SOCIAL MEDIA LESSONS RELATED TO THE DEVELOPMENT OF LONG-DISTANCE PUBLIC TRANSIT IN THE UNDERDEVELOPED COMMUNITIES

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ABSTRACT

Over decades, advanced technology has been rapidly evolving in the public transport industry. Recent strategies to meet the user needs in public transit, are commonly centred around advanced technologies. Ground evidence includes multiple transit-related internet applications. Nonetheless, amid this digitalisation shift, most global rural areas still only have traditional transit systems. Consequently, some public commuters choose the traditional and most criticised option i.e., hitchhiking, on the roadsides and transacted over social media. Internationally, access and mobility constitute a sustainable community's fundamental policy and planning priorities. That is, improved mobility will inevitably improve rural socio-economic cohesions. That said, for the study conducted during the period Jan 2019 – Mar 2020 and Oct 2021 – Jun 2022, this paper summarises the descriptive, origin, and gender-based analyses. The objectives included unpacking the hitchhiking demand (m=880), supply (n=193), post structures, and general transit-related comments (o=151). In closing, the aim of this paper was achieved, which was to illustrate that social media can be used to inform long-distance public transport (digital) development in rural underdeveloped communities, especially where the mobility poverty is deep, transit systems are traditional, and available information technology opportunities are actively engaged. The impacts include the service competition, inter-regional, research ethics and information technology policies.

Keywords: Hitchhiking, Social Media Research, Rural Public Transport, Rural Demand-Responsive Transport, Rural Long-Distance Travelling, Rural Redevelopment.

1. INTRODUCTION

Accessibility is commonly defined as the ability to reach opportunities (i.e., socio-economic activities and services) using one or more transit modes in a given travel time or cost (Gonzalez-Gonzalez & Nogues, 2019). The underdeveloped communities are characterised by a lack of economic competitiveness and social sustainability, due to their poor accessibility. Globally, rural dwellers are migrating to urban areas to seek improved mobilities (Anburuvel et al., 2022; Gonzalez-Gonzalez & Nogues, 2019). Furthermore, public transport (PT) is at the centre of these challenged communities because many studies, researchers, public members, and officials champion public transport over the private car, and the majority of people do not have access to and cannot afford private vehicles (Anburuvel et al., 2022; Vanderschuren & Baufeldt, 2018).

According to Sörensen et al. (2021), from the user's perspective, PT must be reachable, accessible, affordable, and reliable. Sadly, the traditional PT services are failing to meet

the latter needs. Thus, their developments or improvements revolve around addressing these very same challenges. On the other hand, studies note the significant efficiency and effectiveness improvements in public transport, as a result of Transport Network Companies (TNCs), which are also referred to as e-hailing, ridesharing, carpooling, and so forth (African Union, 2019; Coutinho et al., 2020; DoT, 2018; Franco et al., 2020; Poru et al., 2020; Sorensen et al., 2021). Vanderschuren and Baufeldt (2018), and Woolf and Joubert (2013) state that the concept of ridesharing is transformed from the ancient Jitney service concept, dating back to 1916. The concept was and remains to be seen as a solution for rural or rather underdeveloped communities (Ambrosino et al., 2003; Anburuvel et al., 2022; Ryley et al., 2014). Unfortunately, these TNCs services are solemnly operating in and/or between selected urban areas, they are relatively expensive for long-distance or rather town-to-town trips, and mostly, if any, do not make long-distance trips in rural or remote towns (Chirume, 2017; Mpala, 2018) of underdeveloped communities.

Confronted by the contemporary PT challenges and lack of TNCs services in rural areas, some long-distance public travellers seek and prioritise efficiency and affordability by hitchhiking on the roadside and over social media platforms (e.g., Facebook, WhatsApp, and Twitter). Even though, private rides lack security from crime, public-passenger insurance coverage, client services, and service assurance, to mention a few (Chirume, 2017; STATS SA, 2021). On the positive side, the above-mentioned could be interpreted as the long-distance rural public travellers being ready and/or seeking to adopt telematic transit services. Along the same line, this paper argues and aims to illustrate that the digital trails of hitchhiking or public transport services on social media have the potential to inform the organisation, design, and implementation of digital transit systems and improvements to traditional transit services for long-distance trips in underdeveloped communities. Through attempting to answer the following 6 research questions relating to long-distance rural hitchhiking on social media in underdeveloped countries.

- What are the ride request characteristics, including the request times and rates?
- What are the travel schedules as well as the daily, weekly, monthly, seasonal, and annual travel patterns?
- Are there any indications of rural revitalisation or depopulations?
- What is the supply of informal hitchhiking services?
- How are the general, digital communication structures for hitchhiking services?
- What are the engaged themes, sub-themes, and topics related to both long-distance rural hitchhiking and paratransit services?

