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MALAWI BICYCLE MARKET SYSTEM PROFILE

USAID Bicycles for Growth Project

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
BFG	Bicycles for Growth
DHS	Demographic and Health Surveys
DRTSS	Directorate of Road Traffic and Safety Services
FGD	Focus Group Discussion
GoM	Government of Malawi
IFC	International Finance Corporation
JAA	J.E. Austin Associates, Inc.
JICA	Japanese International Cooperation Agency
KII	Key Informant Interview
MCC	Millennium Challenge Corporation
MMD	Malawi Millennium Development Trust
MTPW	Ministry of Transport and Public Works
MWK	Malawi Kwacha
NGO	Non-Governmental Organizations
NMT	Non-Motorized Transport
NTMP	National Transport Master Plan
NTP	National Transport Policy
RA	Malawi Roads Authority
RFA	Roads Fund Administration
SADC	Southern Africa Development Community
UN	United Nations
USDA	United States Department of Agriculture
USAID	United States Agency for International Development
USD	United States Dollar
WBG	World Bank Group
WBR	World Bicycle Relief

Note on Currency and Exchange Rates

The Malawi kwacha (MWK) and US dollar (USD) are both referenced in this report depending on the source of information. All MWK figures are also presented in USD terms. The USD:MWK exchange rate used throughout the report is 1 USD: 815 MWK based on the approximate rate over the period of data collection. In some cases, USD values may be rounded.

MARKET SYSTEM OVERVIEW

The framework used for this assessment considers three core, interrelated pillars which collectively form the bicycle market system (see Figure 1, following page):

1. Demand,
2. Supply, and
3. (Supporting) Systems.

The Demand pillar of the market system consists of both the individuals and institutions that generate demand for bicycles. While the acquisition and ownership of bicycles are important aspects of demand, they are not the sole consideration. Demand for bicycles is also generated by those individuals utilizing bicycles even as non-owners, such as when borrowing or renting bicycles from neighbors or hiring a bicycle taxi for personal transportation or moving goods. This is important to recognize in the Malawi context, as a substantial share of bicycle *users* are not bicycle *owners*. In the survey conducted by the Bicycles for Growth activity (BFG) in eight market locations across four districts, two-thirds of respondents indicated they used bicycles at least several times per month compared to the slightly more than one-third of respondents who reported ownership of a bicycle within their household. Importantly, a range of institutions including government agencies, donor institutions, and NGOs within Malawi make use of bicycles during their activities – for example, providing bicycles to community health workers to facilitate service delivery. Although bicycle affordability and resource considerations are typically most pressing, users and non-users consider a range of factors when deciding whether and how to use a bicycle, including road safety and transportation alternatives.

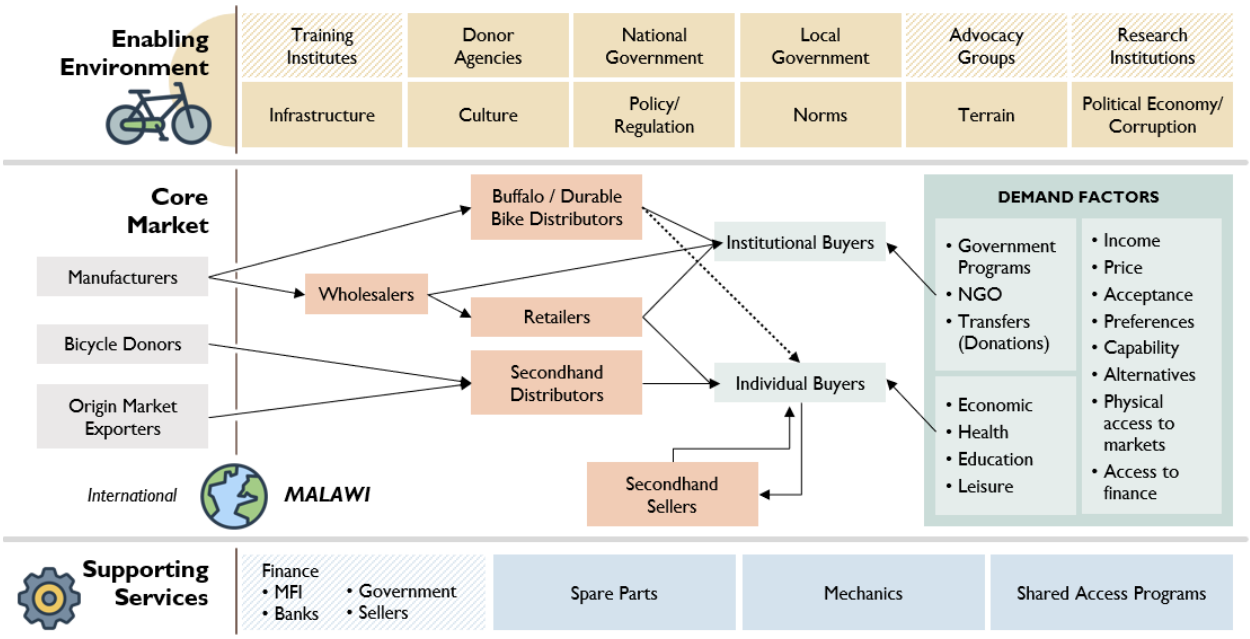
Within the Supply pillar, there are several channels through which bicycles ultimately reach interested buyers. Virtually all bicycles within the market system are imported from international sources. These imported bicycles include new mass market bicycles (typically manufactured in China and India and available at relatively low-price points), new upmarket bicycles (such as the Buffalo Bicycle[1]), and used bicycles (sourced from a variety of locations including North America and Japan). These bicycles are sold across the country in dedicated bicycle stores, hardware shops, agro-dealers, and other outlets. Consumers report that accessing bicycles for sale is generally not a challenge. Further, the secondary bicycle market is quite active, with most bicycle owners reporting that their bicycles were used at the time of purchase. Many individuals acquire their bicycles from other individuals in their community and bicycles are often more than four years old, despite common perceptions that many, if not most, bicycles being used are of low quality.

The Systems pillar includes actors that directly support the ongoing usability of bicycles (namely mechanics and spare parts sellers), sources of finance, and government agencies. Related to the lifespan of bicycles within the market described above, is the issue of maintenance and repairs – perhaps the most consequential element of supporting system. The market for spares parts is healthy and like the bicycles themselves, spare parts are widely available (with some exceptions) – however, market actors report affordability and quality are issues. Bicycle mechanics are common and owners can usually find someone to address common problems. Policymakers are generally not focused on bicycles or bicycle issues and often do not make special consideration of bicycles in planning, infrastructure development, or policymaking. When they do consider bicyclists, it is often framed in terms of road safety issues and

[1] Buffalo Bicycle Limited is a wholly owned, for-profit subsidiary of BFG project partner, World Bicycle Relief.

particularly the interaction between cyclists and motorized transport. The exception to this being concerns on the part of local policy makers regarding bicycle taxi operators, whom they often regard as ignoring the rules of the road. This general neglect has led to a dearth of bicycle infrastructure and often unsafe conditions on the road for bicycle users. Market system actors seldom use finance, with loans to individuals for purposes of acquiring bicycles nearly absent, and limited use of finance on the part of retailers to address working capital constraints.

FIGURE 1: BICYCLE MARKET SYSTEM MAP



ASSESSMENT METHODOLOGY

In carrying out this assessment, BFG used a combination of desktop research and primary data collected through key informant interviews, focus group discussions, and a quantitative survey. The BFG team conducted more than 55 interviews and meetings with actors representing all three pillars of the market system, including importers, retailers, institutional buyers, national and local government officials, donor agencies, donor projects, NGOs, community leaders, microfinance institutions, spare parts sellers, mechanics, logistics providers, and researchers. BFG caried out nine focus group discussions, primarily to collect insights from users – especially women – and bicycle-based businesses. The survey collected information from individual demand side actors at eight rural and peri-urban market sites in four districts (Mzimba, Mchinji, Salima, and Zomba).

Primary data was also collected in the form of a Participatory GIS (PGIS) by World Bicycle Relief and the Zomba chapter of the USAID Youth Mappers, in March 2022, in collaboration with the USAID GeoCenter. This PGIS included one focus group of women, one focus group of men (with 15 participants in each), and three days of transect walks and bicycle rides with participants within the region of Govala market and Malindi Secondary School. Using KoboCollect, YouthMappers captured information about challenges faced by interviewees, prices and availability of spares, most popular bicycle brands, numbers of bicycles arriving/departing at key destinations, as well as distances travelled, destinations, trip purposes, travel modes, and barriers and obstacles to travel. YouthMappers visited formal bicycle stores/spare parts sellers to follow up on challenges emerging during interviews. The map

developed as a result of the spatial and narrative data collection ddelivers insight into the reasons bicycle users need frequent repairs (road conditions), visualizes the distances people travel by bicycle, and for what purpose, and provides an indication of the impact road and river crossing maintenance would have on travel time and safety. Further, it provides evidence to support and strengthen the findings of the earlier BFG assessment.

Unless otherwise noted, all references to survey data in the report refer to the survey conducted by BFG. Annex 2: Methodology and Annex 3: Questionnaire provide details on BFG's approaches to data collection.

COUNTRY CONTEXT

Malawi is a landlocked country in Southern Africa, surrounded by Mozambique, Tanzania, and Zambia. With a projected population of nearly 19 million people in 2021, more than 80 percent of the population is resident in rural areas of the country.[2] Females comprise 52 percent of the population,[3] and nearly four fifths (78 percent) of the population is aged under 35 years.[4] Subsistence agriculture is the main source of livelihoods; overall, at least 80 percent of households in the country are engaged in agricultural activities, but the share is greater in rural (93 percent) than urban (40 percent) locations. Malawi has one of the lowest unemployment rates in the world,[5] but has high levels of poverty. The most recent statistics show that half (51 percent) of the population live below the national poverty line,[6] while approximately 70 percent lived below $2.15 a day (2017 PPP). The majority of those living in poverty are found in rural areas.

A large percentage of the population is financially excluded from formal financial services. Less than half (43 percent) of persons aged 15 years and above have access to either a financial institution account or mobile money account or both, while only 20 percent of the population have financial institution accounts.[7] Low access to formal financial services is driven primarily by lack of sufficient money to use the account (87 percent of those without accounts), lack of necessary documentation (49 percent), cost of operating accounts (33 percent), and lack of truest in financial institutions (22 percent).

MOBILITY CONTEXT

Although data on modal split in Malawi is scarce, available information indicates that non-motorized transport (NMT) is commonly used in Malawi, especially in rural areas. Bicycles represent 85 percent of wheeled vehicles on tertiary and district roads in Malawi[8], suggesting that bicycles are an important mode of transportation in the country.

Malawian bicycle ownership rates are relatively high among sub-Saharan African countries, ranking 6th among the 42 countries for which DHS survey data is available.[9] Ownership rates increase in rural areas: 42 percent of rural households own bicycles, compared to 30 percent of urban households.[10] Bicycle ownership in Malawi has a greater positive impact on rural consumption and income compared to those of urban households.[11] Bicycle taxis are popular in Malawi, offering affordable transportation solution for those who cannot afford motorized travel and is a source of income for those engaging in the business. In

[2] National Statistical Office, Malawi Government. 2022. Malawi in Figures 2022.
[3] National Statistical Office, Malawi Government. 2022. Malawi in Figures 2022
[4] National Statistical Office, Malawi Government. 2020. 2018 Malawi Population and Housing Census.
[5] International Labour Organization. 2023. Statistics on unemployment and labour underutilization. https://ilostat.ilo.org/topics/unemployment-and-labour-underutilization/
[6] Population with consumption (expenditure) levels lower than K165, 879 were defined as living below the national poverty line.
[7] World Bank. *The Global Findex Database 2021*.
[8] RoM, "National Transport Policy", Policy draft: third edition, 2019
[9] Malawi Demographic and Health Survey, 2015-2016
[10] Ibid
[11] Teddy Triza Nakanwagi et al., "The Effect of Bicycles on Household Poverty, Per Consumption, Enterprises and Education in Malawi: Correlational Analysis," *SSRN Electronic Journal*, 2021

the BFG survey, nearly half (45 percent) of bicycle owners and a fifth (21 percent) of non-owners reported that they had used a bicycle for bicycle taxi business.

Equity in access to transport more generally, not specifically for cycling, is acknowledged as a mobility issue in Malawi's National Transport Policy (NTP), although structures for implementing gender mainstreaming are not yet fully established.[12] The NTP acknowledges that access to transport may be more challenging for women and for the disabled community.[13] There is no evidence that more specific policies directly addressing these challenges have been implemented, nor is there data available that describes differences in access to transport and NMT based on gender.

TRANSPORT MODE AND NEED ANALYSIS

Although not nationally representative, the BFG survey provides some insights into modal share in Malawi. Most BFG survey participants (93 percent) rely on walking or bicycles to travel to work or to market, an indication of the importance of non-motorized transportation to the lives of people in living in the four target locations, and in Malawi in general. Between cycling and walking, cycling offers the ability for quicker and further travel. Although travel times can be highly variable depending on terrain and infrastructure, one study of healthcare access and mobility estimated that among people living with HIV in remote rural Malawi, roundtrip travel times to healthcare facilities can exceed 4.5 hours while the same trip may take 3.5 hours via bicycle.[14]

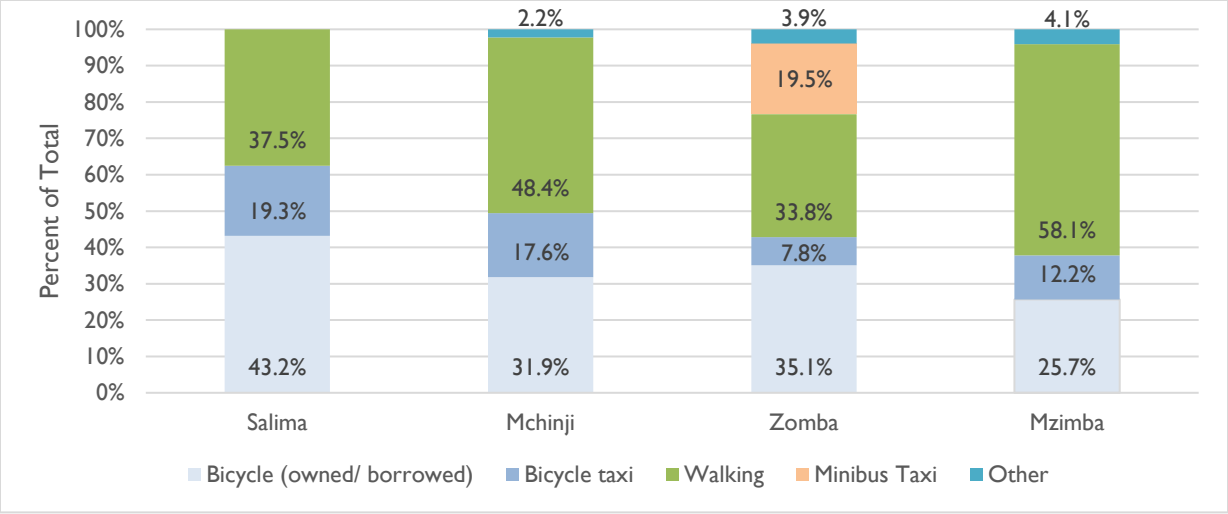
In the BFG survey, bicycles emerged as the most popular mode of transportation, used by 49 percent of those surveyed when considering both user owned/borrowed bicycles and bicycle taxis. This was followed by walking, as reported by 44 percent of survey participants.

Transport mode varied substantially by district within the survey, as indicated by **Error! Reference source not found.**. Among surveyed districts, Salima stood out with 63 percent of respondents indicating using bicycles in some form to access employment or markets. This reinforces a widely held perception that bicycles are particularly widespread within Salima, as noted by stakeholders from across districts in conversation. By contrast, Mzimba was the district with the lowest rate of bicycle usage in this measure – a still sizable 38 percent. At the same time, Mzimba had the highest reported rate of walking at 58 percent – a full 10 percentage points higher than the next closest district for walking. It should be noted that much of the terrain in Mzimba is relatively hilly and less conducive to cycling than other districts with substantially flatter terrain.

Notably, Zomba was the sole district in the survey in which individuals reported using minibus taxis while also having the lowest rate of walking and lowest rate of bicycle taxi usage. This may indicate that with the presence of affordable shared motorized transport, individuals will bypass bicycles and utilize minibus taxis instead.

[12] Malawi, National Transport Policy, 2019
[13] Ibid
[14] Palk et al.

FIGURE 2: PRIMARY MODE OF TRANSPORTATION TO WORK/ MARKET BY DISTRICT

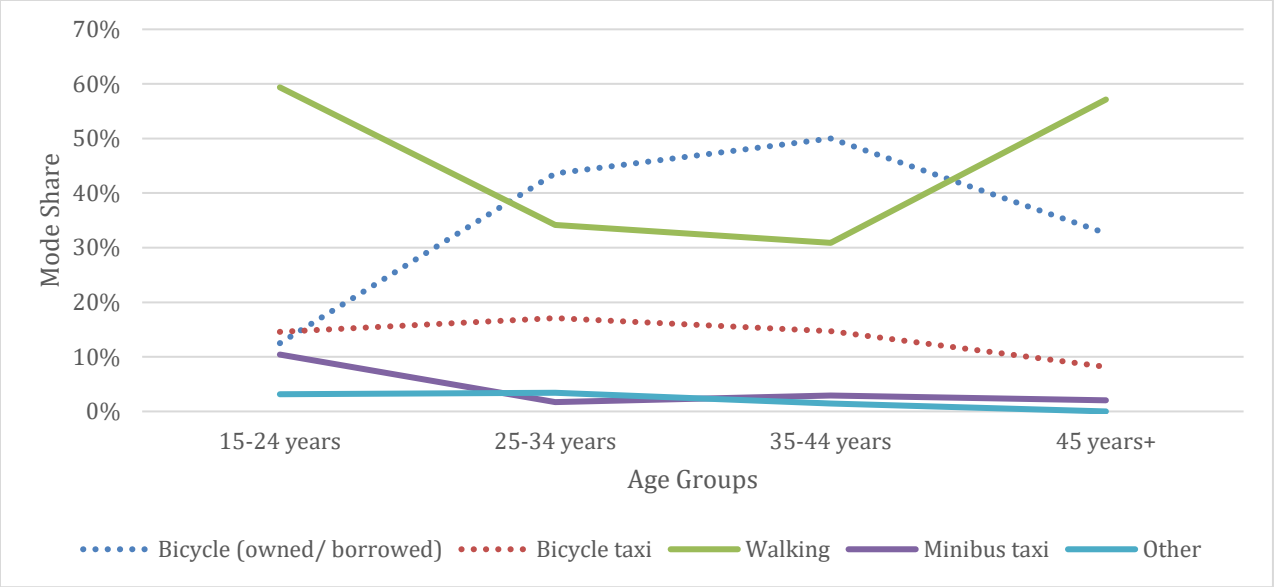


Another key observation from the survey participants is the variation in transportation modes across gender. The vast majority (63 percent) of women rely on walking. This is significantly higher than the percentage of men (30 percent) who report that walking is their main mode of transportation. While women constitute 60 percent of all those who walk to work or market, they comprise only 26 percent of those who use bicycles as the primary mode of transportation. Generally, women are more likely to be passengers on bicycles than to be cyclists: 50 percent of those who used bicycle taxis were women compared to 16 percent of those who cycled to work or market. Taken together, these data points indicate that women are, relative to men, underutilizing bicycles for mobility and stand to benefit from increased utilization and ownership.

The popularity of bicycles as a mode of travel is lowest among younger age groups compared to older age groups; 27 percent of those aged under 25 years used bicycles as primary mode of transportation for travel, compared to 58 percent of those aged 25 years or above.

Certain patterns between groups also emerge from the survey data. As displayed in **Error! Reference source not found.** below, there is a U-shaped pattern in terms of primary mode of transport to work or market across age groups with regards to both bicycles and walking. Walking is the preferred mode for the youngest (under 25) and oldest (over 45) groups of survey respondents, however this falls for those in the middle age groups. An inverse pattern emerges in terms of bicycle usage, with rates of bicycle usage highest among middle-aged respondents.

FIGURE 3: PRIMARY MODE OF TRANSPORTATION ACROSS AGE GROUPS



While the NTMP notes that bicycle use has increased rapidly, the MTPW believes this is not sustainable, and anticipates significant changes in bicycle use over the next decade or so. The growth in bicycle taxis is likely to slow down or decline with the growth of motorbike taxis and more affordable public transport. Demand for bicycles is reducing as motorcycles are easier to come by and are better able to serve users' mobility needs in shorter amounts of time. This is particularly true with regards to taxis and bicycle-based businesses. Most bicycle taxi operators note the increased competition from motorcycle taxis. Retailers have taken notice as well, noting declines in demand for bicycles from businesses (although demand continues from household buyers).

Bicycle use in urban areas is mostly likely to lose its value as a commercial or income generating mode. In rural areas, the role of bicycles is more likely to remain vital for transport and income-generation, as the pace of infrastructure development is likely to be slower. Growing rural household incomes will also help to address bicycle affordability. Although there is growth in motorized alternatives, these remain limited in many areas. In the short- to medium-term, bicycles represent an important means of enhancing mobility and accessing opportunity relative to walking.

DEMAND

Demand for bicycles in Malawi is robust, with upwards of 1.4 million bicycles present in the country.[15] Bicycle use is widespread, with bicycles being the primary mode of transportation to market for more than one-third of survey respondents. Among individuals and households, bicycles serve many purposes – general transportation, facilitating access to services, supporting household chores, assisting with farm activities, and enabling direct and indirect income generation. Bicycle usage and access at the household level is often tied to economic activity. Bicycles play a vital role in addressing mobility challenges for individuals and households with limited resources and alternatives. While bicycles can be high-cost assets relative to incomes, utilization does not necessarily require ownership. The majority of bicycle users are making use of bicycles they themselves do not own – whether it is in the form of renting from a community member, borrowing from a relative, or hiring a bicycle taxi.

Institutional buyers, including government agencies and donor projects, are a distinct and noteworthy category. These institutions make use of large volumes of bicycles as means of addressing their own organizational mobility issues – often in accessing rural communities or facilitating mobility for project stakeholders in rural areas.

Affordability of bicycles remains the largest constraint on the demand side of Malawi bicycle market system. Among surveyed non-owners, 95 percent of respondents cited affordability issues as the primary reason they did not own a bicycle.

CHANNELS OF DEMAND

As previously noted, two major market segments serve as sources of demand within the Malawi bicycle market system: individual users and institutional users. While both are significant within the market system, these differ in several important respects, as detailed below.

