

Exploring Mobility Characteristics in Rural Sub-Saharan Africa: A Case Study of the Yamoussoukro Region, Côte d'Ivoire

David Ziegler^{1*}, Philipp Rosner¹, Clemens Pizzinini¹,
Mathis Kremer¹, Sara Grambs¹, Victor Rommel¹,
Markus Lienkamp¹

¹Institute of Automotive Technology, TUM School of Engineering and Design, Technical University of Munich (TUM), Boltzmannstr. 15, 85748 Garching b. München, Germany.

*Corresponding author(s). E-mail(s): david.ziegler@tum.de;

Contributing authors: philipp.rosner@tum.de; clemens.pizzinini@tum.de;
mathis.kremer@tum.de; sara.grambs@tum.de; victor.rommel@tum.de;
lienkamp@tum.de;

Abstract

Access to transportation is a key enabler of economic and sustainable development in rural emerging economies. Implementing effective improvements requires a deep understanding of the current mobility landscape. Despite its significance, recent research on transportation and mobility characteristics in rural Sub-Saharan Africa remains limited. This study addresses this gap by analyzing mobility patterns and motivations in central Côte d'Ivoire, based on a series of quantitative and qualitative field surveys conducted between 2021 and 2023. We comprehensively assess rural transportation by situating our empirical findings within the context of existing transportation models and prior studies while evaluating their implications for the Sustainable Development Goals. The findings provide important guidance for policymakers and industry stakeholders, helping to develop sustainable interventions and business models that improve local access to goods, services, and economic opportunities.

Keywords: Transportation, Rural Mobility Patterns, Sub-Saharan Africa, GPS Logging, Surveys, Interviews, Sustainable Development Goals

Appendix A Research Design

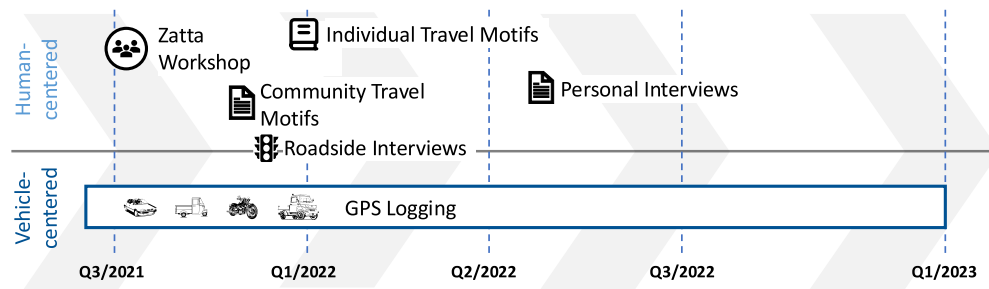


Fig. A1: Timeline and mobility-focused surveys of the project.



(a) Electric flatbed truck, operated in the target region.



(b) Exemplary tricycle, mostly operated as goods transport service vehicles.



(c) Local taxi and taxi driver tracked within the study.



(d) Usual motorbike operated in the target region, often by farmers.

Fig. A2: Short impression of all vehicle types we tracked during the research project in Zatta and its surrounding region.



Fig. A3: Representative cards for the collective interview.

