

An aerial photograph of a city street featuring a modern pedestrian bridge with a metal truss structure. The bridge spans over a road and is surrounded by lush green trees and landscaped areas. In the background, there are multi-story brick buildings and a clear sky. The overall scene depicts an urban environment with integrated green infrastructure.

Transportation Transformations

How Highway Conversions Can Pave the Way
for More Inclusive and Resilient Places

Cover photo: Long Street Bridge Cap over I-71 looking west toward downtown Columbus/Michael Cairns

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About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 48,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide. ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 84 countries.

About the Randall Lewis Center for Sustainability in Real Estate

The ULI Randall Lewis Center for Sustainability in Real Estate is dedicated to **leading the real estate industry in creating places and buildings where people and the environment thrive.**

The Lewis Center works with ULI members and networks to drive industry change, cultivate champions, and shape cities and regions for health, sustainability, resilience, and social equity. Our strategies include advancing knowledge and action through research and publications, convening ULI members and partners to share insights, providing technical assistance in communities, and more.

The Lewis Center is home to the following programs:

- **Decarbonization**, which accelerates progress toward net zero in real estate practice, buildings, and communities, and manages **Greenprint**, a worldwide membership alliance of leading real estate owners and developers committed to improving the environmental performance of buildings.
- **Healthy Places**, which advances health and social equity in real estate practice, buildings, and communities.
- **Urban Resilience**, which prepares real estate leaders, buildings, and communities for the impacts of climate change and other environmental vulnerabilities.

Together, these activities catalyze the adoption of transformative practices for real estate and land use practice and policy and promote investment in sustainable, healthy, resilient, and equitable buildings and communities.

About This Report

Urban highways in the United States have contributed to many of today's pressing issues, including structural inequities, racial and economic segregation, increased greenhouse gas emissions, elevated exposure to shocks and stresses, and disparities in health outcomes.

Transforming outdated automobile-oriented infrastructure to promote resilience, health, and equity—by identifying community priorities through robust engagement practices, creating new parks and green infrastructure, and employing nature-based solutions while supporting economic activity—can help support quality of life in communities throughout the United States. This report shares promising examples of efforts to reconnect divided communities by converting highway infrastructure to welcoming, people-centered environments that advance equitable, sustainable, resilient outcomes.



Built in 1941–1942, the Davison Freeway in Detroit and Highland Park, Michigan, was one of the first depressed urban freeways in the United States; construction required that dozens of homes be moved or demolished.

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Executive Summary

Transportation Transformations shares promising examples of efforts to reconnect communities divided by highway infrastructure by converting roadways into welcoming, people-centered environments that advance equitable, sustainable, resilient outcomes.

Specifically, the report:

- **Highlights connections among transportation infrastructure and health, resilience, and real estate development opportunities;**
- **Makes the case for leveraging public and private funds to support efforts to reconnect communities divided by automobile-oriented infrastructure; and**
- **Shares promising examples of efforts to reconnect communities through multimodal transportation investments, parks, equitable development, and more.**

The automobile transportation system in the United States, which includes interstates and other highways, has contributed to many of today’s pressing issues, including structural inequities, increased greenhouse gas emissions, elevated exposure to *shocks and stresses*, and disparities in health outcomes. [Shocks](#) are sudden and extreme events, or disasters, whereas [stresses](#) are long-term social, economic, and environmental issues that undermine system responses to hazards.

The automobile transportation system’s influence is significant because many urban highways divide communities and reinforce racial and economic segregation. They create conditions that are dangerous for drivers and nondrivers alike, and they limit opportunities for real estate development that supports positive health and environmental outcomes.

Transforming outdated automobile-oriented infrastructure to promote resilience, health, and equity—including by creating new parks and green infrastructure and employing nature-based solutions—can support quality of life in communities throughout the United States.

Advancing Highway Conversions

Undoing the harm caused by automobile infrastructure that divides communities is complicated and requires participation by multiple sectors and stakeholders. While projects to turn outdated and underused highways and roadways into parks and community-serving spaces can take many years, there is increasing momentum for action.

Cities from Pittsburgh to Toronto to San Francisco are retrofitting or removing highways to create connected sidewalks, art installations, and parks. And they are installing features to manage stormwater and mitigate the effects of extreme heat. Community groups, engaged citizens, public-sector agencies, and real estate developers have formed cross-sector coalitions to ensure that new infrastructure supports resilience, economic prosperity, and equitable development.

Examples of the types of investments being made include:

- **Stitches.** Stitches are enhanced crossings over highway rights-of-way. Such crossings often include widened sidewalks, bike lanes, seating areas, art installations, and green spaces.
- **Caps.** Caps are full structural covers over highway rights-of-way that include features such as green space, parks, crossing streets, and buildings. Caps can strategically link neighborhoods that a highway separated or divided.
- **Removals.** Highway removals involve taking limited-access roadways and turning them into lower-capacity surface-level boulevards, green spaces, or waterways. This can dramatically increase safety, reduce traffic, and improve the built environment.
- **Public space beneath elevated roadways.** Such projects involve creating parks, enhanced public realms, and trails beneath active roadways.



OVERVIEW OF FEATURED HIGHWAY CONVERSIONS

Project	Location	Type	Key community amenities	Key resilience and sustainability features
<u>I-579 Cap/Frankie Pace Park</u>	Pittsburgh, Pennsylvania	Cap	Three-acre (1.2 ha) public park, pedestrian and bicyclist infrastructure, incorporation of design elements created by local artists	Permeable lawns and open trench drains to capture stormwater, rain gardens, new trees
<u>I-70/I-71 Long Street Bridge and Cultural Wall</u>	Columbus, Ohio	Stitch/cap	Reconnection of neighborhoods, art that celebrates the community and reduces roadway noise, improved sidewalks, green space	New trees, use of drought-tolerant and disease-resistant plants
<u>Capitol Crossing/ Third Street Tunnel</u>	Washington, D.C.	Cap	Reconnection of the street grid, increased open space	Centralized water collection and reuse system to treat stormwater runoff, eco-chimneys to clean exhaust and toxins from parking garage, green areas and increased shade, use of graywater for landscaping
<u>Park East Freeway Removal</u>	Milwaukee, Wisconsin	Removal	Extension of the Milwaukee RiverWalk trail, community benefits agreement guiding corridor redevelopment with equitable development priorities	Reduction in impervious coverage and surface parking, reduction in vehicle congestion
<u>The Bentway</u>	Toronto, Ontario	Public space beneath an elevated roadway	Creation of urban park underneath the expressway, winter skate trail, new multiuse path that connects to surrounding communities, addition of restrooms and free wi-fi	Transformation of a brownfield to a safe, clean, and usable public space, stormwater treated on site using native plantings and permeable ground treatments
<u>Presidio Tunnel Tops</u>	San Francisco, California	Cap	Addition of new park spaces including play structures, visitor center, and open meadows, reconnection of park areas for the first time since the 1930s	Reduction in impervious pavement, creation of green space and parkland, adjacency to new marshland that replaced impervious pavement

Funding Opportunities

As the United States prepares to make the largest infrastructure investment in a generation, an opportunity exists for key partners to support and leverage equitable and resilient transportation projects that create and sustain community and real estate value.

Through 2026, [\\$590.7 billion](#) will be spent on U.S. transportation networks through the Infrastructure Investment and Jobs Act of 2021, more commonly known as the Bipartisan Infrastructure Law (BIL). Additional federal funding from the Inflation Reduction Act (IRA) of 2022 can fund equitable transportation investments and can potentially be leveraged by the real estate industry.



Specific federal funding programs that can support highway conversion efforts include:

- **Reconnecting Communities.** The BIL includes the first-ever federal funding program to reconnect communities “cut off from opportunity and burdened by past transportation infrastructure decisions.” The \$1 billion [Reconnecting Communities](#) discretionary grant program awarded the first \$185 million in funding in 2023 to 45 communities, including six capital construction grants and 39 planning grants.
- **Neighborhood Access and Equity Grants.** The IRA includes more than \$3.2 billion for the [Neighborhood Access and Equity Grants](#) program. The program is intended to support projects that improve walkability, safety, and affordable transportation access in communities. It will also address environmental harm caused by transportation projects in disadvantaged communities. The program will reserve \$1.1 billion in funding for low-income communities.
- **Rebuilding American Infrastructure with Sustainability and Equity (RAISE).** The BIL also includes discretionary grant funding to support “safety, environmental sustainability, quality of life, mobility and community connectivity, economic competitiveness and opportunity including tourism, state of good repair, partnership and collaboration, and innovation” through the [RAISE](#) program.

Beyond these specific, discretionary, competitive grant funding opportunities, additional funding, particularly through the BIL, can be used to support equitable, resilient, and climate-friendly transportation investments. Many of the new federal dollars can be used for decarbonizing the transportation sector, building green infrastructure, improving bicycle and micromobility facilities, and better connecting public transportation, schools, and jobs. (Learn more on [page 23](#).)

While there is recent momentum to focus on reconnecting communities by converting harmful highway infrastructure, funding programs under the BIL and the IRA remain relatively small in the context of the total amount of transportation funding across the United States. As of 2020, state and local government funding accounted for roughly [75 percent of highway and road spending](#), with federal sources making up the other 25 percent.

Overall, up to [87 percent](#) of federal funds that state departments of transportation (DOTs) receive comes from formula funds, which can be used for almost all types of transportation projects. According to the [American Road & Transportation Builders Association](#), in fiscal year 2021, 43 percent of federal highway funding went to repair and reconstruction of roadways and 27 percent went to build new roadway capacity. It remains to be seen how states will spend federal highway funding coming from the BIL.

Although up to 50 percent of many federal highway funding programs [can be moved into other programs](#), only [4 percent of eligible federal highway funds](#) is spent on transit projects. Only 2.1 percent of federal transportation funds was designated for [walking and biking projects](#) between 2012 and 2016.

These figures show that the status quo still favors spending on roadways—whether for maintenance or for increased capacity—and that projects to reconnect communities are the exception rather than the rule. However, an increased focus on the benefits of different types of transportation projects—including highway conversions—could help shift this balance.



Lessons Learned

Around the country, efforts to repair the social, economic, and environmental harm done by urban highway projects can provide inspiration and guidance for communities aiming to advance similar efforts. Several overarching lessons can be gleaned from highway conversion efforts. A brief overview is below.

- **Understand and acknowledge the current and historical context to build trust.** Urban highways are often infamous as markers of physical, racial, and economic divides, and they shape the way many people view and experience their cities. Efforts to convert highway infrastructure into spaces that serve communities must first start with understanding the specific historical context and how the consequences of previous transportation decisions affect communities today.
- **Create a community-centered process.** Community co-creation must play a key role in efforts to repair the harm caused by many urban highway routings. Using a strong, collaborative, and intentional engagement process can help address the need for greater inclusion of marginalized voices in future growth and development.
- **Enhance resilience.** Highway transformations can enhance resilience through thoughtful design strategies that mitigate acute shocks such as extreme heat and flooding. Transformations can further address chronic stresses by supporting daily quality of life and improved resident health outcomes.

- **Leverage public and private funding.** Highway transformation projects are complex and typically involve multiple funding sources, including federal, state, and local funds as well as private investments. Leveraging public funds with private investments will be essential in helping level the resource distribution playing field and ensuring highway transformations can produce the greatest possible benefits for communities.
- **Embrace nature.** Incorporating nature-based solutions in highway conversion projects—including creating, enhancing, and maintaining natural spaces through investments in permeable pavement, trees, greenways, parks, and wetland restoration—can advance ecosystem restoration while protecting against climate change, improving overall community health, increasing access to nature, and supporting real estate success.
- **Integrate local storytelling and art.** Highway transformation efforts provide opportunities to collect and elevate stories of area residents and share them through the incorporation of art as significant project components. By honoring the perspectives and culture of community residents through art, highway conversions can acknowledge the past, current, and future of those with ties to the local area.

DEFINING RESILIENCE

Resilience can be defined as “the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.”

Learn about real estate development projects showcasing best practices in resilient design at [ULI Developing Urban Resilience](#).



Introduction

[Transportation infrastructure](#)—the “underlying system of public works designed to facilitate movement”—has always shaped the development and character of cities and the quality of life of residents.

Starting in the mid-20th century, government policies and decisions often routed highways through communities that

were, and are, home to significant populations of Black and brown people. Transportation planning decisions are often coupled with land use and zoning policies that promote sprawl and racial and economic segregation. They also fail to address natural hazard risks or to provide equitable access to community amenities, such as parks and other green spaces.



Although momentum for building urban freeways has eased, even today, many state DOTs continue to expand and invest in highway projects that perpetuate harmful results.

Leaders from cities and towns across the United States increasingly recognize the need to transform outdated, inequitable, and often underused automobile-oriented infrastructure to

promote resilience, increase access to parks, enhance the public realm, and reconnect communities divided by racially motivated transportation planning decisions. Even with the recent increased focus on repairing the harm created by highway routing decisions, it will take additional cross-sector collaboration to advance community-centered highway conversion projects.

History of Highway Routing in the United States

The creation of the interstate highway system in the United States led to prosperity for some and harm for others. Highways facilitated intercity mobility for freight and people with automobiles, but they also cut once-thriving communities in two, displaced thousands of low-income households, and otherwise disproportionately harmed Black people and communities of color.

Planners of the interstate highway system, which gained momentum after the [Federal Aid Highway Act of 1956](#), routed many highways directly through Black and brown communities—[often deliberately](#). In many cases, the government took homes and businesses by eminent domain.

Highways in most cities were built after explicit racial zoning was outlawed. Yet, some highways were built right on boundary lines that had been used during the time of [racial zoning](#) to [create barriers](#) between white communities and those that were home to Black and ethnic minority residents.

Some neighborhoods that were home to Black and brown people, and businesses that supported these communities, were targeted for new highway routes when other, more logical locations were available. In the article [“The Interstates and the Cities: Highways, Housing, and the Freeway Revolt,”](#) author Raymond A. Mohl noted that these locations included the following:

- **Miami, Florida.** State highway planners and local officials deliberately routed Interstate 95 through the Black neighborhood of Overtown even though an alternative route using an abandoned railroad corridor was available. When the expressway was built in the 1960s, it destroyed homes and Overtown’s main business district. A single large expressway interchange replaced roughly 20 square blocks of densely populated land and destroyed housing for up to 10,000 people.
- **Nashville, Tennessee.** Interstate 40 was built with a curve that routed it to divide the Black community of North Nashville, destroying hundreds of homes and businesses. The decision for the route of I-40 was made in 1957 at a nonpublic meeting of white business leaders and state highway officials.
- **Montgomery, Alabama.** Interstate 85 was routed through a neighborhood that was home to multiple Black civil rights leaders. At the time, the state highway director was a high-level officer of the Ku Klux Klan and the White Citizen’s Council. The chosen route wiped out homes of Black residents, churches, and schools even though an alternate route on vacant land was available. Although organized opposition to the highway slowed construction, federal highway administrator Rex M. Whitton stated that the route was chosen “based on a thorough evaluation of all engineering, economic, and sociological factors involved.”

