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ORIGINAL ARTICLE

Mapping Juvenile Justice: Identifying Existing Structural Barriers to Accessing Probation Services

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Highlights

- A novel, interdisciplinary approach to explore systemic disparities impacting system involved youth.
- We use GIS methods to explore structural and spatial barriers that may hinder youth responsivity.
- Justice-involved youth are faced with various spatial and structural barriers to probation services.

Abstract The majority of justice-involved youth are placed on probation; however, many of those same youth struggle to comply with probation requirements and are subsequently confined. In Baltimore, 20% of newly committed youth were detained for violations of probation. While there are various reasons youth fail to comply with probation requirements, there have been recent calls to consider the impact of structural and spatial barriers to accessing probation programs and services. Centering the goals of community psychology, we aim to identify how existing structural barriers in Baltimore City may be contributing to social injustice through *inequitable* access to probation services for youth and their families. In this study, we take a novel, interdisciplinary approach to identify structural or spatial barriers facing justice-involved youth in Baltimore, MD. Specifically, we explore transportation barriers (i.e., vehicle access) and spatial disparities between youth residences and probation office locations. Our findings suggest that there are several barriers facing Baltimore's justice-involved youth that may impact access to and engagement with juvenile probation. Specifically, we found that 1 in 3 youths reside in areas with extremely low levels of vehicle access and where the median household income is 25% below the city median. We also find that the majority of youth live beyond walking distances; many would require lengthy transit commutes. These findings highlight the structural and spatial barriers facing justice-involved youth that may impact access to and engagement with probation services.

Keywords Juvenile probation · Transportation barriers · Responsivity · Geography · Juvenile justice

Introduction

Juvenile probation is the most commonly assigned disposition within the juvenile justice system (Puzzanchera, Adams, & Hockenberry, 2012). The objective of juvenile probation is to hold youth accountable while simultaneously providing youth and their families with community-based rehabilitative programs and services. While probation or community supervision is often used as an alternative to confinement (i.e., being detained pre- or post-adjudication), when youth do not comply with probation requirements—by incurring new charges or technical violations—they can have their probation revoked and be confined. Technical violations are distinct from delinquencies or new charges; instead, technical violations are incurred when court-mandated requirements are not met (Sedlak & Bruce, 2010). Youth may incur technical violations by not attending school, missing curfew, failing to appear for probation review hearings or treatment, among other things (Sedlak & Bruce, 2010). Successfully adhering to all probation requirements is not a simple task and can result in severe consequences. Indeed, a recent study of youth on probation in Philadelphia, PA found that just over 50% of all youth failed to comply with the terms of their probation; 48% of the youth who technically violated subsequently had their probation revoked and were

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committed or detained to a facility (Nemoyer et al., 2014). Philadelphia is not unique in detaining youth for technical violations; national census data from 2013 to 2017 show that between 19 and 24% of all youth in detention were detained for technical violations (Sickmund, Sladky, Kang, & Puzzanchera, 2019). It is essential to highlight that this may be youths' first experience in confinement. In Baltimore, MD, 20% of all *first-time commitments* resulted from technical violations of probation (Maryland Department of Juvenile Services, 2018).

While there are many potential reasons why youth may struggle to comply with probation requirements, much of the research has focused on individual-level factors to the exclusion of more structural explanations. Research consistently shows certain youth-specific risk factors, such as race, are associated with technical violations and non-compliance (Farrell et al., 2015; Kapoor, Peterson-Badali, & Skilling, 2018; Nemoyer et al., 2014; Smith, Rodriguez, & Zatz, 2009). However, scholars and advocates alike have begun to acknowledge the potential impacts of contextual or structural factors on youths' ability to engage with and access services (e.g., Amani et al., 2018; Harvell et al., 2018; Rodriguez, 2013; The Annie E. Casey Foundation, 2018). The values guiding community psychologists encourage us to not only consider the role of the individual but to broaden our focus by accounting for the impact of systemic and structural barriers. From this perspective, we hope to explore where existing structural inequities may be exacerbating or perpetuating the disproportionate impact of the criminal legal system on communities of color and disadvantaged communities. In the present study, we acknowledge that youth and their families, especially those from disadvantaged areas, may face structural or spatial barriers that impede equitable access to probation programs. We rely on a novel, interdisciplinary approach to explore the spatial mismatch between where justice-involved youth reside and probation locations in Baltimore City as well as the structural barriers that are present in those areas. Identifying underserved areas and structural barriers may aid probation departments in reducing barriers to access for justice-involved youth. These data allow us to begin to explore whether justice-involved youth in Baltimore City are faced with structural or spatial barriers that can hinder access to probation programs, ultimately impacting the potential effectiveness of those programs.

The Importance of Contextual Factors: Structural and Spatial Barriers

While much of the research on juvenile probation compliance focuses on youth-specific risk factors such as race, ethnicity, age, or gender, scholars are beginning to recognize the potential impacts of structural factors on experiences of juvenile probation. For instance, it was recently found that youth who failed to appear at probation review hearings were likely to have their probation revoked and to be confined to a facility (Nemoyer, Brooks Holliday, Goldstein, & McKitten, 2016). Of course, it is possible that youth who are struggling on probation may fail to appear because they want to avoid potentially aversive hearings (Ebata & Moos, 1991). However, the authors argued another possibility is that youth from disadvantaged backgrounds may face barriers to meeting their probation requirements, such as not having access to a vehicle or having to pay for public transportation (Nemoyer et al., 2016). Other scholars have come to similar conclusions; for instance, Smith et al. (2009) found that probation non-compliance was associated with neighborhood-level socioeconomic status. Therefore, it is possible that youth from disadvantaged neighborhoods—historically redlined neighborhoods or neighborhoods without city-directed investment—may experience more difficulty accessing programs, services, and even court hearings than youth from neighborhoods marked with more city-directed investment.

