

An aerial photograph of an urban area. A multi-lane highway runs vertically through the center. To the left of the highway is a large parking lot filled with cars. To the right is a park with a green field, a playground with blue and red equipment, and a row of trees. Buildings and more parking areas are visible in the background.

# MITIGATING THE DAMAGE FROM HIGHWAYS IN URBAN AREAS

CREATED BY  
**RECONNECT AUSTIN**  
FOR DISTRIBUTION AT  
**CNU 29: DESIGN FOR CHANGE**  
MAY 20, 2021



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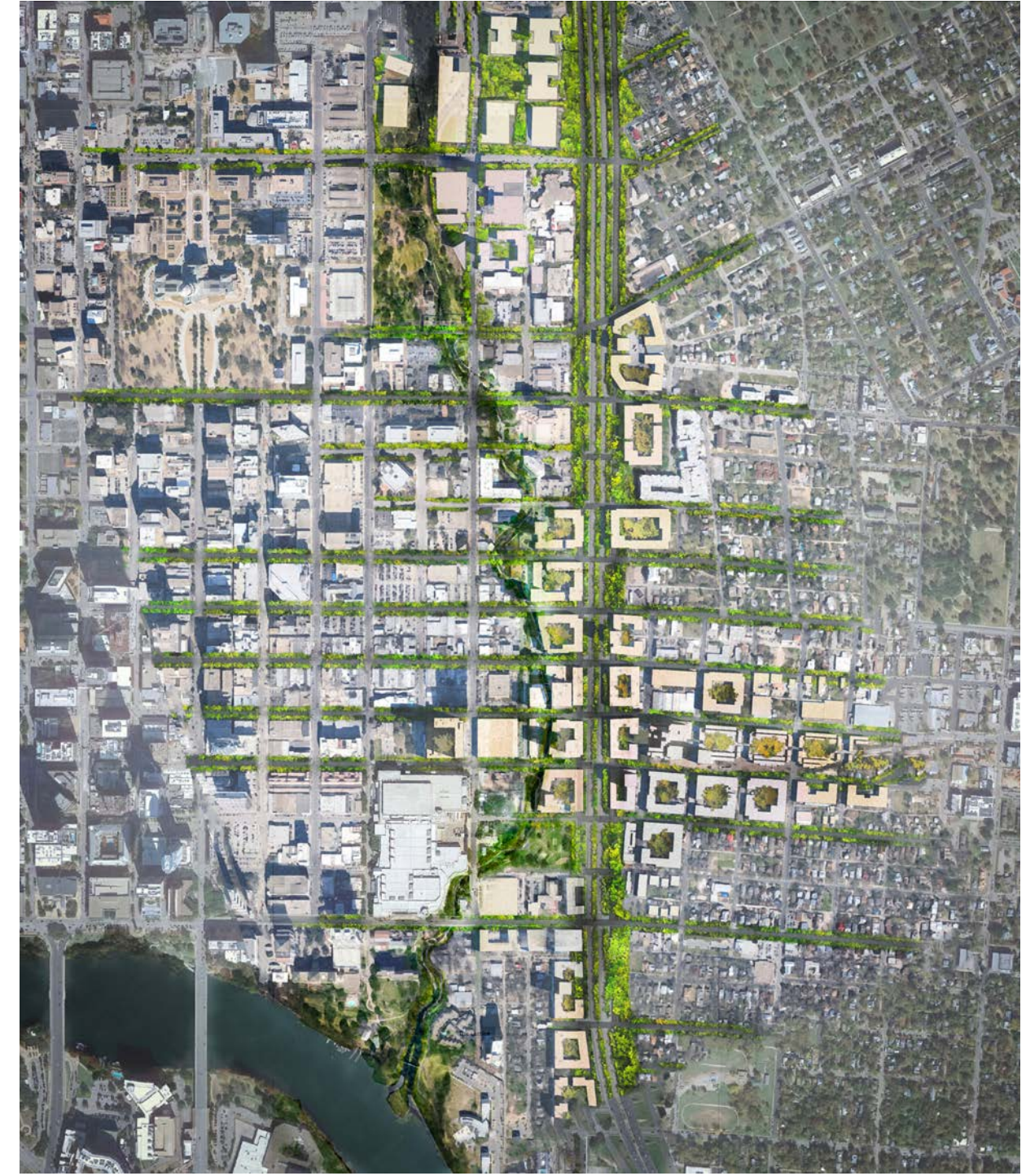
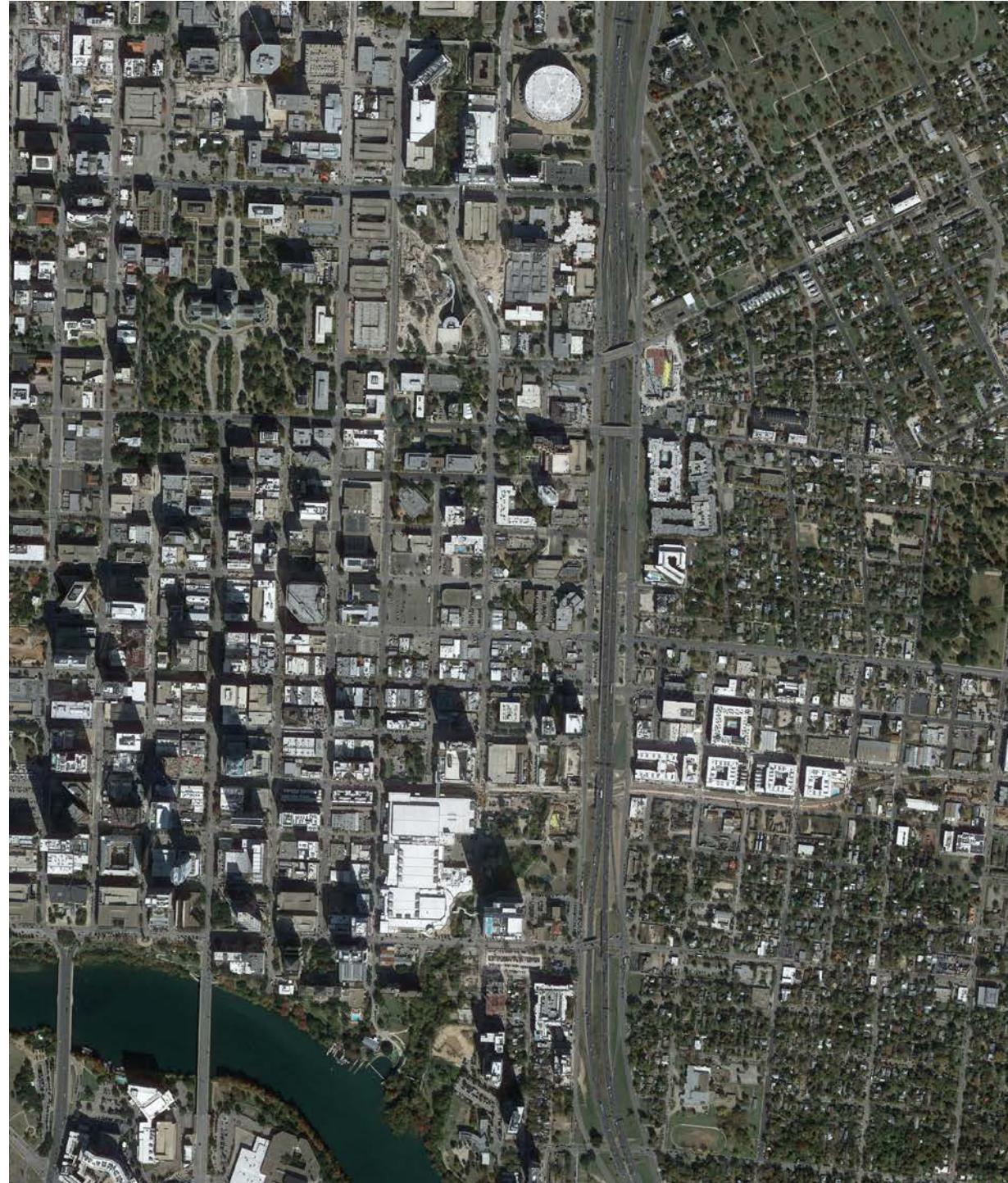
# INTRODUCTION

Reconnect Austin is part of a long and varied history of highway removal and renovation projects in the US and around the world. As early as the 1960s, people living near urban highways began to question the necessity of heavily polluting, high-speed, dangerous freeways that cut through downtowns. The first of these projects in the US was Portland's Harbor Freeway, now a public park connecting downtown to the revitalized waterfront. Since then, these types of highway renovation projects have become exceedingly popular. Again and again, city residents and designers successfully create beloved public space out of failing highway infrastructure. Business-as-usual suggests that these projects

should have simply expanded the highways in question with little regard to alternative uses for that space. But repeated challenges to the status quo have resulted in some of the most famous and beloved public spaces around the world. Reconnect Austin hopes to continue this legacy with its vision for I-35.