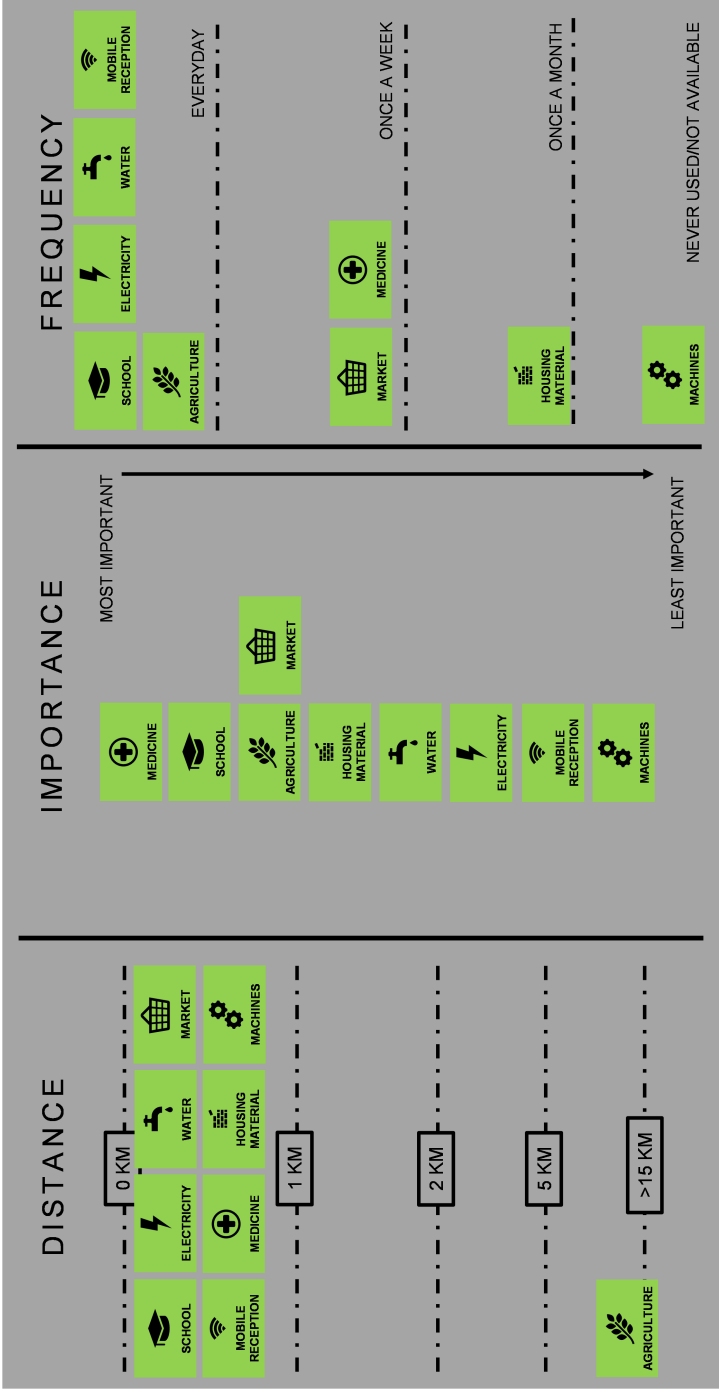


Fig. A4: Board design of the collective interviews, including exemplarily the results of Zatta.

Table A1: Full overview of the participants' tracking, including the participants' occupations and problems that came up during the recording process.

Participant	Occupation	Vehicle	Distance recorded in km	Considered	Problems
1	Carrier	aCar	2016	✓	-
2	Carrier	aCar	1884	✓	-
3	Carrier	Tricycle	742	✓	-
4	Carrier	Tricycle	0	x	SD-Card missing
5	Carrier	Tricycle	0	x	Energy installation broken
6	Carrier	Tricycle	0	x	SD-Card missing
7	Carrier	Tricycle	0	x	Logger missing
8	Construction Manager & Worker	Car	0	x	Logger missing
9	Cooperative Representative	Motorbike	840	✓	-
10	Farmer	Motorbike	2655	✓	-
11	Farmer	Motorbike	1858	✓	-
12	Farmer	Motorbike	1781	✓	-
13	Farmer	Motorbike	1722	✓	-
14	Farmer	Motorbike	883	✓	-
15	Farmer	Motorbike	772	✓	-
16	Farmer	Motorbike	674	✓	-
17	Farmer	Motorbike	97	x	Antenna cable broken
18	Farmer	Motorbike	0	x	Data corruption
19	Farmer	Motorbike	0	x	SD-Card missing
20	Farmer	Motorbike	0	x	Data corruption
21	Farmer	Motorbike	0	x	Data corruption
22	Farmer	Tricycle	116	✓	SD-Card missing once
23	Farmer	Tricycle	0	x	Logger missing
24	Farmer	Tricycle	0	x	Logger missing
25	Pisteur	Motorbike	1072	✓	-
26	Pisteur	Tricycle	0	x	SD-Card missing
27	Plumber	Motorbike	2064	✓	-
28	President of Rice Cooperative	Motorbike	1410	✓	-
29	Taxidriver	Car	10002	✓	-

Table A2: List of all personally interviewed locals, including their occupation, age, and living place.

No.	Interviewees' occupation	Gender	Age	Village	Date of interview
1	Carpenter	male	42	Zatta	04.05.2022
2	Doctor	male	55	Zatta	04.05.2022
3	President of Youth	male	35	Zatta	07.05.2022
4	Representative of Youth	male	25	Zatta	07.05.2022
5	Representative of Agricultural Cooperative	male	56	Zatta	29.04.2022
6	Representative of Women	female	55	Zatta	05.05.2022
7	School Director	male	60	Zougonou	05.05.2022
8	Teacher	male	45	Zougonou	05.05.2022
9	Farmer	male	60	Koussé	05.05.2022
10	Farmer	male	30	Koussé	05.05.2022
11	Farmer	male	30	Koussé	05.05.2022
12	Farmer	male	42	Koussé	05.05.2022
13	Housewife	female	40	Koussé	05.05.2022
14	Moto -Taxi Driver	male	32	Koffikro	02.05.2022
15	Farmer	male	40	Koffikro	28.04.2022
16	Merchant	female	40	Koffikro	28.04.2022
17	Tailor	female	25	Koffikro	28.04.2022
18	Village Chief	male	60	Bokabo	02.05.2022
19	Advisor to the Village Chief	male	50	Bokabo	02.05.2022
20	Moto -Taxi Driver	male	19	Bokabo	02.05.2022

Semi-structured interview guideline

Information

The guideline was developed during a Bachelor's Thesis of Grambs (2022) in the context of the research project connected with this publication. The guideline language is French, the predominant language in the survey region around the village of Zatta.

1. Demande de données personnelles

Nous vous remercions d'avoir accepté de participer à cette interview. Tout d'abord, quelques questions sur votre personne :

- Nom, Âge, sexe, (ancienne) profession, situation/état civil.

