

Lid Case Studies

Urban Systems

*Minnesota Department of
Transportation TAP*

Metropolitan Design Center
University of Minnesota

May 25, 2016

HIGHWAY LID CASE STUDIES

1938 - FDR Expressway - New York, NY (Deck)

1950 - Brooklyn Height Promenade - Brooklyn, NY (Deck)

1970 - Lytle Park - Cincinnati, OH (Tunnel)

1976 - Jim Ellis Freeway Park - Seattle, WA (Tunnel)

1982 - Arlington Gateway Park - Rosslyn, VA (Bridge)

1984 - Copley Park Project - Boston, MA (Tunnel)

1985 - Aubrey Davis & Luther Burbank Lid - Mercer Island, WA (Tunnel)

1985 - Sam Smith & Jimmy Hendrix Lid - Seattle, WA (Tunnel)

1990 - Margaret T Hance Park - Phoenix, AZ (Tunnel)

1992 - Leif Erickson Park - Duluth, MN (Tunnel)

2000 - Riverfront Park & Founders Bridge - Hartford, CT (Tunnel)

2004 - Millenium Park - Chicago, IL (Tunnel)

2004 - I-670 Cap at Union Station - Columbus, OH (Bridge)

2006 - South Riverside Park - Trenton, NJ (Tunnel)

2006 - 5th Street Bridge - Atlanta, GA (Sidewalk Expansion / Bridge)

2008 - Rose Kennedy Greenway - Boston, MA (Tunnel)

2012 - Klyde Warren Park - Dallas, TX (Tunnel)

2012 - Teralta Park - San Diego, CA (Tunnel)



HIGHWAY LID CASE STUDIES

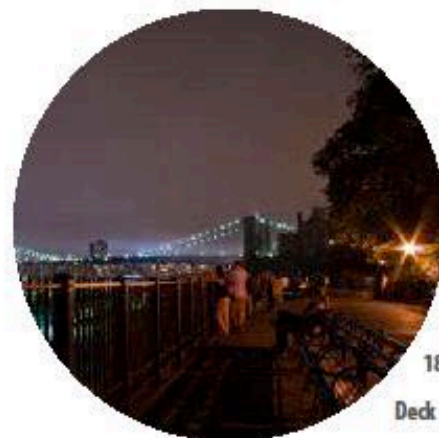
Jim Ellis Freeway Park - Seattle, WA



1976
\$23 Million
Interstate 5
5.2 Acres
528ft. Long
\$45/Sq. Ft.
Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> Bridge: \$5.53 million Parking garage: \$4.2 million Construction: \$4.07 million Cost of park was \$45/sq.ft. at time when purchase of downtown land was \$50/sq.ft. 	<ul style="list-style-type: none"> 1984 First expansion linked the park with a residential neighborhood and a retirement community. 1988 Second expansion for construction of 370,000sq.ft. convention center - increasing length to 1500 feet. 	<ul style="list-style-type: none"> \$5.5 million – Federal Highway Administration and State Washington DOT funds \$4.2 million – City of Seattle for municipal parking garage \$4.1 million – King County-Approved Forward Thrust Park Bonds, CBDC funds, municipal and interstate highway funds, Metro, HUD Open Space, Interagency Outdoor Recreation, and American Legion (funding for the parks) \$9 million – Private developers 	<ul style="list-style-type: none"> Park is a value addition for the residents, shoppers, downtown office workers, and visitors. Municipal parking garage benefits from its link with the park as well as to the reestablishment of pedestrian access between First Hill and downtown. The park provides a passive space for residents, shoppers, downtown office workers, and visitors to enjoy while adding value to the Park Place building, which ultimately increases property tax revenues. Was the first project in the United States whose merits convinced city, state, and federal agencies plus private developers to convert freeway airspace to an open oasis that is usable for its citizens.
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none"> Uses air rights of Washington DOT 	<ul style="list-style-type: none"> Seattle Dept. of Parks and Recreation Owners of Park Place Board of the Convention Center Freeway Park Association 	<ul style="list-style-type: none"> None 	

Brooklyn Heights Promenade - Brooklyn, NY



1950
\$NA
Interstate 278
.03 Acres
1826ft. Long
Deck

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> \$11.6 million allocated to study rehabilitation alternatives for the deck 	<ul style="list-style-type: none"> Through public pressure, communities can impact the design or redesign of freeways, and ultimately improve their quality of life through the public funds invested for improved transportation infrastructure Provides waterfront visibility for residents
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none"> New York City DOT 	<ul style="list-style-type: none"> NYC Parks and Rec 	<ul style="list-style-type: none"> None 	

HIGHWAY LID CASE STUDIES

Aubrey Davis Park/West I-90 Lid Park - Mercer Island, WA



1985
\$300 Million
Interstate 90
28 Acres
Half mile in length
\$330/Sq. Ft.

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
	<ul style="list-style-type: none"> NA 		<ul style="list-style-type: none"> Reconnects communities Curbs noise & air pollution Football and soccer fields, three baseball diamonds, two outdoor basketball courts, four tennis courts that might double as skateboard arenas, a sheltered picnic area, children's play equipment, bicycle and pedestrian trails - all this on 24 acres with a view of the Cascades, the Olympics and the downtown high-rises of both Bellevue and Seattle.
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none"> Washington DOT 	<ul style="list-style-type: none"> City of Mercer 	<ul style="list-style-type: none"> The ventilation tunnel stacks are architecturally integrated into the design of the park, and the retaining walls are sculpted and painted neutral beige. The lid includes 13 9-foot-diameter exhaust fans and 3,800 lights. 	

Leif Erikson Park - Duluth, MN



1982
\$220 Million
Interstate 35
2.5 Acres
3/4 Mile long
\$2,020/Sq. Ft.

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> \$45 million - rail relocation \$3.8 million - Leif Erikson Park, including park restoration, bike/ped path and landscaping \$23 million - Leif Erikson Park tunnel (1,480' long) \$10 million - Lake Place Park (3 acres) 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Federal and state motor fuel tax Federal government paid for 90% of the project Interstate substitution (I-Sub) funds State funds (10% of total project) 	<ul style="list-style-type: none"> Freeway and park deck design reconnected Community leadership is extremely important. In this case, the community organized against the initial design of I-35 and ultimately turned a major transportation investment into city renaissance. Millions have been invested in the old warehouse Brewery District since completion of the project. Duluth is now a tourist destination, attracting thousands from the Twin City area during the summer months. Freeway and park deck design reconnected downtown with the lakefront, providing access to Lake Superior Air quality was ultimately improved, since the tunnels allowed for through traffic through the downtown, reducing the amount of start/stop traffic congestion
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none"> Minnesota DOT FHWA 	<ul style="list-style-type: none"> Duluth Parks and Rec 	<ul style="list-style-type: none"> NA 	

HIGHWAY LID CASE STUDIES

Rose Fitzgerald Kennedy Greenway - Boston, MA



2008

\$40 Million

Interstate 93

30 Acres

1.5 Miles long

\$30.61/Sq. Ft.