INDIVIDUAL

The largest source of demand for bicycles within Malawi, both in terms of ownership and utilization, are individuals. Malawi is a nation of more than 19 million people, of which more than 80 percent live in rural areas.[16] Bicycle ownership rates are relatively high, with 2015-16 Demographic and Health Surveys (DHS) finding that 40 percent of Malawian households possess a bicycle – a rate that is double the regional average of 19.5 percent.[17] Other national surveys indicate comparable levels of bicycle ownership.[18] Bicycles can be particularly valuable for rural households because walking is the primary mode of transportation and alternatives are often limited either in their availability or affordability.

[15] This estimate is derived from 2018 Malawi census, which indicates that there 4.0 million households in Malawi, and the 2020 Integrated Household survey, which indicates that 34.7% of households own a bicycle. Both of these were implemented by the Malawi National Statistical Office.
[16] World Bank.
[17] Demographic and Health Surveys. Regional average calculated based on most recent surveys during 2012-2021 period from 31 sub-Saharan African countries.
[18] While there is a degree of variation across survey sources, they remain close in their findings.

Bicycles are regarded as important assets in rural areas, particularly where many villages are inaccessible to affordable motorized transport and household resources are limited. In these areas, bicycles are prized assets with economic value and indicators of status.

However, perceptions in urban areas differ. Urban users indicated bicycles are a marker of poverty – a perception exacerbated by the rapid increase in the number of motorcycle taxis which are faster, can travel further, carry heavier loads and numbers of passengers, and involve less physical exertion.

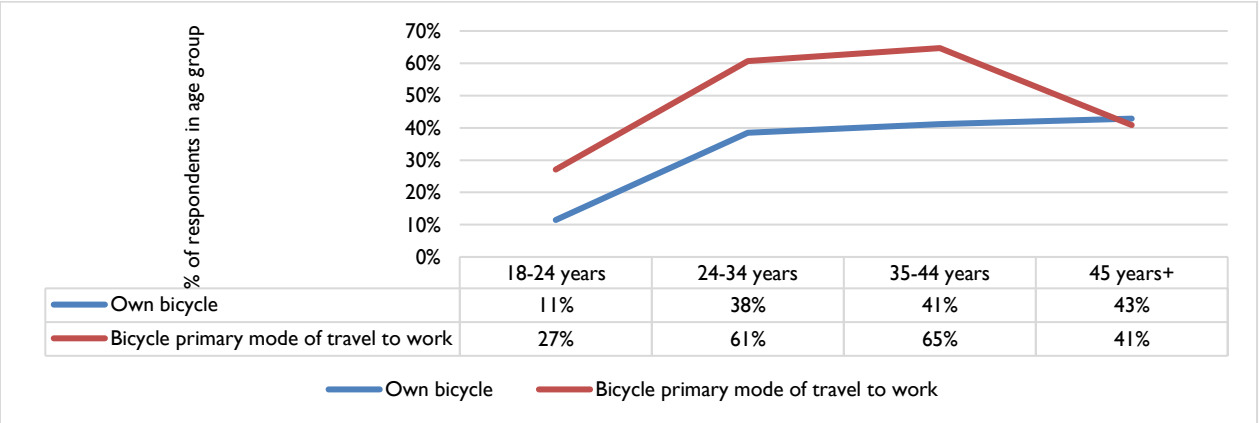
While the individual bicycle market is large in terms of the number of potential buyers and uses, it is still broadly resource constrained. GDP per capita is under US$650,[19] making the cost of even a lower end mass market bicycle (starting around US$60) a substantial outlay.

Although bicycle ownership is itself relatively high in Malawi (37 percent of respondents in our survey indicated owning a bicycle within their household), an even larger number of individuals and households utilize bicycles that they do not directly own through several means, such as borrowing and renting from within their community or hiring bicycle taxis. These channels of non-ownership utilization also contribute to underlying demand for bicycles within the market system.

Little is known about the characteristics of bicycle owners in Malawi on a national scale. Available data is limited to surveys that NGOs such as WBR have administered to their customers. The BFG survey found that demand for bicycles is most pronounced among men than women. Nearly half (45 percent) of men surveyed by BFG owned bicycles, compared to 15 percent of women. Demand is also more pronounced among older age groups, compared to younger age groups. In the BFG survey, the share of those aged 55 years and older with bicycles was nearly five times the share of youths (18–24-year-olds) with bicycles (see Figure 4).

Individual bicycle users engage in the markets for both new and used bicycles. Within the new bicycle market, individuals typically purchase mass market imports in the US$60-$100 range. They may also acquire bicycles through non-market channels, such as donations from NGOs or as gifts from individuals. Nearly 10 percent of bicycle owners surveyed by BFG indicated that they did not pay for their bicycle.

FIGURE 4: BICYCLE OWNERSHIP AND USAGE BY AGE GROUP



	18-24 years	24-34 years	35-44 years	45 years+
Own bicycle	11%	38%	41%	43%
Bicycle primary mode of travel to work	27%	61%	65%	41%

[19] World Bank.

INSTITUTIONAL

Many institutions within Malawi make use of bicycles. These institutional buyers in Malawi include government ministries, donor agencies, NGOs, and other organizations. These institutions commonly own fleets of bicycles which are utilized by staff in the execution of their duties, such as community health workers visiting patients or extension workers going to farms. The size of these fleets can vary from a few bicycles to thousands of bicycles – with some recent public tenders seeking to procure more than 10,000 bicycles. Some institutional buyers use bicycles in addition to other forms of motorized, such as motorcycles. The choice to purchase bicycles over other forms is often driven by upfront costs and the practical aspects of maintaining a fleet of vehicles to meet significant mobility needs.

Compared to individual users, institutional buyers face fewer resource constraints. Institutional buyers indicated less price sensitivity. They typically seek to acquire more upmarket, durable bicycles. Procurement is often (but not always) conducted through public tenders laying out desired product specifications, of which price is one of several award criteria.

While estimating the total market for institutional purchases versus individuals is difficult, BFG estimates institutional users represent a significant share of the bicycle market. Consider that in a given year approximately 85,000 bicycles are imported to Malawi through formal channels and that in 2021 Buffalo Bicycles, a notable supplier to institutions, distributed 14,500 bicycles to institutional buyers in Malawi.[20]

BICYCLE OWNERSHIP AND ACCESS MODELS

There are several modes of bicycle ownership and access. Although bicycle usage is widespread across Malawi, ownership is less common than usage. In addition to ownership, users have multiple means of access to bicycles, such as shared access with family or community members, rental, or bicycle taxis.

OWNERSHIP

Bicycles are either owned by individuals or by the household (joint ownership). Overall, just 32 percent of all survey participants owned bicycles as individuals, though a slightly higher share (37 percent) reported owning bicycles at the household level. This is consistent with other sources such as the DHS and the 2020 national integrated household survey which found that 34.6 percent of households overall (and 36.6 percent of households in rural areas) reported ownership of bicycles.[21] One implication of this is that *ownership* at the *household* level is not necessarily consistent with *access* at the *individual* level. This ownership-access difference often reflects gender dynamics. Although many female focus group participants report that they have ready access to the bicycle within their household or that access is decided based on the priority of competing potential uses (e.g., income generation versus making a social visit), some indicate that male relatives (particularly husbands) restrict access.

The majority of bicycle owners (79 percent) are also the primary users of the bicycles. However, women are less likely to be the users of the bicycles they own. The majority of female bicycle owners

[20] Based on data from UN Comtrade and WBR's *2021 Global Impact Report* and data from Buffalo Bicycle Limited Malawi.
[21] National Statistical Office, Malawi Government. 2020. The Fifth Integrated Household Survey (IHS5) 2020 Report.

(67 percent) were not in fact the primary users. In comparison, 90 percent of men who owned bicycles were also the primary user of their bicycle. The rest of the male bicycle owners (10 percent) reported that the primary users of their bicycles were mainly their children and not their spouses. In general, women were less likely to be the owners or users of bicycles: 80 percent of all bicycle owners were men and 92 percent of all primary users were men.

BFG found no significant differences in individual bicycle ownership rates across the four districts or across geographical settings. However, significant differences across gender are evident; the percentage of men who owned bicycles was three times that of women. Bicycle ownership is higher among older respondents; the percentage of those aged 35 years or over who owned bicycles was four times that of under 25-year-olds. Bicycles ownership appears to be more popular among merchants and farmers. Just under 50 percent of formal merchants owned bicycles, and nearly 40 percent of farmers and informal merchants were bicycle owners. BFG found no significant differences in bicycle ownership across education levels of the respondents.

Bicycle acquisition has a seasonal component, particularly in agricultural communities. Retailers notice sales increase substantially following harvest season when incomes are higher. Correspondingly these sales drop during the agricultural offseason. These results comport with the relatively high upfront cost of acquisition and the relative seasonality of incomes.

People tend to own bicycles for long periods of time. At the time of survey, the average number of years that individuals had owned bicycles was 4 years and 10 months. Fifty percent of the respondents reported that they had owned their bicycles for at least 3 years, while 10 percent had owned them for at least 10 years, while 5 percent had owned bicycles for at least 15 years. The longest number of years of ownership reported was 27 years. Both new and previously owned bicycle were owned for long periods of time.

INDIVIDUAL/HOUSEHOLD SHARING AND BICYCLE HIRE

Bicycles in Malawi are shared both within and outside the household. Findings from the survey participants show that 71 percent of bicycle owners reported that they lent their bicycle to other people outside of their households. The rate was highest in Salima and Mzimba, where 88 percent and 80 percent of bicycle owners in the two locations, respectively, reported lending out the bicycle, compared to Mchinji (61 percent) and Zomba (57 percent). Focus group respondents reported varying levels of difficulty in finding a third-party bicycle to use, with some reporting it is always possible to find a bicycle while others reported challenges (though this may reflect individual unwillingness to lend a bicycle). These focus groups indicated that renting a bicycle for a fee is more common than borrowing at no cost.

Payment for borrowed bicycles varies depending on distance, usage, and relationships. In Salima, for example, respondents reported paying in the range of MWK500 (US$0.61) to MWK1,500 (US$1.85) to rent a bicycle.

Within surveyed districts, between 79.7 percent (Mzimba) to 89.6 percent (Zomba) of respondents strongly or somewhat agreed that they were satisfied with the availability of bicycles in their communities. While this level of satisfaction is high, it should be noted that Mzimba was lower in terms of both overall satisfaction and intensity. Lower satisfaction within Mzimba may reflect several

differentiating factors – the topography includes more hills and is less conducive to cycling relative to other survey locations, the supply of bicycles for sale may be more limited in quality or other preferred features, and the supply of bicycle services (e.g., taxis) may be more limited (as discussed below).

Users and owners manage repairs to borrowed or rented bicycles in a variety of ways: at times, the owner will split the cost of repairs, and in others, will charge the full cost to the borrower.

BICYCLE TAXI SERVICES

Bicycle taxis, known locally as *kabazas*, are widely used. These bicycle taxis charge customers based on several factors including distance, terrain, number of passengers, and luggage. In addition to moving people, they also often serve as couriers moving goods or running errands for a fee.

Among all survey respondents, 14.5 percent indicated bicycle taxis were their primary mode of transport to work or market – the third highest mode after walking (44.2 percent) and an individually owned or borrowed bicycle (34.2 percent).[22] However, this varied substantially across districts. Just 7.8 percent of respondents in Zomba used bicycle taxis a primary mode of transport. However, Zomba is the one district in the survey in which respondents reported notable use of minibus taxis, indicating that these served as substitutes for bicycle taxis. Respondents in Mzimba were also relatively less inclined to use bicycle taxis as their preferred mode of transport. Interview subjects reported the presence of bicycle taxis in the district is relatively limited due to the challenging terrain and the wider presence of motorcycles (which is in part tied to the issue of the terrain).

Even when households own a bicycle, it is common for them to make use of bicycle taxi services, as the household bicycle may be in use by other family members or there may be access limitations.

Bicycle taxi operators often form associations with other operators. These associations serve to organize activity, particularly around taxi ranks, and may provide some limited services to members, often in an informal manner. Public agencies have also encouraged the formation of associations as a means of engagement with bicycle taxi operators, who are generally viewed negatively by policymakers due to their perceived lawlessness. The associations provide voice to the views of their members during the policy development process, and communicate changes in policies and regulation to members, although this does not appear to be happening on widespread level.

Not all bicycle taxi operators own the bicycles they utilize. One operator in Salima, for example, estimated that 75 percent of taxi operators own their bicycles and 25 percent make use of bicycles owned by others. Non-owner bicycle taxi operators pay daily or weekly rental fees to the owner. In Salima, this was reported to be in the range MWK600-700 (US $0.74-$0.85) per day or MWK3,000-3,500 (US$3.68- $4.30) per week.

While nearly all bicycle taxi operators are men, a higher share of women (16.9 percent) report relying on bicycle taxis as their primary mode of transport relative to men (12.8 percent). This may be due to

[22] A more detailed analysis of these themes is presented under "**Error! Reference source not found.**" in the Systems section of the report.

men's likelihood to control access to the bicycle within a bicycle-owning household, or individual ownership of a bike.

The bicycle taxi sector is highly competitive with many service providers offering identical services, low barriers to entry and exit, and wide availability of bicycles and supporting services. While it is generally easy for consumers to make use of bicycle taxi services, the sector faces mixed long-term prospects. Many bicycle taxi operators and other market system actors observe a long-term movement away from bicycle taxis and towards motorcycle taxis or other forms of motorized transport. While bicycle taxis are generally more affordable relative to motorcycles, motorcycles are nonetheless affordable to many and bicycles face greater limitations in terms of travel time, carrying capacity, and terrain.

A taxi operator in Govala (Zomba district) reported the price for the 8-kilometer trip to Matawale for a bicycle taxi is in the range of MWK600-700 (US $0.74-$0.85) compared to MWK1,000 for a motorcycle taxi (US$1.25). Bicycle taxi operators also note that in some cases, motorcycle taxi operators will draw customers away from them by offering to transport at only a marginally higher fare than the bicycle taxi. Many of the bicycle taxi operators interviewed indicated they would aspire to or prefer to operate *motorcycle* taxis, with cost of purchasing a motorcycle being the primary barrier to switching.

GENDER & BICYCLE USE AND ACCESS

Bicycle use by women in Malawi is not generally viewed negatively, although some women do report uncomfortable reactions by the community.

Several women users reported perceptions of revealing one's body while cycling, a negatively viewed activity by community members. However, this perception did not necessarily deter cycling. Some women cyclists wear pants underneath a skirt as one means of addressing this perception. Additionally, women who use bicycles reported a preference for lower top tubes (e.g., step-through frames) which are more accommodating of their typical clothing.

TABLE 1: PERCEPTIONS REGARDING USAGE AND OWNERSHIP OF BICYCLES BY WOMEN

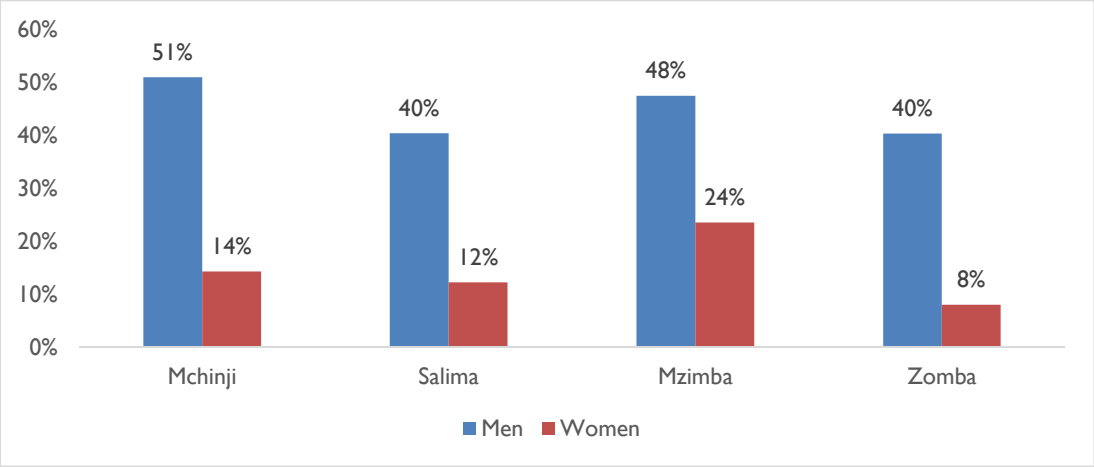
	Respondents agreeing that it is acceptable for women to use bicycles			Respondents agreeing that women will benefit from owning bicycles		
	% of all respondents	% of Men	% of Women	**% of all respondents**	% of Men	% of Women
Total (all districts)	**96%**	94.3%	98.7%	**97%**	94.7%	100.0%
Districts						
Mchinji	**90%**	91.8%	97.6%	**95%**	91.8%	97.6%
Salima	**94%**	91.5%	97.6%	**94%**	91.5%	97.6%
Mzimba	**100%**	100.0%	100.0%	**100%**	100.0%	100.0%
Zomba	**97%**	96.2%	100.0%	**97%**	96.2%	100.0%

As previously noted, women seem to have less access to bicycles than men. Some women note that they must ask their husband's permission to use a household bicycle or provide advance notice. In some cases, husbands will restrict access altogether. This is backed up by the survey, which indicates that

when the household owns a bicycle, it is most likely to be owned by a male, and women in the household are less likely to be a user of the bicycle.

Within the household, there may also be competing demand to use a bicycle between children and adult women. In this case, economic or community commitments come first. In some cases, however, children are the owners of the bicycles, having received them as part of a donation program. Women report that if the household bicycle is being used for school, they must commission a bicycle taxi to, for example, collect produce from the fields and deliver to market.

FIGURE 5: BICYCLE OWNERSHIP RATES AMONG MEN AND WOMEN BY DISTRICT



BICYCLE USAGE

The primary underlying use of bicycles is transportation of people; however, the purpose of trips can vary and bicycles can bring utility through a range of other means.

FREQUENCY AND INTENSITY OF USE

Bicycles are a popular mode of transportation in Malawi. Over half (52 percent) of survey respondents used bicycles regularly (either daily or several times per week), 14 percent used them several times a month and 33 percent used them infrequently.

Respondents spend substantial amounts of time traveling via bicycle with a reported average of 10.8 hours per week. This varied by location, with Mchinji and Salima users spending the most time traveling by bicycle, and Mzimba and Zomba users spending less time. However, BFG did not find significant usage variation across geographies. Bicycle *owners* are the most frequent and intensive users of bicycles; 87 percent of bicycle owners used their bicycles frequently, and the average hours they reported travelling on bicycles was 19 hours per week (approximately 2.7 hours per day).

Compared to women, men spend significantly more time travelling with bicycles; men spent an average of 14.6 hours per week on bicycles compared to 5.6 hours reported by women. Across economic sectors, regular bicycle usage was highest among merchants (formal and informal) and farmers who spent an average of between 11 and 16 hours per week on bicycle. This information is presented in Table 15 in Annex 6: Additional Statistical Tables.

PURPOSES OF USE

Bicycles in Malawi are used for a range of purposes. They play a critical role not just in getting from one point to another, but in unlocking opportunities and facilitating access to key services.

A substantial amount of bicycle usage and demand is tied to economic activity of various sorts. Bicycle owners identified economic activity as the most common reason for bicycle use (see Table 2), particularly among men. Even when not central to economic activity, bicycles are useful in accessing opportunities such as commuting to school.

TABLE 2: KEY USES OF BICYCLES AMONG PREVIOUS AND CURRENT BICYCLE OWNERS

Category of Bicycle Use	% of all respondents	% of Men	% of Women
Economic activity	69.3%	73.8%	56.1%
Accessing health facilities	53.4%	50.8%	61.0%
Shopping	34.4%	29.5%	48.8%
School commute	25.8%	23.0%	34.1%
Access energy	18.4%	19.7%	14.6%
Fetching water	9.8%	7.4%	17.1%
General transport	6.1%	8.2%	0.0%
Exercise	4.9%	6.6%	0.0%
Farm activities	4.3%	4.1%	4.9%

The significance of bicycle usage varied across locations and geography types. For example, the role of bicycles in healthcare access is elevated in rural areas, where individuals are generally further from health services and needs are often higher. Other research has found that in Malawi bicycling reduces average roundtrip travel time to rural healthcare facilities by nearly one hour relative to walking, addressing an important barrier to healthcare access in a country in which approximately 80 percent of people living with HIV reside in rural areas.[23] Similarly, institutions exhibit significant demand for bicycles for health activities. For example, organizations like the Ministry of Health and NGOs utilize bicycles to help deploy community health workers to rural areas for service delivery.

The PGIS process highlighted differences in the travel patterns of men and women, with focus group participants describing variations in typical destinations. The destinations which were more frequently described by men and women are presented in Table 3 below.

TABLE 3: MORE FREQUENT DESTINATIONS BY GENDER

More Frequent Destinations for Men	More Frequent Destinations for Women
Farms	Vegetable gardens
Church/mosque	Church
Boreholes	School
Markets	Childcare
Maize or rice mill	Healthcare centers
Friends' homes	Boreholes

[23] Palk, Laurence et al. "Travel time to health-care facilities, mode of transportation, and HIV elimination in Malawi: a geospatial modelling analysis." *The Lancet. Global health* vol. 8,12 (2020): e1555-e1564.

Places of work	Markets
Football ground	Village banks
Places of leisure	River for washing of clothes
Construction sites	Co-operative stores

INCOME GENERATION

Both bicycle owners and non-owners widely use bicycles for income-generating activities. Transporting goods (e.g., a merchant taking items to their shop), on farm activity, and bicycle taxi operation are among the most cited ways in which users utilize bicycles to generate income.

As shown in Table 4, the BFG survey found that 62 percent of all respondents used bicycles for income generating activities. Of these, 63 percent used them for business purposes. Comparison across economic sectors shows that use of bicycles is more common among merchants and farmers, likely reflecting the utility of bicycles for transporting goods and other items. A higher share of bicycle owners (82 percent) report using bicycles for income generation relative to non-owners (53 percent), which nonetheless utilize bicycles for income generation at relatively high levels.

TABLE 4: BICYCLE USAGE FOR INCOME GENERATION

Category	% using bicycles for income- generating activities
All respondents	**62.1%**
Bicycle ownership	
Owner	81.9%
Non-Owner	52.9%
District	
Mchinji	67.0%
Salima	64.8%
Mzimba	58.1%
Zomba	57.1%
Geographic Setting	
Rural	63.3%
Urban	53.1%
Peri-urban	68.8%
Gender	
Male	68.1%
Female	54.2%
Age Group	
15-24 years	42.7%
24-34 years	69.2%
35 years+	70.9%
Employment Status	
Farmer	61.4%
Informal merchant	77.3%
Formal merchant	88.2%
Employment- private or government	31.6%
Unemployed	44.4%

BICYCLES AS HOUSEHOLD ASSETS

In addition to their functional utility, bicycles serve as household assets. They are items of value which can be utilized by households to create liquidity through the sale of a bicycle or by utilizing it for

collateral in obtaining a loan. Some focus group participants also indicated bicycles could be used indirectly to access informal loans by indicating that they had a means of income generation and therefore creditworthiness.

