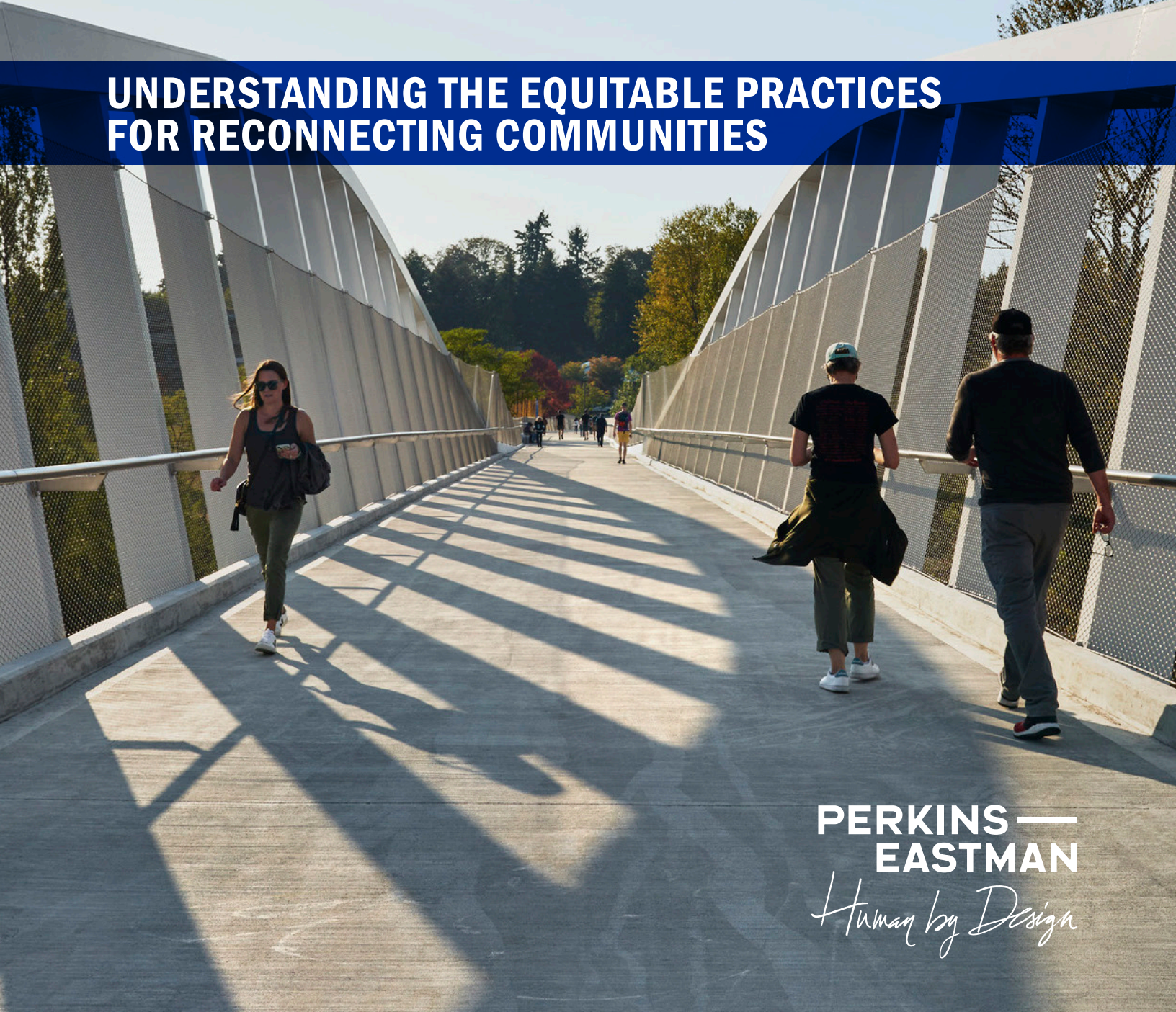


exploring equitable reconnection

UNDERSTANDING THE EQUITABLE PRACTICES
FOR RECONNECTING COMMUNITIES



PERKINS —
EASTMAN
Human by Design

SIOBHAN MITCHELL 2023 WELLNESS FELLOW

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ABSTRACT

abstract

The Federal Interstate Highway Program arose as standard practice during the mid-20th century, transforming our cities. Highway projects cut swaths out of downtowns, traveled through parks, and next to waterfronts. Compared to today, they were built quickly. A freeway in mid-century could move from property acquisition to construction in under 10 years. Freeways formed the template for modern travel, but they also knocked apart neighborhoods - tearing apart communities that once bustled with businesses and homes such as West Oakland, CA, the Fifth Ward in Houston, the Overtown neighborhood in Miami, or the International District in Seattle. Neighborhoods fondly remembered by their now aging residents.

Over the past several years the implicit city-shaping results of the highway program have been made more visible. Researchers and community members are revisiting the choices behind the original freeway siting, and the present day consequences for communities. Before passage of the Civil Rights Act (1964), and the Environmental Protection Act (1970) freeways could follow the path of least political resistance, dovetailing with other federal planning programs for urban renewal and “blight clearance.” Freeways occupied the seams in our cities comprised of lower-income and minority populations. These neighborhoods were often segregated; and subject to “redlining,” making homeownership and mortgage access difficult.

We know that health and place are undeniably linked. The places where people live, work, grow, and learn influence opportunities to achieve the complete physical, mental, and social well-being entitled to “every human being without distinction of race, religion, political belief, economic or social condition.”^{9,10}

In 2021, and in recognition of past practices, the Biden Administration launched the Reconnecting Communities Pilot (RCP) Program. The program’s \$1 billion in discretionary grants challenges the concept that we must accept divided neighborhoods. If the Reconnecting Communities program aims to “repair harm caused by some of the infrastructure choices of the past,”¹ this paper explores how we can best measure “repair and reconnection” not only in a project’s present day impact, but set transformational goals for improvement and communicate our best intention.

We propose that practitioners and policy makers apply a “spatial equity” lens to highlight and track the disparities in health, economic, and mobility outcomes across geographies. Spatial equity tools showcase the impact of compounding decisions, and how deeply our health outcomes are related to where we live, how we move, and our access to essential goods and services. We believe spatial equity’s data-driven framework further builds the case for public investment in connectivity, ultimately leading to more robust, cohesive communities and better public health outcomes.

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SPATIAL INEQUITY IN AMERICA

In 2021, the Biden-Harris administration signed the Bipartisan Infrastructure Law and Inflation Reduction Act. Included are a set of “Reconnecting Communities” grants intended to “remove, retrofit or mitigate transportation facilities like highways or rail lines that create barriers to mobility, access, or economic development,”⁷ including roads, streets, parkways, and other transportation facilities.⁸ The RCP’s \$1 billion budget over 5 years, while minor compared to the annual highway budget (nearly \$70 billion), has still brightened our collective ability to deliver and plan for urban “reconnection.” It is also worth noting that the Bipartisan Infrastructure Law made the single largest dedicated investment in American transportation infrastructure since the mid-century construction of the Interstate Highway System. As a result, many communities, RCP grant awardees and beyond are actively engaged in robust, civic conversations about how to physically (and socially) reconnect.

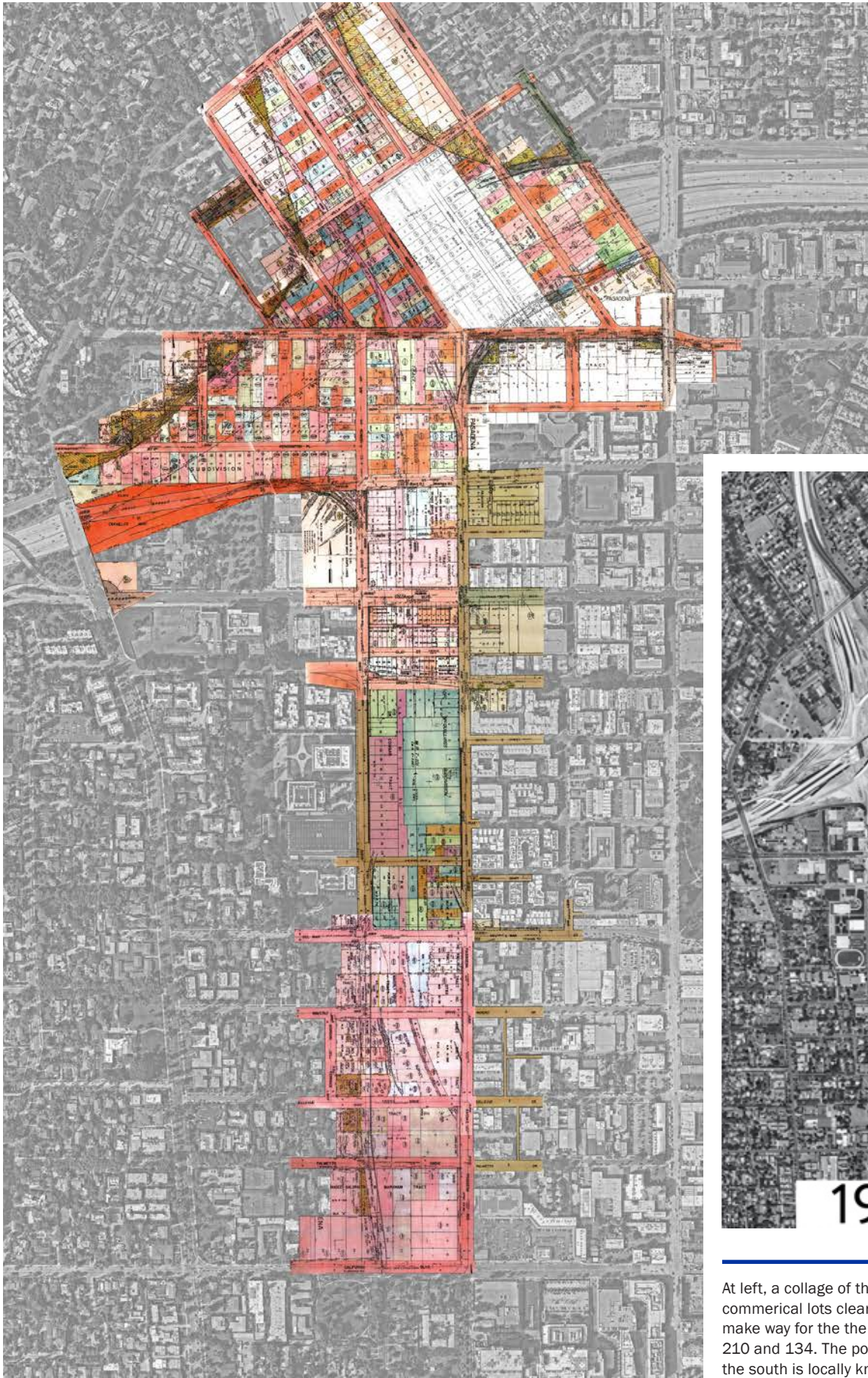
RCP can serve as a guide for our efforts to reinforce the nation’s aging infrastructure assets. RCP and related infrastructure investment more generally offers us a chance to reset expectations for more equitable outcomes, and intentional policy priorities. RCP’s imperative also contributes to the shift away from single-use, road-based solutions and towards multimodal and transit-based solutions that serve denser, human-scaled environments. When coupled with data on improved public health outcomes, the facts become harder to disregard: investment in more

and larger roadways simply does not solve urban congestion.²

Despite some cultural shifts, many Federal and State governments maintain a conventional playbook. Projects that have been “on the books,” and long promised to constituents can offer freeway expansions as core solutions for continued urban expansion and population growth.

