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Greenway use and preferences in diverse urban communities: Implications for trail design and management

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ABSTRACT

Greenways represent corridors of benefits with a unique capacity to contribute to sustainable urban development, yet more research is needed to understand the extent to which greenway-related benefits are realized and distributed across diverse populations and settings. Using intercept surveys of greenway users during summer 2015, our study explored use patterns and preferences along two trails traversing diverse neighborhoods: the Eastside Trail in Atlanta, GA (n = 505), and the Leon Creek Greenway in San Antonio, TX (n = 429). Descriptive statistics and regression-based analyses revealed that exercising and escaping the stress of city life were the top motivations for visiting both trails, and safety and security were rated as top concerns among visitors (particularly women and racial/ethnic minorities). On the urban Eastside Trail, where more users accessed the trail by foot or bicycle and engaged in a variety of trail-based activities, cultural benefits linked to social interaction and community connectivity were more widely acknowledged. On the suburban Leon Creek Greenway, where most visitors tended to travel longer distances to access the trail, typically for physically-active recreation, experiential benefits stemming from outdoor recreation in natural settings were more strongly recognized. Both trails attracted substantial numbers of racial/ethnic minorities, with Hispanics and other non-white users representing about 55% of Leon Creek Greenway and 32% of Eastside Trail visitors. Social and nature-based motivations were more common among these user groups. Planners and managers can utilize these results to identify strategies for maximizing greenway-related benefits among diverse groups of potential trail users.

1. Introduction

As rapid outward growth of urban areas and associated grey infrastructure, commonly known as urban sprawl, continues to expand, many cities are prioritizing protection of urban green space (UGS) and the diverse benefits associated with managed natural areas (Chiesura, 2004; Landers & Nahlik, 2013; Walmsley, 2006). In addition to providing opportunities for creative and meaningful recreation experiences that impact physical, mental, and socio-economic wellbeing (Larson, Jennings, & Cloutier, 2016; Tzoulas et al., 2007), UGS also provides many environmental benefits (i.e., ecosystem services) such as increased vegetation and wildlife habitat, storm water management, air and water purification, and climate regulation (Elmqvist et al., 2015). One unique type of UGS is the greenway: a popular form of linear park that remains one of the fastest growing urban planning and design features in the United States and around the world (Ahern, 1995; Fabos, 2004; Akpinar, 2016).

Greenways are public resources that enhance the multifaceted functionality of Green Infrastructure, providing many of the benefits associated with urban parks as well as other unique assets (Benedict & McMahon, 2006; Larson, Keith et al., 2016; Weber, Boley, Palardy, & Johnson Gaither, 2017). Due to their linear nature, greenways provide valuable ecological services by connecting urban habitats and associated biodiversity (Ahern, 2013; Bryant, 2006) and creating opportunities for positive interactions between humans and nature in congested cities (Chon & Shafer, 2009; Gobster, 1995). Greenways also enhance residents' quality of life by contributing to physical health and exercise (Dallat et al., 2014; Fitzhugh, Bassett, & Evans, 2010) and providing activity-promoting transportation opportunities that link urban parks and neighborhoods (Shafer, Lee, & Turner, 2000). Regardless of their design and structure, greenways represent "multiple objective, open space corridors that perform natural functions while offering desirable

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aesthetic qualities to humans as they recreate or commute along trails" (Shafer, Lee, & Turner, 2000, p. 164). Consequently, greenways have a unique capacity – perhaps greater than other types of urban parks – to simultaneously integrate natural resource conservation and public health promotion.

Although many greenway-related benefits exist, they may not be equally distributed among all segments of the urban population. Concerns regarding the design, development, and utilization of urban parks (including greenways) have therefore emerged as a significant environmental justice issue (Dai, 2011; Kabisch & Haase, 2014; Wolch, Byrne, & Newell, 2014). Studies have revealed that low-income, minority populations often have disproportionately greater access to UGS (Barbosa et al., 2007) and parks (Wen, Zhang, Harris, Holt, & Croft, 2013) than their higher-income counterparts, seemingly contradicting the hypothesis that disadvantaged neighborhoods tend to lack access to health-promoting UGS. However, other studies have shown that, even when these resources are present, certain populations are less likely to use parks for social and cultural reasons (Smiley et al., 2016), often linked to perceived safety and crime (Cutts, Darby, Boone, & Brewis, 2009; McCormack, Rock, Toohey, & Hignell, 2010). Similar patterns have been observed for greenways (Lindsey, Maraj, & Kuan, 2001; Starnes, Troped, Klenosky & Doehring, 2011). Regardless of geographical location, previous research has typically documented a lack of diversity on greenways. For example, many studies show that the vast majority of greenway users are white, have a high annual income, and possess a higher degree of education than non-users (Coutts & Miles, 2011; Furuseth & Altman, 1991; Lindsey, 1999; Lindsey, Han, Wilson, & Yang, 2006; Reed, Hooker, Muthukrishnan & Hutto, 2011; Wolch et al., 2010). In other words, despite have access to greenways, historically disadvantaged groups often have the lowest chance of experiencing benefits related to use of urban trails – a finding consistent with research in other urban parks settings (Ernston, 2013; Jennings, Larson, & Yun, 2006).

