

## Walking in Air: Pedestrian Bridges

Pedestrian bridges can reunite downtowns with their waterfronts, add dynamic forms to city skylines, give historic vehicular bridges new life, and bring citizens closer to nature.

MAKING CITIES MORE PEDESTRIAN friendly may be the goal of today's urban planners, but rail lines and multilane freeways pose formidable barriers. Even natural features such as rivers and creeks—perfect for promenades—can divide cities for those on foot. To further complicate matters, walking above busy railroad tracks and highways is not generally welcoming, and spans across waterways risk obstructing or damaging the very natural environment they are intended to capitalize on.

While Europe has a long tradition of elegant and pleasant footbridges, the United States has been slower to move away from largely functional crossings. In recent years, however, creative examples of these structures have gained a high profile for their potential to raise civic pride, draw tourists, and serve as a landmark for neighborhoods, businesses, and cities.

The following ten pedestrian bridges illustrate a range of approaches to connecting the urban environment for walkers

and bikers, in the process linking downtowns to the waterfront, adding dynamic forms to the skyline, bringing people closer to nature, or turning historic vehicular bridges to new uses.

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### 1. Chihuly Bridge of Glass

#### TACOMA, WASHINGTON

**Architect:** Andersson-Wise Architects, in collaboration with glass artist Dale Chihuly of Seattle, Washington  
**Structural Engineer:** Andersen Bjornstad Kane Jacobs, Seattle, Washington

A glass fantasia, the Chihuly Bridge of Glass suspends hundreds of Dale Chihuly's glass sculptures above nine lanes of interstate highway and three train tracks.

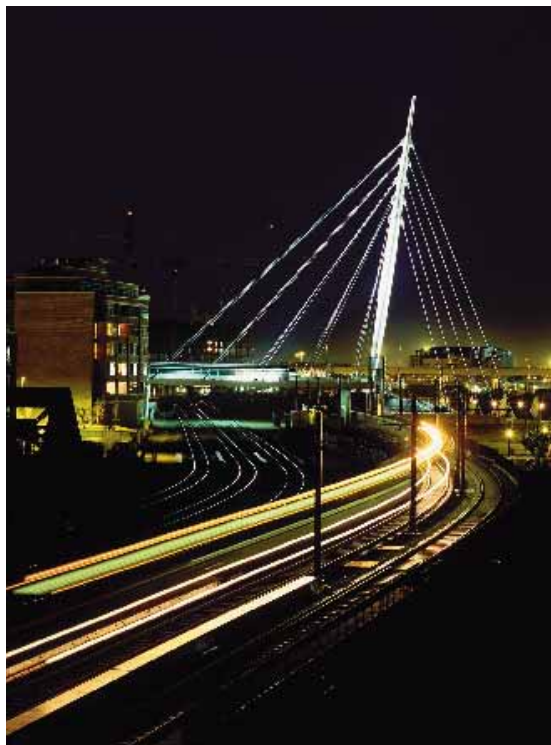
The 500-foot-long (152.4-m-long) bridge opened in 2002, reconnecting Tacoma's downtown and cultural district to the waterfront, a former Superfund site that now houses the Museum of Glass and new residential development. At the center of the bridge stand two illuminated 40-foot (12.2-m) towers of weather-resistant polyvitro crystals. Flanking the towers are two semi-enclosed pavilions, one with Chihuly's Venetian-style vessels on shelves

(behind security glass), the other with hundreds of glass sculptures displayed in a transparent ceiling. Federal, local, and private contributions funded the project; the city owns the bridge, while the Museum of Glass donated the enclosures and artwork.



TIM HURSELEY

TIM HURSELEY



## 2. Denver Millennium Bridge

### DENVER, COLORADO

**Architect:** ArchitectureDenver, Denver, Colorado

**Structural Engineer:** Arup, New York, New York

The redevelopment of Denver's Central Platte Valley, once home to rail yards, warehouses, and viaducts, has been decades in the making. Opened in 2002, the Denver Millennium Bridge, a 130-foot-long (39.6-m-long) cable-stayed structure that crosses rail tracks and a light-rail corridor, extends the activity of the 16th Street Mall to the green space of Commons Park. Supporting the structure with a 200-foot-tall (61-m-tall) tapered steel mast enabled the concrete platform to sit as low over trains as possible, minimizing the climb for pedestrians. Painted white, the dramatically canted mast gives the valley new visibility. Funding came from the city of Denver, the Central Platte Valley Metropolitan District, and East West Partners, private developers building a master-planned community adjacent to Commons Park.