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> \$40 million (of the \$14 billion Big Dig cost.) 	<ul style="list-style-type: none"> 1984 First expansion linked the park with a residential neighborhood and a retirement community. 1988 Second expansion for construction of 370,000sq. ft. convection center - increasing length to 1500 feet. 	<ul style="list-style-type: none"> Federal & State Agencies 	<ul style="list-style-type: none"> Reconnected neighborhoods; Improved accessibility in/out of downtown CBD; 250 acres of parks and open space; Access to the river by connecting downtown financial district and East Bay with river front; Air quality improvement through reduced traffic congestion
Ownership	Maintenance	Ventilation	
Massachusetts Turnpike Authority	<ul style="list-style-type: none"> The non-profit Rose Fitzgerald Kennedy Greenway Conservancy has been created jointly by the Turnpike Authority, the City of Boston, and the Commonwealth of Massachusetts to oversee maintenance, fundraising, and programming of the Greenway parks. In 2008, the State Legislature confirmed the Conservancy as the designated steward of the Rose Kennedy Greenway and established a 50%-50% public/private funding model that has proven successful. Today, each dollar from the state is leveraged by more than one dollar of private support. 	<ul style="list-style-type: none"> To make the project work on the premium parcel, the architect designed the facility around two 237-ft. high ventilation stacks from the underground Central Artery Tunnel, incorporating the shafts into the building's footprint. 	

Margaret T Hance Park - Phoenix, AZ



1990

\$105 Million

Interstate 10

29 Acres

.5 Miles long

\$83.12 / Sq. Ft.

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> \$100 million for decking structure \$5 million for park City pays \$300/year for a 50-year air rights lease from the State, the City maintains all park facilities 	<ul style="list-style-type: none"> 1984 First expansion linked the park with a residential neighborhood and a retirement community. 1988 Second expansion for construction of 370,000sq.ft. convection center - increasing length to 1500 feet. 	<ul style="list-style-type: none"> \$92 million -- FHWA for decking structure \$8 million - State and additional discretionary funds \$5 million - City for park deck 	<ul style="list-style-type: none"> Catalyst for commercial and residential revitalization in surrounding area; Public support and Interdepartmental communication key to such projects; Waterproofing is a major concern; Lighting can be a potential problem when entering/exiting the tunnel; Design of Exit ramps is a major concern for this particular project Immense public support for the park deck enabled the freeway to be built through the heart of the City. Deck park has been a catalyst for commercial and residential revitalization in surrounding area. Deck has experienced some minor leakage from the pond on top. Lighting can be a potential problem when entering/exiting the tunnel. Exit ramps are too sharp and too quick so accidents occur frequently. Trees must be carefully and appropriately selected. Due to weight limitations, special fills are required much like a green roof.
Ownership	Maintenance	Ventilation	
City rents air rights from the State	City of Phoenix	Smoke stacks	

HIGHWAY LID CASE STUDIES

Klyde Warren Park - Dallas, TX



Tunnel

2012

\$106.7 Million

HWY 366

5.2 Acres

1,045 Feet in length

\$471/Sq. Ft.

Cost Breakdown	Expansion	Funding
<ul style="list-style-type: none"> Total cost of construction: \$106.7 million Cost per Square Foot \$471.06 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> City of Dallas (bonds): \$20 million; TxDOT (via state/feds): \$20 million; Private Donations: \$50 million; Stimulus Funds: \$16.7 million Construction of the park was funded through a public, private partnership including \$20 million in bond funds from the city of Dallas, \$20 million in highway funds from the state and federal government through TxDOT, and nearly \$50 million from private donations. In March 2009, the Park was selected to receive \$16.7 million in stimulus funds that were specifically for transportation enhancement construction.
Ownership	Maintenance	Benefits
<ul style="list-style-type: none"> City of Dallas Texas DoT Klyde Warren Foundation 	<ul style="list-style-type: none"> Woodall Rodgers Park Foundation (The primary movers behind this foundation are the Real Estate Council Foundation, the City of Dallas, the Dallas Parks Foundation, Texas Department of Transportation, the Uptown Public Improvement District, Downtown Dallas, The Real Estate Council, and a host of private entities.) 	<ul style="list-style-type: none"> Spurred in excess of \$1 billion in new development Reconnected districts; Improved accessibility in/out of downtown CBD; Air quality improvement through reduced traffic congestion Additional lids being proposed in other parts of Texas

I-670 Cap at Union Station - Columbus, OH



Bridge

2004

\$7.8 Million

Interstate 670

1.12 Acres

227 Feet in length

\$159.88 / Sq. Ft.

Cost Breakdown			Funding	
<ul style="list-style-type: none">• Site Acquisition Cost: \$7,800,000• Construction Costs: \$5,843,000• Superstructure: \$1,693,500• Electrical: \$90,000• Plumbing/sprinklers: \$176,000• Masonry/stone: \$86,000• Fees/general conditions: \$372,000• Finishes: \$210,000• Graphics/specialties (fiberglass panels/columns): \$845,000	<ul style="list-style-type: none">• Tenant improvements: \$2,200,000• Soft Costs: \$1,957,000• Preliminary development zoning: \$28,000• Appraisal: \$4,750• Architecture: \$160,000• Taxes: Ten-year abatement• Construction interest: \$450,000• Loan fees: \$98,000• Development fee: \$600,000• Commissions: \$253,000	<ul style="list-style-type: none">• Contingency: \$200,000• Other: \$163,000	<ul style="list-style-type: none">• Ohio Department of Transportation provided \$1 million in Transportation Enhancements funds.• City had to gain "air" rights for development from landowners who sold only the ground at the time the highway first went through.• City put up \$325,000 to install utilities.• City to extend developer a 20-year lease for the platforms with up to 10, 5-year renewable terms for up to a total of 70 years.• Developer will pay \$1 rent each year and receive a 100% real estate tax abatement for 10 years.• Cost to retailers about 20% higher than other retail space in the area, in large part due to higher development costs.• After 3 years, the city will receive 10% of the retail development's net rental income.	
Benefits			Ownership & Maintenance	Ventilation
<ul style="list-style-type: none">• Opened in October 2004, the project effectively heals part of a 40-year scar that was created by the construction of the city's Interstate 670 (I-670) inner-belt highway. Composed of three separate bridges—one for through-traffic over the highway, and one on either side for the retail structures—the Cap provides 25,496 square feet (2,369 square meters) of leasable space. The void caused by the highway—called an "engineered gash" by New York Times architecture critic Herbert Muschamp—has now been transformed into a seamless urban streetscape. While other cities like Seattle and Kansas City have erected convention centers over urban highways, the I-670 Cap is one of the first speculative retail projects built over a highway in the United States.			Continental Real Estate Companies	<ul style="list-style-type: none">• None

HIGHWAY LID CASE STUDIES

Luther Burbank Park Lid- Mercer Island, WA



1985
\$300 Million
Interstate 90
28 Acres
Half mile in length
\$330/Sq. Ft.
Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none">The lid complex consumes approximately one-tenth of the cost of the seven-mile freeway.\$1.6 billion for entire project (about \$225 million per mile)	<ul style="list-style-type: none">NA	<ul style="list-style-type: none">The state Department of Transportation, with 90% funding from the federal government, is providing the earth cover and most of the landscaping as part of a \$146 million project that includes the roadway, lid structure and the ventilation building and equipment.Mercer Island expects to spend about \$1 million: approximately half from the 1989 King County open-space bond issue, with the council raising the rest by repackaging existing bonds.	<ul style="list-style-type: none">Reconnects communitiesCurbs noise & air pollutionFootball and soccer fields, three baseball diamonds, two outdoor basketball courts, four tennis courts that might double as skateboard arenas, a sheltered picnic area, children's play equipment, bicycle and pedestrian trails - all this on 24 acres with a view of the Cascades, the Olympics and the downtown high-rises of both Bellevue and Seattle.
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none">Washington DOT	<ul style="list-style-type: none">City of Mercer	<ul style="list-style-type: none">The ventilation tunnel stacks are architecturally integrated into the design of the park, and the retaining walls are sculpted and painted neutral beige. The lid includes 13 9-foot-diameter exhaust fans and 3,800 lights.	