CONSUMER PREFERENCES AND DEMAND FACTORS

Survey respondents cited bicycle cost as the most significant factor which, if addressed, would lead individuals to increase their bicycle usage. However, as shown in Table 5, it is not the only factor limiting bicycle usage. Cost remains a barrier even when the cost is framed around *usage* rather than *ownership*. First, some respondents may see lower bicycle costs as increasing their likelihood of purchasing a bicycle for themselves, which they would then use. These respondents may also view lower bicycles costs as increasing the overall supply of bicycles in their communities, thereby increasing their access to bicycles through borrowing, renting, or hiring affordable bicycle taxis. Second, many of the other most frequently cited factors relate to the experience of riding or owning a bicycle. Road safety, an issue identified in virtually all BFG study interviews, is a deterrent to usage nearly on the level of cost. Lack of suitable paths to ride bicycles diminishes the user experience and added to maintenance costs because of increased stress on the bicycle and likelihood of damage.

TABLE 5: TOP FACTORS TO ENCOURAGE INCREASED BICYCLE USAGE

Factors	% of interested respondents	% of Men	% of Women
Cheaper bicycles	57.7%	58.3%	56.9%
Better road safety	51.7%	56.5%	45.4%
Bicycle paths	32.9%	36.3%	28.5%
Secure bicycle parking/ storage	21.1%	23.2%	18.5%
Better bicycle design	9.4%	6.5%	13.1%

Quality, which is often used as an interchangeable term with durability, is a major consideration for bicycle owners. Bicycles are long-term (i.e., durable) household assets which are expected to serve a function and maintain some level of value over time. Consumers are particularly sensitive to this consideration due to local road and infrastructure conditions and practices such as hauling heavy loads that are taxing on bicycles and can contribute to their failure.

DEMAND DRIVERS AND CONSTRAINTS

TRANSPORT AND MOBILITY NEEDS

The fundamental underlying driver of demand for bicycles within the Malawi market system (as elsewhere) is the need for mobility. Bicycles are well-suited to meeting the mobility needs of individuals and households, particularly when walking is the primary transport alternative, and when those needs include covering short to medium distances over conducive terrain, and transportation of goods. Relative to walking (the primary alternative transport mode for most Malawians), bicycles substantially shorten trip times and increase the distances that individuals can cover.

Participants in the PGIS data collection describe trip distances in terms of journey time rather than distance. Walking trips tend to be up to 30 minutes one way, on occasion up to 45 minutes or an hour. Walking takes place mostly on footpaths.

Personal bicycles were more likely to be used for daily, shorter trips (up to 45 minutes).Bicycle taxis were more likely to be used for longer, and less frequent trips. Overall, bicycle trips (personal or by taxi) tended to be between 4-8 km one way. Motorbike taxis were more likely to be used to transport more than one passenger.

The needs of specific individuals also determine what is an optimal or fit-for-purpose bicycle for an individual. Individuals using bicycles for short trips on paved roads put less wear on a bicycle relative to a bicycle taxi operator making those same trips or a trader transporting heavy goods to market.

Other modes of motorized and non-motorized transport can serve as either complements or substitutes to bicycles. Some individuals, for example, make use of bicycles to access (motorized) public transport. Among all survey participants, 71 percent used bicycles to access other forms of transportation. This observation was evident across all geographical settings, among both men and women, across age groups and economic occupation, and among owners and non-owners of bicycles. In other cases, potential bicycle users opt for motorcycle taxis over bicycles based on the purpose and nature of a given trip. During focus group discussions, women in particular mentioned "distance" as a reason to take a motorcycle taxi rather than a bicycle (whether to ride it themselves or take a bicycle-taxi).

A majority (56 percent) of survey respondents indicated that a bicycle meets their transportation needs with peri-urban residents having the highest positive response rate (66 percent). Nonetheless, this response rate leaves 44 percent of the population viewing bicycles as, at best, a partial solution for their mobility needs.

BICYCLE AFFORDABILITY

There is clearly strong demand for bicycle *usage* (52 percent of respondents), while bicycle *ownership* is less common (37 percent of respondents). Cost remains the main barrier to bicycle ownership. More than 95 percent of non-owners surveyed identified cost as the reason they do not own a bicycle. Cost was identified as the main constraint to ownership across demographic groups and locations.

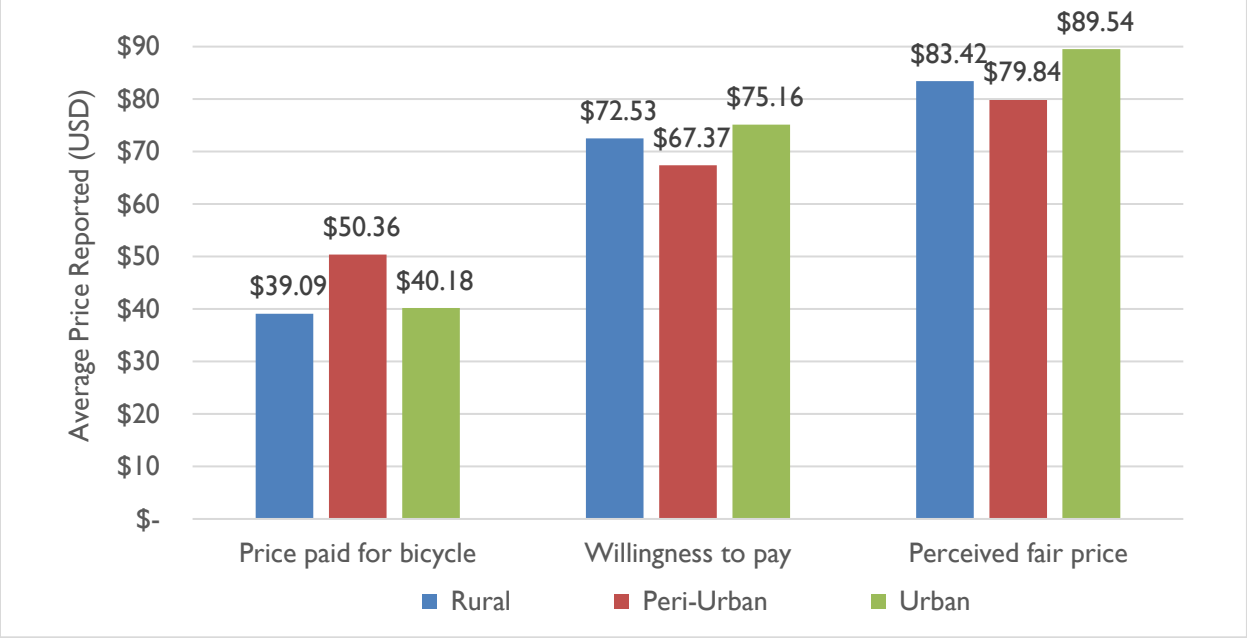
Survey respondents estimated about MWK65,000 (US$80) as the average "fair price" to pay for a bicycle. This roughly corresponds to the price point for a new lower-end bicycle imported from China or India and above the prices of second-hand bicycles. However, this is well below the price point for upper end, high-quality durable bicycles such as the Buffalo, which costs (MWK 192,000 [US$235]), indicating limited demand for such fit-for-purpose bicycles within large segments of the market.

The issue of affordability for individuals and households is more acute in rural areas, where poverty is concentrated. Challenges with affordability are reflected in the survey data, with rural respondents reporting a lower average "fair price" (about US$80) than urban respondents (nearly US$90).

Examining bicycle owners specifically, the survey data shows relative consistency regarding the price they would be willing to pay for a bicycle, along with the slightly higher perception of a fair price. Both willingness to pay and cited fair prices are substantially above the prices owners reported having actually

paid in the past (Figure 6). Peri-urban owners report having paid the highest prices for bicycles but have the lowest willingness to pay currently.

FIGURE 6: PRICE CONSIDERATIONS FOR BICYCLE OWNERS



COST OF TRANSPORTATION

Transport costs in Malawi are among the highest in the SADC region.[24] Further, according to the Malawi National Transport Master Plan, minibus-taxi fares are not regulated and are impacted by other factors such as fuel and maintenance costs. Compared to other cities at a comparable affordability level, fares are extremely high – and like most countries in Sub-Saharan Africa, minibus taxis constitute the primary form of public transport (privately owned unscheduled services, usually referred to as paratransit). Due to poor road conditions, minibus taxis do not fully penetrate residential areas, and when they do, they charge premium fares. The high cost of motorized transportation is likely one of the key underlying drivers of the demand for bicycles.

BFG survey participants reported that the average amount of money spent on transportation 30 days preceding the survey was approximately MWK7980 (US$9.79). There are no significant variations in transportation expenditure across gender or age groups. However, there are significant differences across districts, geographical setting (urban/rural) transportation mode, and economic occupation. Those living in Salima and Zomba appear to spend more on transportation (US$11.17 and US$12.49 respectively), compared to those in Mchinji ($6.47) and Mzimba ($9.42). The average spend in Zomba is nearly twice that of Mchinji. When spending is assessed across transportation modes, the average spend is highest (US$18.22) among those who use motorized transportation (motorbikes, mini-bus taxi, and private cars), and lowest among those who primarily walk ($7.,72). The relatively higher spend on motorized transportation, compared to non-motorized ones, could be the contributor to relatively higher average transportation expenditure recorded in Zomba. Nearly a quarter of respondents in Zomba reported using non-motorized transportation. Besides transportation, there are also some

[24] National Transport Policy, 2019.

significant variations in spending across economic occupation. Formal merchants reported the highest spend, 2.4 times the average spend reported by those unemployed, 1.9 times that of farmers and 1.4 times that of informal merchants. More information can be found in the Appendix section (**Error! Reference source not found.**).

FINANCE

Financing, which would address resource and liquidity constraints, is nearly non-existent for bicycles. Access to finance more generally is challenge in Malawi, with relatively low levels of households having bank accounts or making use of loans. While 24.6 percent of Malawian households have applied for a loan, just 17.7 percent of households have actually obtained a loan.[25] Improvements in banking and finance, either broadly or specifically targeted at bicycles, have the potential to increase demand within the bicycle market system by increasing the availability of household resources and overcoming an immediate barrier to ownership. This report discusses these issues in-depth in the Systems section (see the section entitled "Finance").

BICYCLE AVAILABILITY AND QUALITY

While survey respondents stated the availability of bicycles does not diminish their demand for bicycles, bicycle availability is nonetheless a factor for consumers and may lead to mismatches between the type of bicycles that are acquired and what is optimal for a given user.

While outlets selling bicycles are common in urban and peri-urban areas, retail options are much more limited in rural areas. Just 36 percent of rural survey respondents indicated they were familiar with bicycle retailers in their area, compared to nearly 90 percent in urban areas. One implication of this is that interested buyers in rural areas may find themselves selecting from a limited range of bicycles, such as one being sold by an individual community member or those for offer at a distant retailer during a particular time.

More broadly, the issue of bicycle quality and durability shapes demand. Many bicycle users and other actors in the market system perceive the typical bicycle available as exhibiting low quality. This perception exerts downward pressure on demand for ownership, as many of those seeking to use bicycles may seek access through borrowing, renting, or hiring taxi services rather than ownership and the burden of regular maintenance. Improved matching between consumers and appropriate bicycles can address this barrier to ownership. For example, better matching could take the form of improved marketing by suppliers to educate buyers or initiatives on the part of other actors to raise self-awareness of needs on the part of bicycle users.

MAINTENANCE COSTS AND SPARE PART AVAILABILITY

Bicycle maintenance is a major concern for bicycle owners. Nearly three quarters (72 percent) of owners surveyed reported needing to replace spare parts monthly or more frequently, with the rate of replacement part needs greatest among rural owners.

The most common spare parts sourced by bicycle owners are tires/tubes, spokes, and chains. These spare parts tend to be readily available, but access to quality, durable spares remain a concern for respondents, and the cost of quality spares can be prohibitive. These considerations lead to bicycle owners utilizing low cost, low quality spare parts, which then increase long-term maintenance

[25] Malawi National Office of Statistics. *The Fifth Integrated Household Survey (HIS5) 2020 Report.*

requirements and costs. Three-quarters of surveyed bicycle owners stated that they were concerned about the cost of spare parts.

Bicycle mechanics, bicycle taxi operators, and bicycle users who participated in the PGIS data collection routinely noted that the cost of bicycle spares is prohibitive. There was little geographic variation in the cost of spares and cost of bicycles (except for Zomba), and mechanics and service providers do not appear to compete with one another in this respect. Only one store in the area stocks a full range of spares; others stock only tires, tubes, patch kits and other similar minor repair accessories.

Ensuring that a reliable supply of affordable, quality spare parts is available can increase the functionality of the bicycle market system and ensure bicycles remain usable over time.

BICYCLE SECURITY

As a valuable household asset, owners and potential owners cited bicycle security as a notable concern. More than 80 percent of survey respondents indicated that bicycle theft was a concern within their community. Further, among those that expressed concern, 43 percent of respondents stated bicycle security influenced their decision-making around ownership. Enhancing asset security – whether through physical protection or through risk-mitigation products such as insurance to guard against loss – could provide a means to increase household demand for bicycle ownership.

INCOME GENERATION POTENTIAL

As detailed above, bicycles serve as tools for economic activity, whether for bicycle-based businesses such as bicycle taxis or for others utilizing bicycles in the course of their work.

Further, the income generation potential of a bicycle can possibly be leveraged to unlock financing. Microfinance institutions (MFIs) in particular target loans in range of bicycle price points and are particularly keen to make loans tied to income generation as a means of ensuring repayment.

In the specific case of bicycle taxis, which form an important source of demand for bicycles (directly by their operators/owners and indirectly by their consumers), respondents questioned the long-term viability of the service. Many bicycle taxi operators themselves voice pessimism about the direction of their industry, as competition from motorcycle taxis increases. As motorcycles in Malawi become more prevalent and services become more affordable, more consumers are likely to make the switch from bicycles. Many bicycle taxi operators note that motorcycle taxi prices are not substantially higher than bicycle taxis in many cases. While price sensitive users will likely still opt for bicycles, those with more elastic demand will likely increasingly opt for the mode which can cover greater distance in shorter time while carrying more cargo.

ROAD CONDITIONS AND BICYCLE INFRASTRUCTURE

Respondents highlighted poor road conditions make bicycle usage less appealing. The experience of riding is less pleasant, travel is more physically challenging, damage to bicycles is more frequent, and poor bicycle infrastructure on roads (such as shoulders) leads to greater interface between motorized transport and bicycles.

Additional bicycle infrastructure remains limited in Malawi – for example, just 6 percent of survey respondents reported having secure bicycle storage available in their communities. The lack of such infrastructure dampens demand in different ways. While enhanced bicycle pathways or lighting would

improve the user experience of cycling, secure bicycle storage would address concerns about theft and the security of an important household asset.

PGIS participants drew attention to the following road, infrastructure, and environmental hazards:

- Dogs
- Vegetation that obscures pathways during rainy season
- Piles of gravel in the road shoulder
- Raveling road edges
- Makeshift river crossings and deep puddles
- Dense vegetation that harbors thieves
- Gated estates or plantations that prevent short-cuts
- Steep slopes

ROAD SAFETY

Road safety is a major issue within Malawi. National figures for road safety are among the worst in the world: Malawi experiences 31 road fatalities per 100,000 population, compared to a global figure of 18.2 and 26.6 for Africa as a region. Further, cyclists make up 16 percent of fatalities in Malawi, compared to 4 percent of fatalities across Africa.[26]

Nearly 80 percent of those who participated in the BFG survey were concerned about road safety issues. Respondents voiced concern about road safety for bicyclists in nearly every interview – regardless of the position of the interview subject.

The use of helmets and other safety devices is extremely rare in Malawi. One study looking at 225 injured bicycle users and passengers in Lilongwe found just two patients had used helmets and only one had used a reflective device at night.[27]

Despite concerns of safety, fewer than 40 percent of survey respondents said safety concerns would influence their decisions to use bicycles, and even less (32 percent) said safety concerns would influence their decision to purchase bicycles.

SUPPORTING INSTITUTIONS

Few organizations within Malawi promote bicycle usage and raise awareness of bicycle issues. The growth of such organizations could stimulate demand for bicycles by both raising awareness and interest on the part of users and by promoting improved conditions for bicycling.

[26] World Health Organization. *Global Status Report on Road Safety 2018*.
[27] Sundet, Mads et al. "Adult pedestrian and cyclist injuries in Lilongwe, Malawi: a cross-sectional study." *Malawi medical journal : the journal of Medical Association of Malawi.* vol. 32,4 (2020): 197-204.

SUPPLY

The supply side of Malawi's bicycle market is competitive with several large importer/wholesalers (primarily based in Lilongwe and Blantyre) and large numbers of retail outlets spread across the country – though these are less numerous in rural areas. New bicycles are largely sourced from centers of low-cost production in India and China. Secondhand bicycles come from a variety of sources, notably Japan.

Official data on the supply side remains sparse. However, Malawi imported an average of 85,000 bicycles worth $4 million on an annual basis through formal channels during the 2016-2020 period.[28] Large trading enterprises based in commercial centers typically import the bicycles, which then sell the bicycles onward to retailers across the country. However, some bicycle supply chains within Malawi are integrated from import to sale. The market is generally competitive at both the wholesale and retail level. The exceptions to this are in rural areas where bicycle sales outlets may not exist at all.

Major constraints on the supply side include (1) weak linkages between wholesalers and retailers, which inhibit trading relationships and limit the upstream transmission of market feedback, (2) limited retailer working capital, which reduces the ability to be proactive in inventory management, and (3) rising/ unpredictable costs of bicycles. Recent global inflationary trends are exerting upward pressure on bicycle prices, as the costs of raw materials (notably steel) and shipping from production sites have risen substantially since the start of the COVID-19 pandemic. The China Bicycle Association reports that the average value of all exported bicycle from China during the first six months of 2021was US$68.60 – a year-on-year increase of 20 percent.[29] With these trends continuing, bicycle price inflation is likely to reflect similar or even greater increases during 2022.

BICYCLES ON THE MARKET

There are several broad categories of bicycles available in the market, with many potential layers of further categorization.

MASS MARKET IMPORTS

Relatively inexpensive imported bicycles from India and China are available under several brand names. The 186 surveyed current and former bicycle owners reported having 45 different brands of bicycle. Most of these brands are Chinese or Indian imports: by far the most widely owned brand is Hunter, accounting for 37 percent of bicycles owned by respondents. The second most widely owned brand, Humber, accounted for 9 percent, and only one other brand, Kamongo, approached 5 percent.

These mass market import bikes tend to be relatively simple, single speed steel bicycles, often with starting price points of around MWK 50,000 (US$61.30). These mass market imports are sold at a range of outlets across Malawi including dedicated bicycle retailers, hardware shops, agro-dealers, and supermarkets.

[28] UN Comtrade.
[29] China Bicycle Association. "Analysis of the economic operation of China's bicycle industry from January to June 2021." 12 August 2021.

Lighter weight sport bikes are used for individual transportation that does not require moving substantial weight. Riders tend to use these for shorter distances.

For users such as bicycle taxi operators and those transporting goods to market, heavier bicycles featuring carrying racks are preferred. These bicycles typically have standard diamond frames (i.e., featuring a high, straight top tube). Diamond frames are structurally the strongest bike frame design compared to other common designs with lower top tubes.[30]

UPMARKET DURABLE BICYCLES

The Buffalo Bicycle is available through nine branded shops in Malawi; however sales are primarily to institutional buyers rather than individuals. Compared to other new bicycles on the market, the Buffalo is significantly more expensive (MWK192,000 [US$235.60]) than alternatives. However, the price reflects higher quality and improved features relative to imports at the lower end of the market. For example, the Buffalo is made with heavy gauge steel, reinforced spokes, and includes a carrying rack with a lab-rated capacity of more than 100 kilograms.

Buffalo established its presence in Malawi in 2017 and is a notable actor in the market considering the volume of their bicycles present in Malawi – with more than 50,000 Buffalo Bicycles distributed and nearly 21,000 of those entering the market in 2021 alone.[31]

Additional "heavy duty" bicycles are available in the market, though they do not typically have the same brand recognition or support system provided for Buffalo owners through dedicated retail networks, branded spare parts, and mechanic training programs.

SECOND-HAND BICYCLES

Used bicycles account for a large share of Malawi's bicycle market. These include both bicycles that were imported into Malawi as new bicycles and then sold by their original owners to others and second-hand imports. A major source of second-hand imports is Japan. Retailers report that although these are sold at a lower price point than most new imports, the bicycles are perceived to be durable.

Some second-hand bicycles also enter the market through donations, which are either then distributed to beneficiaries or refurbished and sold at competitive prices. A prominent example of the latter case is the Zomba-based social enterprise Africycle. Africycle's business model is to import donated bicycles from North America and Europe, service these to ensure quality and then sell these refurbished bicycles in the market. Africycle screens bicycles before importing them to Malawi to select for bicycles suited to the Malawi context, i.e., selecting fit-for-purpose bicycles. The bicycles are priced competitively with new bicycle imports.

Africycle's bicycles are generally perceived to be of high quality with much of their business coming from repeat customers or referrals. Between its foundation in 2007 and 2020, Africycle facilitated the import of more than 16,000 bicycles to Malawi. Further, they are flexible and adaptive market actors – like other supply side market actors, they have pursued and been successful in winning a small number of

[30] Lin C-C, Huang S-J, Liu C-C. Structural analysis and optimization of bicycle frame designs. *Advances in Mechanical Engineering*. December 2017. doi:10.1177/1687814017739513
[31] World Bicycle Relief, *2021 Global Impact Report*.

institutional procurements, including one which entailed them importing, assembling, and delivering 6,900 bicycles to an international institution at sites across the country.

ELECTRIC BICYCLES

While electric bicycles ("e-bikes") have expanded in popularity globally, they are not widely available or used in Malawi. The price point of many e-bikes is near or above that of an entry-level motorcycle, putting it out of reach for most Malawian households and presenting a poor value proposition for income generation relative to faster motorcycles with greater load capacity. Although price data in Malawi is scarce, one Lilongwe-based retailer advertised e-bikes for MWK 1.6 million (US$1,960).

PRODUCT-MARKET FIT

Data on product-market fit is conflicting. While many interview and focus group discussion participants report that bicycle quality is an issue, survey data collected by BFG indicates there is a relatively high degree of satisfaction with bicycle quality. The degree of satisfaction is consistent with both current and former bicycle owners. This discrepancy may reflect consumers adjusting their expectations to the bicycles available to them at a particular price point.

Outside of the Buffalo and similar upper-end, durable bicycles, mass market import bicycles are not purposefully designed for carrying heavy loads of goods or passengers.

