

Making of home: Transportation mobility and well-being among Tucson refugees

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ABSTRACT

The article is based on a multidisciplinary research project that aimed to study mobility challenges that refugees in Tucson, Arizona experience after their resettlement. Using qualitative and quantitative data collected from interviews and survey data, we argue that mobility shapes the ways refugees foster social connections, attain employment and access educational opportunities. Accordingly, barriers to mobility negatively impact refugees' perception of well-being in post resettlement. However, these challenges are not experienced unevenly. Nor are refugees passive subjects who lack agency in overcoming various barriers they experience. The study also reveals the resilience of the refugee community in navigating the intersectional challenges they confront related to their mobility. We hope that the implications of this study can inform various stakeholders to better support refugees in navigating existing mobility and transportation challenges and to promote policy change that can increase better spatial mobility for all Tucson community members.

1. Introduction

Refugee issues have garnered significant attention in political and public debate in recent years with a number of globally displaced persons across the world reaching record high. Today 82.4 million or 1 in 95 people in the world are forcibly uprooted from their homes and homelands (United Nations High Commissioner for Refugees (UNHCR) 2021). Only a small fraction of these forcibly displaced people gets resettled annually in safe countries. While resettlement has typically provided an important escape for millions of forcibly displaced persons from otherwise unpredictable and often dangerous conditions of displacement, most refugees experience an array of challenges in their post-resettlement as they integrate into new communities (Myadar, 2021; Myadar and Dempsey, 2021; Morris et al., 2009). Many of these challenges are related to their ability to get to and from places that are important to their sense of autonomy and well-being, including sites of worship, education, medical care, and employment (Jamil et al., 2012). There has been a significant body of research on refugees' life satisfaction in their post-resettlement environment; however, the role of mobility remains understudied.

In this paper, we focus specifically on mobility-related challenges

refugees face after their resettlement. Drawing on a multi-disciplinary research project conducted in Tucson, Arizona, the paper provides a window into the lived context of post-resettlement refugee life experiences. By doing so, the paper challenges the homogenizing representation of forcibly displaced persons as refugees which creates 'the refugee figure' – "a figure that has no agency and is identical in his/her experiences to other refugees" (Myadar, 2021:2). We do so by embedding this paper with stories of different people whose experiences and journeys are unique to them. Although we are mindful of the generalizing notion of the term *refugees*, we use it to indicate their legal-political status through which they were resettled in Tucson.

We start with background information on global refugee regime that regulates displacement and resettlement of refugees to contextualize why we focus on refugees. The theoretical section that follows provides a discussion on the current debates on refugee scholarship as it relates to mobility. We use intersectional methods to attend to the intimate and embodied experiences of refugees which are often overlooked in broad empirical studies. We then introduce the research methodology – a combination of quantitative and qualitative data collection methods – that was employed for this project followed by a discussion of our key findings. In the concluding section, we offer our recommendations for

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meeting the needs of refugees in rebuilding safe and fulfilling lives in post-resettlement.

2. Displacement and resettlement

Millions of people around the world leave their homes and homelands because of forces beyond their control. They are forced to navigate uncertain and often treacherous conditions of displacement. Many remain in this state of liminal and protracted existence of precarity. The terms “refugee”, “asylum-seeker” and “migrant” are often used interchangeably to describe those who are on the move, often beyond their countries of origin. However, the terms connote specific meanings within the international legal framework (for extended definitions, see Douglas et al., 2019).

The key difference between an asylum-seeker and a refugee lies when one is legally recognized as a refugee by the international convention (a refugee) and when one has not yet been designated as such (an asylum seeker) although they may share similar circumstances and conditions for their displacement. Migrants generally refer to those who are on the move but do not have a legal designation as a refugee or an asylum seeker. The circumstances of their mobility may or may not be forced in nature or politically induced unlike refugees or asylum seekers who are often displaced because of politically induced conflict and persecution. Displaced persons on the other hand are individuals who have been expelled, deported, or impelled to flee from habitual residence by the forces or consequences of war or oppression. As such either migrants, asylum seeker or refugees can be referred to as displaced persons (Douglas et al., 2019).

In this project, we focused on people who are displaced but who have been legally recognized as refugees and resettled in Tucson through that designation. We did not exclude people based on any other criteria except for age. Per our IRB approval, we were authorized to interview people who were at least 18 at the time of their interview and survey participation. Our research offers as a humble attempt at understanding the challenges refugees experience after their resettlement in doing so hopefully inform policy and practice in ways it might have some positive impacts in the lives of refugees.

The global refugee regime was established and has operated to meet the needs of these displaced persons. The term originated from the French word *réfugié*, meaning ‘to seek refuge.’ The formal designation of the term was adopted by the 1951 Refugee Convention to define a category of people who were displaced and forced to seek refuge away from their homelands (Myadar and Dempsey, 2021; Jones, 2020). But the scope of the original Convention was limited to those who were displaced in Europe in the aftermath of World War II. The 1967 Protocol broadened the scope to cover refugees universally (Ibid.). The current legal definition of a refugee is someone “who is outside his/her country of nationality or habitual residence; has a well-founded fear of persecution because of his/her race, religion, nationality, membership in a particular social group or political opinion; and is unable or unwilling to avail himself/herself of the protection of that country, or to return there, for fear of persecution” (United Nations, 1967).

Since the inception of the Genocide convention, millions of people have benefitted from the protection the current refugee regime provides (Myadar and Dempsey, 2021). However, the rigid category has simultaneously excluded millions of others from the definition thereby denying much needed protection that the Convention aimed to provide (Jones 2020; Myadar and Dempsey, 2021). Those who meet the criteria go through layers of screening process to be resettled in a safe country that can take up many years.

Historically the United States has resettled more refugees than any other country reaching its peak in refugee admissions in 1992 with about 132,000 people resettled that year (U.S. Department of State, 2021; Pew Research Center, 2017). However, our project was conceived when the US refugee acceptance was capped at the lowest ceiling since the refugee resettlement program was created in 1980. Under the Trump

Administration, the US Refugee admissions ceiling was reduced from 120,000 in FY 2017 to 15,000 for FY 2021 (Amos, 2020).

During this period, refugee resettlement agencies also suffered dramatic cuts in their already anemic budgets, which had a direct impact on the amount of assistance that refugees received from these organizations. Geographer Pablo Bose suggests, the increased politicization of refugee resettlement has profoundly impacted resettlement programs in the United States (Bose, 2020: 2). Bose argues that several factors contributed to this volatile political climate including home country violence, national border restrictions and closures, increasing refugee numbers, and US political turmoil expressed in both domestic and international spheres (Ibid.).