2. Pour commencer, nous aimerions savoir à quoi ressemble votre vie quotidienne.

- À quelle heure commence votre journée ?
- Quelles sont les activités de votre travail ?
- Combien d'heures dure votre travail ?
- Combien d'heures après/en dehors du travail sont travaillées dans la journée sans être rémunérées ? Par exemple, l'éducation des enfants, l'administration, les fonctions attribuées, les tâches ménagères ?
- Avez-vous des activités de loisirs spécifiques ?
- Y a-t-il des cycles hebdomadaires ? Par ex. le jour du marché.
- Questions spécifiques à la profession, par ex. jour de marché :
 - Comment se déroule un jour de marché typique ?
 - Différentes personnes ont-elles des rôles différents ?
 - Où apportez-vous la marchandise ?
 - Quelle part de la marchandise gardez-vous au village et quelle part est vendue ?
 - Qui achète la marchandise ?
 - Où vont les marchandises à la fin ?
 - La marchandise est-elle perdue, par exemple si elle n'est pas vendue ou si elle est endommagée pendant le transport ?
 - Qu'achetez-vous au marché ?

3. Questions sur les habitudes de mobilité

3.1 Nous souhaitons maintenant savoir comment vous vous déplacez dans votre vie quotidienne.

- Où vous déplacez-vous ?
- A quelle fréquence vous déplacez-vous ?
- Quand vous déplacez-vous ?
- Y a-t-il des périodes précises pendant lesquelles la mobilité est accrue ? A quels intervalles ?
- Pendant combien de temps vous déplacez-vous ?

- Avec quels moyens de transport vous déplacez-vous ?
- Avec quelles personnes vous déplacez-vous habituellement ?
- Combien d'argent consacrez-vous à la mobilité dans votre vie quotidienne ?

3.2 Opinions sur les différents moyens de transport

- Se déplacer à pied : avantages et inconvénients, activités, personnes adaptées.
- Effectuer des trajets à vélo : avantages et inconvénients, activités, personnes adaptées.
- Effectuer des trajets en moto/mobylette : avantages et inconvénients, activités, personnes adaptées.
- Parcourir des trajets en tricycle : avantages et inconvénients, activités, personnes adaptées.
- Effectuer des trajets en voiture : avantages et inconvénients, activités, personnes adaptées.
- Auriez-vous volontiers recours à d'autres moyens de transport si cela vous était possible ?

4. Décrivez les problèmes/besoins que vous percevez dans votre localité.

4.1 Approvisionnement et utilisation de l'énergie

- Utilisez-vous actuellement de l'électricité ?
- De quelle source ?
- Dans quel but ?
- Combien vous coûte l'électricité ?
- Quels sont les problèmes que vous rencontrez dans votre utilisation quotidienne de l'électricité ?

4.2 Soins médicaux

- Quel est le lien avec les soins de santé ?
- Comment réagissez-vous en cas d'urgence médicale ?
- Quel est le coût du transport en termes d'urgence médicale ?

4.3 Disponibilité de l'eau potable

- Quelle eau buvez-vous ?
- Combien de temps faut-il pour se procurer de l'eau potable ?
- Combien payez-vous pour l'eau potable ?

4.4 École

- Où se trouvent les écoles les plus proches ?
- Combien de temps faut-il pour se rendre dans ces écoles ?
- Comment les écoliers se rendent-ils à l'école ?

5. Questions dans le cadre d'un atelier du futur

- Quelle utilisation de la mobilité pensez-vous pouvoir être envisagée à l'avenir ?
- Comment pensez-vous que la mobilité évoluera à l'avenir ?
- Qui profiterait particulièrement des différents changements en matière de mobilité ?
- Pensez-vous que la mobilité peut conduire à une amélioration de la qualité de vie générale ?

6. Projet aCar (en rapport avec le rooting)

- Présentation du projet.
- Y a-t-il des trajets que vous empruntez particulièrement souvent ?
- Pourriez-vous envisager d'utiliser l'aCar comme service ?
- Pensez-vous que la voiture offre une valeur ajoutée que les autres voitures ne peuvent pas avoir ?
- Si vous pensez à l'équipement de la voiture, y a-t-il des caractéristiques particulières à prendre en compte ?
- Qui, selon vous, profiterait le plus d'un tel moyen de transport ?

Appendix B Research Results

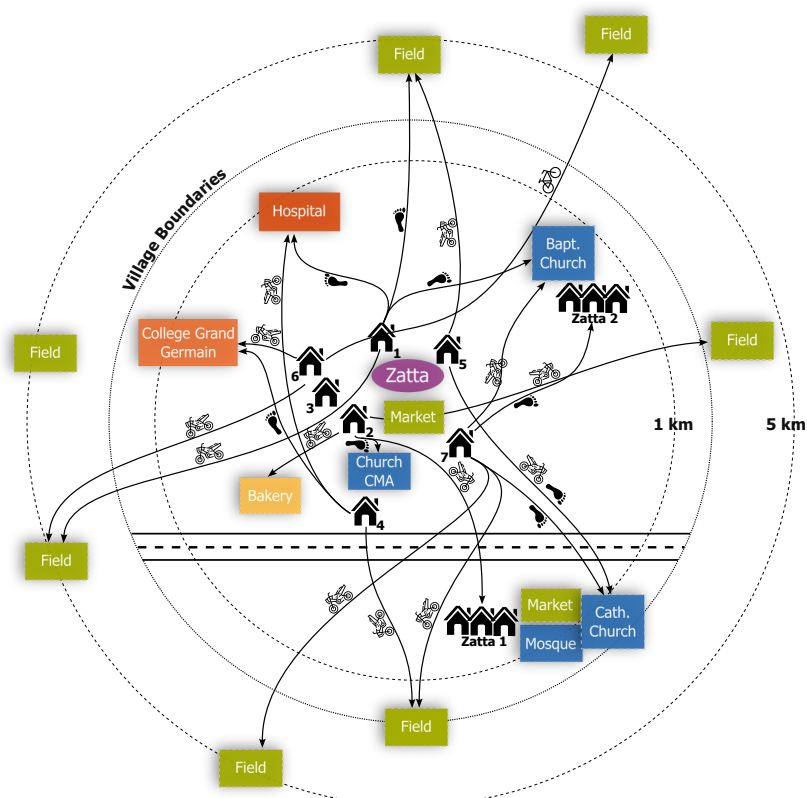


Fig. B5: Important locations identified during the Zatta workshop by the first group of locals.