Mount Baker Ridge Tunnels - Seattle, WA

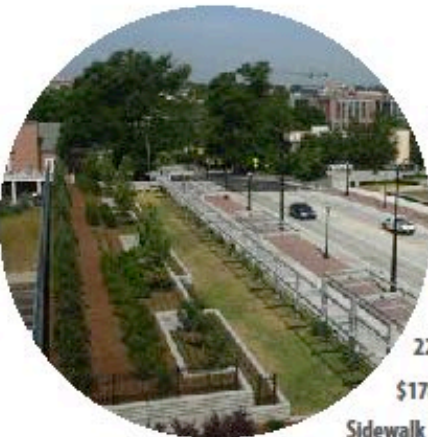


1985
\$400 Million
Interstate 90
45 Acres
3400 Feet in length
\$200/Sq. Ft. (approx.)
Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none">NA	<ul style="list-style-type: none">1440 Ft Bored Tunnel2000 ft cut and cover LidTotal Distance of Cover Right of Way = 3440 ft or 0.65 Mile	<ul style="list-style-type: none">NA	<ul style="list-style-type: none">Reconnect neighborhoodsMitigate noiseCurb pollution
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none">Washington DOT	<ul style="list-style-type: none">City of Mercer	<ul style="list-style-type: none">Twenty-one large ventilation fans will be used in the air supply exhaust systems, with air quality monitored throughout the entire roadway.	

HIGHWAY LID CASE STUDIES

5th Street Bridge - Atlanta, GA



2006
\$10.68 Million
Interstate 75/85
1 Acre
223.25 Feet
\$178.68/Sq. Ft.
Sidewalk Expansion / Bridge

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> Bid Price: \$10,305,379.00 million Supplemental Cost: \$380,113.00 Total: \$10,685,492.00 Total construction cost: \$10,117,213.00 Cost per square foot = \$178.68 per/ft2 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Connects Georgia Tech Campus and the newly developed Technology Square to the Midtown Atlanta area. Acts as an inviting pedestrian connection into Georgia Tech campus. Hosts activities such as pregame tailgating prior to football games.
Ownership	Maintenance	Ventilation	
Georgia DOT	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> None 	

Millenium Park - Chicago, IL



2004
\$475 Million
Sits above rail station & parking garage
24.5 Acres
1,210 Feet in length
\$445/Sq. Ft.
Bridge

Cost Breakdown				Ownership
<ul style="list-style-type: none"> Garage proposed: \$87.5 million / final: \$105.6 million Metra superstructure proposed: \$43 million / final: \$60.6 million Jay Pritzker Pavilion proposed: \$10/8 million / final: \$60.3 million Harris Theater proposed: \$20 million / final: \$60 million 	<ul style="list-style-type: none"> Parks+landscaping proposed: \$NA / final: \$42.9 million Design+management proposed: \$NA / final: \$39.5 million Endowment proposed: \$10 million / final: \$25 million Crown Fountain proposed: \$15 million / final: \$17 million 	<ul style="list-style-type: none"> BP Pedestrian Bridge proposed: \$8 million / final: \$14.5 million Lurie Garden proposed: \$4-8 million / final: \$13.2 million Cloud Gate structure proposed: \$6 million / final: \$23 million Exelon Pavilions proposed: \$NA / final: \$7 million 	<ul style="list-style-type: none"> Peristyle/Wrigley Square proposed: \$5 million / final: \$5 million Chase Promenade proposed: \$6 million / final: \$4 million McCormick Tribune Plaza & Ice Rink proposed: \$5million / final: \$3.2 million Misc. (fencing, terraces, graphics) proposed: \$NA / final: \$1.6 million 	City of Chicago
Maintenance	Benefits	Ventilation		
<ul style="list-style-type: none"> Chicago Department of Cultural Affairs 	<ul style="list-style-type: none"> Millennium Park is considered one of the largest green roofs in the world, having been constructed on top of a railroad yard and large parking garages. 	<ul style="list-style-type: none"> The existing garage has approximately 37 fresh air intakes and 8 exhaust vents positioned within, and bordering, the park that had to be maintained. As a result, exhaust openings coupled with garage egress stairs were incorporated directly into the landscape design to have minimal visual impact on the new park. Fresh air intakes were the most challenging due to the fact that many of the large vents were located within proposed open meadow plains. To accommodate for the open areas, the design team created air tunnels between the garage roof and the park grade surface to redirect existing vents to new openings at the surface in positions that didn't interrupt the revised landscape. 		

HIGHWAY LID CASE STUDIES

Riverfront Plaza & Founders Bridge - Hartford, CT



2000
\$24.6 Million
Interstate 91/I-84
1.5 Acres
1,100 Feet in length
\$376.50/Sq. Ft.
Bridge

Cost Breakdown	Expansion	Funding	Ventilation
<ul style="list-style-type: none"> \$115 million for the entire I-91/I-84 Interchange Project \$24.6 million for Riverfront Plaza 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> 22% State of Connecticut Department of Transportation (\$5,502,300) 62% Federal Highway Administration (\$11,349,500, plus \$4,000,000 Federal ISTEA Grants) 12% US HUD funds (\$2,900,000) 4% Private money through non-profit Riverfront Recapture, Inc. (\$850,000) 	<ul style="list-style-type: none"> None
Ownership	Maintenance	Benefits	
NA	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> High quality park and major civic improvements; \$700M planned development projects adjacent to Plaza, including a convention center, hotel, retail and entertainment center, Science Center, and 400 housing units; Power of public/private partnerships to serve as a catalyst for investment and redevelopment Timing the construction of the park deck with needed highway reconstruction created opportunity to build a high quality park and major civic improvements The non-profit group Riverfront Recapture, Inc., championed the riverfront revitalization effort since 1981. They learned how to harness power of public/private partnerships to serve as a catalyst for investment and redevelopment. More than \$16M in economic activity from events and attractions More than \$700M planned development projects adjacent to Plaza, including a convention center, hotel, retail and entertainment center, Science Center, and 400 housing units 	

Copley Place - Boston, MA



1984
\$500 Million
Interstate 90 & rail yards
9.5 Acres
840 Feet in length
\$1,208/Sq. Ft.
Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Reclaimed old rail yards, reconnected neighborhoods, and initiated revitalization of Boston's Back Bay; One of the largest mixed use developments in New England; Public process has major impact on the design and community benefit
Ownership	Maintenance	Ventilation	
<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Simon Property Group 	<ul style="list-style-type: none"> The ventilation system requires fans to handle as much as two million cubic feet of air per minute, via appropriate ventilation shafts and machinery rooms. 	

