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The 606 at Three: Trends in Use of Chicago's Elevated Rail-Trail

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Abstract

The 606, Chicago's 2.7-mile, \$95 million trail, is the only elevated, multiuse trail in the US. Opened to use in June 2015 after more than 15 years in planning and development, The 606 was designed to provide residents of nearby neighborhoods having major open space deficits with a safe, attractive place for recreation, fitness, commuting, and other purposes. Above all, The 606 was designed to be *used*, incorporating features to address concerns of local residents and facilitate walking, jogging, bicycling, and other activities. To better understand its use, we studied trends and patterns in trail traffic during the first three full years of operation (2016-2018). Based on analyses of counts taken with infrared sensors at two locations along the trail, our data show that, while The 606 is heavily used, total use declined in both 2017 and 2018. Cumulative trail traffic volume on the western, less affluent end of the trail declined 16.1% from 1.2 million in 2016 to just over 1 million in 2018. Cumulative volume on the eastern, more affluent end of the trail declined 11.9% from nearly 1.4 million in 2016 to just over 1.2 million in 2018. Despite these declines, patterns of use have remained consistent, with much higher use in summer and “shoulder” seasons than in winter, higher use on weekends than weekdays, and different hourly patterns on weekends than weekdays. A statistical model shows that approximately 78% of the variation in daily use is associated with variation in weather and day-of-week. We hypothesize that the declines in use could be associated with differences in weather patterns over the years, congestion on the trail during peak periods of use, a novelty effect that has worn off over time, or changes user perceptions and preferences, perhaps associated with the resource. Research strategies to test these hypotheses are outlined.

Introduction

The 606 opened in Chicago with great fanfare in June 2015 as the only elevated trail in the US designed for both pedestrian and bicycle use. The \$95-million trail was the result of more than 15 years of planning and development by the City, the Trust for Public Land, other nonprofit and community organizations, and neighborhood residents. It was designed to reduce disparities in access to high quality recreation areas and meet long-standing neighborhood needs for open space on the City's northwest side. Because of its unique characteristics, high cost, and potential to serve as an innovative model for urban livability, several researchers have initiated studies of The 606. As its principal design objective was to support neighborhood use for recreation, physical activity, and commuting, studies of how the trail is used are needed to assess its success and inform future plans.

This paper reports trends and patterns in use of The 606 during its first three full years of operation. We first describe the trail and highlight findings from recent and ongoing studies, then outline the methods used in our analysis. Our findings show that The 606 is heavily used, but also reveal a decline in use over the period studied along with consistent differences in use between the western and eastern segments of the trail. We hypothesize explanations for these trends and identify strategies to assess their validity. We conclude with a brief discussion of the importance of continued evaluation of the impacts of the trail.

Background and Literature Review

The 606

The “Bloomingdale Trail” was first proposed in the City’s Bike Plan in 1998 as an innovative reuse of the Bloomingdale Line, an abandoned elevated rail corridor (The 606 n.d.; Chicago Department of Transportation 2011). A 2004 neighborhood open space plan for Logan Square raised awareness of the corridor and how it could help meet its needs for public open space, which were among the lowest per resident in the City. Following years of community meetings hosted by the Trust for Public Land in collaboration with the City, a final design was published in 2012 (The 606 n.d.). The project was branded “The 606” (for the City’s ZIP code), incorporating the elevated Bloomingdale Trail with a series of ground-level parks into a broader 13-acre greenway concept that would “enhance the urban environment as a space to socialize, contribute to public health by encouraging walking and bicycling, and connect communities” (The 606 n.d.).

Community members engaged in the design process stressed the importance of meeting the needs of the neighborhoods’ most vulnerable groups—children, the elderly, and persons with disabilities (The 606 n.d.; City of Chicago 2012). The 606 therefore was designed to be accessible to all users, with 12 access points with ramps for bicyclists, wheelchairs, and other wheel-based users. The idea was to attract both users who wanted to move and users who desired a “slow” park experience. Safety was promoted by the design of lighting, lines-of-sight, and signage/wayfinding along the trail, as well through connectivity to adjacent communities. Funding has been provided by both public and philanthropic sources. Construction was completed in 2015.

The 606 connects the neighborhoods of Logan Square and Humboldt Park on the west with Bucktown and Wicker Park on the east (Figure 1). The contiguous neighborhoods on the western segment have lower incomes and higher populations of racial and ethnic minority individuals, primarily Latino. Figure 2 includes photos of (a) the main trail, (b) an access ramp, (c) trail lighting, and (d) community art along the trail. Plans are underway to improve connectivity to both Chicago’s Loop – its central business district – and its lakefront parks.