The Biden administration pledged to reverse this trend. In May 2021, President Biden increased the FY21 refugee admissions cap to 62,500. However, when the fiscal year ended in September 30, the United States’ admissions number did not even hit the previous administration’s ceiling of 15,000 because of the barriers that had been set by the previous administration as well as the COVID-19 specific challenges. The current administration has since pledged to bring the ceiling to 125,000 persons for FY22 and has announced its program to resettle the 55,600 Afghans, 40% of whom are underage children (Montoya-Galvez, 2021).

2.1. Refugees in Tucson, Arizona

Arizona has welcomed thousands of those who have made it through the complex vetting process and approved for resettlement in the United States. Between 1975 and 2017, the state has received over 82,000 refugees or 2.3% of all US refugee resettlement during this time period (Arizona Department of Economic Security, 2021). As one of the top refugee-resettling states, Arizona has hosted refugees from 102 countries. The top five countries from which refugees come are Iraq, Vietnam, Cuba, Somalia and Bosnia (Department of Economic Security, 2021). Tucson is one of the two main cities where refugees are resettled in Arizona (Phoenix is the other city). As of 2020, at least seventeen Tucson-based organizations directly provide services to resettled refugees, including technical skill and vocational training (Tucson Refugee Ministry, 2020).

2.2. Why study refugees

Transportation mobility is a basic material need. Consequently, questions of transportation disadvantage and justice runs throughout the transportation literature. However, the intersectional challenges refugees experience distinguishes them from other vulnerable groups. Although refugees are similarly socioeconomically disadvantaged as other vulnerable groups, many refugees confront additional linguistic and cultural barriers and experience racialized, nativist and unwelcoming sentiments from politicians as well as the general public. This comparison to other vulnerable populations is not to rank vulnerabilities across different socio-economic groups or privilege a challenge over another. Instead, we focus on refugees to provide a context to the layered often unique challenges refugees experience directly linked to the context and conditions of their displacement and resettlement.

For example, as a city in a border state, Tucson is home to a high immigrant population with 15.3% of its residents identifying as foreign-born (2% higher than the national average). Refugees share similar vulnerabilities to Tucson’s large immigrant population, but they also have distinct experiences. The majority of the foreign-born persons in Tucson come from Mexico or other Spanish-speaking countries in Central and South America. With 43.6% Tucson’s population Hispanic or Latino, Spanish is the second most widely spoken language after English. Indeed, in some areas of the city, Spanish is as dominant as English. For many refugees who do not speak English or Spanish, a language barrier remains a critical challenge in the context of transportation (Liu and Schachter, 2007; Shay et al., 2016) and in other aspects of daily life. Learning English comes ancillary for many refugees as US federal policy

prioritizes economic self-sufficiency for recently resettled refugees, restricting the development of communication skills relied on for integration (Baratta, 2016).

Refugees, as a category of people, had to flee their homelands because of violence, wars or conditions that imperiled their lives. Because of the conditions of their displacement, refugees may bear physical and psychological wounds from these experiences. The majority have also spent years in interim places such as refugee camps before arriving in the US in spatially excluded, temporary housing situations served by transportation systems that may be informal or unsafe and difficult to navigate (Ozkazanc, 2021). Research conducted in Houston by Kaplan et al. (2022) found that recently resettled refugees are at higher risk of finding and retaining employment because of challenges to access public transportation. Understanding these layered challenges provides a context to unpacking the intersection between refugees' mobility and their sense of well-being.

3. Theoretical considerations

Scholars from interdisciplinary backgrounds have produced an important body of scholarship on various facets of refugee resettlement. Bose (2020) has revealed that English language acquisition, getting a job, and getting education are among the top three factors that refugees consider important for their post-resettlement success. Being able to move around easily is critical for refugees to access necessary resources and educational and employment opportunities. Despite its importance, the relationship of mobility and refugee resettlement success has remained relatively understudied.

In understanding the concept of mobility, Tim Cresswell's conceptualization is instructive. He argues that mobility can be defined by its integral facets: the starting point, speed, rhythm, routing, experience, and friction (Cresswell, 2010). Each facet contributes to creating our modern and increasingly mobile world. However, as Cresswell suggests, mobility is also an entanglement of complex and diverse social relations and is deeply imbued with meanings (Cresswell, 2010). According to him, "mobility lies at the centre of constellations of power, the creation of identities and the microgeographies of everyday life" (Cresswell, 2010: 551). Cresswell suggests that transport geography primarily focuses on figuring out the best way to from A to B but the mobilities research seeks to understand complex meanings and relations that pertain to getting from A to B (Ibid.: 554).

We are interested in understanding not only how people get to A to B but also how this process is shaped by complex relations that are spatial and social. We do so by relying on Shaw and Hesse's (2010) call to find a common ground between transport geography and mobilities research. We are mindful of how transport affects society's poorest and most socially disadvantaged groups, including their experience of transport disadvantage. Recently transport geographers have drawn our attention to the way how transport disadvantage and reduced mobility contribute to social exclusion among the society's most vulnerable members (Preston and Rajee, 2007; Lucas, 2012). Preston and Rake (2007: 153) suggest that "social exclusion is not due to a lack of social opportunities but a *lack of access* to those opportunities."

Feminist scholars have also made an important contribution to understanding the connections between mobility, home and belonging. Moving beyond the simple dichotomies between men/ women and oppression/ subjugation, feminist research is characterized by its anti-essentialist approach as well as its diversity. Feminist research is also interdisciplinary and transdisciplinary as it relies on different methodologies grounded in understanding that a context is always shifting and fluid. Feminist methods allows researchers to interweave questions about identity, power and subjectivity. Ahmed et al. (Ahmed et al., 2003: 1) address how home and belonging are experienced in relation to uprootings and regroupings where "being grounded is not necessarily about being fixed; being mobile is not necessarily about being detached." As the authors suggest the interdependent relationship between

migration and home and belonging thus can be understood from a layered and intersectional lens rather than a linear and simple process that starts at point A and ends at point B (Ibid.). This relationship is experienced differently by each individual. Ahmed's work similarly examines how notions of belonging travel with and within the bodies of those who migrate and claim a new type of belonging and homing (Ahmed et al., 2003).

For Jennifer Hyndman, mobility is "an outcome of various economic, geopolitical, gendered, and racialized relations and is constitutive of people's locations as social and political subjects (Hyndman, 2012). The feminist approach allows us to probe these constellations and relations in lived contexts that are unique to individuals. To echo Hiemstra, the feminist approach helps us pay "attention to scales, voices, and topics previously ignored or undervalued" (Hiemstra, 2017: 329). Important as they are, the large-scale empirical studies do not attend to the intimate experiences of people navigating challenges in their post-resettlement lives (Myadar, 2021; Myadar and Dempsey, 2021; Myadar, 2021). These feminist methods are helpful in teasing out mobility challenges in different life contexts.

