



# Evaluation of World Bicycle Relief's Bicycles for Educational Empowerment Program: *South Africa Opportunity Study*

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## Executive Summary

School children in rural communities often must walk long distances to school, jeopardizing attendance and achievement. Through its Bicycles for Educational Empowerment Program (BEEP), World Bicycle Relief (WBR) provides rural students with bicycles, to help them get to school more quickly and safely so they can spend less time walking and more time learning.

BEEP has been operating in Zambia since 2009, but the program in South Africa is much newer, beginning in 2014. The purpose of this “opportunity study” was to identify the opportunity that bicycles could offer to rural South African schoolchildren; the critical factors that support and hinder implementation; and areas to consider for program improvement.

The research took place at four schools in Limpopo Province in the northeast of the country: one of South Africa’s poorest and most rural provinces. Limpopo has among the lowest academic achievement of the provinces, and 79% of its students walk to school. Bicycles are less common in South Africa than in many African countries, resulting in a less prominent bike culture that offers both opportunities and challenges for BEEP.

The schools selected for the research had participated in BEEP for at least 6 months at the time of the data collection and represent a range of program implementation quality. Data were collected from April to June, 2016, including a survey of over 200 beneficiaries in grades 8-10 and interviews with district and school leaders, teachers, families, BEEP bike mechanics, members of bicycle supervisory committees, and program staff, as well as monitoring data provided by the schools. Outcomes are self-reported by program participants and have not been independently verified.



## The Opportunity

When learners ride their bikes to school, they and other stakeholders report:

- **Dramatic reductions in travel time to school.** Before receiving their bikes, 63% of learners reported that their one-way commute took over 30 minutes, compared to only 10% after bikes were distributed.
- **Substantial increases in on-time arrival at school.** Ninety-five percent of students said that with the bike, they were less likely to be late for school. Other reported benefits of reduced travel time include more time for chores, studying and homework; reduced fatigue; and increased concentration at school.
- **Claims of widespread improvements in academic performance.** Eighty-eight percent of learners and most parents reported that grades had improved in the time since learners had their bicycles, due to on-time arrival, improved concentration, and more time to study.

- **Some improvement in attendance reported.**

Thirty-eight percent of learners reported one or more days that would otherwise have been missed because they overslept or were tired. However, meaningful attendance improvements were less of an opportunity in this setting, as attendance at most schools was already strong prior to the introduction of the program.

- **Theft and sales of bicycles.** These were prominent challenges in one school, where construction reduced security of bicycle storage and some families were reported to have sold the bike for income.

## Key Factors Affecting Ridership

The benefits described above are opportunities when students ride their bikes to school regularly. Across the four schools, 55% of learners reported that they road their bike to school on a daily basis. However, the frequency of bike use for school transportation varies considerably by school, with generally higher ridership for schools near flat paved roads rather than hilly terrain, and for boys more than girls. Key factors that limit daily ridership in Limpopo include:

- **Maintenance issues.** Sixty-two percent of learners reported that they were unable to ride their bike to school at least once because their bike was inoperable. Primary cited reasons include a lack of routine maintenance, poor road conditions, and inappropriate uses of the bike, such as racing or carrying heavy loads required for chores or family livelihood.
- **Cost of bike maintenance.** While the bikes themselves are free of charge and trained bicycle mechanics are available, the cost of the mechanics' services is borne by families, many with limited financial means.
- **Concerns about bike safety.** Cited issues—some typical for riders with limited biking experience—include the fear of falling or experience of an accident; poor conditions of the roads, and sharing roads with automobiles and lorries; a prominent racing culture; and reluctance to wear helmets.

## Considerations for Program Refinement

Frequency of bike use for school transportation is clearly linked to the potential effectiveness of the program; in schools with lower ridership, potential impact of the program is diluted. The considerations for program refinement outlined below are intended to help increase the frequency at which the bikes are being used to transport learners to school. Considerations for program refinement include:

- **Continue to evolve family and beneficiary training offerings to promote a bike culture.** Many South African beneficiaries and families are new to bike riding. Learners might benefit from an expanded orientation that emphasizes biking skills, safety, and maintenance over the course of the year. With additional program contact, families may begin to see the bicycle as an essential support for education and for family needs.
- **Focus on the needs of girls.** Supporting girls' participation, wellbeing and outcomes has long been a BEEP priority. In South Africa, girls face some particular barriers, including less biking experience on average than their male counterparts and cultural norms that may discourage girls from riding. Tailored programming might help girls to improve their biking skills and confidence, as well as providing appropriate encouragement for families.

- **Promote and require regular bicycle maintenance.** Bikes must be in working order to provide benefit for learners. Enablers might include mandatory monthly mechanic hours at the school, free routine maintenance, and firmer monitoring of the maintenance stipulation in contracts.
- **Improve program monitoring with regular ground-truthing of school-reported usage data.** Collecting accurate program monitoring and evaluation data from schools is a costly endeavor, but a necessary one for informing program implementation and promoting success. Increased hands-on contact with schools could both support monitoring and encourage a stronger balance between program fidelity and local control.
- **Consider the trade-offs between school and family ownership of bikes.** Family bike ownership is an important program design element to promote both learner responsibility and family benefit. A number of stakeholders

suggested that school ownership might increase ridership to school, reduce problematic bike uses, and improve maintenance. While the trade-offs are substantial, the issue of ongoing bike ownership might be a worthwhile program variation to explore.

SRI has great respect for the expertise and commitment of WBR leadership and staff to continue to refine BEEP and make it the most effective program possible in South Africa. WBR staff are doing extraordinary work under quite challenging circumstances and this has been readily acknowledged by the learners, heads of household, and school staff we interviewed. WBR and BEEP continue to serve critical transportation needs in developing countries through the power of bicycles.



# 1. Background

In rural communities in the developing world, the lack of public transportation options means that most learners walk to school over substantial distances. Many arrive tired after the start of their first class, with some learners missing school entirely, particularly when the weather turns bad. For girls, the walk can be particularly anxiety-ridden and may be unsafe.



Learners walking to school in rural South Africa

Through the distribution of bicycles to school children, the goal of World Bicycle Relief (WBR)'s Bicycles for Educational Empowerment Program (BEEP) is to reduce the time it takes for rural learners to travel between home and school, providing learners with a safer and less tiring transportation option. The program aims to reduce tardiness, boost attendance, increase learners' levels of concentration in the classroom, and, ultimately, improve academic performance and personal empowerment. World Bicycle Relief also hopes that BEEP will improve overall family well-being if the bikes are used outside of the school day to improve the families' access to health clinics, markets for buying and selling goods, paid work opportunities, and a broader network of family and friends, as well as to allow learners more time to complete chores.

The BEEP program distributed its first bikes in a set of Zambian schools in 2009. Since that time, WBR has distributed more than 90,000 bikes globally to learners in primary and secondary schools.

In 2013, WBR teamed with implementation partner World Vision International (WVI) to begin distributing

bikes in South Africa.<sup>1</sup> To date the partnership has distributed 12,300 bikes in 113 schools across five provinces. The UBS Optimus Foundation sponsored 2500 bikes that were distributed in South Africa in 2015.

Walking to school is quite common in South Africa, particularly for rural and low-income learners. Research from the South African National Household Travel Survey conducted during 2013 (Statistics South Africa, 2014) indicated that over 60% of the 11 million learners nationally who walk to school each day are in the lowest household income quintile. More than 27% of learners walk more than 30 minutes to school each way and about 6% more than one hour. It is these children, and their families, that WBR hopes to serve with the BEEP program.

In 2015, the UBS Optimus Foundation contracted with SRI International to conduct a study of BEEP in four participating schools in the Limpopo province of South Africa. The purpose of this "opportunity" study was

<sup>1</sup>WBR is known as Qhubeka in South Africa, and BEEP is known locally as Bicycle Education Empowerment Programme.

to help inform WBR's ongoing work to adapt BEEP to the local context by understanding 1) how BEEP is being implemented in the South Africa, a country with a relatively young bike culture; 2) the potential of the program to improve academic outcomes; and 3) what programmatic refinements might support more effective implementation. We also hoped that this research would lead to the development of frameworks and instruments for BEEP program implementation research that could be leveraged in other evaluations of BEEP and enable cross-site comparisons. The field research was conducted from April to June, 2016.

## 1.1 The Bicycle Education Empowerment Programme (BEEP) in South Africa

To select the schools in which bicycles will be distributed, WBR and WVI work with national and local education authorities to identify regions and communities in which WVI is active that have known school transportation challenges that contribute to low academic performance. Once a region is identified, they work with local education authorities to identify schools with the greatest school transportation needs and then visit the identified schools, meet with school leaders, collect data on the extent of the school's transportation needs, and judge the capacity and commitment of the school leaders and community to participation in the program.

Once a school is selected, a Bicycle Supervisory Committee (BSC) is formed to help implement and monitor the local program. The BSC is comprised of local stakeholders, school administrators and teachers, and members of a school's governing board (parents). Through a series of orientation meetings provided by WVI staff, the members are given guidance on the selection of the bike recipients (also known as beneficiaries) and the nomination of bike mechanics. Ultimately the BSCs are responsible for communicating about the program

to the broader community and establishing policies and practices governing the use of the bikes. In addition, the BSCs are responsible for monitoring the program during the school year, including confiscation of bikes that they determine are not being used properly by the learners.