The roll-out of redlining in the 1930s, which forbade federal loans in primarily black and brown urban neighborhoods—deeming those neighborhoods, and those living in them, hazardous or declining—is a primary driver of many American interurban spatial differentiation (Aaronson, Hartley, & Mazumder, 2017; Massey & Denton, 1993; Squires, Velez, & Taeuber, 1991). This spatial differentiation through market manipulation, combined with city-directed capital investment through targeted public finance and public policy, are primary drivers of uneven development of the city (Walker, 1978). Continued failure at the federal level to institute and fund public housing and the neoliberal shift in public housing policies exacerbated this unevenness (Goetz, 2013). More recently, the unevenness and resulting neighborhood poverty are augmented by "backwash" effects, which produce cumulative causation—a feedback cycle—in declining incomes and declining public services (Fujita, 2007; Myrdal, 1957). Local municipalities and agencies responsible for public services in more impoverished neighborhoods have both higher operating costs and lower revenue. The resulting public service in those neighborhoods is not only of significantly inferior quality, but it ultimately entrenches neighborhood poverty by deteriorating capacity for equity building or social mobility. These changes ultimately reduce the attractiveness of those neighborhoods to city-directed investment, potential residents, or new business operations, further driving the increase in poverty and reduction in public service quality (Joassart-Marcelli, Wolch, Alonso, & Sessoms, 2005). Seeking to address the

legacy of racist market manipulation and the inherent unequal distribution of power and resources, scholars and activists have engaged in a vigorous discourse around mobility justice incorporating elements of sustainability, bicycling, and health (Behrsin & Benner, 2017; Golub & Martens, 2014; Hoffmann, 2015; Mahmoudi, Lubitow, & Christensen, 2020; Martens, Golub, & Robinson, 2012; Pereira, Schwanen, & Banister, 2017).

Structural Barriers May Limit Responsivity

It is possible that contextual factors, beyond individual-level factors, may impact access and responsivity to treatments. Current best practices follow a risk needs responsivity model (RNR) of rehabilitation, which proposes that interventions are most effective when they match a youth's individual need and capacities (Andrews & Bonta, 2010; Andrews, Bonta, & Hoge, 1990). First, the *risk* principle posits that people at higher versus lower risk of offending benefit from differential approaches. For example, whereas higher-risk cases may benefit from more intensive intervention, lower risk cases may experience better results with little to no intervention (Andrews et al., 1990). Second, the *need* principle highlights which criminogenic, amenable *risk factors* should be the focus of the intervention. Specifically, interventions should focus on those risk factors that are highly predictive of recidivism (Kapoor et al., 2018). Finally, and importantly for the focus of this paper, the third aspect of the RNR model is the *responsivity* principle, which speaks to ensuring that youth will be able to engage with and respond to the intervention (Taxman, 2014). Initially, assessing responsivity to treatment meant accounting for an individual's level of maturity, personality, or learning styles when matching with appropriate treatment (Andrews et al., 1990). More recently, though, there has been an expansion to how responsivity is conceptualized in the literature (Bonta & Andrews, 2007; Kapoor et al., 2018; Taxman, 2014).

Several have argued for a broader consideration of individual, contextual, and systemic factors that also impact someone's level of responsivity to treatment (Bonta & Andrews, 2007; Kapoor et al., 2018; Taxman, 2014). Recently, studies have begun to identify factors that may impact youths' responsivity to treatment, such as their perceptions of probation (Fine, Fountain, & Vidal, 2019) or exposure to traumatic experiences (Holloway, Cruise, Morin, Kaufman, & Steele, 2018). However, contextual or systemic factors may also impact an individual's level of responsivity to treatment (Bonta & Andrews, 2007; Taxman, 2014). For community psychologists, understanding how contextual and systemic factors may create inequitable access to services is key to identifying how systems can respond to such inequities in the goal for social justice. Systemic factors, such as having an inadequate number of programs addressing the needs of justice-involved youth, may serve as a barrier to treatment (Taxman, 2014). Additionally, family or lifestyle factors may also impact access to services (Kapoor et al., 2018). For instance, Bonta and Andrews (2007) argue that court-involved parents may require childcare in order to attend court-mandated treatments, which may apply to youth as well. Applying a similar logic to justice-involved youth requires considering if they are licensed or have access to a vehicle, if they rely on their parents for transportation, or if they require subsidized transportation. These factors have recently been shown to impact youth engagement; specifically, youth may have lower rates of participation in probation programs when parents are unable to participate or provide transportation (Kapoor et al., 2018). It may also be essential to consider the youth's broader context such as level of economic security, which may impact compliance and rates of reoffending (Kapoor et al., 2018; Smith et al., 2009). RNR requires that effective interventions are responsive to youths' abilities to engage with programming (Harvell et al., 2018). Furthermore, principles of community psychology posit that without equitable access we fail to achieve social justice. Probation departments must first ensure that youth can reasonably access court-mandated programs before expecting that youth can actively engage with and potentially benefit from services.

The Impact of Structural Barriers on Families of Justice-Involved Youth

Overlooking barriers to access can place additional burdens on youth and their families and reduce the likelihood that they may benefit from rehabilitative programs which may lead to increasing inequities. Parents are often expected to help their children adhere to court-mandated or probation requirements (Fountain & Woolard, 2020; Maschi, Schwalbe, & Ristow, 2013; Osher & Hunt, 2002); however, families may struggle to do so without additional support. Amani et al. (2018) conducted focus groups with juvenile court staff including advocates, defense attorneys, and clinicians and found that families struggled to meet court-mandated requirements as a result of being overextended and lacking the necessary resources to meet requirements. Parents were overburdened by competing priorities (e.g., job, caretaking responsibilities) and having to coordinate multiple probation-related appointments at various locations (Amani et al., 2018). Indeed, youth on probation are not only expected to meet with probation officers but may also be expected to concurrently comply with as many as nine probationary requirements (Nemoyer et al., 2014). Amani et al. (2018) found that probation officers were aware that parents' competing responsibilities could often interfere with their ability to

drive their child to probation meetings. They even acknowledged that non-compliance was often a result of parents being unable to provide transportation. However, instead of offering transportation support, they found that probation officers attempted to "remove structural barriers" by encouraging parents to seek transportation assistance from a family member or neighbor (Amani et al., 2018, p. 483). While probation officers were aware of and chronicling existing structural barriers, parents—not probation departments—bore the responsibility of finding solutions and eliminating barriers.