Female users have noted that the position of the upper crossbar on heavier duty bicycles, such as Hunters, is an issue. A higher crossbar can make the bicycle harder to mount and ride for women wearing dresses or who are shorter. Bikes with lower crossbars or a single crossbar are more conducive for mounting and riding but are viewed as poorly suited for business purposes because they lack carriage racks and are harder to balance when weighted down. For women seeking to use bicycles for income generation, this lack of appropriate models is a limitation.

The Buffalo Bicycle is designed to account for the preferences and needs of both men and women. The Buffalo has a dipping crossbar, which maintains durability and carrying capacity while addressing female riders' concerns. Feedback from focus group participant on the Buffalo is nearly universally positive, with many praising its durability. However, the Buffalo's high price puts it out of reach for most individuals in the market.

BICYCLE MARKETS

Bicycles are widely available across Malawi. In larger population centers, substantial numbers of bicycle retailers and related businesses can be found clustered together, such as in central Lilongwe. These bicycle outlets may be dedicated bicycle retailers, hardware shops, agro-dealers, or general traders. Fewer bicycle sellers operate in rural areas – especially dedicated retailers. Residents of these areas must either travel to other locations or acquire bicycles locally from individuals.

WHOLESALE MARKET

The wholesale market for mass market import bicycles is highly competitive and consists of firms based in commercial centers, namely Lilongwe, Blantyre, and Mzuzu. In addition to main offices, these relatively large wholesalers may have multiple distribution centers, reflecting their broader national geographic footprint.

Approximately 10 large firms compete nationwide in this space. The market is dynamic and fluid, with firms regularly entering and exiting. Wholesalers typically proffer a range of brands and models – one supplier indicated it had approximately a dozen models on offer. Many wholesalers have no or minimal interface with buyers in the retail market and exclusively or nearly exclusively sell downstream to retailers.

Wholesalers will often import both complete bicycles and spare parts, though with varying volumes. For example, a large trader reported that 90 percent of sales were in spare parts rather than assembled bicycles. Additionally, some traders import both new bicycles from India or China and used bicycles from Japan. Retailers are then able to buy both new and used bicycles for sale in their outlets.

RETAIL MARKET

Bicycle retailers are present throughout the country. These include dedicated bicycle shops, hardware stores, agro-dealers, and other general traders. These sellers often have multiple models or brands on offer. Multiple bicycle outlets often compete in commercial centers. The competitive marketplace limits the ability of these retailers to exert pricing power, as buyers are price sensitive and will look to purchase from the lowest priced option if other preferences and needs are met.

Non-specialist retailers such as agro-dealers tend to sell a limited range of lower-end bicycles rather than heavier duty bicycles. Specialized bicycle retailers complement agro-dealers by focusing on what the agro-dealers, which are often national chains, do not offer.

In rural areas with lower population densities, few retailers of any sort operate. In many rural areas, buyers must travel to obtain a bicycle.

Retailer-wholesaler relationships vary, though retailers are typically able to freely trade with wholesalers of their choice. Some wholesalers form preferential relationships with select retailers for which they offer favorable terms of credit. However, most respondents indicated they transact on a cash basis.

Independent retailers typically order bicycles from wholesalers as they run low on inventory. Retailers reported basing their ordering on observations of sales and limited market feedback. These retailers face multiple challenges in obtaining inventory. First, they typically have limited working capital available and can only order new stock after having run down existing stock to generate cash. Sellers not operating in the formal sector have limited ability to access finance, as most financial institutions, including MFIs, will only make SME loans to formal businesses. Second, because this approach to inventory management is not forward looking, it can lead retailers to acquiring what is in stock with wholesalers at a particular time. Several wholesalers stated that retail businesses' lack of focus and limited business acumen may diminish the effectiveness of the market system.

INSTITUTIONAL BUYER MARKET

Individual buyers acquire bicycles based on what is available within the bicycle market at a given time – whether in the immediate vicinity or further afield. In contrast, institutional buyers acquire bicycles through procurement processes in which the buyers provide product specifications and sellers respond with corresponding bids. The buyers generally allow enough lead time for bidders to order the bicycles from manufacturers with delivery at an agreed upon date, rather than supplying out of existing stock.

The procurement market is highly competitive. For example, a 2021 tender issued by the Ministry of Gender for 15,000 bicycles received almost 50 bids. The bidders on these tenders often include a large array of the supply side of the bicycle market – wholesalers of Chinese and Indian imports, social enterprises, and large retailers among others. These tenders are appealing to suppliers because of their high volumes and reliable payment. Nonetheless, large procurements can pose acute challenges for select suppliers if working capital is limited or terms of payment (with either the institutional buyer or manufacturers) are not sufficiently accommodating. This issue can be further exacerbated by long lead times in manufacturing, as described in more detail below.

Although there are many bidders on tenders, procuring agencies emphasized to BFG that not all suppliers have the capacity to deliver upon what they have proposed. Many bidders also fail to comply with the requirements of a particular bid by not providing sufficient documentation or proof of financial capacity, critical administrative elements of most procurement processes.

NON-MARKET SUPPLY

In addition to traditional market channels, bicycles reach owners through non-market channels. Nearly 10 percent of surveyed bicycle owners reported not paying for their bicycles. This non-market supply is closely tied to market channels, with bicycles initially acquired through market transactions. The bicycles are then transferred through mechanisms outside of the market system. These non-market transfers occur through several channels including donations from NGOs, bestowals by institutions, and transfers between individuals.

Several institutions transfer ownership of program bicycles to bicycle custodians (e.g., community health workers) at the conclusion of a program. Similarly, several NGOs reported simply procuring bicycles for donation to individuals and households participating in their programs. While the volume of these types of donations are difficult to estimate, just 2.5 percent of survey respondents indicated they had received a donated bicycle from an NGO.

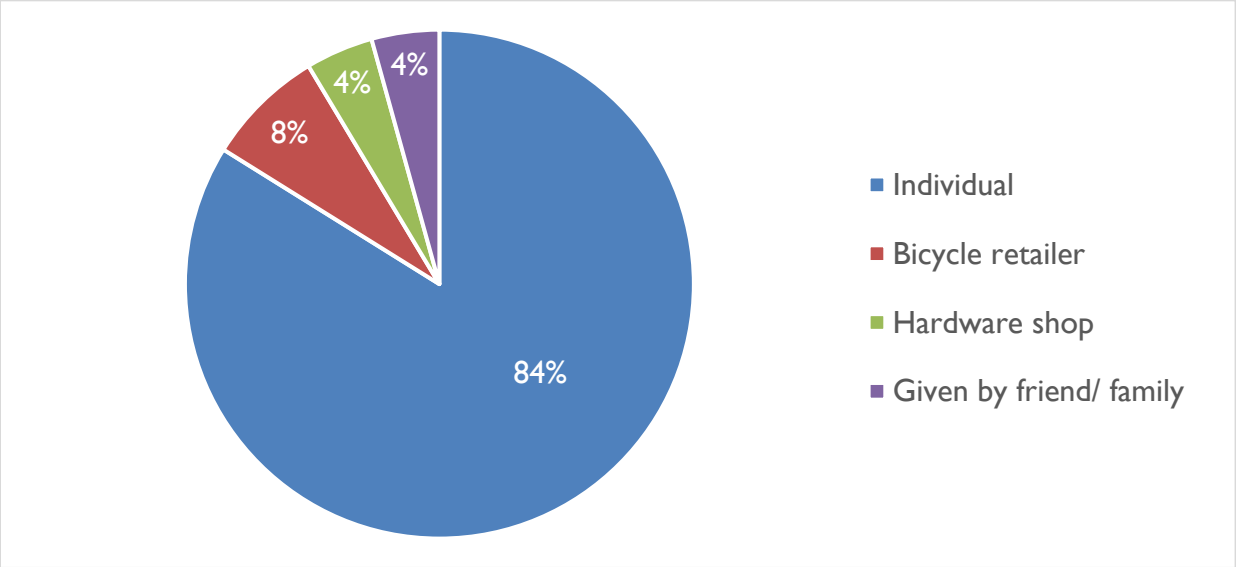
Non-market transfers are more prevalent in rural areas, as donor programs and the public sector utilize bicycles more intensively in rural areas.

SECONDARY MARKET

Malawi's market for secondhand/ used bicycles is substantial. Nearly half of bicycle owners indicated their bicycle was used at the time they acquired it. A wide majority of these owners reported that they purchased their bicycles from individuals in their communities, indicating interpersonal acquisition is a critical pathway to bicycle ownership. In addition to individuals selling their personal bicycles, there are many informal traders who acquire and refurbish bicycles for resale in markets or other locations.

Of BFG-surveyed owners, more than 40 percent reported the bicycle they owned was acquired in a used condition from another individual. Only 12 percent of secondhand bicycle owners reported acquiring their bicycle from a business (see Figure 7). While a relatively small share of the supply on the market, this is still a notable and important channel.

FIGURE 7: ACQUISITION SOURCE - SECOND-HAND BICYCLES



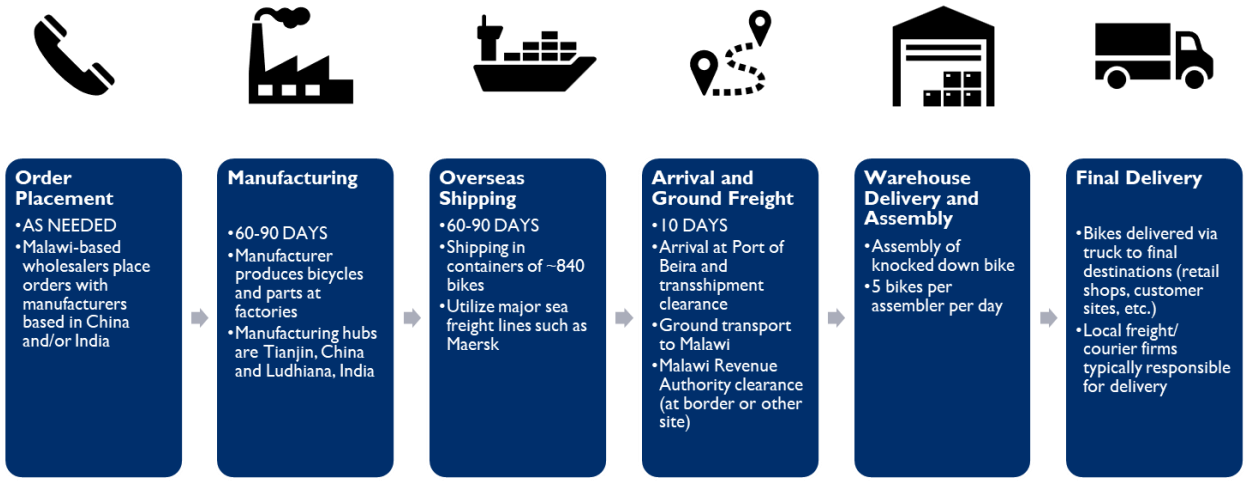
Although the secondary market is sizable, suppliers of new bicycles do not necessarily consider secondhand bicycles as a direct competition. Most new bicycle sellers noted that secondhand bicycles' lower price point targets a different market segment. Indeed, to reach a broader range of market participants, many outlets that sell new bicycles also sell used bicycle.

SUPPLY CHAIN

The bicycle supply chain in Malawi follows a relatively standard structure. Importer/wholesalers order large volumes of bicycles and spare parts from overseas manufacturers. These manufacturers, primarily based in China and India, produce bicycles based on these orders. Newly manufactured bicycles are then shipped in containers via sea between origin countries and major regional ports in Southern or East Africa, with Beira being the preferred port. These containers of bicycles are offloaded from ships and placed on trucks to transport them from port inland to Malawi. After crossing the Malawi border, the containers clear customs and are delivered to buyer warehouses. Wholesalers then assemble knocked down bicycles and arrange with retailers for delivery to retail outlets, at which point the bicycles are sold to consumers. In the case of institutional sales, fully-assembled bicycles travel from assembly warehouses to sites agreed to with the buyer.

This process, from initial order placement to delivery of a complete bicycle to a retailer may take upwards of 6 months. COVID-19 related supply chain disruptions have generally exacerbated lead times, as these there often substantially shorter prior to the pandemic.

FIGURE 8: ILLUSTRATIVE MALAWI BICYCLE SUPPLY CHAIN



According to UN Comtrade data, Malawi formally imported more than 73,000 bicycles at a trade value slightly exceeding $3 million in 2020. As previously noted, China and India are the primary sources for bicycle imports, which together account for 69 percent of Malawi's imports. Japan, the third largest source of bicycle imports, is an important source of used bicycles.

Some suppliers also report acquiring bicycles from distributors in Tanzania. These bicycles arrive in knocked down form for final assembly in Malawi, in the same manner as those imported directly from manufacturers. While these are purchased from a third country, the bicycles themselves are manufactured in China or India under brand names such as Kamongo and Nice.

TABLE 6: MALAWI BICYCLE IMPORTS 2020[32]

Country	Trade Value (US$)	Number of Bicycles	Average Dutiable Bicycle Value	Share of Total Volume
China	$1,264,060	30,027	$42.10	40.9%
India	$1,047,072	20,401	$51.32	27.8%
Japan	$426,374	13,559	$31.45	18.5%
Rest of World	$291,832	9,478	$30.79	12.9%
Total	*$3,029,347*	*73,467*	*$41.23*	*100.0%*

UN Comtrade data presented above captures *formal* trade. Market participants noted the existence of informal crossborder trade. By its nature, the scale of this informal market is difficult to estimate. Mozambican officials have cited bicycle spare parts as one of the major goods being smuggled across the border.[33]

[32] UN Comtrade.
[33] *360 Mozambique*. "Smuggling of Agricultural Products at the Border with Malawi Worrying the Mozambique Revenue Authority." 25 February 2022.

MANUFACTURING AND SHIPPING

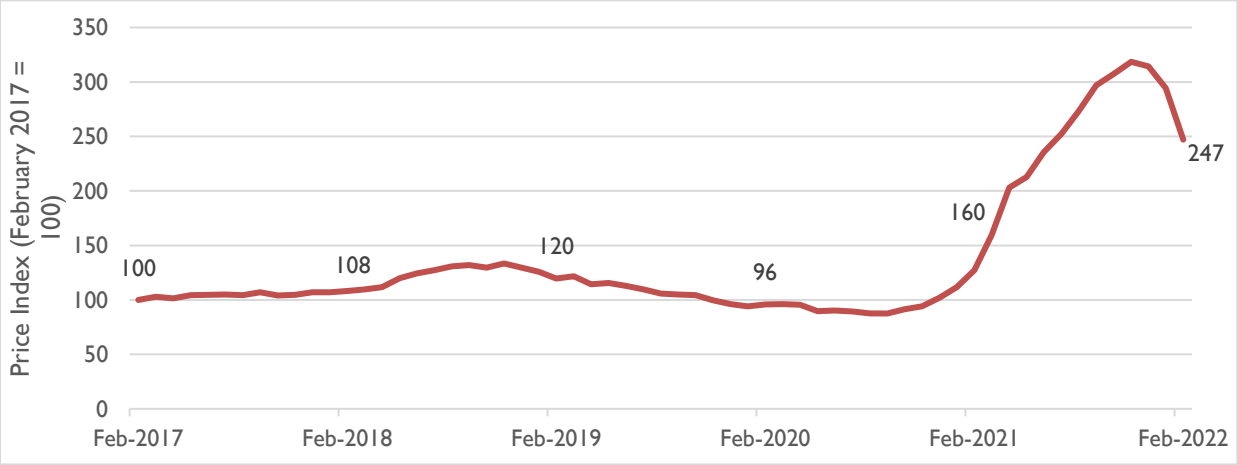
Manufacturing of bicycles that enter the Malawi market is clustered in India and China. The cities of Ludhiana, India, and Tianjin, China, are the main hubs for production.

Bicycle supply chains face several challenges at this time, including several driven by COVID-19. Respondents emphasized that supply chain challenges have increased costs and manufacturing lead times.

Global bicycle demand has increased substantially during the pandemic. Frequently cited reasons include a desire to maintain social distancing, fewer transport options, and the desire to realize health benefits. Increased global demand led to notable bicycle shortages during 2020-21, particularly at the lower end of the bicycle market. With manufacturing concentrated in China and India, and manufacturers already operating at or near maximum capacity, importers in Malawi compete with importers elsewhere for supply. Respondents indicated a substantial increase in manufacturing lead times. In some cases, lead times doubled between when a bicycle order is submitted to when the bicycle rolls off the production line. One interview subject noted that pre-pandemic manufacturing lead times were typically in the 6-to-8-week range; they are now consistently in the 12+ week range.

Raw materials, particularly steel, account for 70-80 percent of the cost of bicycles.[34] Steel costs have risen sharply since 2020, after several years of relative price stability (see Figure 9). These and similar rising material costs have created upward pressure on wholesale and retail bicycle prices in Malawi. Suppliers indicated that they expect input prices and the corresponding cost of bicycles will remain elevated in the short- to medium-term.

FIGURE 9: STEEL PRICE INDEX[35]



In line with the rising cost of inputs and extended manufacturing lead times, the cost and time required for shipping has also risen during the COVID-19 pandemic. These increases have been substantial. One supplier reported their shipping costs from Asia to Malawi doubled from approximately US$6 per

[34] KPMG. *Pedaling India's Growth: Cycling into the future.* June 2021.
[35] Federal Reserve Bank of St. Louis. "Producer Price Index by Commodity: Metals and Metal Products: Hot Rolled Steel Sheet and Strip, Including Tin Mill Products, Index Dec 2003=100, Monthly, Not Seasonally Adjusted."

bicycle (with a full container) to approximately US$12 per bicycle. These increases are significant when considering that the reported dutiable value of a bicycle is under US$45.

MARKET INFORMATION TRANSMISSION

Market feedback is generally not transmitted effectively from the individual consumer upstream through supply chains. Most retailers collect only limited feedback from customers beyond basic sales information and observations related to pricing within the market. Retailers note that some customers do report to them about durability issues, though this is not proactively collected or aggregated in a comprehensive way. Durability and other quality concerns are used by retailers in making inventory decisions, but the feedback on product design is generally not reported to wholesalers or manufacturers.

The gaps in market information transmission, both from consumer to retailer and retailer to wholesaler, is a potential source of poor product-market fit. More deliberate market research and feedback collection on the part of retailers and improved upstream supply chain linkages may have the potential to address this.

One exception to this supply chain information transmission issue is Buffalo Bicycles. Buffalo essentially has an integrated supply chain running upstream from the market, including a close relationship with its manufacturer, and multiple mechanisms for soliciting user feedback within Malawi (and the other countries it operates in). This information is collected and analyzed by Buffalo's product development teams, who then iterate the Buffalo Bicycle's design to address user feedback.

PRICE ANALYSIS

Segmentation of bicycle prices follows the structure of bicycles available within the market. New and used bicycles represent two major market segments, with new bicycles generally being substantially more expensive. Survey respondents indicated having paid more than 50 percent more for a new bicycle relative to a used bicycle.

Survey data collected by BFG is presented in Table 7. These prices, reported by buyers, are in line with those reported by retailers or observed by the project, albeit at the lower end of the market. This likely reflects the relatively high number of owners in the survey sample who have held on to their bicycles for substantial lengths of time.

TABLE 7: MALAWI AVERAGE REPORTED BICYCLE PURCHASE PRICES (USD)[36]

	All bicycles	New bicycles	Pre-owned
Overall	$ 45.78	$ 55.66	$ 36.03
Location			
Mchinji	$ 46.39	$ 61.77	$ 33.47
Salima	$ 42.12	$ 49.40	$ 35.92
Mzimba	$ 55.26	$ 60.72	$ 44.84
Zomba	$ 40.34	$ 47.65	$ 34.48
Geographic Setting			
Rural	$ 42.92	$ 50.52	$ 35.52

[36] BFG survey. Prices converted from MWK to USD.

	All bicycles	New bicycles	Pre-owned
Urban	$ 41.36	$ 47.20	$ 37.27
Peri-urban	$ 54.47	$ 68.53	$ 35.72
Ownership Status			
Current Owner	$ 46.32		
Former	$ 44.84		

A more nuanced understanding of pricing emerges when looking only at bicycles acquired within the last 24 months. Figure 10 and Figure 11 show this for both new and used bicycles, respectively. Comparing these, prices of used bicycles are broadly lower than new bicycles, although there is a degree of overlap between the two. More than half of used bicycles were purchased in the US$30-50 range and only just over 10 percent were priced above this.

Approximately one-quarter of new bicycles were acquired for under US$50 and nearly half were sold in the US$50-80 range.

FIGURE 10: DISTRIBUTION OF PRICES PAID FOR NEW BICYCLES (USD)[37]

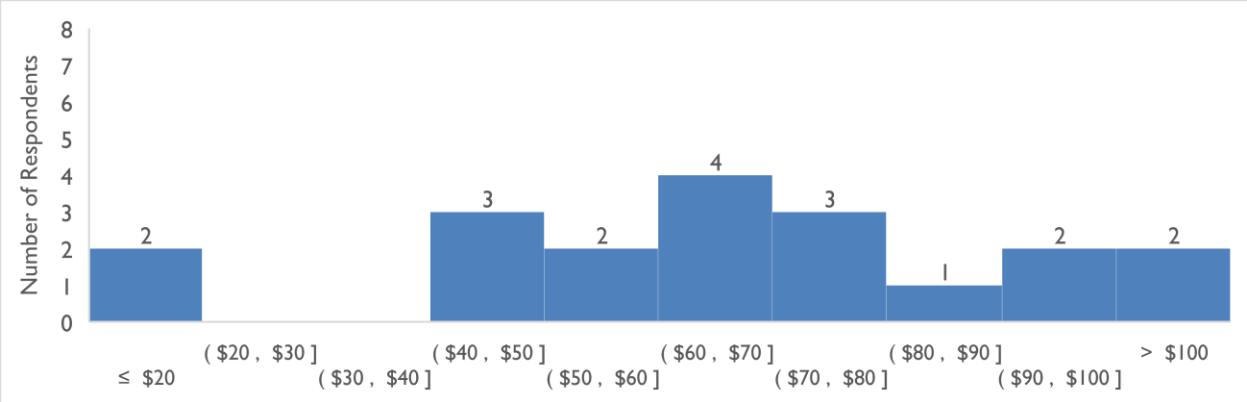
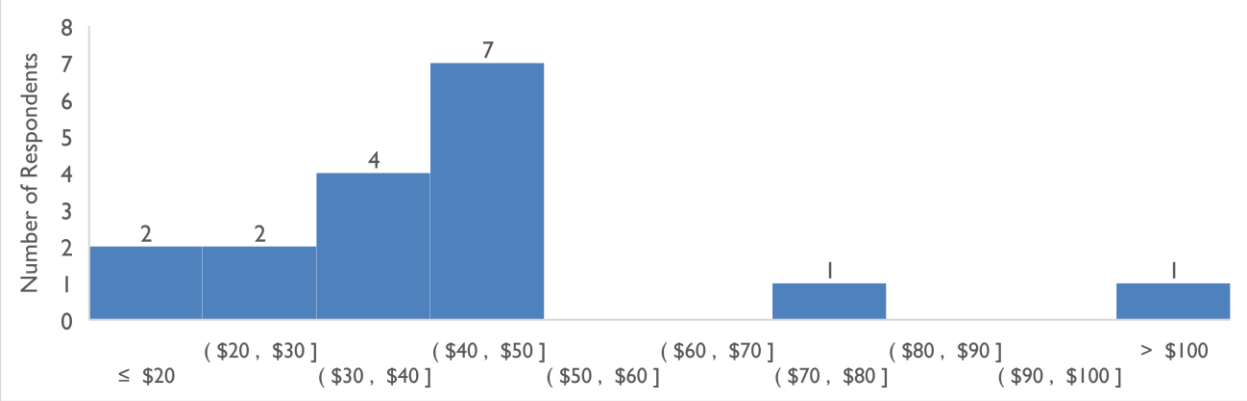


FIGURE 11: DISTRIBUTION OF PRICES PAID FOR USED BICYCLES (USD)[38]



Bicycle retailers generally report that they set prices based on their costs, both for the underlying good and associated costs such as transportation. Most of these retailers indicated that they apply a small

[37] Data includes only bicycles purchased in the last 24 months. Does not include donated or gifted bicycles.
[38] Data includes only bicycles purchased in the last 24 months.

markup, perhaps approximately 10 percent, to these costs. Competitive pressures in most cases restrict their ability to pursue higher profit margins, as sellers are sensitive to being undercut.

