

Playbook

Electric Mobility Pilot

April 2026

Credits

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Introduction

Foreword

Electric mobility is more than a transport solution. It is a pathway to economic transformation, as this pilot demonstrated.

From February 2024 to April 2026, Frontier Tech Hub and FCDO set out to explore whether electric third-wheel attachments, powered attachments for manual wheelchairs that converts them into a three-wheel electric tricycle (trike), proven in India and Colombia, could work in the informal settlements of Nairobi. The initial questions were straightforward: Could the technology transfer? Would the terrain allow it? Would users adopt it?

However, what we found went far beyond the technical. Within days of deployment, wheelchair users in Korogocho were selling goods, making deliveries, attending political meetings, and mentoring younger people with disabilities. Community members coined a nickname for the devices: "ndege" which is the Swahili word for aeroplane. Not because of speed alone, but because of what movement meant for the people using them.

This playbook documents what was built, what was learned, and what it takes to do it again. It is the product of two phases of real-world evidence, a consortium of Kenyan and international partners, and most importantly, the wheelchair users who tested, rode, and shaped every insight contained here.

It is written for those who want to invest in, build upon or replicate this work such as funders, implementers, community organisations, and policymakers, as well as for those who simply need to understand what inclusive mobility can achieve when it is designed with, not for, the people it serves.

Key participants and stakeholders

- Many members of the Korogocho and Mathare communities
- Herman Lihanda (Leader of Jionee group and hub coordinator)
- Jorgs Mbugua – Ebikes Africa (CEO)
- Christine Wandera – Kounkuey Design Initiative (Community and MEL Support)
- James Kirika – Kounkuey Design Initiative (Community and MEL Support)
- Somba Evans – Kounkuey Design Initiative (Community and MEL Support)
- Swostik Dash – NeoMotion (CEO)
- Paarth Asthana – NeoMotion (CEO)
- Martín Londoño – MATT Movilidad (CEO)
- Simón Echavarría – MATT Movilidad (Head of Product Development)
- Anne Mackinnon – FCDO (Disability and Assistive Tech Research Adviser)

- Dr. Jacqueline Owigo – FCDO (Research and Innovation Adviser)
- Phyllis Gichuhi – Frontier Tech Hub (Innovation Executive – Brink)
- Nick Moore – Frontier Tech Hub (Principal Consultant in Innovation – DT Global)
- Ben Hardman – Global Disability Innovation Hub (Project Director and Head of Innovation Ecosystems)
- Mikaela Patrick – Global Disability Innovation Hub (Head of Research and Delivery)
- Annamae Muldowney – Global Disability Innovation Hub (Inclusive Infrastructure Lead)
- Daniel Hajas – Global Disability Innovation Hub (Innovation Manager)
- Shantosh Cumarasurier – Global Disability Innovation Hub (Innovation Lead)
- Marketa Smitova – Global Disability Innovation Hub (Project Manager)
- Rebecca Joskow – Global Disability Innovation Hub (Research Assistant)
- Harrison Kamau – Global Disability Innovation Hub (Communications and Engagement Executive)

Partners

Frontier Tech Hub: The Frontier Tech Hub is a UK International Development-funded programme that collaborates with the UK Foreign, Commonwealth and Development Office (FCDO) and global partners to explore, test, and scale innovative frontier technologies within the international development context. Managed by a consortium including Results for Development (R4D), DT Global, and Brink, the Hub invests in early-stage, radical technological solutions, builds capacity for responsible technology use, and supports locally led innovation worldwide. It also connects FCDO colleagues with the tech world to critically examine how new technologies can transform development efforts.

UK Foreign, Commonwealth and Development Office (FCDO): The FCDO is the governmental department responsible for leading the United Kingdom's diplomatic, development, and consular work worldwide. The FCDO integrates foreign policy with international development efforts, centring its impact on tackling pressing global challenges including ending extreme poverty, combating disease, addressing mass migration, countering terrorism, and mitigating climate change, all while advancing British national interests. Through its substantial development programmes and diplomatic efforts, the FCDO works to build peaceful and stable societies, foster economic growth, fight corruption, empower women and girls, and deliver life-saving humanitarian assistance. It plays a crucial role in shaping international policy and providing significant investment to foster sustainable development and global stability.

Global Disability Innovation Hub (GDI Hub): The Global Disability Innovation Hub is a research and practice centre focused on advancing disability innovation to support a fairer world. Its vision is a world without barriers to participation and with equitable opportunities for all. GDI Hub positions disability innovation as a component of a broader movement toward disability inclusion and social justice. Operating across five key domains including research, innovation, programmes, teaching, and advocacy, GDI Hub brings expertise in Assistive and Accessible Technology, Inclusive Design, Inclusive Education Technology, Climate and Crisis Resilience, and Cultural Participation. Headquartered in East London and established as part of the legacy of

the London 2012 Paralympic Games, the organisation delivers world-class research and develops ideas and inventions that generate new knowledge, solutions, and products. It also contributes to shaping policy through co-creation, participation, and collaboration. GDI Hub is both an Academic Research Centre (ARC) and a not-for-profit Community Interest Company (CIC).

NeoMotion (India): NeoMotion is an Indian social enterprise dedicated to transforming mobility for wheelchair users in the Global South. Their flagship product (amongst a number of AT devices they produce), the NeoBolt, is an electric third-wheel attachment that clips onto their NeoBolt wheelchair, converting it into a powered three-wheeled vehicle capable of navigating the uneven terrain and dense environments typical of informal urban settlements. Developed and refined through years of real-world deployment across India, the NeoBolt has demonstrated that powered mobility can be both affordable and income-generating through their Livelihood on Wheels programme. NeoMotion brought the NeoBolt to Nairobi for Phase 1 testing as part of the international knowledge exchange at the heart of this pilot.

MATT Movilidad (Colombia): MATT Movilidad is a Colombian social enterprise that designs and manufactures the MATT device, an electric third-wheel attachment engineered to connect to a wide range of manual wheelchairs, making it adaptable to diverse user needs and chair configurations. Developed and iterated through deployment in Medellín, the MATT device has demonstrated transformative impact for its users. MATT Experiences, the organisation's livelihood programme, enabled wheelchair users to become city tour guides, leading inclusive experiences across Medellín and earning approximately double the national minimum wage. MATT Movilidad brought their device and their community deployment expertise to Nairobi for Phase 1, contributing both technology and hard-won knowledge of what it takes to make these systems work in real communities.

Ebikes Africa: Ebikes Africa is a Kenyan company improving mobility for commuters, logistics for businesses, and access to financial services for delivery riders using electric bicycles and digital technology. Offering businesses on-demand, tech-enabled last-mile logistics that utilises GPS and messaging platforms to digitise and automate fleet operations, Ebikes Africa provides savings, visibility, and controls at scale. The company is enabling people to contribute to economic growth within their communities by providing access to affordable light electric vehicles and embedded financial services. In this pilot, Ebikes Africa led the local device supply and assembly workstream, drawing on their expertise in electric vehicle logistics and Kenyan market knowledge to assess the feasibility of local manufacturing.

Kounkuey Design Initiative (KDI): Kounkuey Design Initiative is a non-profit design and community development organisation. With a team comprising landscape architects, urban planners, civil engineers, architects, community organisers, and researchers, KDI partners with under-resourced communities to advance equity and activate the unrealised potential in neighbourhoods and cities. KDI works with residents to transform unsafe and underused sites into productive public spaces, integrating key amenities such as community buildings, water and sanitation facilities, green infrastructure, and open spaces for recreation and exercise. In this pilot, KDI provided essential community and monitoring, evaluation, and learning support across both phases, bringing deep existing relationships and contextual knowledge that grounded the project in the realities of the communities it served.

