

Landscape infrastructure and the retrofitting of sustainability into suburban communities: Irvine, California’s Jeffrey Open Space Trail

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Introduction

This paper investigates the performance of the Jeffrey Open Space Trail in Irvine, CA a recent ‘green infrastructure’ project. It emphasizes the social performance of this landscape—its ability to promote healthy community life, stronger identity and public health. The data consisted of observations conducted in January 2016 and analysed using Ahern’s (2007) cultural performance indicators. The results suggest that while this linear park successfully provides Irvine residents many opportunities for physical activity and diverse visual experiences, it fails to serve as social and community-building infrastructure.

Background and literature review

20th century cities have known an unprecedented urban development at the metropolitan edge through a diffused urban fabric of single-family homes and auto-oriented shopping areas. This pattern remains very common around the world yet many have attempted to reform it. In the 1990s, New Urbanism envisioned new, denser, more walkable and less auto-centric suburbs surrounded by nature (Calthorpe, 1993). Contemporary ‘blue-and-green’ planning in Europe and Landscape Urbanism in the US have renegotiated nature’s role by envisioning neighbourhoods where green infrastructure—parks, habitat areas, urban agriculture—structures built form, performs ecosystem services (Waldheim, 2016; Rice, 2010), promotes biophilia and builds community (Hester, 2006; Manzo et al, 2006; Beatley, 2011). As landscape-based urbanism enters a more mature phase, a critical assessment of its benefits is paramount.

Since 2010, the Landscape Architecture Foundation has sponsored over 100 landscape performance evaluations (<http://landscapeperformance.org>). In these studies, social performance was operationalized in terms of quantity of users and accessibility rather than the landscape’s experiential qualities. The Public health field been concerned with the effects of parks and green infrastructure on perceived health, safety, and well being (McKenzie et al. 2006; Lachowycz and Jones 2013). Urban designers have investigated performance in terms of walkability, connectivity, accessibility and

satisfaction, using environmental audits, surveys, and post occupancy evaluations (Clifton 2007; Cooper Marcus and Francis 1997).

Most recently, green infrastructure has attempted a holistic and systemic landscape performance assessment model incorporating abiotic, biotic and cultural functions (Ahern 2007). This research focused on cultural indicators, defined as direct experience of natural ecosystems; physical recreation; experience and interpretation of cultural history; provision of a sense of solitude and inspiration; opportunities for healthy social interactions; and stimulus of artistic/abstract expression(s). The critical case study of the recently designed Jeffrey Open Space Trail in Irvine, California illustrates the benefits and challenges of retrofitting green infrastructure principles in urban development at the urban edge.