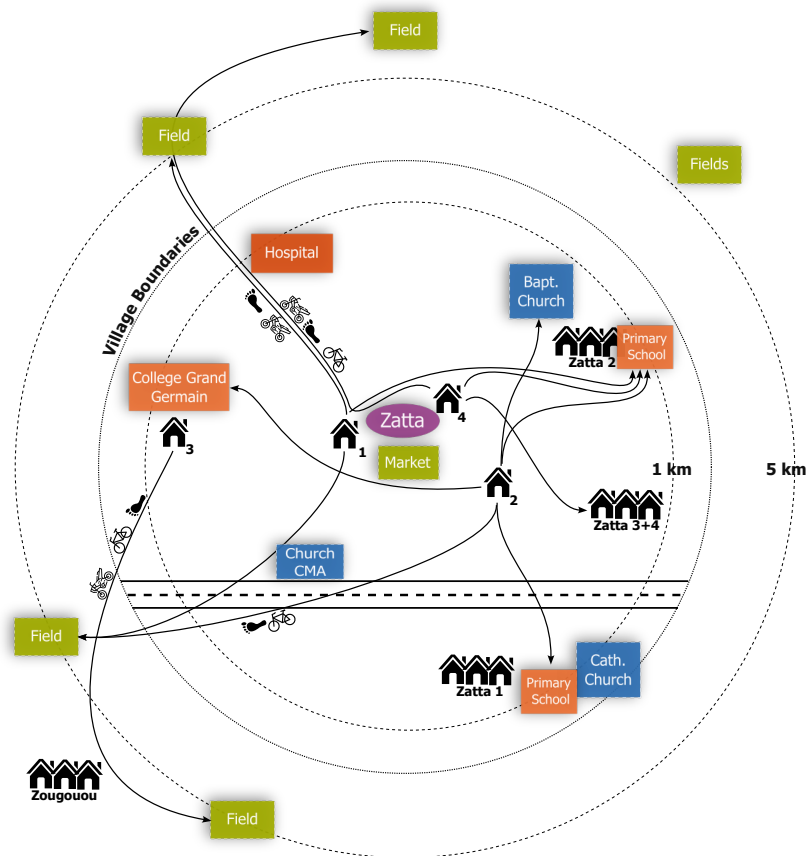


Fig. B6: Important locations identified during the Zatta workshop by the second group of locals.

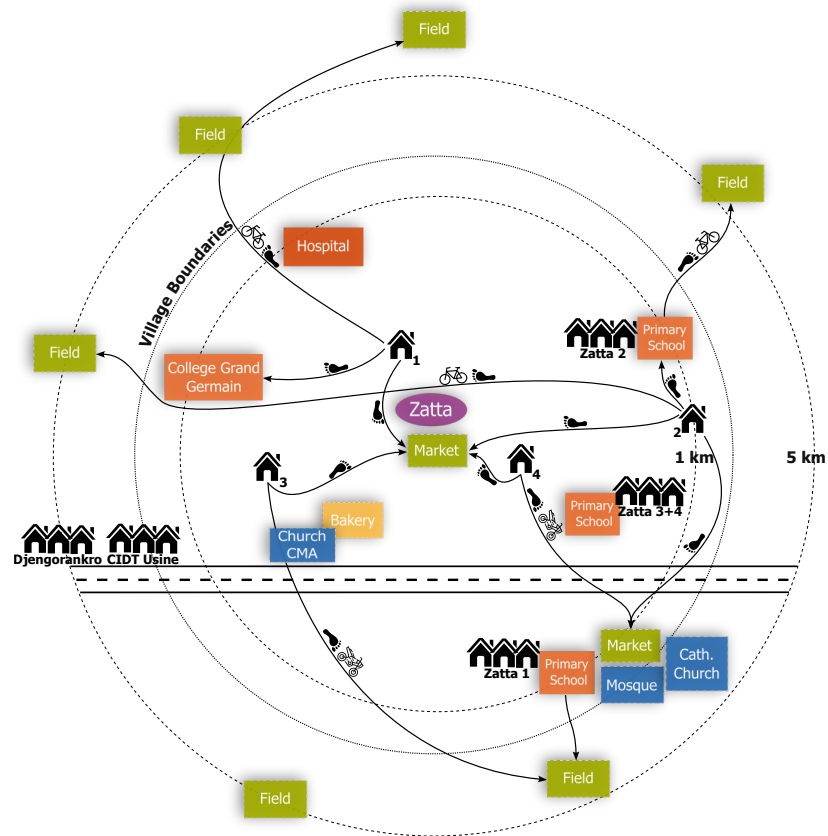


Fig. B7: Important locations identified during the Zatta workshop by the third group of locals.