The next section is the methodology section, which details the theoretical approaches of the research, including the study area chosen and the type of data employed. Followed by the results and discussions. Then, lastly, is the conclusion & recommendations section, which is the summary of how the goal of this paper was achieved, each research question is outlined, as well as the knowledge gaps for possible future studies.

2. METHODOLOGY

Refer to Figure 1 below, Waterberg District Municipality (WDM) in Limpopo Province (South Africa) is chosen as the case study area. It entails the diverse socio-economic and environmental aspects of typical rural areas in lower-income countries, refer to Table 1 (Municipalities of South Africa, 2021; WDM Profile, 2020). Thus, it provides a real-life context without compromising statistical representativeness (Gerring, 2006; Sandelowski,

2010; Yin, 2011) of rurality. The latter is true, because there are multitude of definition for rural areas.

Source: WDM Profile (2020)

Figure 1: Waterberg District Municipality

However, common global definitions make references such 'agrarian', 'countryside', 'peripheral', and 'territories' (Berdegue & Soloaga, 2018; Leick & Lang, 2018; Li et al., 2019; Meijers & van der Wouw, 2019; Qi, 2019). For example, in Spain, 9999 inhabitants distinguish rural areas and OECD utilises a threshold of 150 inhabitants per km^2 for rural area (Gonzalez-Gonzalez & Nogues, 2019). Food and Agriculture Organisation of the United Nations defines rurality in terms of 'sparse settlement' (i.e., the size and density of human settlement), 'land cover and use', and remoteness in relation to urban areas (FAO, 2018). International, 'sparse settlement' is the most relevant to present statistics (FAO, 2018), and hence in South Africa, enumerated areas (EAs) are used, which employ cadastral features and numbering (STATSSA, 2003; STATSSA, 2020).

Table 1: Waterberg District Municipality socio-economic characteristics

Town	Spatial Area (in km^2)	Population	Population Density (per km2)	Main Economic Sectors
Bela-Bela	3413	76296	22,35	Tourism, vegetables farming
Lephalale	14000	140240	10,02	(Renewable) Energy generation, wildlife, mining, ICT hubs, tertiary institutions
Modimolle	4678	68513	14,65	Trade, agro-Processing, goats, and vegetables farming
Mokopane	6170	325292	52,72	Mining, goat farming
Mookgophong	5689	35640	6,26	Mining, agriculture
Thabazimbi	11241	96232	8,56	Tourism, mining, vegetables and meat farming

Source: Municipalities of South Africa (2021), and WDM Profile (2020)

This paper adopted the Six Steps Approach of Ambrosino et al. (2003) for evaluating the user needs in relation to Demand-Responsive Public Transport. Where the Step 1 outlines the objectives for examining the user needs. Step 2 specifies the subject users in the community. Step 3 reviews literature and other previous studies and data. Step 4 determines the adequacy and relevance of data. Step 5 is design and implementation of the appropriate methodology. Step 6 analyses and highlights the impacts of the results. Moreover, this paper followed Townsend and Wallace (2018), who provide ethical guidelines to social media research, and these include differentiation of public and private contents, consent acquisition for private contents, anonymisation of private and confidential information, and consideration of other related ethics framework that applies to the subject study.

Primary datasets were mined from the public interfaces of social media, Facebook. Because it is commonly used and contains relatively rich, day-to-day hitchhiking and paratransit-related contents for the case study. A solid grasp of the platforms and its users' grammars are essential for conducting this exercise (Omena et al., 2020).

Figure 2 illustrates the stages of social media data mining. The process was systematic and manual, because Facebook prohibit automated data extraction (see Automated Data Collection Terms). Stage 1 identifies the search keywords from historical posts on various pages and groups. In South Africa, especially for indigenous communities, hailing or thumbing is commonly referred as seeking 'lift'. Thus, 'lift' was the first keyword to begin the search. Stage 2 reiterate the search using the learned keywords from the previous stage. In addition, the usernames from the retrieved searches (and keywords) were also used to search for additional relevant posts and therefore, keywords. Stage 1 and 2 were iterated extensive.