Advocates and scholars alike have highlighted the importance of addressing barriers to specific responsivity factors that may impact youths' ability to access court-mandated and probation requirements. For example, some have suggested that probation practices and policies should address families' needs by holding meetings where youth can quickly attend or by providing transportation for youth and families (Harvell, Rodas, & Hendey, 2004; Maschi et al., 2013; Rodriguez, 2013). Furthermore, in 2018, the Annie E. Casey Foundation proposed juvenile probation reforms to reduce the disproportionate effects of probation revocation and subsequent confinement on youth of color. To achieve this, they recommend that juvenile probation departments should conduct *geographic mapping* to identify spatial disparities between youth and service locations (The Annie E. Casey Foundation, 2018). Although there have been recent calls to identify and address spatial disparities, to our knowledge, research has not yet investigated spatial disparities or barriers to transportation that might affect access to probation locations.

Baltimore as a Site

Baltimore city, as a site of research and a place for the everyday lived experiences of justice-involved youth and their families, is an ideal site to study structural and spatial barriers affecting justice-involved youth. The city has high levels of segregation along the lines of both income and race in part due to a long history of uneven development as a prototype and progenitor for racial covenants (Pietila, 2010). Further, the recent uprising after the death of Freddie Gray in 2015 renewed local unrest and brought national attention to racial and spatial injustices associated with uneven and targeted policing (Patton, 2017; Pinard, 2014). Baltimore also has a long history of transit injustices associated with racially charged demolition for highway development (MacGillis, 2016). In 2015, Governor Hogan vetoed funding for a much-anticipated east–west rail line to improve the city's rail network and instead redirected the funding to build an east–west rail line in Maryland's portion of DC suburbs and to build road projects throughout the rest of the state (Dresser & Broadwater, 2015). While justice-involved youth in Baltimore City are provided with transit fare to meet with probation officers, youth are not compensated for travel to visit other probation-related services (e.g., substance treatment facilities); additionally, there is still the matter of having to rely on unreliable transit (Central Maryland Transit Alliance, 2018). Despite efforts in 2017 to update the transit system to be more equitable and reliable for Baltimore residents, a recent report examining the changes made to the transit system found that bus reliability was still a significant problem in the city. In a recent draft proposal to revise Central Maryland's transit, the Maryland Department of Transportation acknowledged the woeful reliability of transit services and that poor reliability is one of the main reasons users do not use transit (Maryland Department of Transportation, 2020, p. 21). Specifically, only a third (32%) of major city bus lines and 42% of local lines arrived within −1/+5 minutes of the proposed window of time (Central Maryland Transit Alliance, 2018). In one observation, they observed the comings and goings of buses during a two-hour period at a particular stop. Eight buses were scheduled to arrive every 14–20 minutes, but they only witnessed this happening 29% of the time, and one bus failed to arrive at all. Reliable transit also has important implications for education attendance in Baltimore, which is often a requirement of probation compliance.

The Present Study

As a first step to understanding how spatial and structural barriers impact the equitable distribution of services and responsivity to treatment, the current study takes an exploratory approach to determine whether there are spatial disparities and structural barriers between where youth reside and the Department of Juvenile Services' (DJS) locations in Baltimore City, MD they are expected to visit. Our primary goal was to geolocate DJS locations and identify if they are evenly distributed across the city, such that there would be no underserved areas based on distance and public transportation access. To do this, we relied on geospatial analysis to map the spatial disparities between DJS locations and residences of justice-involved youth. Our secondary goal was to geolocate where justice-involved youth reside and to categorize those residences by differential levels of car access, public transportation access, and income level. To do this, we combine the previously mapped data with census data to better understand structural barriers that may produce uneven access to services.

These goals allow us to explore if there is an *equitable* distribution of service locations that justice-involved youth are required to access while accounting for any potential economic disparities. One of the primary values within community psychology is that all individuals have the same opportunities for engagement. In the context of community supervision, this would imply that all youth have access to

the services required to facilitate success on probation and subsequent reentry into the community. Inequitable access may compound existing racial and economic disparities found in juvenile justice systems by increasing the likelihood of non-compliance for some youth. In other words, youth without access to a car may experience greater barriers to meeting probationary requirements therefore making probation success more difficult and unlikely. The current study leverages geographic mapping data to identify potential gaps that may lead to greater economic and racial injustice stemming from justice system involvement.

Method

Data and Participants

We used publicly available residential address data from justice-involved youths' case records to map their residences. Because juvenile justice case records are not publicly available, we relied on data of youth tried as adults in Baltimore, MD as a proxy to determine where justice-involved youth live. While this group will serve only as a proxy for juvenile justice-involved youth, both groups are somewhat similar due to a majority of youth tried as adults in Maryland being transferred back to juvenile court (Goldstein & McMullen, 2018). A recent report by the Abell Foundation found that over two-thirds of youths' cases that began in adult court were ultimately heard in juvenile court (Goldstein & McMullen, 2018).

We gathered data of youth tried as adults in Baltimore, MD, from October 2016 to October 2019 using Maryland's online Judiciary Case Search. We searched for cases alphabetically and by year using the criteria party type = defendant, case type = criminal, county = Baltimore City, and limited filing dates to one-year intervals. Then, we sorted the data by date of birth to identify cases where the defendant was under 18 on the date of filing. This case search resulted in 130 unique adolescents tried as adults between the ages of 13 and 17 (M = 16.6, SD = 0.7) at the time their case was filed. We then documented the youths' reported addresses, age, and date of birth. Using an address geolocator constructed from a Maryland state road shapefile, we determined the latitude and longitude for justice-involved youth residences. We corrected incomplete or inaccurate addresses where necessary.

Measures

Income Data and Redlining Data

We used U.S. Census data on Median Household Income from the American Community Survey 5-year sample for 2013–2017 in 2017 inflation-adjusted dollars. We used the 5-year sample at the block group level to address issues of data reliability and reduce the margin of error that is endemic in smaller census geographies.[1] To investigate the overlap between current median household income and historical market manipulations, we marked block groups whose centroid are within the 1937 Home Owner Loan Corporation's ratings of the federal loan risk for categories labeled C or D (Declining or Hazardous).