As referenced above, the bicycle market is facing inflationary pressures. It is unclear the extent to which this is being felt with in the market, though several interview subjects noted issues around price stability. Bicycle suppliers report that their prices are increasing, which will ultimately be passed on to consumers.

REGULATION, PRICE DISTORTIONS, AND TAXES

Complete bicycles are exempt from import duties. However, tax authorities apply duties to spare parts, including tires, at a 15 percent rate. Some suppliers reported duties creating incentives to import a relatively larger share of bicycles compared to corresponding spare parts – though they did not indicate that this is necessarily a substantial impact.

Value-added tax (VAT) of 16.5 percent is applicable to bicycles and spare parts. Firms are obligated to remit VAT payments to the Malawi Revenue Authority on a monthly basis. Across the Malawian economy, VAT compliance is reported to be fairly low – with the Ministry of Finance estimating that just 14 percent of potential VAT revenue is collected by authorities, compared to a world average of 51 percent collection.[39]

Suppliers did not report policy and regulation as being a major challenge for their operations. They are however affected by issues impacting the broader import sector. One area of concern raised by many bicycle importers is the challenge of foreign exchange. Per Malawian law, domestic transactions must largely be conducted in Malawian kwacha. However, virtually all international business is conducted in US dollars. This generates a regular need for access to foreign currency and exposes these suppliers to exchange rate risk. Managing exchange rate fluctuations can be a complicating factor for business over time. The uncertainty of long lead times in the manufacturing and import process can be intensified because of fluctuations in the relative values of currencies used for paying international suppliers and those received from domestic buyers. Additionally, at the time of report writing, Malawi is facing an acute shortage of foreign exchange currency leading to the slowing of import markets.

[39] Malawi Ministry of Finance. *Domestic Revenue Mobilization Strategy 2021-2026.*

SYSTEMS

Underlying demand and supply are the supporting systems in the bicycle market system. Key to the functioning of the bicycle market systems are providers of spare parts and maintenance services (i.e., mechanics) which keep bicycles themselves functioning. The spare parts market, as represented by import figures, is substantially larger than the market for new bicycles.

Notable within the Systems pillar are those elements or actors which are not present or performing to their fullest potential to support the functioning of the bicycle market system. Financial institutions, especially in the microfinance space, have great potential to help address affordability and resource challenges for individuals and households and assist SMEs to overcome working capital constraints. However, financial institutions are minimally active in the bicycle market system at this time. Bicycles and related non-motorized transport issues have been often neglected by policymakers in their efforts to address transportation, infrastructure, and mobility in Malawi. Additionally, international donor agencies – serving as key sources of expertise and resources for Malawi's development – have also largely overlooked the role of bicycles and needs of bicycle users.

SUPPORTING SERVICES

Within the Malawi bicycle market system, there are multiple supporting services. Most critical to the current functioning of the market system are spare parts suppliers and mechanics. In many cases, mechanics function as spare parts suppliers or vice versa.

While affordability is a major constraint to bicycle ownership within Malawi, finance has been largely underutilized to overcome this. Bicycle-focused lending is nearly non-existent, despite bicycles being valuable assets with income generating potential.

MAINTENANCE

SPARE PARTS

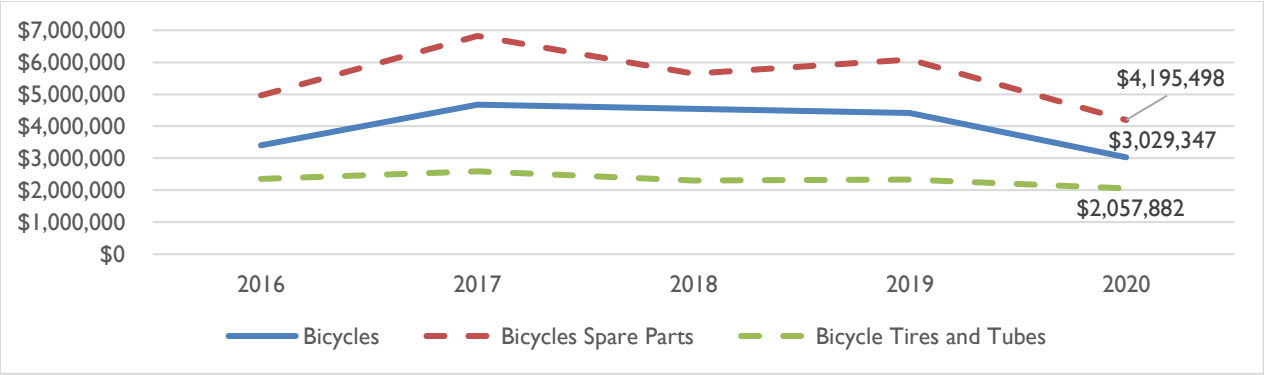
The availability and affordability of spare parts within the market system are critical to the functionality of the bicycle market system within Malawi. Nearly all survey respondents indicated the need to purchase replacement parts for their bicycles at some point. Further, repairs are a common occurrence, with almost all owners indicating that their bicycles require replacement of parts several times per year – and more than 30 percent indicating that they require replacement weekly. Among the most needed spare parts are tires, tubes, and broken spokes, likely due to the state of infrastructure and the conditions in which bicycles are operated (also described in more detail below under "Infrastructure"). Many users note this connection between poor road conditions and damage to bicycles. It is also worth noting that over the most recent five years of available data, more than US$2.3 million worth of bicycle tires and tubes have been imported annually.[40] Many repairs do not necessarily require replacement of parts but do require mechanic services.

The market for spare parts is sizable. Over the most recent five years of available data, more than US$2.3 million worth of bicycle tires and tubes have been imported annually.[41] Total imports of spare

[40] UN Comtrade.
[41] UN Comtrade.

parts (including bicycle tires and tubes) exceed imports of bicycles by an approximately two-to-one margin in import value (see Figure 12). The age of the majority of bicycles within Malawi may contribute to the demand for spare parts. Older bicycles require regular replacement of parts over time. Based on estimates presented elsewhere in this report, BFG estimates just over 6 percent of the total stock of bicycles enters Malawi each year, implying an aging bicycle fleet requiring regular repair and parts replacement.[42]

FIGURE 12: MALAWI BICYCLE AND SPARE PART IMPORTS (2016-2020)[43]



Rural respondents indicated that they had success in finding spare parts (92 percent) but were less successful relative to urban (97 percent) or periurban (100 percent) respondents. Focus group participants and interviewed mechanics generally reinforced the relative availability of spare parts, although noted that it could be difficult to find particular parts at a given time.

While the quality and durability of spare parts is highly variable, most bicycles available in the market have standardized components, thus they do not require specialized or brand-specific parts. This increases accessibility and reduces the constraint of needing an item from a specific manufacturer. Exceptions to this include the Buffalo Bicycle, which does require specialized parts, and many of the second-hand imports, which are not necessarily standardized. Buffalo is known for having high-quality, durable parts and these may be used on non-Buffalo Bicycles (and often are because of their quality), but the inverse is not true for most parts. This can lead to spare part availability being a particular constraint for Buffalo users.

Although maintenance and general spare part *access* does not appear to be a major constraint within the bicycle marketplace for individuals, maintenance *costs* are a major issue. Three-quarters of survey respondents indicated that they are concerned about maintenance costs. This is likely due to the issue of maintenance frequency. For example, the part most commonly needed replacement is the tire or tube. Even at the low end, a replacement tire costs MWK 6,000 (US$7.40) – a substantial expenditure for individuals with limited incomes or financial means. Consumer sensitivity to spare part prices leads to them purchasing lower quality, less durable parts – adding to long-run costs as they must make more repairs and purchase more parts. The issue described above of particular parts being hard to find at certain times may itself be an issue of affordability in many cases. Some mechanics and spare parts sellers frame limitations of part availability in terms of affordability (i.e., a part may be unavailable at an

[42] This assumes that there are 1.4 million bicycles in Malawi and 85,000 bicycles imported.
[43] UN Comtrade. "Bicycle Spare Parts" includes all imports under HS Codes within 8714.9 range. "Bicycle Tires and Tubes" includes imports under HS Codes 401329 and 401150.

affordable cost), and challenges related to working capital affect inventory management in the manner observed with bicycle retailers.

Spare part access is a major issue at the institutional level in two ways. First, institutional users as fleet operators may take the approach of being responsible for maintenance at the institutional level rather than having individual custodians be responsible. In such cases, institutions must ensure they always have an inventory of spare parts available and accessible to users to maintain fleet readiness. Because they are responsible for a large volume of bicycles, this requires advanced planning and procurement to ensure that in-demand parts are on hand. Second, institutional users may allocate maintenance responsibilities to custodians of the bicycles (e.g., community health workers). This decentralized approach is common and in many ways easier to manage for institutions. Often the institution will provide a regular stipend to custodians for maintenance. However, this model does not necessarily lead to optimal maintenance outcomes because the stipend funds can be used for other purposes. One institutional buyer reported that their organization provides a stipend of approximately US$5 per month to custodians. This funding is typically sufficient to cover the cost of repairs on an annual basis, but it does not necessarily align with how maintenance issues arise in practice when costs come as sudden shocks exceeding the monthly stipend amount (e.g., a $15 repair).

MECHANICS

Mechanic services are widely available, with 98 percent of surveyed owners reporting that it is easy or very easy to find a mechanic.

Mechanics are often self-taught or learned from other mechanics on the job. Experienced mechanics are highly skilled and capable of addressing most of the maintenance issues that bicycle owners present to them. In focus groups, one mechanic noted that there has "never been a scenario where I failed to repair a bicycle problem," a comment that is typical of mechanics interviewed.

Buffalo Bicycles regularly implements 7-day comprehensive mechanic training programs in Lilongwe. To date Buffalo has trained 147 mechanics. Trainees come from around Malawi for these workshops. Most trainees support programs in their local areas. Third-party organizations can request to send outside mechanics to this training, though they must fund them at a cost of US$600 (which includes a Buffalo Bicycle and mechanic tools). This training has not been marketed to individual mechanics and would be unaffordable to most individuals if they had to pay the full cost of training. In interviews and in feedback provided to Buffalo Bicycles, mechanics report earning low incomes for their services (e.g., less than MWK 5,000 [US $6.10] per day) and tend to have multiple sources of income.

Similarly, Africycle has offered training in maintenance skills to individual purchasers under its loan program and to organizations purchasing bicycles. Africycle has also provided advanced training to institutional buyers so buyers have skills within their organization to maintain bicycle fleets.

While mechanics are generally willing and able to offer preventative maintenance services, demand is low and most maintenance is reactive rather than preventative. This presents a potential opportunity either through general awareness raising campaigns or marketing on the part of mechanics to demonstrate the benefits of preventative maintenance. Servicing of bicycles can be used to reduce long-term costs and diagnose and address major potential problems before they occur.

The PGIS provides visual evidence of the density of the network of roadside bicycle repair facilities in the area under study in the Zomba region. This network density enables and supports bicycle travel in a context where road conditions are sub-optimal. Repairs are mostly minor (fixing flat tires, pinch flats, and bent rims), but the knowledge that there is a repair facility within walking distance gives people the confidence and security to use a bicycle despite the risk. The density of roadside repair facilities both meets the demand for repairs and enables/sustains the demand for bicycles.

FINANCE

DEMAND-SIDE FINANCING

Access to formal finance for individuals and households in Malawi is limited, with only slightly more than one-third of the adult population holding an account with either a bank or mobile money service provider.[44] Interest rates are high and variable, currently around 25 percent.[45] However, the trend has been positive in recent years with increased formal financial access and falling interest rates for borrowers.

Financing for the individual acquisition of bicycles is virtually non-existent within Malawi, with the notable exception of Africycle's innovative (but small scale) loan program and initiatives within donor programs. Most bicycle owners acquire their bicycle using savings and only a small number use any sort of formal or informal financing to fund their purchases, as shown in Table 8 below. In focus groups, some participants indicated that they used funds from village savings and loans associations (VSLAs) to purchase bicycles, though this was typically done through savings over time. It should be noted that although bicycle-focused lending is very rare, a bicycle can play a role in accessing finance as a borrower's asset for collateralizing a loan or proving creditworthiness, as raised by some focus group and interview participants. To the degree that bicycles are used as collateral for loans, this appears to occur virtually exclusively in the context of group loans in which a group member may offer a bicycle as collateral, with the group being responsible for taking ownership of the bicycle in the case of default. Among MFIs that were interviewed, none indicated that they would accept a bicycle as collateral for a loan to individuals, even though they were open to other higher value forms of moveable collateral such as motor vehicles.

TABLE 8: PAYMENT MODE FOR BICYCLE PURCHASES

Mode of Payment	Number of Responses	Percent
Own savings/ Farm income	149	90.4%
I did not pay	15	9.2%
VSLA	3	1.8%
Borrowed from informal lender	3	1.8%
Borrowed from family	1	0.6%
Making payments to seller	1	0.6%
No response	1	0.6%
In kind payment	0	0.0%
Borrowed from bank	0	0.0%
Microfinance	0	0.0%

[44]Demirgüç-Kunt, et al., "The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution", (World Bank 2018)

[45] The World Bank, "World Development Indicators," accessed May 2022.

Africycle has piloted a bicycle financing program through which customers can purchase a bicycle and then repay over a 4–5-month period. Africycle screens potential borrowers for this by requiring referrals in most cases. The interest rates charged by Africycle for this are below bank interest rates and they report high level of repayment. Currently, about 10 to 15 percent of Africycle's annual sales occur through this program. In another program, the USAID Agriculture Diversification (AgDiv) project has supported three local partner organizations to distribute 825 Buffalo Bicycles at subsidized prices of US$75 using 24-month installment plans with annual interest rates of just 3 percent.

Microfinance institutions (MFIs) play an important role for access to finance in Malawi. As of late 2021, MFIs registered with the Malawi Microfinance Network (MAMN) had gross outstanding loans of approximately 52 billion MWK (US$65 million) to 600,000 customers. Among the roughly 50 registered MFIs within Malawi, there are four large deposit-taking institutions (which operate somewhat similar to banks and have relatively large geographic footprints) and nine non-deposit taking institutions (which provide credit in rural and urbans areas, primarily through group lending), with the balance of MFIs being small scale local lenders (resembling informal lenders).

There is no evidence that any MFIs in Malawi currently offer loans specifically designed for the acquisition of bicycles. However, there is strong potential for this offering. MFIs typically provide loans in the range of MWK 100,000-125,000 (US$123-153). These loans are typically secured with collateral, however bicycles are not commonly used as collateral for individual loans. This is well within line of the cost of high quality, durable bicycles in Malawi. MFIs are most inclined to lend to customers with strong productive capacity because of their ability to repay. Recognizing this, bicycles which are tied to income generation, be it from improved market linkages, taxi or freight services, or some other application, enhance the productive capacity of individuals.

One MFI interviewed by BFG expressed enthusiasm about the potential for bicycle-focused lending. This particular MFI has been running a pilot program to finance the acquisition of motorcycles for taxi operators. The indications to date are that this pilot has been successful. The MFI recognized the parallels between lending for motorcycle taxis and lending for bicycle taxis.

Bicycle taxi associations may be an entry point for group lending, as these are existing groups with a shared purpose around bicycle-based income generation. In interviews, some bicycle taxi associations indicated interest in financing opportunities while noting their current absence.

SUPPLY-SIDE FINANCING

The financing situation for bicycle suppliers diverges between retailers, who face substantial challenges in accessing finance, and wholesalers, who are largely well-capitalized and able to access commercial loans as needed.

In interviews, most independent retailers noted that their business was in some manner constrained by limited working capital or access to finance. As a result, they could not expand or manage inventory optimally. Underdeveloped business systems are barriers for retailer. Relatively weak linkages with wholesalers mean that most wholesale transactions are cash-based rather than through financing provided by either the wholesaler or a third-party.

TRANSPORT AND LOGISTICS

Transports and logistics service providers are important to effective functioning of bicycle supply chains. The system of service providers which facilitate the importation of bicycles into Malawi, notably shipping providers and customs clearing agents, is well-developed. Suppliers report generally high levels of satisfaction and relatively few problems with these service providers. Bicycle importers note that their primary concern with inbound logistics is delays either at ports or at the border, either of which can be generate significant unplanned costs for storage of shipping containers. However, these cases appear to be relatively rare.

Transport and logistic issues have been an area of focus for international donors, often within the context of initiatives focused on regional trade or infrastructure development. For example, the World Bank's multi-country Southern Africa Trade and Transport Facilitation Program has supported the upgrading of several border crossings and improvements to trade procedures through measures such as harmonizing processes and technology adoption.

Currently, the biggest challenge in this regard is the increase in shipping times and limited available capacity on shipping routes. This is a global issue affecting supply chains everywhere.

Once bicycles have reached wholesaler warehouses within Malawi, domestic transporters are utilized for distribution to final destinations. These include both professional transporters and more informal operators. These local operators may use containerized vans or open trucks for transportation purposes. The sector is highly competitive, but suppliers note that freight provider quality varies substantially. Many of the more professional operators are members of the Transporters Association of Malawi. Membership is considered to be one indicator of quality by some supply side actors.

POLICIES AND INSTITUTIONS

On paper, Malawi transport policy is generally favorable to cycling as an individual transport, passenger transport, and micro-freight mode. These policies have the stated intention to improve safety, legitimacy, affordability, and comfort. In practice, however, road infrastructure and motorized travel has priority where financing and capability resources are limited. While use of bicycles in rural areas is a crucial transport mode, neither the government nor development partners are directing resources to improve policy implementation to improve the bicycle market system.

The key national government institutions within Malawi engaging with the bicycle market system include:

- **Ministry of Transport and Public Works (MTPW):** Responsible for the overall direction of transport policy and infrastructure development and coordination between agencies;
- ***Roads Authority (RA):*** [46] Quasi-government body responsible for development of main, secondary, and tertiary road infrastructure;
- ***Road Fund Administration (RFA):*** Responsible for financing of road infrastructure;
- ***Directorate of Road Traffic and Safety Services (DRTSS)***: Responsible for regulating road safety issues, collecting accident data, and raising awareness of road rules and safety considerations; and

[46] Institution in *italics* report to or fall under the Ministry of Transport and Public Works.

- **Malawi Revenue Authority (MRA)**: Responsible for levying and collection of taxes on businesses and important in creating facilitative conditions for trade.

In addition to these national agencies, local governments make policy and are key stakeholders as well. Typically, local governments are responsible for the ongoing maintenance of road infrastructure and can play a role in encouraging bicycle usage, as well as creating a positive enabling environment for the private sector.

The MTPW acknowledges that bicycle travel is a major mode in rural Malawi, but that motorized transport has priority in terms of planning. This manifests itself in the infrastructure challenges noted above. The Ministry acknowledges that in the past they did not take cyclists into particular account and notes that the country will, going forward, focus on developing non-motorized transport (NMT) infrastructure in urban areas. The World Bank supports this approach, indicating that urban areas are more likely recipients of development finance institution funding for infrastructure.

Both pedestrian and bicycle mobility have received attention in the Malawi National Transport Master Plan (NTMP) – supported by the World Bank – and the revised National Transport Policy (NTP), which was approved in 2019 by the Government of Malawi. The country does not yet have a standalone NMT policy or strategy – something the RA sees as a policy gap. In the RA's view, such a policy should include separate chapters on bicycles, tricycles, pedestrians, and animal-drawn transport. The RA would also like to see NMT infrastructure and planning guidelines which would enable systematic and defensible decision-making regarding budget and resource allocation.

The purpose of the NTMP is to provide infrastructure proposals for all transport sub-sectors in Malawi. It also provides a prioritized time-bound plan (between 2017-2037) for introducing and developing policy and regulatory measures, institutional and organizational reforms, and capacity-building through the training and enhancement of capabilities in all sub-sectors. The NTMP's strategic goals (i.e., reducing transport costs, improving safety, and enhancing freight and passenger transport) have direct relevance to the bicycle market system and fostering positive conditions. The NTMP notes that bicycle use is increasing rapidly, with bicycle trips having increased three-fold between 2010 and 2015, and to this end proposes that Malawi:

- Introduce 500 kilometers of segregated cycle/pedestrian facilities on high trafficked roads;
- Introduce design guidelines for urban roads;
- Improve road safety awareness through updating the school curriculum; and
- Improve regulation and its enforcement.

Overall, however, the NTMP does not appear to reflect realities and needs in Malawi. Several proposals are drawn from relatively standard urban cycling strategies, such as requiring bicycle parking at new developments, cycle facilities at workplaces, formal bike share at bus rapid transit (BRT) stations, and the identification of safe cycling routes for cyclists. None of these were given high priority (and in some cases were not even mentioned) in focus groups and interviews.

Policy regarding bicycle infrastructure is also not necessarily fit for the Malawi bicycle context. For example, urban bicycle lanes are not being properly used, as in Lilongwe where bicycle taxis still make use of main roads. Further, load carrying bicycles can take up significantly more space than a standard "best practice" bicycle lane of 1.5 meters would provide. The NTMP does make some proposals that

align with findings of this research: that safe bicycle conversion practices are given attention and that micro-credit and loan schemes be explored.

