Transforming rural access: motorcycles, low-cost infrastructure and appropriate standards
Transforming rural access: motorcycles, low-cost infrastructure and appropriate standards

Introduction

Victor Simfukwe
Project Manager, Transaid
Agenda

• Workshop overview and objectives
• Recent ReCAP activities concerning motorcycle taxis - (Caroline Barber – Transaid)
• Transforming community access to the rural road network: motorcycle infrastructure to connect all villages in Liberia – (Paul Starkey – ReCAP)
• Strengthening rural access through transport associations – a case study from Uganda – Victor Simfukwe
• Group work to discuss:
  • Key issues
  • Policy implications
  • Research needs
Workshop Objectives

1. To raise awareness about the many issues of motorcycle taxis in rural areas
2. To share information concerning the recent April 2017 motorcycle webinar
3. To stimulate discussion on ‘best practices’ relating to motorcycle taxis in rural areas, including issues relating to improving safety, training, operator associations, regulation and infrastructure provision
4. To stimulate discussion on the policy implications and research needs arising from the issues raised during the workshop
Motorcycle taxis…

- There are clearly some legitimate safety concerns relating to motorcycles and motorcycle taxis
- However in rural areas they can provide a vital service (and bridge a gap) regarding accessing essential services (health, markets, education….)
- In some countries there been explosion in their use (examples)
- Countries have reacted differently to this growth (examples)
Recent ReCAP activities concerning motorcycle taxis –

Caroline Barber – Transaid
Previous ReCAP work on motorcycle taxis

- In 2014 AFCAP undertook clustered research on transport services in Tanzania, this included:
  - Study on the magnitude and characteristics of road traffic injuries on low volume rural roads including motorcycle taxis
  - Development of an appropriate training curriculum for motorcycle taxi riders
  - Research by HelpAge International - older people and access
Introductory webinar on motorcycles in the Rural Context in Sub-Saharan Africa and South Asia

• 6th April 2017
• Webinar – an effective way to share information and encourage discussion
• Brought together African and Asian transport researchers, regulators and practitioners
• Three presentations – covering safety and regulation, helmet use, access to essential health services
• Recording is available on youtube (search for Transaid)
• Or find the presentation on the Transaid website
• Will be on ReCAP site soon
• Qs - info@transaid.org
Introductory webinar - metrics

- 150 people registered
- 59 joined the live broadcast on the day
- Another 36 joined via ‘link up hubs’
- From 24 countries
- Feedback has been very positive – for over half of our participants it was their first webinar
Webinar – key discussion points

The most common recurring themes from the Q&As and discussion included:

• challenges of regulating and enforcing law for the motorcycle taxi industry
• Requests for “good practice” examples
• low utilisation of helmets and other safety gear
• training
• use of motorcycle taxis for access to health services
• the role of innovation and technology
Recommendations

• Appetite amongst participants for attending more webinars
• Participants wanted more time for debate and questions and answers session
• Suggested future research topics:
  • Rider training across the whole country
  • Leveraging technology to enhance safety and efficiency of motorcycle transport services.
  • Making motorcycle transport a profession that make a living which is stable and viable
  • Rural paths to facilitate access
  • Enforcement and scope to work with associations
  • Disaggregation of motorcycle use/crashes at different stages in the transport network
  • Research on behavioural issues of riders & accidents
  • Safety equipment and visibility
Thank you for your attention

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Follow ReCAP on:
Transforming community access: enabling motorcycles to reach all villages in Liberia and elsewhere

Paul Starkey

Transport Services Research Manager
Africa Community Access Partnership (AfCAP)

8th Africa Transportation Technology Transfer Conference, 8-10 May 2017, Livingstone, Zambia
Presentation outline

- Liberian multimodal master plan study
- Motorcycles are transforming rural access
- Nature of required investments
- Strategic investment plan analysis approach
- Initial cost benefit analyses
- Conclusions and next steps for Liberia
- Sierra Leone: similar issues
- Conclusions: can other African countries benefit . . .
Liberia multi-modal transport investment plan

- Government of Liberia: Ministry of Public Works and Ministry of Transport
- Funding from World Bank
- Study implemented by Cardno IT Transport
- All transport modes (road, rail, water, air)
- International, urban, inter-urban and rural transport
- Infrastructure, services and regulatory authorities
- New motorcycle trail infrastructure identified as a key rural transport investment
Remarkable transport ‘revolution’ in Liberia in the past ten years

