

CYCLING IN THE 15-MINUTE CITY: STRATEGIES TO REDEFINE OUR URBAN ENVIRONMENTS AND MOBILITY WITHIN IT

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ABSTRACT

Advancing all forms of cycling – mobility, recreation, exercise and sport – constitutes a necessary and critical component of the strategy to address many of the major mobility and related challenges in 21st century urban environments. As society increasingly face the dangers of exponential climate change, overpopulation and congestion, health complications due to inactivity, and elevated road-based dangers, modern society needs to embrace each and every solution that potentially mitigates and refocuses our lives to one of health and sustainability. The bicycle serves as one of the greatest inventions of all in the quest to bring about equality and independence in mobility: the ideal vehicle on which to both tread lightly on the earth, and connect people in a dynamic and healthy manner.

This paper will explore current measures to promote cycling in all its forms, and the strategies required to shift the balance in the urban environment from the dominant (private motor car) towards active mobility. Land use, road design, greening the city, universal access, an understanding of human behavioural choices, and the dismantling of barriers to safe and active travel – all require interrogation. The shift to a compact, fifteen minute city will result in a city for people.

1. INTRODUCTION

In order to shift the balance: from motorised to active mobility and cycling, society requires a paradigm shift, and to build upon the effective and progressive work of the last 50-100 years to adapt our urban environments to green, economic and social systems of sustainability. This has been well documented for decades, with many of the world's leading academics and organisations exploring ways in which this can be achieved. Climate change is real, and it is largely man-made. The increase in extreme weather patterns, storms, drought, floods, and ravaging of food supplies, most notably in vulnerable areas (coastal, poorer communities, areas prone to extreme storms), demonstrate this repeatedly. Urban environments, given the significant effect to which large dense population groups contribute, need to dramatically shift the manner in which they operate.

The International Association of Public Transport (UITP)'s "New mobility and urban space: how can cities adapt?" outlines the reasons for shifting as follows: 'with urban areas responsible for 70% of global carbon dioxide emissions, it has pushed cities to rethink the way mobility is organised. Initiatives have been taken to discourage individual car use, offering a greater role to public transport, regaining space from cars and providing infrastructure for active mobility. Cities have to adapt to find solutions to integrate these new mobility services in an efficient and sustainable way (UITP, 2020).



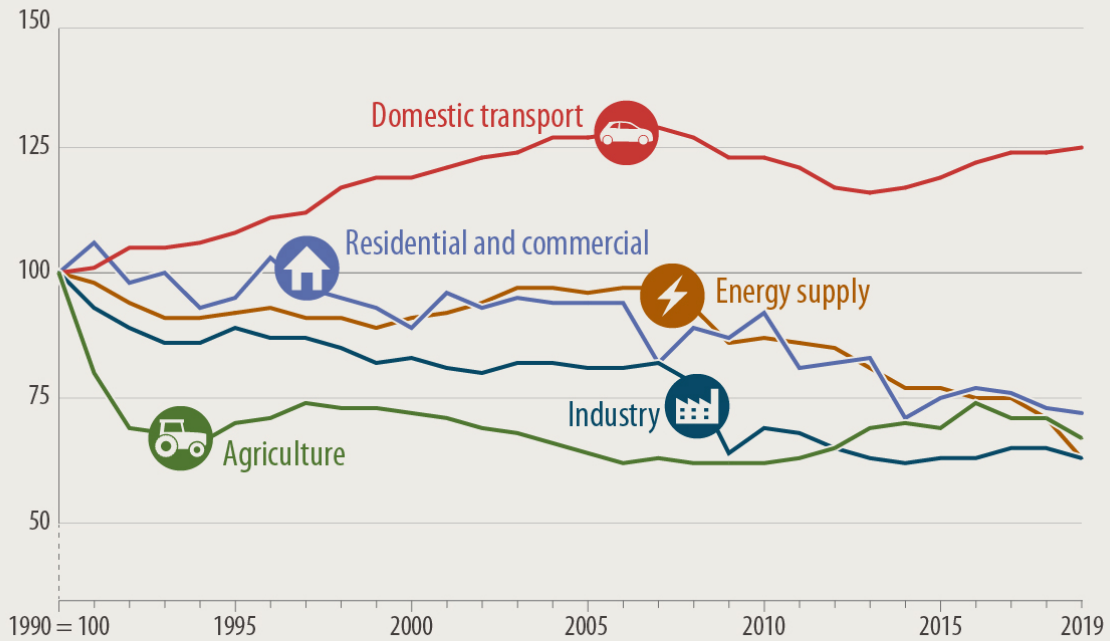
Figure 1: How we have moved, and where we have to go (UITP, 2020)