This report aims to showcase the rich history of these projects. Each one is a precedent for Reconnect Austin's proposal regarding I-35 through Central Austin. The projects range from around the US and the world, and were completed as early as 1978 and as recently as 2018. They cover highway demolition and rerouting, highway-to-boulevard programs,

cut-and-caps, and more. Our intent with this report is to demonstrate the success that results from challenging business-as-usual in the course of urban highway construction and maintenance. As of May 2021, the Texas Department of Transportation (TxDOT) proposes to expand I-35 to 20 lanes as it cuts through downtown Austin. We can follow in the footsteps of Seoul, Portland, and Madrid in improving our city by challenging the necessity of our urban highway. TxDOT can recreate their success with the Klyde Warren Park in Dallas. We have a massive opportunity before us - let's do the right thing.







HIGHWAY REMOVAL PRECEDENTS COVERED IN THIS REPORT

1. Alaskan Way Viaduct	Seattle	US
2. Harbor Freeway	Portland	US
3. Klyde Warren Park	Dallas	US
4. Gateway Arch National Park	St. Louis	US
5. Pompidou Expressway	Paris	France
6. Madrid Rio	Madrid	Spain
7. Seoullo 7017	Seoul	South Korea
8. Cheonggyecheon Expressway	Seoul	South Korea