Recent research on greenways and The 606

Greenways and multiuse trails have been studied extensively over the past 25 years to strengthen the evidence base for public investments that increase opportunities for recreation, accessibility, and urban livability (Tracy & Morris 1998; Shafer, Lee, & Turner 2000; Lindsey, Maraj, & Kuan 2001; Fábos 2004; Conine et al. 2004). Local efforts to implement trails have been supported by federal funds for multi-modal transportation – bicycling and walking. Between 1992 and 2017, federal funding contributed to more than 10,000 projects, including \$821 million for rail-trails (Maher 2009; Transportation Alternatives Data Exchange 2018). By 2018, 2,095 rail-trails with 23,631 miles of trail had been developed, and an additional 797 projects with 8,506 miles of rail-trails were under development (Rails-to-Trails Conservancy 2019). Calls for evaluations of trails have come along with these increased investments. The FHWA (2013) has published guidance for monitoring bicycle and pedestrian traffic, and Lindsey and colleagues (2014, 2018) have described how FHWA methods can be adapted to monitor trails.

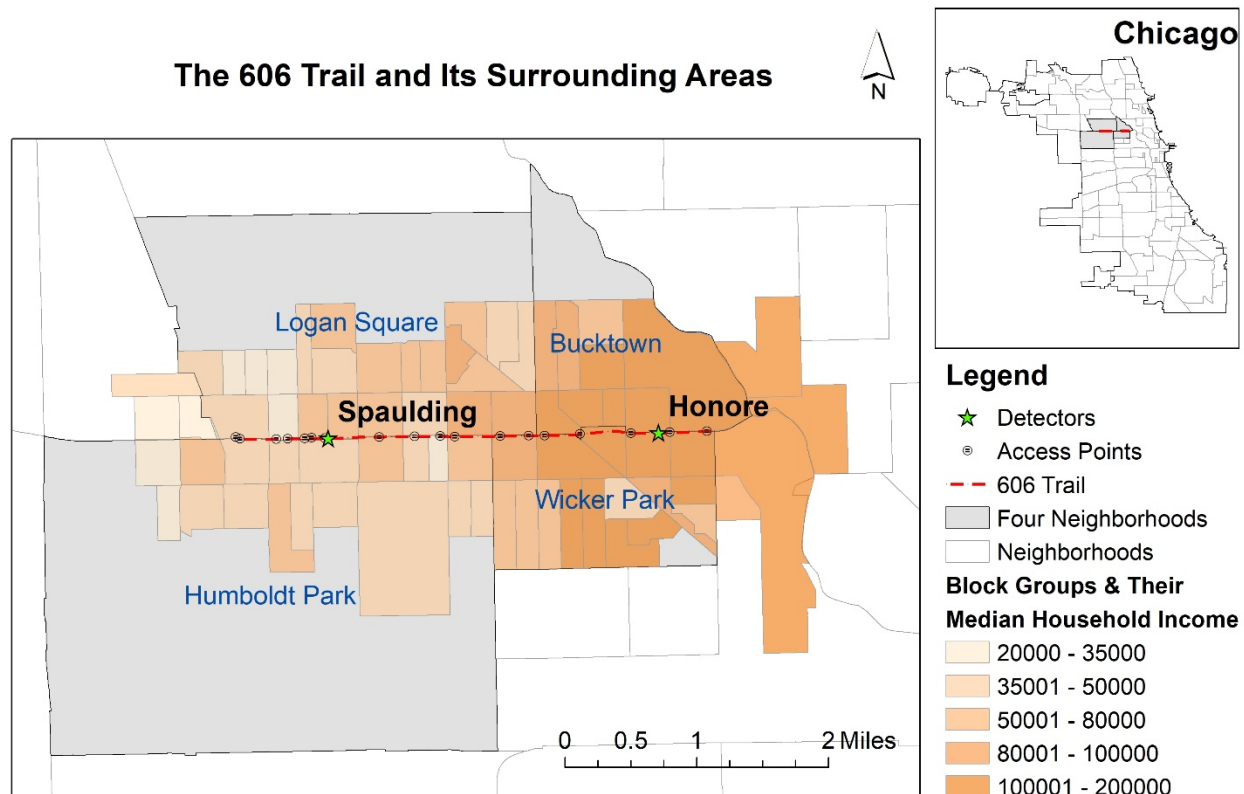


Figure 1. The 606 and US Census Household Incomes of Surrounding Neighborhoods (ACS 2012-2016).

The 606 has attracted the attention of a number of researchers because of its unique characteristics and the potential to assess how major public investments in recreational infrastructure affect urban livability and dynamics. For example, The 606 has been characterized as an example of “city-nature hybridity” and a “slow landscape” (Sinha 2014) but also critiqued for its “deracialized conception” of urban space (Loughran 2017; Loughran 2018). We previously documented patterns of use during the first six months of 2016 (Gobster et al. 2017). Evidence of differences in the racial/ethnic mix of users between the east and west sections of The 606, where the predominant residents are Anglo and Latino, respectively, has been described (Harris 2018; Kraft et al. 2018).