- **Kansas City, Missouri.** The South Midtown Freeway was routed through an integrated community, destroying 1,800 buildings and displacing thousands of people. Previously, in the early 1950s, city manager L.P. Cookingham [had stated](#) that “no large city can hope for a real future without expressways that cleared slums and preserved the central business district.”
- **Camden, New Jersey.** In the 1960s, Interstate 95 was built through neighborhoods where 85 percent of the 1,289 families that were displaced were of minority origin. Between 1963 and 1967, 3,000 low-income housing units in Camden were destroyed but only roughly 100 new low-income units were built.
- **St. Paul, Minnesota.** Interstate 94 was built through Rondo, the city’s Black community, in the 1950s and ‘60s, displacing one out of seven people that made up St. Paul’s Black population.
- **Los Angeles, California.** The Century Freeway in Los Angeles was approved in 1968 by the state DOT even though it would displace 3,550 families, 117 businesses, and many parks, schools, and churches—mostly in areas home to Black people, including Watts and Willowbrook. In Pasadena, freeway construction displaced more than 4,000 Black and Mexican-American residents, many of whom were forced to move back into inner-city Los Angeles.

URBAN RENEWAL

Often coupled with intentionally routing highways through neighborhoods home to Black people, the federal policy of “urban renewal” [provided federal funding to cities](#) for “slum clearance,” which involved seizing properties and forcing redevelopment in areas classified as “blighted.” Urban renewal programs were formally established by the Housing Act of 1949 and, alongside highway construction and the development of public housing, they aimed to improve property values. In practice, these policies led to residential and commercial displacement in cities throughout the country, and they separated people from communities and social ties.

[As an example](#), the Tulsa, Oklahoma, neighborhood of Greenwood—once known as Black Wall Street—saw both the construction of the city’s Crosstown Expressway and deployment of urban renewal policies that left many acres of land empty and under the control of urban renewal authorities in place of a once-thriving community.



Greenwood had been the site of the [Tulsa Race Massacre](#) in 1921, a brutal two-day attack on the city’s Black population by white residents, Ku Klux Klan leaders, the Tulsa Police Department, and the Oklahoma National Guard. The massacre destroyed businesses and resulted in at least 300 deaths.

After the near total destruction of Greenwood—and in the face of many political and policy-related obstacles—residents built back the neighborhood and generally experienced nearly half a century of prosperity before the neighborhood was decimated again by the construction of the Crosstown Expressway and associated urban renewal policies, which replaced the mixed-use, mixed-income, and walkable neighborhood with highways and empty land. [As of 2023](#), the Urban Renewal Authority owned hundreds of acres of land in Greenwood that continues to sit vacant.

Harmful Effects of Urban Highways

The routing of highways in many cities has generated or exacerbated economic inequities and health, climate, and livability disparities for people living nearby. While the national highway system has facilitated interstate automobile travel and commerce, negative effects of the interstate highway system on communities include the following:

- **Residential displacement.** Urban highways directly [displaced more than 475,000 households](#)—generally in communities of color.
- **Exacerbated extreme weather events.** The interstate highway system is subject to [extreme weather events](#)—such as coastal storms, extreme heat, and flooding—which are increasing in frequency due to climate change. In the United States, there are more than 60,000 miles (97,000 km) of roads and bridges in coastal floodplains that may be at risk for the effects of climate change. Because highways increase the amount of impermeable surface, they contribute to increased flood risk. They also compound the urban heat island effect because roadways [absorb and emit heat](#) to a greater extent than most natural surfaces.
- **Reduced land values.** Highway routing choices reduced local land values for home and business owners.
- **Physical barriers.** At-grade and elevated highways created barriers within and between communities, disconnecting people from economic opportunities and access to services and community amenities, such as parks.
- **Racial and economic segregation.** The interstate highway system facilitated the development of many suburban communities, which often excluded people of color, facilitated white flight, and [reinforced racial segregation](#). Communities that are home to historically disenfranchised groups [lack equal access](#) to housing and opportunities for economic mobility and may suffer disproportionately when exposed to shocks and stresses, including extreme weather.
- **Lower investment in public transportation and regional rail systems.** The lower tax base in communities that experienced reduced land values and white flight due to the location of highways led to less [profitability for regional transit systems](#). Less-convenient transit service limits mobility for those who cannot afford a car, who are unable to drive, or who choose not to drive.
- **Negative health outcomes.** Living near a major highway [increases the risk of premature death](#) and [numerous health conditions](#) due to air pollution, including asthma, chronic obstructive pulmonary disease, decreased lung function, and a higher risk of dementia.
- **Reduced pedestrian safety.** Increases in interstate lane miles are directly [associated with increases in pedestrian fatalities](#), for reasons including that pedestrians experience more exposure to automobiles both on and off the interstate.
- **Contributing to climate change.** As of 2021, the transportation sector generated the [largest share of greenhouse gas emissions](#) in the United States, contributing 29 percent of emissions. [Cars and trucks](#) produce 80 percent of these emissions.

EXCLUSIONARY ZONING, HIGHWAYS, AND SPRAWL

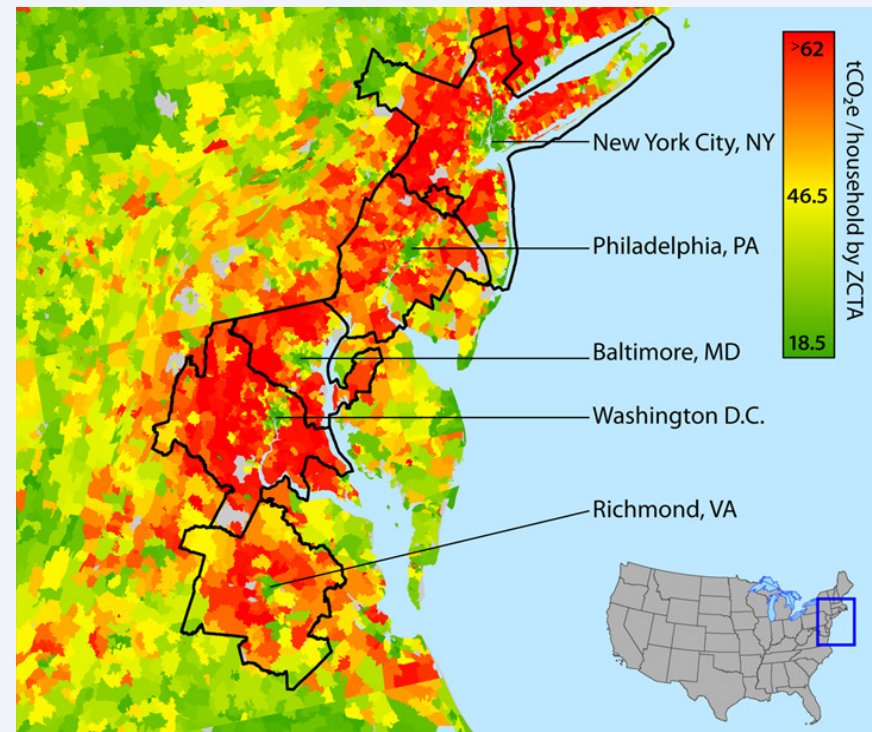
Transportation infrastructure decisions—especially the routing of highways through neighborhoods home to Black and brown people—are often closely connected to residential zoning. In tandem, transportation planning and land use policies have often served to enforce racial segregation and have produced negative environmental, health, and socioeconomic disparities.

[Exclusionary zoning](#) is the use of ordinances to restrict the types of homes that can be built in certain neighborhoods. These ordinances can be used to discriminate against people of color and maintain property prices in suburban and urban neighborhoods. Research has directly connected this practice to racial segregation, which has led to measurable disparities in health outcomes and economic opportunity and has contributed to the racial wealth gap.

In addition to segregating communities, the combination of traditional zoning policies and investments in highways has promoted or failed to address urban sprawl, which has created adverse environmental outcomes and contributed to development patterns leading to chronic health problems such as obesity, diabetes, and cardiovascular and respiratory disease. Moreover, because sprawl has contributed to the concentration of vulnerable populations in areas with existing health and environmental risks, climate change factors such as rising temperatures and seas and more frequent and intense storms exacerbate impacts on these communities and stymie their recovery from adverse events.

Sprawling and decentralized urban development has consumed agricultural and other wildlands, [harming](#) biodiversity and ecosystem services, and increasing risks from wildfires, droughts, and other natural disasters.

Excessive space devoted to roads and parking exacerbates the urban heat island effect. The reliance on vehicular transportation infrastructure leads to dangerous conditions for pedestrians and preventable injuries. As of 2021, [pedestrian deaths in the United States](#) had reached their highest level in 40 years, with nearly 7,500 people killed while walking—equivalent to roughly 20 deaths every day.



Sprawling, low-density suburban areas produce greater greenhouse gas emissions than do central cities.

Source: [UC Berkeley CoolClimate Network](#).



Moving Forward

Around the country, efforts are underway to repair the social, economic, and environmental harm done by urban highway projects. In place of dangerous, unattractive, and unhealthy highways that divide communities and exacerbate natural hazard risks, cities are creating parks, sidewalks, and boulevards and adding trees, art installations, and green infrastructure.

These transportation transformations not only improve quality of life and environmental and health outcomes, but they also play a role in addressing the legacy of inequitable and racially motivated transportation planning decisions that decimated once-thriving communities in cities and towns across the United States and beyond.

POTENTIAL BENEFITS OF HIGHWAY TRANSPORTATION TRANSFORMATIONS



Enhanced equitable development opportunities



Increased access to parks and green space



Opportunity to incorporate green infrastructure and nature-based solutions



Reduced greenhouse gas emissions



Enhanced resilience to the impacts of extreme weather events



Incorporation of community-serving retail



Potential for equitable economic development



Safer and more convenient pedestrian and bicyclist infrastructure



Improved air quality



More social gathering spaces



Reconnecting communities



Undoing past harms of racially motivated transportation investments



KLYDE WARREN PARK: CREATING A PARK OVER A HIGHWAY

Adapted from Karen Jordan, [“Highway Removals: Communities Reunite, Breaking Down Barriers, and Righting Wrongs of the Past,”](#) *Urban Land*, October 24, 2022.

In Dallas, the Woodall Rodgers Freeway connects Interstate 35 with North Central Expressway and Interstate 45. It has been considered the busiest road in the city. When it was completed 60 years ago, its construction came at a high price to those who lived in some of the surrounding neighborhoods.

People who resided in the predominantly Black community of Oak Cliff were profoundly segregated and cut off from downtown Dallas, which helped spur inequity and destitution in that neighborhood.

Now, local officials and private partnerships are working to ameliorate the past with projects such as Klyde Warren Park, which was erected over the freeway. The now-decade-old park connects downtown to uptown Dallas and communities beyond.

“It’s really becoming a stitching back together of communities that were divided with this highway system that just blew right through neighborhoods over the past several decades,” says Kit Sawers, president of Klyde Warren Park. The park receives more than 1 million visitors per year and was the 2014 ULI Urban Open Space Award winner. “It has established really the center of the wheel for the city,” Sawers says, maintaining that its role is “critically important.”

“There’s a hub now. There’s a vibrancy,” she adds. “Things can grow from it, and it has benefited not only those neighborhoods but the rest of the city.”

The \$110 million Klyde Warren Park was funded through a public/private partnership and is located across from the Dallas Museum of Art. The park features an outdoor stage with arts performances and offers movie nights, fitness classes, festivals, and concerts, some of which are sponsored by area organizations. The aim is to provide a venue to “showcase different cultures and talents from around the city,” according to Sawers.

An “enhancement” is being built that will include 1.7 acres (0.7 ha) in addition to the current 5.2 acres (2.1 ha) and that will double the size of the children’s play area.

The park has also had a positive impact on the local real estate market. Over the past decade, the value of the surrounding real estate has increased by \$4.1 billion, generating about \$525 million in tax revenue. That money will now benefit the city as well as the local school district, roads, and other parks. “It’s truly been the gift that keeps on giving,” Sawers says.

People from around the United States are now viewing the park as a model for similar projects that are in the works in their cities. They are learning from both the successes and mistakes associated with Klyde Warren Park and its impact on the city. Sawers warns that the programming staff and the budgets for programming should not be underestimated.

Another project, the Southern Gateway Park, is also in the works in Dallas. Its first phase has a planned opening in early 2024 and will ensure that the Oak Cliff neighborhood will no longer be disconnected from the city.

Eric Johnson, the mayor of Dallas, says that the Southern Gateway Park will be “a game-changing investment. Parks can be a catalyst for change that can strengthen our neighborhoods and provide greater opportunities for our residents,” he says. “And it’s my view that parks and trails should be considered critical infrastructure for our city.”



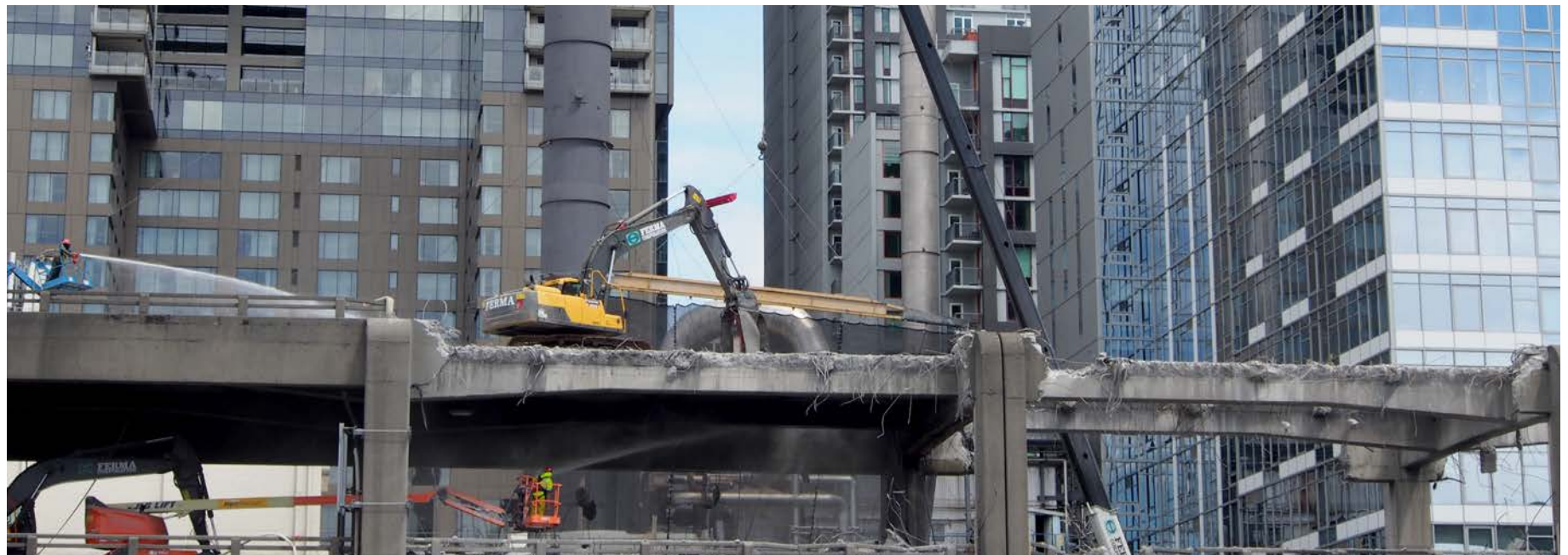
Leveraging Momentum for Change

As the United States prepares to make the largest infrastructure investment in a generation, an opportunity exists for key partners to support equitable and resilient transportation projects that create and sustain community and real estate value.