In interviews, suppliers did not single out the policy environment as a major obstacle for growth, which is no surprise since there is no import duty on bicycles and relatively few bicycle-specific considerations. However, import duties on spare parts (15 percent compared to 0 percent for finished bicycles) is a constraint on demand to some extent. Given the need for regular parts replacements in rural areas, this is a cost element that may suppress demand for bicycles and cause buyers to seek the cheapest possible spare parts rather than those which are most durable and suited for user needs.

Civil society and the private sector are not very active in advocacy or dialogue to improve the NMT and bicycling policy and governance systems. Perhaps the most active area of bicycle-related policy is focused on bicycle taxis. In most contexts, officials view bicycle taxis as a problem because of their failure to follow the rules of the road and the related challenges they introduce for other (primarily motorized) road users. Policies around bicycle taxis are evolving and location specific, but local governments appear generally interested in increased regulation of the sector. Government agencies encourage taxi operators to join bicycle taxi associations. The government is able to exert some form of control and associations serve as a channel to offer road safety education. Awareness campaigns attempt to ensure that operators know the rules of the road and how to operate a bicycle taxi. While bicycle taxi associations do engage with policy makers to some extent, particularly at the local level, around bicycle taxi regulation, the relationship is often antagonistic. Bicycle taxi operators at times generate public antipathy towards the cause of bicycling as they are notorious for dangerous behavior and are resistant to traffic regulation enforcement, licensing, and other control, believing that their actions reflect a right to ply their trade despite risks to others.

Other aspects of the political economy are unfavorable for bicycling. The government does not see bicycling as a priority – this extends to the MTPW and RFA – with motorized transport by road seen as a higher priority to help improve the economy and alleviate poverty. Additionally, some market system actors note that political processes themselves pose challenges to creating highly functional infrastructure. Political actors face natural incentives to bring infrastructure projects, such as roads, to their constituencies. However, this can lead to a patchwork system in which many disconnected small road projects are funded and initiated, rather than focusing the limited resources available to focus on projects with broad social benefits, such as ensuring that major thoroughfares are optimized for all users, including cyclists.

The national government funds roads, but local governments must maintain them, which makes coordination between institutions a challenge. In addition, as stated above, the private sector and civil society are not well-organized or well-prepared to engage in advocacy and provide feedback to the government to identify, prioritize, and overcome policy and institutional obstacles to growth of the bicycle market system.

INFRASTRUCTURE

Road quality in Malawi is generally quite poor, ranking 117th out of 137 countries globally by the World Economic Forum.[19] Government institutions in Malawi that are dedicated to road safety and transport infrastructure, such as the MTPW, RA, and the RFA, recognize that more resources must be dedicated to building and maintaining roads. However, financing of road infrastructure continues to be a major

challenge. Although RFA funding comes from a range of sources including budget appropriations, fuel levies, fees, donor agencies, and bond markets, resources are inadequate to cover annual needs for road maintenance along with new construction. The vast majority of the rural network is unpaved and only about 20 percent of roads are in "good or fair condition." A lack of rural roads poses an accessibility problem for the rural population, especially during the rainy season.[47] Further, poor road conditions generate excess wear and tear on bicycles, leading to higher maintenance costs.

The issue of limited bicycle infrastructure was further raised within the BFG survey. Just 39 percent of respondents reported the presence of a paved shoulder for cycling on main roads in their community. As discussed elsewhere in the report, the lack of bicycle infrastructure is something noted by many interview and focus group participants and contributes to other concerns such as road safety, user experience, and long-term costs of ownership.

The NTMP calls for all new urban and main roads to consider cyclists and "include dedicated cycle lanes when the existing and predicted demand justify this."[48] The RFA has also prioritized integrating NMT infrastructure, such as cycling lanes, into future roads projects. The Ministry of Transport has indicated that these considerations are in fact being used in planning: lanes for bicycle users appear in designs for new or rehabilitated roads. Government agencies' abilities to remedy cycling safety and infrastructure issues are constrained by funding, and the patchwork nature of bilateral and multilateral infrastructure projects, especially in urban areas.

Donors fill some of the financing gap, and their roads projects consider NMT. Donor-funded road projects generally adhere to Southern African Development Community (SADC) standards for road design. These standards include shoulders on the side of main roads which can be used by cyclists, pedestrians, and other forms of NMT. However, these shoulders typically do not provide physical protections between motor vehicles and other road users. Malawian officials report that Donors are perceived as prioritizing road length over enhancements. Most donor-funded road construction is concentrated in commercial corridors, although there is an expectation that rural road construction will become a priority in the future.

Government officials observe a close relationship between infrastructure quality and cycling uptake. Representatives from both the MTPW and the Roads Authority indicated that as road quality improves, cycling on these roads increases. However, increased cycling uptake on paved roads can lead to safety challenges and increased accidents involving cyclists as paved roads, more common in urban and peri-urban areas, allow for faster velocities of motorized transport, putting cyclists at risk.

Infrastructure development can also be expected to contribute to modal shifts beyond walking to cycling, which has been a theme in this assessment. As infrastructure improves between relatively distant points, individuals may be more likely to opt for motorcycle taxis or minibuses over bicycles – even though conditions for bicycle travel are substantially improved. Long-term preferences for bicycles are likely to be strongest for shorter distances and rural areas with limited infrastructure.

[47] Malawi Ministry of Transport and Public Works. *Malawi National Transport Master Plan – Final Report.* 2018.
[48] Malawi Ministry of Transport and Public Works. *Malawi National Transport Master Plan – Final Report.* 2018.

DONOR SUPPORT

Donor institutions such as USAID, the World Bank, African Development Bank, and others have generally not directly supported or promoted cycling within Malawi. While many donor projects such as USAID Client-Oriented Response for HIV Epidemic Control (CORE) Activity have made use of bicycles as tools to advance programming (e.g., providing bicycles to community health), providing bicycles as tools for economic growth have been less common. The USAID Feed the Future Agricultural Diversification (AgDiv) Activity is an example of a donor-funded project which has promoted bicycles beyond core programmatic purposes. AgDiv, in partnership with World Bicycle Relief (WBR), facilitated the distribution of 825 bicycles to cooperative members and farmworkers in Chikwawa under a repayment scheme to promote COVID-safe mobility and increased access to market.

Infrastructure and roads development is a major priority for bilateral and multilateral donors present in Malawi. However, donors have not traditionally prioritized infrastructure design that accommodates cycling or promotes safe passage for non-motorized transport users. Instead, decreasing transportation costs for trade by increasing infrastructure linkages tends to be the primary concern, as indicated by donor agencies themselves in interviews and project plans.

Many donors are supporting infrastructure development within specific transport corridors, in which a given donor agency leads support. For example, the Japanese International Cooperation Agency (JICA) has been implementing this approach near Zomba. Meanwhile, the Malawi Millennium Development Trust (MMD), the Government of Malawi entity responsible for implementing the Millennium Challenge Corporation (MCC) Malawi compact, is currently focused on supporting "accelerated growth corridors" within Malawi. Programming, which is still in planning stages, will address the high cost of freight within Malawi by developing 3-4 corridors that establish first mile roads and link them with major thoroughfares within these corridors. "Targeted road civil works interventions" — trade-related donor agency infrastructure development projects — aim to improve road conditions and access to rural areas and facilitate greater flow of agricultural products from farmgate to regional and export markets."[49]

Roads developed under this upcoming initiative will include shoulders that may accommodate cycling and walking. Bridges will also have cycling and walking lanes, but programming will not otherwise deliberately seek to promote cycling.

Similarly, the World Bank does not generally support NMT in their urban infrastructure projects. World Bank roads projects in Malawi follow a SADC standard, which typically includes the construction of a shoulder that might accommodate walkers and cyclists.[50]

In interviews, government officials identified disjointed donor activity and roads initiatives as a potential challenge because it can lead to patchwork infrastructure projects. This can be disruptive to cyclists in particular because they may need to use multiple forms of transportation to arrive at their final destination, depending on road quality and the varying presence of motorized traffic.

[49] Millennium Challenge Corporation, "Congressional Notification, Supplemental Information – Section 609(g) Assistance for Malawi." January 25, 2021.

[50] The size of these shoulders can vary based on the type of road. In the case of a recent World Bank project to upgrade a section of the M1 road between Karonga and Songwe, improvements included widening shoulders to be 2 meters in width.

ANNEX 1: CONSTRAINTS MATRIX

Constraint Symptom	Causes	Potential Solutions
DEMAND		
Perceived high prices of bicycles	Limited household resources	Financing for bicycle purchases through microfinance institutions or banks
Concerns about costs and burdens of maintenance	Affordability of quality spare parts Poor road conditions	Advocacy to reduce VAT and/or duties on spare parts to promote affordability Advocacy to promote improved infrastructure for bicycle users
Concerns about bicycle security	Limited facilities in public areas to lock or secure bikes	Increased construction of bicycle racks and similar low-cost security measure in high traffic areas such as markets and workplaces Awareness campaigns and marketing around security devices such as locks
Concerns about road safety	Dangerous behavior on the part of drivers Lack of dedicated infrastructure for bicycles and pedestrians leading to increased interface with motorized transport Limited awareness of road rules on the part of bicyclists Low levels of safety device usage	Advocacy by bicycle users and suppliers to raise government awareness and follow through on commitments to infrastructure development Awareness campaigns to promote familiarity with road rules Awareness campaigns to promote helmets, reflective material, and other safety measures
SUPPLY		
Limited knowledge of consumer preferences and feedback on	Limited information collection by retailers	Creation of deliberate market information collection process

Constraint Symptom	Causes	Potential Solutions
the part of upstream supply chain actors	Weak linkages between retailers and wholesalers	Strengthened retailer-wholesaler linkages Creation of market information systems
Suboptimal retailer inventory management and offerings	Limited retailer working capital Weak linkages between retailers and wholesalers	Strengthened retailer-wholesaler linkages Support to retailers for improved business process and skills to facilitate access to finance and supplier trust
Rising bicycle prices and uncertainty	Rising input costs in global markets	Limited viable options under market conditions
SYSTEMS		
Low utilization of finance for bicycle purchases	Limited MFI and bank awareness of bicycles as income generating tools Loose structure of associations for bicycle-based businesses	Support MFIs to develop bicycle lending products to offer directly to buyers or to sellers as intermediaries Support to associations of bicycle-based businesses to formalize and engage with MFIs
Lack of consideration or tailored measures for bicycle users in policy decisions	Limited awareness of cycling issues and viewpoints on part of policy makers	Engagement and advocacy with policymakers by market system actors Increased organization of bicycle actors through associations and civil society groups Creation of platforms for public-private dialogue
Limited follow through on commitments to improve cycling conditions in official policy	Limited awareness of cycling issues and viewpoints on part of policy makers	Engagement and advocacy with policymakers by market system actors

Constraint Symptom	Causes	Potential Solutions
	Adoption of approaches/policies from external sources without tailoring to Malawi context	Capacity building for policy makers in non-motorized transport areas

ANNEX 2: METHODOLOGY

OVERVIEW

The BFG Malawi Bicycles Market System Assessment was a cross-sectional, mixed-methods data collection activity across five districts in Malawi. The assessment used primary and secondary data sources to answer research questions around supply, demand, and systems in the Malawi bicycles market system.

Primary data was collected through qualitative and quantitative methods, including a quantitative survey of 363 respondents in five districts, 30 key informant interviews (KIIs) and 9 focus group discussions (FGDs). Data collection districts included: Lilongwe, Mchinji, Mzimba, Salima, and Zomba.

Primary quantitative data was collected and managed by BFG's Malawian research partner, the Centre for Development Management (CDM) from March 14-21, 2022.

Primary data was also collected in the form of a Participatory GIS (PGIS) by World Bicycle Relief and the Zomba chapter of the USAID Youth Mappers, in March 2022, in collaboration with the USAID GeoCenter. This PGIS included one focus group of women, one focus group of men (with 15 participants in each), and three days of transect walks and bicycle rides with participants within the region of Govala market and Malindi CDSS. Using KoboCollect, YouthMappers captured information about challenges faced by interviewees, prices and availability of spares, most popular bicycle brands, numbers of bicycles arriving/departing at key destinations, as well as distances travelled, destinations, trip purposes, travel modes, and barriers and obstacles to travel. YouthMappers visited formal bicycle stores/spare parts sellers to follow up on challenges emerging during interviews. The map developed as a result of the spatial and narrative data collection ddelivers insight into the reasons bicycle users need frequent repairs (road conditions), visualizes the distances people travel by bicycle, and for what purpose, and provides an indication of the impact road and river crossing maintenance would have on travel time and safety. Further, it provides evidence to support and strengthen the findings of the earlier BFG assessment.

Secondary data was sourced during desktop research, examining existing literature and reports on cycling and non-motorized transport in Malawi, as well as existing data on relevant trade and economic activity in Malawi.

SAMPLING DETAILS

SELECTING STUDY SITES AND DATA COLLECTION LOCATIONS

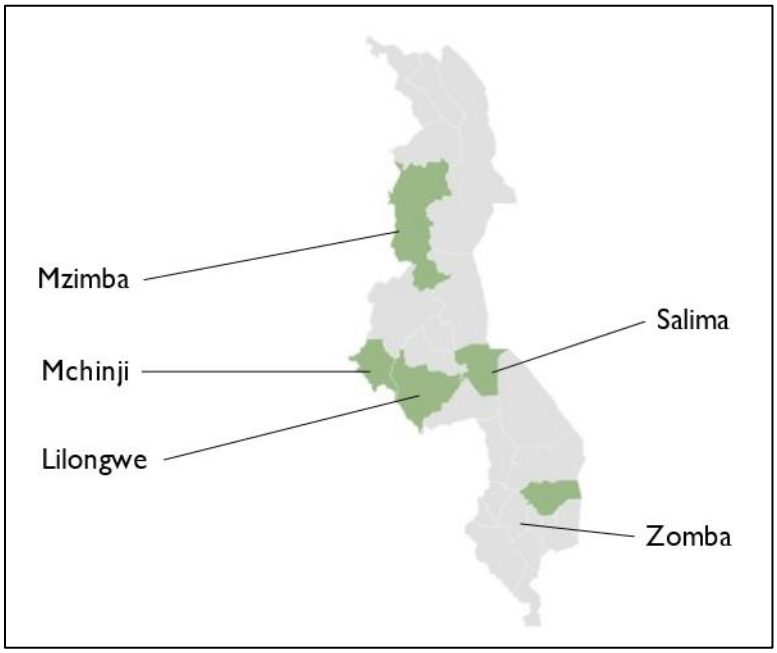
CDM led the selection of study and data collection sites with guidance from the project. The BFG selected implementation districts based on the following criteria:

- User demographics – income, age, gender, transportation needs, etc.
- Interest of local leaders and stakeholders
- JAA and/or WBR team footprint
- Bicycle distribution available – volume and variety of bikes

- Transport alternatives and geography
- Cycling culture, perceptions, and gender norms

Mchinji, Mzimba, Salima, and Zomba were selected as the districts of interest because they represented a broad range of economic, social, and geographic characteristics across the country. Additionally, initial piloting of data collection tools was conducted in Lilongwe district Figure 13 demonstrates this distribution below:

FIGURE 13: DISTRICTS OF FIELD DATA COLLECTION



BFG collected survey data at two sites in each of the four primary assessment districts, taking into consideration the project research questions and criteria for data collection sites. The descriptions of each site and explanations of their relevance to the evaluation are described below in Table 9.

TABLE 9: FIELD DATA COLLECTION SITES

No.	District	Region	Site	Site Description
1	Mzimba	North	Jenda	One of the nine rural growth centers in Malawi. Lies along the main road that connects the four major cities in Malawi.
2	Mzimba	North	Enukweni	A rural and small trading center situated at the northern end on Mzimba district. Lies along M1 road.
3	Salima	Central	Salima Boma	Salima boma, a headquarter and a central point of Salima district
4	Salima	Central	Makande	A rural and small trading center in Salima district. It connects to the tarmac road to Salima and Lilongwe with a dirt road

No.	District	Region	Site	Site Description
5	Mchinji	Central	Guillime	A small and rural trading center in Mchinji. It was established by the Church after the construction of a mission and school. It connects to the tarmac road that goes to Lilongwe and Mchinji through a dirt road
6	Mchinji	Central	Kamwendo	A busy trading center in Mchinji. Located along the main road that connects Mchinji and Lilongwe
7	Zomba	South	Govala	A trading center situated in Zomba rural. A dirt road connects Govala to Zomba city.
8	Zomba	South	Zomba City	Zomba municipality city, one of the biggest urban centers in Malawi. It is fourth largest urban center in Malawi.
9	Lilongwe	Central	Mitundu	A trading center situated at Lilongwe rural. A paved road connects Mitundu to Lilongwe city.

STUDY PARTICIPANTS

The selection of study participants varied depending on the data collection tool being used. The quantitative survey was administered as an intercept survey in markets in the selected data collection sites. Respondents included bicycle users and non-users, as well as individuals that use other forms of non-motorized and motorized transportation.

Participants in Focus Group Discussions were approached based on the purpose of a given focus group. These included women (bicycle users and non-users), as well as mechanics and livelihood groups.

Key Informant Interviews targeted stakeholders and government agencies within the bicycle market system who can provide deeper insights into the bicycle market system in Malawi according to the three pillars of the assessment: demand, supply, institutions/policy environment. Key informants interviewed included government officials, wholesales, bicycle retailers, donor institutions, and civil society groups.

TABLE 10: DATA COLLECTION OVERVIEW BY DISTRICT

District	Completed FGDs	Completed KIIs	Completed Surveys
Lilongwe	1	27	30 (Mitundu:30) *[Pre-testing – not included in report analysis]*
Mchinji	2	6	91 (Guillime: 45; Kamwendo: 46)
Mzimba	2	6	73 (Enukwenu: 40; Jenda: 33)
Salima	2	6	88 (Makande: 45; Salima Town: 43)
Zomba	2	10	78 (Zomba Town: 40; Govala: 38)
Other	0	4	
Total	*9*	59	*363*

DATA COLLECTION INSTRUMENTS, MANAGEMENT, AND ANALYSIS SAMPLING DETAILS

DATA COLLECTION INSTRUMENTS

Each tool collected responses to the key research underlying this study. The data collection instruments were drafted in English and were translated into the relevant local languages by accredited translators. Translations will remain true to the nuances of the way in which questions have been drafted and structured in the original as far as possible. A copy of the quantitative questionnaire is available in Annex 3. KII and FGD guides were tailored to the targeted respondents.

DATA ANALYSIS METHODS

Descriptive and bivariate analysis was applied to quantitative data to provide average estimates on key demographics and socio-economic status, and bicycle ownership and utilization. Where possible, the analysis presents results stratified across gender, age groups, socio-economic levels, occupation, and location. Through statistical analysis, BFG also explored associations between bicycle ownership/use and other variables of interest, including demographic and geographical characteristics, transportation needs, bicycle acquisition and ownership, enabling conditions, and attitudes and perceptions.

The qualitative data was translated or recorded in detailed notes. These notes and translations were reviewed thoroughly and organized into the key themes represented in this assessment report. Other methods such as literature reviews were used for the desktop, secondary data research phase of this assessment

ANNEX 3: QUESTIONNAIRE

COMMUNITY QUESTIONNAIRE

Hello. My name is ..... and I am working with the Bicycles for Growth (BFG) Project, funded by USAID. We want to learn about how your community uses bicycles and what your personal experience with bicycles is. We are conducting a survey and would appreciate your participation. I would like to ask you about your transportation and mobility experiences. This information will help the BFG project to assess whether there is a healthy market for bicycle use in your community. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. You can also choose to stop participating at any point in the survey. However, we hope that you will participate in this survey since your views are important. There is no compensation for participating in the survey. If at any time during this survey you have any questions about our study, please feel free to ask to speak with our manager.