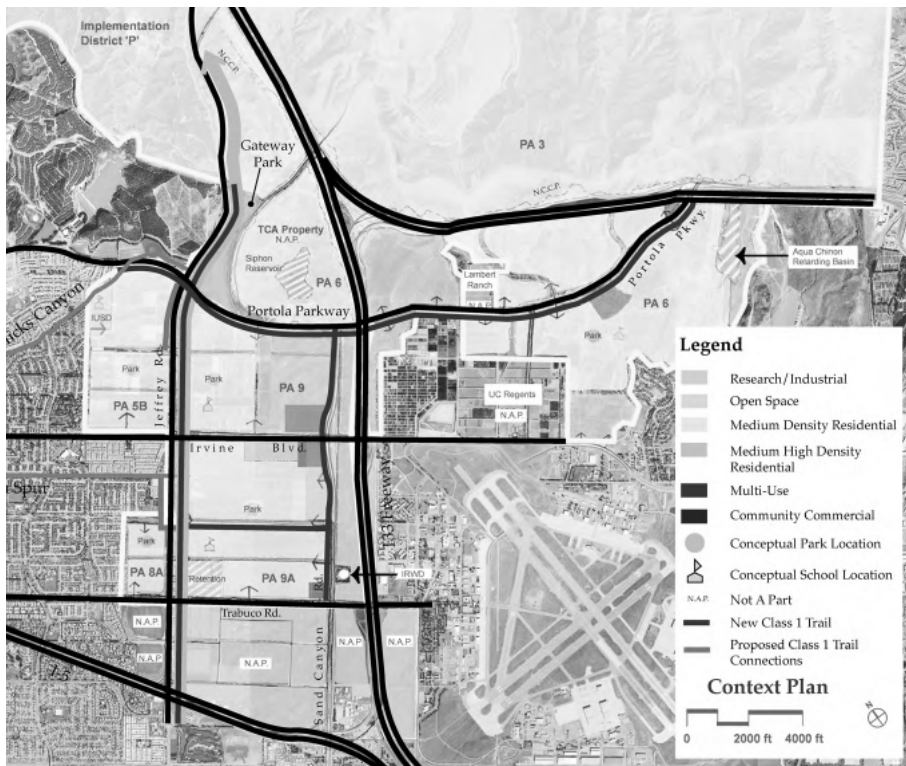


Figure 1. The Jeffrey Open Space Trail frames urban development in Irvine’s northern sphere (courtesy: SWA Group)

Case study: the Jeffrey Open Space trail in Irvine, California

Irvine, California is America’s largest New Town, planned in the mid 1960s as a polycentric urban structure of villages defined by heavily landscaped arterial roads. Within each village, a green network of small parks, tree-lined streets, trails and paseos linked residents to shopping areas, schools and offices. This strong landscape framework would allow the architecture evolve and adapt to changing consumer taste. It also gave the city a unique identity as the most landscape architectural of the American New Towns (Forsyth 2005, Ruggeri 2009).

After the 1996 establishment of the 40,000-acre NCCP nature preserve, Irvine begun to plan new greenways and link residential areas to nature. In the late 1990s, the municipality, the Irvine Company Development Corporation and the SWA Group formed a partnership to oversee the creation of a greenway, known as Jeffrey Open Space Trail or simply JOST (fig. 1). JOST challenged the city’s well-established custom to place parks at the centre of each neighbourhood for safety and natural surveillance, The Jeffrey Open Space Trail served as the physical seam between the newly built neighbourhoods of Woodbury (opened in 2008), Stonegate (2010) and Cypress Village (2014). On January 16, 2016, JOST was opened to the public in its entirety.



Figure 2. The segment two of the Jeffrey Open Space Trail and the three sub-areas investigated by this research (illustration by the author)

Research question: the cultural benefits of green infrastructure

This paper sought to investigate the cultural performance of the Jeffrey Open Space Trail. The researchers used participant-observation and mapping to map social and physical activity between January 12th and January 19th, 2016. The observations took place in Segment two of JOST, the most established and mature part of the trail, which opened in 2008. The park was divided into three sites “A, B, C” (fig. 2). The times of observations were randomly selected in order to capture its performance throughout the day.

Daily site observations for each of the three sites lasted 30 minutes. A template including a sketch plan of each sub-area, conventional symbols for gender and direction of travel was used to facilitate the data collection. The template also included an activities’ checklist, weather/wind conditions, a two-minute traffic count and noise levels (in decibels). A final set of participant-observation questions assessed the quality of the user experience: Who is there? What are they doing? Where are they? How does the space feel as a user? How does the place ‘work’ as a user? And what changes may be suggested to improve its design?

Ahern’s cultural performance indicators of green infrastructure provided the theoretical grounding for the interpretation of the data collected during the post occupancy evaluation (table 1). The analysis focused on the assessment of JOST’s cultural benefits, which are discussed in the following sections via three umbrella themes: social, health, and identity/education.²⁸

Table 1. Green infrastructure functions (Ahern 2007)

| Abiotic | Biotic | Cultural |
|---|---|--|
| Surface:groundwater interactions | Habitat for generalist species | Direct experience of natural ecosystems |
| Soil development process | Habitat for specialist species | Physical recreation |
| Maintenance of hydrological regime(s) | Movement routes and corridors | Experience and interpretation of cultural history |
| Accommodation of disturbance regime(s) | Maintenance of disturbance and successional regimes | Provide a sense of solitude and inspiration |
| Buffering of nutrient cycling | Biomass producti | Opportunities for healthy social interactions |
| Sequestration of carbon and (greenhouse gasses) | Provision of genetic reserves | Stimulus of artistic/abstract expression(s) |
| Modification and buffering of climatic extremes | Support of flora/fauna interactions | Environmental education |