Jionee: Jionee is a community-based organisation (CBO) founded and led by Herman Lihanda, with the ambition of developing people with disabilities to their full potential. Operating on a membership structure in Korogocho, Nairobi, Jionee runs awareness-raising events within the community to reduce attitudinal



barriers toward disability, and provides practical support to its members, with a particular focus on young people with disabilities, who receive mentorship to help them build confidence, skills, and pathways to independence. Jionee's roots in the community, its established trust among residents, and Herman's own experience as a wheelchair user and, since the end of phase 1, a MATT ambassador made it the natural anchor organisation for the Community Device Hub in Phase 2. It was through Jionee's leadership that the hub model was brought to life: coordinating riders, managing daily operations, and demonstrating that a community-owned mobility enterprise can be both financially viable and genuinely transformative.

Other contributors

We would like to thank the following contributors for their valuable input:

- **Motivation Charitable Trust Kenya**
- **The Accessibility Institute**
- **Pete Donnelly – The Wheelchair Skills College**
- **Linccell Technology**
- **Riziki Source**
- **Enviroserve Kenya**
- **Hope Mobility**

Purpose

This playbook exists to turn a proof of concept into a replicable model and to make the case for investing in it.

The Electric Mobility Pilot showed that community-owned hubs, powered by electric third-wheel attachments, can generate real income for wheelchair users in informal urban settlements. It showed that local manufacturing and assembly have the potential to reduce costs dramatically and boost the local economy. And it also showed that when mobility is unlocked, the changes that follow, economic, social, civic, are far greater than anyone anticipated.

The opportunity is significant. Kenya alone has an unmet wheelchair need exceeding 95,000 units annually (AT2030, 2021). Globally, more than 80 million people need a wheelchair but cannot access one that is appropriate, durable, or suited to their environment (WHO, 2023), and in low- and middle-income countries, access to assistive technology sits as low as 3–5% (WHO & UNICEF, 2022). This is not a niche humanitarian concern, it is a large, underserved market with a clear value proposition: devices that pay for themselves through the livelihoods they enable, manufactured locally at reducing cost, distributed through community-owned models built to sustain themselves.

- For investors, this playbook sets out what the model costs, what it earns, what local production can save, and what a pathway to scale looks like.
- For implementers and community organisations, it captures the conditions, partnerships, and operational systems that made the Korogocho hub work and what any comparable context would need to replicate it.

For public funders and policymakers, it provides the evidence base and the asks.

Each section, or "play," addresses a distinct dimension of the challenge: from defining the problem, to examining the evidence base, the financial model, and the risks. Together, they form a practical guide that is honest about the challenges, clear about what works, and grounded in the experiences of the riders who brought this pilot to life.

This is not a finished blueprint. It is a living tool, one designed to be adapted, invested in, and improved by everyone who uses it.

Play One

The problem worth solving: why mobility is the missing link to everything else

Globally, around 1 billion people are persons with disabilities (WHO, 2011), and of those, an estimated 80 million need a wheelchair (WHO, 2023). In high-income countries, access to assistive technology can exceed 90%, but in low- and middle-income countries the picture is starkly different, with access rates as low as 3–5% (WHO/UNICEF, 2022). For wheelchairs specifically, the World Health Organization (WHO) estimates that there are 80 million people in need, yet the vast majority do not have access to one that is appropriate, durable, or suited to the environment they actually live in. In Kenya, around 100,000 people require a wheelchair each year, and fewer than 5,000 receive one through formal distribution channels which is a 95% unmet need, confirmed by a 2021 situational analysis showing that provision by both the public and private sector stands at just 5,000 units annually (AT2030, 2021). That gap is not experienced equally. It disproportionately affects those already most disadvantaged, particularly those living in poverty, in informal settlements, and in communities where support systems are limited.

Mobility is not just about movement

It would be easy to frame this as a medical problem, a question of supply chains, procurement, and clinical provision. But that framing misses what is really at stake.

Mobility is the gateway to everything else. It is what allows a child to get to school, an adult to reach a job, a patient to access a clinic, and a person to participate in the life of their community. When mobility is denied, these opportunities are denied with it.

The specific challenge of informal settlements, and why the project started here

Nairobi's informal settlements, including Kibera, Kayole, Korogocho, and Mathare, are home to approximately 60% of the city's population (KIPPRA, 2024). For people with mobility impairments, navigating these areas presents a distinct set of challenges: unpaved and uneven roads, physically inaccessible public transport, buildings without ramps, and open drains. During the rainy season, routes that are already difficult can become completely impassable. For many residents, simply leaving home demands careful planning and, often, the help of others.



Image 1: *An image showing one of the pilot participants facing difficult terrain.*

These realities are precisely why the project team chose to begin here. An informal settlement is, in many ways, the hardest test a mobility solution can face, and that is precisely its value. If an intervention works on unpaved roads, in dense and crowded spaces, and for users managing real economic pressures, it can work almost anywhere. A solution that only functions in well-resourced environments with smooth pavements and reliable electricity is not a solution for everyone and would not reach those who need it most.

To ensure the pilot was genuinely grounded in the communities it set out to serve, the team partnered with Kounkuey Design Initiative (KDI) and Jionee, organisations with deep existing relationships in these areas and with lived experience of what it means to live with a mobility impairment in this context.

The technology: a practical innovation for an overlooked gap

The devices at the centre of this pilot are electric third-wheel attachments, motorised units that clip onto a standard manual wheelchair, lift the small front caster wheels off the ground, and convert the chair into a powered three-wheeled vehicle. They are modular, detachable, and built for rough terrain.



Image 2: *The MATT device on the left, and the NeoMotion device on the right.*

This matters because the alternatives each fail in their own way. Conventional powered wheelchairs are expensive, heavy, and poorly suited to unpaved surfaces. Standard manual wheelchairs leave users dependent on others to push them; constrained by gradient, distance, and the availability of a willing helper. Electric third-wheel attachments sit in the gap between these two options: more capable than a manual chair, and more accessible and robust than a powered one in difficult terrain.

Crucially, this is not an untested idea. India's NeoBolt and Colombia's MATT devices have already demonstrated that user-designed, third-wheel electric attachments can work in dense, informal, real-world urban environments across the Global South.

What had not yet been tested was whether the surrounding system could work in a new context, and how could make these devices be made accessible, affordable, and economically meaningful for those who need them most. That is the question this pilot set out to answer.

Play Two

The proof: two phases of real-world evidence

This work was grounded in two distinct phases of real-world testing: Phase 1: Device Testing and Knowledge Exchange (2024–2025) and Phase 2: Community Device Hub and Local Device Supply Viability (2026). Each phase was designed to generate practical evidence about whether electric third-wheel attachments could work in Kenya, and what it would take to make them sustainable.

Together, these two phases form a growing body of evidence: that the devices work in Kenyan conditions, can be locally manufactured, enable users to generate meaningful income, and can be sustained through community-owned models.

The sections below summarise what was explored in each phase and the headline findings. Detailed findings are presented in subsequent sections of this playbook.

Phase 1: Device testing and knowledge exchange (2024–2025)

The first phase brought international innovators to Nairobi for a concentrated programme of device testing and collaborative learning. The central question was whether third-wheel attachment technology that had proven successful in India and Colombia could be transferred to the Kenyan context or whether the terrain, infrastructure, and user needs of Nairobi required a fundamentally different approach.

What was explored

Two devices were brought to Nairobi for testing: the NeoBolt from NeoMotion (India) and the MATT device from MATT Movilidad (Colombia). Both attach to manual wheelchairs, lifting the front casters and converting the chair into a powered tricycle, with the NeoBolt attaching to an accompany NeoFly wheelchair, and the MATT designed with the intention of attaching to any wheelchair. Each had been refined through years of use in their home countries, and each offered a different design.

Testing was carried out across three informal settlements, Korogocho, Kayole, and Kibera, over three days. More than 20 local wheelchair users participated, riding the devices through the environments they navigate daily: unpaved roads, narrow pathways, steep inclines, and busy community spaces. The testing was structured around four critical themes identified in early collaborative workshops:

Device Fit & Technical Suitability	Affordability, Access & Collaboration
• Could existing devices from India and Colombia handle Nairobi's terrain and road conditions without modification? • Were the devices suited to the body types, wheelchair configurations, and daily contexts of Kenyan users?	• What financing or local manufacturing models could make the devices accessible — rent-to-buy schemes, income linkage, or other mechanisms? • How could local communities, NGOs, and government bodies be engaged to ensure relevance and scalability?