An example of the tension between “business as usual” and community-driven advocacy is the \$13 billion expansion of I-45 between Dallas and Houston. First conceived in the early 2000s, TxDOT seeks to solve its growing traffic problems by expanding the highway, and rebuilding parts of Houston’s outdated freeway structure. However, two additional lanes in each direction requires extensive land acquisition. The proposal has been criticized by many as a continuation of mid-century practices. It is estimated that the project will displace >1,000 affordable and public housing units and 300 businesses, while worsening air quality and other related health impacts. I-45’s disproportional effect on minority communities and TxDOT’s lack of transparency led to a 2021 Title VI complaint. While unsuccessful at altering the project scope, the suit did lead to changes in process; forcing twice-annual community meetings, allocation of a \$30 million affordable housing fund, and some (albeit small) commitments to air quality monitoring. The project has also resulted in a vocal set of advocates that continue to fight for substantive procedural change.

Image - Composite Title Map, Perkins Eastman. Aerial Photo Courtesy of Perkins Eastman



At left, a collage of the residential and commercial lots cleared during the 1960s to make way for the the 710 interchange with the 210 and 134. The portion of the interchange to the south is locally known as "The Stub."



GREEN
FALTY FOOD

The West I-26/I-526 Lowcountry Corridor project in North Charleston, South Carolina, is also attempting to relieve traffic congestion by increasing freeway capacity⁴ at a cost of about \$3 billion. Many residents live with the present-day environmental and noise pollution effects of the 1969 completion of I-26 and I-526, citing the destruction of natural areas and noise pollution near their homes. I-26 threatens to repeat history with the planned acquisition of 33 homes, four apartment buildings, 11 mobile homes, eight duplexes, and a church in a majority Black community.

BUILDING FOR RECONNECTION

One example of a freeway project playing out differently is in California's Los Angeles region, an area famously planned around its freeway grid. Planned in the 1950s, SR-710 was envisioned to link the northern portion of LA County with Long Beach and the Port of LA. However, the 710 was never completed. Citizens of the City of South Pasadena waged a three decade, grassroots battle against the roadway. Their intense community opposition, combined with the runaway costs for freeway completion, led Caltrans to officially defund the SR-710 corridor in 2017.

But before it was defunded, Caltrans acquired and cleared land in the mid-1960s for the

710's interchange with the I-210 and SR 134. Caltrans also built a fast-moving entry and exit to the regional system, known locally as "the stub." In recognition that the City's and Caltrans's priorities have now changed, the 50 acres making up the "stub," a formerly redlined neighborhood, is now the subject of a closely watched community planning process. As a recipient of RCP funding, the 710 Vision Plan will determine the best way to relink neighborhoods that have been separated for over 50 years.

How we move forward with projects such as the I-710 in California or the I-45 in Texas will influence another generation of urban residents. It is imperative that we create workable project processes that can deliver infrastructure with the greatest public benefit for the money.

While the US is just beginning to address reconnection, international projects like the Cheonggye Freeway removal project in Seoul, South Korea, provide us with useful case studies illustrating the tight relationship between improved community connectivity and the environment. Decades after its installation, facing disrepair, pollution, traffic congestion, and other harmful environmental consequences, Seoul's local government rewrote the story of the riverfront and enacted the freeway's removal.

Now complete, the Cheonggye freeway removal has been characterized as a shift "from a car-oriented city to a human-oriented city."²⁴

Perkins Eastman led a feasibility assessment for a pedestrian and bicycle connection and active freeway lid spanning Interstate-405 in Bellevue, WA. This project completes the City of Bellevue's vision for a 'Grand Connection' from the waterfront through downtown and to a regional bicycle network.

A vision for the "Catalyst Connector" builds on many of the concepts of Reconnecting Communities Projects—it provides an active, safe, sustainable spine with generous pedestrian and cycling facilities, with links directly into new buildings, public parks and open spaces. The Catalyst Connector is moving to its next phase of design.

PERKINS EASTMAN DESIGNED THE JOHN LEWIS MEMORIAL CROSSING OF I-5, SIGNIFICANTLY EXTENDING THE REACH OF THE LINK LIGHT RAIL FROM THE NORTHGATE CENTER TO THE NORTH SEATTLE COMMUNITY COLLEGE.



© Kevin Scott 2022

“This bridge was built on a foundation with one goal in mind: bringing people together. This new infrastructure will transform much more than commutes—it will transform the lives of North Seattle College students heading to class, families visiting the Kraken Iceplex, and seniors who cannot drive but still want to move about the city.”

CITY OF SEATTLE COUNCIL MEMBER DEBORA JUAREZ



Freeway removal enabled daylighting of a creek and the reallocation of car space to green space. Changes were measured carefully and holistically. A few examples follow: the average neighborhood summer temperature surrounding Cheonggye Creek dropped by 3.3 degrees Celsius,²⁵ small-air particle pollution dropped from 74 micrograms per cubic meter to 48, residents self-reported increased exercise in the newly available public spaces,²⁴ and travel time to downtown decreased. The project serves as a model for the benefits of replacing freeways with usable green space and has led other Korean regions to pursue similar initiatives.²⁶

Building on this and other examples, we offer a set of metrics to track how reconnection can be advanced over time. Metrics present an avenue to both investigate and communicate the value of contributing programs and policies, drive goal setting, and prioritize our decisions against outcomes.

The following indicators borrow from Spatial Equity NYC, a joint project by Massachusetts Institute of Technology (MIT) and Transportation Alternatives. We adapt Spatial Equity NYC's indicators to the "principles of reconnection."

We also test a selection of proposed metrics in the context of RCP capital construction grant awardees to understand if and how awardees addressed reconnection objectives.

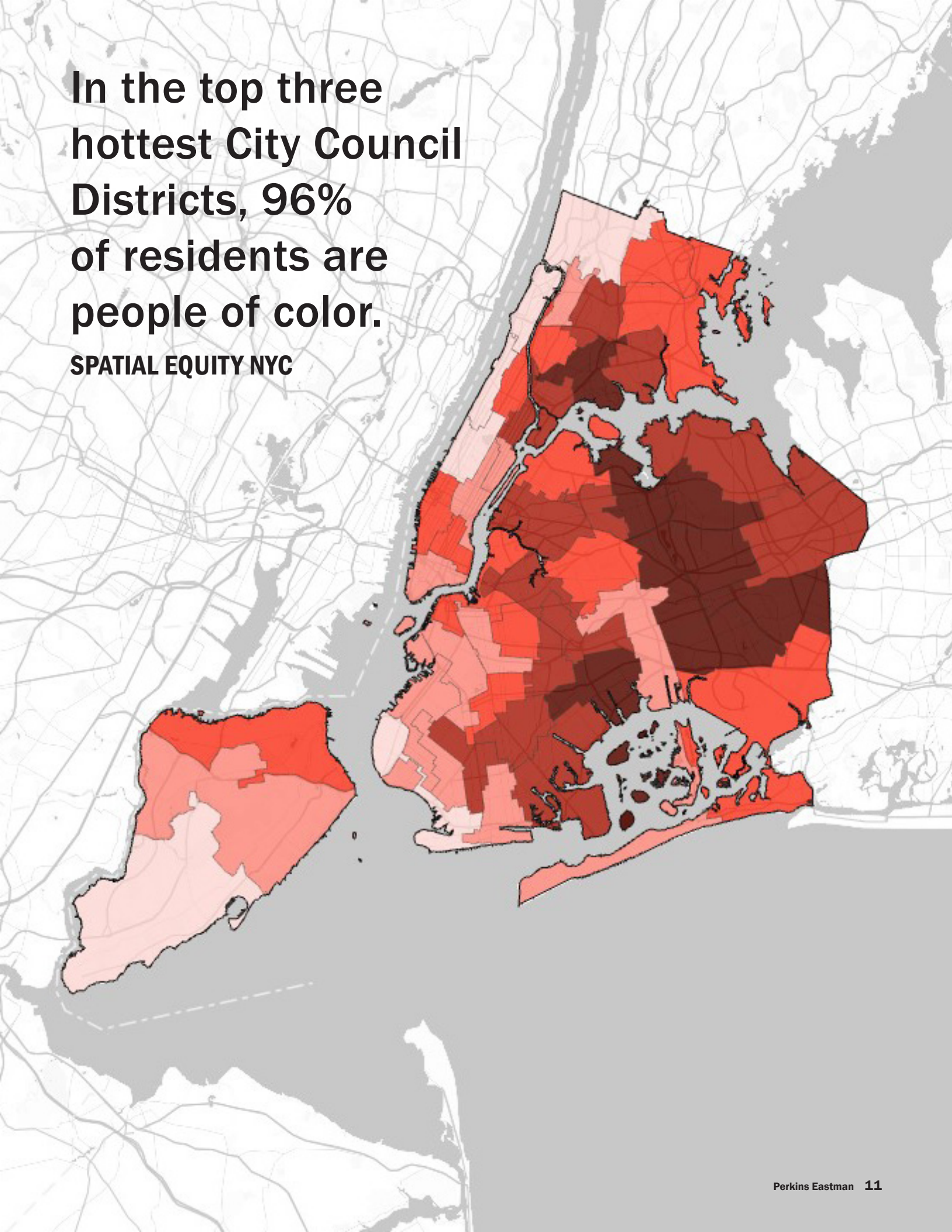
We include three case studies from the FY22 RCP capital construction grants in California and Michigan.