The interview will last between 30-45 minutes. Would you be willing to participate in the survey? Do you agree ? Yes_____ No_____

A11	Enumerator:	A15	[Insert sub-national unit]:	
A12	Date:	A16	City/town:	
A13	Start/Finish Time:	A17	Village:	
A14	Geography Type:	A18	Cooperative/ Association:	

Demographic

B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Household status	Marital status	Gender	What was your age at your last birthday?	How many individuals live in your household for at least four nights a week?	How many children under the age of 15 live in your household for at least four nights a week?	What is the highest level of education you have completed?	Primary economic activity *(choose only ONE)*	Do you or anyone in your household currently own a bicycle?	If B9=yes, who in your household owns the bicycle?	If B9=yes, Who is the primary user of the bicycle?
[1] Head of Household [2] Other adult in the house [3] Youth in house	[1] Single [2] Married [3] Divorce [4] Widowed	[0] M [1] F [95]Other	_____ *Years [98] I don't know [99] No response	# male # female	# male # female	[1] Less than primary [2] Completed primary [3] Less than secondary [4] Completed secondary [5] Certificate/ Diploma [6] University Degree	[1] Farmer [2] Informal merchant [3] Formal merchant [4] Private sector employment (including casual worker) [5] Gov't employee [6] Unemployed [95] Other (specify) [99] No response	[1] Yes [0] No [98] I don't know	[1] Myself [2] Spouse [3] Child [4] Other relative [95] Other (specify) [98] I don't know	[1] Myself [2] Spouse [3] Child [4] Other relative [95] Other (specify) [98] I don't know

Transportation Needs												
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**
During the last 30 days, how much did you spend on transportation?	In the previous harvest season, what types of transportation did you use? *(check ALL that apply)*	In the previous harvest season, what was your primary form of transportation? *(choose only ONE)*	Are you satisfied with your primary form of transportation on a scale of 1 (very dissatisfied) to 5 (very satisfied)?	If you had the option, what would be your preferred form of transportation? *(choose only ONE)*	What is your primary form of transportation to your place of work or market?	How much time do you currently spend on a one-way trip using your primary form of transportation to your place of work or market?	Does your primary form of transportation prevent you from working more/ expanding your business?	Do you think that owning a bicycle improves/ would improve your ability to increase your economic activity?	Are you familiar with any bicycle retailers in your area?	If C10=yes, Does the retailer offer bicycles that are of interest to you?	Do you currently or have you in the past ever owned a bicycle?	If you do not currently own a bicycle, what is the primary reason? *(choose only ONE)*
**Price in Local Currency*	[a] Walking [b] Bicycle (owned/ borrowed) [c] Animal transport [d] Bicycle taxi [e] Private car [f] Minibus taxi [g] Motorcycle taxi [h] Motorcycle (owned/ borrowed) [95] Other (specify) [99] No response	[a] Walking [b] Bicycle (owned/ borrowed) [c] Animal transport [d] Bicycle taxi [e] Private car [f] Minibus taxi [g] Motorcycle taxi [h] Motorcycle (owned/ borrowed) [95] Other (specify) [99] No response	[1] Very dissatisfied [2] Dissatisfied [3] Neutral [4] Satisfied [5] Very satisfied	[a] Walking [b] Bicycle (owned/ borrowed) [c] Animal transport [d] Bicycle taxi [e] Private car [f] Minibus taxi [g] Motorcycle taxi [h] Motorcycle (owned/ borrowed) [95] Other (specify) [99] No response	[a] Walking [b] Bicycle (owned/ borrowed) [c] Animal transport [d] Bicycle taxi [e] Private car [f] Minibus taxi [g] Motorcycle taxi [h] Motorcycle (owned/ borrowed) [95] Other (specify) [99] No response	[1] Less than 30 minutes [2] 30 minutes to an hour [3] More than an hour [98] I don't know	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Currently own [2] Owned in the past [3] Never owned [99] No response	[1] Cost of acquisition [2] Cost of ownership [2] Disabled/ physical [3] Not interested [4] Unsafe [5] No place to ride [6] Lack of bicycles available near me [95] Other (specify) [98] Don't know [99] No response

If C12 = YES, GO TO SECTION D ..... If C12 = NEVER OWNED, GO TO SECTION F

Bicycle Ownership – Acquisition										
D1	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**
If C12= yes, how long have you owned your primary bicycle?	What is the brand of your primary bicycle? *(open ended)*	Where did you acquire your primary bicycle? *(choose only ONE)*	When you acquired your primary bicycle was it new or previously owned?	Why did you select the bicycle you acquired? *(check ALL that apply)*	Are you satisfied with the quality of the primary bicycle?	If D6 = NO, would you spend more money next time for a higher quality bicycle? *(choose only ONE)*	What activities do you use your bicycle for? *(check ALL that apply)*	How much did you pay for your primary bicycle?	How did you pay for the purchase of your bicycle? *(check ALL that apply)*	What is the maximum amount of money you would be willing to pay for a bicycle today?
_____ * months [98] I don't know [99] No response	_____ [98] I don't know	[1] Bicycle retailer [2] Hardware shop [3] Other shop [4] Individual [5] Provided by employer [6] Donated by NGO [7] Given by friend/ family [95] Other (specify) [98] I don't know	[1] New – never used [0] Used/ pre-owned [98] I don't know [99] No response	[a] Price [b] Quality/ durability [c] Availability (only option) [d] Features/ design [95] Other (specify) [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Very likely [2] Likely [3] Unlikely [4] Very unlikely [98] I don't know [99] No response	[a] Economic [b] Health facilities [c] School commute [d] Shopping [e] Exercise [f] Fetching water [g] Access energy [95] Other (specify) [98] I don't know [99] No response	* *price in local currency* [98] I don't know [99] No response	[a] Own savings [b] In kind payment [c] Borrowed from bank [d] Borrowed from family [e] Microfinance [f] VSLA [g] Making payments to seller [h] Borrowed from informal lender [i] I did not pay [95] Other (specify) [98] I don't know [99] No response	* *price in local currency* [98] I don't know [99] No response

Bicycle Ownership – Parts									
E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**E9**	**E10**
Is your bicycle currently in working order?	Have you ever needed to buy replacement parts or accessories for your bicycle?	If E2 = yes, the last time you needed to repair, what was the part or accessory you needed to replace? *(check ALL that apply)*	If E2 = yes, the last time you needed to repair, were you successful in finding the spare part or accessory?	If E2 = yes, how difficult was it to find the spare part or accessory?	If E2 = yes, how much did it cost to replace the broken part including mechanic costs?	On average, how frequently do you need to repair your bicycle? *(choose only ONE)*	Are you concerned about the maintenance costs of your bicycle?	Who usually fixes your bicycle? *(choose only ONE)*	If E9 = local mechanic, how difficult is it to find a mechanic to fix your bicycle?
[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[a] Tire/ tube [b] Saddle [c] Chain [d] Pedal [e] Carrier [f] Fork [g] Frame [h] Brakes [i] Wheel/ spoke [j] Pump [k] Patch/ puncture kit [8] Other (specify) [98] I don't know	[1] Yes [0] No [98] I don't know [99] No response	[1] Very easy [2] Easy [3] Difficult [4] Very difficult [98] I don't know	_____ **Price in Local Currency*	[1] Daily [2] Several times a week [3] Weekly [4] Several times a month [5] Several times a year [6] Once a year or less [98] I don't know	[1] Yes [0] No [98] I don't know [99] No response	[1] Self [2] Household member [3] Local mechanic [4] Other (specify) [98] I don't know	[1] Very easy [2] Easy [3] Difficult [4] Very difficult [98] I don't know

Bicycle Utilization

F1	F2	F3	F4	F5	F6	F7	F8	F9
How often do you use a bicycle?	What is the average amount of time you spend traveling by bicycle per week?	Do you ever use a bicycle to access other forms of transportation? (e.g. transport to main road)	If you own a bicycle, do you ever lend your bicycle to people outside of your household?	Do you use your bicycle for your business?	What income generating activities have you used a bicycle for? *(check ALL that apply)*	Does a bicycle meet your transportation requirements?	What would help increase the frequency with which you use a bicycle? *(check ALL that apply)*	What do you think is a fair price to pay for a bicycle?
[1] Daily [2] Several times a week [3] Several times a month [4] Very infrequently [98] I don't know	* *time in minutes* _____x_____ Days Min	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [97] Never owned [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[a] Transporting goods [b] Bicycle taxi [c] Bicycle rental [d] On farm activity [e] I don't use my bike to generate income [95] Other (specify) [98] Don't know	[1] Yes [0] No [98] I don't know [99] No response	[a] Bicycle paths [b] Cheaper bicycles [c] Better road safety [d] Secure bicycle parking/ storage [e] Improved bicycle repair accessibility [f] Better bicycle design [g] I have no need to increase my bicycle usage [95] Other (specify) [98] I don't know	* *price in local currency* [98] I don't know [99] No response

Enabling Conditions

G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
What kinds of bicycle infrastructure or facilities exist in your community? *(check ALL that apply)*	Do you think using a bicycle on the tarmac roads is dangerous?	Do you think that using a bicycle on a dirt road is dangerous?	If G2 or G3 = yes, does your concern influence your decision to use a bicycle?	If G2 or G3 = yes, does your concern influence your decision to own a bicycle?	Are you concerned about bicycle theft in your community?	If G6 = yes, does your concern influence your decision to own a bicycle?	Do any organizations or institutions encourage or promote bicycle use in your community?	If D4=yes, how do these organization(s) promote bicycle use? *(check ALL that apply)*	Do you think the government should do more to encourage bicycle use?
[a] Dedicated bicycle lanes [b] Dirt pathways shared with walking [c] Paved shoulder on main road [d] Street lighting [e] Secure bicycle parking/ storage [f] Other (specify) [g] None [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[1] Yes [0] No [98] I don't know [99] No response	[a] Public awareness campaigns [b] Financial incentives [c] Giving bicycles for free [d] Dedicated infrastructure [e] Formal policies [95] Other (specify) [98] I don't know	[1] Yes [0] No [98] I don't know [99] No response

Attitudes and Perceptions

Z1	Z2	Z3	Z4	Z5	Z6	Z7
In general, I feel bicycle use is looked upon favorably in my community.	In general, I feel (would feel) safe while using a bicycle around my community	In general, I feel that it is acceptable for women in my community to use bicycles	In general, I feel that women in my community would benefit from having a bicycle	I am satisfied with the availability of bicycles in my community	I am satisfied with the quality of bicycles available in my community	From this list below, which are the three most important reasons you would choose a particular bicycle. (*Choose THREE options)*
[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Strongly agree [2] Somewhat agree [3] Somewhat disagree [4] Strongly disagree [98] I don't know [99] No response	[1] Cost [2] Quality/ durability [3] Ease of acquiring bicycle [4] Ease of maintenance [5] Ease of acquiring spare parts [6] Lightweight [7] Ease of riding [8] Style/ design [9] Other [98] I don't know [99] No response

~ Thank you for answering our questions ~

ANNEX 4: AFRICA BICYCLE IMPORT MARKET OVERVIEW

Presented in below Figure 14 and Table 11 is a summary of 5 years of bicycle import data for 54 African countries. All data is sourced from the CEPII BACI dataset and includes all reported imports for bicycles (HS Code 871200) during this period. Figure 14 displays the annual average imports for countries during this period, while Table 11 includes the annual figures for all countries as well. Countries in which BFG has conducted market systems assessments are highlighted in orange on the data table.

FIGURE 14: AFRICA REGION BICYCLE IMPORTS - ANNUAL AVERAGE (2016-2020)

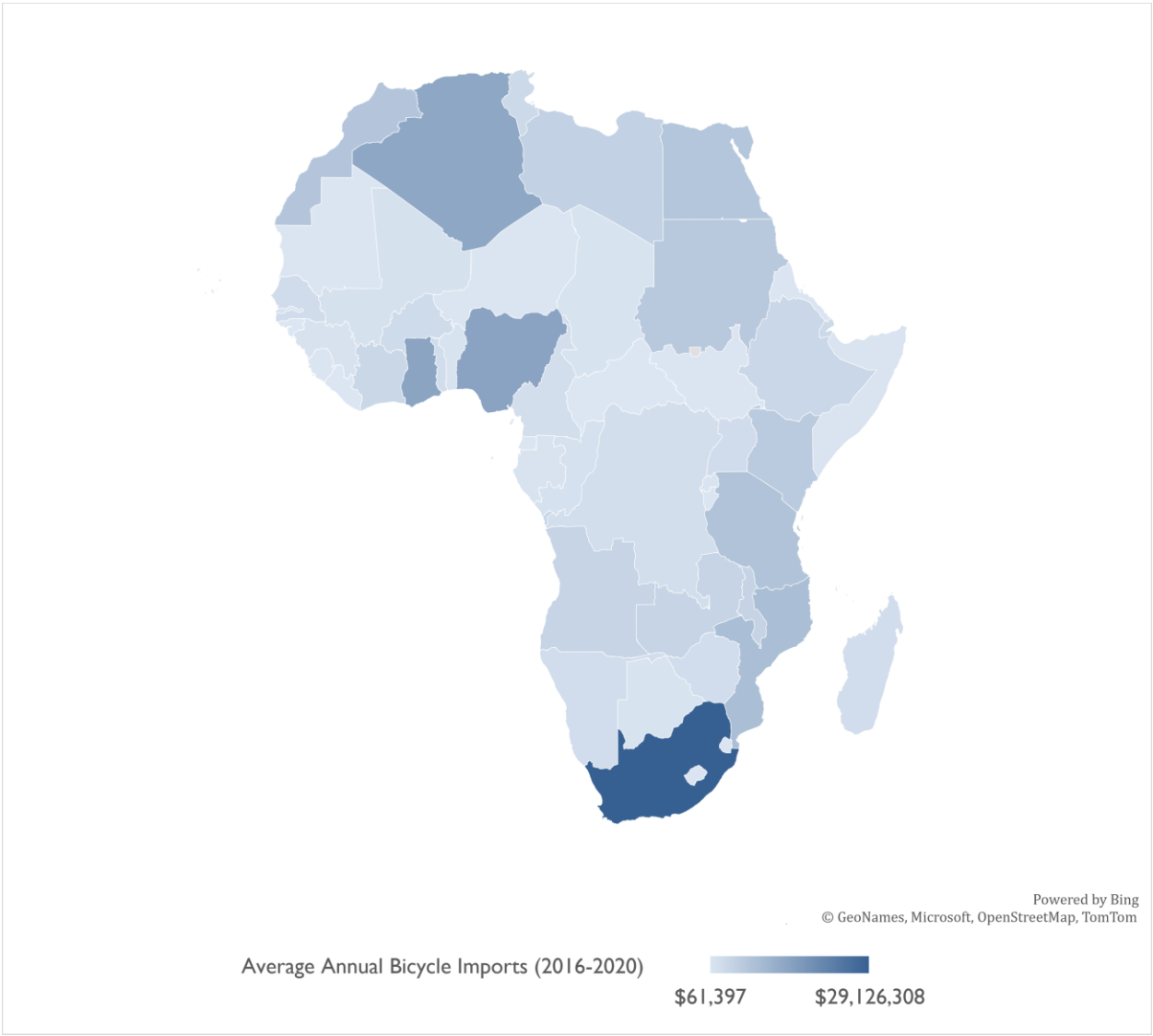


TABLE 11: AFRICA BICYCLE IMPORTS (2016-2020)

	Country	2016	2017	2018	2019	2020	5-Year Total	Avg. Annual Bicycle Imports (2016-2020)
1	South Africa	$25,990,303	$28,226,146	$37,102,643	$28,592,130	$25,720,320	$145,631,542	$29,126,308
2	Nigeria	$10,192,040	$10,248,451	$10,230,851	$25,773,142	$16,069,218	$72,513,702	$14,502,740
3	Ghana	$16,742,609	$14,755,735	$12,759,652	$13,212,675	$14,892,034	$72,362,705	$14,472,541
4	Algeria	$12,444,043	$12,057,572	$10,296,356	$14,032,083	$19,834,305	$68,664,359	$13,732,872
5	Mozambique	$7,292,303	$6,366,513	$10,044,355	$10,979,843	$9,396,424	$44,079,438	$8,815,888
6	Tanzania	$8,489,858	$6,644,234	$6,958,100	$6,532,608	$9,198,815	$37,823,615	$7,564,723
7	Morocco	$5,106,090	$5,737,478	$7,303,912	$7,379,293	$10,031,271	$35,558,044	$7,111,609
8	Egypt	$4,300,480	$6,827,729	$8,585,210	$7,515,549	$7,903,046	$35,132,014	$7,026,403
9	Sudan	$5,251,113	$9,077,093	$4,288,168	$6,299,589	$6,449,419	$31,365,382	$6,273,076
10	Kenya	$4,167,532	$4,769,939	$5,999,576	$6,429,504	$8,275,221	$29,641,772	$5,928,354
11	Libya	$3,087,576	$1,069,377	$3,970,860	$9,044,195	$5,751,769	$22,923,777	$4,584,755
12	Malawi	$3,766,841	$4,970,306	$4,559,601	$4,398,389	$3,161,075	$20,856,212	$4,171,242
13	Angola	$2,286,648	$10,898,840	$2,251,232	$1,958,585	$2,437,130	$19,832,435	$3,966,487
14	Zambia	$4,267,402	$4,518,752	$3,672,414	$3,893,269	$3,345,005	$19,696,842	$3,939,368
15	Ivory Coast	$3,232,611	$3,095,580	$2,824,464	$2,675,685	$5,136,468	$16,964,808	$3,392,962
16	Ethiopia	$1,981,251	$1,575,996	$2,765,823	$5,891,177	$3,817,870	$16,032,117	$3,206,423
17	Tunisia	$2,157,317	$2,813,738	$2,921,115	$2,449,095	$4,416,499	$14,757,764	$2,951,553
18	Djibouti	$1,604,803	$1,651,118	$2,495,285	$2,725,898	$6,242,944	$14,720,048	$2,944,010
19	Mauritius	$2,814,768	$2,232,388	$2,276,431	$1,617,400	$3,579,411	$12,520,398	$2,504,080
20	Burk. Faso	$3,303,002	$3,357,047	$2,174,987	$1,965,933	$1,579,727	$12,380,696	$2,476,139
21	Uganda	$1,206,686	$1,251,521	$1,810,114	$1,828,413	$4,678,026	$10,774,760	$2,154,952
22	Senegal	$2,885,784	$1,440,177	$1,810,890	$1,912,681	$2,711,539	$10,761,071	$2,152,214
23	Namibia	$1,823,839	$2,388,746	$2,223,118	$1,784,478	$1,847,145	$10,067,326	$2,013,465
24	Zimbabwe	$2,645,361	$1,911,208	$2,439,115	$1,393,568	$1,562,085	$9,951,337	$1,990,267
25	Madagascar	$1,354,851	$2,157,633	$2,335,326	$1,538,211	$2,496,864	$9,882,885	$1,976,577
26	Togo	$1,305,773	$1,760,797	$2,197,867	$2,540,809	$1,944,608	$9,749,854	$1,949,971
27	DR Congo	$1,266,250	$1,815,312	$2,207,373	$2,510,727	$1,291,733	$9,091,395	$1,818,279
28	Cameroon	$1,983,261	$1,265,404	$1,198,166	$1,975,579	$2,481,541	$8,903,951	$1,780,790
29	Congo	$1,592,705	$643,919	$1,186,648	$983,239	$1,792,146	$6,198,657	$1,239,731
30	Mali	$1,696,678	$1,123,121	$1,362,391	$835,868	$684,806	$5,702,864	$1,140,573
31	Gambia	$990,855	$1,176,420	$903,133	$953,723	$885,430	$4,909,561	$981,912
32	Guinea	$819,951	$813,565	$743,655	$923,452	$814,130	$4,114,753	$822,951
33	Gabon	$820,447	$589,083	$924,100	$858,936	$904,982	$4,097,548	$819,510
34	Botswana	$875,110	$804,346	$702,430	$707,960	$768,658	$3,858,504	$771,701
35	Benin	$669,276	$710,545	$605,483	$878,408	$876,357	$3,740,069	$748,014
36	Chad	$254,822	$422,102	$745,169	$843,286	$1,206,380	$3,471,759	$694,352
37	Somalia	$448,130	$347,835	$494,079	$894,329	$755,788	$2,940,161	$588,032
38	Seychelles	$466,136	$494,931	$534,871	$398,717	$201,472	$2,096,127	$419,225
39	Rwanda	$501,620	$419,537	$357,153	$537,931	$246,029	$2,062,270	$412,454
40	Burundi	$64,974	$126,757	$186,348	$1,306,168	$200,220	$1,884,467	$376,893
41	Cape Verde	$212,624	$340,016	$477,011	$266,409	$466,251	$1,762,311	$352,462
42	Sierra Leone	$636,061	$330,053	$293,258	$59,354	$108,068	$1,426,794	$285,359
43	Eswatini	$334,921	$272,067	$343,699	$265,841	$184,020	$1,400,548	$280,110
44	Eritrea	$124,646	$90,533	$153,679	$336,161	$604,774	$1,309,793	$261,959
45	Mauritania	$163,647	$181,860	$300,751	$426,485	$216,936	$1,289,679	$257,936
46	Eq. Guinea	$694,585	$111,389	$168,028	$134,567	$122,496	$1,231,065	$246,213
47	Niger	$201,906	$206,559	$121,339	$271,352	$273,600	$1,074,756	$214,951
48	South Sudan	$216,862	$269,180	$165,042	$154,742	$195,438	$1,001,264	$200,253
49	Lesotho	$216,972	$166,936	$188,132	$195,916	$100,725	$868,681	$173,736
50	Liberia	$39,040	$95,473	$152,436	$175,472	$248,024	$710,445	$142,089
51	Comoros	$126,355	$77,703	$87,839	$150,921	$70,204	$513,022	$102,604
52	Guinea-Bis.	$137,079	$17,533	$118,653	$142,340	$56,375	$471,980	$94,396
53	C. Afr. Rep.	$41,624	$122,854	$114,464	$6,547	$75,825	$361,314	$72,263
54	São Tomé	$37,726	$57,786	$45,213	$76,476	$89,786	$306,987	$61,397
	Region Total	*$155,349,092*	*$164,905,573*	*$171,185,539*	*$191,637,102*	*$198,418,464*	*$881,445,628*	*$176,289,126*

ANNEX 5: AFRICA BICYCLE SPARE PART IMPORT MARKET OVERVIEW

Presented in below Figure 15 and Table 12 is a summary of 5 years of bicycle spare part import data for 54 African countries. All data is sourced from the CEPII BACI dataset and includes the sum of all spare part imports inclusive of tires and tubes (HS Codes 87149X, 401320, and 401150) during this period. Figure 15 displays the annual average imports for countries during this period, while Table 12 includes the annual figures for all countries as well. Countries in which BFG has conducted market systems assessments are highlighted in orange on the data table.

It should be noted that there is a significant discrepancy between the value of spare part imports for Ghana calculated by CEPII (US$16.2 million in 2019) versus those provided by UN Comtrade (US$1.5 million during the same period). There is good reason to believe that UN Comtrade understates the value of spare parts imports to Ghana when considering trading partner export data from Comtrade. For example, in 2019 Comtrade reports that Ghana *imported* US$257,849 worth of rubber bicycle tubes (HS Code 401320) from all sources. For the same year, Comtrade reports that China alone *exported* $4.2 million worth of bicycle tubes. Similar patterns emerge with other spare parts. The CEPII BACI dataset attempts to reconcile these discrepancies and for that reason appears more reliable in this case than UN Comtrade import data. Nonetheless, it is important to bear in mind that these figures include a measure of uncertainty.