Development of The 606 has increased price-pressure on existing homeowners and renters in neighborhoods near the trail (Institute for Housing Studies at DePaul University 2016; Anonymous 2016) and may be accelerating gentrification and/or displacement (Gomez-Feliciano et al. 2009; Vivanco 2016; Anderson 2016; Rigolon & Nemeth 2018). Researchers have also assessed changes in rates of crime in adjacent neighborhoods since the trail’s opening (Harris, Larson, & Ogletree 2018; Harris 2018). These neighborhood dynamics have the potential to affect use of The 606.

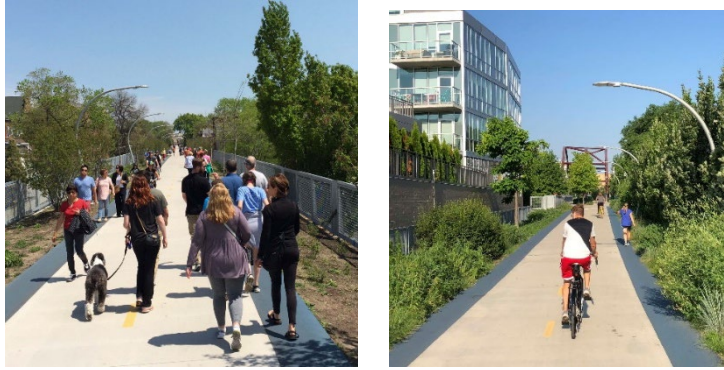


Figure 2a. The 606 or Bloomingdale Trail during high (Sunday, May 8, 2016 1:18 p.m.) and low (Tuesday, July 10, 2018, 7:54 a.m.) use periods (US Forest Service)



Figure 2b. Central Park Avenue Northeast: Ramp to The 606, (City of Chicago 2012)



Figure 2c. Designs for safety: Lighting and Transparent Railings (City of Chicago 2012)



Figure 2d. Community Art Project: Chicago Public Art Group and Logan Square Neighborhood Association (City of Chicago 2012)

Figure 2. The 606, Chicago, Illinois

Goals and Objectives

Our principal objective in this paper is to document levels, trends, and patterns of use of The 606. Secondary objectives are to develop hypotheses to explain trends and patterns of use and explore implications of monitoring results for management and expansion of The 606.

Methods

We monitored trail traffic using infrared monitors at two locations to obtain measures of traffic through the length of the trail. These two locations, Spaulding Avenue and Honore Street, are identified by the names of the cross-streets below the trail (Figure 1). The Spaulding Avenue site is at western end of the trail in neighborhoods (i.e., Logan Square and Humbolt Park) that are less affluent and more ethnically diverse than neighborhoods to the east (i.e., Bucktown and Wicker Park) contiguous to the Honore Street site.

We initiated monitoring in January 2016 using TrailMaster TM1550 active infrared monitors that record a count each time a user breaks an infrared beam across the trail. We replaced the TrailMaster counters with Eco-Counter passive infrared counters in September 2016 because the Eco-Counter devices have greater capacity and data can be retrieved remotely. The passive infrared monitors record a count each time a person passes by sensing temperatures different than the background, ambient conditions. Both devices systematically undercount due to occlusion (i.e., when two or more users simultaneously pass by the monitor). We conducted field studies to validate the sensors, determine rates of undercounting, and develop calibration factors to correct for occlusion (Gobster et al. 2017; Gobster et al. 2019).

Infrared monitors provide only measures of total traffic and do not differentiate among types of users or modes of use such cycling, jogging, or walking. These undifferentiated, or mixed-mode counts are traffic counts and not counts of separate visitors to the trail. Trail users who travel the length of the trail are counted by each monitor, and users who make multiple loops on the trail are counted each time they pass by. These monitoring procedures are consistent with procedures used in vehicular traffic monitoring (FHWA 2013).

Some measurements were missed due to counter malfunction. We imputed missing values using location-specific regression models that predict daily use as a function of daily weather characteristics (i.e., temperature, precipitation, dew point) and day of week. The analyses presented here include these imputed estimates of daily traffic. Additional methodological details, including correction factors and weather models, are available in Gobster et al. (2017, 2019).

Results

The 606 is heavily used, but use has declined each year since monitoring began in 2016 (Figure 3). At the Honore site, the eastern location in more affluent neighborhoods closer to downtown, total traffic declined from 1,380,300 in 2016 to 1,216,153 in 2018. At the Spaulding site, total traffic declined from 1,237,828 in 2016 to 1,038,904 in 2018. The decline at Honore (11.9%) was less than at Spaulding (16.1%) and occurred mainly during 2018. The decline at Spaulding was more consistent each year, with declines in use of 10.7% and 6.0% between 2016-2017, and 2017-2018, respectively. Annual average daily trail traffic (AADTT) at Honore (3,585) has averaged 16.2% higher than AADTT at Spaulding (3,086) over the three-year period (Figure 4).