HIGHWAY LID CASE STUDIES

Arlington Gateway Park - Rosslyn, VA



1982

\$280 Million

Interstate 66

4 Acres

763 Feet in length

\$1,606.97

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> \$280 million for entire project (\$28.6 million/mile) – funds for park deck only not available 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Through public pressure, communities can impact the design or redesign of freeways, and ultimately improve their quality of life through the public funds invested for improved transportation infrastructure. In this case, the city of Rosslyn got nearly 4 more acres of park space added to the system.

Ownership	Maintenance	Ventilation
City of Arlington	<ul style="list-style-type: none"> Arlington Parks & Rec 	<ul style="list-style-type: none"> None

South River Walk Park -Trenton, NJ



2004

\$150 Million

US Route 29

6.5 Acres

.5 Mile long

\$NA

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none"> \$71 million (Roadway only) \$15 Million for Deck Park 	<ul style="list-style-type: none"> xxxx 	<ul style="list-style-type: none"> The NJ Route 29 project was included as part of the 1998 'TEA-21' Federal transportation bill. The contractor's bid for the project was \$71 million. 	<ul style="list-style-type: none"> Built on top of the Route 29 tunnel in Trenton, this urban park complements and enhances the tunnel project, lessens its impacts, provides streetscape improvements, offers access to the Delaware River waterfront, and improves the quality of life for the community's residents. One lot with a value of \$120,000 prior to park construction was developed with six housing units that sold for \$200,000 each. The park also helped attract a new 82-unit market-rate residential development.

Ownership	Maintenance	Ventilation
Mercer County Parks Commission	<ul style="list-style-type: none"> Mercer County Parks Commission 	<ul style="list-style-type: none"> Mercer County Parks Commission

HIGHWAY LID CASE STUDIES

Lytle Park - Cincinnati, OH



1970

XXXXXX

Interstate 71

2.3 Acres

1,100 Feet in length

Tunnel

Cost Breakdown	Expansion	Funding	Benefits
<ul style="list-style-type: none">• NA	<ul style="list-style-type: none">• NA	<ul style="list-style-type: none">• Primarily 90% private funds	<ul style="list-style-type: none">• Innovative freeway design solutions can minimize the negative impacts of construction and provide valuable and long lasting civic amenities
Ownership	Maintenance	Ventilation	
NA	<ul style="list-style-type: none">• XX	<ul style="list-style-type: none">• Its ventilation system is limited to a single set of ceiling intakes in the middle of the tunnel. Exhaust is removed with fans made of simple grates in the sidewalks above.	

HIGHWAY LID CASE STUDIES

SOURCES

Aubrey & Luther Park - Mercer Island, Washington

- <http://northwesturbanist.wordpress.com/2014/02/17/lets-bury-i-5/>
- <http://www.nwhighways.amhosting.net/mercer.html>
- <http://www.nytimes.com/1989/06/18/us/a-highway-of-the-future-whose-time-has-passed.html>

Sam Smith Lid- Seattle, Connecticut

- http://www.concreteconstruction.net/images/Seattle%20Lid%20Covers%20l-90_tcm45-341938.pdf
- <http://www.nytimes.com/1989/06/18/us/a-highway-of-the-future-whose-time-has-passed.html>

Freeway Park - Seattle, Washington

- http://www.seattle.gov/parks/park_detail.asp?ID=312
- http://www.greatbuildings.com/buildings/Freeway_Park.html

Leif Erickson Lid - Duluth, Minnesota

- <http://www.mindspring.com/~tbgray/prch4.htm>

Margaret T Hance Park - Phoenix, Arizona

- <http://archive.azcentral.com/commphotos/azcentral/15832/1/19#1>

Klyde Warren Park - Dallas, Texas

- <http://www.dmagazine.com/publications/d-magazine/2012/special-report-the-park/how-klyde-warren-park-was-built>
- http://getinsight.com/news_woodall_rodgers_park.htm

5th Street Bridge - Atlanta, Georgia

- http://aspirebridge.com/magazine/2008Winter/5th_street_win08.pdf
- <http://www.sunbeltstructures.com/gatechpdf.pdf>
- http://www.arcadis-us.com/Projects/Atlanta_Fifth_Street_Bridge_Replacement_Design-Build.aspx

Millenium Park - Chicago, Illinois

- http://en.wikipedia.org/wiki/Millennium_Park
- <http://economyleague.org/files/File/Millennium.pdf>

CAP @ Union Station - Columbus, Ohio

- <http://casestudiesarchive.uli.org/CSFrameset.aspx?i=C035010>

Lytle Park - Cincinnati, Ohio

- <http://www.cincinnati-parks.com/lytle-park>
- http://en.wikipedia.org/wiki/Lytle_Park_Historic_District
- <http://www.cincinnati.com/story/money/josh-pichler/2014/05/11/lytle-park-work-catalyst-new-development/8984419/>
- <http://www.cincinnati-transit.net/fww.html>

Arlington Gateway Park - Rosslyn, VA

- <http://www.cincinnati-parks.com/lytle-park>
- http://en.wikipedia.org/wiki/Lytle_Park_Historic_District
- <http://www.cincinnati.com/story/money/josh-pichler/2014/05/11/lytle-park-work-catalyst-new-development/8984419/>

Copley Place - Boston, Massachusetts

- <http://www.nytimes.com/1984/03/21/us/copley-place-adds-new-dimension-to-boston-s-back-bay-area.html>

Rose Kennedy Park - Boston, Massachusetts

- <http://www.cityparksalliance.org/why-urban-parks-matter/frontline-parks/parks/255-rose-kennedy-greenway>
- <http://www.bostonredevelopmentauthority.org/getattachment/b6dbd0c9-7e18-4d9b-a085-9b07e5a05498>

Riverfront Plaza & Founders Bridge - Hartford, CT

- http://webcache.googleusercontent.com/search?q=cache:xiB6z8Le_74J:reconnectaustin.files.wordpress.com/2013/07/inventory-of-comparative-decking-projects.pdf+&cd=4&hl=en&ct=clnk&gl=us

Brooklyn Heights Promenade - Brooklyn, New York

- <http://www.nycroads.com/roads/brooklyn-queens/>

South River Walk Park - Trenton, New Jersey

- <http://www.stantec.com/our-work/projects/united-states-projects/s/south-riverwalk-park.html#.VIDGLTHF98F>
- http://contextsensitivesolutions.org/content/case_studies/kentucky_29/resources/kentucky_29_pdf/
- http://webcache.googleusercontent.com/search?q=cache:h7s0gdwC3EUJ:www.eng.buffalo.edu/Courses/cie500d/SUNY-h.capers/SUNY-h.capers/Covered_Roadways_in_Urban_Settings_-_Reflections.ppt+&cd=1&hl=en&ct=clnk&gl=us

Comprehensive Case Studies Featuring Projects

- <http://lasustainability.org/wp-content/uploads/2012/07/LASC-ClementLau-CapParksPolicyBriefing.pdf>
- <http://reconnectaustin.files.wordpress.com/2013/07/inventory-of-comparative-decking-projects.pdf>
- <http://www.nyc.gov/html/dcp/pdf/transportation/deck17.pdf>
- http://lidi5.com/images/SDOT_I-5_Lid.pdf
- <http://kcmo.gov/wp-content/uploads/2013/07/southloopfeasrept.pdf>
- <http://www.ite.org/Membersonly/annualmeeting/2002/AB02H1303.pdf>
- <http://cloud.tpl.org/pubs/ccpe-HighwayDeckParks-GoverningMag2007.pdf>
- <http://cityparksblog.org/tag/freeways/>
- <http://www.wlwt.com/news/local-news/cincinnati/Lytle-Tunnel-to-be-overhauled/16086382>