How it was conducted

Initiated by Anne MacKinnon and Dr. Jacqueline Owigo as pioneers of the FCDO funded Frontier Tech Hub Initiative, the Frontier Tech Hub contracted The Global Disability Innovation Hub (GDI Hub) to coordinate this pilot project. GDI Hub coordinated a consortium that brought together MATT Movilidad from Colombia, NeoMotion from India, Ebikes Africa and Kounkuey Design Initiative (KDI) from Kenya. Observations were captured through journey logs, GoPro footage, and structured feedback sessions including post-it boards where users noted what they liked, disliked, and would want changed.

Facilitators of the workshop sessions recorded not only functional performance, such as how the devices handled terrain, inclines, and obstacles, but also emotional and social responses, including how users felt riding independently in their communities for the first time and how the community responded to them.

Key findings

Both devices demonstrated strong performance in Nairobi's informal settlement environments, navigating terrain that would be impossible for standard manual wheelchairs. User feedback was enthusiastic, with participants highlighting independence, speed, and ease of control as transformative. When asked to indicate if they would like to opt-in to be contacted if the devices were to become available tied to an economic opportunity, 20 out of 21 participants opted in. The community response was also equally positive, with residents and bystanders engaging curiously and supportively with riders.

At the same time, the testing identified a range of context-specific considerations from differences in body types and wheelchair configurations to questions about battery range, and the cost of importing fully assembled units. These insights directly shaped the design of the second phase.



Image 3: *The MATT devices being tested in Korogocho during phase 1.*

Phase 2: Community device hub and local device supply viability (2026)

Building on the evidence from Phase 1, the project was extended along two workstreams: testing the feasibility of a community-owned device hub in Korogocho, and exploring what a locally-grounded, affordable assembly model might look like in Kenya. Phase 2 shifted the question from "Do the devices work?" to "Can communities own and sustain them, allowing a group to work together to improve affordability?" and "Can the device be made more affordable and economically beneficial through local manufacturing or assemble?"

Workstream 1: The community device hub

The first workstream tested a community device hub model, operating through Jionee, a community based organisation (CBO) based in Korogocho, led by Herman Lihanda who was a participant in Phase 1. As a community organisation of persons with disabilities, Jionee operates on a membership model with established community trust, making it an ideal host for a pilot built on collective accountability.

The concept for how the hub should run was established through meetings between GDI Hub, Jionee, KDI and Ebikes Africa, ensuring the operating model was viable from multiple perspectives, from community needs to commercial sustainability. The hub was designed to generate value through two streams: individual members renting devices at KSh 200 per day to pursue income-generating activities, and the organisation itself pursuing revenue opportunities such as advertising, event stewarding, and tour-based activities. Any surplus would feed back into hub operations or in the future to fund additional devices.



Image 4: *Representatives from KDI, Frontier Tech Hub, Jionee and GDI Hub meeting at the Hub in Korogocho.*

What was explored in workstream 1

The four-week pilot tested core assumptions about whether the hub model could function in practice: whether participants would use the devices consistently, whether the KSh 200 daily fee was both affordable

for users and viable for the hub, whether Jionee could manage operations independently, and whether the devices could support meaningful income-generating activity.

Riders undertook a wide range of economic activities using the devices, including buying and selling fruits, delivering shoe repair materials, selling paraffin, vending second-hand clothes, and attending community meetings. The devices also functioned as primary transport, enabling riders to access meetings, attend to personal business, and move freely through their communities.

Key findings from workstream 1

The hub model worked. The riders generated real income consistently covering their daily device fee and, in most cases, making meaningful personal profit on top. The hub was financially viable in two of the three operating weeks. Riders, hub staff, and the surrounding community all engaged with the pilot positively, with the devices attracting admiration and described informally as "ndege" (aeroplane) by community members.

Challenges emerged too. Battery range limited daily reach, the absence of cargo storage required improvisation, weather and terrain constrained operations on some days, and the financial model needed refinement. These are not fundamental barriers, but practical design problems that the recommendations in later sections address directly.

Workstream 2: Device affordability and local assembly

Running in parallel, the second workstream, led primarily by Ebikes Africa with support from GDI Hub, explored what a Kenya-based manufacturing or assembly model might look like. This included investigating supply chain options, identifying what components could be sourced locally, and assessing how the device could be made significantly more affordable by reducing dependence on fully-imported units.

With an imported device currently landing in Nairobi at approximately US$650–$1,150 per unit after freight and port fees (depending on specification and exemption status), the case for local assembly is compelling. Phased local assembly (CKD model) could reduce the per-unit cost to around US$795, and deeper localisation at scale could bring it down to approximately US$685, representing a 25–40% cost reduction.

What these two phases tell us

Taken together, Phase 1 and Phase 2 answer the original question posed by FCDO Pioneers Anne MacKinnon and Dr. Jacqueline Owigo: can this technology work in Nairobi, and can it be adapted to meet the specific mobility needs of Kenyans living with disabilities?

The evidence says yes. The devices navigate Nairobi's terrain, users adopt them enthusiastically and generate income from them, a community-owned hub model can operate and sustain itself, and a pathway to local production exists. What remains is to act on the lessons, refine the model, and build the conditions for scale.

The plays that follow provide the detail: on what the pilots found, on what needs to change, and on how to move from proof of concept to lasting, community-owned impact.



Play Three

The model: how a Community Device Hub works and how it can be replicated

What the model is

The Community Device Hub model is a community-led system that gives wheelchair users daily access to rent electric third-wheel attachments while building collective economic opportunity from the ground up. It is not a service delivered to a community, but a system owned and operated by one.

The hub in Korogocho, Nairobi is led by Jionee, an Organisation of Persons with Disabilities, and works because it is built on existing relationships and trust rather than imported infrastructure. Herman Lihanda, a MATT ambassador and third-wheel user himself, steers the model from within the community it serves.

The result is a self-reinforcing, locally owned system where mobility enables both individual independence and community-wide economic participation.

