services or healthcare. Making matters worse, public authorities lack necessary resources to enhance the transport system.

Given these realities, cycling as a mode of transport has the unique ability to support Monrovia's development in several ways:

Three major advantages

1. ***Traffic relieving***: As a space-saving, non-polluting and energy-independent form of transport with low operating costs, cycling is a very efficient use of public resources.
2. ***Social access:*** Cycling enables access to transport for all socioeconomic groups of the population and thus helps people to meet their daily needs like education, public services and health services.
3. ***Poverty alleviating***: Cycling helps to fight poverty indirectly through better access to transport and directly through job creation. The bicycle sector is labour intensive, and doesn't need high investment or sophisticated technologies. There are opportunities to generate income through jobs in maintenance, manufacturing, transport of goods and people sales and courier services.

Four major obstacles for cycling in Monrovia

1. ***Road safety***
2. ***Financial access***
3. ***Infrastructure***
4. ***Ability to cycle***

Less important: Climate & Geography, Recognition of Benefits, Status of Cycling, Availability of bicycles.

Figure 25: *Girls Race, VIDA Cycling Program, Ghana 2013.* © Clemens Rudolf, www.afrikafahrrad.de

Five approaches to increase bicycle use

1. ***Financial Access***: The abolishment of VAT for bicycles and a support of regional production initiatives would lower the price of bicycles. Saving plans for the purchase of bicycles through employers and public rental systems can also improve access to bicycles.
2. ***Ability***: Training courses at schools and/or in cooperation with local stakeholders like Monrovia's women network assure that all pupils learn how to cycle, regardless of gender.
3. ***Safety***: A range of measures, including awareness campaigns, safety training, traffic enforcement (*e.g.* speed limits), the collecting of accident statistics and adapted cycling infrastructure, can assure safer cycling.
4. ***Infrastructure***: Cycle paths have to be separated and protected from motorised transport. The design speed of cycling infrastructure has to be higher due to the low safety standard of bicycles in Sub-Saharan Africa. To avoid misuse by pedestrians a foot path also has to be provided.
5. ***Institutional***: A holistic approach that assures the coordination of cycling measures, together with the public and stakeholders from the transport sector, is needed to build a positive cycling environment. Cycling has to be included within Monrovia's transport strategy to a reasonable degree and in combination to other modes of transport.

Due to the low standard of development, Monrovia has the chance not to repeat the failures of other cities since many roads still have to be built within the next decades. This gives Monrovia the huge chance to leapfrog car-oriented development towards a transport system that includes all of society.

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