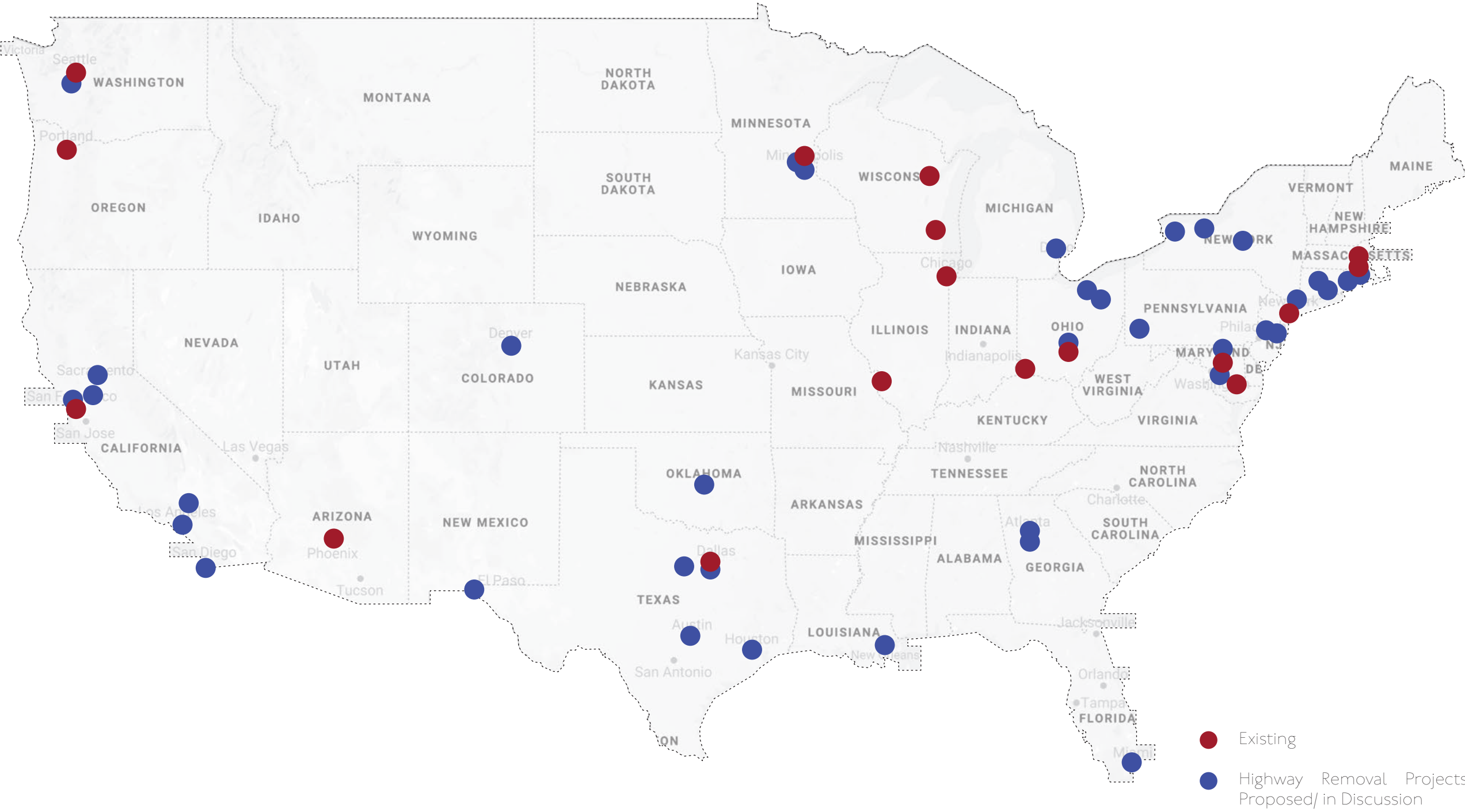


HIGHWAY REMOVAL PROJECTS PROPOSED/ IN DISCUSSION

I-5	San Diego	CA
I-280	San Francisco	CA
I-980	Oakland	CA
Route 710	Pasadena	CA
U.S. 101 in Downtown	Los Angeles	CA
W Sacramento Freeway	Sacramento	CA
I-70	Denver	CO
Route 34	New Haven	CT
Aetna Viaduct	Hartford	CT
Whitehurst Freeway	Washington	D.C
I-395/Overtown Expressway	Miami	FL
Downtown Connector	Atlanta	GA
Midtown Connector	Atlanta	GA
Claiborne Corridor/I-10	New Orleans	LA
Route 79	Fall River	MA
I-170	Baltimore	MD
I-375	Detroit	MI
I-35	Duluth	MN
I-94	St. Paul	MN
I-94	Minneapolis/St.Paul	MN
I-40	Oklahoma City	OK
I-579	Pittsburgh	PA
I-95	Philadelphia	PA
Route 29	Trenton	NJ
Sheridan Expressway/I-895	New York City	NY
Routes 5 & 98	Buffalo	NY
Inner Loop	Rochester	NY
I-81	Syracuse	NY
Innerbelt	Akron	OH
West Shoreway	Cleveland	OH
I-280	Columbus	OH
I- 195	Providence	RI
I-35	Austin	TX
I-35	Dallas	TX
I-30	Dallas	TX
I-345	Dallas	TX
I-45	Houston	TX
I-10	El Paso	TX
I-30	Fort Worth	TX
I-5	Seattle	WA

EXISTING PROJECTS

I-10	Phoenix	AZ
Embarcadero Freeway	San Francisco	CA
Capitol Crossing	Washington	DC
Millennium Park	Chicago	IL
I-90	Boston	MA
Central Artery	Boston	MA
US 40	Baltimore	MD
I-35 W,	Duluth	MN
Cap and a Stitch	St. Louis	MO
Park Avenue	NYC	NY
Fort Washing Way	Cincinnati	OH
I-280	Columbus	OH
Harbor Drive	Portland	OR
Woodall Rodgers Freeway	Dallas	TX
Park East Freeway	Milwaukee	WI
Route 99	Seattle	WA





# ALASKAN WAY VIADUCT SEATTLE, USA

The State Route 99 Alaskan Way Viaduct was an elevated highway that cut between downtown Seattle and the waterfront. From its construction in 1953 until 2019, it was an eyesore and a major dividing line in Seattle.

In 2001, the viaduct was damaged by an earthquake and spurred a rethinking of the highway that would maximize safety and prevent damage from future earthquakes. The eventual replacement project diverted all traffic from the elevated Alaskan Way Viaduct into a new underground double-decker tunnel called SR99, which ran under downtown Seattle along roughly the same route. The elevated highway was demolished in favor of developing new public space along the downtown Seattle waterfront. The SR99

tunnel opened successfully in February 2019.

Most notable about this project was the three-week period between the closure of the highway for demolition and officially opening the tunnel. The Alaskan Way Viaduct had carried an average of 90,000 cars a day. Traffic engineers warned of massive congestion throughout those three weeks, referred to by engineers as the “Period of Maximum Constraint,” and by residents as “Viadom.” But on Day One of highway closure, there was no added congestion. For the entire three weeks, traffic in Seattle operated at normal levels. Rather than sit in traffic along alternative routes to the Viaduct, commuters temporarily moved onto bikes and transit. The predicted 90,000

car pileup was nowhere to be seen.