Through 2026, [\\$590.7 billion](#) will be spent on U.S. transportation networks through the Infrastructure Investment and Jobs Act of 2021, more commonly known as the BIL. Additional federal funding from the IRA of 2022 can fund equitable transportation investments and can potentially be leveraged by the real estate industry.

While these funds are significant—especially when combined with state and local spending—leveraging public funds with private investments can also help level the resource distribution playing field and ensure highway transformation investments can produce the greatest possible benefits for communities.

Investments in highway transformations can catalyze complementary projects. For example, public investments in highway conversions that feature public art, sidewalks, or parks may unlock opportunities for adjacent real estate development with beneficial features such as green roofs, new trees, and access to nature for area residents. With community coordination focused on equitable development, these complementary investments can ultimately lead to cleaner air, more opportunities for people to engage with nature, and more resilient communities overall.



INFRASTRUCTURE AND REAL ESTATE INVESTMENT

The overall quality of infrastructure, along with consumer demand, is a [key driver](#) for real estate investment. As identified by survey participants for the joint ULI/PwC report [Emerging Trends in Real Estate® 2022](#), transportation and infrastructure are of “great importance” for real estate.



Asked to identify infrastructure priorities for investment in the metropolitan area where they primarily work, participants in the ULI Member Global Infrastructure Survey conducted April 20 to May 17, 2021, responded that—among other concerns—priorities and top priorities included the following:

- Adapting to and mitigating climate change
- Increasing renewable and green energy generation
- Maintaining existing infrastructure
- Improving public transportation
- Improving pedestrian infrastructure
- Addressing injustice and inequity
- Reconnecting divided communities
- Improving water/wastewater systems
- Improving or expanding parks and trails

Projects to update or remove highway infrastructure can support many of these priorities in tandem. Real estate developers are essential constituents and partners in efforts to ensure that such projects support key resilience, health, livability, and sustainability goals, while providing needed community connections and access to green spaces.

The real estate industry can leverage the current focus on infrastructure investment—including from the BIL and the IRA. With significant flexibility built into these federal funding streams, developers and other land use professionals have an opportunity to provide leadership in local infrastructure conversations to encourage spending on resilient, sustainable, and equitable priorities—including highway transformations.



Key Funding Sources

Investments in transportation infrastructure with the potential to reconnect communities typically involve numerous partners, often including the U.S. Department of Transportation (USDOT), state and local DOTs, [metropolitan planning organizations](#) (MPOs)—organizations created and designated to carry out the metropolitan transportation planning process—city governments,

the real estate development community, community groups, and other stakeholders. Funding for transportation projects comes from federal, state, and local sources. State DOTs have a key role in [determining transportation planning and funding priorities](#) across the United States.



State DOTs direct how billions of dollars of federal and state transportation dollars are spent and often have near complete flexibility on how they spend federal money. The amount of funding states receive from the federal government varies by state and by year.

Federal transportation funding programs include both [discretionary](#) and mandatory, or [formula](#), funding. With discretionary funding, USDOT (or the relevant federal agency) can exercise judgment in selecting funding recipients through competitive grant processes. With formula funding, the agencies are required to award funding if recipients meet certain predetermined conditions.

State funding sources often include gas taxes and highway tolls. In 2020, state and local government funding accounted for roughly [75 percent of highway and road spending](#), with federal sources making up the other 25 percent. This split will change with the infusion of BIL funds delivered to states in coming years.

Flexible Federal Funding Programs

Overall, 80 percent of federal transportation funds support “highway” projects, with the other 20 percent supporting transit. Much of what is known as “highway” funding can be spent not just on maintaining or expanding roads, but also on sustainable, resilient, and equitable priorities, including transit and infrastructure to support walking and bicycling. The federal government’s main role is to ensure that projects comply with federal rules, including environmental regulations and civil rights laws.

Regardless of this potential flexibility, only [4 percent of eligible federal highway funds](#) is spent on transit projects and, overall, only 2.1 percent of federal transportation funds was designated for [walking and biking projects](#) between 2012 and 2016. The real estate industry and community and advocacy groups can play a role in shaping transportation funding decision-making to advance more equitable, sustainable, and resilient priorities—including highway conversion projects.

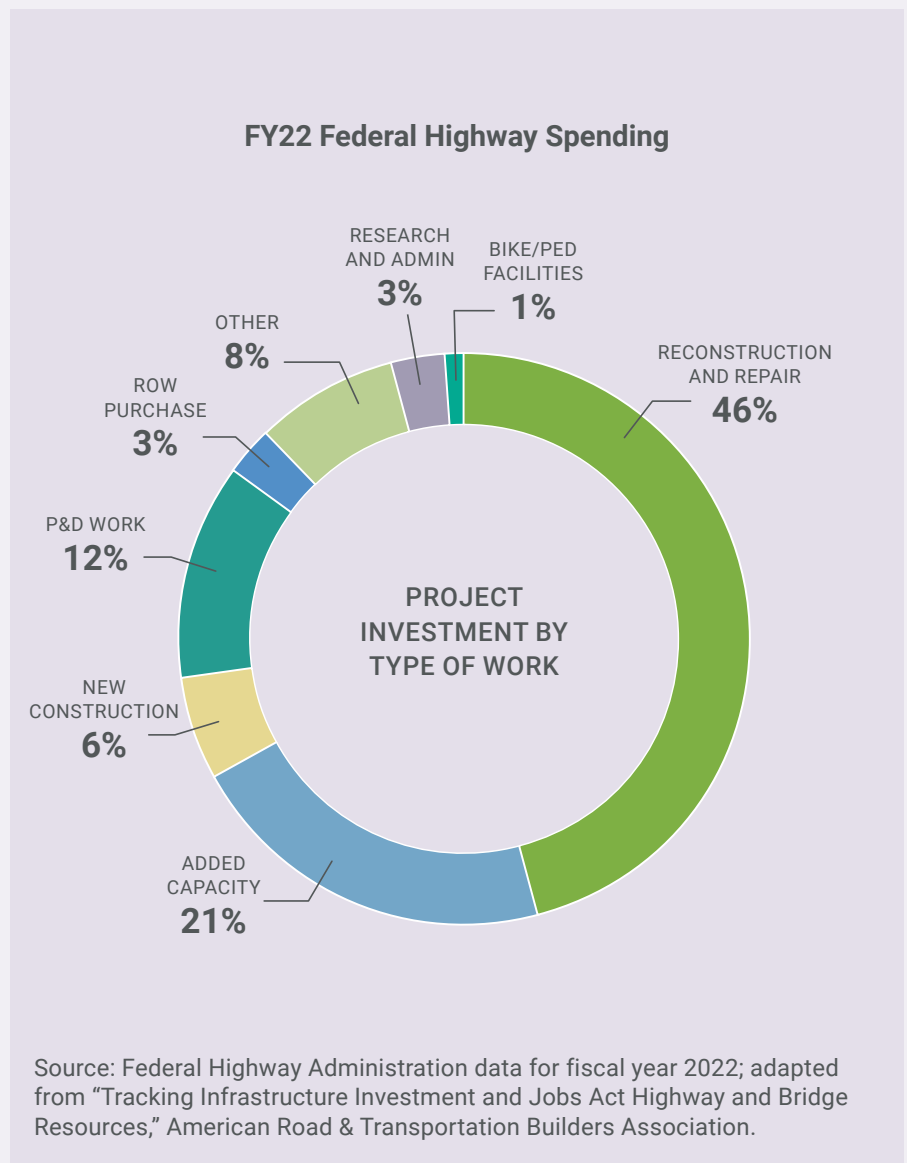
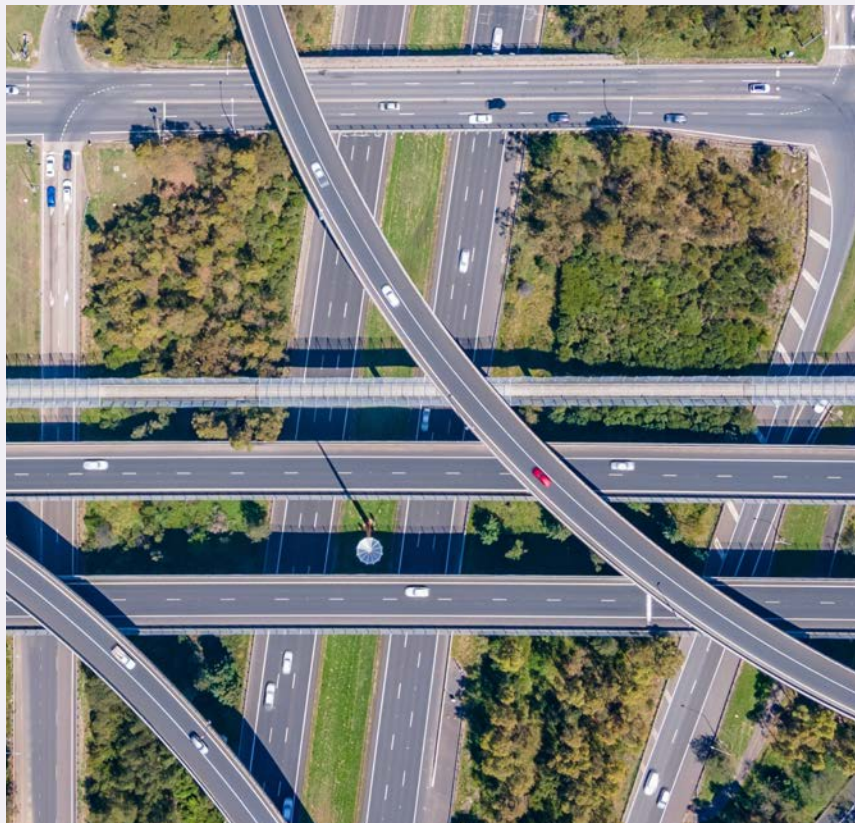
The [largest flexible federal highway programs](#) include the following:

- **National Highway Performance Program.** This is the largest federal formula transportation funding program. Generally, it funds interstate highway projects; however, it can also be used to fund transit near a highway if the investment in transit would be more cost effective than expanding highway capacity.
- **Surface Transportation Block Grant Program and Carbon Reduction Program.** Funds can be spent on transit infrastructure without additional requirements. These programs are controlled by states, but large amounts of funding must be spent in metropolitan areas where MPOs play a significant role in determining funding priorities.
- **Congestion Mitigation and Air Quality (CMAQ) Program.** These funds support transit projects in areas where air quality violates U.S. Environmental Protection Agency (EPA) standards. MPOs generally play the lead role in determining how to spend CMAQ funds in their areas.

In addition, up to 50 percent of many federal highway programs [can be moved into other programs](#).

HOW STATES USE FEDERAL HIGHWAY FUNDS

According to the [American Road & Transportation Builders Association](#), in FY22, 46 percent of the federal highway funding went to repair and reconstruction of roadways and 27 percent went to build new roadways or to add capacity. However, this split [varied widely by state](#), ranging from just 14 percent spent on repairs in Arizona, Delaware, Georgia, and Virginia to 70 percent or higher in Minnesota, Nebraska, and South Dakota. It remains to be seen how states will spend federal highway funding coming from the BIL.



The Bipartisan Infrastructure Law and the Inflation Reduction Act

Over the coming years, the United States is poised to make a significant infrastructure investment through the BIL and the IRA. Nearly 70 percent of BIL funding will be [distributed through formula funding](#)—grants to states with amounts based on factors such as population or state size. The largest share of funding in the \$1.2 trillion BIL over its 10-year life span will be administered by the Federal Highway Administration (FHWA) and directed by states and MPOs.

These and other federal infrastructure funds can be used to support equitable, resilient, and climate-friendly transportation investments that can be components of highway conversions, such as bicycle lanes and micromobility facilities. However, for much of this formula funding, state and local leaders have significant flexibility in which projects to support, meaning funds can be spent on priorities likely to increase greenhouse gas emissions, including new highway construction and expansion. How new federal funds are used will play a major role in setting the path for the country's economic, social, and environmental future.



Beyond BIL formula funds, specific discretionary federal grant funding programs through the BIL and the IRA can support highway conversions. These programs include the following:

- **Reconnecting Communities.** The BIL includes the first-ever federal funding program to [reconnect communities](#) “cut off from opportunity and burdened by past transportation infrastructure decisions.” The \$1 billion Reconnecting Communities program awarded the first \$185 million in funding in 2023 to 45 communities, including six capital construction grants and 39 planning grants. Eligible facilities include highways, roads, streets, parkways, or other transportation facilities, such as rail lines, that create barriers to community connectivity, including barriers to mobility, access, or economic development, due to high speeds, grade separations, or other design factors. Funding can be used for planning, technical assistance, and/or capital construction.
- **Neighborhood Access and Equity Grants.** The IRA includes more than \$3.2 billion for the [Neighborhood Access and Equity Grants](#) program. The program is intended to support projects that improve walkability, safety, and affordable transportation access in communities. It will also address environmental harm caused by transportation projects in disadvantaged communities. The program will reserve \$1.1 billion in funding

for low-income communities. Grantees can use funding for activities, including:

- Converting highways into boulevards and advancing “complete streets” principles;
 - Adding pedestrian, bike, or trail crossings, and/or other safety features;
 - Incorporating sustainable and green infrastructure solutions; and
 - Increasing access to transportation options, including micromobility.
- **RAISE.** The BIL also includes discretionary grant funding to support “safety, environmental sustainability, quality of life, mobility and community connectivity, economic competitiveness and opportunity including tourism, state of good repair, partnership and collaboration, and innovation” through the [RAISE](#) program. The RAISE program [previously encompassed](#) the Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) discretionary grant programs, which were first created through the 2009 American Recovery and Reinvestment Act. Highway transformation projects that have used these funds to help reconnect communities include Pittsburgh, where funds supported the construction of the I-579/Frankie Pace Park highway cap project. (See profile on [page 46](#).)