FIGURE 15: AFRICA REGION BICYCLE SPARE PARTS IMPORTS - ANNUAL AVERAGE (2016-2020)

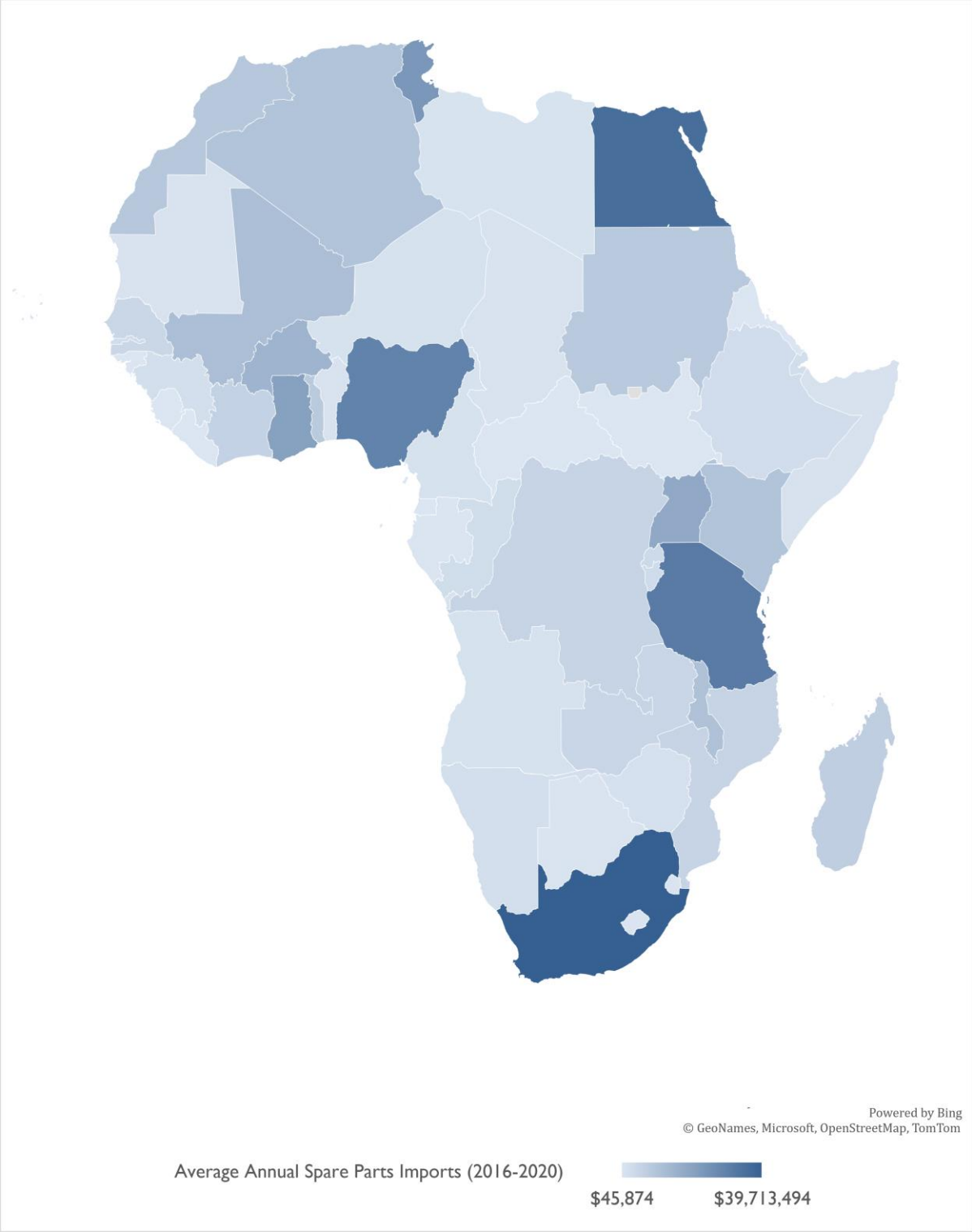


TABLE 12: AFRICA BICYCLE SPARE PARTS IMPORTS (2016-2020)

	Importing Country	2016	2017	2018	2019	2020	Total	5-Year Avg Annual Spare Parts Imports
1	South Africa	$46,408,079	$49,505,649	$41,504,224	$36,395,593	$24,753,923	$198,567,468	$39,713,494
2	Egypt	$31,227,720	$20,776,614	$35,171,342	$36,381,685	$54,032,261	$177,589,622	$35,517,924
3	Tanzania	$33,396,488	$25,929,936	$27,300,280	$36,275,217	$35,075,124	$157,977,045	$31,595,409
4	Nigeria	$28,098,719	$29,807,015	$29,499,073	$35,054,019	$24,203,709	$146,662,535	$29,332,507
5	Tunisia	$30,177,985	$22,161,852	$17,875,854	$20,669,137	$25,795,643	$116,680,471	$23,336,094
6	Ghana	$21,633,096	$21,542,074	$16,264,326	$16,246,475	$27,307,411	$102,993,382	$20,598,676
7	Uganda	$18,725,301	$21,335,824	$18,733,089	$15,679,169	$15,339,201	$89,812,584	$17,962,517
8	Burkina Faso	$15,011,864	$14,687,526	$12,868,306	$16,909,725	$13,648,657	$73,126,078	$14,625,216
9	Mali	$16,884,515	$10,525,922	$10,337,971	$13,543,614	$6,410,611	$57,702,633	$11,540,527
10	Malawi	$10,153,343	$12,264,161	$10,786,719	$12,378,623	$8,128,423	$53,711,269	$10,742,254
11	Algeria	$9,758,261	$9,306,602	$9,218,351	$9,546,171	$12,573,834	$50,403,219	$10,080,644
12	Kenya	$9,568,897	$9,648,047	$9,828,527	$9,625,118	$11,553,242	$50,223,831	$10,044,766
13	Morocco	$9,252,768	$7,632,076	$9,192,290	$8,945,450	$9,645,558	$44,668,142	$8,933,628
14	Sudan	$8,870,492	$9,877,308	$5,754,065	$7,713,711	$9,384,728	$41,600,304	$8,320,061
15	Togo	$6,228,065	$5,764,336	$9,444,944	$11,758,467	$7,720,673	$40,916,485	$8,183,297
16	Madagascar	$7,466,506	$7,112,418	$7,555,846	$6,523,189	$6,428,894	$35,086,853	$7,017,371
17	Ivory Coast	$4,477,774	$7,057,035	$4,852,939	$6,799,095	$6,834,711	$30,021,554	$6,004,311
18	DR Congo	$4,908,692	$4,872,698	$5,821,268	$5,364,240	$6,236,474	$27,203,372	$5,440,674
19	Mozambique	$4,994,759	$4,222,501	$5,660,064	$7,051,367	$4,603,450	$26,532,141	$5,306,428
20	Zambia	$4,036,908	$4,425,308	$5,185,661	$4,935,123	$4,810,905	$23,393,905	$4,678,781
21	Senegal	$5,346,951	$4,128,225	$4,279,936	$4,083,153	$4,546,668	$22,384,933	$4,476,987
22	Rwanda	$3,818,570	$1,846,377	$4,140,315	$4,298,788	$3,862,076	$17,966,126	$3,593,225
23	Burundi	$3,079,020	$2,995,580	$3,041,446	$2,957,629	$3,219,473	$15,293,148	$3,058,630
24	Congo	$2,203,745	$2,131,883	$3,200,845	$3,287,129	$3,226,568	$14,050,170	$2,810,034
25	Gambia	$2,144,881	$2,569,204	$3,047,682	$3,032,915	$2,535,910	$13,330,592	$2,666,118
26	Ethiopia	$1,678,677	$3,137,217	$1,932,329	$3,235,615	$3,137,966	$13,121,804	$2,624,361
27	Djibouti	$1,435,201	$2,279,394	$2,437,769	$3,183,565	$2,381,695	$11,717,624	$2,343,525
28	Namibia	$2,614,839	$2,678,742	$1,992,682	$2,135,216	$1,438,974	$10,860,453	$2,172,091
29	Guinea	$2,291,051	$2,163,350	$1,858,269	$1,778,174	$1,995,620	$10,086,464	$2,017,293
30	Mauritius	$1,617,361	$1,511,706	$1,824,755	$1,686,230	$1,634,376	$8,274,428	$1,654,886
31	Zimbabwe	$2,184,953	$1,778,913	$1,686,615	$589,071	$673,961	$6,913,513	$1,382,703
32	Niger	$1,552,504	$1,538,850	$1,372,610	$977,981	$1,087,375	$6,529,320	$1,305,864
33	Angola	$1,117,748	$1,408,306	$1,531,261	$1,236,185	$676,594	$5,970,094	$1,194,019
34	Cameroon	$1,031,077	$673,063	$844,652	$1,344,242	$1,971,197	$5,864,231	$1,172,846
35	Somalia	$2,045,137	$1,156,017	$1,505,135	$350,725	$473,272	$5,530,286	$1,106,057
36	Libya	$1,190,402	$685,686	$848,590	$1,207,359	$814,747	$4,746,784	$949,357
37	Benin	$1,091,442	$1,286,667	$874,061	$589,180	$502,409	$4,343,759	$868,752
38	Mauritania	$553,565	$1,047,878	$1,185,905	$679,930	$845,162	$4,312,440	$862,488
39	Chad	$419,316	$437,283	$909,655	$1,202,536	$1,159,966	$4,128,756	$825,751
40	Botswana	$946,558	$959,313	$602,249	$504,806	$656,192	$3,669,118	$733,824
41	Eswatini	$371,715	$650,392	$573,604	$326,461	$238,186	$2,160,358	$432,072
42	Gabon	$90,123	$45,499	$32,195	$442,229	$1,412,943	$2,022,989	$404,598
43	Lesotho	$335,364	$485,434	$321,714	$229,322	$136,305	$1,508,139	$301,628
44	Cape Verde	$109,883	$217,425	$198,939	$436,920	$275,836	$1,239,003	$247,801
45	Seychelles	$277,555	$314,686	$305,827	$152,432	$165,412	$1,215,912	$243,182
46	So. Sudan	$52,615	$129,539	$167,839	$415,123	$151,733	$916,849	$183,370
47	Liberia	$217,742	$40,481	$109,409	$172,681	$107,848	$648,161	$129,632
48	Sierra Leone	$59,160	$111,547	$209,490	$80,454	$65,124	$525,775	$105,155
49	S. Tomé	$68,847	$88,379	$95,001	$125,036	$14,983	$392,246	$78,449
50	Eq. Guinea	$116,087	$98,220	$59,725	$16,916	$69,091	$360,039	$72,008
51	Comoros	$39,625	$43,205	$111,793	$51,911	$59,539	$306,073	$61,215
52	Guinea-Bissau	$172,024	$12,562	$106	$79,802	$25,806	$290,300	$58,060
53	Eritrea	$32,303	$31,293	$17,564	$46,185	$161,808	$289,153	$57,831
54	Cen. Afr. Rep.	$15,617	$99,651	$81,795	$9,388	$22,919	$229,370	$45,874
	Regional Total	*$361,601,890*	*$337,236,869*	*$334,256,901*	*$358,740,477*	*$354,235,166*	*$1,746,071,303*	*$349,214,261*

TABLE 13: AFRICA AVERAGE ANNUAL IMPORTS BY SPARE PART CATEGORY (2016-2020)

	Importing Country	Bicycle Tires	Bicycle Tubes	Frames, and Frames	Brakes	Hubs	Saddles	Wheel Rims and Spokes	Pedals and Cranks	Other Parts	*All Spare Parts*
1	So. Africa	$3,082,363	$1,602,072	$10,807,890	$1,889,617	$1,898,282	$852,557	$4,349,221	$2,733,466	$12,498,024	*$39,713,494*
2	Egypt	$3,883,672	$2,697,725	$6,130,849	$1,331,611	$1,118,057	$1,981,410	$3,398,740	$1,607,117	$13,368,742	*$35,517,924*
3	Tanzania	$7,787,754	$4,915,461	$2,138,769	$1,621,591	$1,611,385	$1,314,273	$2,396,062	$2,308,316	$7,501,797	*$31,595,409*
4	Nigeria	$5,930,581	$5,274,007	$989,474	$1,319,880	$3,448,704	$785,483	$3,153,450	$1,823,415	$6,607,513	*$29,332,507*
5	Tunisia	$2,344,232	$934,695	$5,020,261	$1,077,302	$854,979	$710,270	$755,573	$1,369,436	$10,269,347	*$23,336,094*
6	Ghana	$3,457,554	$4,098,849	$1,026,499	$968,619	$653,338	$1,605,211	$760,812	$943,328	$7,084,467	*$20,598,676*
7	Uganda	$2,912,500	$2,746,413	$1,788,306	$739,422	$2,174,044	$354,028	$1,307,747	$1,489,593	$4,450,462	*$17,962,517*
8	Bur. Faso	$1,916,796	$2,170,907	$2,067,534	$635,668	$1,509,759	$929,923	$775,847	$1,799,214	$2,819,568	*$14,625,216*
9	Mali	$2,455,493	$729,495	$595,765	$178,183	$2,065,408	$288,911	$289,632	$550,544	$4,387,095	*$11,540,527*
10	Malawi	$2,556,292	$1,475,762	$1,127,017	$410,900	$975,658	$336,520	$906,091	$603,252	$2,350,761	*$10,742,254*
11	Algeria	$1,505,463	$1,716,901	$483,075	$626,004	$338,361	$486,433	$541,254	$473,054	$3,910,099	*$10,080,644*
12	Kenya	$1,558,580	$1,575,630	$543,323	$418,109	$652,996	$377,246	$1,372,458	$595,483	$2,950,941	*$10,044,766*
13	Morocco	$2,229,541	$1,694,309	$176,525	$368,911	$356,978	$358,900	$525,395	$353,145	$2,869,925	*$8,933,628*
14	Sudan	$1,020,857	$1,191,965	$164,984	$186,686	$227,227	$288,308	$234,486	$358,156	$4,647,390	*$8,320,061*
15	Togo	$1,988,740	$1,499,819	$167,517	$368,475	$189,570	$457,694	$235,044	$444,525	$2,831,913	*$8,183,297*
16	Madag.	$1,257,144	$526,621	$382,675	$257,618	$318,791	$380,627	$599,578	$546,492	$2,747,826	*$7,017,371*
17	C.d'Ivoire	$1,835,129	$606,367	$903,639	$209,282	$210,604	$433,525	$642,898	$322,275	$840,591	*$6,004,311*
18	DRC	$1,220,967	$606,979	$753,176	$186,280	$311,243	$83,190	$330,738	$117,386	$1,830,716	*$5,440,674*
19	Mozamb.	$747,823	$681,200	$249,428	$119,603	$433,212	$148,853	$365,258	$307,051	$2,254,001	*$5,306,428*
20	Zambia	$870,094	$963,089	$300,725	$82,825	$453,890	$86,936	$243,686	$271,793	$1,405,744	*$4,678,781*
21	Senegal	$720,444	$822,364	$437,022	$130,268	$161,023	$311,381	$238,259	$242,867	$1,413,358	*$4,476,987*
22	Rwanda	$728,811	$189,484	$321,361	$94,445	$190,569	$63,725	$500,666	$231,442	$1,272,721	*$3,593,225*
23	Burundi	$827,166	$256,006	$326,036	$76,008	$174,034	$83,519	$148,030	$257,179	$910,652	*$3,058,630*
24	Congo	$58,570	$35,520	$457,156	$135,456	$526,150	$48,637	$387,753	$580,550	$580,242	*$2,810,034*
25	Gambia	$510,302	$448,677	$137,471	$85,949	$197,867	$173,431	$142,299	$254,396	$715,727	*$2,666,118*
26	Ethiopia	$157,062	$266,935	$204,789	$191,041	$151,473	$32,117	$292,671	$37,834	$1,290,439	*$2,624,361*
27	Djibouti	$429,058	$278,765	$84,030	$80,812	$72,339	$112,035	$197,906	$83,668	$1,004,912	*$2,343,525*
28	Namibia	$165,636	$59,118	$354,281	$51,710	$71,835	$28,436	$614,393	$46,495	$780,187	*$2,172,091*
29	Guinea	$409,748	$389,971	$62,748	$126,853	$101,196	$52,841	$79,161	$144,816	$649,959	*$2,017,293*
30	Mauritius	$277,324	$209,740	$53,985	$58,483	$134,807	$21,688	$74,554	$28,616	$795,688	*$1,654,886*
31	Zimba.	$476,942	$240,762	$23,857	$56,837	$125,519	$22,222	$35,888	$78,742	$321,936	*$1,382,703*
32	Niger	$764,435	$24,997	$38,945	$8,036	$11,256	$70,683	$18,058	$18,979	$350,476	*$1,305,864*
33	Angola	$98,517	$43,392	$50,118	$105,777	$44,376	$17,260	$50,663	$58,058	$725,857	*$1,194,019*
34	Camer.	$86,838	$132,709	$77,442	$35,337	$138,416	$21,616	$226,278	$61,565	$392,644	*$1,172,846*
35	Somalia	$26,705	$590,778	$11,720	$28,800	$5,343	$1,160	$41,004	$3,875	$396,672	*$1,106,057*
36	Libya	$158,526	$199,061	$17,115	$23,653	$33,179	$39,728	$84,753	$42,432	$350,910	*$949,357*
37	Benin	$78,410	$67,430	$215,635	$54,891	$97,168	$8,415	$136,056	$10,350	$200,396	*$868,752*
38	Mauritan.	$25,562	$173,000	$26,451	$8,258	$10,690	$6,606	$42,871	$10,387	$558,665	*$862,488*
39	Chad	$100,023	$130,180	$79,075	$21,485	$105,976	$27,283	$85,525	$127,590	$148,614	*$825,751*
40	Botswana	$88,153	$51,722	$33,548	$103,940	$28,389	$17,174	$127,996	$24,922	$257,978	*$733,824*
41	Eswatini	$27,862	$12,404	$58,786	$22,956	$29,877	$1,770	$100,578	$25,150	$152,689	*$432,072*
42	Gabon	$12,859	$2,718	$2,635	$4,752	$110,715	$174	$10,365	$533	$259,847	*$404,598*
43	Lesotho	$3,931	$2,813	$34,283	$29,880	$3,904	$3,355	$100,050	$3,560	$119,853	*$301,628*
44	C. Verde	$30,621	$27,508	$3,521	$112,536	$2,152	$2,183	$12,346	$1,050	$55,883	*$247,801*
45	Seych.	$13,606	$11,614	$11,791	$21,969	$5,668	$2,447	$77,723	$5,052	$93,313	*$243,182*
46	So. Sudan	$8,058	$4,778	$2,304	$8,660	$10,795	$0	$20,756	$3,547	$124,470	*$183,370*
47	Liberia	$14,753	$8,924	$2,306	$8,929	$1,198	$157	$5,624	$2,243	$85,498	*$129,632*
48	S. Leone	$18,802	$2,823	$19,473	$4,715	$15,007	$92	$8,585	$1,623	$34,034	*$105,155*
49	S. Tomé	$4,440	$2,667	$1,141	$6,375	$1,710	$555	$13,636	$2,218	$45,708	*$78,449*
50	Eq. Guinea	$22,181	$5,125	$4,190	$424	$13,266	$71	$15,560	$149	$11,043	*$72,008*
51	Comoros	$4,035	$1,890	$470	$3,089	$913	$23	$2,458	$2,521	$45,816	*$61,215*
52	Guinea-B.	$42,732	$6,059	$754	$0	$2,505	$2	$662	$49	$5,296	*$58,060*
53	Eritrea	$11,545	$37	$617	$100	$4,533	$39	$6,431	$27	$34,502	*$57,831*
54	Cen. Af. Rep.	$397	$4,093	$3,014	$1,404	$363	$0	$2,638	$0	$33,965	*$45,874*
	Regional Total	*$3,082,363*	*$1,602,072*	*$10,807,890*	*$1,889,617*	*$1,898,282*	*$852,557*	*$4,349,221*	*$2,733,466*	*$12,498,024*	*$39,713,494*

ANNEX 6: ADDITIONAL STATISTICAL TABLES

TABLE 14: BICYCLE OWNERSHIP RATES

	Number of BFG survey respondents	% Bicycle owners
All respondents	**330**	31.8%
Bicycle Ownership		
Owner	225	100.0%
Non-owner	105	0.0%
District		
Mchinji	91	34.1%
Salima	88	27.3%
Mzimba	74	36.5%
Zomba	77	29.9%
Geographic Setting		
Rural	169	29.0%
Urban	81	29.6%
Peri-urban	80	40.0%
Gender		
Male	188	44.7%
Female	142	14.8%
Age Group		
18-24 years	96	11.5%
24-34 years	117	38.5%
35-44 years	68	41.2%
45 years+	49	42.9%
Economic Activity		
Farmer	44	35.8%
Informal merchant	119	38.9%
Formal merchant	51	46.6%
Employment private (e.g., casual) or government	79	23.2%
Unemployed	36	5.3%

TABLE 15: BICYCLE USAGE FREQUENCY AND INTENSITY[51]

	% Reporting regular bicycle usage[52]	Average hours per week spent travelling on bicycles
All respondents	**52.4%**	**10.8**
Bicycle Ownership		
Owner	86.7%	19.2
Non-owner	36.4%	6.8
District		
Mchinji	53.8%	15.0
Salima	63.6%	13.6
Mzimba	45.9%	6.6
Zomba	44.2%	6.5
Geographic Setting		
Rural	50.3%	10.9
Peri-urban	53.8%	11.2
Urban	55.6%	10.1
Gender		
Male	65.4%	14.6
Female	35.2%	5.6
Age Group		
24 years and below	27.1%	5.9
25-34 years	65.8%	13.3
35 years and above	59.8%	12.2
Employment Activity		
Farmer	47.7%	11.5
Informal merchant	59.7%	12.6
Formal merchant	76.5%	16.3
Employment- private or government	46.8%	7.5
Unemployed	13.9%	3.3

[51] BFG survey.
[52] "Regular bicycle usage" defined as used either daily or several times per week.

TABLE 16: AVERAGE TRANSPORTATION EXPENDITURE

	n	Average 30-day expenditure (MWK)	Average30-day expenditure (USD)
All Respondents	**330**	7980.00	$9.79
Districts			
Mchinji	91	5276.00	$6.47
Salima	88	9105.00	$11.17
Mzimba	74	7680.00	$9.42
Zomba	77	10179.00	$12.49
Geographic Setting			
Rural	169	7292.00	$8.95
Peri-urban	81	10630.00	$13.04
Urban	80	6751.00	$8.28
Gender			
Male	188	7909.00	$9.70
Female	142	8074.00	$9.91
Age Group			
24 years and below	96	6387.00	$7.84
25-34 years	117	8151.00	$10.00
35 years and above	117	9116.00	$11.19
Primary Mode of Travel			
Walking	146	6289.00	$7.72
Bicycle (own)	113	8116.00	$9.96
Bicycle taxi	48	9513.00	$11.67
Other (motorized)	22	14848.00	$18.22
Economic Activity			
Farmer	44	6139.00	$7.53
Informal merchant	119	8152.00	$10.00
Formal merchant	51	11573.00	$14.20
Employment private or government	79	7942.00	$9.74
Unemployed	36	4753.00	$5.83
Bicycle Ownership			
Owner	105	9451.43	$11.59
Non-owner	225	7293.33	$8.95

TABLE 17: PRIMARY MODES OF TRAVEL

		Mode of travel to work or market				
	n	Bicycle (owned/ borrowed)	Bicycle taxi	Walking	Minibus Taxi	Other
All locations	**330**	34%	15%	44%	5%	2%
Districts						
Mchinji	91	32%	18%	48%	0%	2%
Salima	88	43%	19%	38%	0%	0%
Mzimba	74	26%	12%	58%	0%	4%
Zomba	77	35%	8%	34%	19%	4%
Geographic Setting						
Rural	169	33%	14%	50%	0%	2%
Peri-urban	81	40%	14%	25%	19%	4%
Urban	80	31%	16%	51%	0%	1%
Gender						
Male	188	51%	13%	30%	5%	2%
Female	142	13%	17%	63%	4%	3%
Age Group						
24 years and below	96	13%	15%	59%	10%	3%
25-34 years	117	44%	17%	34%	2%	3%
35-44 years	68	50%	15%	31%	3%	1%
>=45 years	49	33%	8%	57%	2%	0%
Economic Activity						
Farmer	44	36%	16%	43%	0%	5%
Informal merchant	119	42%	12%	43%	1%	3%
Formal merchant	51	49%	22%	24%	2%	4%
Employment private or government	79	28%	13%	44%	14%	1%
Unemployed	36	0%	17%	78%	6%	0%
Bicycle Ownership						
Owner	105	15%	19%	58%	6%	3%
Non-owner	225	76%	5%	15%	2%	2%