Vehicle Data

We used U.S. Census data on Aggregate Number of Vehicles Used in Commuting by Workers 16 years and Over by Sex from the data from the American Community Survey 5-year sample for 2013–2017 at the block group level. We summarized the data for all workers to determine whether or not workers had access to vehicles as a proxy to household access to vehicles. To provide context, 4.6% of workers in the broader Baltimore–Columbia–Towson Metropolitan Statistical Area do not have access to a car (U.S. Census Bureau, 2019). Block groups where up to 10% of workers do not have access to a car—selected because a 10% cutoff represents up to approximately double the metro average—we consider to be "near" the metro average. In total, one-third (n = 67; 33.5%) of block groups were in this category. We categorized block groups where 10% to 20% of workers do not have car access as having "low" car access (n = 56; 28%). This category represents two to four times as many workers as the metro average reporting that they do not have access to a car to get to work and *must* rely on other forms of transportation, increasing the stress on other forms of transportation infrastructure. We categorized block groups where 20%–30% of workers do not have car access as having "very low" car access (n = 58; 29%). Lastly, we categorized block groups where more than 40% of workers do not have car access as "extremely low" car access (n = 19; 9.5%).

Walking and Transit Time Data

We used the Bing Maps Application Programming Interface (API; Microsoft, 2019) to determine the distance that one walk or take transit, from a particular address along a street network. We selected Tuesday at 3:00 PM to

[1] We used the most recently available 5-year ACS data and compared with the most recently available cases. The two-year overlap in the data (2016 and 2017) is sufficient to identify urban spatial patterns in Baltimore regardless of the imperfection in the yearly overlap. Per warning from the Census Bureau, we chose not to use the 1-year ACS data (e.g., for 2017) because of the significantly larger margins of error.

approximate after school traffic and transit availability. According to the literature, Americans are not likely to walk more than 20 minutes (about a mile) to access urban amenities, travel to work or school, or for leisure (Yang & Diez-Roux, 2012). We centered our analysis on 20 minutes, half this distance to denote the distance one is most likely to walk instead of drive (10 minutes), and double this time to denote distances that most people would likely drive if the means were available (40-minutes). Using a script, we queried the API with the latitude and longitude of DJS Offices and created GIS-accessible shapefiles with a polygon showing the range that a person could travel, one for walking (walk-shed) and one for transit (transit-shed), in the provided time periods of 10, 20, and 40 minutes.

Analysis

Using QGIS 3, we combined data from our multiple sources. To address the fact that some walking distances were farther than transit distances, we merged the resulting transit and walking geographies from each time increment of 10, 20, and 40 minutes into a single geography that included data from both transit and walking modes of transportation in an effort to provide a more accurate picture of "transit" geography. We used block groups as a geography to summarize the data and describe the neighborhoods in which justice-involved youth residences were located.

Results

What are the Structural Barriers Facing Justice-Involved Youth?

Median Household Income

The median household income is $46,641 in Baltimore City, MD and $78,916 across the state of Maryland (U.S. Census Bureau, 2019). The majority of justice-involved youth sampled (n = 105; 81%) lived in areas where the median household income fell below the Baltimore City median. All youth lived in areas where the median household income fell below the state's median level (Fig. 1).

Access to a Vehicle

The majority of justice-involved youth sampled (n = 109; 84%) lived in areas where workers did not have car access at rates higher than the near metro average (Fig. 2). Specifically, about 50% of justice-involved youth live in areas marked by low to very low car access or where 10–30% of workers do not have access to a car. Additionally, 35% of justice-involved youth live in areas with extremely low car access such that up to 70% of families do not have access to a car.

Multiple Structural Transportation Barriers

Approximately a third (35%) of youth sampled live in areas where the median household income falls below $35,000 and where over 30% of workers do not have access to a car. Additionally, 25% of youth live in areas where the median household income is between $35,000–$45,000 and where there is "low" car access (0.5–1 in 5 families do not have access to a car).

What are the Spatial Barriers Facing Justice-Involved Youth?

Walking Distance to DJS Locations

There are five juvenile probation offices (including the juvenile courthouse) located across Baltimore City. Most justice-involved youth are located beyond more than double what the distance of a typical walk (a typical walk being 10 minutes, see Yang & Diez-Roux, 2012). Specifically, 94% of justice-involved youth live more than a 20-minute walk, and 72% of justice-involved youth live more than a 40-minute walk from DJS probation offices (Fig. 3).

Transit commutes to DJS locations

The majority of youth can access DJS probation offices by bus or train in 40 minutes or less (Fig. 4). Specifically, 18% can access DJS probation offices in 20 minutes or less, and 65% of youth require a 20- to 40-minute commute each way. However, 16%, or 1 in 6, youth were required to commute more than 40 minutes each way to meet with their probation officers.

How Many Justice-Involved Youths are Affected by Both Structural and Spatial Barriers?

Youths that live in areas marked by low car access are likely expected to walk or use public transportation to meet with their probation officer. Therefore, we wanted to identify how many youths are simultaneously living in areas with low levels of car access *and* require long commutes to probation offices (Table 1).

Lower Car Access and Large Walking Distances

The majority of youth (78%) live outside of walking distance (more than 20 minutes) from DJS and in areas