Several recent works have attempted to piece together how refugees experience the transportation system. They studied the mobility patterns of refugees in Burlington, Vermont (Bose, 2014), Durham, North Carolina (Farber et al., 2018), Clarkston, Georgia (Karim, 2015), Colorado Springs, Colorado (Morken, 2016), and Buffalo, New York (Okour, 2019). Bose's study is one of the most comprehensive studies that demonstrated the importance of mobility for refugees' quality of life and personal autonomy. His study focused on a small city in Vermont, Burlington, with a small refugee population and limited public transportation options. His study revealed that refugees not being able to move around easily "adversely affect their ability to seek and secure gainful employment, receive necessary medical care, and access other goods and services vital to both basic survival and social advancement" (Bose, 2014: 152).

The transportation challenge among refugees is similarly observed across different refugee communities in Tucson and immigrant communities in the US. Refugees in Tucson experience significant transportation disadvantage even as they heavily utilize social networks to piece together mobility patterns. In contrast to US born individuals, Chatman and Klein (2013) found foreign-born workers are nearly three times as likely to commute by transit and 50% more likely to carpool. Indeed, the literature studying immigrants at large suggests transportation patterns are connected to pre-migration life. For example, Blumenberg and Smart, 2010, 2011, 2014 suggest a "transit habit" built before migration may be reflected in car ownership and carpooling rates in immigrants, particularly when they initially live in transit-rich neighborhoods upon arrival in the US. These and other studies also suggest that until immigrants have access to a vehicle, they rely heavily on the established ethnic social network that predates the immigrant (Blumenberg and Smart, 2014; Chatman and Klein, 2013). Chatman and Klein's (2013) interviews of immigrants in New Jersey suggest slightly more nuance. Still, as families grow and financial situations become more stable, car ownership increases among immigrants (Chatman and Klein, 2013).

Transportation disadvantage or transportation poverty (Lucas et al., 2016) are two terms that are often used to describe those who are not able to meet daily needs – employment, school, healthcare, basic shopping, and even social obligations – due lack of or unsteady transportation arrangements. Although the term transportation disadvantage is widely associated with lack of vehicle ownership, it is often operationalized by identifying households with other disadvantaged socio-economic characteristics (Shay et al., 2016). For example, transportation disadvantage can apply to vehicle-owning low-income, racial minorities, and those who do not speak the dominant language. This is particularly the case if the vehicle(s) do not consistently meet the needs of the household such as refugees from diverse backgrounds or when the first acquired vehicle is older, less reliable, and costly to maintain

(Blumenberg and Smart, 2010). Finally, transportation disadvantage can be exacerbated by the need to travel longer distances (Shay et al., 2016).

Transportation disadvantage is not experienced equally. Indeed, even the operational characteristics of disadvantage – household SES status measures – mask the challenges that certain individuals within the household may encounter (Lucas et al. 2016). While surveys can reveal important details about patterns of challenges refugees experience related to their mobility and transportation, it does not tell us stories of how these challenges are experienced individually or in the context of a specific place and transportation system. For this reason, we turned to in-depth interviews (Chatman and Klein, 2013) with individuals as a way shed a critical light on the microgeographies and social relations that shape how individuals navigate their daily lives in Tucson.

4. Research methods

For this project, a team of researchers from geography, public health and transportation employed a mixed-methods study to better understand transportation and mobility-related choices, challenges, and impacts on the well-being of refugees who have resettled in Tucson as a part of the US Refugee Admissions Program (USRAP). Using an interdisciplinary approach to understanding how refugees experience the transportation system, we included both a broad survey among refugees in Tucson and interviews with refugees that highlight the lived experience. We augmented the refugee survey and interviews with interviews conducted with personnel at refugee-resettling agencies, and officials from transportation authorities in Tucson. The specific details of these methods are discussed after reviewing the context of Tucson as a research site below.

4.1. Research site

We conducted our study in Tucson, Arizona. In addition to being the resettlement destination for a relatively large refugee population, Tucson is an ideal site to study mobility-related barriers and challenges that refugees experience because the land use and transportation systems are similar to many mid-size cities in the US currently targeted for resettlement. Spread over 238 mile², Tucson is the second-largest city in Arizona with city and larger metropolitan area populations of 540,000 and 1.04 million people, respectively (U.S. Census Bureau, 2019). Most mid-sized US resettlement cities are low-density and car-dependent. Yet refugees arrive in these cities with no access to a personal vehicle. Tucson is no different. With 2500 persons per square mile, single-occupancy vehicle use represents nearly 75% of all commuting trips, while an estimated 3.5% of Tucson residents use public transportation (City of Tucson, 2015: 2).

Tucson is not particularly easy or safe to navigate by a non-vehicular transportation mode. For example, Arizona had a pedestrian fatality rate of 2.91 per 100,000 people in, 2019, the 5th worst in the country (National Highway Traffic Safety Administration (NHTS), 2019). Tucson recorded 39 pedestrian deaths that same year (Conover, 2020). Refugees are likely to be even more vulnerable as suggested by the 2015 study which revealed that motorists are less likely to stop for racial minorities (Goddard et al., 2015).

There is some effort on the city’s part to address alternative modes. For example, the recent passage of Tucson Complete Streets Ordinance aims to engage vulnerable populations in developing design guidelines and prioritizing improvement projects. Recent initiatives to make Tucson more bike-friendly have included road renovation efforts such as Green Lanes and Buffered Bike Lanes (City of Tucson, 2015). Those without access to a vehicle likely rely on public transit for longer trips. The city’s most extensive public transportation apparatus is the Sun Tran bus system – a privately owned bus company contracted by the City of Tucson that covers 296 mile² with 29 fixed routes and 12 express routes (City of Tucson, 2015: 2). Of the 29 fixed routes, only 10 provide

headways of 15 min during weekdays; most buses are on 30-min schedules (City of Tucson, 2015). An above-ground train system - the Sun Link Modern Streetcar - travels a mere 4-mile route primarily through non-residential districts in the city’s downtown area.

Since the users’ experience of alternative modes in Tucson is both a dangerous and demeaning proposition (Ingram et al., 2020) hampered by the city’s bimodal monsoon seasons and severe heat, with 108 days of 100 degree or higher temperatures recorded in 2020 (National Oceanic and Atmospheric Administration (NOAA), 2021), many refugees are compelled to find the resources to purchase and maintain a car shortly after arriving in Tucson. The COVID-19 pandemic led the city to make the bus system free to all users, and if this decision is maintained public transportation may become a more attractive option for all Tucsonans including refugees. However, automobiles continue to be the preferred and privileged mode in Tucson.