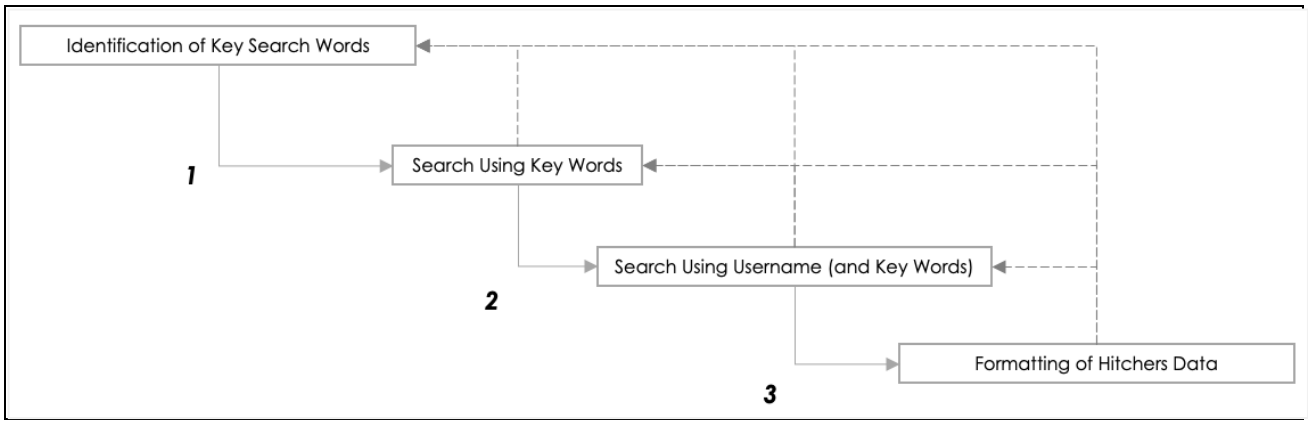

Figure 2: Stages of social media data mining

The results revealed that common keywords are "lift", "transport", "hike", and "taxi", which were then used with names of towns of interest in the search box. The period of interest was January 2019 – March 2020 and October 2021 – June 2022, which enables contrasting Pre- and Post-Covid 19 pandemic. Stage 3 formats the retrieved datasets, i.e., excluding duplicates and categorising the posts in themes and feelings – for details see Kar and Aswani (2021). At every stage 1, 2 or 3, based on new compelling insight, previous stage(s) were revisited to improve the datasets, and this was iterated until the satisfactory level (according to the authors and value inputs received) is reached. Datasets were saved on and analysed (include the statistical tests) using Microsoft Excel 2010.

3. RESULTS

3.1 Hitchhiking Demand (Ride Requests)

The findings revealed that there are no significant differences between two samples. That is, the overall ride requests made before Covid-19 pandemic (Jan 2019 – Mar 2020; t-score, -1,7595 is smaller than the t-critical, 2,228; degree of freedom 10) and made during or after the pandemic (Oct 2021 – Jun 2022; t-score, -0,9543 is smaller than the t-critical, 2,228; degree of freedom 10). In other words, Covid-19 pandemic did not affect or change the preferred travel patterns of long-distance hitchhiking, at least, on social media.

3.1.1 Ride Requests & Travel Schedules

A total of 880 ride requests were made, of which, the majority are females (66,4%) and the remaining 33,6% are males. Across gender groups, only a few requests (i.e., less than 12,0%) were unconfirmed, i.e., neither a reaction nor comment other than the hitcher or requester themselves. As many as 52,5% of ride requests were initiated outside the study area (i.e., non-WDM, predominantly urban areas). Interestingly, many unconfirmed requests are for males, in general. This finding is worthy of further investigation, i.e., to evaluate the factors that influence the ride request confirmation on Facebook or social media. However, this paper shows that the ride confirmation status is based on neither the posted time nor the requested travel schedule, as the unconfirmed ride posts and travel schedules are random across the entire day- and night-time for all gender and trip origin groups.

As for the ride request rates (request per hour), a 24-hours cycle is divided into four time periods (i.e., 00:00 - 06:00, 06:00 - 12:00, 12:00 - 18:00, and 18:00-00:00). Results show (see Figure 3) females have relatively high requests rates.

Overall, the highest rates are during the period 06:00 – 12:00 (i.e., 63,3 requests/hour), followed by 12:00 – 18:00 (46,3 requests/hour), 18:00 – 00:00 (32,2 requests/hour) and then, 00:00 - 06:00 (overall – 4,8 request/hour). That is, the peak time is during the day (06:00 – 18:00) and the off-peak is at night (18:00 – 00:00). Furthermore, Figure 3 (a–c) displays the hourly ride request percentages per origin type/group, i.e., for females, males, and overall, respectively. For all types, the request activities are below 2,0% between 00:00 and 05:00 hours. After 05:00 hours, the requests drastically increase, and the first peaks (between 6,0 – 8,0%) are reached around 6:00 hours, whilst the highest peaks (around 10,0%) are around 9:00 hours. Thereafter, gradual, decreasing fluctuations are observed with the crossing of the 2,0% threshold before 23:00 hours. Figure 3 (d-f) shows the travel schedule percentiles per hour for all the requests according to their origin types/groups, i.e., females, males, and overall, respectively. The patterns are similar. That is, there are no schedules between 00:00 – 04:00 hours. The drastic increases are seen until the first and highest peaks (between 31,0 – 38,0%). Thereafter, there are sudden drops below 5,0% between 07:00 - 08:00 hours. Fluctuations are seen above and below 5,0% throughout until 23:00 hours for the subject groups.