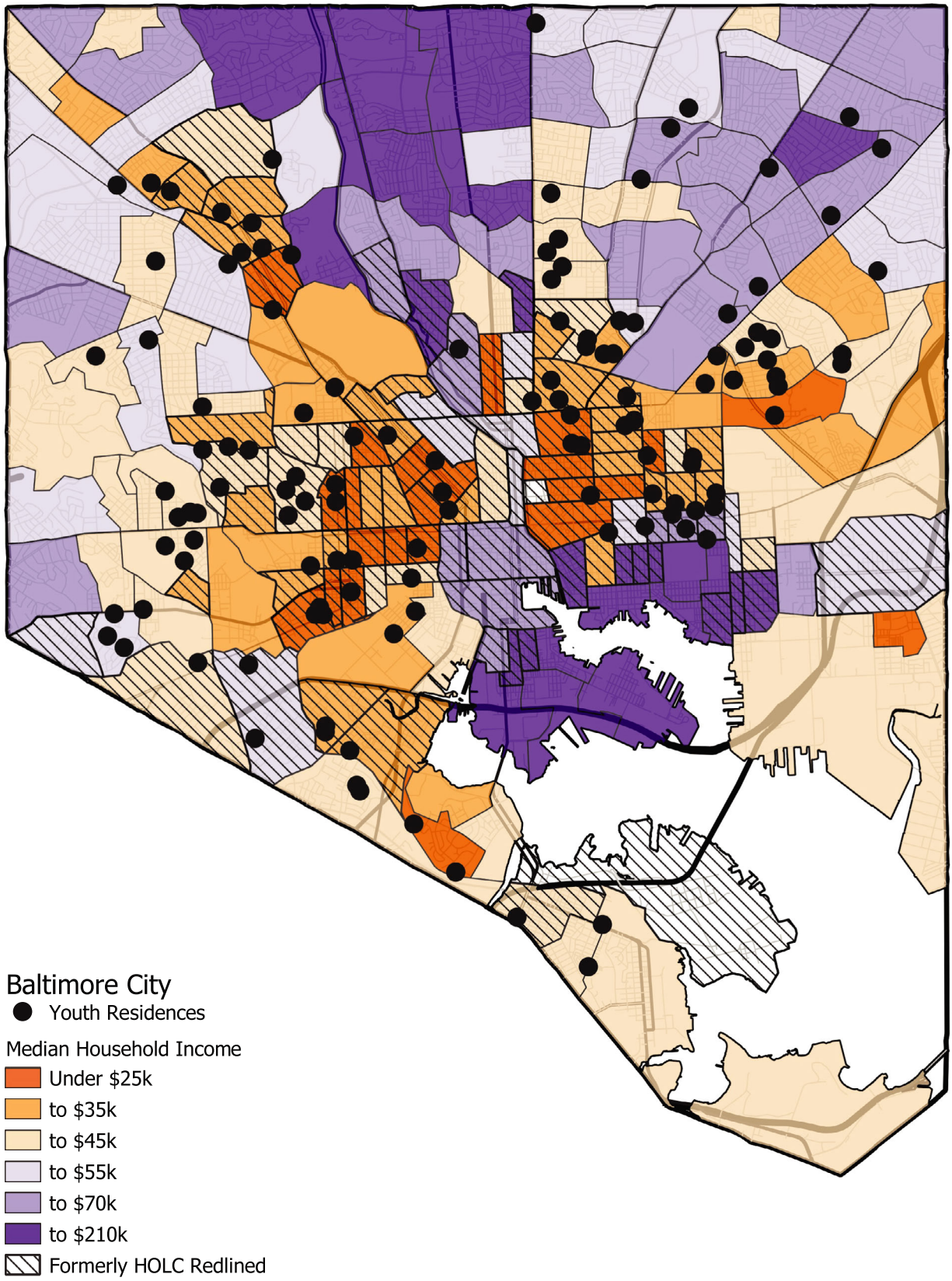

Fig. 1 Median Household Income across Baltimore, MD (U.S. Census, 2013–2017). This map shows the locations of justice-involved youth along with the median household incomes by census block group. Block groups with diagonal lines are formerly redlined spaces in Baltimore, MD [Color figure can be viewed at wileyonlinelibrary.com]