Motorcycles are transforming rural access

Motorcycles are often the commonest vehicles on rural roads
Motorcycles are transforming rural access

Motorcycles increasing rapidly in Liberia and many other countries

- In Tanzania motorcycle numbers increased from about 2,000 in 2003 to over 800,000 in 2014

From: Bishop and Amos, 2015
Motorcycles are transforming rural access

Motorcycle taxis complement and link with larger transport options

More expensive than other transport services  
*(often +50-100%)*

People use motorcycle taxis because

- They are more timely
- They are more convenient (point to point)
- There are no alternatives

In general they complement ‘conventional’ transport services and do not compete directly
Motorcycles are transforming rural access

Motorcycles can be a risky transport option

- Often operated by risk-taking young men
- Behaviour of other road users (drivers, pedestrians, animals)
- Instability when balance is impaired (by potholes, loads, speed, knocks or alcohol)
- Overloading
- Lack of protection

Overloading

Lack of protection
Motorcycles are transforming rural access

Benefits much greater than costs

Better access to health

Better access to markets (greater income, agricultural production and sales)

Rural employment

Rural women and men praise the benefits of motorcycle taxis

Better access to education
Three-wheelers also important and have a role

Track and bridge quality for three wheelers needs to be higher (more expensive investment and maintenance)

Three wheelers need quite good roads or tracks and they cannot use simple footpaths
Motorcycles are transforming rural access

Motorcycles also important on rural paths and trails

Liberia

Concept of access changes when transport services move off the roads
Motorcycles are transforming rural access

Motorcycles also important on rural paths and trails

Some countries have special trails suitable for bicycles and motorcycles that connect villages to the roads

Myanmar (Burma)
Motorcycles are transforming rural access

Motorcycle taxis
Very convenient
Will go off road
Accessible by mobile phone

Have transformed rural transport services

Major importance to rural communities for passenger and freight transport

Motorcycles often contribute over 75% of annual passenger market and annual small freight on rural roads

Their contribution to transport and development is often rated very highly by women and men
Nature of Required Investments (1)

Motorcycle trails connecting villages to the road network

Labour-based work for women and men

Implemented by community-based organisations

Engineering advice (drainage etc)
Nature of Required Investments (2)

AfCAP is supporting research in Liberia on the gender implications of motorcycle taxis, including the role of motorcycle trails.

Log bridges over streams and gulleys.
Simple log culverts where needed.
Community-based organisations and labour.
Local skills with chainsaw.
Engineering advice.
Nature of Required Investments (3)

Metal truss bridges (suitable for motorcycles) over small rivers
Nature of Required Investments (4)

Suspension bridges over large rivers
Nature of Required Investments (5)

Trail suspension bridges can provide all-year motorcycle and pedestrian access to communities separated by large rivers.
Strategic investment analysis approach (1)

Nimba County model: GIS roads and villages

[Diagram showing roads and villages with a 2 km buffer]
Nimba County model: GIS roads and villages

- Total population: 462,000 of which 100,000 urban
- Rural population: \textbf{364,000} in 1307 villages
- \textbf{602 villages (220,000 people)} are NOT on roads. People walk on footpaths to reach markets and medical facilities.
  
  ... unless the paths can be used by motorcycles
## Nimba County model

<table>
<thead>
<tr>
<th>Distance from road (km)</th>
<th>Villages</th>
<th>Population</th>
<th>Ave track (km)</th>
<th>Total track (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-2 km</td>
<td>301</td>
<td>145,000</td>
<td>1.5</td>
<td>452</td>
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<tr>
<td>2-4 km</td>
<td>186</td>
<td>43,000</td>
<td>4.5</td>
<td>837</td>
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<tr>
<td>4-6 km</td>
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<td>16,000</td>
<td>7.5</td>
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<td>45</td>
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<tr>
<td></td>
<td>602</td>
<td>220,000</td>
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<td>2286</td>
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</table>

- Track length estimated at 50% more than average distance straight line with no assumptions on track/bridge sharing

With 2,286 km of tracks (and trail bridges) ALL villages could be connected in Nimba County
### Liberia, all villages