Case Studies

- 1938 - FDR Expressway - New York, NY (Deck)
- 1950 - Brooklyn Height Promenade - Brooklyn, NY (Deck)
- 1970 - Lytle Park - Cincinnati, OH (Tunnel)
- 1976 - Jim Ellis Freeway Park - Seattle, WA (Tunnel)
- 1982 - Arlington Gateway Park - Rosslyn, VA (Bridge)
- 1984 - Copley Park Project - Boston, MA (Tunnel)
- 1985 - Aurbrey Davis & Luther Burbank Lid - Mercer Island, WA (Tunnel)
- 1985 - Sam Smith & Jimmy Hendrix Lid - Seattle, WA (Tunnel)
- 1990 - Margaret T Hance Park - Phoenix, AZ (Tunnel)
- 1992 - Leif Erickson Park - Duluth, MN (Tunnel)
- 2000 - Riverfront Park & Founders Bridge - Hartford, CT (Tunnel)
- 2004 - Millenium Park - Chicago, IL (Tunnel)**
- 2004 - I-670 Cap at Union Station - Columbus, OH (Bridge)**
- 2006 - South Riverside Park - Trenton, NJ (Tunnel)
- 2006 - 5th Street Bridge - Atlanta, GA (Sidewalk Expansion / Bridge)
- 2008 - Rose Kennedy Greenway - Boston, MA (Tunnel)
- 2012 - Klyde Warren Park - Dallas, TX (Tunnel)**
- 2012 - Teralta Park - San Deigo, CA (Tunnel)
- 2014 – 520 Lids – Seattle, Washington (Cut and Cover Deck)



Seattle, Washington

I-90 Lids (cut-and-cover)
Mount Baker and
Mercer Island



520 Corridor Lids
Evergreen Point Lid
84th Ave Lid
92nd Ave Lid



Freeway Park



Seattle Lid Drivers

Fostering community connections

Pedestrian access/safety

Extending existing neighborhood park space

Neighborhood traffic integration

Side effects

Minimize of traffic noise and

Minimize vehicle emissions

Existing Lid Projects

Duluth



Seattle



Dallas



Boston



Klyde Warren Park

Dallas, TX

Completed: 2012

Size: 5.2 Acres, Length: 1,045'

Cost: \$471/Sq. Ft

Attributes:

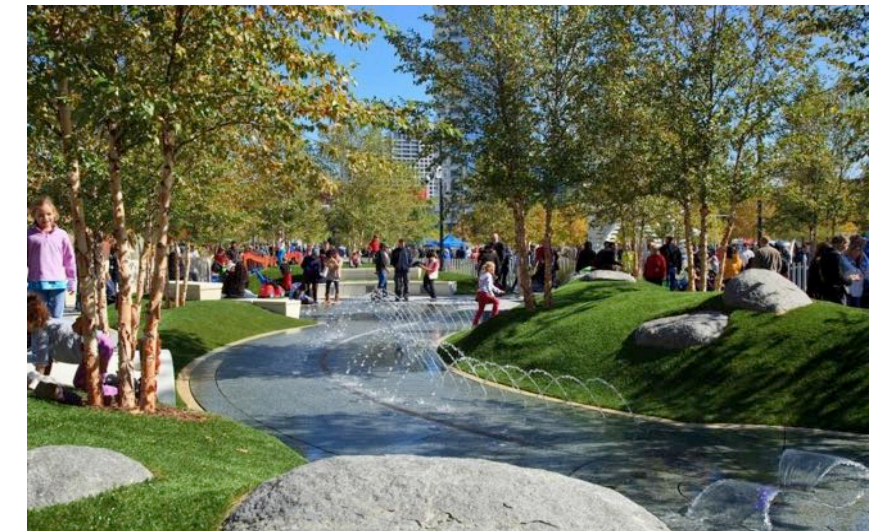
- Spurred in excess of \$1 billion in new development
- Reconnected districts;
- Improved accessibility in/out of downtown CBD;
- Air quality improvement

• **Owner:**

City of Dallas

Texas DoT

Klyde Warren Foundation



I-670 at Union Station

Columbus, OH

Completed: 2004

Area: 1.12 Acres, Length: 227'

Cost: \$160/Sq. Ft

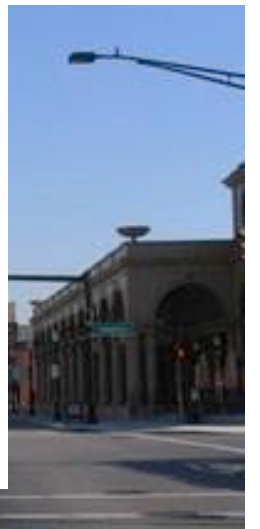
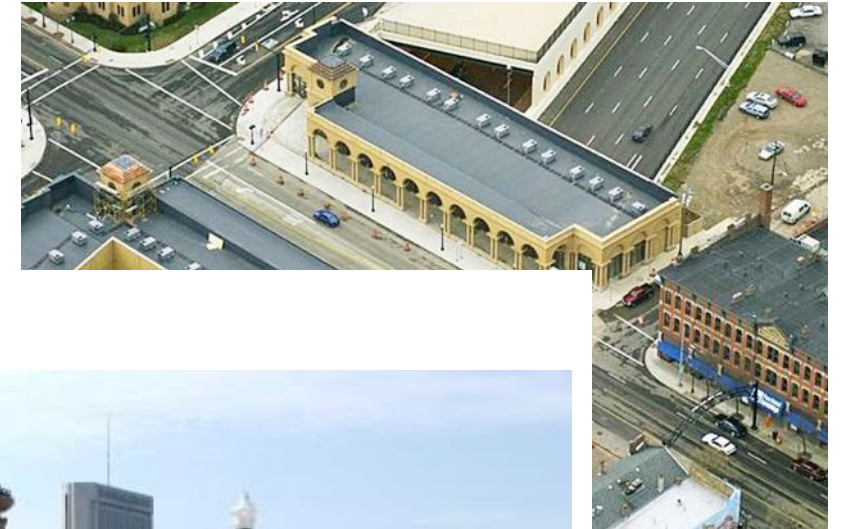
Attributes:

- Mend a 40-year scar
- Composed of three separate bridges
- Provides 25,500 SF of leasable space
- The previous void caused by the highway was transformed into a seamless urban streetscape