Table B3: Roadside interview results of people passing the Zatta entrances.

Location*	Date†	Time	Age	Gender‡	No. of people	Direction††	Mode‡‡	Origin	Destination	Purpose	Detail	Frequency	Distance	Cost**	Interviewers
NW	14.2	13:00	35	m(2x)	2	In	B	Field	Zatta	Cacao, banana, manioc transport	-	-	10 min.	-	1, 2
NW	14.2	13:00	18	m(2x)	2	In	W	Field	Zatta	Cutting the field with machete	Field work	-	14 min.	-	1, 2
NW	14.2	13:00	50	m(1x)	1	In	M	Field	Zatta	-	-	-	-	-	1, 2
NW	14.2	13:00	12	m(5x)	5	In	W	Field	Zatta	Transport of yam, bananas	-	-	15 min.	-	1, 2
NW	14.2	14:00	25	f	1	In	W	Field	Zatta	Transport of bananas and firewood	4x in rainy season, 1x in dry season (p.w.)	-	5,7 km	-	1, 2
NW	14.2	14:00	30, 65, 65	f, m(2x)	3	In	W	Field	Zatta	Transport of wood and grass for cows	Has fields with cocoa, yam, manioc, tomatoes	Daily except Saturday	-	-	1, 2
NW	14.2	14:00	50	f, m	2	In	M	Field	Zatta	Eating selling	-	-	7 km	1.5l for 3 days	1, 2
NW	14.2	14:00	-	m(2x)	2	Out	W	Zatta	Field	Going to the field to transport crops (banana tomato, banana, cacao)	Family lives in Zatta	-	0.1 km	-	1, 2
NW	14.2	14:00	-	m	1	In	B	Field	Zatta	Transport of bananas, manioc, cacao	Manger	5 days per week	6-7 km	-	1, 2
NW	14.2	15:00	40	m	1	In	B	Forest	Zatta	Wood transport	-	-	5-6 min.	-	1, 2
NW	14.2	15:00	60	f	1	In	W	Field	Zatta	-	-	-	-	-	1, 2
NW	14.2	15:00	10	m	1	In	B	Field	Zatta	-	-	-	-	-	1, 2

NW	14.2	15:00	60	m	1	Out	M	Zatta	Field	Good transport	He drives this route daily. Also good transport or transport of water to the fields, but he also detailed the types of goods (manioc, cacao, ..)	Yes, daily	30 km	1000 per liter petrol	1, 2
NW	14.2	15:00	14	m(2x)	2	In	B	Field	Zatta	Transporter wild yam	Also Livestock	Yes, daily	10 min.	-	1, 2
NW	14.2	15:00	40	m	1	In	M	Field	Zatta	Banana, yam transport	For the family	3-4 per week	6 km	-	1, 2
NW	14.2	15:00	40	m	1	In	B	Field	Zatta	Banana, yam transport	For the family	3-4 per week	6 km	-	1, 2
S	14.2	12:00	50	m	1	In	B	Garden	Zatta	Transport firewood to his home	Wood to make fire, which is used for cooking. Also worked in his garden, where he grows tomatoes, aubergines, etc., which he sells	Daily	15 min.	B of his father, price not known	3,4
S	14.2	12:12	45	m	1	Out	W	Zatta	Field	Work on the fields to grow tomatoes, mais, aubergine	Also Livestock	Daily	-	-	3,4
S	14.2	12:36	52	m	1	Out	M	Zatta	Field	Go to work on cocoa plantation	Also grow tomatoes, yam, manioc	Daily	3 km	M: 550000, B: 26000 - 30000	3,4
S	14.2	12:36	43	m	1	Out	B	Zatta	Field	Go to work on cocoa plantation	Also grow tomatoes, yam, manioc	Daily	3 km	M: 550000, B: 26000 - 30000	3,4

S	14.2	12:36	54	m	1	Out	B	Zatta	Field	Go to work on cocoa plantation	Also grow tomatoes, yam, manioc	Daily	3 km	M: 550000, B: 26000 - 30000	3,4
S	14.2	12:48	13	f(3x)	3	Out	W	Zatta	-	Forgot their machete in the fields and want to get it back	-	No	15 min.	-	3,4
S	14.2	13:00	12, 12, 12, 30	f (3x), m (2x)	5	Out	T	Field	Zatta	Bring manioc and firewood to Zatta	Also work in the fields	Daily	4 km	Tricycle rent: 3000 per Day	3,4
S	14.2	13:12	12, 12, 32	m	1	Out	T	Zatta	Farm	Transport water and go to farm	The water is used to mix cement. He wants to build a shed for chicken	Daily	500 m	Tricycle: 900000	3,4
S	14.2	13:24	55	f	1	In	W	Field	Zatta	Firewood (Fago)	Also water	Daily	3-4 km	-	3,4
S	14.2	13:36	41	m	1	In	M	Zatta	Field	Go to work	Maniok, he also sells his maniok in Abidjan. Also works in the garden, growing cucumber and tomatoes.	Daily	5 km	M: 350000 (bought in 2007), now it costs 500000	3,4
S	14.2	13:48	35, 40	m(2x)	2	Out	T	Field	Zatta, tomato field	Work, construction, transport palm leaves	They go to their father's tomato field to build a shed out of palm leaves.	Yes, exceptional purpose	100 m	Tricycle owned by the owner of the farm	3,4
S	14.2	14:00	38	m	1	In	W	Fields (cacao)	Zatta	Firewood (Fago), transport of two chicken	Additional work, actually works as a mechanic	Daily	1 km	Wheelbarrow: 5000	3,4
S	14.2	12:24	12	f	1	Out	W	Zatta	-	Take firewood and water	-	Daily	20 min	-	3,4