FRANK DOMS

## 3. Helix Pedestrian Bridge

### SEATTLE, WASHINGTON

**Architect:** Johnson Architecture, Seattle, Washington

**Structural Engineer:** KPFF Consulting Engineers, Seattle, Washington

Located next to Olympic Sculpture Park, the 10.5-acre (4.2-ha) Elliott Bay Park offers views of Puget Sound as well as bike and pedestrian paths and a fishing pier. However, it has long been hard to reach, separated from the rest of the city by 11 active railroad tracks. That changed in 2004, when Amgen, one of the country's largest biotechnology companies, included a 420-foot-long (128-m-long) pedestrian bridge patterned after a DNA helix as part of its new 27-acre (11-ha) campus on the waterfront. The bridge was part of a deal with the city, which paid for construction of a new vehicle bridge in exchange for Amgen building the pedestrian connection. In addition to facilitating public access to the park, the



JAMES B. HATFIELD/© KPFF, 2007

bridge makes it easy for the company's employees to take the bus or bicycle to work. The steel structure serves as a dramatic calling card for the company and a symbol of biotechnology's rising prominence in Seattle's economy.

## 4. James D. Pfluger Bridge

### AUSTIN, TEXAS

**Architects:** Kinney & Associates, Austin, Texas, and Carter Design Associates, Austin, Texas

**Structural Engineer:** HDR, Inc., Austin, Texas

Auto accidents in 1991 and 2000 killed a cyclist and a jogger on Lamar Boulevard Bridge, a popular route for athletes, pedestrians, and commuters across Austin's Town Lake. Rapid population growth and the resulting heavy traffic had made the bridge unsafe for shared use. After extensive public input, the city decided to make the historic 1940 bridge auto-only and construct a separate 700-foot-long (213.3-m-long) pedestrian and bicycle bridge alongside it. Fully wheelchair accessible, the four-lane James D. Pfluger Bridge opened in 2001 with two curving avenues that join in the center before fanning out again. A mid-bridge gathering area offers planters and benches. On the north shore, a helical ramp leads to trails. Next year, construction is expected to begin on an extension of the bridge, crossing over busy West Cesar Chavez Street to facilitate connections north to downtown.



HDR

## 5. Liberty Bridge

### GREENVILLE, SOUTH CAROLINA

Architect: Rosales + Partners, Boston, Massachusetts

Structural Engineer: Schlaich Bergemann and Partner, New York, New York

Not many cities have the asset that Greenville, South Carolina, has: a 60-foot-high (18.3-m-high) waterfall in the middle of downtown. But for decades, a six-lane vehicle bridge crossing the Reedy River blocked views of the falls. The redevelopment of Falls Park, completed in 2004, not only removed that bridge and added two amphitheaters, gardens, trails, patios, and sculpture, but also included a 380-foot-long (115.8-m-long) pedestrian bridge. The Liberty Bridge, supported by two inclined 90-foot-tall (27.4-m-tall) steel towers and one suspension cable, serves as a beacon for the downtown and provides unobstructed views as it curves toward the falls. Dedicated in 2004, the park and bridge have helped spark development nearby, including condominiums, offices, and shops in a public/private develop-



ment called RiverPlace across from the park. The \$13 million park and bridge development was funded by the city's hospitality tax and private fundraising.

## 6. Marsupial Bridge

### MILWAUKEE, WISCONSIN

Architect: La Dallman Architects, Milwaukee, Wisconsin

Structural Engineer: Bloom Consultants LLC, New Berlin, Wisconsin

Pedestrians could use the 1920s-era Holton Street Viaduct to get across the Milwaukee River, but they tended not to. With concrete barricades to protect them from automobile traffic, steel mesh fences, and the bridge's great distance above the water, crossing was not a pleasant experience. As the city worked to reclaim its riverfront from industrial uses, neighborhood groups collaborated with the municipality to realize an effective solution: a new 650-foot-long (198-m-long) footbridge suspended beneath the viaduct. Completed last year, the Marsupial Bridge brings people close to the river and links the Brady Street and Brewers Hill neighbor-



hoods with burgeoning commercial and residential development in the once-industrial Beerline B area. The project also incorporates a new bus shelter on Brady Street and a well-lit urban plaza beneath the bridge that hosts civic events.



TOM FLOYD/SWA GROUP

## 7. Sabine-to-Bagby Promenade Bridge

### HOUSTON, TEXAS

Architect: The SWA Group, Houston, Texas

Structural Engineering: United Engineers, Inc., Houston, Texas, with Tan Associates, Inc., Houston, Texas

The 189-foot-long (57.6-m-long) pedestrian bridge at the Sabine-to-Bagby Waterfront Park helps restore access to the Buffalo Bayou as part of an \$800 million redevelopment of the area. The 23-acre (9.3-ha) park opened in 2006 with two miles (3.2 km) of hiking and biking trails, public art, and landscaping. By connecting promenades on either side of the bayou, the bridge links the downtown theater district and the Hobby Center for the Performing Arts to parking areas and residential neighborhoods, enabling theatergoers to park on one side and cross the bayou easily. In addition, pedestrians and bicyclists can now complete a loop around the waterway while avoiding busy streets. Blue and white LED lighting along the bridge and promenades further enhances safety and adds a touch of magic, encouraging active nighttime use.