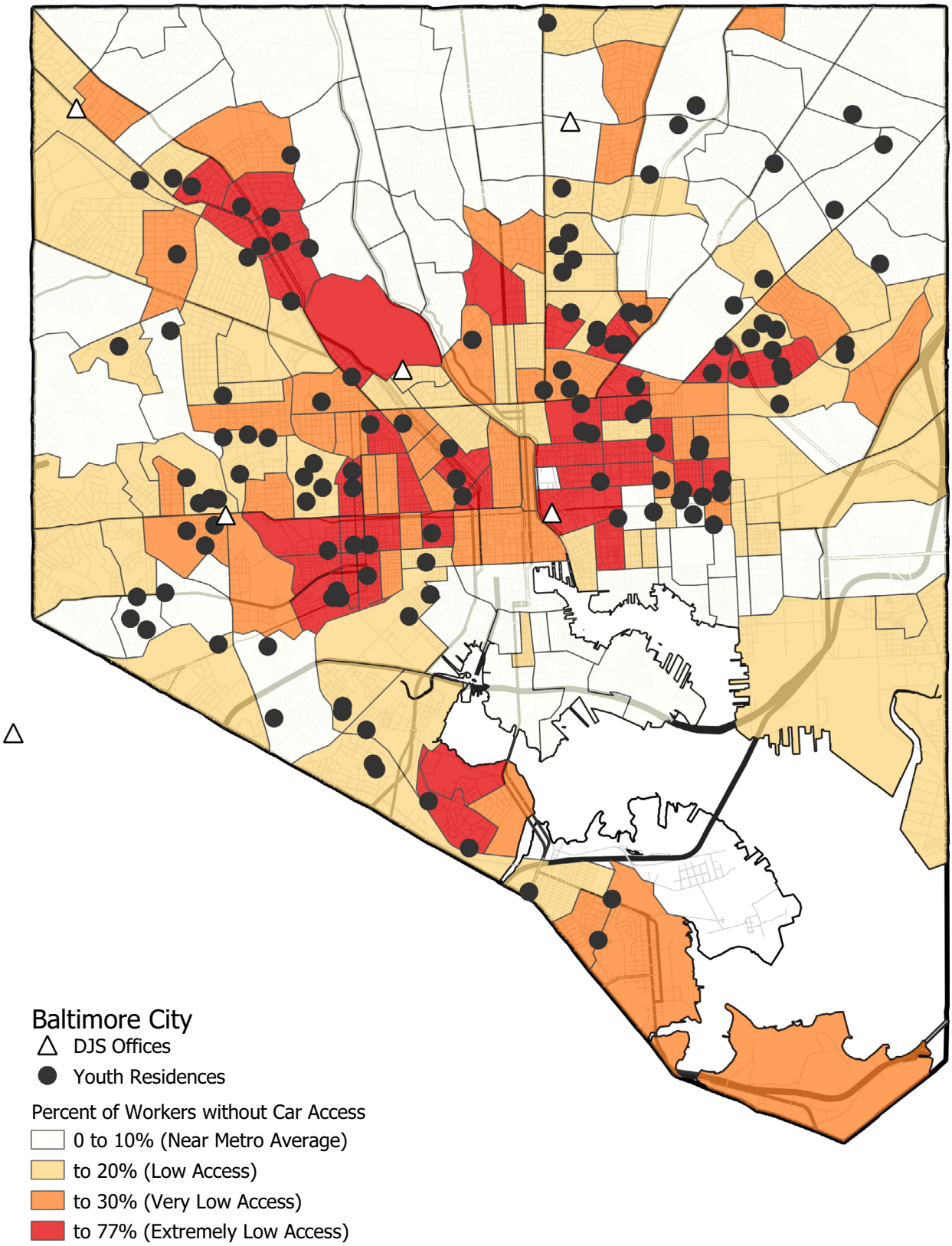

Fig. 2 Map of Areas in Baltimore City with Varied Levels of Vehicle Access (U.S. Census, 2013–2017). This map shows the locations of justice-involved youth along with the percentages of households without access to a vehicle per census block group [Color figure can be viewed at wileyonlinelibrary.com]

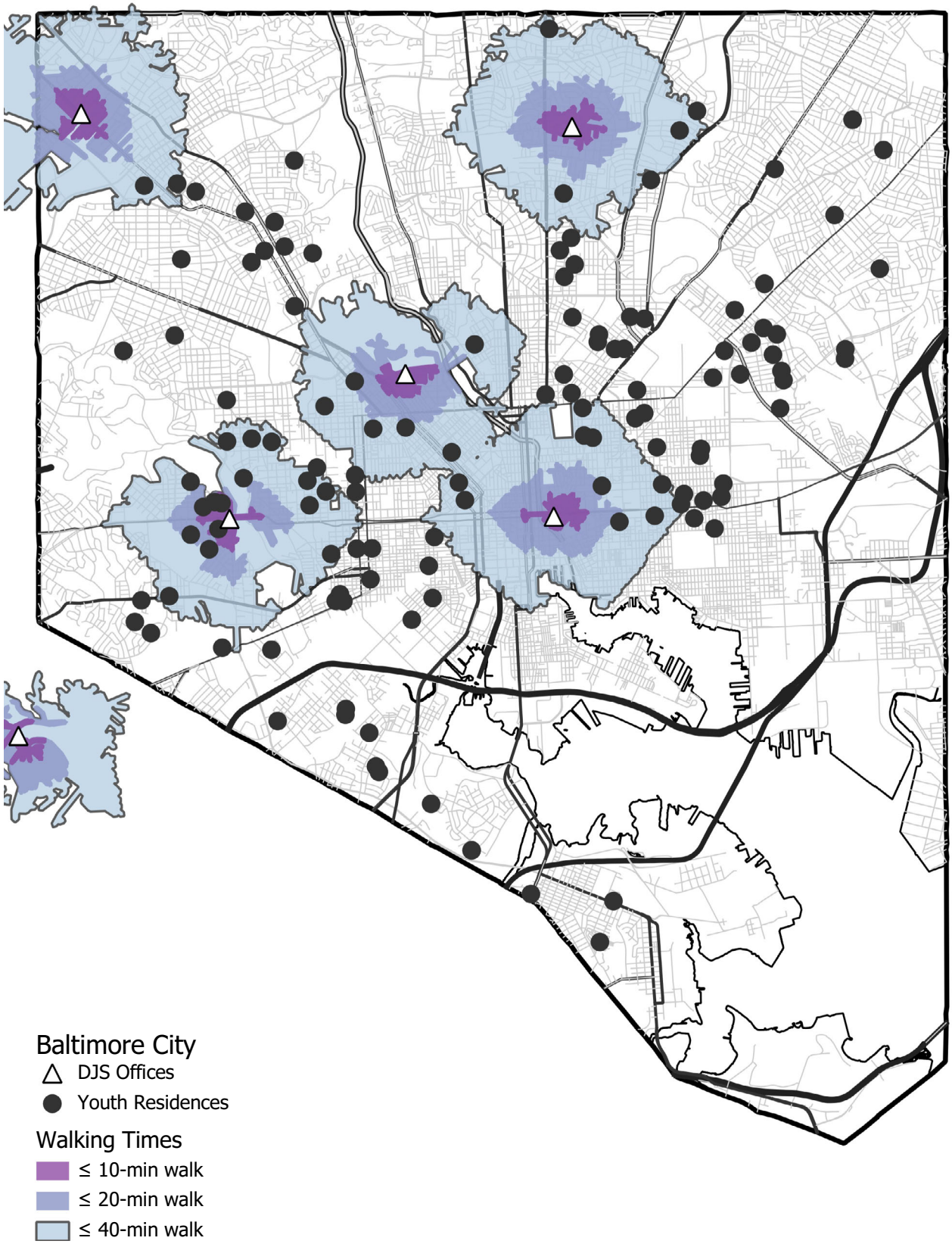

Fig. 3 Walking Isochrones from DJS Probation Offices (U.S. Census, 2013–2017). This map shows the walking distances from DJS locations in 10-, 20-, and 40-minute time increments. This map also shows how many justice-involved youths reside within those walking distances [Color figure can be viewed at wileyonlinelibrary.com]