One of the primary responsibilities of the BSCs is the selection of the BEEP beneficiaries. Interested families complete applications and submit them to the BSC for review. The main eligibility criterion for receiving a bike is the distance a learner travels to school (typically 3 kilometers or more), with learners who walk the furthest receiving highest priority. However, the committee has the discretion to use other criteria they deem appropriate, including the frequency at which a learner is late to school, poor attendance due to distance, gender (with a preference for girls), and families with special needs.

Bicycles are distributed at a hand over ceremony at each school, attended by both beneficiaries and parents and guardians. Two to three weeks prior to the ceremony, the beneficiary and the head of each household sign a contract that highlights appropriate uses of the bike by learners and other family members, the fact that maintenance is the responsibility of the family, and the consequences if the BSC determines that a bike is not being used appropriately. At the ceremony, learners are given their bicycles along with a helmet, riding instruction, and a small maintenance kit. Additional information is provided by the BEEP mechanic on basic repairs and maintenance, and by a representative of the Traffic department on riding rules and safety.

If the household complies with the terms and conditions of the contract for two years, the bike becomes the property of the household.

To facilitate the maintenance of the bikes within each school, candidate bike mechanics are identified within each community and trained by WBR staff (the bikes were designed and are assembled locally by WBR).

The training is conducted over a one-week period and includes technical content (how to fix and assemble the bike) as well as business content such as how to create a budget. Mechanics are supplied with the proper tools to provide regular maintenance of the bikes. WBR is also responsible for providing the mechanics with access to spare bike parts which the mechanics must purchase. Households are charged minimal fees for bike maintenance and mechanics are encouraged to service bikes from outside of the BEEP program to generate additional income.

Program monitoring data is collected by each school and reported to local WVI managers on a monthly basis. Each school is required to keep a daily record of the number of bikes that show up at school. The data are recorded in a standard form developed by WBR and WVI. At some schools, learners may be responsible for collecting and recording data: in other cases this may be a teacher or security guard. BSCs are also required to

provide WVI managers with monthly reports on various aspects of the program including number of bikes requiring repairs, bikes stolen, and bikes confiscated by the BSC due to some type of infraction. Finally, WBR attempts to monitor the prevalence of bike maintenance issues with monthly logs kept by the mechanics, capturing counts and details of bikes repaired, problems fixed, and spare parts used.

## 1.2 The Setting for the Research: Limpopo Province

This research was conducted in four schools in the Limpopo Province, the northernmost province in the country bordering Botswana, Zimbabwe, Mozambique, and Swaziland. Limpopo is one of the poorest and most rural of South Africa's provinces. According to a national education report published in 2013 (Department of Basic Education, 2013), Limpopo had



Limpopo is the northernmost province in South Africa bordering Botswana, Zimbabwe, Mozambique, and Swaziland

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the lowest academic achievement in mathematics and home language of all the provinces, with approximately 96% of Grade 9 learners failing to achieve even elementary levels of achievement in mathematics. Ninety-four percent of learners in the current study's research sample reported walking to school each day as their only means of school transportation, compared to 79% across Limpopo (Statistics South Africa, 2014) and 67% nationally (Statistics South Africa, 2016).

Another important characteristic of the setting, both Limpopo Province and South Africa more broadly, is its relatively young bike culture. Of the learners in our sample, 36% (20% of boys and 52% of girls) reported that they had never before ridden a bicycle. Prior to the BEEP program, over 90% of these learners reported walking to school every day; only 5 out of 204 (less than 3%) rode or shared a bicycle as school transportation. Furthermore, parents in the region typically do not have biking experience. This newness might be expected to increase the opportunity presented by the BEEP program, as it is introducing a very new form of transportation for many families. It might also pose a challenge, as learners and their families have limited prior experience with bike riding and may be predisposed to view the bicycle as recreation rather than an essential tool contributing to learner and family well-being.

For these and other reasons, WBR and WVI have been actively monitoring and adapting BEEP to the South African setting. For example, based on observations of the type of terrain through which learners were biking in some areas, the bike's braking system was redesigned to improve riding safety. This research is intended to inform this ongoing process of program improvement.

Four schools were selected for the research that had received bikes prior to August 2015, at least 6 months

prior to data collection, so that we could observe the program in these schools after patterns of bike use and other program components had had a chance to stabilize. Additional selection criteria included:

- **Distance to school**, targeting schools that serve learners who traveled greater than 30 minutes to school prior to receiving a bike
- **Variation in bicycle usage and academic performance**, so that the research could learn from schools with different needs, capacities and challenges in implementing BEEP.

Ultimately two schools were selected in each of two different regions with contrasting economic development and terrain. In both regions, WVI had historical and strong relationships with communities and schools and provided ongoing health, economic, and social services and programming. One of the regions (Region 1) is more rural and has hilly and steep terrain. The two schools in this region (A and B) were located about 22km and 15km away from the nearest asphalt road respectively; local roads were instead dirt or gravel. By contrast, the other region (Region 2) is more economically developed, with fairly flat terrain. The two schools in this region (C and D) are each located less than 200 meters from an asphalt road. Three of the four schools began their BEEP participation in 2015. One school, School D, started in 2014.

Table 1 shows baseline information for the beneficiaries in the selected schools, as well as the number of bikes distributed in 2015 and their distribution across genders. Overall, slightly more boys than girls received bikes (352 vs 334). A majority of learners in the research sample (64%) reported walking over 30 minutes to school prior to receiving a bike from BEEP, compared to 27% nationally and 21% within all of Limpopo (Statistics South Africa, 2014).

Table 1. Baseline Data for Limpopo Schools Participating in the Research<sup>a</sup>

Region	School	# of bikes distributed in 2015, by gender (boys/girls)	Average distance traveled to school <sup>b</sup>	Average time to walk to school <sup>b</sup>	Average # of days absent <sup>c</sup>	Average academic performance <sup>d</sup> (previous term)
1	A	122 (62/60)	2.5km	2 hours	1	64%
1	B	110 (65/45)	4km	3.5 hours	6	50%
2	C	300 (147/153)	4.5km	2.5 hours	1	51%
2	D	154 (78/76)	3.5km	2.5 hours	1	49%
<b>Total bikes in 2015</b>		<b>686 (352/334)</b>				

<sup>a</sup> The data in this table are drawn from monitoring and evaluation data collected by WVI, prior to the conduct of this research. In the remainder of this report, self-reported data on distance and time to school comes from the learner survey, which may explain any discrepancies in data.

<sup>b</sup> Data are self-reported and obtained from the application forms submitted by beneficiaries.

<sup>c</sup> Data are recorded from school records for the term prior to bike distribution in the school.

<sup>d</sup> Represents the average percent correct on end-of-term exams across multiple subject areas including math and reading for the term prior to bike distribution in the school.

Note that with the exception of School B, the baseline rates for school absences are very low: an average of 1 day per term or 3 days per school year. In most BEEP settings, one of the main goals of the BEEP program is to increase school attendance by helping learners, who normally walk relatively long distances to school, to get to school more easily. However, in these schools attendance was generally already high prior to receipt of bicycles, and the small number of reported absences did not tend to correlate with the distance the learners lived from school. As a result, the ability of BEEP to impact school attendance in these schools is limited. In addition, the fact that BEEP does not appear to address a driving need in these schools and communities to improve school attendance may also affect learners' and families' perceptions of the importance and value of the bicycles for education and, ultimately, how frequently the bikes are used for school transport.



## 2. Research Design

This research was designed and led by SRI International in collaboration with WBR and WVI staff and staff in the Centre for Statistical Analysis and Research (CESAR) based in Johannesburg, South Africa. SRI contracted with CESAR to collect and analyze field data within schools and households and with key program stakeholders.

To understand how the program was working in the selected schools and the local factors that impacted implementation, a series of data collection activities were conducted from April to June, 2016. The study included a survey of a sample of beneficiaries in grades 8-10 within each school as well as semi-structured interviews with a range of stakeholders, including heads of households of the beneficiaries surveyed, district and school leaders, teachers, members of the BSCs, bike mechanics, and key staff from WBR and WVI that were directly involved with the program in Limpopo. The field data were complemented by monitoring and evaluation data from the four schools compiled by WBR over a 6-month period beginning in December, 2015.

SRI developed all instruments, including a learner survey and interview protocols for each category of respondent, with input and review by WBR and CESAR. When available, SRI leveraged existing research instruments developed by WBR for prior evaluations of BEEP. CESAR translated the learner and household protocols into local languages and trained and certified field staff in their use. Sample



instruments used, including the learner survey and head of household interview, are available in the Appendices A and B.

### 2.1 Sampling

Beneficiaries surveyed were selected randomly from all beneficiaries within a school, with a goal of surveying 200 learners across the four schools. A stratified random sampling approach was used—weighted by the number of beneficiaries within each school, grade and gender category—to provide a sample proportional to the number of beneficiaries in each stratum. Interviews were conducted with 40 heads of households (parents or guardians) selected randomly in proportion to the number of learners surveyed in each school. The sampling of the other stakeholders was mainly purposive as summarized in Table 2.