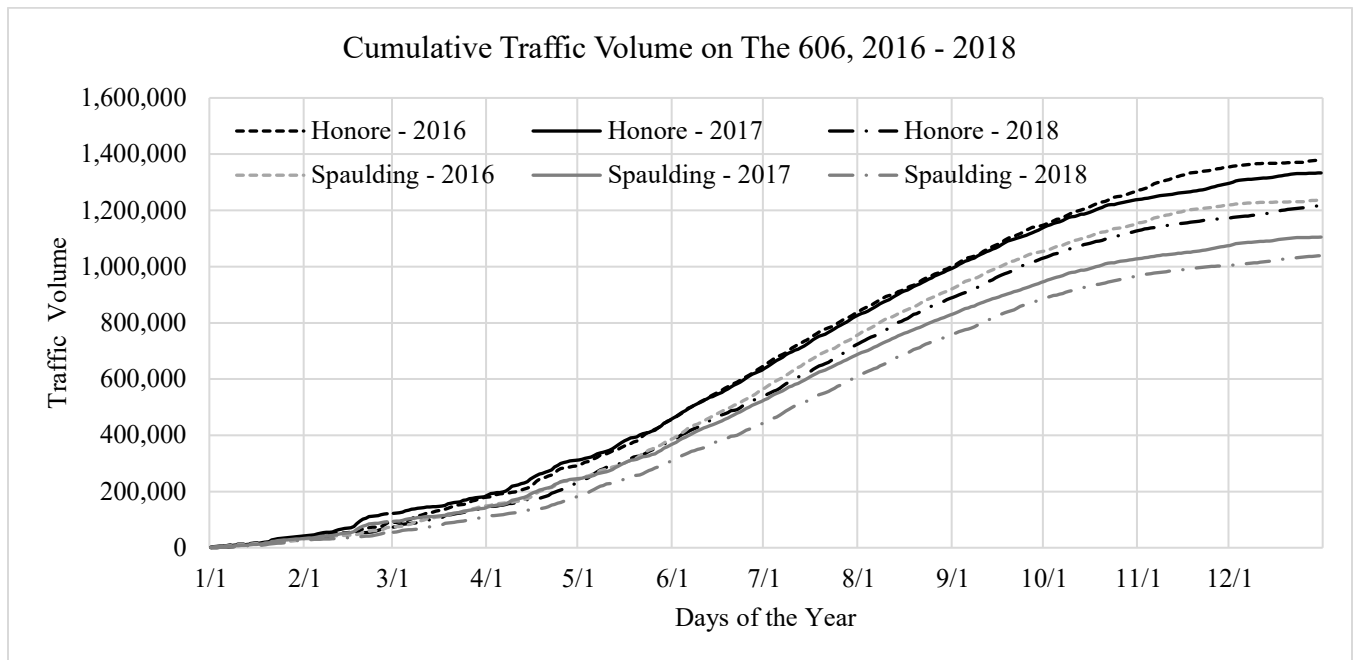


Figure 3. Cumulative Traffic Volume on The 606, 2016 – 2018.

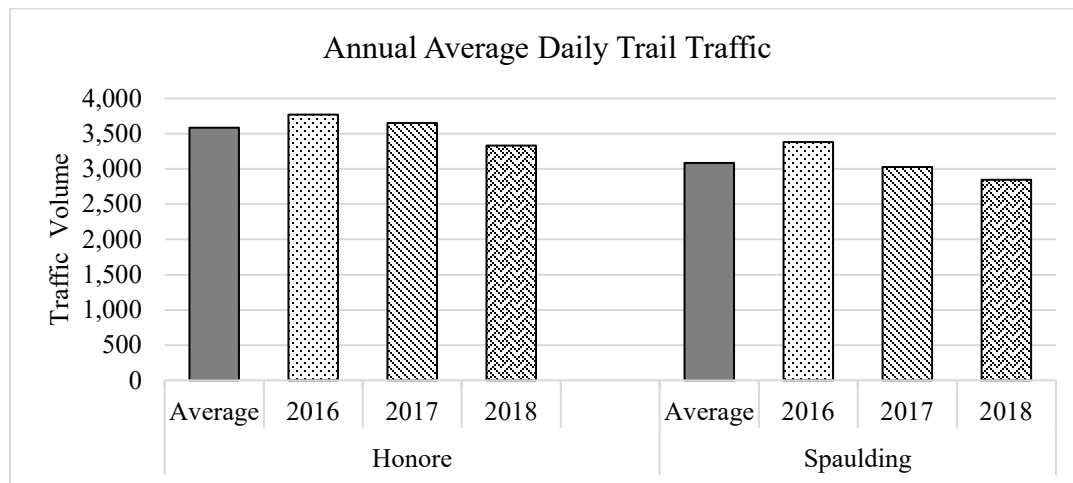


Figure 4. Annual Average Daily Trail Traffic at Honore and Spaulding, 2016 – 2018.