The extent to which global urban environments have moved from stage 1 to 2, or from stage 2 to 3 as depicted in the Figure 1, depends on which city one is citing. Global cities need to, as far as possible, move to stage 3, and demonstrate that their strategy, action and implementation significantly reflect this. A healthy mixture of an identity as a city of places, combined with progressive public transport and thriving active mobility – cyclists and pedestrians – will result in a fabulous city for people – and indeed for all who live and move through it.

Why are these drastic steps necessary, and lobby policy makers required to move faster, in order to achieve this? It is needed, because the science is clear: climate change is real, and the effects of vehicle-produced pollution form a large component of this. According to a report by the European Environment Agency (EPA, 2022), the EU emission levels have changed since 1990 – with domestic transport moving dramatically higher than other sectors, such as energy supply, agriculture and industry. It is clear that much needs to be done to limit/reduce the use of polluting vehicles for transport. Similarly, the emissions in South Africa grew from 300m tons in 1992 to 435m t in 2021 (Ritchie & Roser, 2022).

EMISSIONS IN THE EU*

Change in emission levels by sector since 1990
(in CO2 equivalent)



* Data excluding the United Kingdom

Source: European Environment Agency (2022)



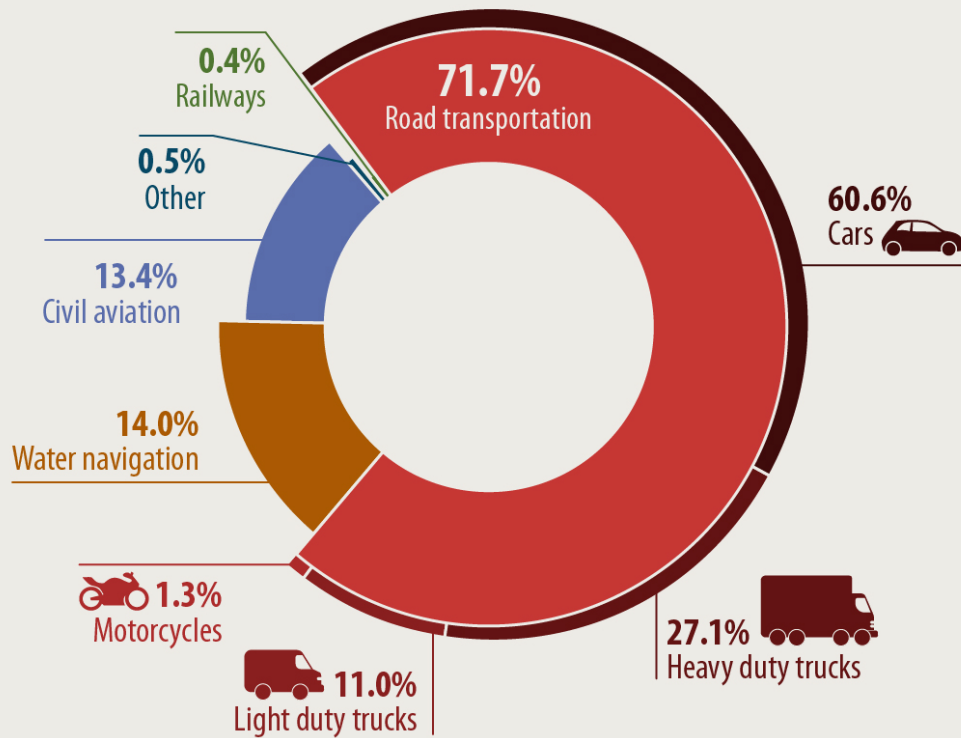
Figure 2: Emissions in the EU (EPA, 2022)

However, mobility is a real and necessary component of everyday lives. Society needs to be mobile and to connect with one another – for the purposes of work, education, health, social engagement and other service-related trips. This will not end, it is a vital part of life, and part of being human. Just how we do this needs to be addressed: can society do this in a more energy-efficient and less-polluting manner? One could question how bad is it – is it not that cars are getting more efficient, and cleaner – and could we not simply continue as we are on the trajectory knowing that our private cars are becoming less of an environmental concern?

