

Klyde Warren Park



Landscape Performance Benefits

- Hosted over 1 million park visitors in its first year, including 40,000 on opening weekend.
- Improves the quality of life for 90.9% of the 224 park users surveyed, primarily by reducing stress, providing a place to be outdoors and improving the area's sense of place.
- Promotes healthy living for 86.3% of the park users surveyed. 69% of the survey respondents also agreed that the park increases their participation in outdoor activity.
- Sequesters 18,500 lbs of CO₂ annually through newly planted trees, equivalent to the CO₂ emitted from driving approximately 22,636 miles in a single passenger vehicle. These trees also intercept 64,214 gallons of stormwater runoff annually through their canopies.
- Reduced summer temperatures in the park by 1-9°F compared to the average temperature for the park's zip code during the week of observations.
- Contributed to a 61% increase in ridership on the M-Line trolley, which connects downtown and uptown. After completion of the park, the trolley line was re-routed, with 3 new trolley stops adjacent to the park.
- Created 8 full-time and 5 part-time positions in maintenance and operations, in addition to the approximately 170 temporary jobs that were created during design and construction.
- Projected to generate \$312.7 million in economic development and \$12.7 million in tax revenue. Development spurred by the park will contribute to a projected 8.8% population increase in the two Census Block Groups surrounding the park by 2017, supporting the regional goal of making metropolitan centers attractive and viable places to live.
- Increases property value. For example, the 21-story 2000 McKinney Tower saw a 65% increase, from a 2008 total market value of \$32,255,970 to a projected market value of \$91,175,000 in 2013.
- Encourages social interaction beyond its boundaries with 14,683 Facebook 'likes', 5,212 'tagged' Facebook photos at the park, 6,980 Twitter followers, and 959 Instagram followers, all in the first six months.

Designer

The Office of James Burnett

Land Use

Transportation
Park/Open space

Project Type

Park

Location

Klyde Warren Park
Dallas, Texas 75201

Size

5.2 acres

Budget

\$110 million

Completion Date

2012

Overview

Klyde Warren Park is a landmark central open space, which spans the 8-lane, sunken Woodall Rogers Freeway, bridging Dallas' Uptown and Arts District neighborhoods. It is the world's largest suspended infrastructure to contain a park and provides a new programmed public space that physically, socially, and culturally connects two bustling districts. Complex technical engineering solutions structurally support massive loads above the busy freeway while allowing for an open, flexible park layout with sufficient soil to support a variety of trees and plantings. The park includes a wide pedestrian promenade, Great Lawn, pavilions, a children's playground, interactive water features, a dog park, botanical garden, and numerous plaza and garden spaces. Top-notch programming includes free daily events such as yoga classes, family activities, and outdoor theater and concerts. The park exemplifies innovation and is rapidly becoming the new civic heart of Dallas.

Sustainable Features

- The park is supported by more than 300 pre-stressed concrete box beams, spanned by concrete slabs. These slabs, framed by the groups of beams, form trenches, which function as large planter boxes with space for tree roots to grow. The trenches also provide space for fiber optic cables, telephone, electric, water and gas lines, all topped by five feet of fill and 18 inches of soil. Using engineered soil where planting soil wasn't needed and filling the deck with geofoam dramatically reduced the weight of the deck. This complex structure supports the park above the 200-ft stretch of freeway, acting as a "bridge, park, and tunnel design, all in one," according to the Engineer of Record.
- There are 15 programmed spaces within the park including a 2,300 sf concert/multi-use pavilion, a 28,000 sf event lawn, a 10,000 sf recreation lawn, a reading and board games room, a dog park, a children's playground, activity area, and interactive water features.
- The park was planted with 322 trees, 904 shrubs and 3,292 groundcover/perennials of a variety of species, with 52% native to the north Texas area. Trees are planted within a grid system aligned with the 100 trenches created by the beams and slabs.
- All together, Klyde Warren Park – including its lawns, plantings and gravel surfaces – is more than 50% permeable, compared to 100% impermeable freeway it covers.
- The planting beds are irrigated with a subgrade dripline system that reduces surface runoff and the live load of the water on the deck.
- The 14,000-sf children's playground is a major attraction for the park. Programmed spaces include an interactive water feature, multiple geometric-inspired jungle gyms, a look-out tower and a shaded restroom pavilion. To provide a safe play surface that is comfortable during the hot summer months, the playground uses a combination of durable, rubber material and synthetic turf-covered mounds to soften the hardscape groundplane.
- To conserve energy, the project uses high-efficiency LED lighting and fixtures with solar panels.
- A subgrade reservoir can collect and store up to 12,000 gallons of greywater from the park's water features for treatment and reuse in irrigation. A drainage mat between the soil and deck infrastructure also stores excess water, helping to maintain soil moisture.
- Dynamic seating options are available through 'café seating'. A visitor has access to 143 small round tables (24-in diameter), 48 larger round tables (30-in diameter), 88 luxemborg chairs and 286 bistro chairs.
- A 6,000-sf restaurant, a 'grab and go kiosk', and 9 food trucks provide a variety of dining options within the park. The restaurant will use geothermal energy for cooling and heating, along with high-efficiency light features. The mobile food truck vendors not only offer tax income for the City but also generate revenue for the Park Foundation. Each food truck pays a 10% commission of daily sales; in return, the vendors are not required to have a permit to sell along the park's edge.
- The 5.2-acre park project added approximately 1/2 mile of walkable streetscapes and 9 crosswalks, connecting and encouraging walking within the greater Uptown and Arts District areas.