Although traffic volumes at the two sites differ and total use on both segments has declined, temporal patterns of use on both segments of the trail are comparable and have remained stable. Monthly patterns reflect seasonal use consistent with Chicago's temperate climate, with highest use in July and during the summer of each year on each segment (Figure 5). Differences in volumes between Honore and Spaulding were smaller in January and February, the two coldest months.

Patterns of day-of-week traffic at the two sites is also similar. Over the three year period, average daily weekend traffic at Honore (4,456) was 31.0% higher than average weekday traffic (3,402); at Spaulding, average daily weekend traffic (3,613) was 20.8% higher than average weekday traffic (2,992) (Figure 6). Differences in traffic volume between Honore and Spaulding have been highest on the weekends.

Weekday use is highest on Mondays and Tuesday and lowest on Fridays at both locations. These traffic patterns suggest that people use The 606 primarily for recreation and fitness.

Both weekend and weekday hourly traffic patterns have remained remarkably consistent on both segments of the trail (Figure 7). Weekday use begins earlier in the morning and peaks in early evening, while weekend use begins later in the day, is more or less level from mid-morning through late afternoon, and declines before evening. Weekday peak-hour use at both Honore and Spaulding occurs between 6:00-7:00 p.m. and accounts for approximately 10-11% of average weekday use. While some of this use may be attributed to commuting, hourly patterns reinforce a dominant pattern of recreational use. Weekend peak use occurs between 10:00 a.m. and 3:00-4:00 p.m., with use relatively consistent during this five to six-hour period (i.e., each hour accounting for approximately 8-9% of average weekend daily use). Although weekday peak hours account for a higher percentage of traffic than weekend peak hours, the absolute peak hour volumes (not shown in Figure 6) are comparable. Between 2016-2018, the average weekday p.m. peak hour traffic volume at Honore was 360; average weekend peak hourly volumes ranged from 360 to 380. At Spaulding, the average weekday p.m. peak hour traffic volume was 292, while the average weekend peak hourly volumes ranged from 270 to 290.

Over the three-year monitoring period, daily volumes at Honore ranged from 136 to 10,365, while daily volumes at Spaulding ranged from 87 to 9,404. As noted, day-of-week, variation in weather, and location on the trail account for most of the variation in traffic volumes ($\text{Adj. } R^2 = 0.78$). We estimated an OLS regression model to illustrate the marginal effects of different factors on observed traffic volumes (Table 1). For example, a unit increase in daily high temperatures is associated with an increase in traffic of about 80, while traffic on rainy days drops by more than 1,040. After controlling for weather and other factors, including location, weekend traffic volumes are more than 800 greater than weekday volumes. Daily traffic volumes at Spaulding are estimated to be 500 less than Honore. Volumes in 2016 and 2017 are estimated to be, respectively, 394 and 162 higher than in 2018, confirming a substantial reduction in use over time.

As a measure of total use of the trail, we followed FHWA (2013) procedures for estimating user-miles traveled. This procedure, which is based on the assumption that individuals travel the length of a trail segment on which they were counted, involves multiplying total segment counts times segment lengths. We estimate that users traveled more than 3 million miles on The 606 in 2018.

Discussion and Conclusion

The 606 in Chicago is unique among recreational facilities in the U.S. It was designed in consultation with residents of the neighborhoods it bisects to address longstanding disparities in accessibility to open space and parks. Our analyses show The 606 is heavily used. The average daily traffic volumes are comparable to the highest average trail volumes reported in some major urban areas, and much higher than in others. For example, volumes are comparable to the highest volumes observed throughout an 80-mile trail network in Minneapolis, Minnesota, including the pedestrian/bicycle Stone Arch Bridge over the Mississippi River (Wang et al. 2016). Trail traffic volumes on The 606 are about double the highest volumes measured on segments in 100+ miles trail networks in both Columbus and Cincinnati, Ohio, including the pedestrian/bicycle Purple People Bridge over the Ohio River (Wang et al. 2016; Lindsey et al. 2019, forthcoming). However, use of The 606 decreased in both 2017 and 2018, with larger decreases in 2018 and on the segment that traverses less affluent, more diverse neighborhoods. These