Not so fast, it seems. Data from the European Environment Agency (2022) report shows that road transportation makes up 71% of these greenhouse gas emissions – with cars listed as a subset 60% of this.

TRANSPORT EMISSIONS IN THE EU

Greenhouse gas emissions breakdown by transport mode
(2019)



Source: European Environment Agency (2022)



Figure 3: Transport emissions in the EU (European Environment Agency 2022)

In the past decade electric vehicles (EV's) have grown in popularity as an alternative to the internal combustion engine variant. And whilst EV's on balance having a lower carbon footprint, they are less so when it comes to their production, and to their disposal. This is gradually improving with new technology. Certainly, if one is considering the purchase of a new car, then an EV is the better option, eventually, given a sustained amount of driving kilometers, than a combustion engine car. But critically, it is the dependence of private vehicles as a concept that we need to address. Society needs to shift the balance from a dependence on motorised, polluting vehicles, and cars in general, to one of active mobility. For this to occur, many factors need to be in place to assist and support the process. Short origin-destination distances, safe and efficient routes on which to travel, amenities and services that fall within a radius from home that is manageable on foot or by bike; or when not, ensuring that the public transport system is set up to take care of this efficiently and at a low cost. Importantly, it needs to make sense – from a time, effort, financial cost, and efficiency level – to NOT use a car to go about your daily commute. It is here that the concept of a 15-minute city becomes important, and strategic.

Local Governments for Sustainability (ICLEI) describe the 15-minute city as a place that is people-centered. 'The idea of "15-minute city" is not new, and many cities (Barcelona, Bogotá, Buenos Aires, Melbourne, Milan, Paris and Portland) around the world have been using its elements to create people-centred urban development models. Recently, the concept has been adopted by a number of cities around the world but was made famous by the city of Paris where mayor Anne Hidalgo made it part of her re-election campaign. The trending concept is quite the opposite of traditional urban planning models that segregate different land uses, especially residential from businesses, retail, industry and leisure. Traditional planning models often encouraged more car traffic in-order to connect activities like home-work, home-business, and home-leisure (ICLEI, 2022). On the contrary, 'the 15-minute city' concept integrates various land uses into a cohesive people-centred development trying to get away from private cars and promoting walking, cycling and use of public transport.'

The 15-minute city has further been described over time as the return to a local way of life where residents can meet all of their most pressing needs easily, conveniently and timeously. First coined in 2016 by French-Colombian scientist Carlos Moreno (ref: Wikipedia), it is a growing concept of mobility and access in a localized area, or community, to counter decade's old urban sprawl; and with it, extended reliance on the motor car. The compact city, or polycentric city, forms one that is vibrant, intense, productive and intrinsically linked to all important factors (ICLEI, 2022). These factors are those which affect us all - a need for access to natural green spaces, shops, services, the workplace, education and social gatherings. The environment needs to be designed to bring all that one needs within a radius of 3 to 5 km (ICLEI, 2022). One critical way to address mobility in the 15-minute city is through advancing and promoting cycling (routes, access, availability of bicycles, parking, safety, education, etc.), and building on and improving already existing pedestrian routes. Achieving a systematic institutional and social growth in cycling is an often arduous and complex task. The various enabling factors, and pillars of support, need to be perfectly aligned, and to remain so for many years, for the culture of using bicycles as a form of mobility to take root and form an established component of the culture of a particular city or nation. It requires constant encouragement, planning, building, training, education, facilitation, and investment. It is no different to building cities for cars – other than being less expensive, more user-friendly, healthier, environmentally sustainable, less congestion-imposing and polluting, and allowing for greater freedoms and independence for all citizens.