Funding Predictability

The fact that the BIL and the IRA include specific discretionary funding programs to support highway conversions is proof that public-sector leaders and others recognize the harmful effects of many urban highways on people and communities, as well as the need to invest in new infrastructure to support equitable and resilient community priorities.

However, since formula funds continue to represent the largest share of federal transportation investment, it is possible that the existence of these discretionary programs may play a role in maintaining investment in “traditional” automobile transportation projects, including those that expand roadway capacity and increase greenhouse gas emissions. This is because discretionary programs offer additional sources of funding for highway conversions and other equitable and resilient infrastructure priorities that may incentivize local leaders to continue supporting the status quo through projects supported by formula funding.

Without shifting the majority of federal transportation spending—including formula funding—to support equitable, resilient, and community-oriented projects such as highway conversion efforts, such projects may remain the exception rather than the rule. Discretionary grant programs to support these projects highlight their importance but may prevent state DOTs and other decision-makers from moving forward with them.

The highway conversion efforts profiled in this report leveraged funding from a variety of sources—including federal formula and discretionary funds, and state, local, private, and philanthropic sources. These examples showcase the complex web of funding often needed to successfully complete large, multifaceted transportation projects. More consistent use of federal formula funds for highway conversion efforts could potentially increase their feasibility, thereby expanding the total number of projects completed and allowing state and local governments to address the legacy of harmful urban highway routings more systematically.

“Reconnecting communities is so important because we know for the last 50 to 60 years, the way we’ve invested transportation dollars, the way we’ve aligned transportation dollars with land use, in many cases, was sometimes not in the benefit of the full community—and sometimes it’s actually been in direct opposition to neighborhoods.”

—Christopher Coes, assistant secretary for transportation policy at USDOT, [quoted in](#) “Highway Removals: Communities Reunite, Breaking Down Barriers, and Righting Wrongs of the Past,” from *Urban Land* magazine.

TRANSPORTATION PLANNING TO CUT GREENHOUSE GAS EMISSIONS IN COLORADO

In 2021, Colorado began to require the Colorado Department of Transportation (CDOT) and [MPOs](#) to [estimate the total greenhouse gas \(GHG\) emissions](#) from the transportation projects included in their plans. They must also ensure that their approved plans do not go beyond specific GHG reduction targets for each region. CDOT and the MPOs can meet required reduction levels by choosing different projects or by mitigating the impact of projects through investment in other GHG reduction measures.

The rule change comes as Coloradans are more frequently experiencing [poor air quality](#), including from wildfires exacerbated by the effects of climate change. (Read more about the implications of wildfires for the real estate industry and best practices in building design and land use policy that can reduce the impacts of wildfires in ULI's [Firebreak: Wildfire Resilience Strategies for Real Estate](#).)

This rule is already producing impacts by [redirecting about \\$900 million](#) in transportation funding from widening Interstate 25 in Denver to other projects, including a new bus rapid transit corridor. Prioritizing projects to reconnect communities and provide green space and green infrastructure instead of widening highways can be a key strategy in reducing GHG emissions, thereby improving air quality, reducing the urban heat island effect, and enhancing stormwater management. For example, creating cool, green space islands, such as by replacing pavement with parks, can [reduce surrounding air temperatures](#) by at least 2 to 4 degrees Fahrenheit (1.1 to 2.2 degrees Celsius).



Denver on a hazy day. Coloradans are more frequently experiencing poor air quality, including from wildfires exacerbated by the effects of climate change.



Advancing Equitable Outcomes

Advancing highway conversion efforts can create opportunities for transformative change within communities that results in new real estate value and increases in community health and resilience. Using a strong, collaborative, and intentional engagement process can help address the need for greater inclusion of marginalized voices in future growth and development.

With intentionality, community engagement processes can be powerful vehicles for equity and inclusion, and can build opportunities for greater transparency, shared decision-making, and mutual accountability.

Engagement processes should [leverage the democratic spirit of residents](#) and should be informed by strong local examples of public participation. Highway transformation efforts give cities the chance to demonstrate these values through the practice of equitable development.



Key actions and outcomes for community engagement related to highway conversion efforts identified through ULI’s [I-35 Corridor in Austin, Texas](#) Advisory Services panel—which explored how I-35 is a barrier between neighborhoods and provided recommendations on opportunities to improve connectivity between downtown and the east side of Austin—include the following:

- **Co-create a vision for the future.** This vision should include an articulation of shared values, such as equity, as well as a commitment to incorporating these values across agencies, projects, and approaches.
- **Build trust among stakeholders.** Historical injustices and exclusion, repeated attempts at updating roadways with studies that did not result in change, and different growth priorities may have led to distrust among stakeholder groups. It is critical that community engagement processes work to build trust as a precursor to building consensus (or agreement) on a path forward for highway retrofit projects. This process can begin with naming and acknowledging past injustices that some stakeholder groups have experienced.
- **Create a scoping working group.** This group can consist of representatives of the city, economic development groups, and community leaders.
- **Establish design principles.** These principles are intended to guide decision-making and the physical design for updating the highway infrastructure to serve community needs.

COMMUNITY AND AGENCY COLLABORATION TO RECONNECT A BLACK COMMUNITY IN THE TWIN CITIES

Adapted from Karen Jordan, [“Highway Removals: Communities Reunite, Breaking Down Barriers, and Righting Wrongs of the Past,”](#) *Urban Land*, October 24, 2022, and [Rethinking I-94](#), Minnesota Department of Transportation.

During the 1950s, Interstate 94 bore through a St. Paul neighborhood and displaced 700 homes and 300 businesses, according to the nonprofit Reconnect Rondo. It devastated the once-vibrant community where it is estimated that at least half of St. Paul’s Black residents lived.

Reconnect Rondo’s goal is for the land bridge to cap I-94 and connect St. Paul’s Black community of Rondo, according to Keith Baker, executive director of the Minneapolis-based organization. A recent ULI study found that erecting a land bridge in Rondo would be advantageous to the local Black community.

“Through it all, stakeholders agreed that the Rondo Community Land Bridge is a worthy investment not only to realize a physical connection that would enhance livability, but also to provide an opportunity for long-overdue social justice for a neighborhood,” the 2018 study states. The idea of a land bridge dates to 2009 and the nonprofit organization has secured \$6.2 million for predevelopment from the Minnesota Legislature.

“There was a transit project—the Central Light Rail Corridor project—that was going to be going through from Minneapolis to St. Paul along University Avenue,” Baker explains. “University Avenue cuts through the northern portion of the Rondo community, but there were no stops planned in the community of Rondo. Naturally, the community was upset by that.”



Rondo Commemorative Plaza in St. Paul, Minnesota.

Community meetings were held and, as a result, residents let it be known to the FHWA that something needed to be done to remedy the issue. This funding includes consideration for a land bridge that could allow for 13 acres (5.2 ha) of public space, according to a recent feasibility study, which also indicates that the community could have around 576 new housing units and 108,000 square feet (10,000 sq m) of retail space and that the proposed project could generate \$4.2 million in annual revenue for the city, according to Baker. The project is expected to yield 1,800 new jobs and provide space for a business incubator.

“If you can imagine, there were 300 businesses taken in Rondo,” Baker says. “We envision 300 businesses replaced.” Reconnect Rondo is now focused on the idea of creating an “African American cultural enterprise district” that was first imagined in 2015 by the Rondo Roundtable initiative and what was once Rondo before the freeway destruction.

The project is in the predevelopment phase. The goal is to honor the area’s historical culture and simultaneously celebrate the city’s current diversity “while setting conditions for the future,” according to Baker.

Rethinking I-94 in the Twin Cities

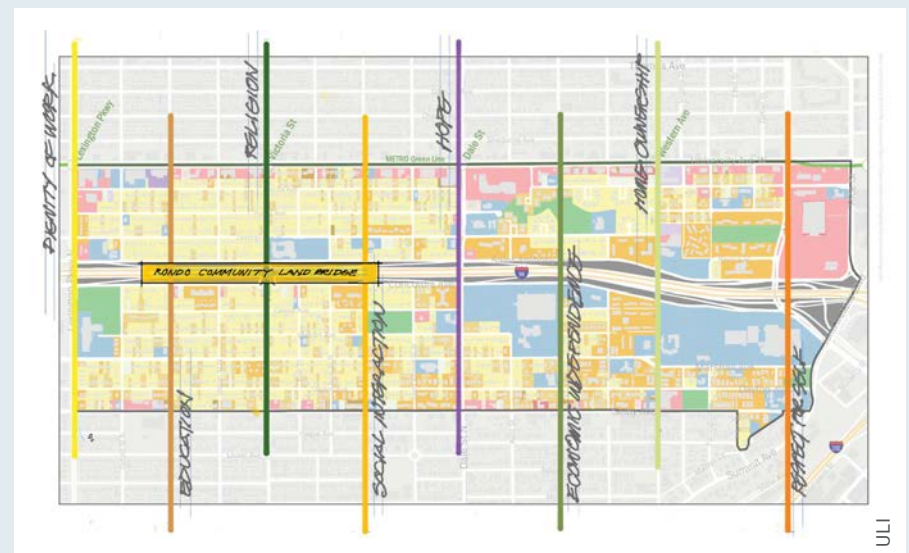
In summer 2015, Minnesota DOT (MnDOT) commissioner Charles Zelle hosted a healing ceremony in the Rondo community alongside community leaders and elected officials. Zelle publicly acknowledged how past transportation decisions had harmed the neighborhood.

MnDOT is advancing an effort called Rethinking I-94 to improve engagement and relationships with communities along highways in Minneapolis and St. Paul. Through public engagement, stakeholders and MnDOT partners are helping develop a plan for the corridor that centers on the needs and health of people who live, work, or recreate along the highway route.



HUDSON KINGSTON

Interstate 94 runs through the historic African American community of Rondo.



ULI

The panel’s proposed Rondo Community Land Bridge superimposed on ReConnect Rondo’s values.

Addressing Potential Displacement

Highway conversion project leaders need to consider antidisplacement strategies, especially when projects include new park space that may spur [green gentrification](#)—“the process by which environmental greening leads to increases in perceived local desirability that result in higher property values and rents.”

Various strategies can be used to mitigate the risk of displacement and ensure that current residents will reap the benefits of investments. Important considerations include the following:

- Conducting extensive public engagement at regular intervals to learn and document local needs and observations;
- Collecting and monitoring data on rent, property taxes, and turnover within community stakeholder areas;
- Reviewing and following best practices learned in other cities;
- Advancing collaboration among housing- and park-focused organizations;
- Encouraging community developers to pursue affordable housing projects and seek affordable housing funding; and
- Integrating antidisplacement strategies and requirements into local policy, laws, and funding requirements wherever possible.

EQUITABLE DEVELOPMENT PLANNING AT THE 11TH STREET BRIDGE PARK, WASHINGTON, D.C.

The 11th Street Bridge Park in Washington, D.C., aims to create a first-class park over the Anacostia River on the piers of the old 11th Street Bridge. The park would serve existing residents and preserve the neighborhoods they call home.

To achieve this goal, Bridge Park staff worked with community stakeholders to create an [Equitable Development Plan](#) in 2015, which was updated in 2018. The plan aims “to ensure that the park is a driver of inclusive development—development that provides opportunities for all residents regardless of income and demography.”

The plan took shape after years of intensive engagement with residents, which was essential to overcome skepticism and cultivate trust. The community-led process uncovered that the Bridge Park could serve as a “connection between a booming area of the city and one that has long been excluded from the city’s economic progress.”

The park, which is not yet built, is positioned to be a catalyst for equitable economic growth and is advancing affordable housing, creating local jobs, and strengthening the bonds of culture that hold neighborhoods together. As of 2021, over \$60 million had been invested into the community, nearly matching the capital costs of building the Bridge Park, which is scheduled to begin construction in 2023.

Source: Next City, “Can a Park Prevent Gentrification?,” February 10, 2021, <https://nextcity.org/urbanist-news/can-a-park-prevent-gentrification>.

Note: Quotations are from the Building Bridges across the River, 11th Street Bridge Park website at <https://bbardc.org/equity/>.

Equitable Resilience Considerations

Resilience is an essential consideration when planning and implementing equitable, community-centered highway transformation projects, especially because people with low socioeconomic status are likely to be [disproportionately affected by climate change](#) and are more likely to “live in fragile housing, be exposed to environmental hazards, and have more limited ability to prepare for or recover from extreme climate events.”

Highways increase the amount of impermeable surface in an area, thereby contributing to heightened flood risk and compounding the urban heat island effect. As such, communities near interstate highways and other similar roadways may be especially vulnerable to [extreme weather events](#), such as coastal storms, extreme heat, and flooding, which are increasing in frequency due to climate change. The climate impacts of highways contribute to inequities because many highways were deliberately routed through Black and brown communities—including formerly redlined areas now at [higher risk](#) of extreme heat.



The [USDOT 2021 Climate Action Plan](#) identifies key climate-focused transportation planning and investment principles. A summary of these principles is below.

- **Use best available science.** Climate adaptation and resilience strategies should be grounded in the best available scientific understanding of climate change risks, impacts, and vulnerabilities.
- **Prioritize the most vulnerable.** Adaptation and resilience plans must prioritize people, communities, and infrastructure that are most vulnerable to climate impacts—including “underrepresented groups, low-income communities, communities of color, limited English proficient communities, and individuals with disabilities.”
- **Preserve ecosystems.** Protecting biodiversity and ecosystem services through adaptation strategies increases resilience of human and natural systems to climate change and other risks, providing benefits to society and the environment.
- **Build community relationships.** Adaptation and resilience require coordination across multiple sectors, geographical scales, and units of government. Actions must build on existing efforts, knowledge, and meaningful engagement of communities that are affected. Because impacts, vulnerabilities, priorities, and needs vary by region and locale, adaptation will be most effective when driven by local and regional risks and needs.
- **Engage globally.** The transformation of the global transportation sector offers opportunities for significant greenhouse gas emission reduction, healthier cities, and the opportunity to build resilient infrastructure. Working with other nations, multilateral organizations, industry, and nonprofit organizations can support a global transformation that addresses climate change mitigation, adaptation, and resilience.