4.2. Methodology and data collection

We conceptualized our research in, 2019 but when we began our project in 2020 the COVID-19 pandemic led to lockdowns and extensive social distancing measures were put in place across the US. The unique circumstances surrounding the pandemic have prompted us to be creative in achieving our goals of conducting interviews and maximizing our survey outreach. To overcome research challenges presented by social-distancing and other safety restrictions, we sought assistance from three local Tucson refugee organizations, International Rescue Committee, Lutheran Social Services and Iskashitaa, to reach potential participants for survey and interview participants.

Our survey comprised approximately 60 total questions and was implemented using the online data collection platform, Qualtrics. The survey questions were modelled after Bose’s, 2014 study on refugees and transportation accessibility in Vermont. The survey covered sections on demographic information, transportation and mobility, well-being, and pre- and post-COVID-19 pandemic experiences related to transportation. At the end of the survey, participants were offered USD \$5 compensation and the option to register for an interview. To respect participant privacy concerns, survey demographic information submission was optional. Between December 30, 2020, and February 9, 2022, 64 refugees completed a survey (see Table 1).

The in-depth, semi-structured key informant interviews were initially conducted virtually due to COVID-19 physical distancing guidelines. The local refugee agencies helped recruit these individuals. We then used a snowball technique to reach out others. The research team held interviews through video communication modalities (such as FaceTime, Zoom, WhatsApp) that lasted approximately 45–60 min each. The interview guidelines were developed during the preparation stage and incorporated input from team members that specialize in the fields of refugees resettled in the United States, geography, health, transportation, urban planning, and development. The purpose of the interview guidelines aimed to provide a loose structure for conversation and also allow contextual fluidity. We followed the feminist ethics of care in

Table 1
Description of survey participants.

Characteristics	Number	n = 64	
Age	18–24	28.1%	18
	25–34	28.1%	18
	35–44	10.9%	7
	45–54	7.8%	5
	55–64	7.8%	5
	65 and over	3.1%	2
	Prefer not to answer	14.1%	9
Sex	Female	28.1%	18
	Male	32.8%	21
	Other	12.5%	8
	Prefer not to answer	26.6%	17

our conversation, disrupting the hierarchy between the interviewer and interviewee. It was thus important for us to listen, to be engaged and to remain attentive to the details shared by the participants.

The interview began by asking the participants' basic background information including their place of residence prior to resettlement and age upon resettlement in Tucson. This helped provide the team with contextual grounding in how pre-resettlement experience with transportation may have informed and shaped refugees' post-resettlement experiences. Interview questions progressed to understand each person's unique experience with getting around in Tucson immediately after resettlement and how each has navigated and dealt with different mobility-related challenges in Tucson over the subsequent years. We also aimed to understand whether refugees' sense of well-being and life-satisfaction were connected to mobility.

When the social distancing measures eased, we gave participants the option to interview in-person. However, most individuals still favored remote interviews. At the time of the submission of this article, we have conducted 29 remote and 5 in-person interviews with 29 refugees and 5 other stakeholders. Refugees we interviewed came from Afghanistan, Bhutan, Burundi, the Democratic Republic of Congo (DRC), Ethiopia, Iraq, Liberia, Rwanda, Somalia, Sudan, Uganda, Yemen and Zambia (see Table 2). The completed interviews were transcribed and coded using MAXQDA and Microsoft Excel to identify common themes and narratives. In this paper we share survey and interview details as consented by our participants and approved by the University of Arizona's Institutional Review Board for research.

4.3. Key findings

Our research findings reveal various sentiments shared across disparate populations regarding challenges related to post-resettlement experiences, specifically related to mobility. Some of the key themes that emerged include the critique of Sun Tran bus system, well-being, gender disparity, COVID-19 related challenges as well as strategies different individuals use to overcome mobility-related challenges.

4.4. Sun Tran bus system

Most refugees rely on the Sun Tran public bus system at least initially upon arriving in Tucson. Refugee-resettling agencies provide bus passes and help them to get acquainted with the service - typically through a case worker who is assigned to assist the family or individual. For most refugees, relying on the bus system is only temporary as they aspire to get their own private vehicle.

Survey data is helpful for unpacking primary reasons for the relatively quick shift from bus to vehicles. Our results indicate that the top reasons for not using public transportation are a lack of accessibility

Table 2
Description of interview participants.

Characteristics		Number	n = 43
Gender	Male	48.8%	21
	Female	34.9%	15
	Not specified	16.3%	7
	Afghanistan	4.7%	2
Country	Burundi	9.3%	4
	DRC	16.3%	7
	Ethiopia	2.3%	1
	Iraq	2.3%	1
	Liberia	4.7%	2
	Nepal	2.3%	1
	Pakistan	2.3%	1
	Rwanda	18.6%	8
	Sudan	23.3%	10
	Uganda	2.3%	1
	United States	9.3%	4
	Yemen	2.3%	1

(lack of public transportation near respondent home or near destinations), inadequate service (public transportation is too time intensive), discomfort (too crowded, not air-conditioned, no Wi-Fi), and difficulty understanding the public transportation system. The least reported reasons for not using public transportation are the ride cost, weather hindrances (e.g., rainfall), and COVID-19 specified under "Other" (See Fig. 1).

Interviews revealed a more nuanced picture. A few informants shared that Sun Tran remains their primary mode of mobility. For example, Zaroon, who is originally from Pakistan and spent eight years in Nepal before coming to the US, told us how convenient it was to use the bus system in Tucson. He showed us the Sun Tran mobile app that he uses to track arrival times of buses, allowing him to plan his trips efficiently. Similarly, Bosco, a Congolese young man, used to own a car but as he found it too expensive to maintain. Instead, he now takes the bus everywhere. Like Zaroon he uses the mobile app and thinks that overall, the Sun Tran system is fairly effective.

Interviews and survey responses also revealed that others face an array of barriers to accessing and navigating the Sun Tran bus system. Difficulties associated with using Tucson's bus system that surfaced during interviews included expensive bus fares, language barriers, bus-route confusion both in planning and implementation, limited routes and available destinations, inconsistent bus arrival times. Additionally, COVID-19 health and safety concerns, and harassment/discrimination received from other bus users were also noted by project participants.