Findings: The Jeffrey Open Space Trail as ‘performing’ infrastructure

- a) The social performance of JOST: Opportunities for healthy social interactions

Successful landscapes should be supportive of healthy interactions and social capital construction. While JOST was designed for small gatherings,

²⁸ A study of the ecological performance of JOST was conducted in 2013 by the SWA Group. It pointed at JOST’s plantings of native species as the largest in the region, reduced water consumption, and its biodiversity as key indicators of successful performance.

observations suggest a strong performance with regard to community/social life. True to its landscape infrastructure identity, the trail is flanked by schools, sports fields and community centres, which activate its 3,5 mile long stretch and make JOST a safe and convenient route to school, shop, or recreation. The presence of these community spaces offers important affordances for social interaction and might explain the variety of users and activities observed.

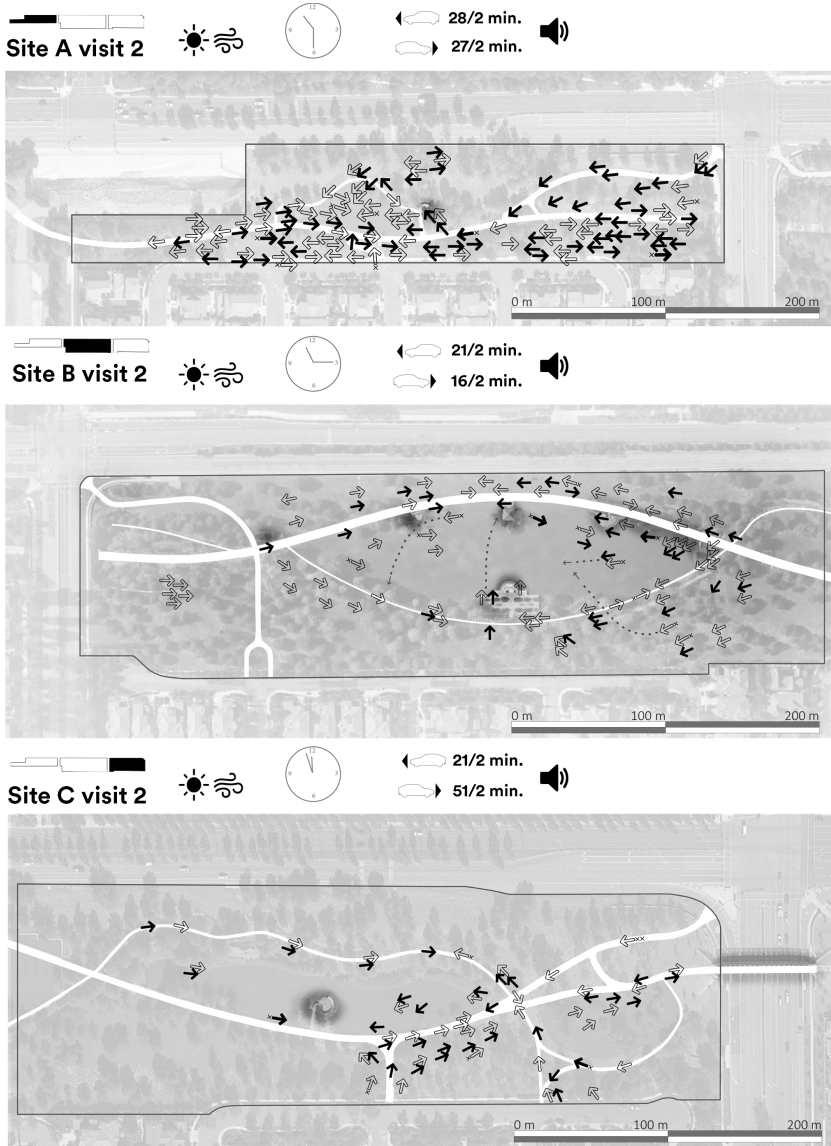


Figure 3. Observation results for Sunday, Jan. 17th (illustration by the author)

The Jeffrey Open Space Trail is used by diversity of user groups, which alternate and vary considerably based on weather conditions, time of day and weekend/weekday status. On weekends, the JOST trail is activated by a large number of users equally divided between men and women, young and old. On weekdays, women tend to be less numerous, while seniors and teenagers appear respectively earlier and later in the day. Senior citizens like to visit the park in small groups of three or four and prefer afternoons. Mothers with strollers prefer mornings, while children and teenagers dwell in the park on weekdays, on their way back from school.