Lessons Learned

Every highway transformation effort is unique. This report profiles six examples from communities across North America—each with its own history, climate risks, city and neighborhood context, community needs, and opportunities. While the details vary, several overarching lessons can be gleaned from these innovative endeavors and others explored in earlier sections of the report.

When aligned with complementary city policies—like zoning code codes—highway conversions can promote public- and private-sector investment that advances key goals.

Understand and acknowledge the current and historical context to build trust. Urban highways are often infamous as markers of physical, racial, and economic divides. The legacy of racial segregation and economic inequity shapes the way many people view and experience their cities. Efforts to convert highway infrastructure into spaces that serve communities must first start with understanding the specific historical context. This is especially true in instances where previous transportation decision-making excluded communities of color and low-income residents, resulting in residential and commercial displacement.



Future site of Frankie Pace Park in Pittsburgh.

It is equally important to understand how the consequences of previous transportation decision-making affects communities today. This could include separating people from community ties and economic opportunities and producing health and climate disparities for people living near highways versus those whose communities were spared from disruptive highway projects.

For example, Pittsburgh’s Lower Hill District was [cut off from downtown](#) due to the construction of I-579/Crosstown Boulevard in the 1950s and early 1960s. During the same period, the construction of the former Civic Arena resulted in razing more than 1,300 structures over 95 acres (38 ha) and displacing 8,000 residents and 413 businesses in the predominantly Black neighborhood. The highway also isolated the neighborhood from downtown Pittsburgh. The Frankie Pace Park project capped the highway to provide park space, connections to downtown, and cultural opportunities for current residents.

Only by acknowledging history and understanding the current impacts of harmful transportation investments can trust be built among community representatives and other project leaders, resulting in highway conversion efforts with the potential to serve nearby residents.

As an example, in summer 2015, MnDOT commissioner Charles Zelle hosted a healing ceremony in St. Paul’s Rondo community alongside community leaders and elected officials. Zelle publicly acknowledged how past transportation decisions had harmed the neighborhood as part of efforts to improve engagement and relationships with communities along highways in Minneapolis and St. Paul that had been affected by the routing of Interstate 94 through their communities.

Create a community-centered process. Community engagement and co-creation can play a key role in efforts to repair the harm caused by highway investments. Using a strong, collaborative, and intentional engagement process can help address the need for greater inclusion of marginalized voices in future growth and development. With intentionality, community engagement processes can be powerful vehicles for equity and inclusion, and can build opportunities for greater transparency, shared decision-making, and mutual accountability.

For example, hundreds of hours of community engagement with more than 10,000 participants shaped the final design of new park space in San Francisco's Presidio created after the formerly elevated Doyle Drive highway was replaced with an at-grade roadway and tunnels. The public input process included a focus on including perspectives from San Francisco neighborhoods that were farther away from the Presidio to raise awareness among people who were not currently using the park. Input goals included gaining perspectives from a broad geographic area and including culturally diverse voices.



The Bentway's multiuse path makes connections to Toronto's network of pedestrian and cycling trails, increasing access to the waterfront.

Enhance resilience. Highway transformations can enhance resilience through thoughtful design strategies that mitigate acute shocks. Such strategies anticipate and plan for the impacts of climate change, such as increased heat, more intense rainfall, and more frequent flooding. Examples include providing shaded areas, adding drought-tolerant plants, and reducing impervious pavement.

For example, the Bentway in Toronto transformed a brownfield to a safe, clean, and usable public space that significantly enhanced the built environment under the Gardiner Expressway. Stormwater is treated on site using native plantings and permeable ground treatments, and topography was created using displaced soil to control stormwater.



The Rose Kennedy Greenway is a linear park in Boston that sits on land created from demolition of the John F. Fitzgerald Expressway.

Leverage public and private funding. The United States is in the process of making the largest infrastructure investment in a generation, including through the BIL and the IRA. The BIL and IRA both include specific programs, such as [Reconnecting Communities](#) and the [Neighborhood Access and Equity Grants](#) program, aimed at promoting walkability, safety, and affordable transportation access in communities. These programs also address environmental and social harms caused by transportation projects in disadvantaged communities.

Highway transformation projects are complex and typically involve multiple funding sources, including federal, state, and local funds, as well as private investments. Leveraging public funds with private investments will be essential in helping level the resource distribution playing field and ensuring highway transformation investments can produce the greatest possible benefits for communities.

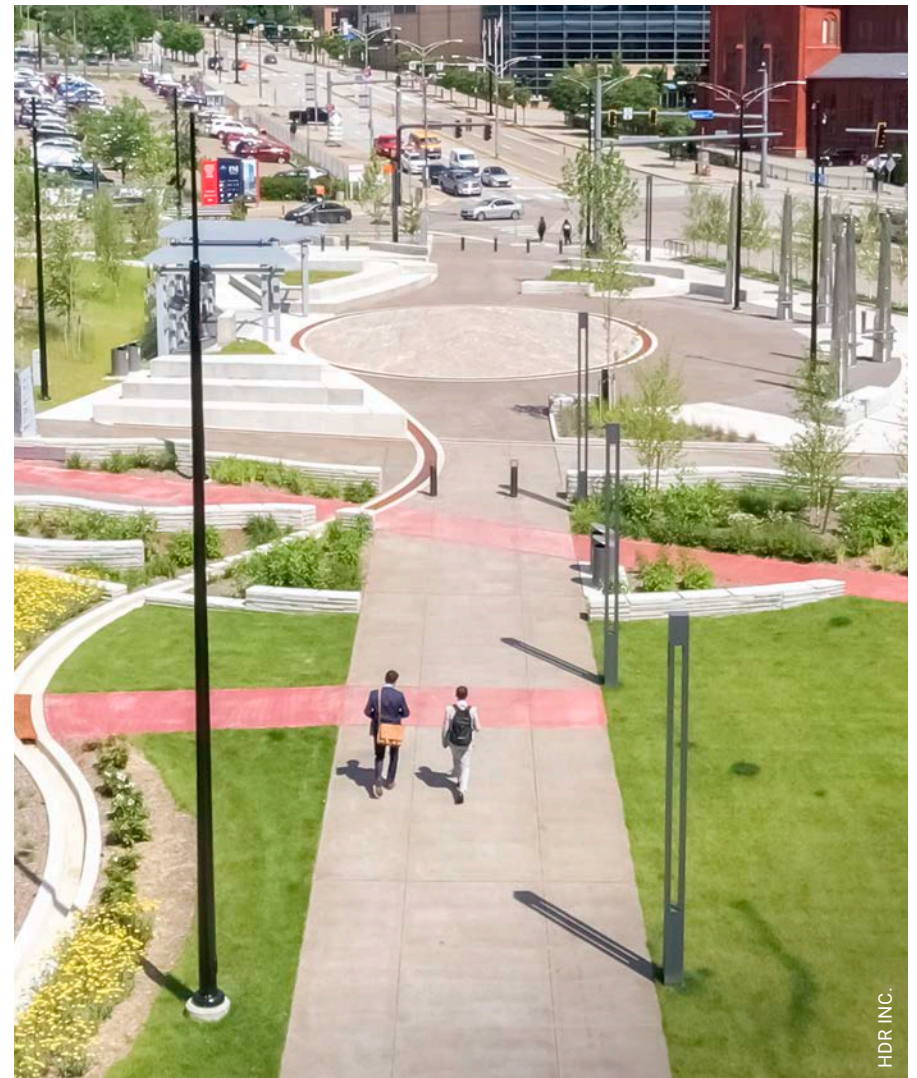
Both public and private investments related to highway transformations can catalyze complementary projects. For example, public investments in creating sidewalks or parks in place of former highway infrastructure may unlock opportunities for adjacent real estate development with green roofs, a focus on expanding the tree canopy, and access to nature for area residents. With community coordination focused on equitable development, these complementary investments can ultimately lead to cleaner air, more opportunities for people to engage with nature, and more resilient communities overall.

The Capitol Crossing development in Washington, D.C., was privately funded, and resulted in a seven-acre (2.8 ha) highway cap that was completed in 2021 above a recessed section of I-395 near the U.S. Capitol. The development includes community-serving features, such as a centralized water collection and reuse system designed to treat over 90 percent of stormwater runoff that would otherwise pollute the Chesapeake Bay.

Embrace nature. Climate change threatens the built environment in ways that have serious consequences for the health, viability, and economic vitality of our cities. Many of the communities most vulnerable to risk have also been subject to generations of racial, social, environmental, and economic injustices—many of which are related to transportation decision-making.

Because environmental and human health are intrinsically linked, many potential highway transformation solutions deliver complementary benefits. Incorporating nature-based solutions in highway conversion projects—including creating, enhancing, and maintaining natural spaces through investments in permeable pavement, trees, greenways, parks, and wetland restoration—can advance ecosystem restoration while protecting against climate change, improving overall community health, increasing access to nature, and supporting real estate success.

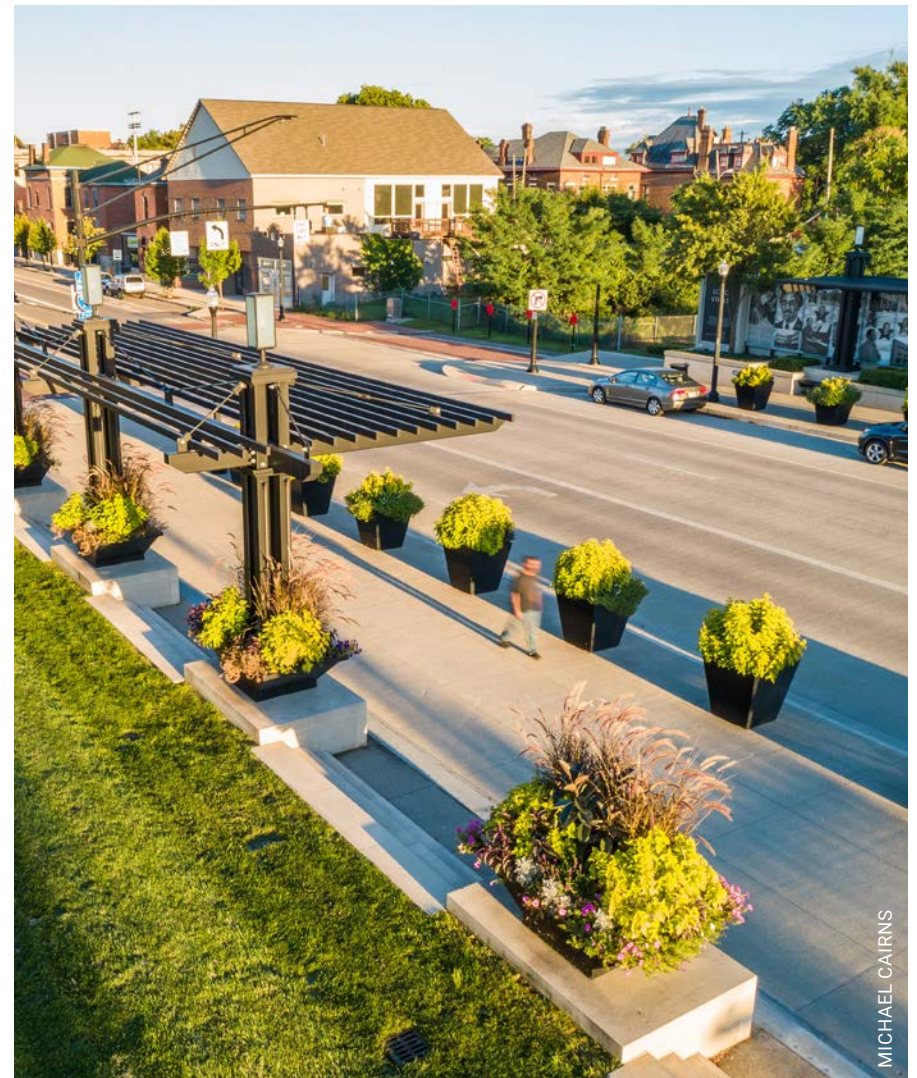
Pittsburgh’s Frankie Pace Park highway capping project includes green infrastructure features as central components of the project, with goals to capture stormwater, provide needed shade, and reduce the urban heat island effect. Specific features include lawns to capture stormwater, open trench drains and rain gardens, trees that add to the urban canopy, and native plant selections.



Integrate local storytelling and art. [Creative placemaking](#)—combining art and culture in tandem with good design—can create a unique sense of place that attracts people while fostering “healthy, culturally rich, and economically thriving places to live, work, and play.” This benefit is especially significant in neighborhoods that have experienced disinvestment and negative outcomes associated with inequitable and racially motivated decisions on the routing of highways.

Highway transformation efforts provide opportunities to collect and elevate stories of area residents and share them through the incorporation of art as significant project components. By honoring the perspectives and culture of community residents through art, highway conversion projects can acknowledge the past, current, and future of those with ties to the local area.

For example, the Long Street Bridge and Cultural Wall project in Columbus, Ohio, transformed an outdated bridge over I-70/I-71 into a community amenity that celebrates the King-Lincoln neighborhood. The project includes a 240-foot-long (73.2 m) Cultural Wall mural that celebrates the community and shields those spending time on the bridge from the lanes of traffic below—reducing noise, visual impact, and wind.



The bridge includes green space where community gatherings can be held, as well as wide sidewalks and a dedicated bike lane.



The Tom McCall Waterfront Park was created following the removal of South Harbor Drive in Portland, Oregon.

ATUL666/WIKIMEDIA COMMONS

Project Profiles

Cities across North America have been working with community groups, state DOTs, public officials, real estate developers, and others to advance various highway transformation projects to reimagine spaces for people—rather than just for automobiles.

Cities from Pittsburgh to Toronto to San Francisco are retrofitting or removing highways to create connected sidewalks, art installations, and parks, and they are installing features to manage stormwater and mitigate the effects of extreme heat.

Traditionally, state DOTs have been powerful stakeholders in decisions to route highways through Black, brown, and low-income communities or to build or widen roadways in ways that limit equitable economic development and increase vulnerability to climate risks such as extreme heat and flooding. Today, some state DOTs continue to invest in highway expansions (see the

FY22 Federal Highway Spending chart on [page 26](#)). However, there are multiple examples of state DOTs partnering with community representatives and other stakeholders to begin to repair the damage created by investments in highways that divided communities.



Fifth Street Pedestrian Plaza Bridge in Atlanta. The stitch, or enhanced crossing, helped reconnect the Georgia Institute of Technology with downtown.