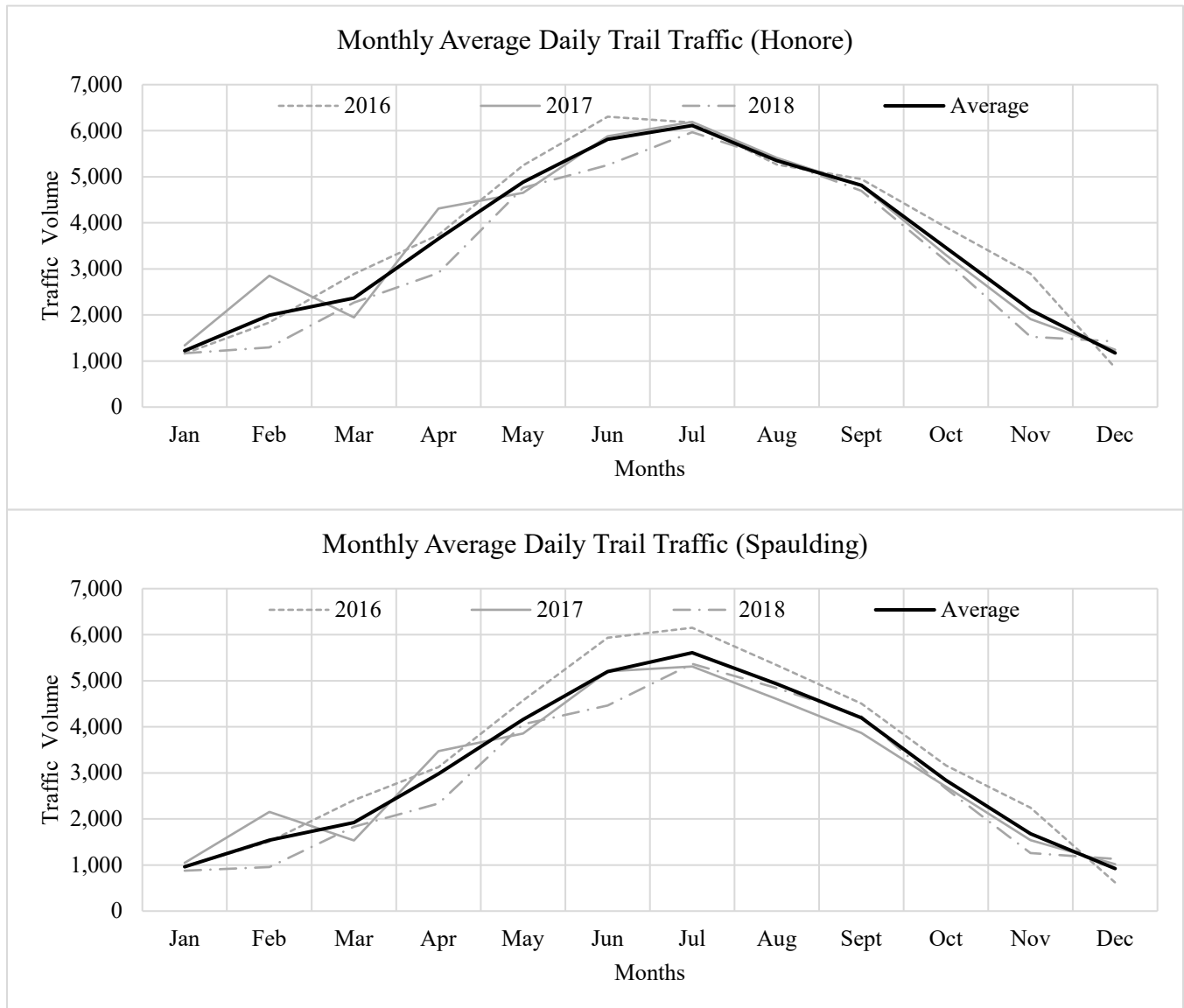


Figure 5 . Monthly Average Daily Trail Traffic, 2016 – 2018.

decreases were not anticipated, and the factors that have contributed to them are unclear. As other researchers who have studied The 606 have observed, development of a major, new recreational facility in a densely populated, diverse urban neighborhood is a complex and sometimes controversial process. To address and propose strategies to reverse these declines in use, we need to understand why they have occurred.