Even more concerning, both survey and interview findings suggest that people who always/often use public transportation as a primary mode of transportation experience negative impacts to their sense of wellbeing (66.6%) more often than those who always or often use other modes of transit (52.1%). Conversely, the same studies have suggested that a lack of access to transportation options can create barriers to refugees' social integration and ultimately their well-being in their post resettlement. Similarly, public health scholars have noted that transportation is a key factor to one's ability to access necessary health care including mental health care. Tools such as the Barriers to Care Questionnaire (BCQ) has been used to characterize barriers to accessing health care among minority populations in the US Transportation and mobility is a major component of the BCQ along with language proficiency, cost of care, health care system navigation, and discordant beliefs about illnesses (Seid et al., 2009; Jacob et al., 2016). Likewise, lack of such access is considered a major public health issue resulting in deferred preventive care, exacerbated chronic disease and poor mental health (McNeely and Morland, 2016).

Several participants emphasized both initial confusion about the public transportation system and its role in getting basic material needs met. One participant interviewed was a pastor from DRC who left his country when he was 18 years old. He travelled by foot for a month before reaching a refugee camp across the border in Uganda. Four years later he was granted refugee status and resettled in Tucson. Pastor Safari told us that the first main challenge for refugees in the United States is the immediate need to find employment, affirming "You have to work, but there is no assistance in helping refugees with transportation." Pastor Safari recalled difficulties using Sun Tran buses because of unclear bus routes and communication barriers that forced him and his family to interact with the bus driver and other riders using body language.

Another man came to Tucson after spending five years at refugee camps in Zambia, Zimbabwe, and South Africa. He quickly discovered that the Sun Tran bus system was the only mode of transportation available but also confusing and expensive, explaining that:

Connections between bus locations are not very clear. Most new refugees think that when you get on a bus it will take you anywhere. [Refugees] don't know about bus routes and the bus price is very expensive too.

Such disorientation is not unusual for those who are displaced.

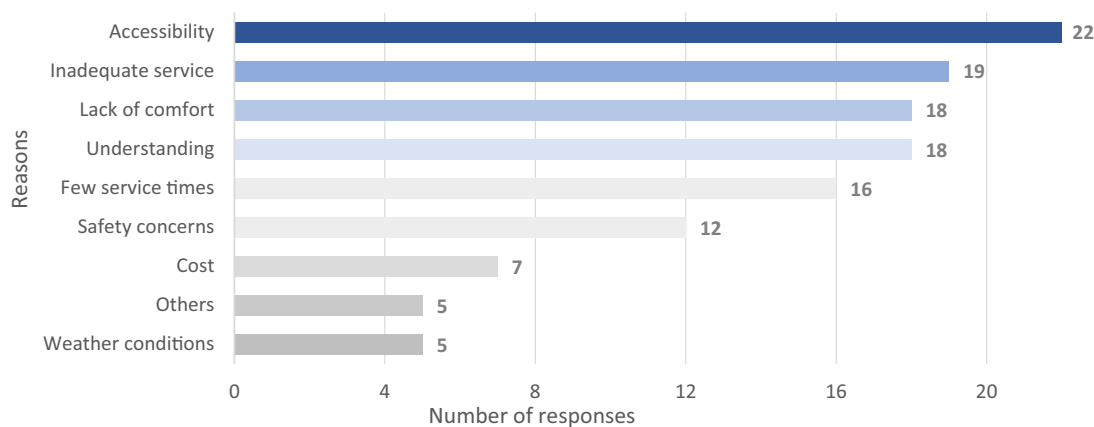


Fig. 1. Reasons for not using public transportation reported by respondents.

Geographers have paid attention to the ways spatial disorientation is experienced cognitively and corporeally (Di Friedberg and Marcella, 2017; Fernández, 2020; Bissell and Gorman-Murray, 2019). Getting disorientated and lost is not only a matter of inconvenience. Several informants, for instance, shared instances of becoming lost on their way to job interviews or the places of their employment, with additional financial and material well-being implications.

While it is possible that the interviewees' perception of the Sun Tran system might be due to their prior reliance on different transportation systems in places they had lived previously, a Tucson bus operator echoed the sentiment that the Sun Tran system can be hard for refugees.¹ Glen Wolfgang has been working for the Sun Tran system for the last four years and explained that the Sun Tran bus system has a "mapping problem" and that refugee challenges using the bus system are "related to mapping." Fig. 2 shows current bus routes in Tucson, which according to Wolfgang is not ideal. He argues that the Sun Tran bus system should have "an actual map of the entire system at each stop" that is available in multiple languages. Wolfgang further explained:

If refugees don't speak English, how do they manage to communicate? There's a phone number [for translation services] that they're supposed to be able to call but the only time I saw someone try to use it no one picked up.

Difficulties using the bus due to language barriers were repeatedly identified by interview participants. One interviewee born in Sudan before resettling in Tucson in 2005 claimed:

I think the biggest factor is communication. If they [Sun Tran] had translators that would help speak with English speaking people.

Language barriers can undermine the basic dignity and respect refugees already struggle to receive in public, a phenomenon that is beginning to be better understood in transportation justice circles (Ingram et al., 2020). For example, another participant from Ethiopia identified difficulty communicating as a primary challenge for refugees that use the bus system, adding that:

Sometimes people are not patient, and many people are not understanding. People are disrespectful on the bus. The language barriers are big and [communicating] that you need one more quarter might take time.

For some refugees, avoiding the bus goes beyond expense or

confusion. Josepha Ntakirutimana communicated that wasted time when one uses the bus system is a challenge:

The first time I used the bus, I realized that I was wasting my time. That was time that I could be using for crochet. I wasted time in refugee camp, and I didn't want to waste any more time.

Josepha's perspective about wasted time on the bus is informed by her lived experience as someone whose life was put on hold in a protracted condition of uncertainty and liminality. Josepha was born in Rwanda and fled her country during the upheaval that followed the 1992 genocide. Josepha spent nearly ten years in a refugee camp in Malawi before being admitted to the US with refugee status.

In addition to these constellations of challenges, taking the bus is also expensive for many. Even though it doesn't cost much (the basic fare historically has been \$1.75) to take the bus occasionally, using it every day for one's primary means of transportation can add up. An individual who had spent six years in a Kenyan refugee camp before being resettled in Tucson told us:

Some people don't have money to take the bus. A lot of people just walk. When you go [on the bus] everyday it adds up.

The city of Tucson has offered free bus rides since March 2020 in response to the COVID-19 pandemic. This policy has eased the burden for bus riders such as Bosco, who rely on the bus system as their primary transportation means and otherwise tend to limit their travel for only essential purposes.

These personal stories reveal complex geographies of networks and mobilities that are differently experienced by individuals depending on each person's unique circumstances and spatio-temporal positionalities.

4.5. Mobility and well-being

We attempted to see if there was any correlation between refugees' sense of well-being and mobility-related challenges they experience. Over (95.0%) survey respondents reported that their sense of well-being is sometimes, often, or always impacted by transportation and mobility-related challenges. (See Fig. 3).