Table 2: Sampling of Research Participants

Study Group/Stakeholders	Description of Sampling	Total Number
Learners	Stratified random sampling by school, grade, gender (50% boys, 50% girls in overall sample)	204
Heads of Households	40 (parents/guardians of 10 randomly selected beneficiaries with each school)	39
Teachers	2 teachers from each school	8
School Leaders	1 principal from each school	4
Bike Mechanics	1 bike mechanic serving each school	4
Bicycle Supervisory Committee	1 focus group at each school	21
Limpopo Department of Education Administrator	1 staff member	2
WVI Program Manager	1 staff member	1
WVI ADP program staff	1-2 serving each school	6
Qhubeka (WBR South Africa) staff	Program Manager, Mechanic Trainer, Spare Parts Coordinator	2
WBR Monitoring and Evaluation Director	1 staff member	1

## 2.2 Learner Survey and Stakeholder Interview Administration

Due to expected low literacy levels, the learner survey was administered orally in face-to-face settings, which also promoted trust and allowed for clarification of questions as needed. Using the survey protocol, each learner was interviewed for about 30 minutes at a designated place and time within the school (usually the school hall or an empty classroom) that allowed confidentiality and minimal distraction from schoolwork. Interviews with heads of household also took place within the school in a group setting and took 1-2 hours to complete. Other stakeholder interviews were completed in 45-60 minutes each.

## 2.3 Limitations of the Research

The research has several limitations. Independent assessment of the impacts of the program on academic outcomes and attendance, as well as independent assessment of distance and time to school, was beyond the scope of this research.

Instead, we relied on self-reports from learners, heads of households, members of the BSC, and school staff. Comparison of data across sources, including direct statements by interviewees, suggest some discrepancies that may be due to socially desirable responses on the part of some respondents. In this report, claims are based on the careful triangulation of information across sources.

The four schools we visited were purposively selected to represent a range of school and program characteristics, not to be representative of all BEEP schools in Limpopo or South Africa. In particular, we deliberately included weaker implementations as well as stronger ones in order to understand the conditions which are needed for the program to succeed in this setting. Although we attempt in this report to highlight findings that we believe would likely hold true in other regions with a similar context to Limpopo, careful attention to local implementations and settings should be used when attempting to generalize to other schools.

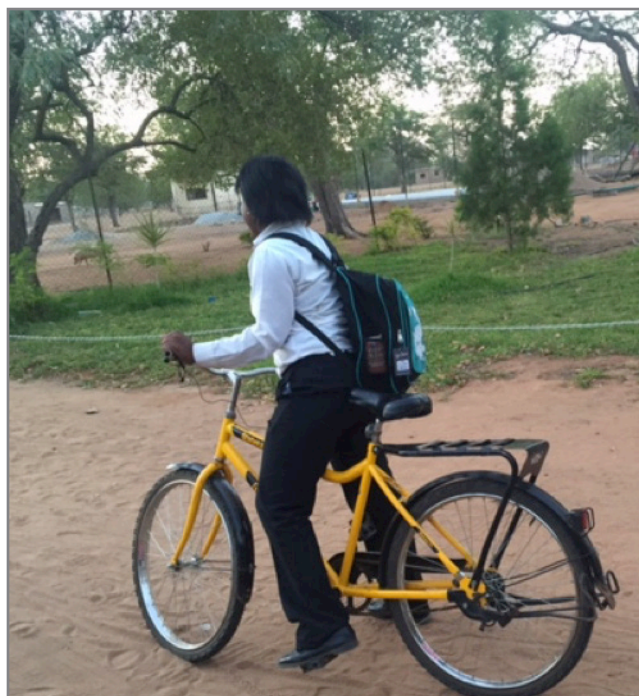
### 3. Research Findings

This section describes the findings of the research, in terms of bicycle use, outcomes experienced by participants, and critical factors that appeared to affect program outcomes in this setting. Outcomes, while self-reported by beneficiaries and other stakeholders, are overwhelmingly positive, and suggest strong opportunity for BEEP to provide important value to rural learners in South Africa. We also summarize a set of challenges that limit consistent ridership of bikes to school, driven in part by the relatively weak pre-existing bike culture in South Africa, that must be mitigated for the program to achieve its full potential.

#### 3.1 Bicycle Use

**The proportion of learners who ride their bikes to school on a daily basis is currently lower than program expectations.** The BEEP program maintains a goal for daily ridership for each school of 80%. Across the four schools in the study, 55% of learners reported that they road their bike to school every school day and more than 1 in 10 beneficiaries surveyed (12%) reported that they never ride their bike to school.<sup>2</sup> However, a majority of learners ride their bikes to school fairly regularly: 82% of learners reported riding their bikes to school at least two days per week.

<sup>2</sup> During the orally administered survey, learners were asked to report how often they had ridden their bikes to school during the previous 2 weeks that school was in session. Response options included: Daily, At least 2-4 times per week, Once a week, Never, and Other.



#### **The frequency of bike use for school transportation varies considerably by school.**

Table 3 shows how frequently learners at each school report riding their bike to school. Learner-reported daily ridership varies from 8% in School B to 85% in School C. School reports of average daily bike attendance are generally lower but follow the same patterns for schools B, C, and D.<sup>3</sup> In general, daily ridership appears stronger at schools C and D, which are in the region with flatter terrain and paved roads, and lower at the schools in substantially hillier settings with gravel or dirt roads that can make bike riding more challenging.

Based on information collected from a variety of stakeholders, the relatively low levels of daily ridership at some schools are likely being impacted by a number of factors. Learners cite bikes not in working condition (46% of learners who do not ride daily)

<sup>3</sup> At School A the school-reported average daily bike use was nearly 100%, but there is suspicion of over-reporting, as this substantially exceeds both learner report and the physical bicycle count performed by researchers on a visit to the school.

Table 3. Learner Reports of Bicycle Ridership to School Within the Previous Two Weeks

Region	Region 1		Region 2		All schools
	School A	School B	School C	School D	
Daily	37% (11)	8% (2)	85% (51)	54% (49)	55% (113)
2-4 days per week	33% (10)	46% (11)	12% (7)	30% (27)	27% (55)
Weekly or less often	13% (4)	4% (1)	1% (1)	7% (6)	6% (12)
Never	17% (5)	42% (10)	2% (1)	9% (8)	12% (24)
<b>Total</b>	<b>100% (30)</b>	<b>100% (24)</b>	<b>100% (60)</b>	<b>100% (90)</b>	<b>100% (204)</b>

and lack of comfort or confidence biking (23%) as the most frequent reasons they don't ride. Learners who ride less frequently were also more likely to cite as challenges the expense of bike maintenance or the possibility of accidents. Challenges that affect frequency of riding are discussed in more detail in the section entitled **Key Factors Affecting Ridership** later in this report.

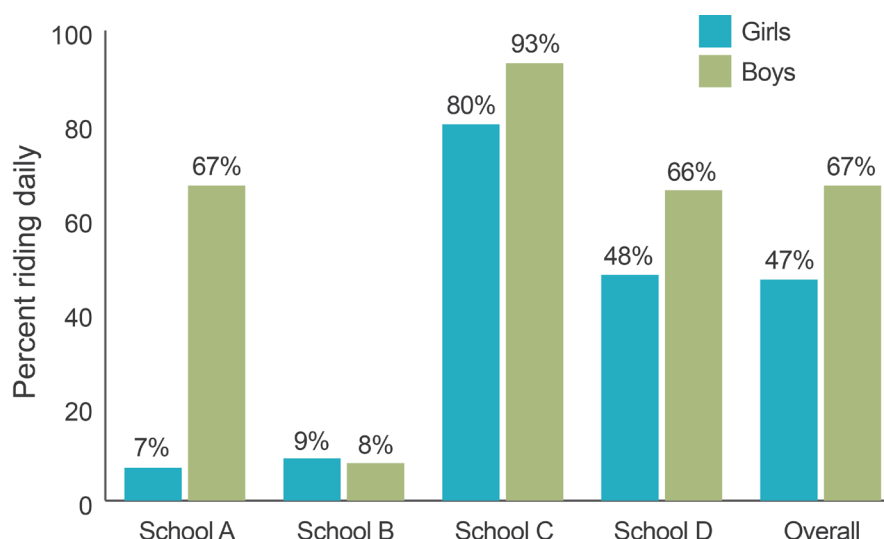
At School B, although some ridership was reported by just over half the learners, only 8% of learners surveyed reported they had ridden their bikes to school each day during the previous two weeks and 42% reported they never rode their bike to school. This is consistent with independent observations made by researchers. In three separate visits to the school, researchers did not see a single bike on school grounds on any of their visits.<sup>4</sup> Explanations by various stakeholders for the particularly low ridership at this school included widespread theft (removal of a fence for construction meant that the school's bicycle parking was not secure from outside access) and the assertion that some of the learners and their families had seen the bikes as a direct source of potential income

and sold them to other members of the community. According to one BSC member, this too was motivated by educational benefit: learners might be selling their bike or bike parts to pay for study guides they could not otherwise afford.

**Daily ridership is significantly more frequent among boys than girls.** As Figure 1 shows, 47% of the girls surveyed reported they ride their bikes daily compared to 67% of the boys, with strong variation by school. These self-reported gender differences from learners are supported by observations from other stakeholders: for example, 3 of the 4 principals interviewed reported that they believed boys were more likely than girls to ride their bikes to school. Interviewees reported a number of gender-specific challenges, including that girls lacked experience or skills to ride the bike (in our sample, slightly more than half of girls had never before ridden a bike) or were not adequately trained, as well as gender-based cultural norms that discourage girls from riding bicycles. It is also noteworthy that the greatest contrast in ridership between girls and boys within a school is in School A (7% of girls ride daily, compared to 67% of boys). School A serves an area with very hilly terrain and unpaved roads, which was cited as a safety concern by a larger proportion of girls than

<sup>4</sup> Monthly monitoring and evaluation data for School B reported by the local WVI program manager indicated that daily bike ridership averaged 5% over a 4-month period from December, 2015 to March, 2016. No ridership data were reported for April and May, 2016.