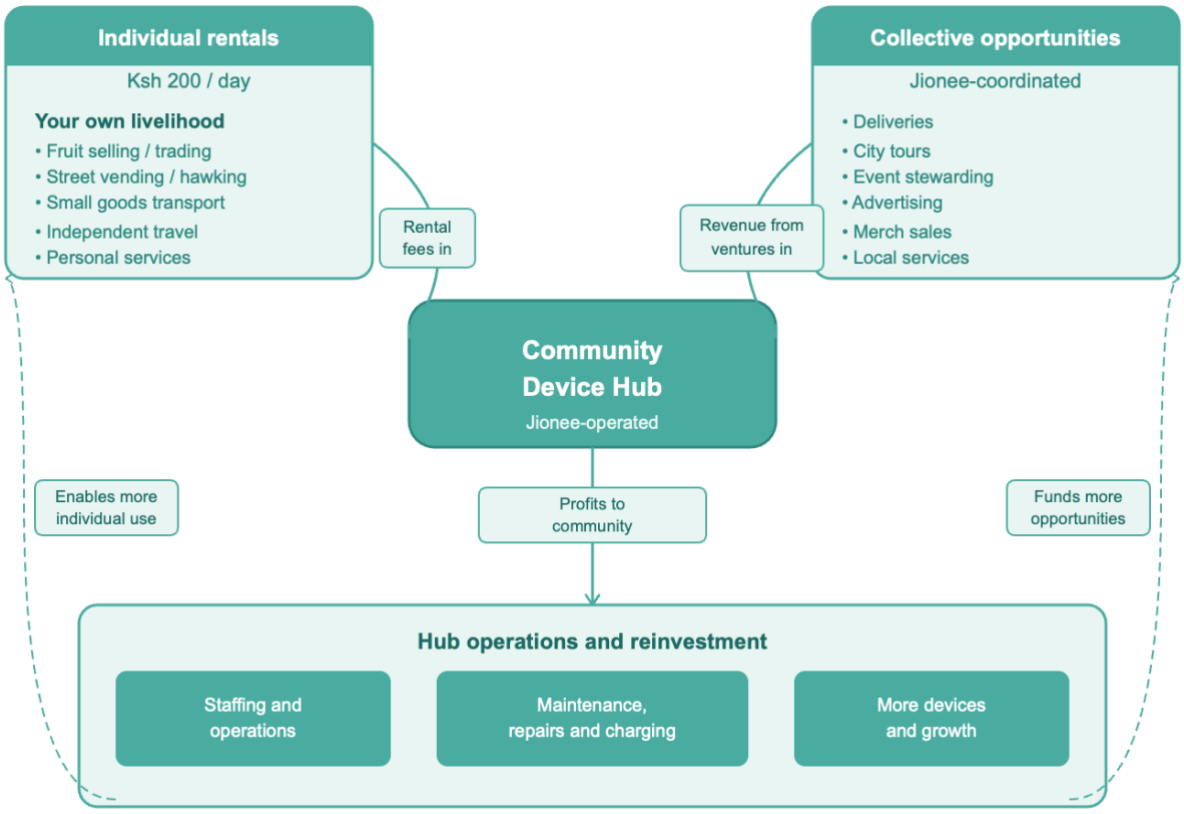


Figure 1: *The Community Device Hub model. Individual rentals and collective activities generate income that flows back into hub operations, growth, and payments to members in a continuous cycle.*

How it works

The hub operates through three interlocking layers that must function together: the daily operational cycle, the financial model, and community coordination. None of these works without the others.

The daily operational cycle

Each morning, devices are allocated to users based on availability, planned activities, and a rotation system designed to ensure fair access. Devices are checked before deployment and used across a range of activities including work, transport, deliveries, and community-based opportunities. At the end of each day, devices are returned to the hub, charged, inspected, and prepared for the next morning.

The financial model

Two income streams feed the hub. The first is individual; users pay KSh 200 per day to rent a device, which they use to run their own livelihoods: fruit selling, market trading, street vending, small goods transport.

The second stream is collective. Jionee actively identifies and coordinates shared income-generating opportunities e.g. deliveries, advertising, local services, that members participate in together as well as stocking an inventory of goods to resell to hub users at a margin that gives a modest profit for the hub and which can be resold for profit for the user. These collective activities currently in-development aim to supplement the low rental rate and increase overall earning potential across the hub.

Revenue from both streams flows back into the hub, covering staffing, operations, maintenance, charging infrastructure, and over time, additional devices and expansion. Surplus can be distributed among members or reinvested into growth. This circular model means the hub sustains itself through the activity it enables.

Community coordination

Jionee sits at the centre of the model, not just as an operator but as an active coordinator of people, resources, and opportunities. This means managing fair access, resolving conflicts, identifying economic opportunities for members, and maintaining the relationships that hold the system together. This layer is what makes the hub a community asset rather than just a rental service.

What makes it sustainable

The hub depends on strengthening a set of core systems over time: consistent daily operations & device utilization, reliable technical support, clear financial tracking, formalised internal processes, and ongoing livelihood coordination.

These are not separate workstreams and they reinforce each other. A hub that tracks its finances well can make better decisions about device maintenance. A hub that coordinates opportunities well generates more revenue to reinvest. A hub with strong community relationships can resolve access disputes before they undermine trust.

The structured approach to data collection and learning embedded from day one is what allows the model to evolve in response to operational realities rather than assumptions.

Replicating the hub model

The hub model can be replicated as it addresses issues which are apparent in many cities and contexts. Globally, an estimated 1.1 billion people live in informal settlements (UN-Habitat), where poor roads, weak



transport systems, flooding, and limited services restrict daily life. Persons with disabilities are disproportionately affected by these infrastructure gaps, with barriers to movement often leading to exclusion from work, education, healthcare, and community life. As these challenges are shared across many cities and can take years to fully resolve, practical mobility solutions are needed in the interim. With more than 1.3 billion people globally living with disabilities (World Health Organization), this model has relevance far beyond Nairobi as an adaptable approach to inclusive mobility and livelihoods, as there as strong links between disability and poverty in low-income countries.

While contextualisation would be necessary in an new context, it is still not just the concept but the system that can be shared such as: the daily operational cycle, the integration of individual and collective use, the financial model linking access to sustainability, and the structured approach to learning and adaptation. However in every context there are also some key conditions and partnerships which must be established in order for the hub to be successful.

The conditions you need before you begin

Successful replication depends on four things being in place:

1. A trusted local OPD or community-based organisation capable of leading implementation
2. Strong existing community networks and relationships
3. Demonstrated demand for both mobility and economic opportunity
4. Basic infrastructure for device storage, charging, and daily coordination

The partners you need

Setting up a hub is not a solo operation. It requires four distinct partner roles, each filling a gap the others cannot:

An oversight coordinating partner that comes in at the start to establish the governance framework, manage funder relationships, bridge partnerships and ensure quality and learning across the model during the initial weeks of set up.

A local operations partner embedded on the ground; leading data collection, managing safeguarding, and supporting implementation in ways that are sensitive to local context.

A technical device partner that supplies and maintains the devices, trains the anchor organisation in basic maintenance, and provides ongoing support to minimise downtime.

A trusted OPD or community-based organisation that provides the local leadership, relationships, and day-to-day operational capacity which holds the whole system together. Alongside community members who staff the hub as coordinators, technicians, and charging managers, and who are also its primary users.



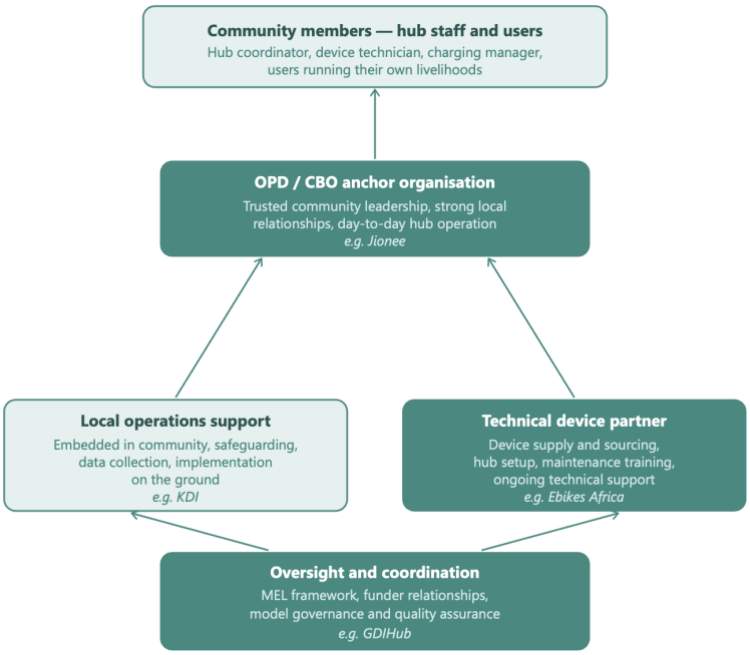


Figure 2: *The partner model required to operate a Community Device Hub. Each role is distinct and the model depends on all four working together.*

The replication pathway

While the core model remains consistent, key elements will vary by context, including the types of income-generating opportunities available, the pricing model, and the structure of local partnerships.