* Spatial Equity NYC, a data tool from Transportation Alternatives and the Massachusetts Institute of Technology. 2023. <https://www.spatialequity.nyc/>



**In the top three
hottest City Council
Districts, 96%
of residents are
people of color.**

SPATIAL EQUITY NYC





RECONNECTING COMMUNITIES SPATIAL EQUITY INDICATORS

indicators

HEALTH

Asthma

Noise Pollution

Traffic Injuries and Fatalities

Air Pollution

ENVIRONMENT

Surface Temperature

Permeable Surface Area

Tree Canopy

Park Access

MOBILITY

Bike Parking

Protected Bike Lanes

Bus Lanes and Speeds

Traffic Volume

Public Seating

HEALTH INDICATORS



ASTHMA

Asthma is a chronic lung disease that causes inflamed and swollen airways in the lungs, characterized by repeated episodes of wheezing, breathlessness, chest tightness, and coughing. Studies show a statistically significant relationship between living close to high-traffic areas and asthma incidence, exacerbation, and recurrent asthma-related emergency department visits.¹¹ Additionally, African American and Latino children living in low-socioeconomic-status urban neighborhoods in America are disproportionately burdened by asthma.¹² Removing pollutant sources by rerouting high-traffic roadways away from schools and residences and introducing air-quality improvement efforts can mitigate impacts for communities with disproportionate asthma burden and risk factors. Strategies to improve asthma risk factors are discussed in the following sections: air pollution, tree canopy, and traffic volume.



NOISE POLLUTION

Noise pollution is defined as unwanted or disturbing sound that interferes with normal activities or disrupts/diminishes one's quality of life.¹³ Additionally, noise pollution has documented negative health impacts, including stress-related illness, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity.¹³ As set by the World Health Organization, environments should be below 70 decibels (dB) over 24 hours or 85dB over one hour to avoid hearing impairment.¹⁴

Living near a high auto-traffic area contributes to the frequency and duration of noise, making it particularly important for communities directly adjacent to high-traffic roadways. When within 50 feet, intensity typically ranges from 70 to 80 dB, a level known to interrupt concentration, increase heart rate, and limit the ability to carry a conversation between two people within three feet of each other.¹⁵ Research shows that reducing vehicle speed to 30 km/h (~18 mph) can lower noise pollution, reduce complaints about roadway noise, and lessen sleep disturbances for surrounding residents.¹⁶ Projects that prioritize lowering vehicle speeds can lessen the impact of noise pollution and its negative health consequences for neighboring communities, making vehicle speed a key consideration when establishing reconnection.



TRAFFIC INJURIES AND FATALITIES

Traffic fatalities for pedestrians reached a 40-year high in 2022, with 7,508 recorded fatalities in the US, a number that fell from 1980 to 2010 but has been increasing since. In addition, traffic injuries contribute to a significant physical and health burden in the US, leading to 104,000 emergency department visits for non-fatal traffic-crash injuries in 2020¹⁷ and are responsible for the first and second most frequent direct post-traumatic stress disorder trauma for men and women, respectively.¹⁸ The rising rates of pedestrian fatalities and the burden on healthcare systems demonstrate the pressing need for measures aimed at reducing traffic injuries and fatalities.

The design and use of public spaces correlate heavily with the prevalence of traffic fatalities, and these risks disproportionately affect minority communities. In 2021, 68.7% of pedestrian traffic fatalities occurred on roadways without sidewalks,¹⁹ and non-Hispanic American Indians, Alaskan natives, and Black people had the highest pedestrian death rates attributed to traffic accidents.¹⁷

The likelihood of a pedestrian being hit and the severity of injury increased with higher vehicle speeds, with most pedestrian deaths occurring on urban roads with posted speed limits of 45-50 miles per hour.¹⁷ Research shows that reducing speed limits from 30 mph to 20 mph reduces the likelihood of severe injury or death for pedestrians struck by a vehicle from 45% to 5%. Similarly, 20 mph zones in the UK reduced child pedestrian and child cyclist accidents by 67%.²⁰



AIR POLLUTION

Air pollution is most commonly characterized by the most harmful urban air pollutant, particulate matter (PM2.5), produced by combustion activity such as burning fuel for vehicles.²¹ These airborne solid and liquid particulates are less than 2.5 microns in diameter, allowing penetration into the lungs and entering the bloodstream, contributing to respiratory and cardiovascular disease, lower life expectancy, and increased risk of death. Areas within a few hundred meters of high-vehicle traffic roads show “pollution hot spots” where economically disadvantaged communities are more likely to live.²² Measuring the PM2.5 air pollution levels in neighborhoods is essential to understanding the health risks communities face. In particular, goal setting should include rerouting and reducing traffic volume near residential areas and low-income communities especially when PM2.5 levels exceed WHO guidelines (annual AQG level of exposure <5 and 24-hour exposure <15).²³

ENVIRONMENTAL INDICATORS



SURFACE TEMPERATURE

Extreme heat is the leading cause of weather-related deaths in the United States.²⁷ Due to more heat-retaining surfaces, fewer trees, and fewer parks that help cool neighborhoods, urban areas experience extreme heat at higher rates, making cities hotter than rural areas, a phenomenon called the “urban heat island effect.” High heat-retaining surfaces like asphalt and lack of cooling infrastructure (e.g., trees) are often felt in low-income communities experiencing barriers to climate-resilient spaces and emergency medical services.

Yale University developed Heat Vulnerability Index (HVI) scores ranging from 10 (least vulnerable) to 26 (most vulnerable) to measure the burden of extreme heat events on communities.²⁹ By assessing heat vulnerability in communities surrounding reconnection projects, projects have the potential to address the disproportionate burden of extreme weather and climate change for communities with increased risk of injury and death from heat.

Projects aimed at reconnection often begin with conditions full of built, paved surfaces, which record the highest relative surface temperature of any land cover. Repurposing auto infrastructure to establish reconnection presents an opportunity to implement green infrastructure and environmental amenities, addressing extreme heat in communities with a high prevalence of heat-retaining surfaces. Where it's not possible to expand green space, changing the color or composition of materials can reflect light and decrease surface temperature.²⁷



PERMEABLE SURFACE AREA

Permeable surfaces include planting beds, mulched beds, gravel, turf, and permeable pavers. Impervious surfaces include concrete, asphalt, stone, and traditional stone/concrete/brick pavers. Permeable surfaces allow water to infiltrate into the ground, reducing flood risk. As the percentage of impervious surfaces increases, so does vulnerability to flooding. A one-percent increase in impervious surfaces like roads, sidewalks, and parking lots increases flood magnitude by 3.3 percent.³⁰

Auto infrastructure relies on paved roads and parking lots that are impervious and prevent water's infiltration into the ground. Given that low-income communities experience greater vulnerability to extreme weather events like flooding, increasing permeable surface area in low-income areas is essential to partially relieving the burdens of climate change for disadvantaged communities. Similar to reductions in heat vulnerability through considering surface temperature, reducing paved surfaces can improve community resiliency to extreme weather, and should be considered when transforming existing transportation infrastructure.



TREE CANOPY

Tree canopy coverage is linked to improved physical and mental health and is strongly connected to enhancing environmental resiliency by protecting against extreme heat, flooding, and air pollution.³¹ Despite these demonstrated benefits, coverage is unequally distributed among Americans, with Black and Brown neighborhoods recording 33% less coverage.³² To measure national disparities in tree canopy, American Forests developed the Tree Equity Score, which measures canopy coverage in relation to race, age, unemployment status, poverty, heat disparity, linguistic isolation, and community health burden.³³ Leading research practices recommend a minimum of 30% tree canopy in neighborhoods to gain the mental, physical, and social health benefits and climate moderation aspects of local trees and green space.³⁴ When reconnection projects reclaim land from vehicle infrastructure, it is essential to use the space to introduce a minimum tree canopy coverage goal of 30% to foster the benefits of tree canopy for new and existing communities in the area.