• **Owner:**

Ohio DoT

30-year lease with an extension to 70 years



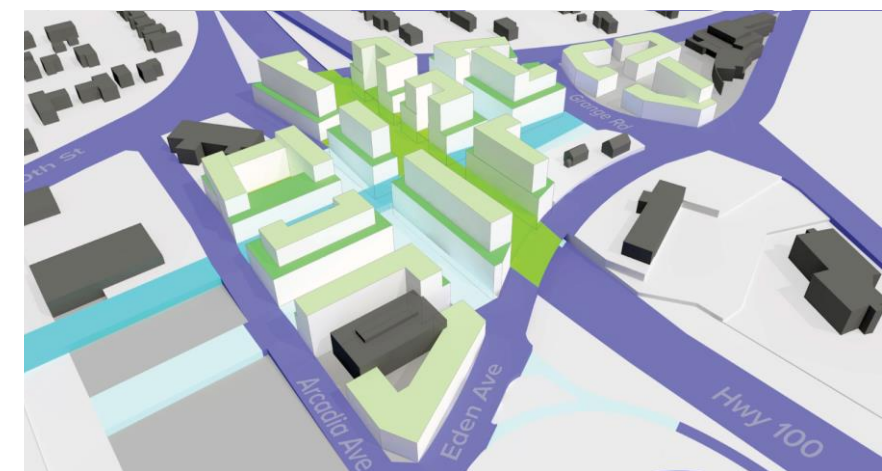
Other Lid Potential: I-94 & Hwy 100



St. Paul - Capital Lid



Minneapolis - Nicollet Ave Lid



Edina – Grandview Lid



St. Paul - Rondo Lid



North Minneapolis - I-94 Land Bridge

MnDOT Owned Right of Way

The Opportunity

Develop long term land value

Develop non traditional cash flow

Create Site Infrastructure through

State and Local sales tax, Real Property tax and Jobs.

Minneapolis/ St Paul Region Lid Drivers

Reconnect our communities

Focus on health, equity and jobs

Create a positive framework for development

Increase density in the right places

Make our Infrastructure Resilient

Zero cost to the people of State of Minnesota

HIGHWAY LIDS



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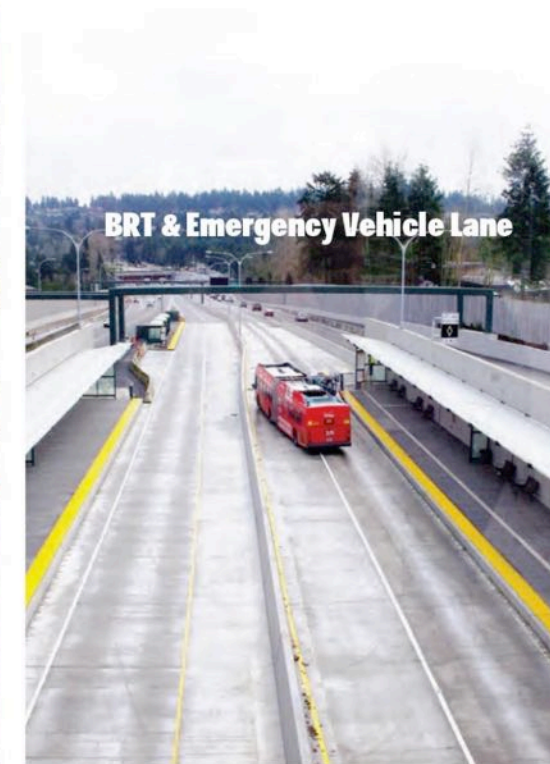
I-90 TOUR