Examples of the types of investments being made include the following:

- **Stitches.** Stitches are enhanced crossings over highway rights-of-way. Such crossings often include widened sidewalks, bike lanes, seating areas, and open space to support enhanced pedestrian and bicyclist mobility and access to green space. Stitches reduce sound pollution from the right-of-way and make crossings more inviting. Examples include Atlanta’s Fifth Street Pedestrian Plaza Bridge, Columbus’s Long Street Bridge, and Chicago’s BP Pedestrian Bridge.
- **Caps.** Caps are structural covers over highway rights-of-way that support parks and other green spaces, crossing streets, and buildings. Caps can strategically link neighborhoods that a highway separated or divided. Examples include Boston’s Rose Kennedy Greenway that replaced the John F. Fitzgerald Expressway-Central Artery, Dallas’s Klyde Warren Park that covers a section of the Woodall Rodgers Freeway, San Diego’s Teralta Park that covers Interstate 15, the Papago Freeway Tunnel in Phoenix, and the Kansas City Convention Center built over Interstate 670.
- **Removals.** Highway removals involve taking limited-access highways and turning them into lower-capacity surface-level boulevards, green spaces, or waterways. This can dramatically increase safety, reduce traffic, and improve the built environment. Examples include South Harbor Drive in Portland, Oregon; Riverfront Parkway in Chattanooga, Tennessee; and Sheridan Expressway in New York City.

- **Public space beneath elevated roadways.** Such projects involve creating parks, enhanced public realms, and trails beneath active roadways. Examples include the Bentway in Toronto and the Underline in Miami.

Each transformational effort has its own challenges and opportunities and context is critical. Whether the project is within a central business district, urban neighborhood, suburban area, or a regionally or nationally significant area—such as a national park—will affect the types of solutions available.

The following project profiles represent examples of completed or nearly completed stitches, caps, and removal projects, as well as a project to create public space beneath an active, elevated roadway.

Each project has innovative elements that are intended as solutions to repair some of the worst impacts of past infrastructure investment decisions. The projects also have the potential to increase resilience by reducing impervious coverage, restoring coastal marshlands, and increasing the urban tree canopy. The projects were selected to represent a range of approaches, goals, scales, innovations, and features.



HDR, INC.

Frankie Pace Park pathways.

I-579 Cap/Frankie Pace Park

I-579 Cap/Frankie Pace Park is a cap project in Pittsburgh with a three-acre (1.2 ha) public park spanning a portion of I-579/Crosstown Boulevard. The park includes stormwater management features and design elements created by local artists.

LOCATION:

Pittsburgh, Pennsylvania

PROJECT TYPE:

Cap

Quick Facts

Ownership and Maintenance: City of Pittsburgh

Partners: City of Pittsburgh, HDR Engineering, Joseph B. Fay Company, Pittsburgh Sports and Exhibition Authority, Pennsylvania Department of Transportation (PennDOT), multiple subconsultants, Office for Public Art, residents of the Hill District neighborhood, Department of City Planning, Department of Public Works, Urban Redevelopment Authority, LaQuatra Bonci Associates

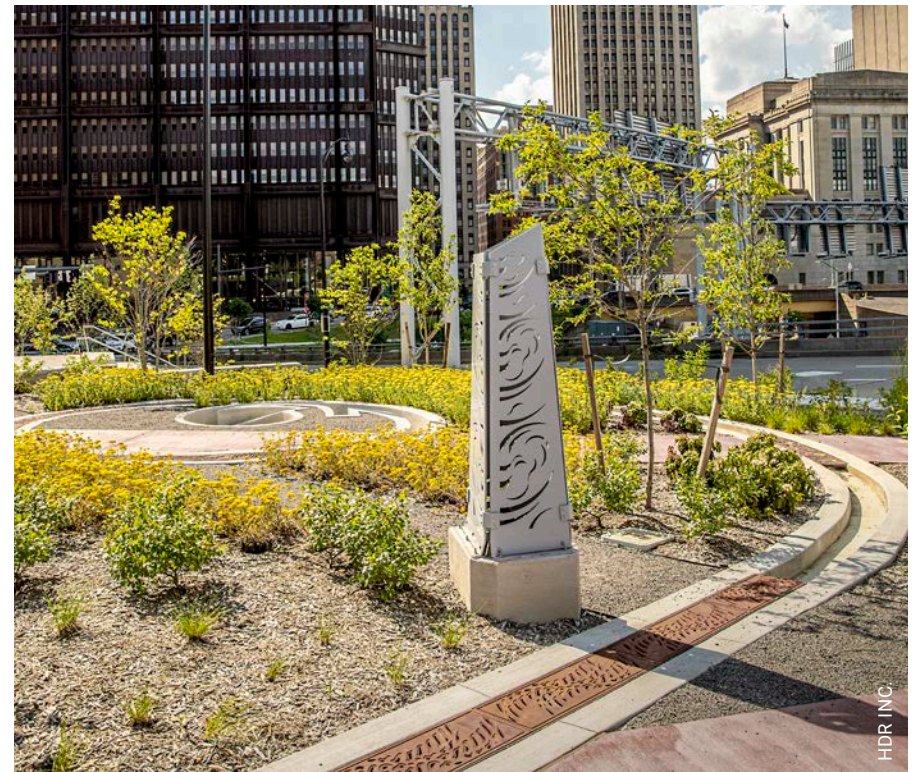
Timeline: Community meetings and design work began in 2016; construction began in 2019; project completed in 2021

Cost: \$32 million

Funding: USDOT through FHWA (TIGER VIII), Pennsylvania Redevelopment Assistance Capital Program, Pennsylvania Department of Transportation (PennDOT Multimodal Transportation Fund), Pennsylvania Commonwealth Financing Authority (Multimodal Department of Community & Economic Development), Pennsylvania Department of Conservation & Natural Resources (DCNR Keystone Recreation, Park and Conservation Fund), Allegheny County Sanitary Authority (ALCOSAN), Sports & Exhibition Authority of Pittsburgh and Allegheny County, Urban Redevelopment Authority of Pittsburgh, Richard King Mellon Foundation, Hillman Foundation, Heinz Endowments, Colcom Foundation

Resilience and Sustainability: Permeable lawns and open trench drains to capture stormwater, rain gardens, additions to urban tree canopy

Community Amenities: Three-acre (1.2 ha) public park, pedestrian pathways and bicycle routes, improvements to adjacent intersections, recreation and performance areas, design elements created by local artists



Project Overview

Frankie Pace Park, formerly known as the I-579 Cap Park, is a three-acre (1.2 ha) public park in Pittsburgh’s Lower Hill District that was built over a portion of the below-grade I-579 Crosstown Boulevard highway. The park opened in 2021 with the aim to reconnect the Lower Hill District neighborhood with downtown.

The Lower Hill District was cut off from downtown with the [construction of I-579/Crosstown Boulevard](#) in the 1950s and early 1960s. During the same period, the construction of the former Civic Arena resulted in razing more than 1,300 structures over 95 acres (38 ha) and displacing 8,000 residents and 413 businesses in the predominantly Black neighborhood. The highway also isolated the neighborhood from downtown Pittsburgh.

As of 2016, more than [50 years of disinvestment in the Hill District](#) led to the community having only 20 percent of its peak population, with 40 percent of residents living below the poverty level and 21 percent unemployed. Over 50 percent of residents walk or take public transportation to work.

The highway cap project includes improved pedestrian and bicyclist access to downtown—the center of employment, education, and services—as well as to the nearby Steel Plaza subway station and a new bus stop on the adjacent Centre Avenue. The park is also located near a proposed bus rapid transit line that would connect downtown with the Oakland neighborhood.

Complementary to the cap project, in 2022, the city of Pittsburgh also [received roughly \\$11 million](#) from a RAISE grant, funded by the BIL, to create human-focused infrastructure in the Hill District. Improvements will include reconstructing intersections and streets with traffic calming measures, sidewalks, and green infrastructure.

Plans for the areas around the park include office buildings and additional open space along Wylie Avenue that will be designed by a team that worked on the park’s design and features that includes Hill District residents with art and architecture backgrounds.

In 2023, the Pittsburgh City Planning Commission [voted to approve](#) controversial development plans in the Lower Hill District for a 4,600-seat entertainment venue with 900 parking spaces on the site of the former Civic Arena. The project has led to calls from Hill District residents and groups, including the Hill Community Development Corporation, for neighborhood benefits because the land was originally cleared of homes, businesses, and churches in the 1950s to build the Civic Arena. As of 2023, discussions among community groups and project leads were ongoing.

COMMUNITY FEATURES AND COLLABORATION

Community meetings and design work for the park started in 2016 and quickly revealed that Hill District residents wanted to feature the work of local artists and designers with direct ties to the neighborhood. A nine-member selection committee comprising four local stakeholders, public agency representatives, and the project’s landscape designer, LaQuatra Bonci Associates, was created.

The selection committee chose three past and current Hill District residents with art, architecture, and community engagement backgrounds to be part of the design team. The committee also included a fourth artist from outside the neighborhood with experience integrating art within PennDOT transportation projects. Selection committee member Jann Rosen-Queralt explained in an article from Pittsburgh radio station WESA, “[The highway] was a scar in the landscape done in the 1950s, and it broke a neighborhood from the city and so the park is intended to in a way make reparation and rejoin or create a union once again.”



The team worked alongside other project partners, including the Pittsburgh Office for Public Art, to develop and refine the project’s art and design concepts, which ultimately included the following:

- **Culturally inspired interpretive signage.** The park includes interpretive signage and a visual motif featuring a hand-drawn Black girl named Keisha with long braids. Keisha was invented by Kimberly Ellis, working with artist Vanessa Brantley-Newton. She welcomes visitors to the park, interprets features such as the rain garden, and is featured on six 15-foot-tall (4.6 m) stainless steel totems, designed by consultant LaKeisha Byrd, that line the park along Centre Avenue.
- **Children’s garden.** A children’s garden designed by Amir Rashidd promotes hands-on learning and includes an herb garden, small amphitheater, tall poles that act as musical chimes, and large metal cubes that can be played like drums.
- **Walking paths.** Walking paths are paved to represent a sankofa—a bird from African folklore that walks forward while looking backward, representing the need to reflect on the past to create a successful future.
- **Outdoor classroom.** An outdoor classroom garden features interactive musical themes.
- **Public art and creative placemaking.** A series of cast-iron plaques created by artist Jann Rosen-Queralt features images of local topography, waterways, coal seams, local Underground Railroad routes, and quotes from writers and poets, including Langston Hughes, Aldous Huxley, and Audre Lorde. Story walls celebrate the lives of influential Hill District residents, including abolitionist, journalist, and educator Martin Delany and community organizer Frankie Pace.

RESILIENCE AND SUSTAINABILITY

Green infrastructure features are major components of the project, with goals to capture stormwater, provide needed shade, and reduce the urban heat island effect. Specific features include the following:

- **Lawns to capture stormwater.** The park's lawns are permeable areas that capture stormwater, which previously ran off I-579's pavement, carrying harmful pollutants with it. The soil composition can absorb up to six inches (15 cm) of rain.
- **Open trench drains and rain gardens.** A system of open trench drains capture stormwater and divert it to six rain gardens.
- **Trees that add to the urban canopy.** New trees provide shade, filter air and water, slow winds and stormwater runoff, and lessen the urban heat island effect.
- **Native plant selections.** [Native plants support biodiversity](#) and are generally easier to grow and less expensive to maintain than other plantings.

The potential benefits of the park's green infrastructure features include detaining rainwater so it can evaporate, be used by plants, or slowly infiltrate into the public drain system. This leads to a significant reduction of stormwater flowing into the public sewer system, thereby reducing pollution and the risk of flooding. By adding to the urban tree canopy, the park should reduce temperatures in the surrounding area and lessen the amount of energy needed to cool surrounding buildings during the summer.



MORE INFORMATION

[I-579 Cap Urban Connector Project](#)

[Pittsburgh magazine](#)

[Sports and Exhibition Authority](#)

[WESA 90.5](#)



MICHAEL CAIRNS

Long Street Bridge Cap and Cultural Wall, in 2018, with matured landscape.

I-70/I-71 Long Street Bridge and Cultural Wall

The replacement of the Long Street Bridge over I-71 in Columbus stitches the King-Lincoln and Near East Side neighborhoods together with the Discovery District and downtown and creates a multimodal connection and gathering space that celebrates local residents.

LOCATION:	PROJECT TYPE:
Columbus, Ohio	Stitch/cap

Quick Facts

Ownership and Maintenance: Ohio Department of Transportation (ODOT), city of Columbus

Partners: City of Columbus, Mid-Ohio Regional Planning Commission, ODOT, MKSK, 3form, Columbus Arts Commission

Timeline: Community engagement began in 2005; construction began in 2011; project completed in 2014

Cost: [\\$7.1 million](#) for the bridge cap; \$12.5 million total including enhancements to the Long Street Bridge area

Funding: ODOT, city of Columbus, Mid-Ohio Regional Planning Commission

Resilience and Sustainability: Green roof (cap), additions to the urban tree canopy, use of drought-tolerant and disease-resistant plants, addition of bike lane and improved sidewalks

Community Amenities: Reconnection of neighborhoods, Cultural Wall mural that celebrates the community and reduces roadway impacts, improved sidewalks, park cap and access to green space



Long Street Bridge Cultural Wall.

Project Overview

The Long Street Bridge and Cultural Wall project transformed an outdated bridge over I-71 in Columbus into a community amenity that celebrates the King-Lincoln neighborhood and begins an effort to heal the divide created when the interstate highway was built.

When the [freeway was originally constructed in the early 1960s](#), the Bronzeville neighborhood (now known as King-Lincoln) was cut off from downtown neighborhoods, leading to socioeconomic decline. In the 1930s, Bronzeville was one of the most dynamic Black communities in the United States with roughly 100 businesses in the neighborhood, but after the highway construction, the neighborhood suffered from disinvestment, leading to increased poverty and unemployment. The local population went from 63,000 people to just 16,000 by 1960.

The Long Street Bridge cap project—a partnership among community leaders, ODOT, the Mid-Ohio Regional Planning Commission, and the city of Columbus—was designed to reconnect these neighborhoods, improve pedestrian safety and accessibility, and showcase the history and future of the area. The project was part of the larger Columbus Crossroads project to reconstruct and reconfigure the downtown innerbelt portions of I-70/I-71/I-670. The project resulted from widespread community input and direction to ODOT to do more than widen the freeway and rebuild the bridges but to instead focus on reconnecting and investing in the gateway to the neighborhoods.

The new bridge includes a green cap along the north side that is 63.5 feet (18.4 m) wide and 263 feet (80.2 m) long, which provides a landscaped park amenity that covers the freeway, helps soften the hardscape of the bridge, and invites pedestrians to comfortably cross over the interstate or even relax in its green space. In addition, pergolas anchor the four corners of the bridge, creating a visual threshold and reducing the perceived distance of the crossing.