Challenge

The charge from the client was to create a landmark central open space that would heal the scar created by the sunken freeway and serve as a new "front lawn" for the city of Dallas. The primary challenge was designing a park on a piece of suspended infrastructure, which would impose limitations on soil depth and planting abilities. Site conditions were further complicated by a significant NW to SE slope, along with vertical clearance requirements on the surface of the freeway. Moreover, because the project was both within the City of Dallas and over a freeway operated by the Texas Department of Transportation (TxDOT), the design of the park needed to comply with federal and state highway regulations, as well as municipal requirements.

Solution

The very unique issue of spanning the Woodall Rodgers Freeway challenged the design team towards innovation. The original design concepts proposed by the structural engineer included a solid web of precast box beams to span the freeway. This would have necessitated the use of raised planters for any trees in the park, which, as demonstrated by William Whyte and others, creates a disconnected condition that results in dramatically lower usage than comparable spaces at street elevation. Through a series of work sessions, the landscape architect steered the engineering team to utilize a drop-slab system with even fewer beams, allowing trees to be placed in grade and creating an open, flexible park layout. The landscape architect also gave careful consideration to ensure that adequate planting soil was available. To allow for flexibility during the design process and to account for cost concerns, most site structures have foundation systems resting on, but independent of, the main structural slab. The construction team and TxDOT used an intricate planning process to coordinate the closure of the heavily-used freeway, ensuring a safe construction process for the workers and passing vehicles.

Cost Comparison

- The dead load on the deck was reduced by substituting the industry standard of soil with 180 tons of geofoam, which is 1% the weight of the standard soil medium. (The 9,600 cubic yards of soil would have weighed 12,000 tons.) To achieve this dramatic weight reduction, the approximate cost of the geofoam was \$481,482 (\$65 per cubic yard) versus the \$482,400 approximate cost of soil (\$50.85 per cubic yard).
- By using a high-efficiency LED lighting system, the park saves approximately 94,000 kilowatts of electricity each year as compared to traditional lighting. At an average cost of \$0.12 kWh, this results in a savings of over \$11,200 per year.

Lessons Learned

- As an extremely complex infrastructure and design project, Klyde Warren Park had a wide variety of funding sources and decision-making stakeholders. The funding structure included a public funded city bond (\$20 million), state organizations (\$20 million from the Texas Department of Transportation), federal stimulus money (\$16.7 million) and private donations (\$50+ million). These stakeholders' goals varied widely, with the City focusing on the need for a vibrant, urban green space and economic development stimulus, and TxDOT and the State focused on improving the infrastructure. To help achieve these varied goals, the Woodall Rodgers Park Foundation acts as an independent management group for the park and has accommodated different needs throughout the lifetime of the project. The Foundation began as a fundraising group -- particularly given the City's requirement that all funding be obtained (not merely pledged) before the construction of each phase -- and later transitioned to become a private park management group. It would have been extremely difficult to achieve such varied goals and take advantage of the full range of funding sources without a dedicated and independent management organization.
- Park maintenance, upkeep, and programming is expected to cost \$2 million in operating expenses per year, all of which needs to be privately raised. This approach, inspired by New York's Bryant Park, had not been implemented in the southwest before the delivery of Klyde Warren Park. To provide institutional support for the Park Foundation, a Park Improvement District (PID) concept was developed to generate revenue for the park through a tax levied on surrounding property owners. Although this proposal initially generated controversy due to funding needs for other nearby cultural facilities, the Dallas City Council approved the Park Improvement District. Projected revenues from the PID are estimated to be roughly \$610,500 (2014) with yearly incremental increases up to \$1,221,000 (2020).
- Initial proposals for the park were not as amenity-rich as the final plan. However, as private fundraising kicked off, donors expressed interest in particular types of park spaces, such as the performance stage, botanical garden, and dog park. As a result, many were incorporated into the park in the early design phases when engineers were determining how to best support the deck over the freeway. This was essential to be able to accommodate stakeholder needs. The engineers' initial weight calculations thus included these elements, as well as park visitors, soil, equipment, over 320 mature trees, over 900 shrubs, and the load from rainwater.

Project Team

Landscape Architect & Lead Designer: The Office of James Burnett
Prime Consultant and Lead Engineer: Jacobs Engineering Architect
Restaurant and Pavilion: Thomas Phifer and Partners Architect
Children's Restroom and Site Structures: EndreStudio
Interior Architect, Restaurant: Johnson Studio Park Programming: Biederman Redevelopment Ventures
Water Feature Design: Fluidity Design Consultants
Lighting Design: Focus Lighting Design
Environmental Graphics Designer: Thomas Phifer and Partners with Focus EGD
Civil Engineer: Dal Tech Engineering
Electrical Engineer: Jacobs Engineering
Structural Engineer, Bridge: Jacobs Engineering
Structural Engineer, Site Features: EndreStudio
Irrigation Design: Sweeney and Associates
Construction Manager: Bjerke Management Solutions
General Contractor, Park and Buildings: McCarthy Building Company
General Contractor, Bridge Structure: Archer Western
Landscape Contractor: ValleyCrest Landscape Development

Role of the Landscape Architect

The landscape architect conducted the initial design feasibility studies for the project and was the lead designer, collaborating with the project team to envision the park, design it, document the plans, and oversee the construction.

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Additional Images