NE	15.2	12:00	30, 35	m(2x)	2	Out	W	Zatta	Construction site	House on construction site	Carried with him: cement, water for drinking	Daily	500 m	-	3,4
NE	15.2	12:00	-	m	1	In	M	Field at Tenikro	Zatta	Worked (caco champ), now. take a rest at home	-	Daily	17 km	-	2,3
NE	15.2	12:00	55	f	1	In	W	Field	Zatta	Firewood, yam	-	Daily, multiple times	3 km	-	2,3
NE	15.2	12:00	52	m	1	In	B	Field	Zatta	Work	Maniok, gombo, aubergine	Not regular	7km	B: 30000	2,3
NE	15.2	12:00	48	m	1	In	B	Field	Zatta	Banana harvest	Bananas are sold on market on Wednesday	5-6 times per week	4km	B: 30000	2,3
NE	15.2	12:30	50	m(2x)	2	In	W	Aeroport	Zatta	Bush rats	2 men with dogs were chasing rats and wanted to sell them later in Zatta	Daily	5km	-	2,3
NE	15.2	12:30	-	m	1	In	B	Field	Zatta	Return to Zatta for rest	Champignon, fish	Daily	3 km	-	2,3
NE	15.2	13:00	58	m	1	In	W	Construction site	Zatta	Getting sth. from the construction site	-	Daily	50m	-	2,3
NE	15.2	13:00	40	m	1	In	M	Field	Zatta	-	-	Daily	3km	40000	2,3
NE	15.2	13:00	35	m	1	In	B	Field	Zatta	Collecting	Firewood, ignam	Daily	7 km	B: 30000	2,3
NE	15.2	13:00	30	f	1	Out	B	Zatta	Construction site	Getting food	Tomates	-	-	-	2,3

* NW: northwest entrance of Zatta, NE: northeast entrance of Zatta, S: south entrance of Zatta; † in the year 2022;
‡ f: female, m: male; †† In: to, Out: out of Zatta; †† B: bicycle, M: motorbike, T: tricycle, W: walk; ** costs in CFA, †† applies.

Table B5: Raw table of answers given during the travel diary survey explained in Section 3.1.3 and evaluated in Section 4.1.2.

Destination	Mean of transport	Days per week	No. of days per week	Distance (one way)	Person	Village
Church	Walk	Wed, Sun	2	0.5	1	1
Field	Walk	Mo, Tue, Thur, Fri, Sat	5	5	1	1
Church	Moto	Sun	1	1	2	1
Field	Moto	Mo, Tue, Thur, Fri, Sat	5	7	2	1
Yamoussoukro	Car	Wed, Sun	2	15	2	1
Church	Walk	Sun	1	0.3	3	1
Field	Moto	Mo, Tue, Wed, Thur, Fri, Sat	6	4	3	1
Church	Walk	Sun	1	0.5	4	1
Field	Walk	Mo, Tue, Wed, Thur, Fri, Sat	6	3	4	1

Table B4: Locals that were just counted during the roadside interview phase.

Location*	Date†	Gender‡	No. of people	Direction††	Mode‡‡	Cargo
NW	14.2	m	7	In	B	-
NW	14.2	m	1	Out	B	-
NW	14.2	m(c)	1	In	B	-
NW	14.2	m	3	In	M	-
NW	14.2	m(c)	1	Out	M	-
NW	14.2	f	9	In	W	-
NW	14.2	f(c)	3	In	W	-
NW	14.2	m	-	In	W	-
NW	14.2	m	-	Out	W	-
S	15.2	m	1	Out	M	Generator
S	15.2	m	3	In	T	Wood
S	15.2	m	1	Out	T	-
S	15.2	f	1	In	W	Wood
S	15.2	f	4	In	T	People
S	15.2	m	1	In	B	-
S	15.2	m	1	In	B	-
S	15.2	m	1	Out	M	-
S	15.2	m	3	Out	T	People
S	15.2	m	1	In	B	Produce
S	15.2	m	1	Out	M	-
S	15.2	m	1	In	B	Produce

* NW: northwest entrance of Zatta, S: south entrance of Zatta; † in the year 2022; ‡ f: female, m: male, c: child; †† In: to, Out: out of Zatta; ‡‡ B: bicycle, M: motorbike, T: tricycle, W: walk