With the exception of the orange grove at Crescent Meadow (site B), the formal seating areas tended to be underused in all of our observations. Their rigid orientation facing lawn areas (but away from natural landmarks of potential vistas on the surrounding landscape) combined with the use of stone that feels rough and uninviting may account for such disuse. The presence of fountains at the seating area in site A invites people to stop, refresh and strike a conversation. Dog-walkers stop at the fountains to feed their pets. Water fountains serve as affordances for impromptu conversations between young mothers with strollers and dog walkers (fig. 3).

b) JOST and health: affordances for physical recreation and solitude/inspiration

JOST is a great resource for the public health and well being of Irvine residents. One in two users have been observed performing mild to high intensity physical activities like speed walking, running, biking, or skating. The original design decision to plan for two interconnected trail systems aimed at providing users with options in terms of intensity and quality of their recreational activity (City of Irvine 2006). The six foot-wide decomposed granite trail was designed with medium physical activity in mind, becoming most popular amongst runners and senior citizens. The 11' wide concrete trail was designed for active biking and running. Its slopes, ranging from 2% to 5% and its layout aimed at providing a universally accessible yet experientially rich park experience. Underpasses and overpasses allow users to bypass the traffic of Irvine's streets without interference from street traffic. The trail was also furnished with trash cans, water fountains, a public restroom area, bike racks and lighting to improve on its overall perceived safety and comfort.

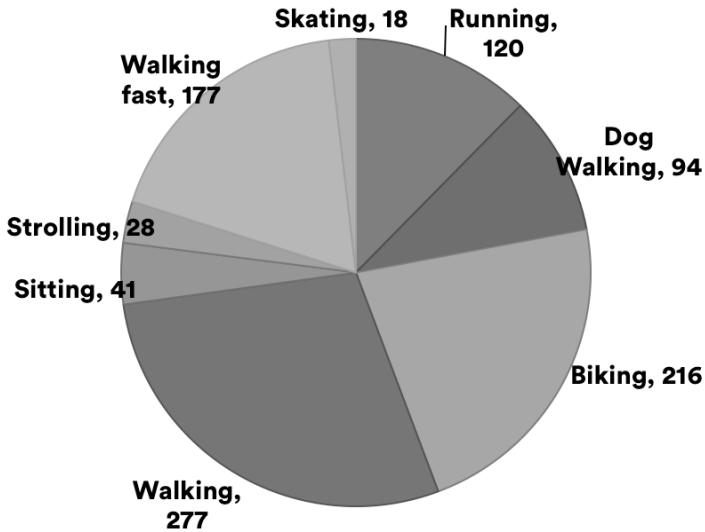


Figure 4. Distribution of physical activities observed (illustration by the author).

Half of the users observed enjoy the park in a more passive mode, walking slowly along its winding paths for relaxation or simply spending quality time outdoors. The original vision for the Jeffrey Open Space Trail distinguished it from other city parks, heavily programmed with sports fields and active recreation. This is reflected in our observations, which accounted for only a few users using the crescent meadow for soccer or kite flying on a windy day. While not specifically designed for them, the smooth surfaces of the concrete trail also attract small groups of teenagers on skateboards and rollerblades (fig. 4).

Users seeking respite from the stress of contemporary life can find ample opportunities for quiet and relaxation within JOST. However, traffic along Jeffrey is quite heavy and this reflects on noise levels averaging during our observations around 65 db, with one peak measurement of 80db on a windy weekday afternoon at site B (crescent meadow) and a low 55db measured on a sunny weekday morning in site A, a small meadow carved surrounded by a pine grove. While these measurements should not affect auditory health, they do suggest the potential for improvement in future park design and the integration of new knowledge on the provision of auditory comfort as a health performance measure.