The pathway below outlines the core steps required to adapt and implement the model in a new setting:

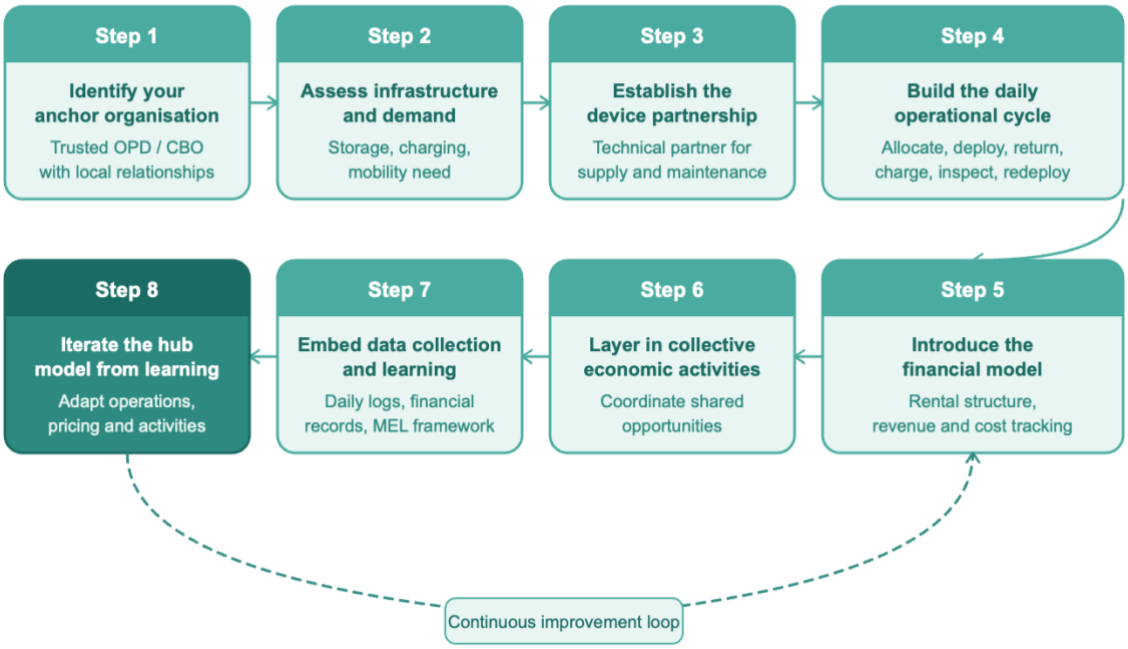


Figure 3: *The pathway to hub replication.*

Play Four

The people it serves: who uses this, why, and what changes for them

This play is about the people at the centre of the pilot, who they are, what the device made possible for them, and what shifted in how they moved through the world, earned a living, and were seen by their community. The evidence is drawn from the mini-pilot run by Jionee OPD between March and April 2026.

1. Who the devices serve

Participants were recruited from within the Jionee membership; all of whom are people with physical disabilities, primarily spinal cord injuries, living in Korogocho and Mathare. From an initial pool of 11, 8 were selected and 4 used devices during the pilot. A further 4 qualified participants remained on the waiting list, as demand exceeded supply of devices. Users of the devices are working-age adults, predominantly male, although efforts were made to recruit more female participants. The users are currently reliant on manual wheelchairs or tricycles that require physical effort or external assistance. They are members of an existing community organisation, providing a layer of social accountability. They are people with economic intent and the capacity to work, constrained primarily by mobility.

2. What they used it for

Devices were in use almost every day from the start of the pilot, with only one day missed due to weather and one due to a participant's unrelated illness. This highlighted the need for a waitlist of backup riders, which was introduced going forward. Use cases were varied and entirely self-directed with no model imposed. Participants, with strong support from their organisation leader Herman Lihanda, identified their own use cases and opportunities, adapting accordingly.

While the devices were primarily used for income generation, as demonstrated in Table 1, a range of everyday and community related uses also emerged. Riders collected disability certificates, registered businesses, attended community meetings, mentored children with disabilities, and accompanied the Hub coordinator to meet the local Member of County Assembly (MCA). The MCA visit was made possible, in part, because of the visibility the devices provided, highlighting the shift in social status the devices made possible for the participants.

Table 1: *Income-generating activities observed during the pilot.*

Activity	Daily Gross Profit (KES)	Notes
Fruit selling (peak)	1,100 (≈ USD 8.50)	Two trips
Fruit selling (typical)	600 (≈ USD 4.60)	Single trip, stable mid-week performance
Fruit selling (slow day)	300 (≈ USD 2.30)	Still net positive after the KES 200 daily fee
Ice cream vending (1 hr)	910 (≈ USD 7.00)	Coordinator demonstration of income potential

Watermelon vending (1 hr)	600 (≈ USD 4.60)	Coordinator demonstration of produce model
Shoe repair delivery	Variable	Multiple trips per day; reduced porter costs
Paraffin / clothing sales	Variable	Combined with community activities

Annualised at modest utilisation, a fruit-vending operator on a slow day still has the potential to earn more than 76% of households in Korogocho, based on APHRC longitudinal poverty data, showing that 76% of households in the settlement live below the critical poverty line.

3. What changed for them

Mobility and independence were the most immediate gains. Riders no longer needed someone to push them or to struggle physically through difficult terrain. They could make multiple trips in a day (when charging allowed), access routes that had previously been avoided, and move without the physical strain of a manual tricycle. Every rider who used the device commercially was able to cover their daily rental fee and generate surplus.

The social outcomes were unplanned and significant. In Korogocho, disability is often associated with dependency. The sight of riders operating independently, running businesses, and moving confidently through the settlement created a different narrative, one the community itself communicated: riders were accepted by the local motorbike fraternity as fellow riders; community members nicknamed the devices "ndege" (Swahili for aeroplane); and some participants went from recipients of support to mentors of younger people with disabilities.

When compared to the Colombian deployment of the same device, the longer arc becomes clear as to what this device might mean financially for the riders. MATT's 285 active users in Medellín earn USD 200–350 per month net of operating costs above the KNBS lower-income threshold of KES 23,670 (USD 182) per month, and sufficient to move riders into a medium-income bracket (Kenya National Bureau of Statistics, 2025).

“These ones do not beg like others.” — Community observation recorded during the pilot, showing how device use changes people’s perspectives of disability.

4. In Practice: One Rider's Story

Case Study:

Peter

Student, Entrepreneur and Community member



Image 5: *Peter outside Jionee group offices in Korogocho.*

Background

Peter is a fourth-year Supply Chain Management student at Kenyatta University, due to graduate shortly. A Jionee member, his daily mobility previously depended on boda boda at a cost of KES 800 per day. He now pays KES 300 for the small number of journeys the device cannot cover, now using the device for around 80% of his travel, saving KES 300 per day after the device rental in transport costs alone. For KES 200, a quarter of his previous daily transport cost, he moves on his own terms and his own schedule, which makes this saving of KES 300 worth even more.

What He Does With It

Peter runs two distinct income activities around a structured daily routine. Each morning he rides 1.5 km to the market to buy watermelon stock, then spends three hours selling, using the device as an asset in itself, since people approach him to ask about it and he uses those conversations to sell. His daily watermelon gross is KES 1,200 against a stock cost of KES 300, leaving KES 900 profit. In the afternoon he moves to his kiosk, where he sells flour, wheat, and household staples to residents returning home. He also uses the device to deliver supplies to customers who cannot collect, a service that would have been impractical before. Beyond sales, he also travels 14 km each way to Kenyatta University on the same device.

What Changed

The financial shift is direct: KES 500 in daily transport savings on top of KES 900 in watermelon profit, before kiosk income or delivery earnings. Journey times have halved with a 10-minute trip now taking two to five minutes. For a student managing university, a morning market run, a vending operation, an afternoon kiosk, and navigating a large campus that reduction is what makes the whole model possible in a single day.

The social dimension is also very strong, and customers approach Peter because of the device. In a settlement where people with disabilities have often been associated with dependency, he is visibly building something and the community has noticed.

In His Own Words

"Before using this device, my profit was so low because I used to pay boda boda to transport me, and after I got the device I found that this transport fee I can cover it using the device so my profit now will increase."

"I have had a good experience. I have attracted many customers using the device, my movement from one place to another the time has reduced — a 10 minute trip is now 5 or 2 minutes, because the device is very fast and it is very comfortable. The days I use it I am so comfortable!"

"In Kenya people have admired this device, not only people with disabilities but also people without disabilities have liked these devices as they see us doing business. It is so very bad to see me after my education going to beg for something, but for now even if the economic or job opportunities are limited, I can also create a job opportunity with this device. I would like many more of these devices to come for those who are without, as many of us are asking for it."