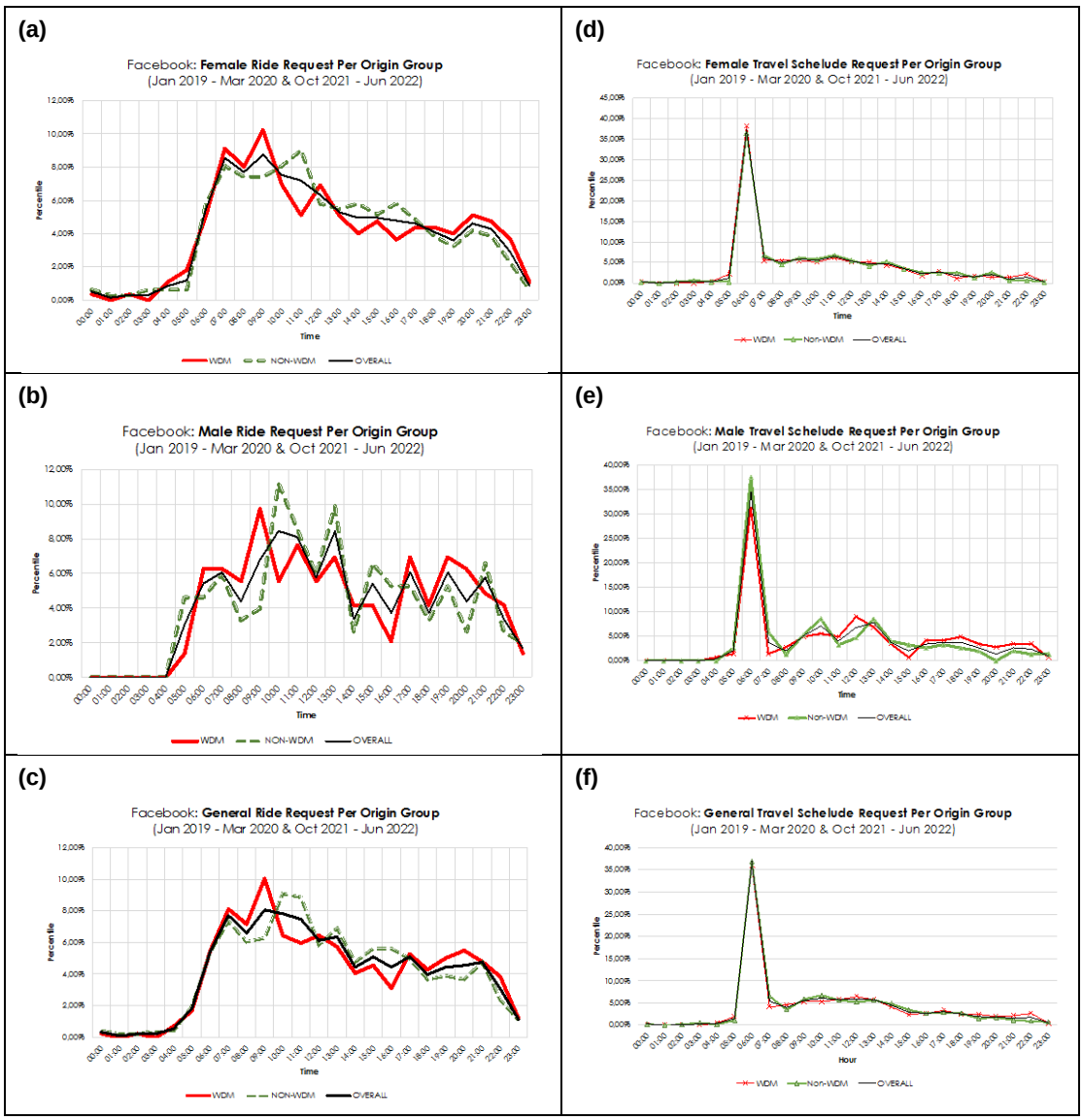

Figure 3: Ride request (a–c) and travel schedule (d -f) per origin group for females (m=584), males (n=296), and overall (o=880)

3.1.2 Travel Patterns – Weekly, Monthly, Quarterly

In terms of the weekly travel patterns, for all gender and origin groups, two peaks are visible in a week. The first and shortest peak is on Monday or Tuesday (with about 15,0%), and the second and highest on Friday (with about 25,0%) Thus, the lowest travelling occurs on Wednesdays, Saturdays, and Sundays experience the lowest travelling.

For evaluating monthly travel patterns, a month is divided into Week 1 (corresponding to the date, 1-7), Week 2 (8-14), Week 3 (15-21) and Week 4 (22-28), and Week 5 (29-31). Similar to weekly travel patterns, all the travel patterns are similar. The peaks (from low to high) are seen in Week 1 and 3, thus, in Week 2, 4, and 5, the ridges are observed and the lowest in week 5. There might be relationships between the hitcher paydays and all the above monthly travel patterns, and therefore, further investigation is needed in this regard.