Figure 1: Daily Ridership by Gender



*Note: This figure represents the girls and boys who reported riding daily at each school, as a proportion of the total number of girls or boys surveyed at that school.*

boys at School A. In contrast, schools C and D are served by flatter paved roads that all learners, both girls and boys, may find easier to ride on, although sharing the road with vehicles is still a common concern. Because WBR has equity-related goals for girls in particular, gender-related experiences may be important to consider.

**Use of the bikes is supporting other learners and family members in addition to the beneficiaries themselves.** The bikes are designed to carry 100 kilos of cargo, including passengers, on a specially designed rack on the rear of the bike. Slightly over half (52%) of the learners surveyed reported that they give rides to other learners as passengers on their bicycles. Nearly 40% of learners reported that they allow others to ride their bicycles without being on the bike themselves at least once a week. In most cases (84%), the other riders are family members. Overall, significantly more girls let family members ride their bikes than do boys (37% vs 24%). Of the learners of either gender who report use by others, the majority of this use is frequent: 93% report that this happens a

least once a week, and for 11% it is daily. According to some stakeholders, bike use by others in the household during the school week is prohibiting some learners from using the bike to travel to school more regularly, despite contract stipulations that require school transportation to receive priority over other uses.

**Learners are using the bikes for purposes other than just traveling to school.** Almost three quarters (73%) of the learners reported that they use their bicycles for purposes other than traveling to school, with just over half of these learners (53%) doing so more than one day a week; these results do not differ substantially by gender. About half the learners reported that they or someone else ride their bike on weekends. Sixty percent of these learners reported that they use their bikes to assist in completing chores or running errands, including shopping, for the family. More boys than girls reported being sent to run errands on their bikes: 69% of boys as compared to 52% of girls. Other commonly cited purposes include using the bikes to visit family or friends (18%), to go to

organized events or activities such as church (16%), or for recreation such as going to play soccer (8%).

## 3.2 Outcome Findings

Because low ridership was reported at School B and no bikes were observed on researcher visits, that school has been excluded from the learner-reported outcomes cited in this section.

### 3.2.1 Impact on travel time to school and punctuality

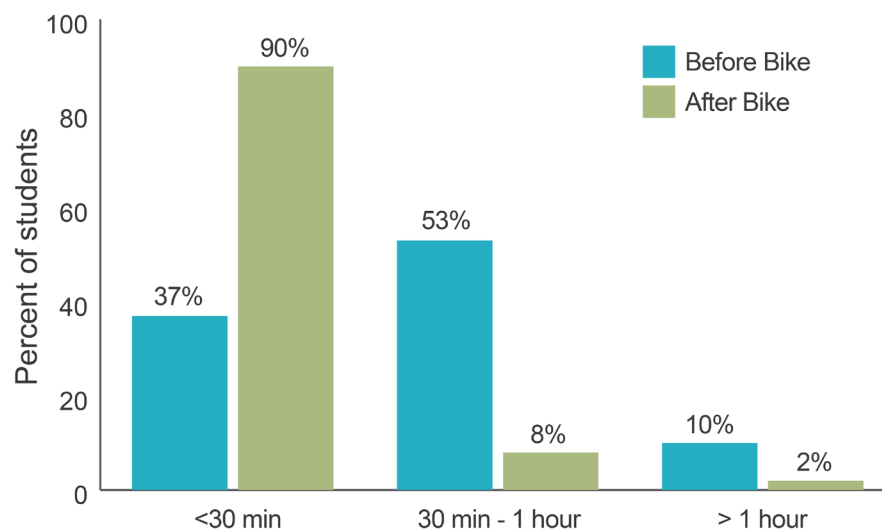
**Learners who received bikes reported dramatic reductions in the amount of time it took them to travel from home to school.** As shown in Figure 2, 63% of learners reported in the survey that it took them over 30 minutes to travel to school prior to receiving their bikes, with 10% reporting they traveled more than one hour each way.<sup>5</sup> In comparison, when asked to report how long it took them to travel from

home to school once they had received a bike, only 10% of learners reported a travel time of greater than 30 minutes and only 2% of learners reported a commute of one hour or more.

**Learners and adults both reported substantial increases in on-time arrival.** Ninety-five percent of learners surveyed reported that being less likely to be late for school was a direct benefit of riding their bike to school. In some schools being late has severe consequences, as the gate to the school yard is closed after the first class session begins and late learners are turned away. Learners reported that they no longer missed class because they were late, and even arrived early and had time to prepare before school began.

*“The bike helps me to get to school earlier than walking. I now have enough time to settle and prepare for the class.” – learner*

Figure 2. Learner-reported One-way Commute Times Before and After Receiving a Bike



<sup>5</sup> These numbers differ from Table 1 because the source of the data is different. Here, we report what learners reported in the learner survey, while in Table 1, information on time of travel was extracted from families' BEEP applications.

*“Since he got the bike I have never been called to come to school because of his lateness.” - parent/guardian*

Other commonly reported learner benefits of bike ownership include more time for chores, studying and homework, and reduced fatigue. These factors did not vary significantly by gender.

- 49% of learners reported spending some of their extra time on chores. This was also mentioned by the majority of parents, some of whom commented that their child was less reluctant to be sent on errands because on the bike it took less time.

*“He uses his free time to go and fetch water.”  
– parent/guardian*

*“When we send her, she no longer complains. She knows that the bike will take her there quickly and bring her back.” – parent/guardian*

- 40% of learners reported having more time for studying and homework. Some described more time to study at home or visit the library, while others said the bike gives them more ability to attend study sessions at school.

*“I get to school quicker and have more time to do homework and study.” – learner*

*“Sometimes I use it to visit my friend to attend study groups and it helps me to study more.”  
– learner*

- Some learners (8%) claimed that they were less tired in school as a result of the bikes, as it is a much more efficient transportation mechanism than walking. Other learners liked that it was a good source of exercise (8%) and mentioned improved concentration in their classes (5%).

*“I concentrate better in class. I understand what they teach.” – learner*

Similar benefits of the bike program were reported by other stakeholders. For example, each of the principals interviewed reported that they believed the bike program had reduced the number of children who were late to school each day as well as reducing the level of fatigue in learners due to traveling to school, and as a result, improving their level of concentration in the classroom.

### 3.2.2 Impact on school attendance

#### **A significant group of learners reported increases in school attendance due to the use of the bikes.**

Thirty-eight percent of learners surveyed reported that the bikes had allowed them to attend one or more days of school during the term that they otherwise would have missed. Half of these learners reported that they attended school two or more extra days during the term because of the bike. These learners reported a number of different reasons they would have missed school on those days if they hadn't had the bike, including bad weather, waking up late, and feeling too tired or sick to walk to school.

*“I woke up late at around 5:40, so if it wasn't for the bike I wouldn't have gone to school.” - learner*

The remaining 62% of learners reported that the use of the bikes to travel to school had no impact on their daily school attendance. This should come as no surprise: as described earlier, according to attendance logs kept by the teachers (described in Table 1), baseline school attendance rates were high in these schools, with the average beneficiary missing only a single day of school in the term prior to distribution of the bikes.<sup>6</sup> Even an

<sup>6</sup> Baseline attendance rates collected from teacher attendance logs are consistent with learners' report: 53% of learners reported that they hadn't missed a single day in the prior term and 29% said they missed only 1-2 days.

additional one or two days of attendance in a term is unlikely to affect academic achievement significantly. Based on reports of learners and other stakeholders, increased punctuality is likely a greater benefit to academic performance than the small increases in attendance which were possible in the Limpopo context.

### 3.2.3 Impact on academic performance

**Most learners and many of the stakeholders reported their belief that the program improved learners' academic performance.** When interpreting these results, it is important to recognize that there was no independent assessment by the research team of the impact of BEEP on learners' academic performance. However, reports from learners and their parents and guardians of the impact of BEEP on academic performance was overwhelmingly positive. Eighty-eight percent of learners surveyed reported that their academic performance improved over the prior 6 months, since they had received their bikes, and almost all parents interviewed reported that they had noticed an improvement in their child's grades. Many of the reasons given by learners, heads of household, and principals for how the bike program appears to support better academic performance were discussed previously: learners are more likely to arrive on time for their first lesson, are less fatigued, have better concentration, and have more time for studying and homework.

*"Honestly the bike played a huge role [in my improved grades], because I used to spend over 1 hour on my way to school and now I spend less than that. I am always on time; I experience less fatigue and I concentrate better." – learner*

*"Her marks are now improving. Before receiving her bike, she used to struggle with some subjects." – parent/guardian*

A few learners also reported that the bike program has increased their motivation to study, complete their schoolwork, and take school more seriously as they are now able to visit the library and participate in study groups with friends, things that were not possible without the bike. For these learners, albeit a small number, having access to a bike appears to allow them to participate in an emerging academic culture made possible by the bike program.