The survey also revealed specific feelings associated with the transportation and mobility related challenges that they experience. Anger was recorded as the strongest feeling among different groups as well as frustration, sadness, and a longing for their homeland as other common feelings connected to the challenges related to mobility.

4.6. Gender and mobility

Study data indicate that challenges to one's mobility elicit differing emotional responses along gendered lines (see Fig. 4). Female survey

¹ To be sure, this can be true of other migrants as well. While previous experiences with informal or different transportation may apply to other migrants, we are simply highlighting the compounding, layered and intersectional nature of challenges refugees tend to experience.

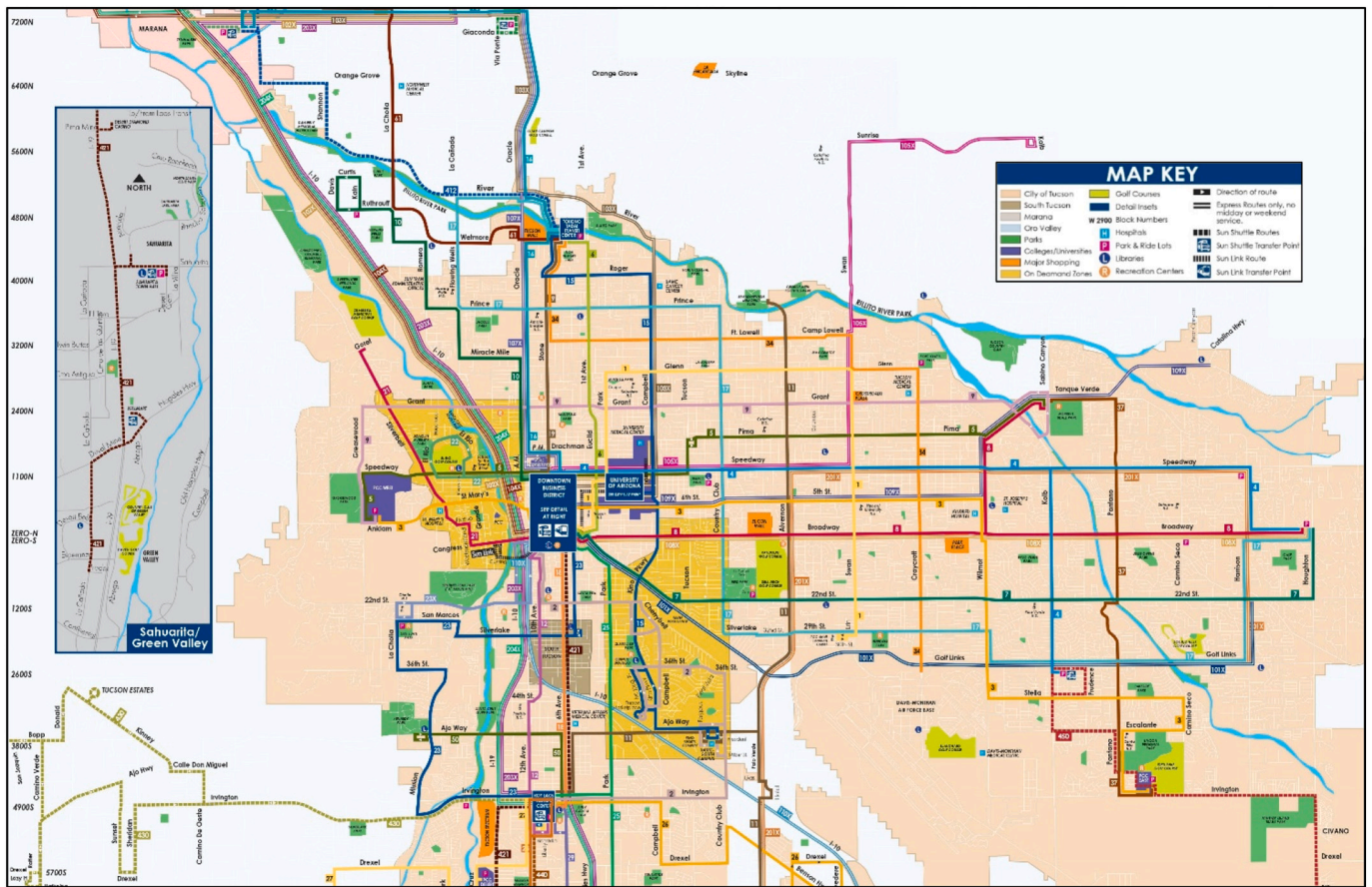


Fig. 2. Map of Sun Tran bus routes throughout Tucson, Arizona.

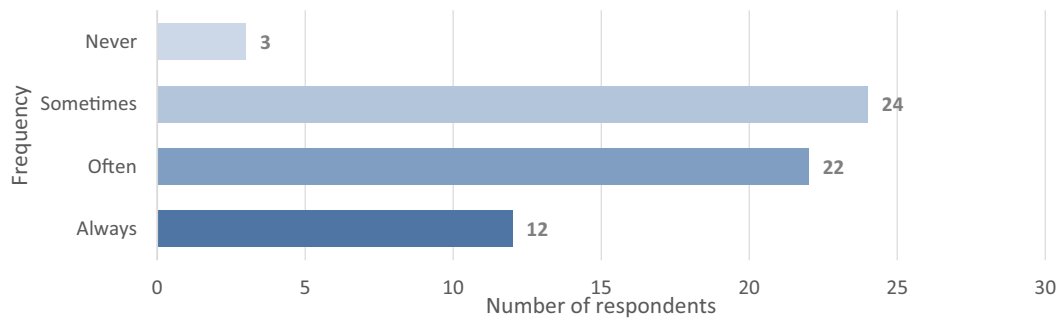


Fig. 3. Survey respondents' reported impacts to wellbeing attributed to mobility-related challenges.

respondents convey feeling anger and sadness more than male survey respondents. Surveyed male participants express feeling more frustration, resignation, and longing for their homeland or country of origin. In addition to feelings, we observed differential challenges associated with gender. Survey data disaggregated by gender show that male respondents report Tucson public transportation to be inefficient (e.g., slow, lack of connections, and too few service times) and difficult to understand more than female respondents. The lack of comfort on public transportation (e.g., overcrowding, inadequate services such as air conditioning and Wi-Fi availability) was more often reported by female survey takers than their male counterparts.

We also found that the domains of impacts from mobility-related challenges are experienced differently by men and women. Female survey respondents report that mobility barriers impact social, mental, and physical well-being more than male survey takers. Male participants report that challenges to mobility impact their economic well-being

more than female participants. Interview data augmented our understanding of this finding. In a household with two adult partners, it appears it is more common for men to either learn to drive first, and, in many cases, remain the sole driver of the family. Men, according to interviewees, have greater need for and access to mobility than their female partners; this is related to men being more likely to become employed earlier than their partners. One interviewee told us: Men are the ones that are more mobile, and gender plays a role in that.