PARK ACCESS

Parks contribute massive economic benefits to cities by mitigating extreme weather events, buffering pollution, and promoting mental/physical health. By providing a place for residents to exercise and adding recreational value, parks are estimated to contribute to billions in reduced healthcare costs.³⁵

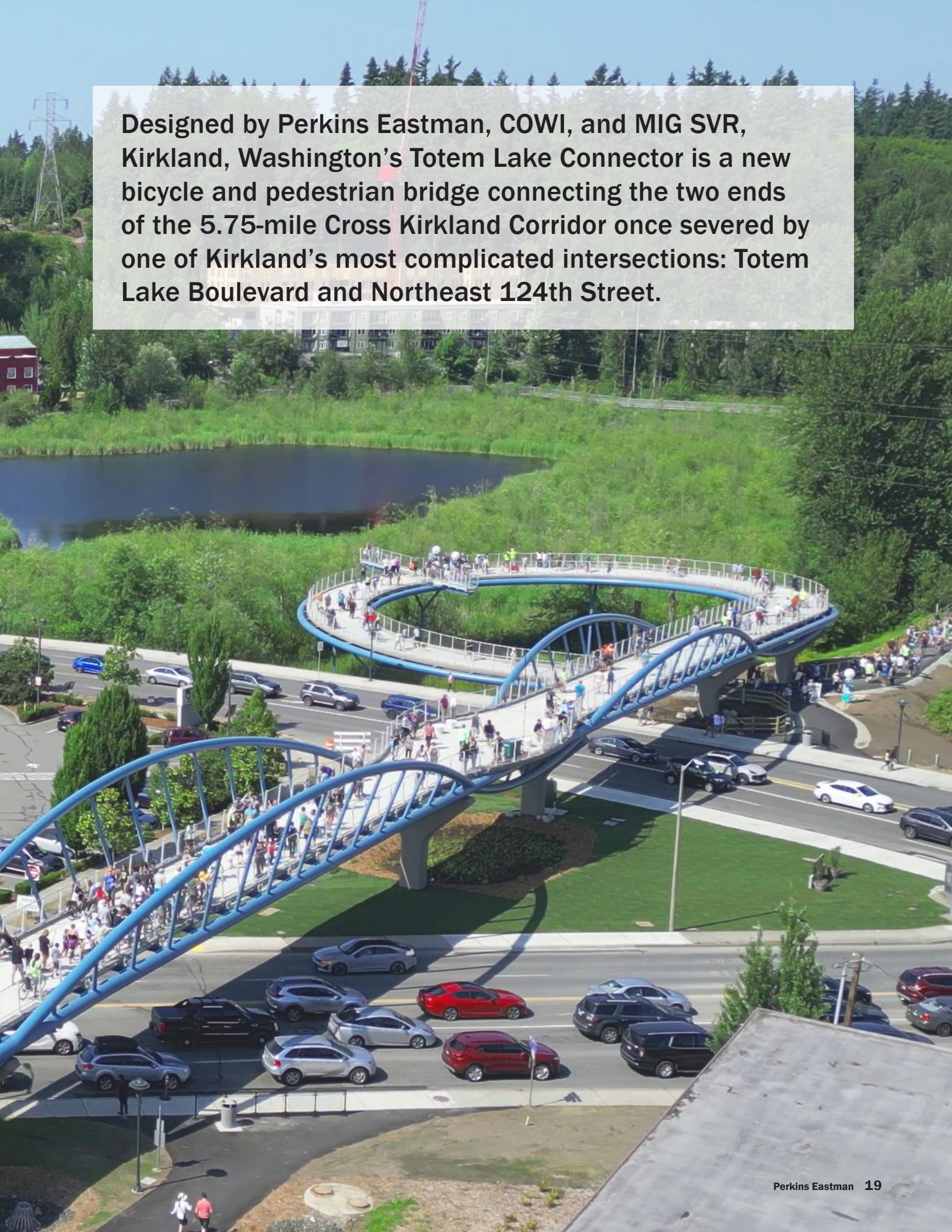
The Trust for Public Land's ParkScore® index rates how the 100 largest U.S. cities meet the need for parks, using community demographics and park availability within a 10-minute walk from home. The data from ParkScore® show neighborhoods with a majority Black, Hispanic/Latinx, American Indian/Alaska Native, Pacific Islander, or Asian American residents have less park acreage per person than white neighborhoods, and residents are less likely to live within a 10-minute walk to a park.³⁶

Natural areas (i.e., parks, greenspace, etc.) are the coolest places in cities, attributed to the ability of plants to cool surrounding areas.²⁷ Expanding, protecting, and providing access to natural areas within cities is an integral part of fostering health and environmental resiliency benefits of natural areas and parklands. With RCP projects that re-envision public space, the impact of community connectivity must consider park access for communities harmed by past infrastructure decisions.

How projects address multigenerational park use is crucial to restoring communities. Reconnection should aim to ease access to parkland for populations with limited vehicle access, less park acreage per person, or longer than 10-minute walks to a park.



Designed by Perkins Eastman, COWI, and MIG SVR, Kirkland, Washington's Totem Lake Connector is a new bicycle and pedestrian bridge connecting the two ends of the 5.75-mile Cross Kirkland Corridor once severed by one of Kirkland's most complicated intersections: Totem Lake Boulevard and Northeast 124th Street.



MOBILITY INDICATORS

Mobility is integral to improving access to economic opportunities, green space, health care, nutritious food options, and more. Lack of vehicle access often poses a barrier for disadvantaged communities relying on public transportation, walkability, and bikeability to access essential resources. In the United States, women, young adults, Black workers, low-income workers, elderly adults, and people with disabilities disproportionately rely on public transportation, making mass transit improvements an issue of social, economic, political, and health equity.³⁷ Expanding mobility options has the potential to strengthen communities by improving regional health and reducing longstanding inequities to access for those without a vehicle. Currently, 8.3% of US households do not have access to a car,³⁸ demonstrating the need to improve affordable transportation infrastructure options everywhere while delivering multi-mobility investments equitably in areas where access to a car is lowest.



Bike parking is critical to facilitating cycling, and it has a relatively small cost in terms of space and budget. An estimated 10 bicycles can fit in a single car parking space, increasing parking capacity by 400 to 800 percent.³⁹ Ensuring bike parking is distributed among marginalized populations promotes the equitable distribution of active transportation options, which are shown to contribute to increased economic growth and productivity.⁴⁰ This is supported

by Princeton University survey data indicating that people of color were far more likely than white people to increase bicycle use with the availability of “plentiful, secure bike parking.” Similarly, individuals earning less than \$75,000 per year were more likely than those earning more to increase their bike usage with “plentiful, secure bike parking.”⁴¹

Free and available bike parking near transit hubs is an international best practice seen in cities like Amsterdam, London, and Paris.⁴² Comparing US bike infrastructure to European standards is often unreasonable but offers a lesson in best practices to promote biking. For example, research suggests that to integrate the bike-and-ride approach into U.S. cities, sheltered, secure bike spaces at mass transit stations should be provided to assist in connecting riders to transportation options.⁴³

In the United States, every car has an estimated eight parking spots, and zoning laws require extensive parking options, influencing the urban landscape and mobility options.⁴⁴ Additionally, bike parking comes at a low cost to space with an estimated 10 bike spots fitting in one car space.⁴⁵ For multi-unit residential buildings, LEED standards recommend providing long-term bike storage for at least 30% of regular building occupants with no less than one storage space per unit.⁴⁶ Scaling this to the neighborhood context, a similar goal is to provide bike parking for 30% of neighborhood residents, which would demonstrate a commitment to transportation efficiency and encourage multimodal transportation options for community members.



PROTECTED BIKE LANES

Protected bike lanes contribute to safety and economic and community benefits by increasing connectivity and access to essential goods and services. The lack of protected bike lanes contributed to 966 bicyclist deaths in 2021, which shows the need for improved and extensive protected bike lanes in the US.⁴⁷ Additionally, pedestrian safety improves by installing protected bike lanes, as shown by data in Washington, DC, New York City, and Denver, where bike use on the sidewalk decreased following the installation of a protected bike lane therefore, reducing the risk of bike-pedestrian collisions.⁴⁸

Data indicate the economic benefits of bike lanes with increased retail sales, property values, and traffic capacity where they are installed.⁴⁹ Additionally, connected bike networks can promote equity in use and improved access to health care, goods, and services for marginalized communities.⁵⁰

Where reconnection aims to build connectivity options for community members, installing protected bike lanes presents an opportunity to increase safety for existing riders. Additionally, as demonstrated through initiatives in New York City, safer bike lanes encourage new riders to utilize the paths, boosting ridership.⁵¹



BUS LANES AND SPEEDS

Buses provide access to economic opportunity, food, medical services, and other basic needs for riders who are disproportionately Black, foreign-born, and make under \$30,000 annually.⁵² To improve equity in access to these essential goods and services, bus lanes shift prioritization away from private vehicles, improving user travel times by passing traffic congestion.⁵³

Bus infrastructure is a low-cost solution to establishing reconnection because bus lanes can be created on existing roadways, requiring little to no capital work. Reconnection projects should consider implementing lanes dedicated to buses to incentivize public transportation use and provide an essential service to underserved communities.



TRAFFIC VOLUME

High traffic volumes harm communities through air and noise pollution, dangerous conditions for pedestrians/bikers, increased impervious surfaces (i.e., pavement), and heat vulnerability. Conditions perpetuated by high traffic volumes are referred to as traffic-related harms.⁵⁴ High-traffic roadways were historically routed through low-income communities, exacerbating health and safety risk factors. The vulnerability to high traffic volume effects is already present in neighborhoods experiencing these conditions, and reducing traffic volume in reconnection projects is integral to the program's goals to repair harm to communities.



PUBLIC SEATING

Public seating is an essential aspect of public open space, allowing people to interact socially or benefit individually from time outside. Seating within these settings builds a sense of community by cultivating familiarity and connection to the more extensive social system and encouraging people to be outdoors.⁵⁵ Public seating allows those with mobility challenges and older individuals to safely use public spaces.⁵⁶ The safety of public spaces relies, at least in part, on community members—often women and older adults—who are sitting and observing within their neighborhoods.⁵⁷

When land is repurposed from auto infrastructure, accessible seating is essential to promoting the use of public space. Reconnection projects have the potential to reclaim land from cars, create new public spaces, and provide adequate seating to promote accessibility for a variety of users. In line with privately owned public space guidelines in New York, a minimum of one linear foot of seating for every 30 square feet of public space should be provided with considerations for comfort, accessibility, and orientation to promote a variety of uses.⁵⁸

Now in construction, Washington DOT's SR 520 project reconnects between neighborhoods. A rebuilt SR 520 transformed what was unsafe, with non-motorized paths, rapid transit, and new pedestrian outlooks, underpasses, and park access.

The freeway project also invests in the public realm well beyond its footprint.

SR 520 creates a series of active public environments rooted in the legacy of “nature meets city,” and returns to the well-loved themes of its Olmstedian 1909 Parks and Boulevard Plan.