### 3.2.4 Other benefits

In addition to outcomes for learners, World Bicycle Relief intends for the bicycles provided to learners to aid families and communities outside of school hours.

As described earlier, nearly 40% of learners report bike use by others at least once a week; the vast majority of these users are family members. Most commonly, learners report that others ride the bike to run errands or do chores. This is also the most common use reported by learners for their own bike use outside of school. For many families, the bikes are being used to travel to shops to buy and haul goods for the household and for other day-to-day transportation needs. A few parents also reported financial savings, typically from reduced transportation costs.

*"Her brother sometimes uses it for going to the shop." - parent/guardian*

*"There have been benefits; we no longer spend anything on transport." – parent/guardian*

Other family benefits, such as support for livelihood or other critical needs such as increased access to healthcare, are more difficult to assess based on the data collected. School officials and mechanics described incidents of regular bike usage by family members during the school day, including using the

bike to get to work, that make the bike unavailable to some learners for school transport. Since this use of the bikes by family members is in violation of the contracts they signed, it is likely that uses of the bikes that may have benefited other members of the family were significantly underreported by parents and guardians. Most of the parents and guardians interviewed told researchers that their son or daughter was the only one who was allowed to use the bike in the household.

*“I face difficulties when dealing with parents, because when I try to explain the purpose of these bikes they say they are the ones who buy the parts.” – BEEP mechanic*

### 3.3 Key Factors Affecting Ridership

BEEP in South Africa is supported by a number of positive program design elements that promote the appropriate use of the bikes by learners and other members of the household. Important enablers include local program control, as enacted by a Bicycle Supervisory Committee at each school; contracts signed by beneficiaries and their parents that stipulate rules of ownership and consequences for disregarding them; a system of trained mechanics to provide quality services in a country where existing capacity is limited; and an implementation partner with strong ties to the communities in which the program operates.

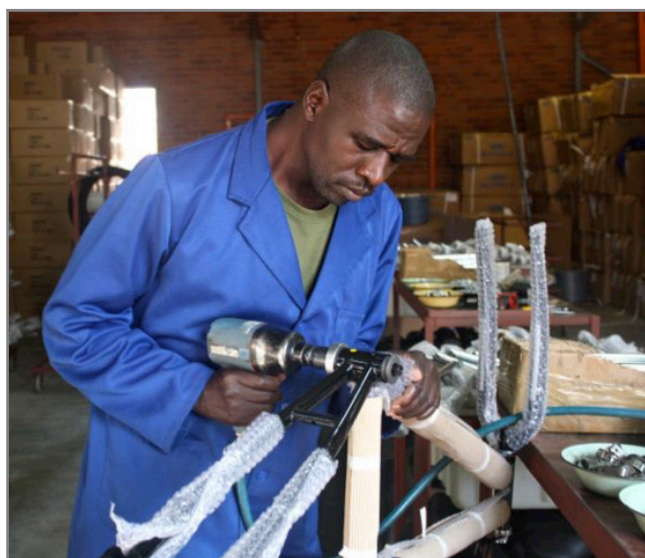
From the self-reported outcomes described above, it is clear that many learners and other program stakeholders believe that learners who ride their bikes to school on a regular basis benefit from the program. But as previously reported, ridership varies a great deal across schools and learners. Several of the factors that influence this are specific to the South African context, and essential to understanding the

program’s opportunities and challenges within the country. This section describes some of the reasons given by learners and other stakeholders for not riding more frequently, and the challenges they face.

Based on the results of the learner survey, and supported by information collected through stakeholder interviews, the three most commonly-referenced challenges of having the bike were keeping the bike operational (reported by 24% of learners), the expense of maintenance (13% ), and safety concerns (26%). Behaviors that arose from jealousy (10%), including jealousy among friends, families, and communities who did not receive bikes, were another commonly-expressed concern.

#### **Maintenance issues are preventing many learners from riding their bikes more frequently.**

Of the learners who reported they did not ride their bikes to school every day, the most common reason cited for not riding daily was that their bikes were inoperable. Sixty-two percent of all learners reported that a problem with their bike had prevented them from riding their bike to school on more than one occasion. Similarly, 40% of heads of households interviewed



**BEEP bicycle mechanic**

reported that a bike problem had prevented their child from riding to school at least once. The most common problems reported by learners were associated with problems with tubes or tires, followed by failures of the chain and rear hub.

Mechanics reported a variety of reasons why bicycles brought to them were often in poor condition, and these were echoed by the reports of other stakeholders. Cited reasons for the poor condition of the bikes include:

- *Inappropriate uses of the bike.* In particular, several stakeholders mentioned the prevalence of racing as a major factor that is associated with increased wear and tear on bike components, rates of bicycle malfunction, and accidents. Interestingly, while only 11% of learners admitted that they race their own bike, 70% reported racing among their friends, suggesting a prevalent racing culture overall. Reported frequency of racing among friends is significantly associated with frequency of visits to a BEEP mechanic. The use of the bikes to carry heavy loads (either by learners or family members) is another use that was cited as producing premature wear and tear on the bikes.
- *Lack of routine maintenance.* Two of the principals interviewed reported felt that the poor condition of the bikes was due to a lack of a “maintenance culture” amongst the learners: routine maintenance and repairs were either not performed or were conducted by the learners (typically boys) or their families, sometimes resulting in further damage.
- *Poor road conditions.* Two of the schools in this research are situated in settings with hilly, rocky road conditions, often leading to tire problems and other failures. Some stakeholders reported that even if local road conditions were satisfactory, this might not be the case in areas where learners visit with their bikes on weekends.

Several stakeholders interviewed, including the bike mechanics, reported that in general girls kept their bikes in much better riding condition than did boys. Mechanics attributed this gender difference largely to the fact that girls tend only to use their bikes to transport themselves to school, compared to boys who are more likely to race their bike on weekends and to do errands and chores including carrying heavy loads on their bikes over long distances and challenging terrain.

*“Most of the time we find boys’ bikes broken more than girls’ and I think this is caused by their careless driving.” - BSC member*

*“They usually ride the bikes to other villages where the road conditions are not good, this damages the tires, and I have observed this with boys.” - mechanic*

**The cost of bike maintenance provided by WBR-trained mechanics is likely contributing to fewer learners bringing their bikes to the mechanics for regular maintenance.** While the bikes themselves are free of charge and bicycle mechanics are available, the cost of the mechanics’ services is borne by families. Several teachers, WVI staff, and BSC members mentioned that the cost of maintaining the bikes can be an unplanned burden on families, many who are already struggling financially and rely on government assistance for basic needs.<sup>7</sup> One mechanic reported that some learners had brought in their bikes for repairs but had not returned for them, presumably because the households could not afford the cost of the service. Two other mechanics echoed a similar sentiment, reporting that they felt that learners and households in their areas did not want to

<sup>7</sup> While the cost of maintenance was reported as a “challenge” by only 13% of learners, the research team heard it more frequently expressed by the adults interviewed, who may be more aware of cost issues than the learners.

pay for the mechanics' services: "People want me to fix their bikes for free".

*"Some are maintained but a few are not. Because of their family background they find it hard to pay for the expenses to fix them." - BSC member*

*"Please repair the bike problems for us freely because some of us really come from poor background." - learner*

Learners and households are required by the contract to bring the bikes to the mechanics for regular routine maintenance (e.g., tightening of bolts, trueing of wheels, inspection of brakes and tires) so that small problems can be identified and fixed before they turn into large problems. Slightly more than one-half of learners surveyed (54%) reported they had brought their bike to the WBR-trained mechanic for some type of servicing, and about half of these learners did so on more than one occasion. For those that do not, mechanics report that learners try to fix the bike themselves or with the help of a family member and only bring the bike to the mechanic when the problem is beyond their ability to repair it. Three of the four mechanics interviewed reported that often by the time a learner brings a bike in for maintenance it is in such poor condition that the bike is not rideable, and sometimes beyond repair, which results in a longer wait time for these learners.

Of the 85 learners that said they had never brought their bike to a BEEP mechanic and gave a reason why (43% of those surveyed), 19% said it was too expensive to go to the mechanic, or that they simply didn't have the money regardless of how much it cost; another 18% said they fixed it themselves; 9% said they used a different mechanic; and 8% said the mechanic wasn't there when they tried to see him. Forty-two percent of these learners told the researchers that they did not bring their bikes to a BEEP mechanic because they had not experienced any maintenance problems.

Difficulties with the distribution of spare parts is another issue that hinders some mechanics and the timely repair of some bikes. According to one stakeholder, in some locations spare parts were not always available even when the mechanics had the money to purchase them. Again, this is a challenge exacerbated in the South African context, where lack of a prevailing bike culture also limits elements of essential infrastructure such as ready supplies of bike parts.

In general, learners who used the services of the BEEP mechanic were satisfied with the experience. Almost all learners (94%) who brought their bikes to the mechanic reported that the problem was fixed by the mechanic most of the time. The repairs also generally appeared to be completed in a timely fashion. Nearly 60% of learners reported that their bikes were fixed by the mechanic within a day. About one-quarter of learners (23%) reported that they had to wait a week or more before their bike was fixed, perhaps reflecting the severity of some of the maintenance issues associated with these bikes or the lack of availability of particular spare parts.