<table>
<thead>
<tr>
<th>County</th>
<th>Villages</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bomi</td>
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<td>80936</td>
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<tr>
<td>Bong</td>
<td>1844</td>
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<td>Gbarpolu</td>
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<td>Grand Gedehe</td>
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<td>Grand Kru</td>
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<td>500</td>
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<td>Nimba</td>
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<td>456513</td>
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<tr>
<td>River Gee</td>
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<td>66388</td>
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<tr>
<td>Rivercess</td>
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<td>69411</td>
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<tr>
<td>Sinoe</td>
<td>475</td>
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<td><strong>Total</strong></td>
<td><strong>9842</strong></td>
<td><strong>2432852</strong></td>
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</table>

- Liberia has approximately 10,000 villages (over 30 people) that are not on a road.
- About 2.5 million people live in these villages.
- Villages tend to cluster and be aligned along waterways or other features.
- Access paths tend to go through other villages so assume 2 km new trail construction per village.
- If new trail requirement is 2 km per village (average), approximately 20,000 kilometres of trails may be needed.
## National model budget estimates

<table>
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<tr>
<th>Item</th>
<th>Number</th>
<th>Cost/unit ($ '000s)</th>
<th>Totals ($ '000s)</th>
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<td>Trail clearing (km)</td>
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<td>Log bridges</td>
<td>10,000</td>
<td>1.5</td>
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</tr>
<tr>
<td>20 m truss bridges</td>
<td>1000</td>
<td>24</td>
<td>24,000</td>
</tr>
<tr>
<td>70 m suspension bridges</td>
<td>400</td>
<td>112</td>
<td>45,000</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td><strong>104,000</strong></td>
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<tr>
<td><strong>Total per kilometre</strong></td>
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<td><strong>5.1</strong></td>
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</tbody>
</table>

Assumptions (to be verified through surveys):

- Community-based track clearance: $1000 per km. Local log bridge: $1500
- 2 km of track per village connected (assuming track sharing and village clusters)
- 4 m log bridge, one per 2 km @ $1500
- 20 m truss bridge, one per 20 km @ $1200/m
- 70 m suspension bridge, one per 50 km @ $1600/m
Cost of connecting ALL 10,000 villages in Liberia is estimated at $104 million (including bridges)

The cost is USD 5100 per kilometre, including bridges

With 2,500,000 isolated rural people the cost is $42 per person connected

The expected benefits to the health of women, men and children is likely to be high as are effects on agriculture, incomes and the economy
Cost Benefit Analyses

Cost Benefit Analysis Nimba County model

- Investment cost USD $10.4 million
- Assumptions (typical figures for rural Africa)
  - Annual maintenance 10% of capital for paths/wood bridges
  - 2 return trail trips per household per week @ 6.35 km
  - 20% trips with heavy head loads
  - Rural wage rate of $2.5 per day
  - 25% of trips and most loads move to motorcycles
- IRR 17% through value of time savings alone
- This does not include benefits relating to agricultural production, health, employment etc
Next steps in Liberia

- Liberia’s Minister of Public Works supports this approach which is likely to be approved in the national transport masterplan.
- Several aid agencies have expressed interest (including SIDA and USAID that are funding feeder roads).
- A new ‘trail’ category of access infrastructure may be designated. This will require guidelines (rather than uniform ‘standards’).
- The trails will be in addition to the expanding feeder road network. Trails will complement feeder roads with strong synergy and benefits.
- Need for good baseline data.
- Need for ‘ground-truthing’ surveys to determine anticipated bridge requirements and priorities for large trail suspension bridges.
- Need for community-based groups to be trained in trail construction, management and maintenance and bridge maintenance and management.
Liberia conclusion

Connecting ALL villages in Liberia within a few years appears possible, practicable and affordable, with major expected benefits to health, agriculture, employment and the economy.
Sierra Leone: similar issues

Rural paths and trails already being made by communities and used by motorcycles
Sierra Leone: similar issues

Rural paths and trails already being used by motorcycles
Sierra Leone: similar issues
Sierra Leone: similar issues

AfCAP is supporting research in Sierra Leone on the gender implications of motorcycle taxis, including the role of women motorcycle taxi operators.
Africa conclusion

With this approach, could we connect ALL villages in Africa to the road network?

What a difference this could make to women, men, children, people with disabilities, etc who are currently isolated from the road network . . . .