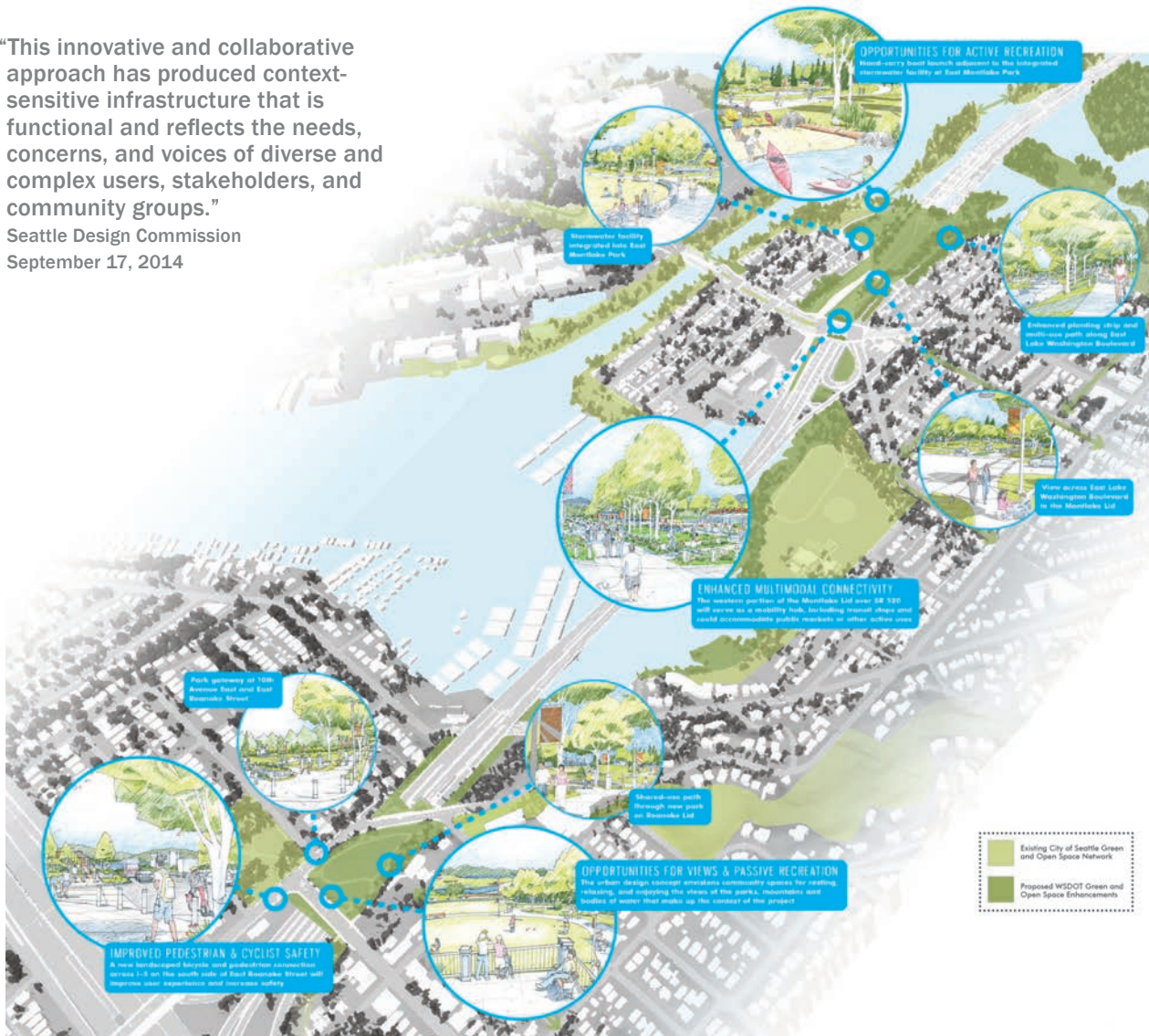
SR 520's west side program stitches the Montlake neighborhood of Seattle to the University District and Capitol Hill. A proactive engagement process between WSDOT and the Seattle Design Commission applied public health and sustainability measures to build consensus and initiate changes to a project design that had been stalled by conflict and litigation.

Before merging with Perkins Eastman, VIA spent 10 years contributing to the BRT station design and the interface between transit facilities, roadway structures, and mature neighborhoods. The team led a series of neighborhood charrettes, workshops, and regional strategic stakeholder discussions and debates.

Image: Montlake urban trail head on the Montlake Lid, Final Design (Perkins Eastman)

“This innovative and collaborative approach has produced context-sensitive infrastructure that is functional and reflects the needs, concerns, and voices of diverse and complex users, stakeholders, and community groups.”

Seattle Design Commission
September 17, 2014



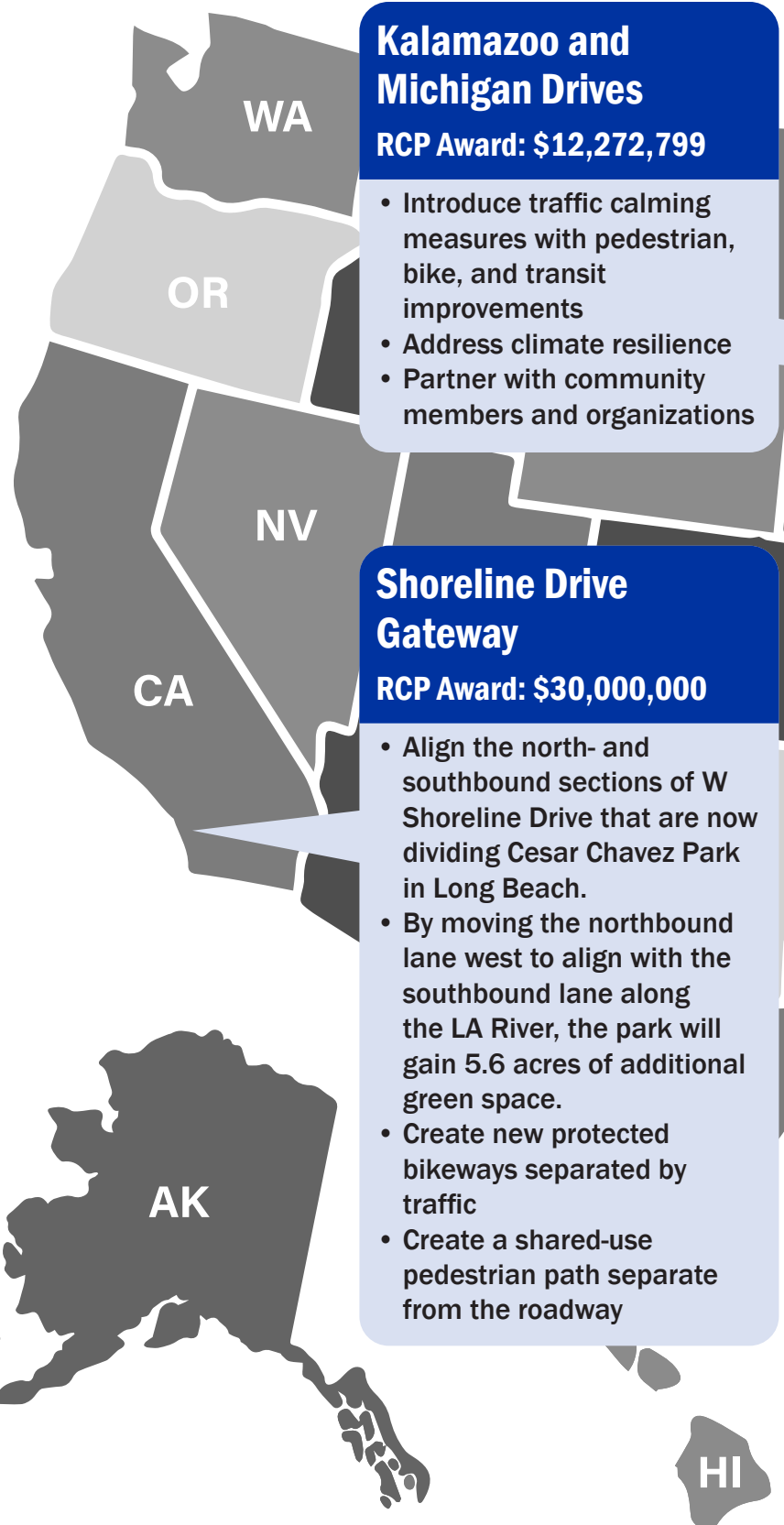
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RCP GRANT AWARDEES 2022

The RCP FY22 cycle awarded funding to 39 planning and six capital construction projects nationwide. These projects explore a variety of reconnection approaches addressing a range of existing conditions. The following case studies from the FY22 cohort of RCP capital construction awardees represent leading trends in contemporary planning efforts in the United States and inform our understanding of how reconnection projects relate to spatial equity goals. Future consideration of spatial equity indicators can support practitioners, advocates, and policymakers in understanding and communicating the non-monetary value of these capital projects.



**Bridging I-696:
Connecting Oak Park**
RCP Award: \$21,704,970

- Reconstruct freeway deck with improved pedestrian and bicycle connection
- Improve driver safety during winter months on I-696