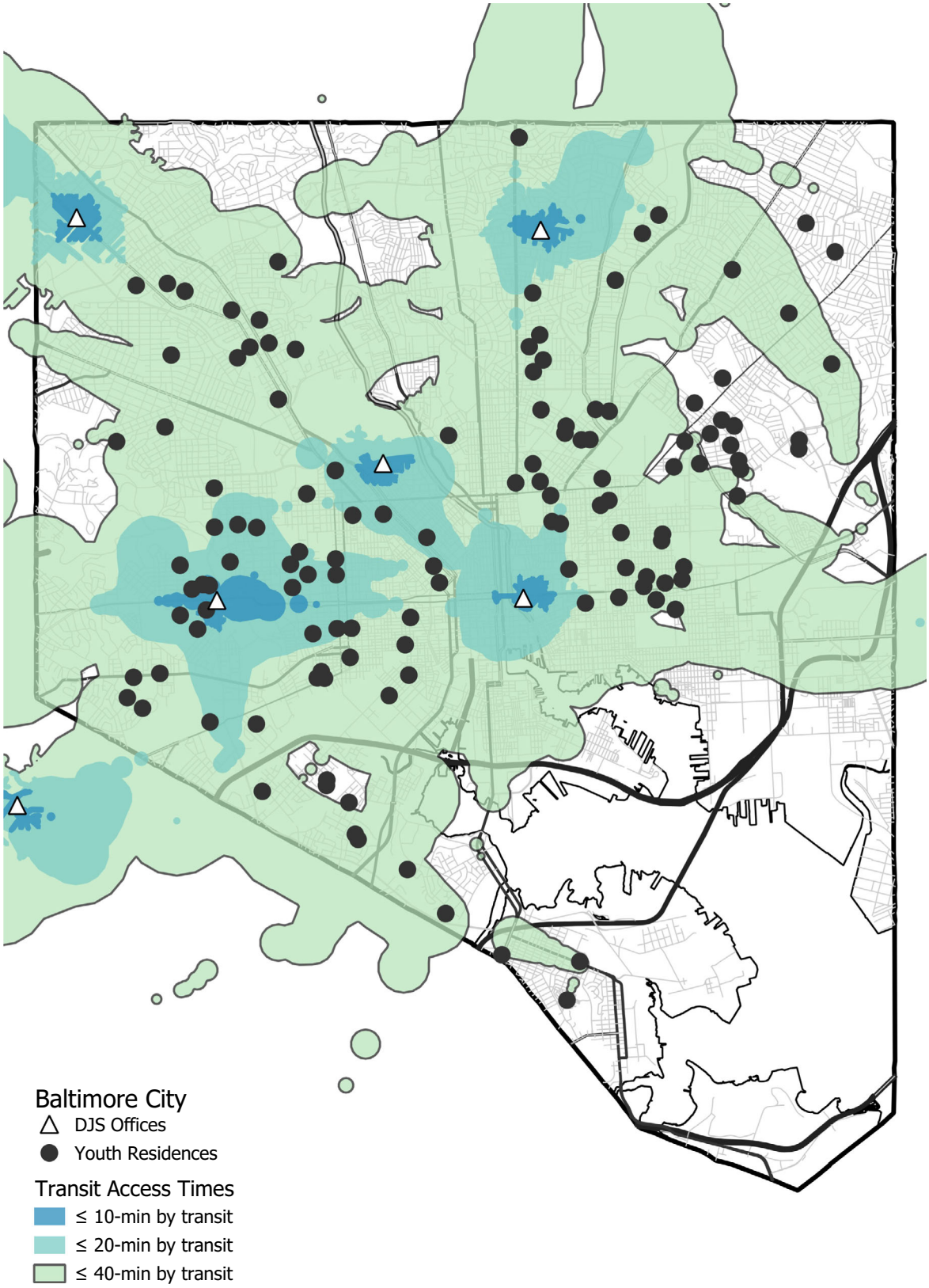

Fig. 4 Transit Isochrones from DJS Probation Offices (U.S. Census, 2013–2017). This map shows the possible transit commutes from DJS locations in 10-, 20-, and 40-minute time increment on a typical weekday afternoon. This map also shows how many justice-involved youths reside within those commute sheds [Color figure can be viewed at wileyonlinelibrary.com]

Table 1 Cross-tabulations of level of car access by walking and transit commuting times from youth residences

	Commute time in minutes from youth residences to nearest DJS Probation Office				
Level of car access	≤10-min walking	≤20-min walking	≤40-min walking	>40-min walking	Total
Near metro average	0 (0.0%)	0 (0.0%)	5 (3.8%)	16 (12.3%)	21 (16.2%)
Low	1 (0.8%)	2 (1.5%)	11 (8.5%)	30 (23.1%)	44 (33.8%)
Very low	1 (0.8%)	2 (1.5%)	5 (3.8%)	12 (9.2%)	20 (15.4%)
Extremely low	0 (0.0%)	2 (1.5%)	8 (6.2%)	35 (26.9%)	45 (34.6%)
Total	2 (1.5%)	6 (4.6%)	29 (22.3%)	93 (71.5%)	130 (100%)
	≤10 min by transit	≤20 min by transit	≤40 min by transit	>40 min by transit	Total
Near metro average	0 (0.0%)	0 (0.0%)	17 (13.1%)	4 (3.1%)	21 (16.2%)
Low	2 (1.5%)	9 (6.9%)	22 (16.9%)	11 (8.5%)	44 (33.8%)
Very low	1 (0.8%)	4 (3.1%)	14 (10.8%)	1 (0.8%)	20 (15.4%)
Extremely low	0 (0.0%)	8 (6.2%)	32 (24.6%)	5 (3.8%)	45 (34.6%)
Total	3 (2.3%)	21 (16.2%)	85 (65.4%)	21 (16.2%)	130 (100%)

marked by low to extremely low car access. 59.2% of youth live more than a 40-minute walk from offices and in areas marked by low to extremely low car access.

Lower Car Access and Long Commute Times

Because the majority of youth live outside of walking distances and in areas with low car access, many youths will require public transportation or other modes of transportation (e.g., ride share or taxi) to get to their probation appointments. Most youth (52.3%) live between a 20- and 40-minute transit commute from probation offices and in areas marked by low to extremely low car access. Approximately 13% of youth live furthest from probation offices (more than 40-minute transit commute) and in areas marked by low to extremely low car access. Not including other barriers such as transit reliability or transit cost, probation offices are inaccessible to about 1 in 7.5 justice-involved youths.

Discussion

This work was aimed at identifying spatial and structural barriers facing justice-involved youth and their families in Baltimore City, MD. We respond to recent calls (e.g., from The Annie E. Casey Foundation, 2018) to investigate spatial and structural barriers to probation in a sample of justice-involved youth. In doing so, we expand the literature on juvenile probation by using a novel method to explore potential structural barriers to probation access. Furthermore, centering community psychology values of social justice and equity to guide this work allows us to identify what may be overlooked in traditional psychological or criminological studies. Specifically, by exploring beyond individual-level factors to understand why some youth may struggle with probation compliance, we avoid making the fundamental attribution error when attempting to explain why some youth may have been historically less likely to succeed on probation. Indeed, our findings indicate that many justice-involved youth in Baltimore City, MD are faced with multiple structural barriers that may make it exponentially more difficult to succeed on probation.