To capture quarterly travel patterns, the quarters are equated to the South African seasons (i.e., Summer: November-January; Autumn: February-April; Winter: May-July; Spring: August-October). For all gender and origin groups, their quarterly travel patterns are similar throughout. High travel percentiles are in autumn and the lowest is in spring. The travel patterns drop from above 10,0% (in January, which is the time most people go back

to school and work from festive holidays) to below 6,0% (in February). Then, fluctuate positively until June with the first peak in March (i.e., Easter holidays), and second and last in June (i.e., the beginning of mid-year holidays, entailing Youth Day on the 16 June). A drastic drop is witnessed in July (i.e., the end of mid-holidays), low percentiles persist for a couple of months and a sudden increase starts after September and then, a drastic increase until December (festive holidays), which holds the highest travel percentiles.

3.1.3 Hitcher Origins & Destinations

Literature highlights that human society is inevitably transforming to acquire urban-industrial and knowledge economies, as well as improved quality of life (Li et al., 2019; Tacoli, Gordon & Satterthwaite, 2015). Urban areas are deemed as the 'go-to' or 'promise lands', due to their relatively centralised, diversified, and resilient socio-economic opportunities (Meijers & van der Wouw, 2019). Therefore, the positive effects result for rural areas near urban areas (Gonzalez-Gonzalez & Nogues, 2019), and so are the negative effects, which are relatively more common. Gonzalez-Gonzalez and Nogues (2019) elaborate that the negative effects could be due to a lack of major infrastructure linking rural and urban (i.e., tunnel effect) or the resources being subtracted from the rural to urban areas and the two areas become connected (i.e., pump effect) – and this is very common in literature. In that light, the hitcher datasets are evaluated to understand if there are indications of positive and/or negative effects.

The findings show that as many as 380 females (i.e., 71,6% of females total) originate from the rural areas and the remaining 151 (i.e., 28,4%) are from the urban areas. As many as 379 (i.e., 60,0%) go to rural destinations and the other 152 (i.e., 40,0% from rural areas) end their trips in urban areas. This implies a rural 'pump effect', i.e., about 0,2% subtraction of females from the rural to urban areas - 71,6% rural origins and 71,4% rural destinations. In contrast, a rural 'positive effect' of about 6,5% (i.e., 66,0% rural origins and 72,5%) is implied for the male hitchers. Overall, as many as 553 (i.e., 69,7%) originate from rural areas, and the remainder, 30,3%, are from urban areas. Therefore, a rural 'positive effect' of about 2,0% is seen, as a result of 69,7% leaving and 71,8% arriving in the rural areas.

Provincially, the majority (73,5%) of the requests originate from Limpopo Province, followed by 24,8% from Gauteng and the remaining less than 2,0% comprises KwaZulu-Natal, Mpumalanga and North-West Province originating requests. Categorically, 60,9% of Gauteng requests, 100,0% of KwaZulu-Natal, 68,6% of Limpopo, 75,0% of Mpumalanga and 87,5% of North-West requests are made by the females and the remaining percentiles are made by the male hitchers.

As for the destinations, the majority (76,5%) of the trips end in Limpopo (i.e., 3,0% gain from 73,5% departures to 76,5% arrivals). Followed by 21,7% arrivals in Gauteng (i.e., 3,2% loss), 1,1% in North-West (i.e., 0,1% gain), and 0,5% in Mpumalanga (i.e., 0,0% gain/loss) and 0,13% in Western Cape (i.e., 0,13% gain). Categorically, 69,8% of Gauteng requests (i.e., 8,9% gain), 66,7% of Limpopo (i.e., 1,9% loss), 50,0% of Mpumalanga (i.e., 25,0% loss), 44,4% of North-West (i.e., 43,1% loss) and 0,0% of Western Cape requests (i.e., no change) are made by the females and the remaining percentiles and corresponding gains/losses are for males.

At the town level, many of the trips (over 70,0%) originating from all six WDM towns, end in the non-WDM towns. The remaining percentiles of trips from the WDM end within the region are as follows. For Bela-Bela, the main intra-regional destination is Modimolle (13,0%), followed by Mookgophong (8,7%) and then, Thabazimbi (4,4%). Lephalale also

has 3 intra-regional destinations, most frequented is Mokopane (19,5%), followed by Thabazimbi (3,7%), and then, Modimolle (1,2%). Modimolle has 4 intra-regional destinations, most percentiles are for Lephalale (11,5%), followed by Bela-Bela, Mokopane, and Mookgophong, each with 3,8%. Mokopane has 5 intra-regional destinations, most hitchers go to Lephalale (16,6%), followed by Modimolle (4,0%), Bela-Bela (1,1%), Mookgophong (1,1%), and then, Thabazimbi (0,5%). For the trips originating from other or non-WDM towns, many of them end in Mokopane (44,9%), followed by Lephalale (22,3%), Modimolle (15,4%), Belal-Bela (7,4%), Thabazimbi (6,4%) and then, Mookgophong (3,6%).