What Would Make It Better

Peter identified two practical gaps: mudguards and a cargo holder. On a wet morning during the pilot he rode to the market on a muddy road and the device picked up significant dirt; a risk to his stock and therefore to his revenue. Both are design additions rather than fundamental limitations, but they matter to someone whose business depends on what he can carry and how it arrives.

"Today morning there was rain and I went to get stock where the market is, 1.5 km away, and the road was very muddy."

5. What got in the way

Several constraints limited what participants could do and earn. Battery performance was the most persistent issue. On the first day, devices ran out of charge 30 minutes from the Hub. Riders adapted by staying closer to base, but this directly limited their commercial reach. With one charger per device and no remote charging points, riders were effectively tethered to the Hub. When charging increased to twice daily in Week 3, costs doubled and erased the Hub's profit margin.

Cargo was an unresolved practical gap. With no storage on the devices, riders improvised using buckets on their laps and makeshift wooden platforms. Rain regularly delayed morning departures, and muddy terrain made some routes impassable. There was no GPS or check-in system, so when a rider could not be reached by phone, the coordinator had no way to locate them. One rider withdrew due to the daily rental cost, highlighting that flexible payment structures may be needed for periods of lower income.

6. What the evidence shows

The pilot evidence is constrained, three weeks, two devices, and four participants, but it is consistent. Participants covered their daily fee and generated surplus on every operational day. They did so across multiple distinct income models, none of which were assigned to them.



Social and civic impacts also emerged, including increased community standing, political visibility, and peer leadership. Demand for the devices outstripped supply throughout.

A powered mobility device is not a welfare expense: it is a productive asset. The Korogocho pilot shows that this device has the ability to change the way a person is able to live their life, allowing them to access economic opportunities and be an active member of their community. It also changes attitudinal barriers in communities around disabilities, allowing people to see that people with disabilities are disabled by their environments and not their will to contribute to their communities.

Play Five

The business case: what it costs, what it earns, and when it becomes sustainable

What this play is really about

This play sets out the economic logic of the model. It explains how costs are structured, how value is generated, and the conditions under which the system becomes sustainable.

This is not a conventional business case. The model operates in a context where user affordability is constrained, and value is generated not only through revenue, but through income creation and economic participation. As a result, sustainability depends on how cost, pricing, and financing are aligned, rather than on revenue alone.

What it costs: the structure behind the numbers

The cost structure is shaped by three components that behave differently over time: the imported component base, local fabrication and assembly, and regulatory cost:

Imported component base: Motors, controllers, and batteries remain imported regardless of local assembly and set a fixed cost floor. These costs do not reduce significantly with scale in the short term.

Local fabrication and assembly: This includes wheelchair fabrication, labour, and workshop overheads. These costs improve with scale as processes become more efficient and fixed costs are spread across higher volumes.

Regulatory cost: The duty and VAT exemption reduces per-unit cost by approximately $150 and has a greater impact on unit economics than operational efficiency.

These dynamics are reflected across scale, as shown in Table 2:

Table 2: *Unit cost at different production volumes.*

#	Volume	Cost (with exemption)	What it means
1	100 units	~ $996	Pilot phase; not sustainable
2	500 units	~ $796	First point where the model begins to hold
3	1,000 units	~ $685	Efficiency starts compounding

The implication is straightforward. Cost does not reduce enough at low volumes to make the model viable. It only begins to stabilise when scale and regulatory conditions align.

What it earns: revenue at system level

The model generates value at two levels: the user level and the system level.

At the user level, the device functions as a productive asset. Evidence from comparable deployments and the Nairobi pilot shows that users can generate between $200 and $350 per month through activities such as delivery, vending, and small trade. Even at lower utilisation levels, daily earnings remain positive after covering rental costs.

At the system level, revenue is structured through a fixed institutional price of approximately $1,250 per device. This is paid by corporate partners, government buyers, or other institutions, while users contribute a smaller portion through rental or payment plans supported by their income.

This creates a blended model in which:

- Institutions fund access
- Users sustain utilisation
- The system captures value through structured pricing

The margin profile in Table 3 shows how this evolves with scale:

Table 3: *Cost and scale pathways.*

#	Volume	Cost (with exemption)	Revenue	Gross margin (%)	Interpretation
1	100 units	~ $996	$1,250	~ 20%	Fragile, dependent on subsidy
2	500 units	~ $796	$1,250	~ 36%	Operationally viable
3	1,000 units	~ $685	$1,250	~ 45%	Scalable and resilient

The model does not rely on price increases. Viability is achieved through cost reduction and consistent pricing as scale increases.

When it becomes sustainable

The model does not reach sustainability at pilot stage. At low volumes, costs remain high and demand is not yet established.

Sustainability emerges at approximately 500 units per year, under two conditions:

- The CKD assembly model is in place
- The duty and VAT exemption is secured

At this point, costs fall to a level where the institutional price can cover operations, enable reinvestment, and reduce reliance on per-unit operational grants.



User economics: why the model holds at a ground level

The viability of the system depends on whether users can generate sufficient income to justify participation.

Table 4: *User economics overview.*

Metric	Value	What this shows
Monthly incomes (users)	$200 – $300	2–6× local baseline incomes
Daily rental cost	~ KES 200 (~$1.5)	Affordable relative to income
Daily profit (observed)	KES 100 – 900	Positive even at low utilisation
Payback dynamic	< 12 months (implied)	Device functions as an income-generating asset.

The key shift is conceptual. The device is not a cost to the user, it is a tool that generates income. This is what allows the model to function at the base of the income distribution.

How this fits into the broader system

This play does not stand alone.

The device and supply chain determine cost.

The community hub model determines utilisation and income generation.

The financing architecture determines how affordability gaps are bridged.

The business case is the point where these elements meet. It reflects how well the system has been designed and aligned.



Play Six

Why build it here: the case for local manufacturing

What this play is about

This play sets out why local manufacturing is not just an operational choice, but a structural requirement for the model to work at scale.

It connects device design, cost, and supply chain decisions directly to the investment case. The question is not whether devices can be imported, but whether the system can become viable, scalable, and locally embedded without building production capacity in-country.

The starting point: what doesn't work

In early deployment, importing fully assembled devices is the fastest way to begin. It allows for testing, user validation, and initial deployment without upfront investment in infrastructure.

However, this model does not hold.

Imported devices carry:

- Higher landed costs
- Limited control over supply timelines
- No pathway to meaningful cost reduction
- No integration with local repair or fabrication ecosystems

Most importantly, they do not respond to local conditions. Devices designed for different environments often fail to meet the realities of informal settlements terrain, usage patterns, and repair constraints.

Import-led deployment is therefore a proof-of-concept pathway, not a scale pathway.

What changes with local manufacturing

Local manufacturing does not eliminate the need for imports. Core components such as motors, controllers, and batteries remain part of a global supply chain.

What changes is everything around them.

By shifting to local fabrication and assembly:

- The wheelchair base can be built to specification, rather than adapted from unsuitable donated stock
- Assembly processes can be optimised for local conditions
- Repair and maintenance can be handled within the system, reducing downtime
- Costs begin to reduce as labour and overhead efficiencies improve



This transition, from importing a product to assembling a system, is what enables the model to move beyond pilot.

The role of local fabrication

One of the key constraints identified early is that existing wheelchair supply is not fit for purpose. Donated and hospital-issued chairs are structurally unsuitable for powered attachments.

Local fabrication addresses this directly.

Instead of screening for compatible chairs, the model shifts to producing chairs that are compatible by design. This removes a major bottleneck and reframes supply from a constraint into a controllable input.

At scale, fabrication costs reduce significantly, contributing to overall unit cost improvements and enabling consistency across deployments.

How this connects to the business case

Local manufacturing is not only a technical decision, it is central to the economics of the model.

Without local assembly:

- Costs remain high and largely fixed
- Margins are compressed
- The pathway to sustainability is delayed

With local assembly:

- Cost reductions begin to emerge at 300–500 units
- Margin improves as fabrication and labour efficiencies increase
- The model reaches its first point of viability at scale

Local manufacturing therefore sits directly within the business case. It is one of the conditions required for the model to move from externally supported pilot to operational system.