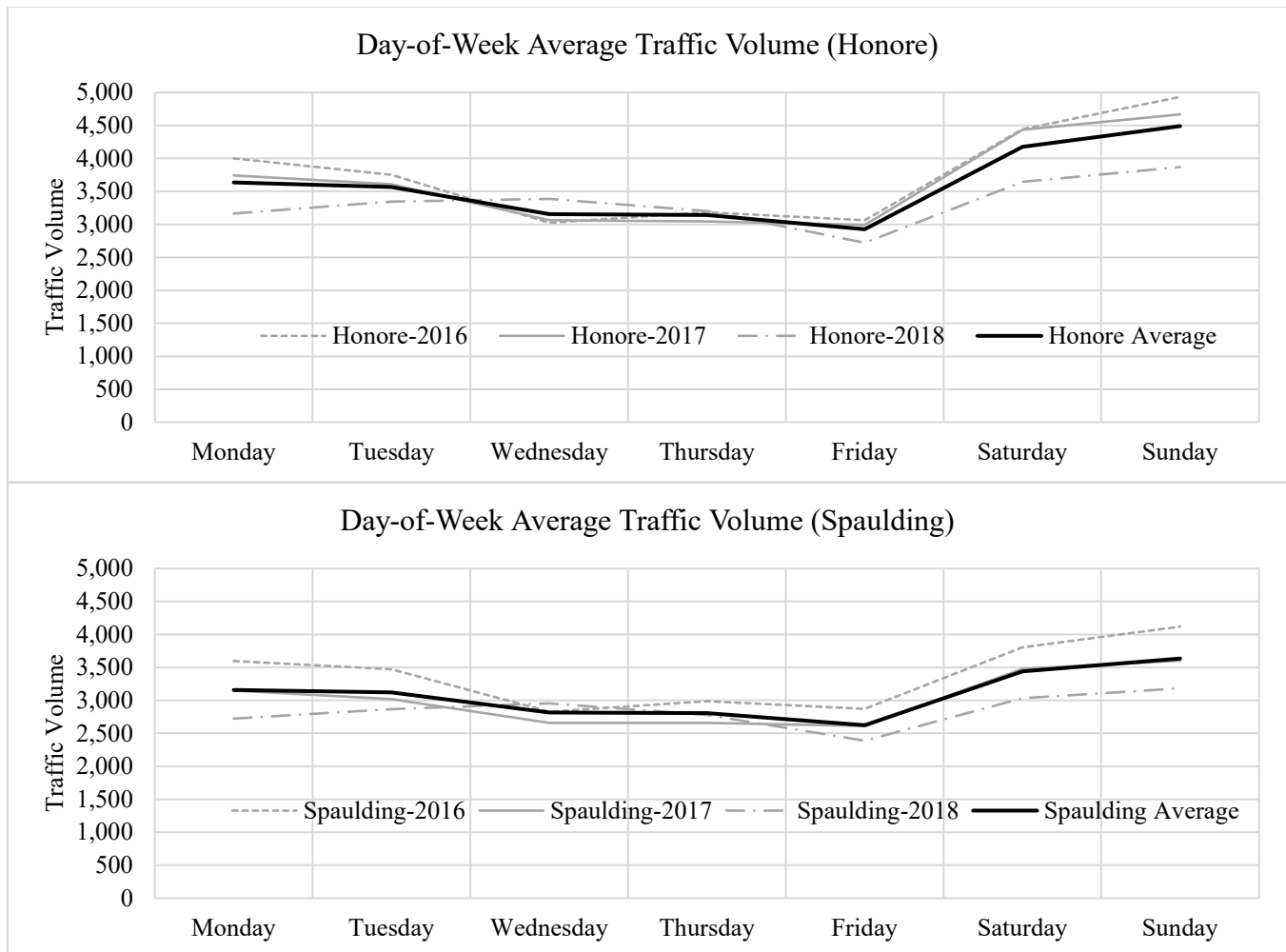


Figure 6. Day-of-Week Average Trail Traffic Volume, 2016 – 2018.

Drawing on our own analyses and insights from research reported by others, we hypothesize four possible factors that may be contributing to declines in use:

1. Changes in weather in 2017 and 2018, including more extremely cold, hot, or rainy days, or more weekend days with weather conditions that reduce use;
2. A congestion effect, in which users who venture to the trail in early evenings during weekdays or during the mid-day on weekends find the trail too crowded to enjoy or to support their preferred type of use;
3. A novelty effect, in which users first drawn to The 606 after its opening because of its uniqueness choose to recreate elsewhere and not return; and
4. Changes in perceptions or preferences toward the resource, including changes associated with resource condition (e.g., maintenance) or availability of alternatives, perceptions of crime, controversies related to gentrification and other neighborhood dynamics, or possibly differences in neighborhood populations.