Furthermore, most gains (i.e., arrival exceeding departing trips) are observed in Modimolle (i.e., 68,7%), followed by Lephalale (36,4%), Bela-Bela (34,3%) and then, Mokopane (17,5%). The latter gains could be the result of the establishment of an energy plant (in Lephalale), allocation of new and affordable residential lands (e.g., in Modimolle), proximity to an urban area, the City of Tshwane (e.g., in Bela-Bela), the opening of new platinum mine (e.g., in Mokopane) and of course, relocation due to Covid-19 pandemic. On the other hand, the most losses are witnessed outside WDM (i.e., other at 49,3%), followed by Mookgophong (35,0%) and then, Thabazimbi (21,9%). The above is in line with Qi (2019), who noted that both local job opportunities (i.e., rural income and investments) and competitive/attractive economic levels are the core centers of the rural repopulation, in-migration, or influx in China.

3.2 Hitchhiking Supply

Most ride drivers/operators prefer to respond to ride requests instead of advertising their rides. During the study period, only 193 unique ride requests were posted on Facebook. Out of which, a minority of ride supplies (19,2%) is made by females and the remaining large amount (80,8%) is made by males. Thus, the transport industry remains to be male dominated. The ride departures include WDM and non-WDM towns, i.e., 48,2% and 51,8%, respectively. In comparison, for both gender groups, WDM adverts are also fewer than non-WDM adverts.

3.3 Post Structures – Requests, Response, Advert

Post structure refers to the basic and commonly utilised framework for requesting/hitching or advertising a ride over the Facebook platform. Based on 880 ride requests, the Facebook users who request rides structure their post as follow:

> *(Greetings), pleading/seeking adverb/phrase, request keyword, origin, destination, date/time (question mark, number of commuters, travel fare, contact details, and emoji).*

Where the words in brackets are often neglected and when analysed, the results show the following. Out of the 880 total posts, many have excluded the greetings (85,3%), number of commuters (98,1%), travel fare (88,2%), emoji (82,4%), contact details (92,6%), and question mark (87,4%). Furthermore, the order of underlined words is commonly random. As for request keywords, many use lift (75,5%), followed by transport (23,6%) and only a few do not use any keyword (0,8%). In terms of the language of the post, many write their requests in English (48,1%), English and Pedi (25,7%), English and Other (23,1%), English, Pedi and Other (1,4%), Pedi and Other (0,8%), Pedi (0,7%), and Other (0,3%). Other languages include Afrikaans, Tsonga, Tswana, Venda, and slang.

Although it is only a few instances, it is worth noting that the ride requests delay appearing to other users after the hitchers post them. This is evident in the posts where the hitcher explicitly notes the departure time. That is, there are significant (a few couples of hours.) mismatches between the departure time in the post and the Facebook timestamp of the post (e.g., a user will state a departure time of 06:00 am and the Facebook timestamp will state the post was created at 09:00 am). This delay could be due to user network connectivity problems and/or activity traffic to Facebook Server. Nonetheless, such delays impose penalties on the hitchers and ride operators, i.e., delayed or even disabled ride matching. Unlike customised internet applications for matching the traveller with a ride, there is barely client service to take accountability. As for the ride advertisements, the common framework is as follows:

> *(Greetings), advertising keyword, space available or the number of passengers needed, origin, destination, date/time, and contact details (travel fare and emoji).*

Similar to ride request posts, the words in brackets are often neglected. In other words, the results show many exclude greetings (95,9%), travel fare (96,2%), and emoji (91,2%). As for ride advertising keywords, many use transport (64,3%), followed by lift (27,5%), and the remaining few, other (8,3%). Where others include ‘let’s go’, ‘space for’, and ‘need people’. The most commonly used language is English (88,6%), followed by English and Pedi (6,2%) and then, English, and Other (5,2%). Where Other languages include Afrikaans, Tsonga, Tswana, Venda, and slang. As for the drivers/operators, who respond to the ride requests instead of creating their posts, they generally respond by reacting to the post and/or commenting. Common comments are merely their contact details or a phrase that the requester/hitcher much go into the inbox (i.e., a private platform to communicate).

3.4 Hitchhiking & Paratransit-Related Challenges

In the same study period (i.e., Jan 2019 – Mar 2020 and Oct 2021 – Jun 2022), the Facebook general comments were harvested, which relate to both long-distance hitchhiking or ride requesting/advertising and paratransit (or minibus taxis, only public transit for town-town trips in WDM) to and from the study area. In total, 151 unique posts with 7250 engagements (i.e., comments related to the post) were found.

Figure 4 provides the engagement counts (EC) per classification scheme.