What local manufacturing enables beyond cost

The impact of local manufacturing extends beyond unit economics.

It creates:

- Local employment in fabrication, assembly, and maintenance
- Technical capacity within the community and partner ecosystem
- Faster turnaround for repairs and servicing
- Greater ownership of the system within the local context

It also strengthens the broader ecosystem by linking assistive technology with existing sectors such as e-mobility, fabrication, and logistics.



This shifts the model from a single intervention to part of a wider economic system.

The pathway

The transition follows a staged approach:

Phase 1: Import-led deployment

Establish proof of concept, validate usage, and generate early demand signals.

Phase 2: Local assembly (CKD model)

Introduce local fabrication and assembly, reduce costs, and build operational capacity.

Phase 3: Deeper localisation

Explore component-level efficiencies, including battery pathways and supplier negotiations.

Each phase builds on the previous one. Skipping steps or accelerating too quickly increases operational and financial risk.



Play Seven

The jobs this creates: why this investment pays for itself in livelihoods



Figure X: Needs Caption

What this play is about

This play positions the model as economic infrastructure, not charity. It shows how the device and the hub create income, enable work, and generate returns that extend beyond the individual user.

The starting point: exclusion is an economic loss

Disability is not a marginal issue. It represents a direct economic loss, as demonstrated in Table 5.

Table 5: *The cost of exclusion.*

Indicator	Value	Implication
GDP loss due to exclusion	~ 6.95% (~$7.7B/year)	Significant untapped productivity
Median income (informal settlements)	~ $57 – $114/month	Low baseline earning capacity
Working-age concentration	Majority aged 26–35	Loss at peak earning years

The constraint isn't willingness to work but a lack of access to mobility and opportunity.

What the device enables

The introduction of the device changes this relationship immediately.

Instead of being limited by mobility, users are able to participate in existing economic activities; delivery, vending, transport, and small trade. The device does not create new markets; it enables access to ones that already exist.

Evidence from pilot activity and comparable models shows that users can generate between $200 and $350 per month, often multiple times their previous income levels. Even at lower levels of utilisation, daily earnings remain positive after covering access costs.

From individual income to system-level jobs

The impact does not stop at the user.

As devices are deployed, a wider set of roles begins to emerge around them. The hub requires coordination, charging, maintenance, and daily operations. The supply chain requires fabrication, repair, and component handling.

Table 6 outlines the employment opportunities this creates across multiple layers:

Table 6: *Employment opportunities across user, hub, and ecosystem levels.*

Layer	Roles	Function
User level	Riders, traders, service providers	Direct income generation
Hub level	Coordinators, technicians, charging managers	System operations
Ecosystem level	Fabricators, mechanics, suppliers	Supply and maintenance

How income flows through the system

The model is structured so that income generated at the user level feeds back into the system.

Users earn through daily activities. A portion of this is paid back to the hub through rental or usage fees. That revenue supports operations, maintenance, and expansion. As more devices are added, more users are able to participate, increasing total economic activity.

This creates a self-reinforcing cycle, where income generation supports system growth, and system growth enables further income generation.

What must be true

For these outcomes to hold, utilisation is critical.

Devices must be used consistently, and users must have access to viable income opportunities. The hub plays a central role in ensuring this through allocation, coordination, and identifying collective opportunities where needed.



Without consistent use, the economic return does not materialise.

Play Eight

The investment ask: what we need, what it unlocks, and why now

What this play is about

This play sets out the investment required to move from pilot to scale. It defines what capital is needed, what that capital enables, and the return it generates across the system. The objective is not to raise capital for a single activity, but to activate a system that is already partially in place.

The starting point: this is not a greenfield build

The model does not begin from zero.

- Devices have been tested
- A community hub has been established
- Local assembly capability exists
- Early income generation has been demonstrated

The constraint is activation and scale. The investment ask is therefore catalytic, not foundational.

What is needed

The capital requirement is not a single pool. It is a set of linked needs, each enabling a different part of the system, demonstrated in Table 7 and Table 8.

Capital requirements

Table 7: *Capital requirements.*

Component	Type	Estimated range	Purpose
Assembly setup & tooling	One time	$3.5K – $14K	Establish local production
Component inventory & working capital	Revolving	~$100K (100 units) – $400K (500 units)	Enable batch production
Demand-side subsidy	Per unit	$200 – $500	Bridge user affordability gap
Clinical assessment	Per unit	$45	Ensure safe deployment
Battery reserve	Ongoing	~$20/unit/year	Cover lifecycle costs

Return across the system

Table 8: *Return across the system.*

Level	Return type	Outcome
Individual	Income uplift	$200 – $350/month earning
Household	Consumption stability	Increased spending and reduced dependency
Community	Economic activity	Local trade and services expand
System	Revenue recycling	Hub sustainability and growth
Economy	Productivity gain	Reduced exclusion and higher participation.

Why this investment structure matters

A key feature of the model is that different capital types serve different functions.

- Grant and concessional capital enable early deployment and absorb risk
- Corporate CSR and public procurement act as demand anchors
- Commercial capital becomes viable only once scale and demand are established

This sequencing is critical. Introducing the wrong type of capital too early creates structural risk and can stall the model.

Why now

Three conditions make this the right moment to invest.

First, proof of concept has been established. Devices have been tested, and income generation has been demonstrated.

Second, the pathway to viability is clear. The transition to local assembly and the 500-unit scale threshold provide a defined route to sustainability.

Third, the enabling environment is emerging. Policy frameworks, ecosystem partners, and demand channels are beginning to align.

Delaying investment risks losing this alignment. Acting now enables the model to move from isolated pilots to a coordinated system.

What must be true

For the investment to translate into outcomes:

- Demand must be validated through committed institutional partners



- Duty and VAT exemption must be secured
- Local fabrication and assembly capacity must be operational
- Working capital must be deployed ahead of production

Without these conditions, capital alone does not create scale.

Play Nine

How to finance it: matching the right capital to the right stage

What this play is

This play provides a practical guide to how the model should be financed. It sets out which types of capital are appropriate at different stages, and how they should be sequenced.

The model does not rely on a single source of funding. It depends on matching the right capital to the right need at the right time.

Why sequencing matters

A common point of failure is not the absence of capital, but the use of the wrong type of capital at the wrong stage.

Introducing commercial capital too early places pressure on a system that is not yet stable:

- Over-reliance on grants without transition pathways limits scalability
- Delayed working capital prevents production, even when demand exists

Financing must therefore follow the structure of the model, not precede it.

The stages of financing

The model moves through three stages, each requiring a different capital mix.

Stage 1: Pilot and proof of concept

At this stage, the focus is on validating the device, the hub model, and initial demand, shown in Table 9.

Table 9: *Pilot and proof of concept capital mix.*

Capital type	Role	What it funds
Grant capital	Risk absorption	Device deployment, early operations
CSR contributions	Initial demand	Small-scale procurement
User payments	Partial contribution	Usage validation

At this stage, the model is not expected to be financially sustainable. Capital supports learning and validation.

Stage 2: Early scale (CKD assembly)

This is the transition phase where the model begins to stabilise, outlined in Table 10.



Table 10: *Early scale capital mix.*

Capital type	Role	What it funds
Concessional capital	Catalytic	Assembly setup, early expansion
CSR / institutional buyers	Demand anchor	Device procurement
Working capital facilities	Operational	Component inventory and production
User payments	Ongoing contribution	Partial cost recovery.

At this stage, financing shifts from supporting activity to enabling repeatable operations.

Stage 3: Scale and expansion

Once the model reaches consistent volumes and demand visibility, additional capital becomes viable.

Table 11: *Scale and expansion capital mix.*

Capital type	Role	What it funds
Trade finance	Liquidity	Working capital cycles
Impact investment	Growth capital	Expansion and system scaling
Blended finance structures	Risk sharing	Larger deployments

Commercial capital becomes relevant only when demand is predictable and operational risk is reduced.