## 8. Shoreline Bridge

### SAN MATEO, CALIFORNIA

Architect and Structural Engineer: Endres Ware, Berkeley, California

City parks represent a crossroads between nature and civilization, so it is appropriate—if rare—that park structures reflect both. This is true at the Shoreline Parks, where the city of San Mateo is reclaiming two miles (3.2 km) of shoreline on the San Francisco Bay with an ambitious master plan for more than 177 acres (71.6 ha) of park and open space. The first phase, opened in 2005, included the 70-acre (28.3-ha) Ryder Park, which offers trails, an aquatic playground, and picnic areas. The park's new 120-foot-long (36.5-m-long) pedestrian bridge across San Mateo Creek is characterized by a steel pipe arcing from large concrete cones on each end. In form, the bridge undulates horizontally, referencing the creek's curves, while vertical cables supporting the wooden deck echo the power lines that tower above the park. In the center, the bridge widens into a viewing platform for bay viewing.

LEROY HOWARD



## 9. Shelby Street Bridge

### NASHVILLE, TENNESSEE

Architect of Record: Frederic Schwartz Architects, New York, New York, and Barge Waggoner Sumner and Cannon, Nashville, Tennessee

An unusual reinforced concrete truss design qualified Nashville's Shelby Street Bridge for a spot on the National Register of Historic Places in 1998. That same year, however, city officials had to close the 1909 bridge to vehicle traffic because of structural concerns. After extensive refurbishing, it reopened in 2003 with a new identity as one of the world's longest pedestrian bridges. Spanning 3,150 feet (960 m) across the Cumberland River, it joins downtown to the East Bank neighborhood's Nashville Coliseum—home of the NFL's Tennessee Titans—as well as Shelby Bottoms Park and the city's greenway system. The bridge includes four overlooks for sightseeing, two ten-foot (3-m) boardwalks for pedestrians, and a 15-foot (4.5-m) lane for bicyclists. At night, dramatic lighting makes the bridge a prominent landmark in the city's skyline.



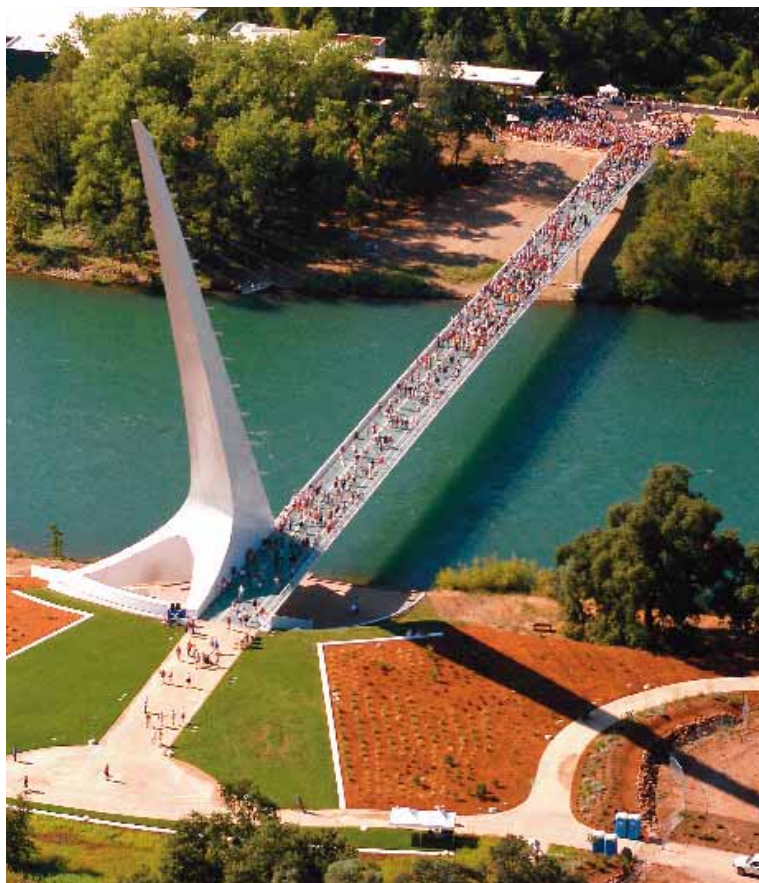
DAVE ANDERSON/DANOPHOTO

## 10. Sundial Bridge

### REDDING, CALIFORNIA

Architect and Structural Engineer: Santiago Calatrava, Zurich, Switzerland

A bridge by a world-class architect seems unlikely in a small community like Redding, California, population 90,000. But with federal and state grants and substantial funding from the local McConnell Foundation to cover the \$23 million cost, the town reached out to architect and structural engineer Santiago Calatrava for help in linking the north and south campuses of Turtle Bay Exploration Park without touching the Sacramento River, thereby protecting the spawning beds of endangered salmon. Intrigued by the challenge, Calatrava designed a 700-foot-long (213.3-m-long), 23-foot-wide (7-m-wide) suspension bridge of glass, prefabricated steel, and broken Spanish tile, topped with a 217-foot-tall (66-m-tall) sundial fin. The bridge's semi-translucent laminated glass deck is illuminated from underneath at night. Completed in 2004, Sundial Bridge has become a destination, enhancing access to the park's museum, aquarium, trails, and wildlife sanctuaries—and raising the city's profile. **UL**



TURTLE BAY EXPLORATION PARK



TURTLE BAY EXPLORATION PARK