In short, in setting this task in motion, it is important to consider the social, psychological, philosophical, economic and aesthetic values and advancements that a bicycle city engenders. It is far more than simply shifting a modal choice from the motor car to the humble bicycle - rather, it is a powerful statement one makes as to who we are as individuals, and how we engage with the city and the world around us. It speaks to our personal relationships and our sense of respect and value for others, and the planet. It infers our sense of care for future generations, as well as for ourselves. According to Clive Citeaux, Professor of Aesthetics at Cardiff School of Art and Design, 'Cycling' in actual fact encompasses an extremely large number of ways of life and forms of being... suggesting that, if cycling is any one thing, it is perhaps first and foremost a set of questions that asks us to reflect on identity and the commitments we make in life" (Cycling UK, 2015). Cycling speaks to our identity. Unfortunately, the access to bicycles, and to being able to cycle freely is not always a straightforward individual choice. As stated above, there are examples where it can be.

Dubai is currently initiating its own 20-minute city, including a 93km walking and cycling loop with 100% renewable energy using kinetic power. It constitutes a zero emission transport system with 100% recycled water for irrigation. “Dubai is the best place for entrepreneurship in urban mobility. THE LOOP project is an embodiment of that entrepreneurial spirit, which aims to make Dubai the most connected city on earth by foot or bike,” architectural firm URB chief executive officer Baharash Bagherian explained. Bagherian added: “The LOOP is the future of urban mobility infrastructures, which are more than sustainable transport systems. These types of infrastructures are spaces and utilities for people, where various leisure and community services can also be provided. These types of infrastructures are an enjoyable mode of sustainable transport, no matter the weather conditions.” If oil-rich (and dependent) Dubai can make the change, all cities can” (Arabian Business, 2023).

2. CHANGING POLITICAL WILL

But just what is political will? It is most often described as the ‘missing factor’ when it comes to inaction by those in control. “We could do this, and our lives would be better, but there is simply no political will to support us” is the oft-heard complaint as to why conditions for those in need are not addressed. According to author David Roberts in Vox (2017), the concept could be defined as follows: “the authors try to wrap these together into a simple definition of political will: “the extent of committed support among key decision makers for a particular policy solution to a particular problem.” Later they break it down into a somewhat more elaborate four-part definition: Political will exists when: 1) a sufficient set of decision-makers; 2) with a common understanding of a particular problem on the formal agenda; 3) is committed to supporting; 4) a commonly perceived, potentially effective policy solution.’

The move to bring about these policy decisions to address conditions that enable the oft-overused and little understood ‘sustainable’, or greener and ‘tread softly on the planet’ type of approach in respect of mobility is indeed a challenging one. It does happen, and indeed many great measures by policy makers over the past fifty or so years have addressed many key factors. The problem is, when it occurs in fits and starts, and when transport and economic policy shifts back away from the ‘green’ solution. When the components of political will listed above are all in place, it is further critical that the policy decisions result in concrete (for want of a better term) action. It is the final result that makes the difference, when local residents welcome and embrace the change in their daily commute. Too often the message is diluted, the area of intervention altered, and the easier, status quo way of doing things – are repeated. This is further compounded by a lack of understanding, or the necessary skills, to fully appreciate the changes that are called for, and needed. Many a good plan on paper results in a derailed and amended reality, where the initial message is lost, and the desired effect – be it reduction of CO₂ or a healthier population – is not realised as intended. This can be avoided when the success is measured by targets: for example, when cycling levels in a given city rise from 5% to 10% of all trips over a 3-year time frame. If this is given as one of the most important indicators, alterations to the plan will be less possible in respect of modal share values.

The 15-minute city is all about reclaiming public space for citizens, in respect of green spaces and parks, and safe and practical facilities for active mobility modes (ICLEI, 2022). It is clearly the people-centred urban development model where locals can access all essential amenities (such as work, shops, schools, medical, recreational areas) within a

15-minute commute on foot or by bike. In other words, without being forced to use a motorised vehicle; and, it follows, the choice to use active mobility is a clear, easy, practical, safe and obvious one.

Investigating the promotion of **cycling** requires researching factors, such as affordability, choice of mobility (including planning, infrastructure), gender, health, the environment, and community safety. Affordability of cycling needs to consider international studies, which demonstrate (Vanderschuren et al., 2022) that cycling amounts to 0.02% of the cost of private car travel. In respect of mobility, up to 40% of all trips locally can be shown to be less than 5km, a distance easily undertaken by bicycle, and one that fits well into the 15-minute city paradigm. Gender and social equality in access to transport and mobility requires an understanding of the specific strategies to encourage women, and other vulnerable groups, into cycling, and low-cost forms of travel, and the barriers thereto.