Figures 5. and 6. Mosaic tiles displaying Irvine’s Historic orange crate and Tree identification labels connect residents to their historic and natural landscape (courtesy: SWA Group)

c) Identity and education: Environmental education through direct experience of natural ecosystems, cultural history and beauty.

Cultural performance indicators of green infrastructure emphasize the educational value of parks both in terms of eco-literacy and in terms of promoting a richer understanding of a places’ history. The idea to embed identity markers throughout emerged very early in the planning for the park (City of Irvine 2006). Extensive research went into identifying the milestones in Irvine’s history and how to best narrate them. An interpretive system of concrete and stone markers, monumental seating areas and mosaic decorations would celebrate Irvine’s rich history from prehistoric to modern times. Located closest to the City centre, segment one would celebrate the planning of the New Town, segment two its early 20th century agricultural history (fig.5), segment three its Mexican heritage, while segment 4 would showcase the region’s pre-historic times.

Our observations revealed that historic markers and installations throughout the park seem to receive limited attention from users. Only a handful of senior citizens and families with children stopped and study the historic timeline. To those using the trail regularly for exercising and transportation purposes, the ‘cultural’ elements of JOST remain a background feature. Similarly, the plant identification signage present throughout the park, a recent addition by a local non-profit, the GFWC Ebell Club of Irvine (fig. 6) also failed to attract users.

An important element in the design of JOST was the integration of art—mosaic tiles, concrete panels etched with historic pictures—and a design aesthetic borrowed from F. L. Olmsted’s work in New York’s Prospect Park or Boston’s Emerald Necklace. The residents’ wish for a timeless, classical

landscape emerged during community participation meeting and seemed to reflect many residents’ wish for an established community with roots deeper than the city’s 50 years of age. Today, many Irvine residents choose JOST as an ideal setting for photo shoots, self-portraits and selfies. With its carefully choreographed landscape of meadows and wooded areas, creeks and open lawns, monuments and historic markers, the park acts as the perfect setting for a family portrait, a couple’s self-shot or pictures of one’s playful pet. As Valerie V., a yelp user who reviewed the trail in 2013, JOST is a “great place to take photos! We did a family shoot here. They have lush trees, rocks and those wheat/barley looking plants (not sure what they are called) to get those cool rustic shots!”

Conclusion: Is the Jeffrey Open Space Trail a success?

This preliminary study wanted to fill a gap in our contemporary understanding of the performance of landscape infrastructure, with particular reference to cultural performance, defined as the ability to support direct experience of natural ecosystems, physical recreation, experience and interpretation of cultural history, provision of a sense of solitude and inspiration, opportunities for healthy social interactions, and stimulus of artistic/abstract expression(s). It employed a participant-observation inspired post occupancy evaluation methodology, which involved the collection of data on user activity and behaviour and a holistic assessment of the overall quality of the experience afforded by the JOST landscape.

The observations unfolded over a total of 10 hours, with different weather conditions and at peak and non-peak times. The focus on a central segment of JOST was dictated by the maturity of its landscape (completed 8 years prior to the observations) and surrounding neighbourhoods. However, it should be noted that while JOST has been completed, many of the areas to the west of it have yet to experience urban development and will take a few decades to complete. As new villages are built, a new flux of JOST users will activate its currently underused spaces and take advantage of the designed street connections.

Overall, our data suggests that JOST’s cultural performance as a landscape infrastructure is positive in all six indicators highlighted earlier. Our observations reveal a diverse and rich social life of the Jeffrey Open Space Spine, which serves seniors and disabled, families and singles, teenagers and younger children. JOST’s design offers them choices in terms of physical activities and experiences. It connects them to Irvine’s history through installations that—albeit being lightly used—generate healthy feelings of place

identity, attachment pride and stewardship in the residents. JOST brings Irvine residents closer to nature, educates them about native landscaping and water scarcity, feeds their need for identity and fosters health, planting a seed of sustainability in the suburban fabric of this of this 60 year-old modernist community.

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