HIGHWAY LIDS



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520 TOUR HIGHWAY LIDS



Seattle Field Research | Metropolitan Design Center | University of Minnesota

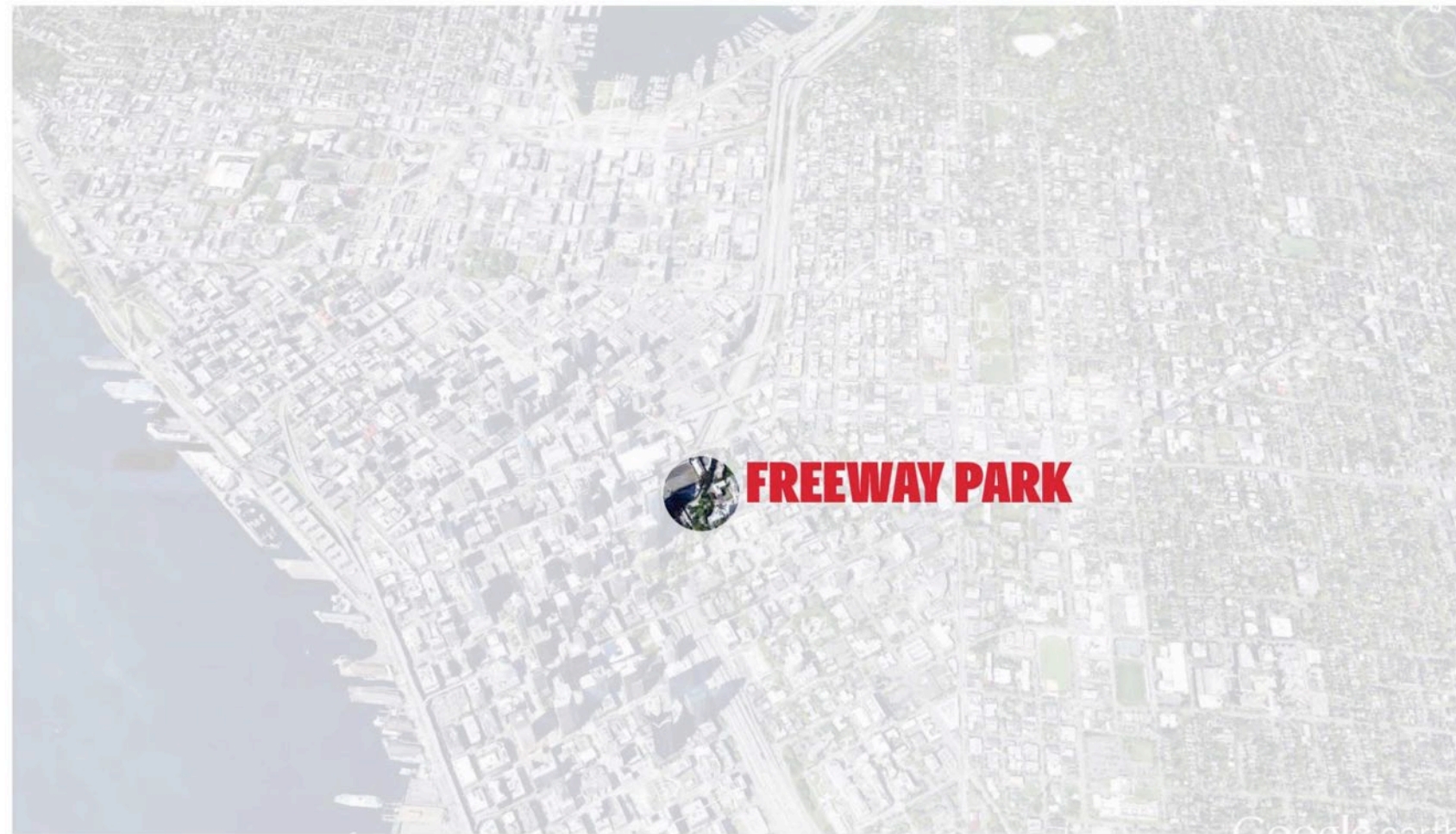
520 TOUR HIGHWAY LIDS



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FREEWAY PARK

HIGHWAY LIDS



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FREEWAY PARK

HIGHWAY LIDS

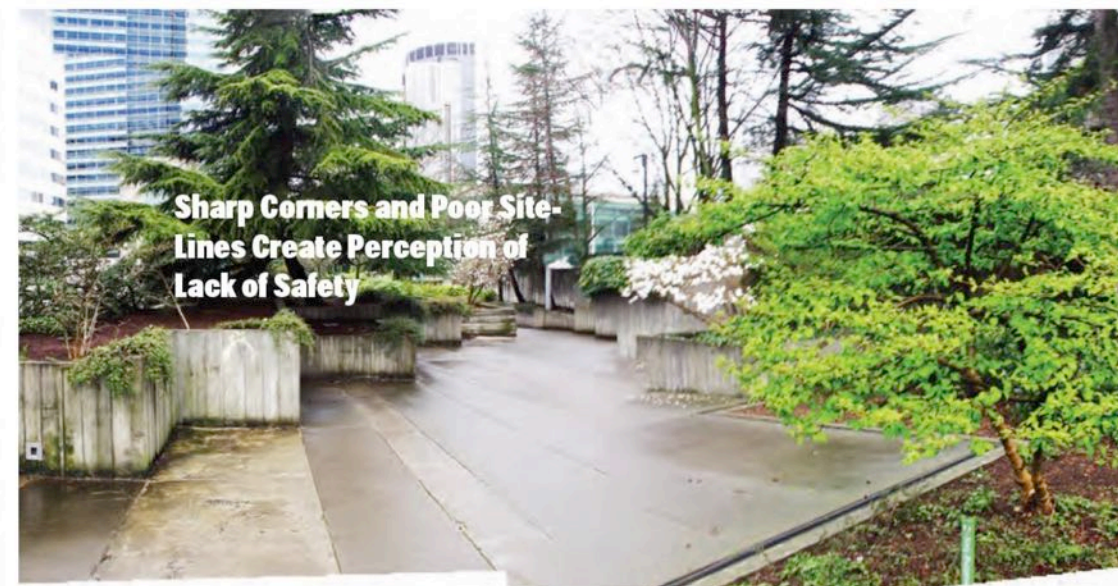
SETTING THE PRECEDENT

JIM ELLIS FREEWAY PARK

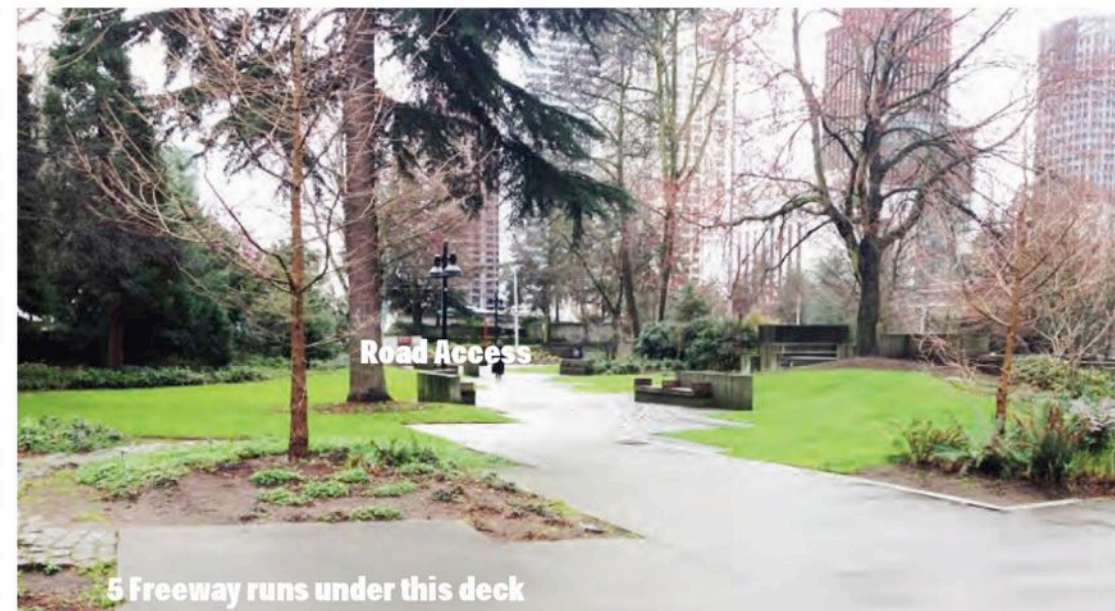
- Built in 1976
- Designed by Lawrence Hallprin
- Park is a value addition for the residents, shoppers, downtown office workers, and visitors.
- Municipal parking garage benefits from its link with the park as well as to the reestablishment of pedestrian access between First Hill and downtown.
- The park provides a passive space for residents, shoppers, downtown office workers, and visitors to enjoy while adding value to the Park Place building, which ultimately increases property tax revenues.
- Was the first project in the United States whose merits convinced city, state, and federal agencies plus private developers to convert freeway airspace to an open oasis that is usable for its citizens.
- Located between 6th and 9th Avenues, Freeway Park is bounded on the north by Union and on the south by Spring Street.
- To the east is First Hill, to the west the park overlooks Seattle's financial center. Freeway Park provides a space where residents, shoppers, downtown office workers, hotel visitors and the whole array of people from all backgrounds who make up the downtown population may come together to enjoy the