Our findings indicate there are various spatial and structural barriers that justice-involved youth in Baltimore City face. First, a majority of youth live in areas marked by concentrated poverty and where many residents do not have access to a vehicle. About a third of the youth sampled live in areas marked by the most disadvantage; these youth live in areas where the median household income falls 30% below the Baltimore City median household income, and where between 30 and 70% of workers do not have access to a vehicle. Furthermore, almost all of these youth live beyond walking distance from DJS probation locations, effectively requiring them to use public transit or costly alternatives, to attend regular meetings with their probation officer.

This study suggests that justice-involved youth in Baltimore city are met with significant barriers that may impact their ability to access probation offices easily. While most youth can technically access probation offices within a 90-minute round-trip commute, it is likely that these estimates reflect only the best-case scenario as they do not take into account reliability factors such as delays or cut buses. While these data do not provide causal links between these barriers and probation compliance, they do highlight the importance of considering context when determining whether youths' service plans will be overly burdensome for youth and their families. For instance, there is evidence that having a high number of requirements to comply with is related to non-compliance among

youth (Nemoyer et al., 2016) and that parents may feel overextended by having to coordinate multiple appointments, transportation, and childcare (Amani et al., 2018). Therefore, assuming that these requirements serve a rehabilitative focus, ensuring that youth and families can easily access them, and are not overextended by doing so, is crucial. Probation departments might consider providing transportation assistance or finding services that are more accessible to families if youth are required to comply with several requirements, especially when they involve long commutes. Importantly, though, while subsidizing public transit may partially address the fact that many of the justice-involved youth sampled live in concentrated poverty, it does not address the issue of managing and adjusting to unreliable transit. Therefore, it is essential to also consider addressing these issues with a more system-wide or structural response such as by locating more offices near youth or increasing the number of programs available across a given jurisdiction.

There is a large body of research examining transportation barriers to healthcare access that can inform our understanding of how vehicle access and reliance on public transportation might impact youth access to probation services. Having access to a vehicle, above and beyond socioeconomic status, is regularly associated with increased access to services (Rask, Williams, Parker, & McNagny, 1994; Syed, Gerber, & Sharp, 2013; Yang, Zarr, Kass-Hout, Kourosh, & Kelly, 2006). One team of researchers explored barriers to health access in 3800 adults in Atlanta, GA and found that those who did not use private transportation delayed care. Furthermore, they found that walking or using public transportation negatively predicted whether someone sought out regular healthcare visits. Their findings are significant as they apply specifically to individuals who live in urban areas and are of low socioeconomic status. Similarly, Silver, Blustein, and Weitzman (2012) found that low-income adults who relied on bus transit were twice as likely to miss appointments when compared to individuals who had access to a car. Furthermore, distance to a facility does not always equate with ease of access. Researchers found that individuals who live in neighborhoods where high proportions of families do not have access to a vehicle were less likely to receive cancer treatments and distance to the treatment facility was not a factor (Salloum, Smith, Jensen, & Lafata, 2012). These barriers can make it difficult for parents to access care for their children. In interviews with Hispanic families, Cristancho, Garces, Peters, and Mueller (2008) found that transportation issues often caused families to miss their child's medical appointments or to arrive so late that service providers would often not see them. This body of work highlights the impacts these barriers may have on justice-involved youth and families given that many families are unlikely to have access to a car and may have to rely on public transportation. It is crucial for future research to examine whether vehicle access also results in missed probation-related meetings or hearings as it does in the healthcare context, especially because missing review hearings can result in probation revocation and confinement (Nemoyer et al., 2016).

It is also possible to see how these findings align with concerns of public transit and access to education in Baltimore City, which is important given that regular school attendance is often a requirement for probation. The education system in Baltimore City allows students to enroll in any school across the system that best meets their needs and interests, resulting in students relying on public transit to get to a school which may not be located in their neighborhood. Currently, only about half of the area high schools are accessible by students within 45 minutes or less. The worst commute times were apparent for youth in northeast Baltimore, which is also where youth in our study with the longest commute times reside (Central Maryland Transit Alliance, 2018). Youth in certain areas of the city are faced with unreliable transit options which have implications for their ability to access essential services, such as those provided by or required for probation, including access to education.

Strengths and Limitations

The novel approach to identifying spatial and structural inequities introduced in this study is one of the primary strengths of this work. By incorporating methods from Geography and Information Sciences, we were able to use spatial mapping tools to identify barriers faced by justice-involved youth and families. Indeed, incorporating these methods may prove useful to probation departments interested in determining if similar barriers exist in their locales. Despite these strengths, this work is not without limitations. First, our sample of justice-involved youth is not actively in the juvenile justice system and instead are youth who have been or may be tried in the adult system. It is possible that some of these youth reside in areas that are different from youth who are under juvenile jurisdiction. Second, with the available data, we were only able to map distances between DJS locations and residential addresses, ignoring the multiple locations justice-involved youth are expected to access. Future research should explore spatial disparities of other locations youth are required to access while on probation such as substance abuse treatment centers. Furthermore, it is also possible that youth are commuting to probation locations from school. However, we did not have access to data about what school youth attend and could not assume school location based on residential address given local choice

policies. Finally, it is crucial to understand the limitations of relying on purely quantitative data. These data speak to the spatial disparities and structural barriers that justice-involved youth and their families are facing; however, they cannot speak to youth and families' direct experiences coordinating and accessing probation services. It will be incredibly important for future research to understand how these spatial and structural barriers impact justice-involved youth and their families.

Conclusion

These data show that justice-involved youth in Baltimore, MD are faced with multiple spatial and structural barriers that may have implications for their access to and engagement with juvenile probation programs and services. For instance, many of these youth live in areas where many people do not have access to a car, and this has been shown to impact accessibility and engagement in health contexts. Additionally, there have been increasing calls to identify spatial disparities and structural barriers for families of justice-involved youth; this novel method of exploring spatial and structural disparities in juvenile probation may inform probation departments that seek to conduct similar analyses. Future research in this area may help local juvenile justice providers to identify service gaps and identify youth who may need additional resources and supports.

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