**NYS Route 33:
Kensington Expressway**
RCP Award: \$55,597,500

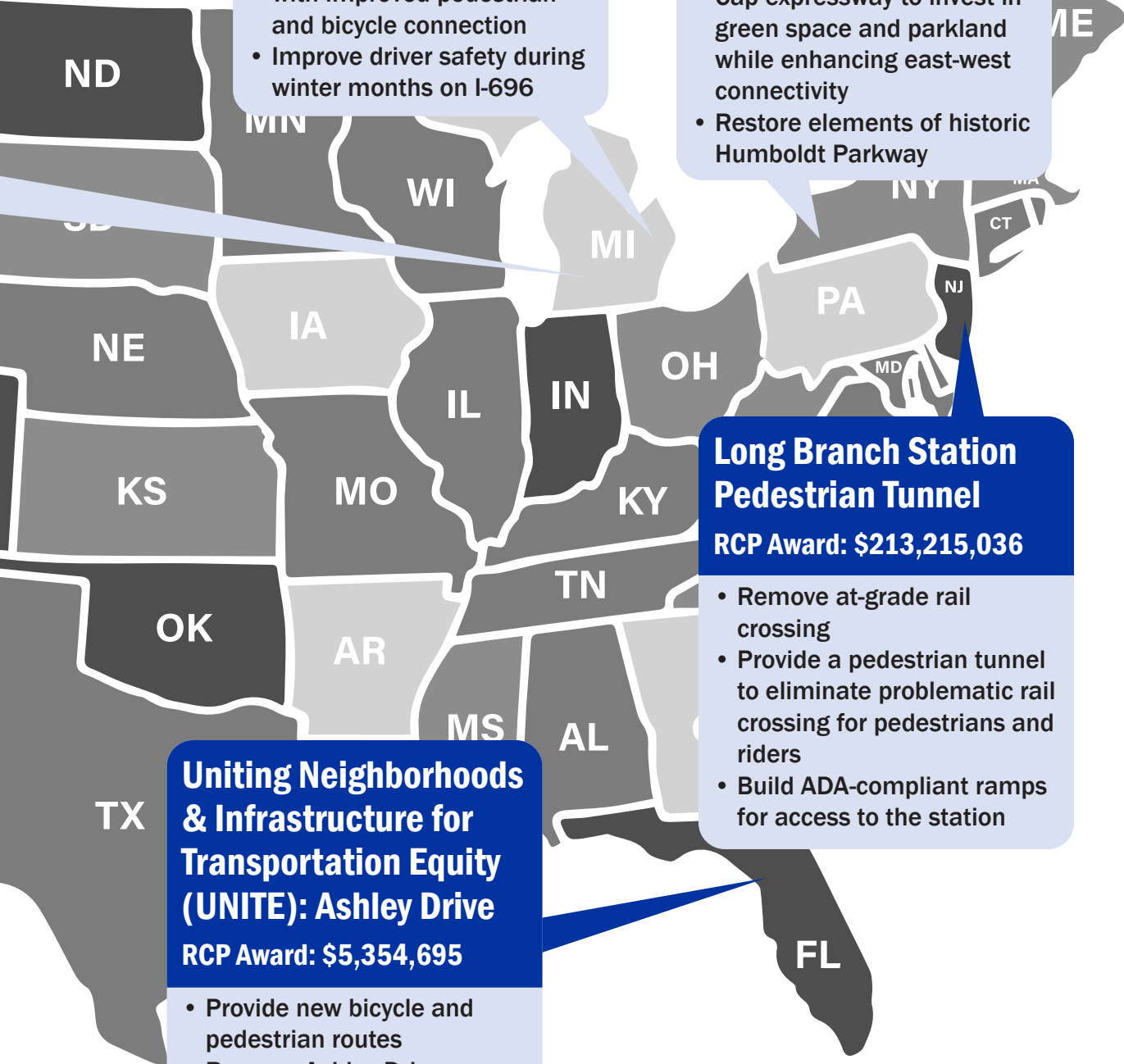
- Cap expressway to invest in green space and parkland while enhancing east-west connectivity
- Restore elements of historic Humboldt Parkway

**Long Branch Station
Pedestrian Tunnel**
RCP Award: \$213,215,036

- Remove at-grade rail crossing
- Provide a pedestrian tunnel to eliminate problematic rail crossing for pedestrians and riders
- Build ADA-compliant ramps for access to the station

**Uniting Neighborhoods
& Infrastructure for
Transportation Equity
(UNITE): Ashley Drive**
RCP Award: \$5,354,695

- Provide new bicycle and pedestrian routes
- Remove Ashley Drive off-ramp to street level
- Establish new roadway connections
- Install new roadway signals
- Install public art elements



CASE STUDY

SHORELINE DRIVE GATEWAY REALIGNMENT

Long Beach, California

Currently, the Shoreline Drive Gateway northbound roadway runs through the center of Cesar Chavez Park, routing on-ramp traffic directly adjacent to Cesar Chavez Elementary School in a predominately Hispanic/Latino* neighborhood.⁵⁹ The northbound roadway is approximately one block away from the residential neighborhood. Routing the northbound traffic away from the school in the proposed design reduces the environmental exposure for Cesar Chavez Elementary School and the residential neighborhood adjacent to the park.



SPACIAL EQUITY IMPACTS:

ASTHMA

For school-age children, major roadway proximity was independently associated with more asthma symptom days using a composite score of school and roadway proximity.⁶⁰ Given the increased risk of asthma for Latino children in the US, reducing exposure to asthma pollutants is particularly important. Routing on-ramp traffic away from the school reduces an environmental risk factor for students, justifying the investment.



PARK ACCESS

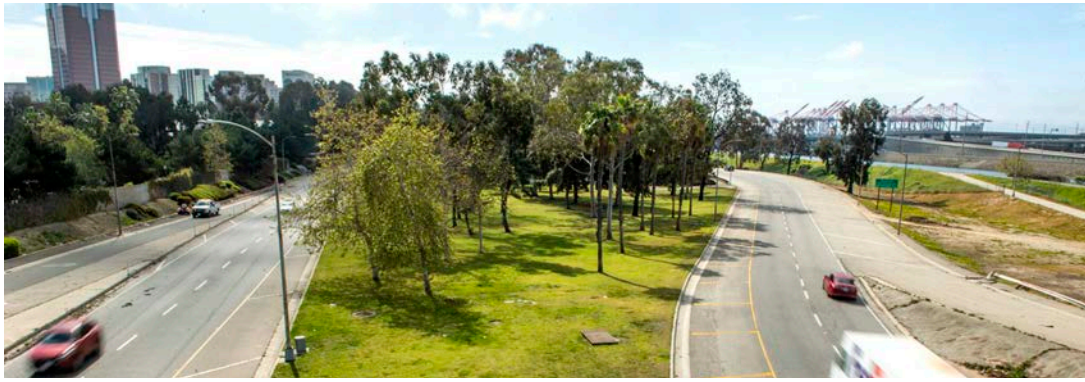
In Long Beach, residents in Hispanic/Latinx neighborhoods have 65% less space dedicated to parkland than the city's median per person. Additionally, 8% of the City's land is dedicated to park space, below the national median of 15%.⁶¹ The realignment of northbound Shoreline Drive creates 5.5 additional acres of accessible park space, which is currently inaccessible due to the roadway barrier, supporting access for the predominantly Hispanic/Latino neighborhood.



TREE CANOPY

Currently, Cesar Chavez Park has a tree canopy cover of 16% and 19%.³³ The realignment of the northbound drive has the potential to open up space for increased planting and tree cover with the proposed project plan including planting along the new pedestrian-bike shared pathway.⁶² The project does not specify tree removals for design consideration of the new roadway, nor does it describe the planting plan. To support the local community in reaping the mental and physical benefits of trees, the plan should aim to bring the parkland to a 30% tree canopy coverage goal.

* Race was defined based upon the terminology used by the data source



BEFORE - EXISTING CONDITION



AFTER - MAKING MORE USABLE SPACE



CASE STUDY

KALAMAZOO AND MICHIGAN DRIVES

Kalamazoo, Michigan

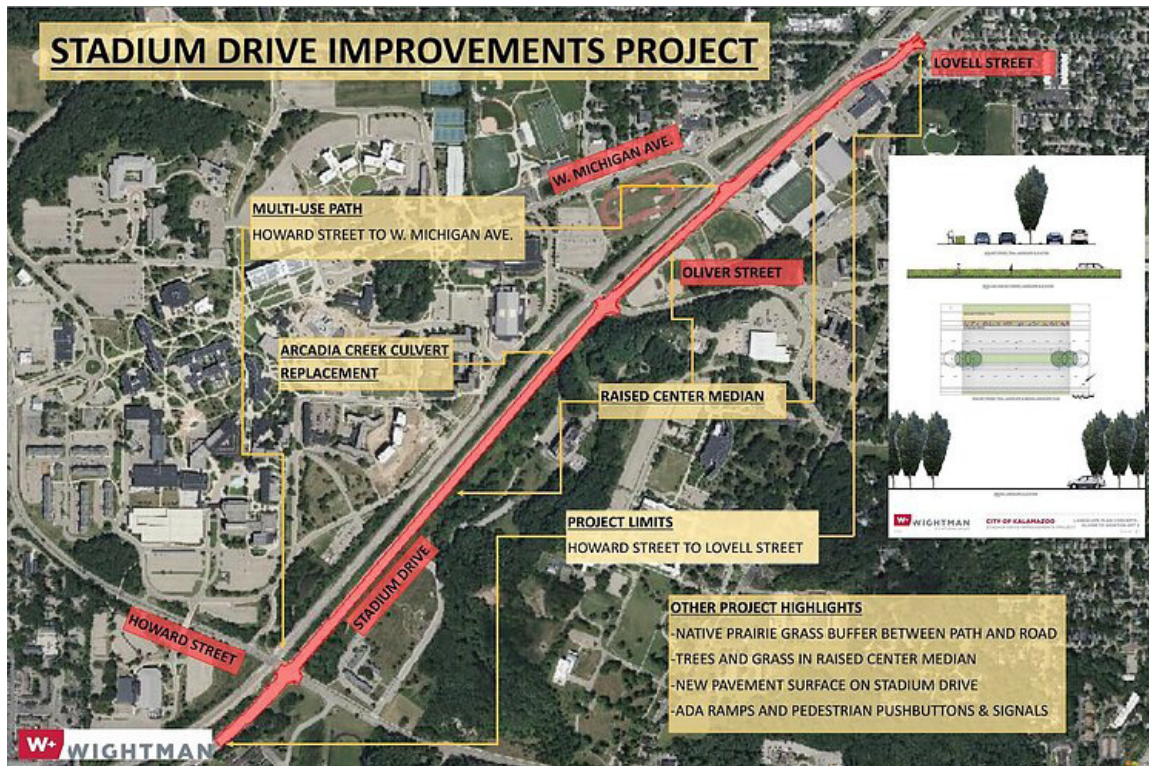
In the mid-20th century, the Michigan Department of Transportation implemented one-way corridors on Michigan and Kalamazoo Avenues to facilitate east-west auto connectivity. This process divided the predominately Black Northside neighborhood from the central business district, creating a physical barrier to access and limiting opportunities for Northside residents.⁶³ The recent transfer of Michigan and Kalamazoo avenues from state to local jurisdiction spurred the community's vision of promoting transportation networks that prioritize safety.