The role of subsidy within financing

Subsidy is not confined to the early stages. It remains a structural part of the model.

At lower income levels, user contributions cannot fully cover costs. Demand-side subsidy, often through CSR or public procurement, continues to play a role even as the model scales.

This should be built into financing structures from the outset, rather than treated as a temporary gap.

This should be built into financing structures from the outset, rather than treated as a temporary gap.



Play Ten

Risk as infrastructure: insurance, system risk, and staying ahead

What this play is

This play sets out the risks that sit outside the financial model but directly affect whether the system can scale. It brings together two layers of risk:

- Structural risk that requires external solutions (such as insurance)
- Operational risk that must be managed within the system

It provides a practical view of what can go wrong, and how to design the system to absorb and respond to it.

Why risk cannot be treated as an afterthought

Inclusive mobility systems operate in environments that are dynamic, informal, and often unpredictable. Devices are used in public spaces, across uneven terrain, and within loosely structured economic systems.

Small disruptions can have disproportionate impact:

- A delayed shipment can stall deployment
- A broken component can stop a user's income
- A stolen or damaged device creates financial loss

In the pilot, these risks were already visible:

- Shipping delays increased costs by up to 25%
- Medical device registration timelines extended up to 12 months
- Users required faster repair turnaround to avoid income loss

Risk is therefore not peripheral; it sits at the centre of system performance.

The structural gap: insurance

One of the most critical risks cannot be managed internally: insurance.

Devices and riders operate in environments where exposure to damage, theft, and accidents is high. However, insurance products for this category are largely unavailable.

This creates a structural gap:

- Devices do not fit standard insurance categories
- No clear underwriting frameworks exist
- Risk pricing is not established

As a result:

- The hub carries financial exposure for device loss or damage



- Users remain vulnerable when operating in public environments
- Institutional partners face compliance and liability concerns

This is a product and policy gap.

What this means for the model

Without appropriate risk-sharing mechanisms:

- Device loss directly affects system viability
- User confidence is reduced
- Scaling increases exposure rather than stability

Thus, insurance becomes a precondition for long-term scale.

Operational risks within the system

Alongside structural risk, the model must manage day-to-day operational risks, outlined in Table 12.

Table 12: *Day-to-day operational risks.*

Risk area	Example	Impact
Supply chain	Delayed components	Disrupts deployment timelines
Device uptime	Breakdowns, slow repair	Loss of user incomes
Hub operation	Allocation disputes, coordination gaps	Reduced utilisations
Governance	Weak oversight	Loss of trust and accountability
Local manufacturing	Quality inconsistency	Safety and reliability issues

How risk is managed in practice

In the pilot, risk was partially managed through system design:

- Daily return of devices to the hub
- Local oversight and coordination
- Structured maintenance and charging routines



However, as the model scales, informal controls are no longer sufficient. Risk management must become embedded, highlighted in Table 13.

Core Risk Management Actions

Table 13: *Core risk management actions.*

Action	Purpose
Embed daily operational routines	Ensure consistency and accountability
Track device usage and downtime	Identify and respond to failures early
Build local repair capacity	Reduce downtime and income disruption
Formalise governance structures	Strengthen oversight and trust
Plan for lifecycle costs	Avoid future financial shocks

The need for a parallel workstream

Addressing structural risks, particularly insurance, requires action beyond the core model.

This includes:

- Engagement with insurance providers to develop suitable products
- Exploration of pooled or community-based risk models
- Partnerships with government and private sector actors to define regulatory pathways

What must be true

For the system to remain stable as it scales:

- Devices must have clear pathways for repair and replacement
- Operational processes must be consistent and enforced
- Risk exposure must be understood and tracked
- External risk solutions (such as insurance) must be developed

Without these, growth increases fragility rather than resilience.



Closing

Across ten plays and two phases of real-world evidence, this playbook demonstrates that electric third-wheel attachments are not simply mobility devices, but economic infrastructure: productive assets that help users generate income, reduce household dependency, and create measurable ripple effects across local economies in ways that standard wheelchair provision cannot. The device is the entry point into that system, but what follows from it — stable income, social inclusion, civic participation, and the kind of community visibility that changes how disability is perceived — represents the deeper and more durable return on investment that funders, governments, and implementing partners should prioritise.

The core model has been validated. The community hub in Korogocho demonstrated that a locally-led organisation of persons with disabilities can own and operate a device rental system that is both financially viable and genuinely useful to its members, with riders covering their daily KSh 200 rental fee and generating consistent surplus across multiple income-generating activities, none of which were assigned to them by the project team. This was achieved despite the hub operating with just two devices and four active participants, a supply constraint that was itself a meaningful signal of demand, given that a further four qualified members remained on a waiting list throughout the pilot, unable to participate solely because no additional devices were available.

The pilot was equally honest about what remains unresolved. Battery range, cargo capacity, the absence of insurance products for this device category, and per-unit import costs of approximately US$1,130 that remain unsustainable without grant support until local assembly reaches the 500-unit threshold (at which point costs stabilise around US$796 per unit) are all documented here as design problems requiring investment, not reasons to pause. Three areas in particular demand dedicated attention: the development of a Kenya-specific device prototype built for local terrain, body types, and repair ecosystems rather than adapted from devices designed elsewhere; the establishment of distributed charging infrastructure across markets, health centres, and transport nodes so that riders are no longer tethered to a single charging point; and the creation of a network of interconnected hubs that can share devices, coordinate income opportunities, pool maintenance resources, and generate the demand volume that makes local assembly economically viable. A single hub operating a small number of devices in one settlement is a proof of concept; a network of hubs operating across Nairobi is the beginning of a market.

What stands between this pilot and a lasting, community-owned mobility system is sequenced capital, supportive policy, and committed partners to move from one hub in Korogocho to a model that serves the more than 95,000 Kenyans who need a wheelchair each year but currently cannot access one.

The pathway is documented in this playbook, and none of it requires starting from scratch. The community relationships, device evidence, local assembly capability, and hub operating model are already in place. What is required now is investment to develop the remaining pieces, and coordination to bring the model to scale. The work that began in Korogocho has shown that inclusive mobility at scale is not a distant aspiration, but a practical and investable next step.





Those who made it possible

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Finally, to everyone who contributed along the way — from local facilitators and researchers to technicians, designers and community leaders — thank you for your generosity, hard work and belief in the potential of inclusive innovation.

We hope that this pilot, supported by the strategies and tools outlined in this playbook, continues to flourish beyond this stage, and that these devices deliver lasting, real-world impact for wheelchair users across Kenya — enabling movement, livelihoods and dignity for all.

References

AT2030 Programme. (2021). *Catalysing AT access: Scaling rehabilitative services and increasing access to AT in Kenya.* Global Disability Innovation Hub. https://at2030.org/catalysing-at-access:--scaling-rehabilitative-services-and-increasing-access-to-at-in-kenya/

Kenya Institute for Public Policy Research and Analysis (KIPPRA). (2024). *Strengthening the upgrading programmes of informal settlements in Nairobi.* https://kippra.or.ke/strengthening-the-upgrading-programmes-of-informal-settlements-in-nairobi/

Kenya National Bureau of Statistics. (2025). *Economic survey 2025.* https://www.knbs.or.ke/wp-content/uploads/2025/05/2025-Economic-Survey.pdf

National Council for Persons with Disabilities (NCPWD). (2024). *Disability inclusion status report 2025: Behavioural science and macroeconomic reframing.* United Nations Development Programme. https://www.undp.org/sites/g/files/zskgke326/files/2024-12/disability_inclusion_status_report_2025.pdf

World Health Organization. (2011). *World report on disability.* WHO Press. https://www.who.int/disabilities/world_report/2011/en/

World Health Organization. (2023). *Wheelchair provision guidelines.* https://www.who.int/publications/i/item/9789240074521

World Health Organization & UNICEF. (2022). *Global report on assistive technology.* https://www.who.int/news/item/16-05-2022-almost-one-billion-children-and-adults-with-disabilities-and-older-persons-in-need-of-assistive-technology-denied-access--according-to-new-report





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