Three-level order classification schemes are used, namely, theme (8 attributes), sub-theme (17 attributes), and topics (44 attributes). The top three (from high to low EC percentiles) schemes are as follows. Theme: road safety (18 pots, 30,3% EC), service quality (33 posts, 17,7% EC), and economics (6 posts, 13,1% EC). Sub-theme: lack of information (62 posts, 10,1% EC), long waiting time (11 posts, 6,9% EC), and rejected service conditions (10 posts, 4,9% EC). Topics: paratransit head-on collisions (7 posts, 21,0% EC), hitchhiking standardised travel fare (2 posts, 11,8%), and hitchhiking disruptions by the paratransit operators/drivers (8 posts, 9,3%). The above classification schemes should inform further studies, particularly those that have opportunities/insights to inform the strategies, which aim to address the rural long-distance public travelling experiences, user needs, and challenges.

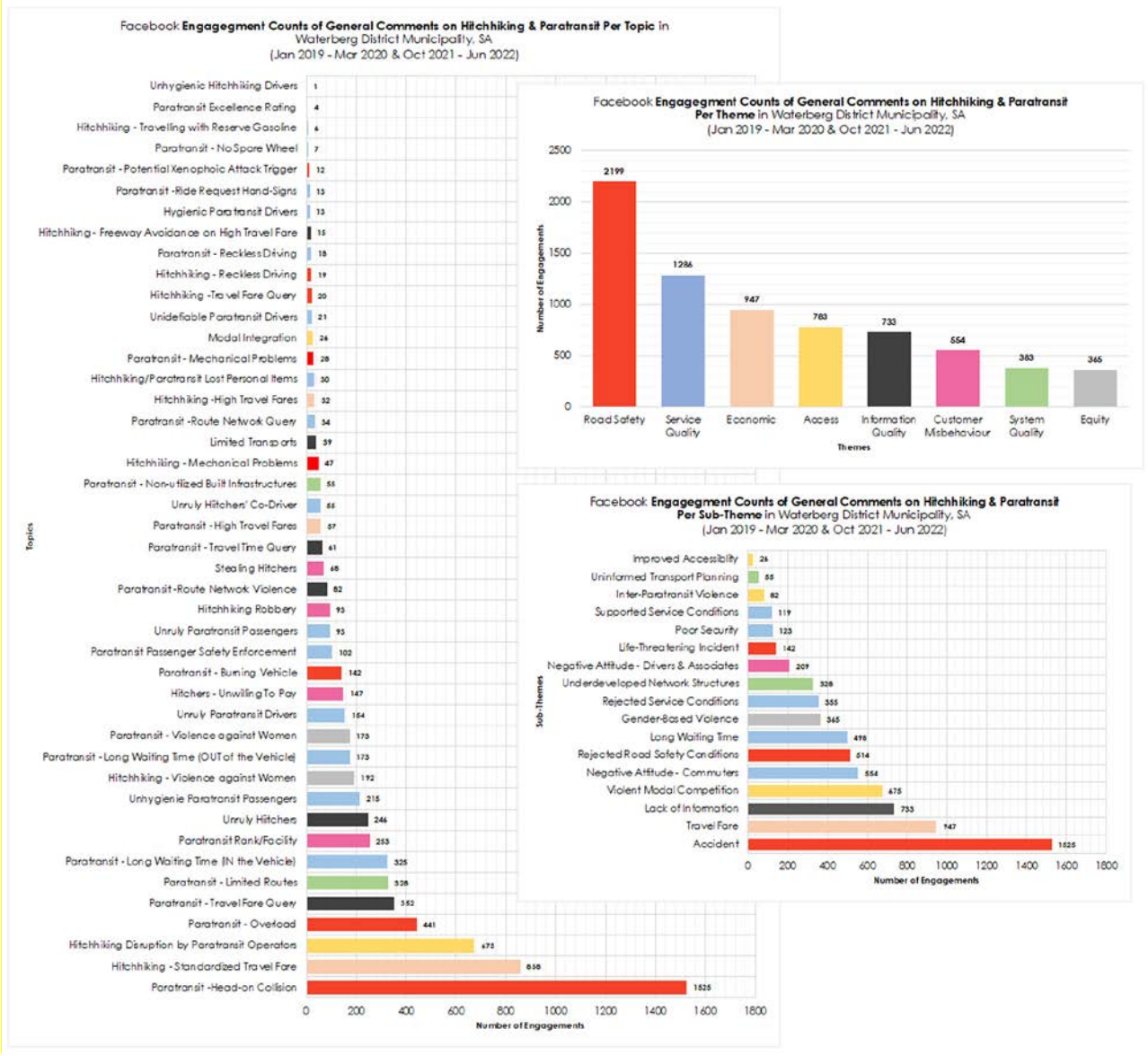

Figure 4: Engagement counts of Facebook general comments related to hitchhiking & paratransit

4. DISCUSSION

Few implications to transport practices and future studies are highlighted. Since this forms part of acquiring the doctoral degree, i.e., financial and time budgets are limited, therefore, acquiring additional datasets to address the preceding limitations were not possible. Firstly, the study shows a gender-based difference in riding confirmations, i.e., the ride confirmation rate of females is higher than their counterparts. Neither request time nor travel schedule is linked to gender differences in ride confirmations. Future studies could perhaps explore the relationship between the drive perception and requester characteristics (e.g., profile picture, request contents). On the other hand, such future studies can help to improve the ride confirmation rates of other travellers, who might be in dire mobility poverty and further be challenged/disadvantaged by their 'unacceptable' request formats. That is, the 'digital divide', which creates inequalities of knowledge on the subject matter.