### Concerns over bike safety may be limiting ridership for some learners.

When asked directly if they had safety concerns about the bikes, almost half of learners (49%) said they did; this was also a theme in discussions with other stakeholders. Of the learners who expressed safety concerns, some of the issues they raised were typical of riders with limited bike-riding experience, and others were specific to the local context and terrain. While there were no gender differences in the total numbers of learners who expressed safety concerns, a significantly higher proportion of learners expressed these concerns in the region with hilly unpaved roads (64%) than in the flatter region (44%).<sup>8</sup> Among the most frequently-raised safety concerns were the hazards

<sup>8</sup> During an interview, one principal mentioned that because his village is in a mountainous region, learners spent extra time training on how to ride safely on steep hills and were encouraged to wear their helmets at all times.

of sharing the roads with automobiles, taxis and lorries (22%); the poor conditions of the roads for riding (10% of learners and more frequently reported in the hillier region); danger due to not always wearing helmets (9%); the dangers posed by speeding or racing (7%, slightly more prevalent among boys than girls); and fear of falling (6%, slightly and more prevalent among girls than boys). Brake failures were cited by some learners as a cause of falls. One principal validated learners' concern about the dangers of racing by reporting that some learners in his school had suffered injuries as a result of racing their bikes.

*"Sometimes when we ride, we do not use helmets and some people ride their bikes very fast to impress people and they cause accidents." - male learner*

*"I am worried that I might fall. I am always conscious about an accident." - female learner*

*"Because of the tar road and the cars moving there, I feel as though I will bump into them." - male learner*

One common safety-related topic mentioned by learners and many stakeholders interviewed was the inconsistent use of bike helmets by learners. Bike helmets were distributed to each beneficiary when they received their bikes. However, many of the adult stakeholders reported that learners often don't wear their helmets when riding; this is of particular concern for boys who are more prone to race with their bikes. Just 45% of learners surveyed reported that they wear their helmets on a daily basis when they ride their bikes. Some learners and teachers commented that they don't believe many of the learners understand the benefit of wearing helmets, suggesting that there has yet to emerge a bike-safety culture within some of these communities.



Poor road conditions and sharing the roads with cars were some of the safety concerns

Since not all learners in a school or schools in a local area participated in BEEP, feelings of jealousy were reported that sometimes resulted in challenges to the program. Many of the stakeholders interviewed reported that unanticipated behaviors, including fights amongst learners, vandalism of bikes, and theft resulted from feelings of jealousy between beneficiaries and other learners within the same schools and within nearby schools that were not participating in BEEP. According to one district official interviewed, there was at least one case where learners were considering transferring from a school that was not participating in BEEP to join a school that was.

*"He would come back and give a report about some learners who used sharp objects to damage the tires of the bike [because they were jealous]." - parent/guardian*

Girls face additional challenges that likely impact ridership. As described above, girls were significantly less likely to have biking experience. Some girls expressed discomfort with the bikes or found the bikes too heavy or difficult to ride up hills. Of the 9 learners that mentioned not feeling comfortable on the bike,

all were girls (about 10% of girls surveyed); of the 9 learners who reported being too “tired” or fatigued as a reason they did not bike to school daily, 8 were girls. Other challenges included perceptions of impropriety, particularly when biking in the skirts that are part of their school uniform, or concerns that it would make them less feminine. In addition, we earlier reported that girls are slightly more likely than boys to let family members use their bike; it’s possible that girls might be required to give up their bike to family members on school days more frequently than boys, although this phenomenon is not possible to quantify from study data.

*“I have to push the bike up the slopes because I cannot ride uphill.” - female learner*

*“I think it [the general lack of biking competency among girls] is because girls are not trained to ride their bikes.” - teacher*

*“I fell down twice because it was my first time riding a bike.” - female learner*

*“If they put on a skirt as they ride the bicycle they look almost like they are naked, that becomes a problem.” – WVI staff member*



## 4. Conclusion and Recommendations

Our research found overwhelming praise for the Bicycle Education Empowerment Programme amongst learners, families, school administrators and teachers. Although the research team was unable to independently validate the claims of study participants, a clear majority of learners and school staff interviewed reported that the bike program led to improvements in punctuality, reduced fatigue, better concentration in the classroom, and improved academic performance. Some school leaders also reported that they had noticed that beneficiaries appeared to be more motivated about their schoolwork as a result of their selection to receive a bike from the program. Reports from some learners support this observation, including learners who told researchers they used their bikes to visit the library or engage in study groups with friends, activities that likely would have been much more difficult without access to a bike.

However, the research also found that BEEP faces a series of challenges in Limpopo that weaken the program's potential impact. These include maintenance issues, inappropriate bike uses and riding behaviors, unsafe road conditions, use of the bikes on school days by others in the household, and (at one school) the alleged selling of bikes or bike parts for profit. The lack of an existing bike culture in South Africa is likely contributing, at least partially, to the emergence of some of these challenges. Most households had never owned a bike, so bikes were not historically considered a necessity for the economic survival of the family as they are in other



BEEP settings such as Zimbabwe and Zambia. Another important characteristic of the setting is that, according to school records, most learners attended school on a daily basis before the arrival of BEEP, so while the bicycles were clearly perceived as beneficial they may not have been seen as meeting a driving need to the degree that is found in some other settings, where the long distances learners live from the nearest school may prevent many learners from attending regularly or cause them not to attend at all. Finally, in one of the regions studied, hilly unpaved roads made bicycles a less efficient mode of transportation than they might otherwise have been, while in the other region sharing the road with cars and lorries was a safety concern. These factors shape implementation and uptake of BEEP in rural South Africa in important ways.

In this study, the challenges described above contributed to wide variation in how frequently the bikes were used for school transport. The extent to

which the bikes are used for school transportation is clearly linked to the potential effectiveness of the program; in schools with lower ridership, potential impact of the program is diluted. The considerations for program refinement outlined below are intended to help increase the frequency at which the bikes are used to transport learners to school. Over the last year, WBR has been taking a number of steps to continue to improve the program in South Africa based on initial experience; thus some of these recommendations are already part of ongoing discussions within BEEP.

**Continue to evolve family and beneficiary training offerings to promote a bike culture, not solely program implementation.** Among countries in which BEEP is operational, South Africa is notable for the proportion of beneficiaries and their families who are new to bike riding.

- *For beneficiaries*, it is difficult for a single session to provide sufficient orientation to engender both comfort and safety. As part of their ongoing refinement to orientation activities, BEEP managers may want to consider instituting a bike riding, safety, and maintenance curriculum that is delivered across the year. Safe riding practices may require particular support and monitoring: to promote skills in safely navigating both hills and busy roads; to encourage and enforce the consistent wearing of helmets; and to discourage racing and other unsafe riding behaviors.
- *For families*, additional programming or visits may be required to help them see the bicycle as an essential support, both for learners and their education and for family needs outside of school hours, and how those two uses of the bicycle can both be satisfied without compromising learners' ability to use the bike for school transportation.

**Focus on the needs of girls.** BEEP program leaders have particular hopes for the educational opportunity that bicycles can provide for girls. This research suggests that girls may be riding to school less often than their male peers. Contributing factors highlighted in this report include that they are less likely to have previous biking experience, and more likely to be uncomfortable biking or find the bikes too heavy; they may experience cultural pressure to avoid biking; and family members may be more likely to use their bikes for other purposes. It may be worthwhile to consider tailored programming that helps girls to improve their biking skills and confidence, as well as appropriate encouragement for families.

**Promote and require regular bicycle maintenance.**

Keeping bicycles in proper working condition is a clear requirement in order for learners to benefit from BEEP. The current lack of sufficient maintenance is also an important sustainability issue for the program, as it may remove bicycles from their intended use temporarily at first and permanently over time. If resources allow, supported monthly mechanic hours at the school would provide centralized services for routine maintenance that is free of charge, an important enabler for many families. Other cost-reduction opportunities may include subsidizing the cost of parts. In addition, while regular bicycle maintenance is stipulated in the contract, it could be monitored as a more firm requirement of bicycle ownership.

**Improve program monitoring with regular ground-truthing of school-reported usage data.** BEEP leaders are well aware of the challenges of collecting accurate M&E data at many of these schools. This research has illuminated some of the difficulties of making basic determinations of compliance and support needs when self-reported data are lacking in quality. Although regular school visits are costly, we

believe that increasing their frequency could promote both support and monitoring goals to a degree that may be worth the investment. In addition, this research disclosed that BSCs in the various schools had vastly different interpretations of beneficiary selection criteria, ranging from distance to age to local perception of need, and different interpretations of their own role in monitoring bicycle use. Again, while local control is an important hallmark of the program, stronger monitoring and support for local interpretation of guidelines may at times support stronger implementation.

**Consider the trade-offs between school and family ownership of bikes.** Family bike ownership is a hallmark of BEEP program design for many reasons: as an incentive, to promote responsibility, and to promote outcomes for families as well as learners. A number of stakeholders we interviewed suggested that school ownership might increase the frequency of use of bikes for school transport, reduce problem ridership by learners

and inappropriate uses by families (both of which promote faster wear and tear on the bicycles), and provide an opportunity for centralized maintenance. While we acknowledge that the trade-offs between family ownership and centralized control may be substantial, bike “ownership”—families versus schools—might be a worthwhile program element to vary and study in other settings within South Africa to understand its potential effect on bike ridership and program outcomes.