Mekdis, who is originally from Yemen, resettled with her family in 2005. She shared that her father received a driver's license two months after arriving in Tucson while her mother used the bus or waited for her father to provide a ride. Some of the gendered roles such as caretaking exacerbated the challenges of riding the bus.

When I was on the bus what I would notice for refugees is that when they have a lot of children it is difficult to watch over them. In that

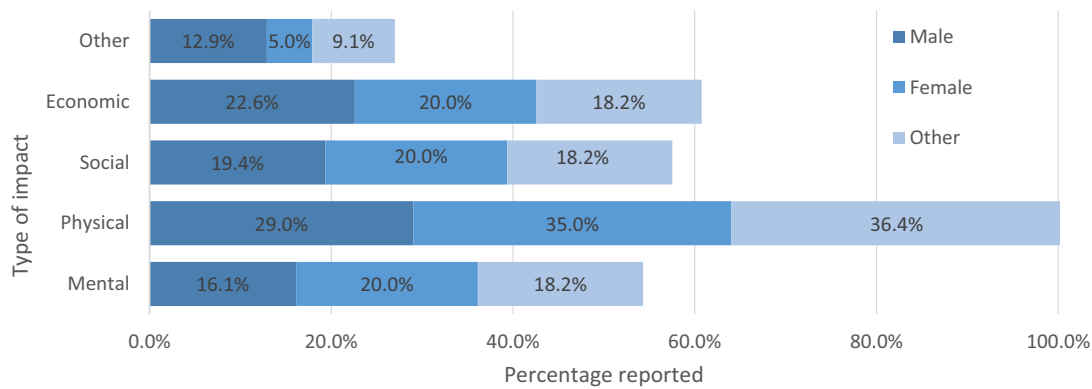


Fig. 4. Type of mobility challenge impact reported according to respondent (disaggregated by gender).

perspective they do struggle. It was difficult for baby strollers and to have all their kids in one hand. Some people are not patient sometimes and many people are not understanding. People were disrespectful on the bus - I feel like it might be cultural. The way they respond - we're not Muslim - but sometimes we like to wear a white head scarf and the way they acted towards [my mom] or other cultures... When [the bus driver] sees you, they might keep going.

After continued discrimination, Mekdis' mom stopped using the bus, which pushed her to rely on her husband for transportation. Survey data suggests that mobility challenges may contribute to relationship tension and issues. Dr. Barbara Eisworth, founder and executive director of Iskashitaa Refugee Network, echoed this sentiment, stating that the male parent becoming the first to drive is a "common phenomenon," adding that:

Everybody learns how to use the bus but then the husband uses the bus the most because he works the first job. He uses it a lot, and then the wife doesn't use it. Then he gets a car, and she doesn't use the bus at all, and she becomes completely dependent on the husband.

However, there was also a generational dimension we observed in terms of gender disparity. Younger women tended to more willing to take on driving earlier than their mothers. Constance from DRC said she could not wait to get her driver's license. She enjoys the freedom that comes with it. However, she also indicated that although it was her father who first learned to drive and got a vehicle, it was not a reflection of gender oppression. Rather, according to her, it was act of love and care on the part of her father. She explained that learning to drive is often dangerous and difficult and the fact that her father took it on himself first showed that he took his responsibility to take care for his family seriously.

Constance's insight allows us to see much more nuanced social relations than a simple number in a survey might suggest. While it is easy to make a subjective interpretation of the gender disparity based on survey findings, stories of people reveal affective and intimate matters within their microgeographies of everyday that are overlooked in an empirical study.

4.7. Echoes of trauma

Our survey and interviews did not ask questions related to past trauma so as to not retraumatize those we were interviewing. But echoes of trauma reverberated in stories of many individuals. Studies have indicated that many refugees suffer from trauma experienced prior, during and after migration, resulting in higher risk of mental health challenges (Hameed et al., 2019) which may impact skills needed to navigate a new transportation system. However, interviews again helped convey a more nuanced understanding of how trauma influences transportation post-settlement. In particular, several instances of trauma

associated with transportation or traveling in their pre-US life hint at why safety and control gained by vehicular travel might be desirable to this populations.

For example, one interviewee shared a childhood experience of spending time in a camp that abutted a game reserve with dangerous animals; his mother would repeatedly warn him not to stray too far to keep physically safe from wildlife. Another young man from Darfur mentioned that his brother at eight years old began fasting on their long journey to resettlement camp because they didn't have enough food even though he was still too young to start fasting in normal circumstances. Perhaps the most difficult and pertinent example of trauma associated with pre-settlement transportation was an interviewee from DRC who identified that getting lost was a barrier to using public transportation. Later in the interview, this participant spoke of trying to navigate an interim place as a pre-teen to source food for the family. The agency he and his brother had previously found for food had unexpectedly closed, so they searched for another food pantry as to not return without food. Eventually, lost and unable to articulate where their family was located, the police sent them to an orphanage where they remained for over a year before being reunited with adults in their family. These stories helped us better understand unique circumstances and vantage point from which each person is navigating various challenges their experience in Tucson.

4.8. COVID-19 impacts on mobility

The layered challenges experienced by Tucson's refugee communities were exacerbated during the COVID-19 pandemic. Many refugees work in essential services including hotels, nursing homes and hospitals. The broader social stress was more acutely experienced by those who worked in frontline roles. Some informants reported that their entire household and multi-household extended family had been infected with the virus. Others lost employment. The lockdown measures and stay home orders made it hard for refugees who rely social network and community network to navigate various daily challenges. Stresses related to COVID-19 thus exacerbated mobility barriers and the means to access essential and nonessential destinations. One interviewee revealed:

It is harder because people have to rely on public transportation just to get around. People are more exposed to getting it [COVID-19] ... It is harder because refugees work in riskier areas and therefore you are relying on public transportation or other people to come and take you. You don't know where they have been.

This sentiment was shared by another interview participant, who fled with his family from Iraq to live in Aleppo, Syria for four years before being granted refugee status. Using the Sun Tran bus was "very stressful" as a result of language barriers, difficulty accessing bus passes, and frustration interpreting bus routes and relying on inconsistent bus

schedules. These challenges were compounded by COVID-19, making it “much harder to move.”

4.9. Resilience and social capital

Despite the disparate challenges refugees experience related to their mobility, our research also reveals the importance of social network and community support systems that are critical in mitigating different challenges individuals and families have encountered. One recurring theme is the importance of social capital or the ability of an individual to access various resources within a particular social network (Bourdieu, 1985). It is similar to what Urry ((Urry, 2012) calls “network capital” or “the real and potential social relations” that are fostered by mobilities.