These seemingly contradictory findings have raised many questions about the social impacts of greenways, generating debates about discrepancies in the anticipated and realized goals of urban trails and the populations they are designed to serve. Similar questions have been raised more broadly about urban parks. There is debate in the literature as to whether or not green space creates a "green wall," acting as a boundary between neighborhoods with different socioeconomic characteristics (Solecki & Welch, 1995), or a "green magnet," attracting different groups to a common space for positive social interactions (Coutts & Miles, 2011; Gobster, 1998). Central to this discussion is the issue of gentrification, an important unintended impact of UGS expansion in historically disadvantaged communities. In many places where parks and greenways are constructed to address environmental justice concerns and reduce disparities, evidence often suggests that property values increase, demographic transition occurs, and benefits remain inequitably distributed (Curran & Hamilton, 2012; Immergluck & Balan, 2017; Gould & Lewis, 2017; Wolch et al., 2014). For all of these reasons, we must develop a more holistic understanding of the social, environmental, and economic consequences of urban park and greenway development (Starnes et al., 2011). Continued clarification of the various types, functions and purposes of greenways would help urban planners and managers recognize how different types of greenways are utilized by different populations and how the presence of these trails impacts broader urban environments.

Shafer, Scott and Mixon (2000) used input from key community stakeholders to develop a Greenway Classification System with three categories: (1) *urban greenways* that are placed in densely populated, highly developed areas, (2) *suburban greenways* located in more residential, moderately developed areas, and (3) *rural greenways* with low levels of development and population density adjacent to the trail. This Greenway Classification Spectrum posited that trails in metropolitan areas (urban and suburban) share primary functions such as flood control, recreation, transportation and aesthetic quality, with economic development being a unique primary function associated with urban greenways. While the Shafer, Scott et al., (2000) typology provides distinctions regarding the key elements that define greenways and potential greenway-related benefits, it does not explain how these attributes influence greenway use and the realization of greenway-related benefits across diverse populations. The purpose of this study was to compare and contrast two different types of trails (one urban and one suburban greenway) in two different metropolitan contexts, examining patterns of greenway use and preferences among diverse populations of trail users to address these guiding research questions: (1) Who is using these greenways, and how?; (2) Why are people motivated to use these greenways, and what site attributes do they prefer?; (3) What are the constraints to greenway use?; and (4) What greenway-related benefits do trail users perceive?

2. Methods

2.1. Study sites

The two greenways selected for this study were the Eastside Trail (part of the Atlanta Beltline) near downtown Atlanta, Georgia, USA, and the Leon Creek Greenway (part of the Howard W. Peak Greenway Trail System) in the northwestern suburbs of San Antonio, Texas, USA (Fig. 1). Both greenways were selected due to their location in diverse neighborhoods or large cities (Table 1), their relatively recent construction (construction began on the Eastside Trail in 2010, while ground was broken on the Leon Creek Greenway in 2009), and the fact that they are part of larger planned municipal trail networks that will eventually encircle both cities. Specific attributes of the trails differed, however. At the time of the study, the Eastside Trail included 2.25 miles of paved trail (width = 14 ft.) surrounded by a narrow strip of vegetation (mostly planted) and dense development (e.g., parks, housing, shops, restaurants, etc.), while the Leon Creek Greenway included 13.5 miles of paved trail (width = 10 ft.) along a corridor occupying a naturally forested riparian floodplain with lower levels of adjacent commercial and residential development (Fig. 2a,b). With few parking lots in close proximity, most access points to the Eastside trail are at road crossings. There are several parking lots along the Leon Creek Greenway. Average residential population densities in Zip codes within 0.5 mile of the trails were substantially higher for the Eastside Trail (6168 people/mi^2) compared to the Leon Creek Greenway (2885 people/mi^2; ESRI, 2011). These general trail descriptions match the criteria for urban and suburban greenway classification recommended by Shafer, Scott et al. (2000).

2.2. Data collection

We collected data along both greenways using intercept surveys of trail users at key access points from May to August 2015. We scheduled survey sessions using a stratified random sampling protocol to ensure adequate coverage across all times of the day on both weekdays and weekends. The access points were identified by greenway managers based on proximity to common trail entryways via well-connected streets or parking lots. Similar intercept survey methods have produced reliable and valid data on other trail-based studies (Troped, Whitcomb, Hutto, Reed, & Hooker, 2009). Survey data sampling was scheduled in conjunction with systematic observations of visitor activity using the System for Observing Play and Recreation in Communities (SOPARC), a tool designed to collect data on recreation participants' physical activity levels in community settings (McKenzie, Cohen, Sehgal, Williamson, & Golinelli, 2006), including trails (Librett, Yore, & Schmid, 2006). The SOPARC observations (not reported here) were used to validate demographic ratios and activity patterns reported on the surveys. Previous greenway user surveys were used to inform data collection and instrument design.

On the survey instrument, participants were first asked to indicate