Instead of chain link safety fencing, this project used innovative polycarbonate panels as a screen wall that blocks the noise, wind, exhaust, spray, and visual impact of the freeway below, making the bridge crossing very pleasant. The panels illuminate at night to create a subtle but dramatic feel. The southern screen wall provides the canvas for the Cultural Wall public art piece.



Long Street Bridge before transformation.

COMMUNITY FEATURES AND COLLABORATION

Before ODOT, the city of Columbus, and the Mid-Ohio Regional Planning Commission rebuilt the Long Street Bridge over I-71, they conducted more than [500 community meetings](#) and collected thousands of public comments as part of the larger Columbus Crossroads innerbelt project.



Long Street Bridge and Cultural Wall Dedication Celebration.

The community goals that resulted centered on connecting communities, hiding the interstate highway, improving multimodal connectivity, and reflecting the neighborhood. The Long Street Bridge project was part of the first phase of Columbus Crossroads—with the intention that it would showcase the ability of the project to reconnect neighborhoods with improved amenities. The resulting project includes the following:

- **Infrastructure to reconnect neighborhoods.** The new bridge and cap reconnect the King-Lincoln (Bronzeville) neighborhood with downtown and minimize the impacts of the roadway below.
- **Cultural Wall.** The project includes a 240-foot-long (73.2 m) [Cultural Wall mural](#), which was the first project of its kind for ODOT. This public art piece was designed by two local artists and celebrates the community’s people, places, and history.
- **Improved public realm.** The bridge includes a dedicated bike lane, widened sidewalks of 18 to 25 feet (5.5 to 7.6 m), on-street parking, architectural trellises, street trees, planters, and an arc-shaped sidewalk that provides access to an event lawn.

To obtain the images for the Cultural Wall, an [art competition](#) was held with assistance from the Columbus Arts Commission and 3form, a manufacturer of architectural translucent resin panels. 3form coordinated on the material used for the illuminated Cultural Wall, which needed to meet structural and safety requirements. Local artists Kojo Kamau and Larry Winston Collins were chosen to collaborate by including photography and wood block prints on the Cultural Wall, providing an informative walk showcasing the history of the local area by highlighting people and places from the past and present.

RESILIENCE AND SUSTAINABILITY

The project includes several features to promote resilience and sustainability. Specific features include the following:

- **Natural elements.** The bridge's landscape includes 20 trees, hundreds of plants, and groundcover in raised beds. The green cap is essentially a green roof over the interstate. Increasing the tree canopy on the bridge structure helps mitigate the urban heat island effect and makes progress toward the city's urban tree canopy goal.
- **Efficient landscaping and irrigation.** Drought-tolerant and disease-resistant plants were chosen, and a stand-alone irrigation system provides water for all landscape areas on the bridge to maintain them efficiently in this harsh environment. Planting beds have drip irrigation. The city of Columbus maintains the landscaping.

MORE INFORMATION

[City of Columbus](#)

[Columbus Dispatch](#)

[Columbus Underground](#)

[Federal Highway Administration](#)

[MKSK](#)





CAPITOL CROSSING ADVISORS

Capitol Crossing development.

Capitol Crossing/ Third Street Tunnel

Capitol Crossing is a seven-acre (2.8 ha) project created by decking over an interstate highway to create three new city blocks. It includes 2.2 million square feet (204,000 sq m) of real estate development and significant air pollution mitigation and stormwater management features.

LOCATION:	PROJECT TYPE:
Washington, D.C.	Cap

Quick Facts

Ownership and Maintenance: Capitol Crossing Advisors LLC (development), District of Columbia (rights-of-way)

Partners: Property Group Partners (developer); Skidmore, Owings & Merrill; Balfour Beatty Construction DC; Office of the Deputy Mayor for Planning and Economic Development; Kevin Roche John Dinkeloo and Associates; Kohn Pedersen Fox Associates; Beyer Blinder Belle; LERA Consulting; Lee and Associate, Inc.

Timeline: Initial concept developed in 1989 by previous owner; National Environmental Policy Act (NEPA) environmental assessment of the project began in 2001; two office buildings and ground floor restaurant space totaling nearly 1 million square feet (93,000 sq m) completed by 2019; highway cap project [completed in 2020](#)

Cost: [\\$1.3 billion](#) including deck over the highway, bridges, and infrastructure upgrades for water, sewer, telecommunications, and electricity ([estimated](#) \$270 million for cap, \$1.03 billion for building construction)

Funding: Privately funded, W.R. Berkley Corporation

Resilience and Sustainability: Centralized water collection and reuse system, eco-chimneys with biofilters to clean exhaust and toxins from the parking garage, green areas and increased shade, use of graywater for landscaping

Community Amenities: Reconnection of the street grid and of the Capitol Hill and East End neighborhoods, reduction in air pollution from the highway, increase in open space



Capitol Crossing site before decking over I-395.



Capitol Crossing development plan.

Project Overview

Capitol Crossing is a privately funded seven-acre (2.8 ha) highway cap above a recessed section of I-395 in Washington, D.C., near the U.S. Capitol. As of 2023, two office buildings including ground floor restaurant space totaling nearly 1 million square feet (93,000 sq m) had been completed. [Future phases of development](#) may include additional office and retail development, a residential building, and a hotel.

In the 1960s, a portion of I-395 was constructed below street level because it had to pass through tunnels near the U.S. Capitol. The highway interrupted the street grid and divided the Capitol Hill and East End neighborhoods.

In 1989, the District of Columbia [awarded air rights](#) to Travenca Development Corporation, granting them the right to develop office space, a hotel, and apartments in the airspace above I-395 between D Street and Massachusetts Avenue. After the plan received approval, community representatives, the D.C. City Council, and others publicly opposed the project. Concerns included the specific development plans and that the \$45 million [appraisal of air rights](#) was too low. However, the D.C. Zoning Commission approved the plan in 1991 after requesting modifications, including minimizing traffic concerns.

By 1999, no progress had been made on the project. By 2003, the Zoning Commission voted unanimously to end the developer's ability to continue with the project. In 2009, the New York-based Property Group Partners (PGP) paid a settlement to the former developer in exchange for the right to buy the property from the city at fair market value. PGP acquired the air rights for the project in 2012 and negotiated an arrangement with the city so that the cost of the building would determine how much they would pay the city for the property air rights.

Capitol Crossing broke ground in 2015. Construction of the highway cap was completed by 2020, reconnecting the street grid and the Capitol Hill and East End neighborhoods—which had been severed by the highway for more than 50 years.

The Capitol Crossing team had to coordinate with the District Department of Transportation, the FHWA, and other local and federal authorities throughout planning and construction. [Control of the project](#) was shifted from PGP to W.R. Berkley's wholly owned subsidiary Capitol Crossing Advisors LLC in 2023.

When completed, the project will include 2.2 million square feet (204,000 sq m) of mixed-use development. The project will include five buildings, which are expected to be Leadership in Energy and Environmental Design (LEED) Platinum certified. As of 2023, two office buildings are complete and have achieved LEED Platinum certification. When complete, the development will include a mix of office, hotel, multifamily, and retail development.



Capitol Crossing site before decking over I-395.

Capitol Crossing is a relatively distinctive highway capping project because it was entirely privately funded by the developer. PGP purchased the development rights, which were [expected to generate](#) as much as \$120 million in payments to the District of Columbia, based on the future value of the property. PGP also invested \$270 million on infrastructure needs, including relocating utilities and reconfiguring access ramps to and from I-395.

The cap project represented an opportunity to build and create new land in a constrained area. The building construction was structured so that the developer could wait for appropriate market conditions to construct new buildings while implementing the infrastructure improvements at the outset.

COMMUNITY FEATURES AND COLLABORATION

Capitol Crossing has created community value despite being a wholly private project. The project reconnected two neighborhoods that were separated by the interstate in the late 1960s through the development of the land bridge over I-395. The new public realm was expanded to include privately managed, publicly accessible third spaces and enhanced pedestrian and bicyclist facilities that were installed above I-395—making travel between Capitol Hill and the East End safer and more convenient.

The project was expected to create 8,000 permanent jobs—generating \$40 million in annual property tax revenue—with at least 51 percent filled by residents of Washington, D.C. The value capture techniques used to fund the project mean that these benefits were paid for entirely with private funds.

RESILIENCE AND SUSTAINABILITY

Capitol Crossing was designed to be D.C.'s first "ecodistrict" due to the inclusion of sustainability features and plans to achieve LEED Platinum certification for buildings. Existing and planned public realm and building-scale investments include the following:

- **A centralized water collection and reuse system.** The system was designed to treat more than 90 percent of stormwater runoff that would otherwise pollute the Chesapeake Bay.
- **Features to support improved air quality.** Eco-chimneys with biofilters clean exhaust and toxins from the integrated parking structure.
- **Water efficiency, extreme heat mitigation, and stormwater management features.** The development includes green roofs, green areas, use of graywater for landscaping, and increased shade.
- **Sustainable design, construction, and operations.** Existing buildings feature LEED Platinum certifications, with plans for future development to also receive Platinum certification.



Capitol Crossing development.

MORE INFORMATION

[Capitol Crossing](#)

[Commercial Observer](#)

[D.C. Office of the Deputy Mayor for Planning and Economic Development](#)

[ENR MidAtlantic](#)

[Federal Highway Administration](#)

[Skidmore, Owings & Merrill](#)

[U.S. Department of Transportation](#)



CITY OF MILWAUKEE/DEPARTMENT OF CITY DEVELOPMENT

Park East Freeway before removal.

Park East Freeway Removal

The Park East Freeway Removal replaced an underused one-mile (1.6 km) elevated highway spur originally built in 1971 with a surface boulevard. The project led to efforts to redevelop the corridor and extend Milwaukee's RiverWalk trail.

LOCATION:	PROJECT TYPE:
Milwaukee, Wisconsin	Removal

Quick Facts

Ownership and Maintenance: Various

Partners: City of Milwaukee, USDOT, Wisconsin Department of Transportation, HNTB Corporation, Planning & Design Institute Inc., others

Timeline: Highway demolition from 2002 to 2003; joint marketing effort in 2011 led to rolling RFP process to redevelop the corridor

Cost: \$45 million, including \$25 million from federal Intermodal Surface Transportation Efficiency Act (ISTEA) Highway Fund and \$1.2 million state funding

Funding: Federal ISTEA Highway Fund, state funding, local tax increment financing through city of Milwaukee to clean up the land and recreate the street grid

Resilience and Sustainability: Reduction in vehicle congestion and improved air quality, reduction in impervious coverage and surface parking

Community Amenities: Extension of the Milwaukee RiverWalk trail; community benefits agreement (CBA) to guide corridor redevelopment



Park East Freeway removal.



The Park East Freeway removal allowed for the creation of outdoor event space.

Project Overview

The Park East Freeway [was planned in the 1960s](#) to form a ring around downtown Milwaukee, but only a one-mile (1.6 km) stretch was constructed in 1971. Future phases of the freeway were cancelled due to local opposition. However, the section that was built created barriers among surrounding communities that were home to Black, German, and Jewish residents, among others. The addition of the highway affected 17,300 homes and 1,000 businesses.



CITY OF MILWAUKEE/DEPARTMENT OF CITY DEVELOPMENT

Park East Freeway before removal.

By the late 1990s, the highway was nearly 30 years old, underused, and in need of reconstruction. However, in lieu of rebuilding it for \$100 million, local advocates successfully pushed for its removal. Demolition began in 2002—funded through federal [ISTEA dollars](#) and local tax increment financing—and was completed in 2003. It was one of the [first highways in the country](#) to be removed without an earthquake or other infrastructure failure.

The freeway was replaced with McKinley Boulevard and the city’s street grid was restored. The boulevard created 26 acres (10.5 ha) of land for redevelopment, eventually leading to mixed commercial, retail, townhouse, and apartment development.

Since the freeway was removed in 2003, the corridor has seen [over \\$1 billion in private development](#). Average land values grew by more than 180 percent between 2001 and 2006 in the footprint of the Park East Freeway. The project had spurred more than [\\$2 billion](#) in economic impact as of April 2019.

“The removal of the Park East Freeway in 2003 shows the transformative impact that reimagining freeways can have on our cities,” says Sam Leichtling, city planning manager for the Milwaukee Department of City Development. “Where an elevated freeway once divided downtown Milwaukee from adjacent neighborhoods, people will now find new homes and businesses, a growing entertainment district anchored by the Fiserv Forum, an exciting future public museum, and a reconnected downtown.”

COMMUNITY FEATURES AND COLLABORATION

The Park East Freeway removal allowed for the reconnection of the street grid and neighborhoods, while spurring economic investment.

As a result of the freeway removal, the city of Milwaukee advanced a redevelopment plan employing a tax increment financing district to fund public infrastructure improvements. “The City of Milwaukee’s adoption of the Park East Redevelopment Plan to guide new development in the area of the former freeway demonstrates the power of thoughtful long-range planning that fosters ambitious visions and delivers results that align with community planning goals,” says Leichtling.

The city also created a new zoning code for future development at the site that incorporated a [form-based code](#)—a type of land development regulation that uses physical form (rather than separation of uses) as the organizing principle for the code—with requirements for building heights, setbacks, and streetscapes. The goal of the code was to provide clear guidelines for developers concerning what developments the city would approve. The code also required developers to extend the Milwaukee RiverWalk trail on any parcels adjacent to the Milwaukee River.

A CBA was created to [guide development](#) in Milwaukee’s Park East corridor. The Good Jobs and Livable Neighborhoods Coalition—a partnership of 27 community-based organizations—campaigns for a CBA so that residents would share in the benefits of the redevelopment spurred by the highway removal.

In 2005, the Milwaukee County Board of Supervisors approved a CBA for 16 acres (6.5 ha) of county-owned land called the Park East Redevelopment Compact (PERC). Requirements of [PERC include the following](#):

- County-owned land must be sold to developers whose proposals would “provide the most jobs, increase the tax base, and enhance the community’s image while offering a fair price.”
- Construction of roads, sidewalks, and other physical amenities must be funded by tax increment financing, allowing local governments to invest in public infrastructure up front and pay for investments later by capturing the future anticipated increase in tax revenues generated by the project.
- Affordable housing units must comprise 20 percent of any housing units built on county-owned land.
- Developers must expand transit and advance building designs to incorporate green elements to address environmental issues.
- At least 25 percent of construction jobs must be from businesses designated as Disadvantaged Business Enterprises/ Minority Business Enterprises; 5 percent must be from businesses designated as Women’s Business Enterprises.
- Developers must provide apprenticeship programs and training opportunities to help low-income and low-skilled residents qualify for construction positions.