SPACIAL EQUITY IMPACT:

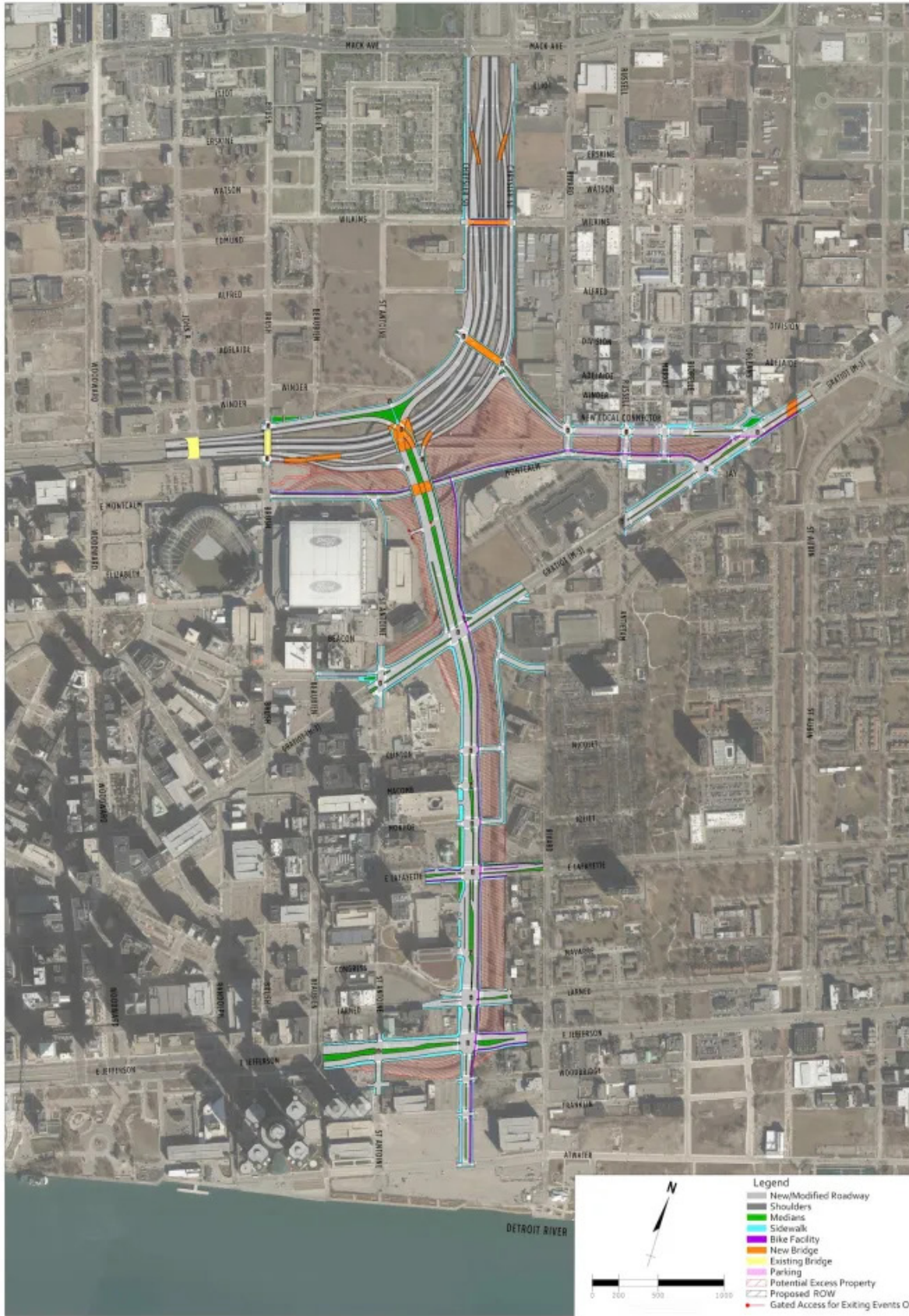


TRAFFIC INJURIES AND TRAFFIC FATALITIES

A major priority is to reduce speed on Michigan and Kalamazoo avenues. To achieve this, the current plan proposes implementing two-way traffic on both streets with pedestrian infrastructure, bike lanes, dedicated left-turn lanes, and on-street parking. Additionally, the project will introduce consistency in auto speeds where existing limits vary along the roadway. This approach aims to reduce the risk of crashes and crash severity. Overall, reducing vehicle speeds will create a safer and more appealing pedestrian experience and support multimodal connectivity between the Northside and the central business district for residents seeking pedestrian access.



I-375 Improvement Project - Selected Alternative 2022



CASE STUDY

LONG BRANCH PEDESTRIAN TUNNEL

Long Branch, New Jersey

The Long Branch Pedestrian Tunnel grant funds tunnel access to Long Branch Station providing access to Long Branch Station from multiple directions. The tunnel aims to eliminate the need for dangerous pedestrian railroad crossings currently required to access the station and provide east–west connectivity, essential for improving access to medical services and economic opportunities.

SPACIAL EQUITY IMPACT:

BIKE PARKING



The project presents an opportunity to improve bike-and-ride for communities with historically low access to private vehicles. Populations in the surrounding area have a higher prevalence of poverty than the national average and lower percentages of

the population with access to a vehicle than the national average, as represented in Table 1.^{64,65} With a lack of vehicle access, pedestrian, rail, and bicycle infrastructure becomes an even more essential resource for communities to access economic opportunity, medical services, food, and green spaces.

Installing bike infrastructure, including bike parking, is particularly important for allowing Long Branch residents in the surrounding communities to access the station. The project plans to install bike racks within a new green station plaza which is currently the parking lot. Turning this paved area into a green space with bike parking helps promote equitable access to the rail station for bike-to-transit riders while improving environmental amenities.

TABLE 1. POVERTY AND VEHICLE OWNERSHIP IN NEIGHBORHOODS SURROUNDING LONG BRANCH STATION, NJ.

LOCATION	CENSUS TRACT	PERCENTAGE OF POPULATION BELOW POVERTY LEVEL*	PERCENTAGE OF POPULATION WITHOUT ACCESS TO A PRIVATE VEHICLE†
East	8058	30.5	25.4
South	8059	11.7	12.2
West	8060	19.2	9.6
North	8056	30.3	14.2

* The national poverty rate for 2022 was 11.5%.⁷³

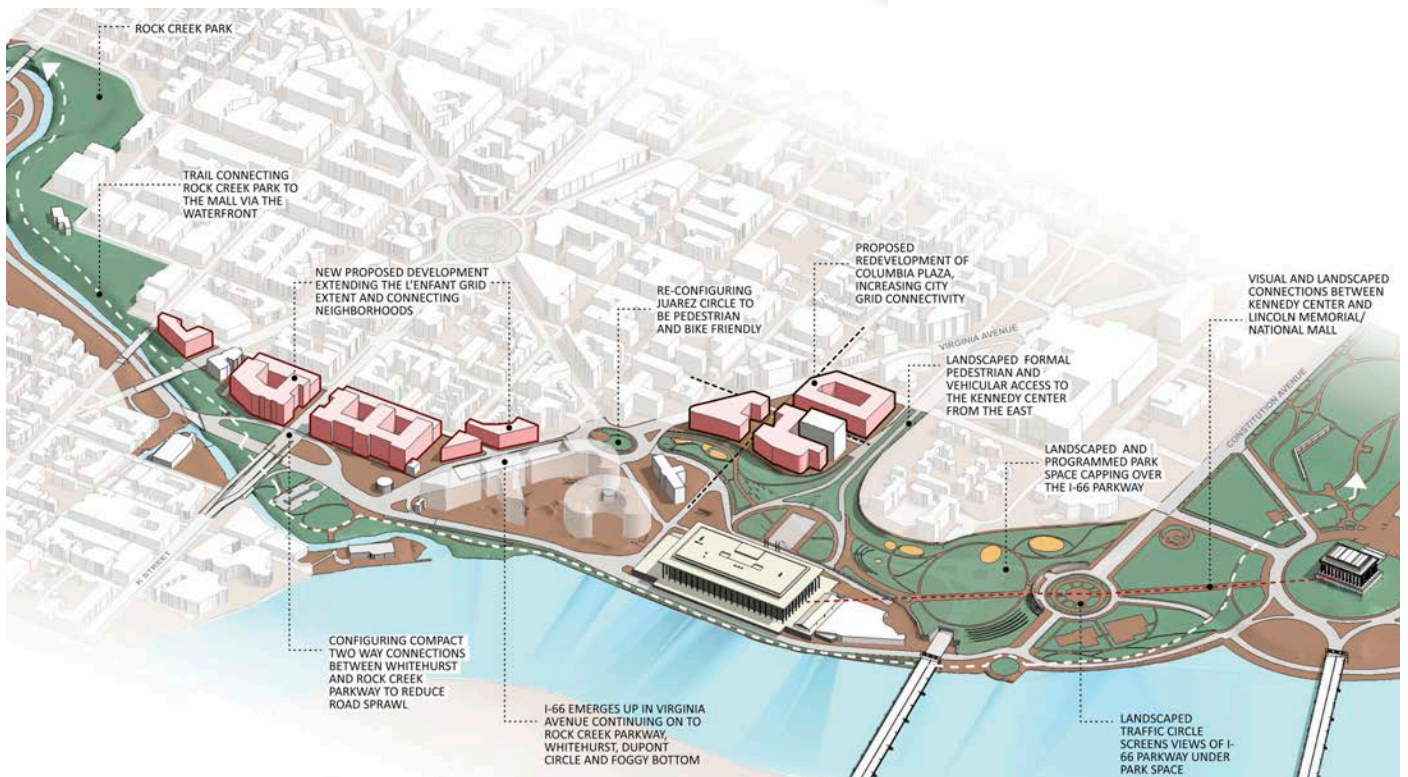
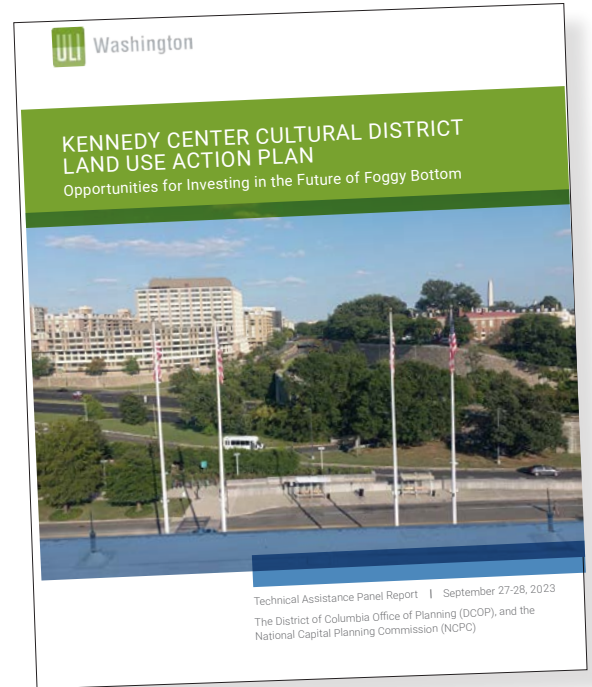
† 8.3% of occupied housing units in the US lack access to a private vehicle



“This grant will help reconnect the east and west sides of the city near the station, make public transportation more accessible, and improve the safety of our transit infrastructure for commuters,” said Mayor John Pallone. “The pedestrian tunnel will ensure riders no longer have to cross the train tracks to access the platforms.”