Health factors list many advantages: increased cycling has a positive effect in reducing obesity, improving cardiovascular health, alleviating depression and improving cognitive functioning, amongst other benefits (Aldred, 2014). Given the seriousness of the current environmental concerns surrounding climate change and the challenges to the liveability of cities, it is clear that cycling as a form of mobility share will contribute to a reduction of CO₂ emissions, including the metal deposits in runoffs from roads and into rivers. Finally, increased rates of cycling greatly enhance a sense of community safety; for more cycling leads to higher levels of individual engagement, lowering of road speeds and heightened local understanding of local areas (Aldred, 2014) (ref). Greater planning, infrastructure build, research and educational programs, strategic bicycle supply and user training all serve to facilitate increased levels of cycling and greater safety and efficiency in low-cost, sustainable travel. It is in investigating these factors that one needs to look both locally and internationally, in order to fully understand best practise and to learn.

Several studies have focused on the need for increasing the levels of cycling as a factor of mobility, some of which are referenced here. In South Africa, cycling levels are particularly low. Vanderschuren et al. (2022) determined that Cape Town has a modal share of commuter cycling of less than 1% (with a corresponding and worryingly high 3% fatality rate). The Netherlands and Denmark present the highest values for cycling as a share of modal split – in some Dutch cities reaching 40% (IPSOS 2022). Copenhagen has some of the best infrastructure and innovative solutions, designed specifically to grow and safeguard all bicycle commuters (Aldred, 2014). One could argue that both Denmark and the Netherlands are long-standing bicycle-orientated societies, so it has proved easier for them to continue to grow their strong bicycle cultures. This is in part true, but does not tell the full story. Both countries struggled with the onset of a strong post-war car culture, and chose to stand against this – the Netherlands in the 1950's, and the Danes in the decades thereafter. Both countries now appear to have always been cycling environments – because they have carefully planned and implemented accordingly, and have had strong political will and a powerful public voice (Aldred, 2014) (ref), striving to keep the urban landscape(s) healthy, sustainable and populated with bicycles – but this can be attributed to enormous pressure and deliberate choices, made over decades of protest, organization and planning.

What of the countries who appear to have lost the battle to the motorcar? The United States has long been held up as the bastion of the motor car, with massive industry in cities like Detroit. Germany, too, has built a solid GDP on the basis of the strength of Daimler-Mercedes, VW, Audi, Porsche, BMW and others. US and German cities were largely designed and built on the strength of the motor car, as the mass mobility system

(Buehler et al., 2021). Yet there are many examples, specifically from the past 30 years, in the period from 1990, where cities in both car-centric countries began to implement strategies to balance the mobility share and to increase cycling. Washington DC grew cycling levels from 1% in the late 1990's to 5% in 2018 – a fivefold increase. Buehler et al. (2021) describe how Frankfurt witnessed a boom from 6% to 20% over the same period. These advancements resulted from political decision-making to re-dress the city planning landscapes: allowing cyclists to travel in car-free pedestrian zones, the opening of more one way streets (always safer for cycling), and the formation of city-wide master plans connecting suburban neighbourhoods to city centers along corridors of safe, signposted and segregated bike paths. In 2005, the emergence of a strong Green political movement in Frankfurt as part of a coalition government helped push the cycling levels to 15% (Buehler et al., 2021). As previously stated, it starts with deliberate and strong political will (Vox, 2016).

Munich (Germany) has witnessed the growth, decline and subsequent growth of cycling in line with political, social and economic events, as outlined in De la Bruheze et al. (2018). From a wartime high of 40-60%, to a significant drop to 6-8% during the postwar car and economic boom (1950-1970), and then gradually increasing to its current 17%, the city has responded in dramatic fashion to the changes it has encountered. In times of economic turmoil, citizens often shift to cycling over the more costly car – and then reverse this as soon as it becomes financially possible to drive once more. Is it a question of laziness? Cultural acceptance? In neighboring Holland, the Dutch largely choose to use bicycles as a form of transport whether the household finances allow for the use of the car daily, or not (De la Bruheze et al., 2018). For them, it is question of practicality – the country is largely flat, the bike lanes are good, the neighbors also ride bikes, it is healthy, and one can perfectly manage almost all local trips by bike. For the longer journeys, or those that may involve the carrying of heavy goods, the car can then be used (Aldred, 2014).