SRI has great respect for the expertise and commitment of WBR leadership and staff to continue to refine BEEP and make it the most effective program possible in South Africa. WBR staff are doing extraordinary work under quite challenging circumstances and this has been readily acknowledged by learners, heads of household, and school staff. WBR and BEEP continue to serve critical transportation needs in developing countries through the power of bicycles.

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## Appendices

## Appendix A. Learner Questionnaire

### BEEP OPPORTUNITY STUDY STUDENT SURVEY QUESTIONNAIRE

QUESTIONNAIRE NUMBER					
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A1	Did you read and explain the information sheet to the participant?	1=Yes	2=No
A2	Did the participant give assent to participate in the study?	1=Yes	2=No
A3	Did the participant retain a copy of the information sheet?	1=Yes	2=No

#### SECTION 00. ADMINISTRATION – DATA TEAM USE ONLY

0.1	Name of Interviewer		0.2	Date of Interview	
0.3	Place of interview				
0.4	Name of supervisor		0.5	Date checked	
0.6	Name of quality controller		0.7	Date checked	
0.8	Name of capturer		0.9	Date captured	

#### SECTION 01 – QUALITY CONTROL

Quality Control				Feedback received from field manager	
Date	Initial	Question number	Description of problem	Date	Initial

Don't Know: 9998      Refused to answer: 9999

1

**SECTION 1: BICYCLE USE**

I am going to start with general questions about your bicycle usage.

1	When did you first receive your BEEP bike?  <b>[If the learner does not remember easily, probe using year, term and month]</b>	MM	YEAR
2	Had you ever ridden a bike before you received this bike	Yes	No
3a	Have you every ridden your bike to school?	Yes	No
3b	In the last two weeks, how often have you ridden your bike to school?  <b>[Read out options and code their response]</b>	1=Daily 2=At least 2-4 times a week 3=Once a week 4=Never 5= Other Please specify .....	
4	<b>Only those who did not answer 1 on Q3, ask:</b>  Why don't you ride your bike to school every day?  <b>Don't read out options</b> <b>Number the responses in the order they are mentioned</b>	Bike not working/broken Bike is uncomfortable/hard to ride/heavy Not confident riding bike Had an accident Someone else uses the bike The bike was sold The bike was stolen Prefer walking with friends Use other modes of transportation Dont attend school daily Weather is bad for bike riding Weather is bad for bike riding Other Specify:	
5	What were your most common means of getting to school before you had access to the bike?  <b>Don't read out options</b> <b>Number the responses in the order they are mentioned</b>	1=Walk 2=Minibus taxi 3=Travel by car (family, friend, teacher etc.) 4=Ride on another bike where you are the only rider 5=Ride with multiple people on one bike 6=Other Please specify:	
6	How long did it take you to get to school before you received the bike?  <b>[Read out options and code their response]</b>	1=Less than 30 minutes 2=Over 30 minutes to an hour 3=Over 1 hr to 1 hr, 30 minutes 4=Over 1 hr, 30 minutes to 2 hrs 5=More than two hours	

Don't Know: 9998      Refused to answer: 9999

2

7	<p><b>Only for those who have EVER ridden their bike to school i.e. those who answered YES to Q3a):</b></p> <p>How long does it take you to get to school when you ride the bike?</p> <p><b>[Read out options and code their response]</b></p>	<p>1=Less than 30 minutes  2= 30 minutes to 1 hr  3= 1 hr to 1 hr, 30 minutes  4= 1 hr, 30 minutes to 2 hrs  5=More than two hours</p>	
8	<p><b>Only for those who have NEVER ridden their bike to school i.e. those who answered NO to Q3a):</b></p> <p>How long would it take you to get to school if you rode the bike?"</p> <p><b>[Read out options and code their response]</b></p>	<p>1=Less than 30 minutes  2=30 minutes to 1 hr  3= 1 hr to 1 hr, 30 minutes  4= 1 hr, 30 minutes to 2 hrs  5=More than two hours</p>	
9	<p>What time do you wake up to go to school?</p> <p><b>[Write in blocks of 30 minutes e.g. 4am, 4.30am, 5am, 5.30am, etc.]</b></p>		
10	Do you sometimes use the bike for purposes other than traveling to school?	Yes	No
11	<p><b>If YES to Q10,</b></p> <p>In the last two weeks, how often have you used the bike for purposes other than traveling to school?</p> <p><b>[Read out options and code their response]</b></p>	<p>1=Daily  2=At least 2-4 times a week  3=Once a week  4=Other  Specify</p>	
12	<p><b>If YES to Q10,</b></p> <p>For what purposes did you use the bike?</p> <p><b>[Don't read out options, Number the responses in the order they are mentioned]</b></p>	<p>To do chores or errands  To visit family or friends  To give a family member or friend a ride somewhere  For fun  To go to organized activities  Other  Specify</p>	
13a	In the last thirty days, have you ever used the bike on weekends?	Yes	No
13b	<p>Who uses the bicycle on weekends? and for what is it used?</p> <p><b>[answer both questions, probe for answers]</b></p>		
14	In the last two weeks, have you ever used your bike to race with your friends or classmates?	Yes	No

Don't Know: 9998      Refused to answer: 9999

3

15	Out of 10 of your classmates with bikes, around how many would you say use their bike to race with friends?	
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**Benefits/Challenges**

I am now going to ask you about the benefits and challenges of having a bike

16	Do you like having the bike?	Yes	No
17	What are the benefits of having the bike, if any?  <b>[Don't read out options, Number the responses in the order they are mentioned]</b>  <b>[If they answer in a way that is too vague to code use these categories, prompt for more information. For example, if they say: I have more free time, ask – What do you use that time for?]</b>	Safer than walking	
		Less expensive than the minibus	
		Less likely to be late for school	
		Less tired in school	
		Better concentration in school	
		I can attend school more often	
		Have more time for studying/homework	
		It's fun	
		More time for chores	
		No benefits reported	
		Other	
Specify:			
18	Apart from the benefits of the bicycle to you, are there any other benefits your family gets from the bicycle?  <b>[Please describe. Indicate if there are no benefits to other family members reported.]</b>		
19	What are the challenges of having a bike, if any?  <b>[Don't read out options, Number the responses in the order they are mentioned]</b>  <b>[If they answer in a way that is too vague to code use these categories, prompt for more information. For example, if they say: It causes problems, ask – What types of problems?]</b>	I had an accident	
		I'm not comfortable riding a bike	
		Jealousy issues	
		Someone tried to steal my bike or afraid someone will steal bike	
		Too expensive to maintain/repair	
		My bike is often broken/does not work	
		Family member fight for the bike	
		No challenges reported	
		Other	
		Specify:	

Don't Know: 9998      Refused to answer: 9999

4

**Attendance and grades**

Now I will ask you about your school attendance and grades

20	How many days of school have you missed in the last two weeks? <b>[Write answer as number]</b>	
21	How many days of school have you missed in this term? <b>[Write answer as number, probe using missed days per week and month]</b>	
22	When you miss school, what are the reasons that you miss school? <b>[Don't read out options, multiple responses allowed]</b>	1=School is too far 2=There is bad weather 3=You need to help with chores 4=You need to care for sick a household member 5=You were sick 6=Other Specify
23	The most recent day you missed school, what was the reason that you missed school? <b>[Do not read out options. Code their response, only one response allowed]</b>	1=School is too far 2=There is bad weather 3=You need to help with chores 4=You need to care for sick a household member 5=You were sick 6=Other Specify
24	In this term, how many days did you go to school only because you have this bicycle, if any? <b>[Write answer as number]</b>	
25	<b>If 1 or more days to Q24</b> How did the bike help you attend school on those days?	
26	Have your grades improved in the last six months? <b>[Read out options and code their response]</b>	1=Yes, Improved 2=No, Not Improved 3= Not Sure
27	<b>If YES, Improved to Q26</b> What are the main factors that contributed to the improvement? <b>Try to probe for at least three factors</b>	
28	<b>If Bike mentioned in Q27,</b> How did the bike help you get better grades?	

Don't Know: 9998      Refused to answer: 9999

5

**Bicycle usage – safety**

29	When you ride a bike, how often do you use helmets?  <b>[Read out options and code their response]</b>	1=Daily 2=At least 2-4 times a week 3=Once a week 4=Never  Specify
30	Out of 10 of your classmates with bikes, around how many would you say use their helmet daily when they ride bike?	
31	Are there any safety concerns around riding the bike?  <b>[Please describe. Indicate if no safety concerns reported.]</b>	

**Bicycle usage – other people**

32	Do you ever give classmates rides on your bike as passengers?	Yes	No
33	Do you let others use your bike without you on the bike?	Yes	No
34	<b>If YES to Q33,</b> Who do you let use your bike? <b>[Multiple options allowed]</b>	1=Friends 2=Family 3=Other Specify:	
35	<b>If YES to Q33,</b> How often do others use your bike? <b>[Read out options and code their response]</b>	1=Daily 2=At least 2-4 times a week 3=Around once a week 4=Around once a month 5=Other Specify	
36	<b>If YES to Q33,</b>  What are the reasons other people use your bike?  <b>[Don't read out options Number the responses in the order they are mentioned]</b>	To do chores or errands	
		To visit family or friends	
		To give a family member or friend a ride somewhere	
		For fun	
		To go to organized activities (appropriate examples? Church? School tutoring lessons?)	
		To carry me when I cannot ride.	
		To go to work	
		Other	
		Specify:	