Our data indicates that these social networks operate as a type of microgeography connecting people, forging relations and sustaining support for each other. These networks are at times maintained among people who share ethnic and cultural backgrounds, and other times they transcend cultural, religious, linguistic and racial differences. Some of the networks referenced in our interviews arose within pre-existing, local community groups, such as religious organizations and recreational soccer groups, and others were developed specifically by refugee resettlement agencies. Pastor Safari said that both before and during the COVID-19 pandemic, he has driven or lent his car to refugees that request it. Another interview participant corroborated the importance of community institutions and networks in aiding refugee mobility:

A lot of people rely on the church to rely on these things because it's really hard when you don't know the language. A lot of times they're not able to get help from people to help so they get help from the church.

Carpooling is one of the common ways refugees to meet with their transportation needs. This is consistent with other studies that reveal that immigrant residents are significantly more likely to rely on carpooling than the US-born residents. (Bose, 2014; Blumenberg and Smart, 2014). In a separate interview a woman from Ethiopia recounted:

Even during the hard times with only my dad working or only him having a car, he would still go around helping others. My family would make food for the new refugees or have people come over to the house to help new refugees. What [my parents] have given, they give the same back.

Resettled from DRC in 2008 with fluency in French but no understanding of English, Ishara explained that members of the Tucson refugee community have continued to support each other – even if members are personally unfamiliar with each other. He said:

To get places during the pandemic, people pick up those without cars. I'm giving rides to people that I don't know.

Social networks are routinely maintained across time and space. We learned that refugees who have settled in Tucson take it upon themselves to support newly arriving refugees, especially those come from the same country of origin or mutual church group. Some refugees use these networks to access transportation to essential destinations including places of employment, the grocery store, social events that provide a sense of belonging, and even to practice driving before testing for a driver's license. Often case, refugees rely on their network capital instead of the formal transit system.

5. Conclusion

This study sheds light on the mobility of resettled refugees and their experiences with Tucson's geography and transportation options. Quantitative findings from a survey revealed barriers common to those experiencing transportation disadvantage. Qualitative data from interviews, however, augments those findings with rich, illustrative stories of cultural norms, trauma, and disparate impacts by gender that

contextualize the intersectional lived reality of refugees. These lived experiences help identify common challenges and thus can be used to develop strategies and recommendations to improve the experience of Tucson refugees around mobility and transportation.

Challenges faced by Tucson refugees are widespread. A need for effective and efficient transportation is a key factor in finding and maintaining employment, which is especially critical for refugees who used a travel loan to resettle and are required to begin loan payments six months after arrival in the US (New York Times, 2019). The Sun Tran bus system was identified as a lifeline for newly resettled refugees, as well as a system that is challenging for many refugees. Language barriers, expensive bus fares, confusion around routes, and infrequent and inconsistent arrival and departure times were reasons that refugees avoided or expressed negative attitudes towards the Sun Tran bus system. Our study is situated in Tucson with a fairly good public transportation system; many other mid-size cities in the US that commonly accept refugees have less bus accessibility. If our findings around bus usage are generalizable, much more needs to be done to remove financial and logistical barriers that were often described by refugees in accessing public transportation.

Results from our survey suggest that transportation and mobility challenges are associated with poor sense of wellbeing and specific feelings of anger, frustration, sadness, and a longing for homeland. These feelings and the challenges refugees experience have gendered components. It is common for male members of the household to begin driving earlier than their female counterparts, starting a cycle of dependency and/or isolation. Women, especially those who are older and do not speak English are particularly prone to becoming dependent on the male members of their households. It is, however, instructive to see beyond the façade of gender disparity. Rather than seeing this disparity as a case of female oppression, our respondents suggested nuanced mediating factors such as care, responsibility and self-sacrifice.

This research identified a variety of strategies that have been developed in refugee networks to mitigate post-resettlement mobility challenges. We routinely heard about the importance of social connections, especially between refugees from the same or nearby countries of origin, plays a vital role in navigating not only transportation and mobility, but the experience of resettlement in Tucson. Refugee networks provide opportunities for transportation via carpool or loaning one's car; assistance finding employment; and giving entry points into new social circles such as religious organizations or shared ethnic group networks. Similarly, our research documents the ways in which unpleasant experiences on public transportation resonate with experiences of trauma in home countries. Resettlement agencies may have a role in sensitizing local transportation officials to the need for cultural humility in their interactions with refugees. A transit-focused public awareness campaign celebrating diversity might assist transit operators and riders practice patience and civility.

While generally beyond the scope of this article, we also asked interviewees about recommendations for improved transportation. Recommendations by interviewees themselves tended to be organized around the need for a public transportation system with more destinations, more buses, increased bus departure and arrival frequencies that is more navigable and intuitive for some of Tucson's newest residents. As a team, we note that refugee organizations and transit agencies occupy a unique space to help orient newly arrived refugees to the transportation system. We also repeatedly heard that transit fare remains a barrier to refugees long after resettlement; the cost of public transportation could be alleviated by broader fare-free policies that are designed for easy access by refugees.

Transportation challenges are not equally experienced in our society. Refugees share many of the characteristics with other transportation disadvantaged populations such as low vehicle ownership, high unemployment, low household income, English as a second language, and racial or cultural identifiers that result in microaggressions and even discrimination. This study demonstrates the extent of those challenges

specifically for refugees. Our findings also elevate the intersectional nature of the refugee's experience, hinting that past trauma associated with travel and transportation itself may result in unique barriers to accessing the transportation system. Poor transportation access may also result in additional erosion of mental health and well-being in a population that has been well documented to be at high risk. Thus, we affirm that the intersectional needs of refugees are unique and warrants continued research; hopes summarized by Pastor Safari:

I hope that there can be a very reliable transportation for refugees that will give them more trust and peace of mind. If they feel like someone is caring for them then that would be a huge help.

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CRediT authorship contribution statement

Chandler Smith: Methodology, Investigation, Project administration, Visualization, Resources, Data curation, Formal analysis, Supervision, Writing - original draft, Writing - review & editing. **Orhon Myadar:** Supervision, Conceptualization, Methodology, Funding acquisition, Resources, Formal analysis, Writing - original draft, Writing - review & editing. **Nicole Iroz-Elardo:** Investigation, Formal analysis, Writing - original draft, Writing - review & editing. **Maia Ingram:** Investigation, Formal analysis, Writing - original draft, Writing - review & editing. **Arlie Adkins:** Methodology, Funding acquisition, Validation, Writing - original draft, Writing - review & editing.

Data availability

The data that has been used is confidential.

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