FREEWAY PARK HIGHWAY LIDS



FREEWAY PARK HIGHWAY LIDS



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FREEWAY PARK HIGHWAY LIDS



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LID/BRIDGE/PARK



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SCULPTURE PARK

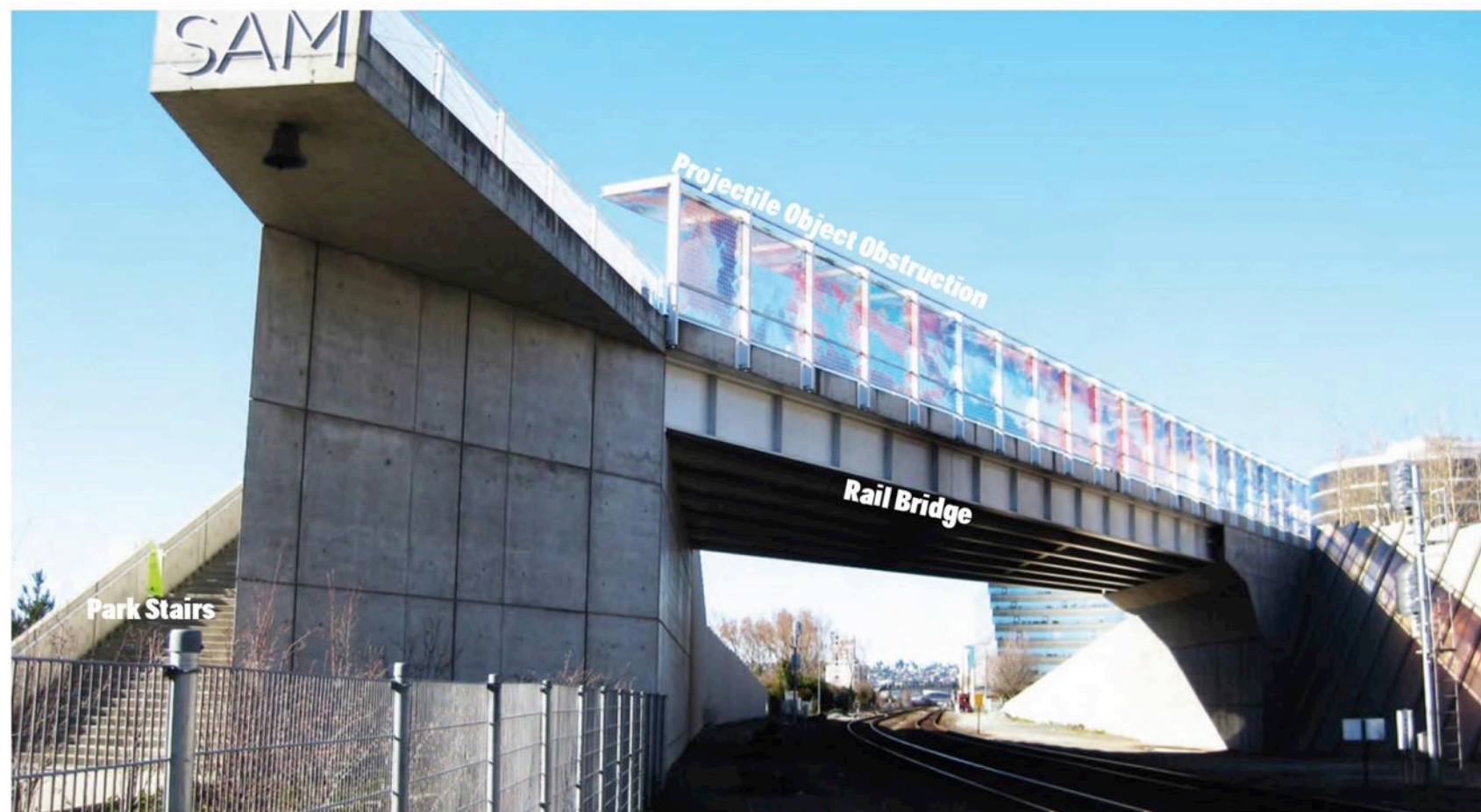
LID/BRIDGE/PARK

- Used creative design to draw funding and cut costs:
 - Pre-cast concrete slabs were designed to cut costs, allow mechanically stabilized earth to fill site, and created a footing drain at the base for stormwater drainage.
 - Designed supporting structure at edge of park to double as the seawall support structure.
 - The seawall was planned for development to improve earthquake and storm surge code.
 - USFWS worked with designers and engineers to create a new seawall that would also work with the supporting wall of the Sculpture Parks edge.
 - These federal funds were added to the parks budget.
 - Pedestrian bridge over Elliot Street is considered a "SkyWalk."
 - Special permitting was needed to construct the bridge.
 - Rail bridge had to conform to rail authority code and designed in a way that could be easily disassembled if necessary.
 - It was easier to work with the rail authority on the bridge than it was working with the City on the SkyWalk.



SCULPTURE PARK

LID/BRIDGE/PARK



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SCULPTURE PARK

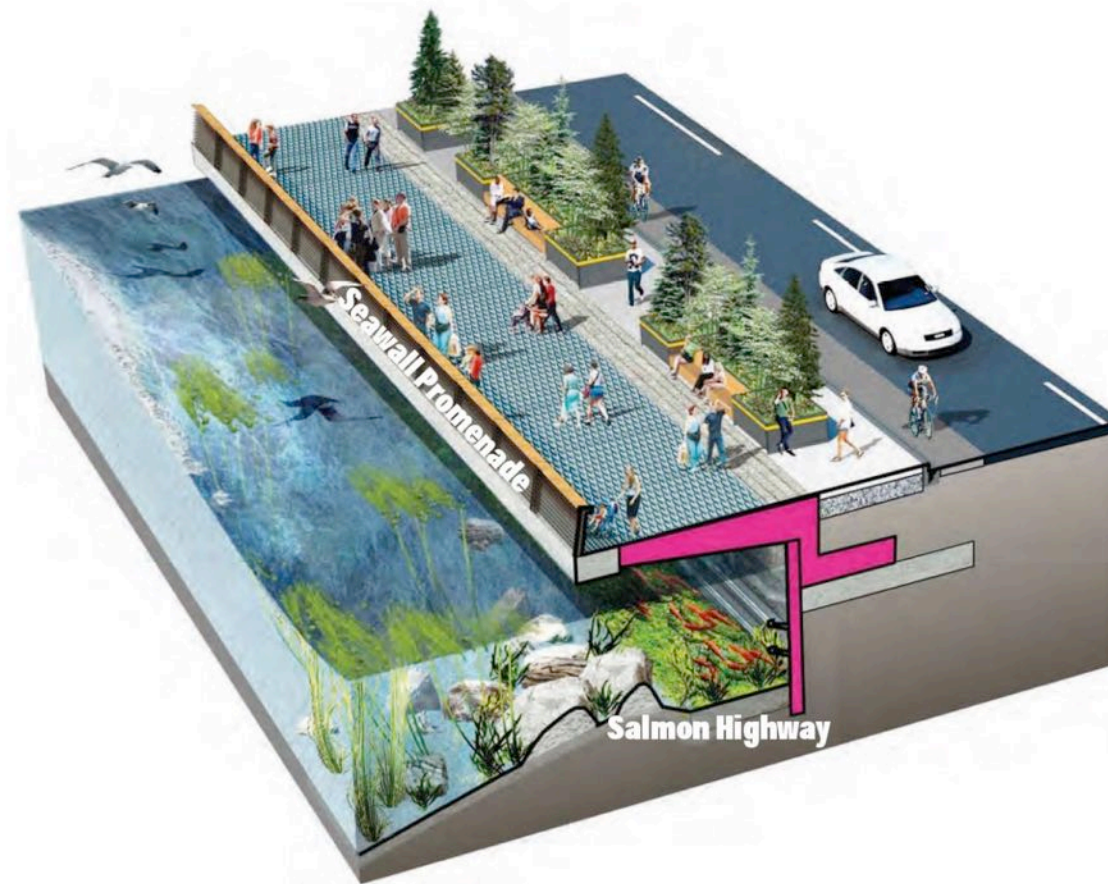
LID / BRIDGE / PARK



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SCULPTURE PARK

LID/BRIDGE/PARK



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SCULPTURE PARK

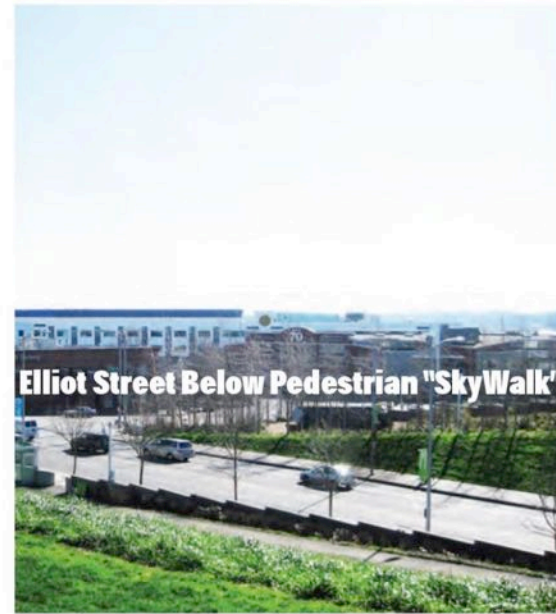
LID / BRIDGE / PARK



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SCULPTURE PARK

LID/BRIDGE/PARK



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