Church	Walk	Sun	1	0.3	5	1
Field	Walk	Mo, Tue, Wed, Thur, Fri, Sat	6	2	5	1
Church	Walk	Sun	1	1	6	1
Field	Walk	Mo, Tue, Wed, Thurs, Sat	5	6	6	1
Yamousoukro	Taxi	Fri	1	21	6	1
Church	Walk	Sun	1	0.5	7	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri, Sat	6	5	7	1
Church	Walk	Sun	1	0.1	8	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri, Sat	6	5	8	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri, Sat	6	2	9	1
Charging Phone	Walk	Wed	1	4	10	1
Church	Walk	Sun	1	4	10	1
Domicile	Walk	Thur	1	5	10	1
Field	Walk	Mo, Tue, Sat	3	8	10	1
Church	Walk	Sun	1	0.5	11	1
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	7	11	1
Zatta	Walk	Wed	1	10	11	1
Church	Walk	Sun	1	1	12	1
Field	Bike	Fri, Sat	2	3	12	1
Field	Walk	Mo, Tue	2	3	12	1
Yamousoukro	Taxi	Wed	1	21	12	1
Zatta	Bike	Thur	1	11	12	1
Church	Walk	Wed, Sun	2	1	13	1
Field	Walk	Mo, Tue, Thurs, Fri	4	6	13	1
Yamousoukro	Bike	Sat	1	24	13	1
Church	Walk	Wed, Sun	2	1	14	1
Field	Walk	Mo, Tue	2	4.5	14	1
Loblakro	Bike	Fri	1	36	14	1
Yamousoukro	Bike	Thur	1	22	14	1
Church	Walk	Sun	1	1	15	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri, Sat	6	3	15	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri	5	4.5	16	1
Yamousoukro	Taxi	Sat	1	22	16	1
Church	Walk	Sun	1	1	17	1
Field	Walk	Mo, Tue, Wed, Thurs, Sat	5	6	17	1
Yamousoukro	Taxi	Fri	1	21	17	1
Church	Walk	Sun	1	0.3	18	1
Field	Walk	Mo, Tue, Wed, Thur, Sat	5	2	18	1
Yamousoukro	Walk	Fri	1	22	18	1
Church	Walk	Sun	1	0.5	19	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri, Sat	6	3	19	1
Church	Walk	Sun	1	0.3	20	1
Field	Moto	Mo, Tue, Wed, Thurs, Fri, Sat	6	4	20	1
Church	Walk	Sun	1	0.3	21	1
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	6	21	1

Yamoussoukro	Walk	Wed	1	22	21	1
Church	Walk	Sun	1	0.3	22	1
Field	Walk	Mo, Tue, Wed, Thurs, Fri	5	6	22	1
Yamoussoukro	Walk	Sat	1	22	22	1
Different Villages	Tricycle	Fri	1	0	23	1
Ville	Tricycle	Wed	1	0	23	1
Work	Tricycle	Mo, Tue, Wed, Thurs, Fri, Sat	6	0	23	1
Church	Walk	Sun	1	1	24	1
Field	Bike	Mo, Tue, Thurs, Sat	4	4	24	1
Yamoussoukro	Taxi	Wed	1	22	24	1
Zougounou	Moto	Fri	1	18	24	1
Field	Walk	Mo, Tue, Thurs, Sat	4	7	25	1
Field	Walk	Mo, Wed, Fri	3	6	26	1
Church	Walk	Sun	1	0.5	27	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	2	27	2
Yamoussoukro	Taxi	Wed	1	22	27	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	2.5	28	2
Yamoussoukro	Taxi	Wed, Sun	2	23	28	2
Church	Walk	Sun	1	0.2	29	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	3	29	2
Yamoussoukro	Taxi	Wed	1	22	29	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	1	30	2
Yamoussoukro	Taxi	Wed	1	23	30	2
Church	Moto	Sun	1	7	31	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	3	31	2
Zatta	Moto	Wed	1	7	31	2
Church	Walk	Sun	1	0.2	32	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	1.5	32	2
Church	Walk	Sun	1	0.3	33	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	3	33	2
Field	Tricycle	Mo, Tue, Thurs, Fri, Sat	5	1	34	2
Yamoussoukro	Tricycle	Wed	1	23	34	2
Field	Walk	Mo, Tue, Thurs, Fri, Sat	5	8	35	2
Zatta	Walk	Wed	1	7	35	2

Table B6: Evaluation of SDG indicators intersecting with mobility within the survey described in Section 3.2.3. Surveyee group numbers align with the entry positions of the groups in Table 8. For categories containing just one gender, only the number of individuals stating the information are listed. Mixed groups include gender information (male: m, female: f).