Don't Know: 9998      Refused to answer: 9999

6

**Maintenance**

37	Has a bike problem ever prevented you from riding your bike to school?	Yes	No
38	<b>If YES to Q37</b> How many times has this happened this term (since the beginning of the school year)?		
39	<b>If YES to Q37</b> What parts broke or needed repair?  <b>[Have them point to a picture of a bike and circle the relevant parts. Code the parts after the interview. [Multiple options allowed]</b>	1=Tires 2=Seat 3=Brakes 4=Tubes 5=Fork 6=Rear Hub 7=Rims 8=Saddle 9=Chain 10=Hub front 11=Crank and Crank arms 12=Bottom Bracket 13=Pedal 14=Handlebar Set 15=Cassette 16=Other Specify	
40	Have you ever brought your bike to the BEEP mechanic for a repair?	Yes	No
41	<b>If NO to Q40</b> Why not?  <b>Don't read out options</b> <b>Number the options in the order they are mentioned]</b>	1=Did not have any problems 2=Too expensive 3=Too far away 4=Mechanic takes too long 5=Do not think the mechanic knows how to fix the bike well 6=The mechanic didn't have the parts 7=Didn't want to have my bike confiscated 8=Fixed the problem myself/or with help 9=I don't know who the mechanic is 10=Mechanic is never around/always busy 11=I took it to another mechanic 12=Other Specify	
42	<b>If YES to Q40</b> How many times have you brought your bike to the mechanic since you got the bike?  <b>[Read out options and code their response]</b>	1=Once 2=Twice 3=Three times 4=More	

Don't Know: 9998      Refused to answer: 9999

7

43	<p><b>If YES to Q40</b></p> <p>What was the longest amount of time you have ever needed to leave your bike with a mechanic? [Code their answer]</p> <p><b>[Read out options and code their response]</b></p>	<p>1=For 1 day? 2=For 2-4 days? 3=For one week? 4=For more than one week?</p>	
44	<p><b>If YES to Q40</b></p> <p>Did the mechanic fix the problem most of the times you visited?</p>	Yes	No
45	<p><b>If YES to Q40</b></p> <p>The last time you took your bike to the mechanic, about how many Buffalo bikes were waiting to be fixed.</p> <p><b>[Read out options and code their response]</b></p>	<p>1=None 2=1 to 5 3=6 to 10 4=11 to 20 5=21 to 30 6 = More than 30</p>	
46	Do you have any suggestions for how to improve the bikes or the program? What are they?		
47	Is there anything else you would like to tell? Please describe.		

Don't Know: 9998      Refused to answer: 9999

8

## Appendix B. Head of Household Interview

### BEEP OPPORTUNITY STUDY HEAD OF HOUSEHOLD INTERVIEW PROTOCOL

QUESTIONNAIRE NUMBER					
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A1	Did you read and explain the information sheet to the participant?	1=Yes	2=No
A2	Did the participant give consent to participate in the study?	1=Yes	2=No
A3	Did the participant retain a copy of the information sheet?	1=Yes	2=No

#### SECTION 00. ADMINISTRATION – DATA TEAM USE ONLY

0.1	Name of Interviewer		0.2	Date of Interview	
0.3	Place of interview				
0.4	Name of supervisor		0.5	Date checked	
0.6	Name of quality controller		0.7	Date checked	
0.8	Name of capturer		0.9	Date captured	

#### SECTION 01 – QUALITY CONTROL

Quality Control				Feedback received from field manager	
Date	Initial	Question number	Description of problem	Date	Initial

Don't Know: 9998      Refused to answer: 9999

1

**SECTION 1: BACKGROUND**

1	Gender	1=Man 2=Women
2	Age group	1=<20 years 2=21-30 years 3=31-40 years 4=41-50 years 5=51- 60 years 6=60 years and above
3	Highest educational qualification	1=No education 2=Did not complete primary 3=Completed primary 4=Some secondary 5= Completed secondary (matric) 6=Tertiary (post matric qualification)
4	Tell us a little bit about how your household became involved in the program – how was your child selected?	

**SECTION2: BICYCLE USAGE**

5	Please tell me how the bike is used?  <b>[Use prompts below for anything they don't mention]</b>		
<b>[If the child uses the bike for school, then Skip to 5d. Otherwise go to Q5a]</b>			
5a.	(If school isn't mentioned) Does your child use the bike to get to school?	Yes	No
5b.	If child does not use the bike to get to school. Why not?		
5c.	(If child does not use the bike to get to school) How does he/she get to school instead?	1=Walk 2=Ride on someone else's bike 3=Minibus taxi 4=Other	
5d.	Tell me about any family uses of the bike.		

Don't Know: 9998    Refused to answer: 9999

2

**SECTION 3: COMPARING MODES OF TRANSPORT FOR SCHOOL**

6.	How did your child get to school before receiving the bike?
7.	What changes, if any, did the bike bring in how your child travels to school? <b>[Use prompts below for anything they don't mention]</b>
7a	Did it change in terms of the time it takes the child to get to school, or not? By how much?
7b	Did it change in terms of how much it costs to get to school, or not? By how much?

**SECTION 4: BENEFITS AND CHALLENGES**

8	Can you describe whether or not there have been any benefits to your child from him/her receiving the bike? Are there any example stories you could share?
8a	Did you notice any changes in your child's school attendance? Or not? <b>[If the child uses the bike for school]</b>
8b	Did you notice any reduction in your child's punctuality? Or not? <b>Tell me about it.</b> <b>[If the child uses the bike for school]</b>
8c	Did you notice any changes in your child's energy level? Or not? If YES, at school or home? <b>Tell me about it.</b> <b>[If the child uses the bike for school]</b>
8d	Did you notice any changes in your child's ability to concentrate? Or not? Tell me about it. <b>[If the child uses the bike for school]</b>
8e	Did you notice any changes in your child's grades? Or not? Tell me about it. <b>[If the child uses the bike for school]</b>

Don't Know: 9998      Refused to answer: 9999

3

9	Can you describe whether or not there have been any benefits to other members in your household from receiving the bike, if there are any? Are there any example stories you could share?
10	How has your child's free time changed (increased or decreased) since receiving the bike, if it has? Please describe.
11	(If MORE FREE TIME in Q7) What does your child do with the extra free time?  <b>[Record the answer. Use prompts below for anything they don't mention.]</b>
11a	(If MORE FREE TIME in Q7) Does your child spend their extra free time doing <b>chores</b> ? Or not?
11b	(If MORE FREE TIME in Q7) Does your child spend their extra free time doing <b>homework</b> or <b>studying</b> ? Or not?
11c	(If MORE FREE TIME in Q7) Does your child spend their extra free time hanging out with <b>friends or family</b> ? Or not?
11d	(If MORE FREE TIME in Q7) Does your child spend their extra free time on <b>TV or social media</b> ?
11e	(If MORE FREE TIME in Q7) Any other way your child uses their extra free time?
12	Can you describe whether or not there have been any disadvantages to having the bike?  <b>[Use prompts below for anything they don't mention.]</b>
12a	Are there any <b>safety</b> concerns around riding the bike? Or not? Please describe?
12b	Have there been any <b>accidents</b> ? Please describe?
12c	Is the bike often <b>broken</b> or not working? Please describe?
12d	Is the bike a <b>financial burden</b> ? Please describe?

Don't Know: 9998      Refused to answer: 9999

4

12e	Are there any <b>jealousy</b> issues with people who didn't receive the bike? Or not? If YES, could you describe some situations?
12f	Has anyone tried to <b>steal</b> the bike? Or are you afraid someone will? Tell me more?

**SECTION 5: MAINTENTANCE**

13	Has a bike problem ever prevented the bike from being ridden?	Yes	No
14	(If YES to Q13) How many times has this happened since you received the bike? And how long did it last each time?		
15	Have you or your child ever brought the bike to a mechanic for a repair?	Yes	No
16	(If NO to Q12) Why not?  <b>[Do not read out options. Code their answers]</b>	1=Did not have any problems 2=Don't know where to find mechanic 3=Too expensive 4=Too far away 5.Mechanic takes too long 6=Do not think the mechanic knows how to fix the bike well 7=The mechanic didn't have the parts 8=Didn't want the bike confiscated 9=Fixed the problem myself/or with help 10=I don't know who the mechanic is 11=Other [Record the answer]	
<b>[If YES to Q15, ask Q17-20, otherwise skip to Q18]</b>			
17	[If YES to Q15] Was it a BEEP program trained mechanic?	Yes	No
17a	If not, why not?		
18	[If YES to Q15] How many times have you or your child brought the bike to the mechanic?  <b>[Read out all options and code answer]</b>	1=Once 2=Twice 3=Three times 4=More	

Don't Know: 9998      Refused to answer: 9999

5

19	[If YES to Q15] What's the longest amount of time that the bike was left with the mechanic for a repair?  [Code their answer]	1=For 1 day? 2=For 2-4 days? 3=For one week? 4=For more than one week?	
20	[If YES to Q15] Were the repairs adequate to fix the problem most of the times you visited the mechanic?	Yes	No

**SECTION 6: OTHER**

21	Does your child like the bike? Why?
22	19. Have you noticed any changes in the community due to the bike program? Tell me about them?
23	Do you have any suggestions for how to improve the bike program? What are they?
24	Is there anything else I should know about? Please describe.

Don't Know: 9998      Refused to answer: 9999

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