FUTURE OPPORTUNITIES USING A SPATIAL EQUITY APPROACH

Perkins Eastman’s “Repairing and Connecting Plan,” completed for the Washington DC’s National Capital Planning Commission (2023), shows how a place-based, stakeholder-driven approach for reconnecting can galvanize interest and build the case for more holistic investments. The work shows what could be possible through repairing the damage resulting from the construction of I-66 between K Street NW and the National Mall. A data-driven spatial equity approach could move the project forward, communicating project benefits to a broad set of stakeholders in experiential terms and making clear program objectives to build the case for change. Reconnecting through spatial equity lets us leverage our taxpayer investments into infrastructure that has multiple benefits, remaking and reinvesting in both physical and social links.



© Perkins Eastman

The construction of the Interstate 66 extension in the 1960s severed nearby neighborhoods from the city’s Potomac River waterfront and the eastern side of the Kennedy Center.



The Perkins Eastman plan adds around 27 acres of usable park space, repairs segments of the city grid, and integrates the Kennedy Center into a the fabric of the National Mall.



ONGOING CHALLENGES

DATA AVAILABILITY

Establishing baseline metrics for the community of interest is integral to understanding the impact of design decisions before, during, and after project implementation. Data availability can inhibit the ability to measure indicators in the project area. This report relies heavily on open data sources. Many RCP awardees do not have a full complement of proposed indicators.

Investment is needed to collect and record reliable information on spatial equity metrics nationwide. Appendix C includes a list of available sources and visualizations for national data on spatial equity metrics.

CONSTRUCTION IMPACTS

During infrastructure project construction or removal, communities must pay special attention to their existing vulnerabilities to environmental and health factors (e.g., high asthma prevalence, air pollution) caused by construction. For example in Syracuse, New York, houses can be located within seven feet of the aging viaduct slated for removal. The viaduct's removal will expose residents to additional construction impact, e.g. dust, while they already live with roadway pollution and high particulate matter.⁷¹

ADDRESSING GENTRIFICATION

When neighborhood infrastructure improves, existing residents are often concerned about increased property and home values. Research shows that the demographic makeup of West Oakland, California was significantly altered following the rerouting of the Cypress Freeway and the construction of the Mandela Parkway. The proportion of Black residents decreased as property values rose. Measures for both affordable housing and business retention are critical to include in RCP projects, ensuring that long-time residents can remain in areas as conditions improve.

Another example in Rochester, New York, points to the ongoing work of addressing gentrification concerns associated with public infrastructure investment. This should be considered an iterative process, with clear information and approaches in place before, during, and after the implementation of new infrastructure. In 2017, Rochester, New York, filled in the eastern section of the sunken Inner Loop Highway to create a smaller pedestrian-friendly road. The reclaimed land was used to construct apartments. While residents were pleased to see the freeway "moat" removed, concerns about gentrification arose following the neighborhood improvements. Community-initiated meetings helped to involve residents in the planning and decision-making process.⁶⁹ Residents continue to watch how the project has and will affect them. The results are unclear about how many existing residents have remained since 2017.⁷⁰

CONCLUSIONS

In 2024, the path to achieving reconnection varies according to the local context, including political climate, population demographics, geography, and urban/rural environment. In our review of RCP awardees, we also see that the extent to which stakeholders are willing and/or able to radically change the transportation landscape differs wildly among grant recipients.

Spatial equity could present a framework to level the field and provide a baseline of measures for projects across varied conditions. This approach aligns with the goals of the RCP program to restore community connectivity by providing for a collection of interdisciplinary indicators.

The framework positions practitioners to convey the program's non-monetary, easily understood benefits. Metrics can be designed to support community process and engagement to inform practitioners, inform practitioners, community members, and elected officials about ways to improve their neighborhoods.

Creative engagement of stakeholders and the public's ability to better portray the scope, risks, and benefits of a project lead to more inclusive—and ultimately more desirable—outcomes.

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APPENDIX A: SUMMARY OF RCP PROGRAM GRANT FUNDING AND ELIGIBILITY

ELIGIBILITY	PLANNING & TECHNICAL ASSISTANCE	CAPITAL CONSTRUCTION
5-Year Total Funding Available	\$250M	\$750M
FY22 Funding Awarded (\$195M available)	\$47,090,000	\$138,145,000
Applicant	States Local governments Federally recognized Tribal governments Metropolitan planning organizations Nonprofit organizations	Facility owner Eligible applicants from planning grants with the facility owner as a joint application endorsing the application
Facility	Road, street, parkway, other transportation facility which creates a barrier to community connectivity	Road, street, parkway, other transportation facility which creates a barrier to community connectivity
Eligible Projects	Public engagement Planning studies assessing feasibility Other planning activities removal, retrofitting or mitigating an eligible facility; replacement with new facility that restores connectivity; delivery community benefits/ mitigate impacts identified through NEPA process	Preliminary design activities and environmental studies Predevelopment/preconstruction Permitting activities (e.g., NEPA)
Minimum Grant Amount	\$2 million	\$5 million
Additional Requirements	N/A	Benefit cost analysis results Environmental studies for design activities Permitting activities (e.g., NEPA)

APPENDIX B: SPATIAL EQUITY

This section summarizes the measures and categories encompassed by Spatial Equity NYC (2023).

HEALTH	ENVIRONMENT	MOBILITY
Asthma (adult asthma prevalence)	Surface Temperature (average summer temperature deviation from mean)	Bike Parking (bike parking spaces per 10,000 residents)
Noise Pollution (dB)	Permeable Surface Area (area squared)	Bus Lanes (% of street miles with bus lane/busway)
Traffic Fatalities (per 100,000 in given geographic area)	Tree Canopy (% canopy coverage)	Bus Speeds. (average mph)
Traffic Injuries (per 100,000 in given geographic area)	Park Access (% of residents within 10-minute walk to a park)	Protected Bike Lanes (% of street miles with protected bike lane)
Air Pollution (PM2.5 11.74 µg/m3)		Public Seating (benches per 10,000 residents)

APPENDIX C: SPATIAL EQUITY CHECKLIST & DATA SOURCES

This section aims to inform how spatial equity indicators are measured and where information is available. Where no data source is provided, local/municipal agencies are the most likely source of the data.

SPATIAL EQUITY PRINCIPLE	MEASUREMENT & DEFINITION	EVALUATION FRAMEWORK	POTENTIAL DATA SOURCE
Asthma	Adult or child asthma prevalence: number of adults/ children with asthma divided by the total population	How does local asthma prevalence compare to the national average?	CDC PLACES
Noise Pollution	Decibels	What proportion of the population is exposed to noise pollution levels above 50dB?	University of Washington Noise Pollution Map
Traffic Fatalities	Fatality Rate (per 100,000 people)	How are traffic fatalities concentrated around the project site? How do traffic fatalities in the county of interest compare to other counties nationally?	US DOT Traffic Fatalities
Air Pollution	PM2.5 ug/m3 O3/ozone	Does the annual mean concentration of PM2.5 exceed the WHO recommendations of 5 ug/m3? Does the mean ozone (O3) pollution in peak season exceed the WHO recommendations of 60 ug/m3?	U.S. EPA AirCompare
Surface Temperature	Average summer temperature deviation from the mean Solar Reflective Index (SRI)	What percentage of paved areas have a solar reflectance index (SRI) over 40? Does the project provide increase shade with focus over waiting, leisure, and active recreation?	Climate Central Urban Heat Island Map NIHHIS Heat Equity Map
Permeable Surface Area	Total impervious surface area	Does the project decrease the total impervious surface area?	
Tree Canopy	Tree canopy coverage	Does the tree canopy coverage in the project area (census tract) cover 30% of the area?	American Forests Tree Equity Score

Park Access	Percentage of residents living within a 10-minute walk to a park	<p>What percentage of city or neighborhood residents reside within a 10-minute walk to a park?</p> <p>What percentage of city residents of color reside within a 10-minute walk to a park?</p> <p>What percent of low-income households are within a 10-minute walk to a park?</p>	TPL ParkScore
Bike Parking	Number of bicycle parking spots available	<p>How many bicycle parking spots are provided per 10,000 residents?</p> <p>How many bicycle parking spots are provided per 10,000 feet of public space?</p>	
Bus Lanes	Linear feet of bus lanes	Are priority bus lanes installed in high traffic areas?	
Bus Speeds	Miles per hour (mph)	<p>What is the average bus speed?</p> <p>How do bus speeds compare to private vehicle speeds?</p>	
Protected Bike Lanes	Linear feet of protected bike lanes	Does the project introduce protected bike lanes?	
Traffic Volume	Count of vehicles at roadways within 500 meters	<p>Have traffic calming measures been introduced in the surrounding area?</p> <p>Does the project reroute traffic volume away from housing and schools?</p>	Climate and Economic Justice Screening Tool
Public Seating		<p>Does the design add public seating?</p> <p>Does 50% of seating have backs to provide comfort and accessibility?</p> <p>Is accessible companion seating provided?</p>	

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