Within a few years, almost everyone in Africa could have access to motorised transport services to access markets, health services, education etc . . .

This could really stimulate rural economies . . .

The benefits to the health of women, men and children are likely to be high as are effects on agriculture, incomes and the economy

Lets make it happen!
Thank you for your attention

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Follow ReCAP on:
Strengthening rural access through transport associations – a case study from Uganda

Victor Simfukwe – Transaid
## Project Summary

<table>
<thead>
<tr>
<th><strong>Project Name:</strong></th>
<th>Merck for Ugandan Mothers (MUM)</th>
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<tr>
<td><strong>Donor:</strong></td>
<td>Merck</td>
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<tr>
<td><strong>Project Timeline:</strong></td>
<td>October 2012 – August 2015</td>
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<tr>
<td><strong>Lead Partner:</strong></td>
<td>PACE (Programme for Accessible Health, Communication and Education)</td>
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<tr>
<td><strong>Aim:</strong></td>
<td>To improve access to maternal health care services through the implementation of appropriate local transport systems.</td>
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</table>
Transaid’s Role

To implement a project enabling pregnant women to overcome the barriers to accessing maternal health care services in 5 rural districts in Uganda.
Formative Assessments between May 2013 & February 2014

- 5 districts
- 111 villages
- 130 focus groups
Community-based Emergency Transport Systems in 3 districts

Facility-based Emergency Transport Systems in 2 districts

Both operate using volunteer motorcycle taxi riders to transport pregnant women to maternal health services providing a safe and affordable means of travel.

Project Implementation 2013 & September 2014
2 motorcycle taxi trailers have been installed one in Alebtong and one in Ibanda District. They are facility-based and are primarily for referrals.
Ongoing Monitoring in 5 districts between September 2014 & August 2015

- To assess the number of active participants
- To correct and confirm contact details of participants
- To reinforce the key messages associated with ETS provision
- To identify and rectify any problems or concerns arising since implementation
- To carry out monthly data collection
## Project Monitoring

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<td><strong>Number of ETS Riders</strong></td>
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<td>HO</td>
<td>IB</td>
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<td>TOTALS</td>
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<td><strong>Number of ETS riders contacted</strong></td>
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<td><strong>Number of women transported</strong></td>
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<td>3.63</td>
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<tr>
<td><strong>Average cost reduction of journey price</strong></td>
<td></td>
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<td></td>
<td></td>
<td>23%</td>
<td>3.66%</td>
<td>28.80%</td>
<td>6.48%</td>
<td>31.86%</td>
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<td>1110</td>
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</table>
Rural Assessments

To establish:

- Level of awareness in communities about the project
- Take up of ETS rider service
- “Correct” messages in identified areas where there has been misinterpretation
- Cross check data from ETS riders with communities
Rural Assessments
Initial Key Findings

Additional rural assessments
- Majority had heard about the scheme through the riders promoting themselves
- Majority got contact details from the riders themselves
- Majority use the same rider again

- Riders are between 0.5km and 4km from the passenger
- Riders take between 2 and 20 minutes to reach the passenger

- Riders in Hoima and Alebtong tend to demand cash up front
- Riders in Ibanda, Lira and Mubende tend to offer credit
“Very happy with the programme, the riders are safe and can be contacted at any time. They are not too fast and careless like these other ones.”

“The rider is very good he picked me up twice in the night without even a complaint.”

“Other riders who are not in the project would charge you 3 times and would not even wait for you at the clinic. We are benefiting a lot as women from this project.”
Zambia-e-Ranger

- Motorcycle ambulance-11 MCA- 5 district
- Facility based MCA
- Dedicated to maternal transfers only
- Health Staff trained Riders
- Link between, community and district based ambulance’s (bicycle and motorised ambulance)
Challenges

- Trained Riders - relocated
- Untrained Riders
- Crashes
- DHMT Support
  - Repairs
  - Fuel allocation
  - Filling in the log books
  - Misuse - remove the sidecar
Any questions?
1) The role and potential of **motorcycle taxi associations** to self-regulate and improve rural access and safety

2) **Regulation, Safety and training**

3) Community based labour to **build tracks/improve infrastructure** to improve rural mobility

For each topic the group will be asked to discuss and then present:
- Key considerations
- Examples of good practice that have been observed
- Proposed future research / implementation
Thank you for your participation

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