SDG	Challenges Potentials	Detail	Surveyee Group										
			1	2	3	4	5	6	7	8	9	10	†
Others†	C	Cost of Transportation	-	-	-	1	-	-	-	-	-	-	-
		Mobility as a safety issue for women	f	1	-	-	-	-	-	-	-	-	-
		Mobility availability	m	-	-	3	1	-	-	-	2	1	-
		Mobility changes due to the rainy season	m	-	-	1	-	-	-	-	1	-	-
		No driver's license	-	-	-	-	-	-	-	2	-	-	-
	P	Empowerment through independent mobility	m	-	-	-	-	-	-	-	1	-	-
		Increase mobility between villages	m	-	-	2	-	-	-	-	-	-	-
		Mobility to develop village	2m	-	-	1	-	-	-	1	-	-	-
	1	Poverty*	2m	-	-	-	-	-	1	-	-	-	-
		Democratize mobility access to strengthen the ecosystem	-	-	-	-	-	-	-	-	-	-	x
2	C	Organization and completion of agricultural projects*	2m	-	-	-	-	-	-	-	-	-	-
		Crop insecurity	-	-	-	1	-	-	-	-	-	-	-
		Food waste	-	-	-	2	-	-	-	-	-	1	-
		Provide school meals	m	-	-	-	-	1	-	-	-	-	-
	P	Develop the agricultural sector by building infrastructure*	2m	-	-	-	-	-	-	-	-	-	-
		Improve of goods transportation to allow a cheaper and better, decentralized goods exchange	-	-	-	-	-	-	-	-	-	-	x
3	C	Cost of health services	f	-	-	2	-	-	-	-	-	-	-
		Lack of medical equipment/staff	m	-	1	-	-	1	-	-	-	-	-
		Mistrust in the health care system*	f	-	1	1	-	-	-	-	-	-	-
		Accessibility to health services	m	-	1	-	-	1	-	-	-	-	-
		Emergency mobility	f	-	-	2	-	-	-	-	-	-	-
	P	Expand health care services	m	-	1	-	-	-	-	-	-	-	-
		VbS services as proposed in Pizzinini et al., 2023	-	-	-	-	-	-	-	-	-	-	x

4	C	Cost of education*	fm	-	-	-	-	-	1	-	-	-	-	-
		Bad school facilities	fm	-	-	-	-	1	1	-	-	-	-	-
		Inadequate coverage of school access because of resources/staff	f2m	-	-	-	-	-	1	-	-	-	-	-
		Long distances to school and unsafe routes	m	-	-	1	-	1	1	-	-	-	-	-
	P	Invest school facilities*	3m	-	-	-	-	1	1	-	-	-	-	-
		Establish a school bus system	m	-	-	1	1	-	-	-	1	-	-	-
		Better transportation system for teachers	-	-	-	-	-	-	-	-	-	-	-	x
5	C	Women's associations*	f	-	-	-	-	-	-	-	-	-	-	-
		Inequality between women and men	f	-	-	-	-	-	-	-	-	-	-	-
		Mobility as a safety issue for women	f	1	-	-	-	-	-	-	-	-	-	-
	P	Giving means of mobility to women	-	1	-	2	-	-	-	-	1	-	-	-
Equal access to motorized transportation and self-driving for woman and men		-	-	-	-	-	-	-	-	-	-	-	x	
6	C	Maintenance of drinking water facilities*	m	-	-	1	-	-	-	-	-	-	-	-
		Drinking water availability/insecurity	-	-	-	3	1	1	-	-	-	-	-	-
	P	Drinking water transportation beyond usual services	-	-	-	-	-	-	-	-	-	-	x	
7	C	Access to energy	m	1	-	2	-	1	1	-	-	-	-	-
		Cost of connection to the energy grid	m	-	-	-	-	1	-	-	-	-	-	-
	P	Usage of batteries	-	-	-	1	-	-	1	-	-	1	-	-
		Application and usages of synergies of BEVs for energy supply	-	-	-	-	-	-	-	-	-	-	-	x
8	C	Organization and completion of agricultural projects*	2m	-	-	-	-	-	-	-	-	-	-	-
		Manual labor*	m	1	-	1	-	-	-	-	-	-	-	-
	P	Develop the agricultural sector by building infrastructure*	2m	-	-	-	-	-	-	-	-	-	-	-
		Improve working conditions*	m	1	-	1	-	-	-	-	-	-	-	-
		Increase business productivity*	2m	1	-	-	-	-	-	1	-	-	-	-
Transport service for agricultural machines		-	-	-	-	-	-	-	-	-	-	-	x	
		VbS services as proposed in Pizzinini et al., 2023	-	-	-	-	-	-	-	-	-	-	x	
9	C	Subsidies by the Ivorian State*	2m	-	1	-	-	-	-	-	-	-	-	-
	P	Develop the agricultural sector by building infrastructure*	2m	-	-	-	-	-	-	-	-	-	-	-
		Modern market*	m	-	-	-	-	-	-	1	-	-	-	-
Market goods transportation service		-	-	-	-	-	-	-	-	-	-	-	x	
10	C	Inequality between youth and elders*	f	-	-	-	-	-	-	-	-	-	-	-
		Mode choice inequalities related to income and gender	-	-	-	-	-	-	-	-	-	-	-	x
	P	Subsidies by Ivorian State*	2m	-	1	-	-	-	-	-	-	-	-	-
		Fair transportation services that reach everyone	-	-	-	-	-	-	-	-	-	-	-	x

11	C	-											
	P	Increase village decision-power on a structural level*	3m	-	-	1	-	-	-	1	-	-	-
		Mobility to develop village	2m	-	-	1	-	-	-	1	-	-	-
12	C	Food waste*	-	-	-	2	-	-	-	-	1	-	-
	P	Improved goods inter-village goods transport via motorized transportation and infrastructure	-	-	-	-	-	-	-	-	-	-	x
13	C	Climate change*	2m	-	-	-	1	-	-	-	-	-	-
		Crop security*	-	-	-	2	-	-	-	-	-	-	-
		Transportation issues due to heavy rain	-	-	-	-	-	-	-	-	-	-	x
	P	More flooding secured streets	-	-	-	-	-	-	-	-	-	-	x

* not directly connected with mobility, but rather indirectly related; † additional content from on-site observations; ‡ general challenges and potentials mentioned within the interviews.