Rachel Aldred (2014), looking at investment in cycling, suggests that were the UK to bring their levels of cycling to those seen in Denmark, the National Health Service (NHS) would save 17bn pounds over 20 years. Their research shows cycling to save 33% of the road space, thereby reducing congestion. As a form of transport, cycling increases the mobility of the poorest by 25%, resulting in greater access to education, employment and purchasing opportunities. Road deaths have been shown to reduce by 30% with greater investment in sustainable mobility. Investment in bicycle lanes increases shopping trips – retail sales can increase by as much as 25% with a larger captive market using different modes. A shift of just 10% from cars to bicycles would save 400 productive life years by reducing air pollution (Aldred, 2014). Bicycle parking takes up only 12% of the space of a car – one can park 8 bicycles in a single car bay. And finally, an adoption of Dutch cycling safety standards could reduce cycling fatalities by 66% (Aldred, 2014).

The Institut Public de Sondage d'Opinion Secteur (IPSOS, 2022) outlines the statistics around increased safety resulting from increased levels of cycling. The Netherlands, China, Sweden – to name but three countries with the highest percentages of bicycle use as their primary transport - notably experience the lowest levels of danger when using bicycles on their daily commute. South Africa, conversely, with a <5% share of commuter cycling, experiences over 50% of those polled suggesting that they do not feel safe when cycling: this supports the argument provided by Vanderschuren et al. (2022), as cited earlier.

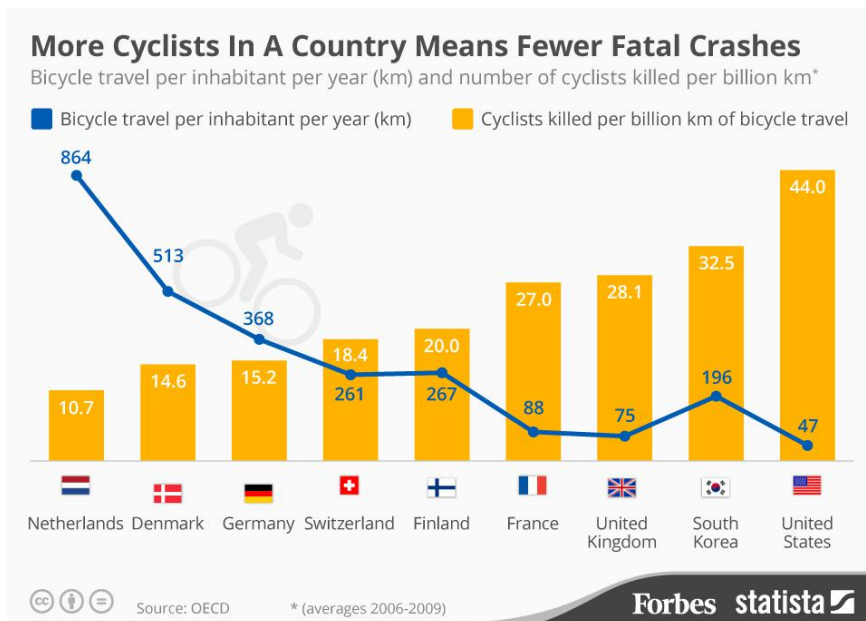


Figure 4: Fatalities vs kilometres covered (Forbes, 2015)

It is clear that integration beats isolation – and city planners need to support plans to include cycling in a city planning vision from the start. The following applies:

- This method allows the bicycle to influence the spatial structure.
- Land use planning and accessibility is integrated.
- An holistic plan to address aspects of time, individual constraints and opportunities.
- Integration of cycling infrastructure into land-use planning before development occurs.
- Consider bike lane width, cyclists needs, mobility needs, environment.
- Well-planned cycling networks.
- Directness, surface, parking, safety, comfort.