Secondly, the study reveals travel patterns (i.e., daily, weekly, etc.). However, it does not explain if there is a relationship between specific travel patterns and travel activities (e.g., going home, to work), as well as personal characteristics (e.g., income date, student). Such information can guide the transport planning and related policies, on how to best incentives public transport that is suitable for the subject travelling groups or individuals (Coutinho et al., 2020; Frei et al., 2016; Ryley et al., 2014).

Thirdly, some implications for rural revitalisation and broader strategies are highlighted. That is, the net effect of females indicates migration from rural to urban areas. This agrees with most literature, which states that the urban areas are more favoured than their counterpart, due to their relatively centralised, diversified, and resilient socio-economic opportunities (Meijers & van der Wouw, 2019). In contrast, males display what is called a positive effect on rural revitalisation, i.e., a net migration to rural areas, in particular migration to the towns that experienced growth in the economy and land use. Although further studies are needed to confirm these overall shifts, scholars (such as Qi, 2019) already revealed that both local job opportunities (i.e., rural income and investments) and competitive/attractive economic levels, reside at the core centres of the rural repopulation, in-migration, or influx in China.

Lastly, the study sheds light on the need to invest in information technology and associated strategies. Thus, the quantity and consistency of ride requests, ride advertisements, and related general comments on public transit services on social media, are a form of declaring a readiness to adopt ridesharing, e-hailing, etc. JICA (2007) and Porru et al. (2020) state that such developments require the restructuring of policies, legislation, and strategies. Berdegue and Soloaga (2018), Camboim et al. (2019), Lazzarini (2018) and Leick and Lang (2018) emphasize that these formal guidelines will enable the rural communities to relevantly assimilate and compete in the socio-economic area without limiting suitable trajectories for (future/new) techno-economic paradigm. Heeks et al. (2021) further add that the institutions in lower-income countries are currently lacking the strategies to guide efficient and relevant tech-orientated transit services to all relevant key stakeholders.

5. CONCLUSION & RECOMMENDATION

In closing, key findings are as follows. Male drivers generate more posts than their counterparts. On the other hand, females request and receive ride confirmations more than males. Most ride requests are made outside of the study area. Requests are mainly made in the afternoons (12:00 – 18:00) and evenings (18:00 – 00:00). The majority of the travel schedules are around 06:00 on each day. Mondays and Fridays have the highest travel demands whilst Wednesdays, Saturdays, and Sundays have the lowest. Monthly, the first- and third weeks experience high volumes (possibly pay dates). Annually, three holiday periods show high travelling, i.e., March (Easter), June (Mid-Year), and December (Festive). The net balance shows more males coming into (rural destinations) and females going out of the study area (urban destinations). Overall, there is more influx in the study area; possible attractive forces are new economic opportunities in Mokopane (new mining shafts) and Medupi (power plant development). As for the post structures, there seems to be some kind of ’template’ for the ride request and advertisement posts. Although all posts are mainly in English, a post can have 3 to 4 other official languages. Slang is also common in most posts, especially ride requests. As for comments relating to transit services, the most touched themes are road safety, service quality, and economics.

It suffices to say that long-distance rural public travellers are ready for the telematic transit systems. Furthermore, social media data has the potential to inform the organisation, design, and implementation of digital transit systems and improvements to traditional transit services. It is crucial to mention that social media is rapidly growing, and although there are already ethical frameworks, this has the potential to change, due to the drastic dynamics that come with these technological platforms. Therefore, it is also important to consider other ethical and policy frameworks when one utilises social media data. Such that the findings can have a strong impact on and/or alignment with the policies.

Moreover, the key limitation of this research is sole use of public social media data, future research should seek to ethically include private datasets, which will stretch the data acquisition period. Another key limitation is finding searching keywords that non-English (or in native language), for the study area and reviewed posts, the learned keywords are in English. Facebook search using keywords focuses on the original post and not the comments, and these exclude posts that have keywords embedded in the comments. Perhaps future version of the platform will address this limitation and another option is to have a formal request the datasets of interest from Facebook, which might stretch the data acquisition period. This paper also lacks the verification of population size of travellers on Facebook, and therefore, lacks statistical significance results. Facebook data requests can also help to address the latter by, at least, focusing on active accounts and historical posts.

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