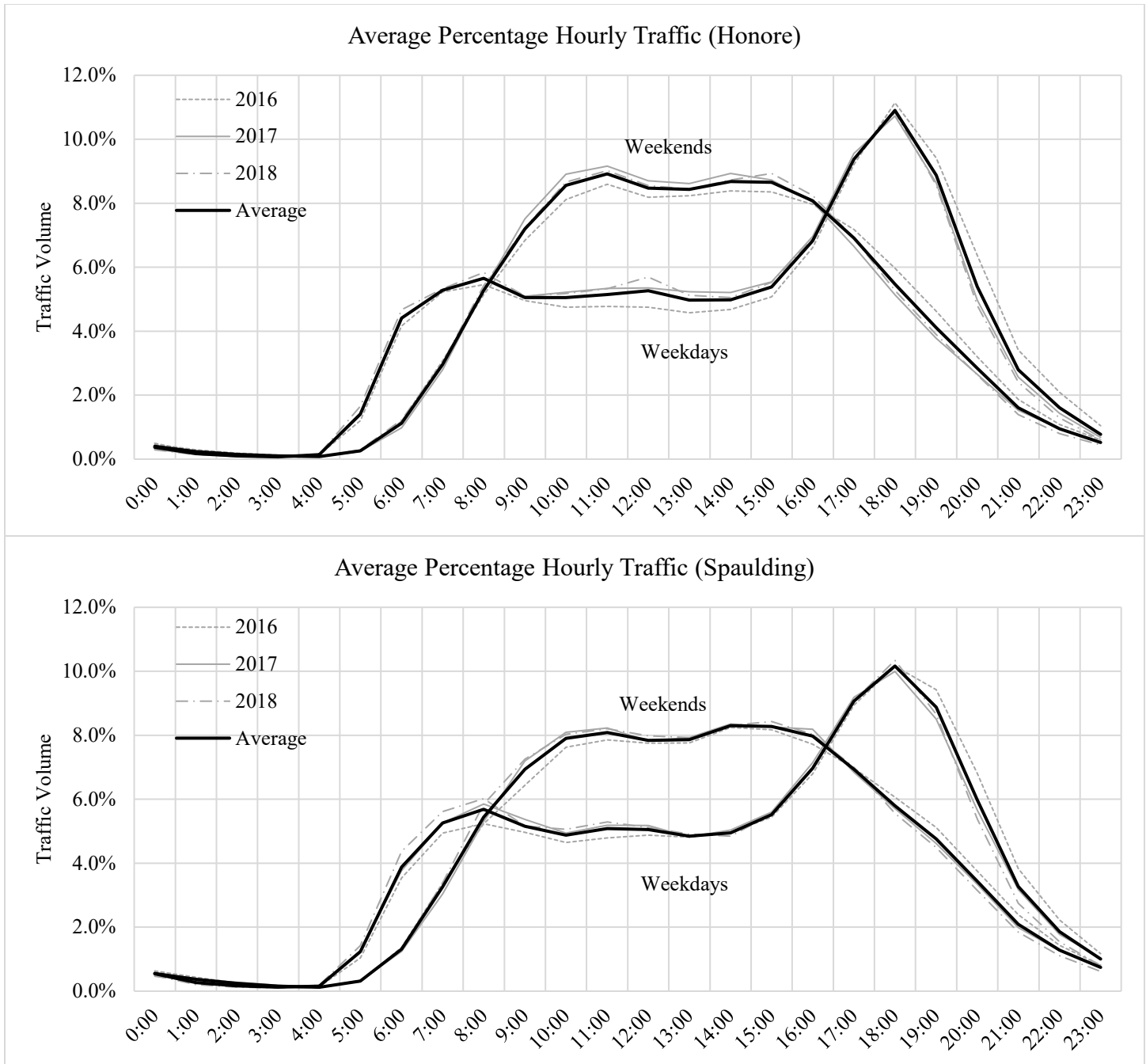


Figure 7. Weekend and Weekday Average Percentage Hourly Traffic, 2016 – 2018.

Table 1. Predictive Model of Daily Use.

Term	B	t-statistic
(Constant)	-2603.506	-13.438**
Daily High Temperature	79.892	69.440**
Rain	-1044.806	-13.577**
Weekend (binary)	826.963	16.922**
Location on Trail (binary, base = Honore)	-502.389	-11.398**
Sky Cover	-436.728	-7.167**
Wind	-46.969	-7.464**
Year (2016 binary, base = 2018)	394.889	7.200**
Visibility	106.426	6.629**
Year (2017 binary, base = 2017)	162.085	2.966 *
Snow	153.186	2.809 *

*p < .005 **p < .001; Adj. R² = 0.78

Additional research is needed to assess the validity of these hypotheses. The effects of weather and congestion can be explored through statistical analyses of existing monitoring data. For example, we believe we can model what traffic volumes “would have been” in 2017 and 2018, using 2016 weather and day-of-week models to create counterfactuals for comparison with actual volumes. We can explore the effects of congestion by analyzing whether reductions in use have been disproportionately associated with the highest hourly volumes. Surveys of both users and non-users may be required to address the novelty effect and to explore changes in resource use, perceptions and preferences. For example, while analyses indicate rates of crime near The 606 have declined, it could be that one or more well-publicized crimes, however infrequent, affect perceptions and deter use. Surveys of individuals would help assess the validity of this factor.

The 606 can be thought of as a major experiment for meeting the needs of urban residents, reducing disparities in accessibility to high-quality open space, and, by supporting active living, addressing the grand challenges of urban livability, public health, and climate change. Continued monitoring and analysis of responses from trail users and neighborhood residents will inform policy-makers and help managers ensure that The 606 realizes its fullest potential.

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