3. DISMANTLING THE BARRIERS TO SAFE, ACTIVE MOBILITY

As introduced earlier, the barriers to cycling are profound and wide – and to understand the impact they have, it is critical to carefully examine the issue of gender. The bicycle gave women the freedom to travel outside the home of their own power. Bicycle riding also necessitated more practical clothing for women and led to significant changes to female attire in society. Susan B. Anthony stated in 1896: ‘Let me tell you what I think of bicycling. I think it has done more to emancipate women than anything else in the world. I stand and rejoice every time I see a woman ride by on a wheel’.

In ‘Barriers to cycling for women and minorities’ Amy Lubitow (2017) reports on the complex nature of the culture behind cycling and the multitude of barriers that exist as a result. These include issues of safety – the necessary inclusion of segregated, protected lanes; visibility and harassment – the need for group rides, bike buddy programs, and bystander support, appearance/practicality – availability of safe areas to lock bikes, shower and change facilities, and elitism/discrimination in bike shops – where women, and people of colour, are often subjected to gender and racial discrimination and treated poorly. These factors add up to a culture, which alienate the presumed ‘out groups’ from partaking in a form of travel that, in reality, ought to be the most inclusive of all modes of travel – it is low-cost, healthy, practical, fun, good for the environment, and ideal over

distances up to 10 km (which forms a large percentage of most daily trips). Cycling as a discipline or modal share ought to be owned by all, and celebrated equally by all.

4. CONCLUSION

The call for expanding active mobility provision in the urban environment is significant. Both cycling and walking are in need of increased investment, planning, design, build- and education initiatives - the latter specifically to support and enhance the potential to grow with the changing cityscape. Already, walking forms a large component of mobility in South Africa, but is largely invisible, and in many instances is ill-equipped and undignified for those that commute on foot. The captive market makes do, often in badly designed and dangerous environments, for it is the only economically affordable alternative way in which to access school, employment, shops, or visit friends and relatives. For the most part, this large category of our society, mostly from low-economic areas, stay silent and simply find a way to reach their destination.

Health related challenges as cited here, aggravated further by the Covid-19 pandemic, has provided the opportunity to bring about a change, a shift in how we design and build our cities. Climate change factors/activists have been demanding this for decades already, albeit for different reasons. Many cities around the world have responded to climate and health challenges with a strategic redesign of their urban mobility planning.

The decision to use a bicycle as your daily transport is something altogether distinct and unique. Walking and cycling are close relatives, but they are not the same. Planning for both walking and cycling needs to form part of the same master-plan, but with specific goals, targets, insights and indicators. This is so as to ensure that the two speak coherently to one another, and to highlight the close connection between the two modes, both of which encourage a simple and healthy picture of the mobility of a city, whilst at the same time having distinct and individual strategies. Cycling for mobility is in a different place to walking, given the nature of the mode, its classification in many countries, including South Africa (as a non-motorised vehicle, to be utilized on the roads alongside motorised vehicles), the cultural challenges to cycling, the dangers involved in sharing space with cars, and the relative expense of, and access to, bicycles. The act of using a bicycle as a form of mobility requires training in the practice of cycling, the funds to buy and regularly service a bike, a place to secure it, an understanding of the rules of the road, and having to negotiate a narrow space alongside fast moving vehicles. As an overarching paradigm, a new direction of political will is required – one that creates dignified spaces and opportunities for the most vulnerable in our society. A strategy that places the needs of those most challenged in terms of access to opportunities at the forefront of their strategic planning and implementation. This is realized through the provision of dignified pedestrian and bicycle infrastructure, linking people with education, employment, recreation and retail opportunities for as many communities as possible. The bicycle forms a large component of this planning, given the nature of trips (distance, function, available time). Policy change, city design, and the formation of a 15-minute city, will all contribute to this result.

South African Economics scholar Margaret Legum, in her presentation to Velo Mondial Cape Town 2006, described the role of the bicycle in the economy as such: “There is much evidence to suggest we are now moving to a new phase where work will comprise livelihoods rather than jobs, when people will work for themselves; bicycle transport fits perfectly into this paradigm, and by its very nature is profoundly democratic”. The nature of work in the 21st century has changed – and with it, mobility needs to. The bicycle

constitutes an essential component of this new paradigm. The strategies discussed above need to work faster and more effectively together to ensure this outcome: a new paradigm of mobility and cycling in our cities.

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