RESILIENCE AND SUSTAINABILITY

By removing the Park East Freeway and replacing it with a surface boulevard and associated development, the project produced both sustainability and resilience benefits. These include the following:

- **Improved air quality.** Through the 1990s, only 54,000 vehicles used the Park East Freeway daily, [yet the freeway caused traffic congestion](#) in its area because it interrupted the street grid. After the highway removal, when the street grid was restored, traffic congestion and access to downtown improved. [Traffic congestion on roads](#) increases fuel consumption, carbon dioxide emissions, and exposure of passengers to pollution. Reducing congestion improves air quality and associated health impacts.
- **Reduced stormwater runoff and urban heat island effect.** The Park East Freeway spur [devalued nearby properties and limited development opportunities](#), leading to surface parking as the dominant nearby land use. The removal of the freeway opened up property for redevelopment and reduced surface parking. Surface parking lots produce [negative environmental impacts](#), including contributing to stormwater runoff and increasing the urban heat island effect.



CITY OF MILWAUKEE/DEPARTMENT OF CITY DEVELOPMENT

MORE INFORMATION

[City of Milwaukee Department of City Development](#)

[Congress for the New Urbanism](#)

[Federal Highway Administration](#)

[U.S. Department of Housing and Urban Development](#)



DENISE MILTZER

The Bentway skate trail.

The Bentway

LOCATION:	PROJECT TYPE:
Toronto, Ontario	Public space beneath an elevated roadway

The Bentway is a 2.5-acre (1 ha) urban park underneath the elevated Gardiner Expressway in Toronto that opened in 2018. The park created a new public space with year-round programs and events.

Quick Facts

Ownership and Maintenance: City of Toronto, the Bentway Conservancy

Partners: Waterfront Toronto, the Bentway Conservancy, city of Toronto; design work from PUBLIC WORK and Greenberg Consultants Inc.

Timeline: Local philanthropists Judy and Wilmot Matthews pledged C\$25 million (US\$19.2 million) in 2015 to the city of Toronto to kick-start the project and build the first phase; Phase I opened in 2018; as of 2021, the second phase of the project—extending the Bentway to the east to create connections into more neighborhoods—was in the design phase

Cost: C\$25 million (US\$19.2 million) for Phase I; expenses to support the work of the Bentway Conservancy—a nonprofit organization to program and operate the space—were C\$3.5 million (US\$2.7 million) for FY20/21

Funding: Local philanthropists Judy and Wilmot Matthews, government grants, donations, corporate partnerships, and event revenue

Resilience and Sustainability: Transformation of a 169,000-square-foot (15,700 sq m) brownfield to a safe, clean, and usable public space, stormwater treated on site using native plantings and permeable ground treatments

Community Amenities: Creation of a 2.5-acre (1 ha) urban park underneath the elevated expressway; park features include two amphitheatres, a summer splash pad, a winter skate trail, a multiuse path connecting to surrounding communities, restrooms, and free wi-fi



The Bentway skate trail.

Project Overview

Until recently, the Gardiner Expressway in Toronto was a point of division, serving as a physical barrier between the city and the waterfront. In 2018, the first phase of the Bentway—a 2.5-acre (1 ha) urban park underneath the elevated expressway—opened, creating a new public space with year-round programs and events that also improves the north-south connection to Lake Ontario.

A combination of private donors and public funds helped make this park a reality. Local philanthropists Judy and Wilmot Matthews pledged C\$25 million (US\$19.2 million) in 2015 to the city of Toronto to kick-start the project and build the first phase. The project moved forward in collaboration with renowned urban designer Ken Greenberg and cooperation from Mayor John Tory and multiple city departments.

In 2016, the Toronto City Council approved a proposal to form a new independent, nonprofit organization to program and operate the space as a platform for creative practice, public art, and connected urban life called the Bentway Conservancy.

The conservancy counts the city of Toronto, city residents, artists, and other supporters as vital partners in its efforts. Funding sources for the conservancy include government grants, donations, corporate partnerships, and event revenue. Expenses, which include those for programming, facilities, communications, design, and staffing and administration costs, reached C\$3.5 million (US\$2.7 million) for FY20/21.

The linear park, which spans just over one mile (1.6 km) running parallel to the waterfront, knits together seven distinct urban neighborhoods that are home to nearly 100,000 people living within a 10-minute walk of the park. Year-round programming draws residents and visitors to the site.



The Bentway hosts numerous events and festivals.

COMMUNITY FEATURES AND COLLABORATION

A critical piece of the Bentway’s development and design included an extensive public process with neighbors, artists, community members, and local organizations. The conservancy determined it was essential to provide free, open, and welcoming spaces and programs to allow anyone to enjoy and benefit from the park.

The Bentway sits on the Treaty Lands of the Mississaugas of the Credit and the traditional territory of the Huron-Wendat, the Haudenosaunee, the Métis, and many other Indigenous nations. In addition, the first phase of the Bentway is located on lands that are part of the Fort York National Historic Site. Home to many diverse Indigenous people, the city of Toronto has the largest Indigenous population in the province of Ontario.

The Bentway Conservancy operates and manages the park and is dedicated to reimagining how people experience public space. With art installations, interactive signage, community workshops and conversations, recreational amenities, performances, and more, the Bentway is continuously evolving its offerings to best support the surrounding communities. The mission—“to ignite the urban imagination”—plays out through demonstration, experimentation, and regeneration.

Public amenities and associated programming along the Bentway include the following:

- **Active public space.** Spaces for the public include two amphitheatres, a summer splash pad, a winter skate trail that weaves between the overpass columns, a multiuse path that

connects to surrounding communities, restrooms, and free wi-fi. As of 2021, the second phase of the project—extending the Bentway to the east to create connections into more neighborhoods—was in the design phase.

- **Programming and activities designed to acknowledge area history and culture.** Recent Bentway programming has included a neighborhood-wide exhibition exploring play in the city; a new artist residency program; dialogue about the past, present, and future of the site; and other programs that stretch from beneath the Gardiner Expressway and beyond.
- **Public art installations designed to maintain and celebrate diverse partners and perspectives.** The Bentway led It’s All Right Now, a citywide public art project and community movement that ran over summer 2020 as a response to the COVID-19 pandemic. As the convener of this project, the Bentway ensured that voices from Black, Indigenous, and people of color (BIPOC) communities, which were disproportionately affected by the pandemic, were foregrounded in this movement.

The park continually works to be more welcoming and inclusive and launched Safe in Public Space in fall 2020. Through a variety of programming and community conversations, using the Bentway as a platform for this work, this initiative seeks to understand ways to address safety, new public health challenges, and equity in public spaces. Results from this work will be used to develop a new public-facing tool kit that outlines best practices for making spaces—including the Bentway—safer for everyone.

RESILIENCE AND SUSTAINABILITY

The transformation from a 169,000-square-foot (15,700 sq m) brownfield to a safe, clean, and usable public space significantly enhanced the built environment under the Gardiner Expressway. Air quality modeling was used to confirm the safety of the area beneath the expressway. Improvements include the following:

- **On-site stormwater management.** Stormwater is treated on site using native plantings and permeable ground treatments, and topography was created using displaced soil to control the flow of stormwater.
- **Use of recycled materials.** The paving system throughout the park was created using recycled materials, including construction debris.
- **Resilience and sustainability education.** The importance of sustainability and resilience is evident in the construction and ongoing programming of the Bentway, as numerous activities and events have focused on resilience and the environment.



The Bentway skate trail.

MORE INFORMATION

[*The Architect's Newspaper*](#)

[The Bentway](#)

[Urban Land Institute](#)



JAMES CORNER FIELD OPERATIONS

Presidio Tunnel Tops after replacement of the Doyle Drive elevated roadway.

Presidio Tunnel Tops

LOCATION:	PROJECT TYPE:
San Francisco, California	Cap

The Presidio Tunnel Tops project created 14 acres (5.7 ha) of new park space over the tops of tunnels in San Francisco's Presidio, one of the most popular national park sites in the United States. Parklands were created after the formerly elevated 1.6-mile (2.6 km) Doyle Drive highway was replaced with an at-grade roadway and tunnels.

Quick Facts

Ownership and Maintenance: Tunnel Tops - Presidio Trust, Doyle Drive - California Department of Transportation (Caltrans), Golden Link Concessionaire

Partners: Presidio Trust, Golden Gate National Parks Conservancy, National Park Service, Caltrans, USDOT, James Corner Field Operations, Swinerton Builders

Timeline: Construction for the replacement of Doyle Drive, a 1.6-mile (2.6 km) segment of U.S. 101, began in 2009, completed in 2015; park construction began in 2018, completed in 2022

Cost: \$1.1 billion (roadway), \$118 million (parklands)

Funding: Federal funds—including funding from the American Recovery and Reinvestment Act and a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan, Caltrans, private financing, private equity, Golden Gate National Parks Conservancy, Presidio Trust

Resilience and Sustainability: Reduction in impervious pavement, creation of 14 acres (5.67 ha) of green space and new parkland, adjacency to seven acres (2.8 ha) of new marshland

Community Amenities: Reconnection of areas of the Presidio for the first time since the 1930s, a nature playground that includes play structures showcasing Presidio history, a visitor center, open meadows, picnic areas with grills, and the Field Station—an active learning center.



Project Overview

In 1993, leaders and citizens from across the San Francisco Bay area began developing a vision for the replacement of the seismically unsafe, 1.6-mile (2.6 km) Doyle Drive, an elevated roadway that opened in 1936. The original roadway had divided sections of the Presidio, a park and former U.S. Army post on the northern tip of the San Francisco Peninsula that is part of the Golden Gate National Recreation Area.

Stakeholders coalesced around a vision to reconstruct the highway using tunnels and to reconnect park areas divided by Doyle Drive by creating new land over the tunnels. James Corner Field Operations, the firm that designed New York’s High Line, was selected as a design partner.

Caltrans and the San Francisco County Transportation Authority jointly led the \$1.1 billion effort to replace Doyle Drive with the Presidio Parkway, which opened in 2015. [The project relied on](#) \$363 million in federal funds, as well as \$152.5 million from the American Recovery and Reinvestment Act, and a \$150 million TIFIA loan.

The new roadway includes twin viaduct bridges, four tunnels, continuous shoulders, and a landscaped median. Phase I and II of the project were completed in 2015 and the parklands opened in 2022. An additional nearby seven-acre (2.8 ha) [tidal marsh](#) opened in 2020 that helps mitigate against rising seas.

The bridge replacement project [was designed to withstand](#) the maximum considered earthquake for the region, improve traffic safety, and improve access to the Presidio and Golden Gate National Recreation Area. Before reconstruction, the elevated Doyle Drive had a federal sufficiency rating of 2 out of 100, with 0 being completely deficient.

The first phase of the [roadway reconstruction project](#) was built using a traditional design-bid-build approach. The second phase was built through a public/private partnership that allowed the project to be completed sooner. The partnership agreement was set up so that Golden Link Concessionaire—the developer who financed, designed, and built the project’s second phase—will operate and maintain the roadways for 30 years, with the goal of allowing for steady funding and ongoing roadway maintenance. The roadway will be returned to the state of California in the future.

The new park space created by the project allows the partnership for the Presidio—a partnership that includes the Presidio Trust, Golden Gate National Parks Conservancy, and National Park Service—to provide more opportunities for people to experience and engage with the park, which serves as a gateway to the greater Golden Gate National Recreation Area and broader National Park System. Led by the Golden Gate National Parks Conservancy, the [Presidio Tunnel Tops campaign](#) raised more than \$98 million of the \$118 million park project.

COMMUNITY FEATURES AND COLLABORATION

Hundreds of hours of [community engagement](#) with more than 10,000 participants shaped the final design of the park site. The [public input process](#) included a focus on including perspectives from San Francisco neighborhoods that were farther away from the Presidio, to raise awareness among people who were not currently using the park. Input goals included gaining perspectives from a broad geographic area and culturally diverse voices. Specific park features informed by the public input process include the following:

- **Multiuse park space.** The new park space includes a central lawn and meadow area and natural green space for recreation that conceals the busy tunnels beneath the park.
- **Recreation and cultural opportunities.** Interpretive signage showcasing Presidio history, a visitor center, open meadows, a glass pavilion and other picnic areas, a two-acre (0.8 ha) nature-based children’s play area, the Field Station discovery center, and an upgrade of the Crissy Field Center Building that supports educational programming.
- **Pedestrian connections.** The park project provides an unobstructed pedestrian connection between the waterfront and the Presidio for the first time in roughly 80 years.



RESILIENCE AND SUSTAINABILITY

The Presidio Tunnel Tops project includes the following significant resilience and sustainability features:

- **Increased green space.** Fourteen acres (5.7 ha) of new park space was created where an elevated roadway with frequent traffic congestion previously stood.
- **Native plantings.** The roadway replacement project was landscaped with more than 200,000 plants—half of them native to the Presidio. Seeds and plants were collected prior to the start of the project in recognition of the area’s serious drought conditions. Soil was extensively tested and incorporates compost to naturally restore and replenish the soil. The overall landscaping [reduces outdoor water use](#) by 61 percent.
- **[Sustainability certifications for the park and roadway.](#)**
 - **Sustainable highway rating.** Presidio Parkway was the first certified sustainable highway project in the United States, earning a Bronze rating from the Greenroads Foundation—a nonprofit corporation that advances sustainability education and initiatives for transportation infrastructure. The Bronze rating was awarded due to the project’s extensive community engagement process; focus on biological, cultural, and natural resources; and environmentally sensitive design.
 - **Sustainable buildings.** The park’s buildings include a focus on reduced water and energy use and were built to comply with LEED Gold certification requirements.

- **Regenerative landscape.** The project is [ReScape](#) certified in recognition of its excellence in regenerative landscape design, construction, and maintenance practices.

- **Adjacency to restored tidal marsh.** The park is adjacent to [Quartermaster Reach](#), a restored seven-acre (2.8 ha) tidal marsh near the park’s Crissy Field. The marsh allows the freshwater stream from the Presidio’s largest watershed to flow into the saltwater Crissy Marsh, and eventually into San Francisco Bay. The brackish habitat allows animals and plants to thrive.

MORE INFORMATION

[American Society of Civil Engineers](#)

[The Dirt](#)

[Federal Highway Administration](#)

[Federal Highway Administration](#)

[Presidio Trust](#)

[Presidio Trust](#)

[PR Newswire](#)

[Road Traffic Technology](#)

[San Francisco County Transportation Authority](#)

[SPUR](#)

[U.S. Department of Transportation](#)

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