Seattle was experiencing the Law of Induced Demand: “increasing roadway capacity encourages more people to drive, thus failing to improve congestion” and its inverse: when you decrease roadway capacity, you encourage more people not to drive, and travelers will use alternative transportation (walk, bike, transit) instead. (Schneider 2018)

Austin can learn from Seattle and their demonstration of induced demand. Building more lanes won’t fix congestion, it will create more traffic in those new lanes. Removing lanes won’t worsen congestion, it will encourage people to walk/bike/use transit.













# SEOULLO 7017

## SEOUL, SOUTH KOREA

Not all highway renovation projects require complete removal of the highway and construction of an alternative route or bypass. A project in Seoul, South Korea called Seoulo 7017 renovated existing highway infrastructure to create new pedestrian infrastructure.

The project is centered on a mile-long section of elevated highway through the center of Seoul. The highway was built in 1970 and, in 2006, was slated for demolition due to structural integrity concerns. Instead of rebuilding or expanding the highway, it was repurposed as an elevated linear pedestrian walkway inspired by the High Line in New York City. The new public park was opened in May 2017.

The 55 ft high linear park is decorated with over 24,000 plants in concrete planters,

and offers a close up view of Sungnyemun Gate, a historic Korean landmark built in 1398. Colored lights along the walkway illuminate it at night. Like the High Line, it serves as both a pedestrian pathway and a unique destination. It offers a car-free transportation route for commuters using the nearby Seoul Station, and hosts amenities such as food and tea vendors for tourists and local visitors.

Seoul's so-called "Hanging Garden" is a fantastic example of repurposing space for cars as space for people. What was previously a polluting, unseemly highway that only served cars became a safe, colorful, green space for pedestrians – and a beloved Seoul destination.

What would Seoul be today without Seoulo 7017? Or NYC without the High Line? Or

Madrid without Madrid Río? Highways hurt cities. But they aren't the end – Seoul successfully repurposed their highway through the center of the city.







BEFORE



AFTER



Seoul Station Overpass, which was built in 1970, will be transformed into Seoul's new landmark in 2017, including 645 tree pots, 18 amenities, a host of rest places and 17 pedestrian paths.



#### Toward jungnim-dong

Install a branch-shaped passage linking the walkways and jungnim-dong



#### Malli-dong Park

Turn former parking lot for garbage trucks into an area for rest and relaxation



#### Rose Garden

Plant many varieties of continuous bloom roses and use the square as an event hall or a rest place



#### Elevator at SeoulStation Square

Install an elevator next to the Seoul Station police box providing access to the walkways



#### Escalator and Elevator on Road to Toegye-ro

Install an escalator and an elevator on the road to Toegye-ro, linking the underground, the road and the overpass



#### Connecting to Hanyangdoseong

Install an elevator leading to Namsan flyover connecting the overpass to Hanyangdoseong and Namsan



#### Connecting to Hoehyeon subway station

Provide direct access to and from the overpass and Hoehyeon Subway Station with an elevator



#### Connecting to surrounding buildings

Connect the overpass and surrounding buildings to enhance accessibility



#### Seoul Station Square Renovation

Spread urban vitality to neighboring areas from Seoul Station which is frequented by 390,000 citizens every day

#### Floor Plate

Preserve the old overpass rail designated as cultural assets

#### Observatory

Installing an observatory at a magnificent view point

#### Toward Cheongpa-dong

Install stairs leading to Cheongpa-dong and crosswalks linking Seoul Station's western entrance and Malli-dong Park

MAP OF SEOULLO 7017 : RELEASED BEFORE ITS OPENING, SHOWING KEY FEATURES OF THE PROJECT AND CONNECTIONS TO THE SURROUNDING AREA



# CHEONGGYECHEON EXPRESSWAY

## SEOUL, SOUTH KOREA

Seoul, South Korea has received international acclaim for its Cheonggyecheon Stream Restoration Project.

Today, a beautiful creek and linear urban park run through Seoul's Central Business District. But from 1950 to 2005, the creek was paved over and the elevated Cheonggyecheon Freeway divided the city.

In an effort to reunite the city and improve connectivity across the Cheonggyecheon Freeway corridor and restore the natural stream, in 2005 Seoul municipal leaders demolished the elevated freeway and built in its place a below-grade urban park. The park features the restored stream with sidewalks on both sides below street level and uncovered. It also features 22 bridges across the stream: 12 for pedestrians and 10 for cars.

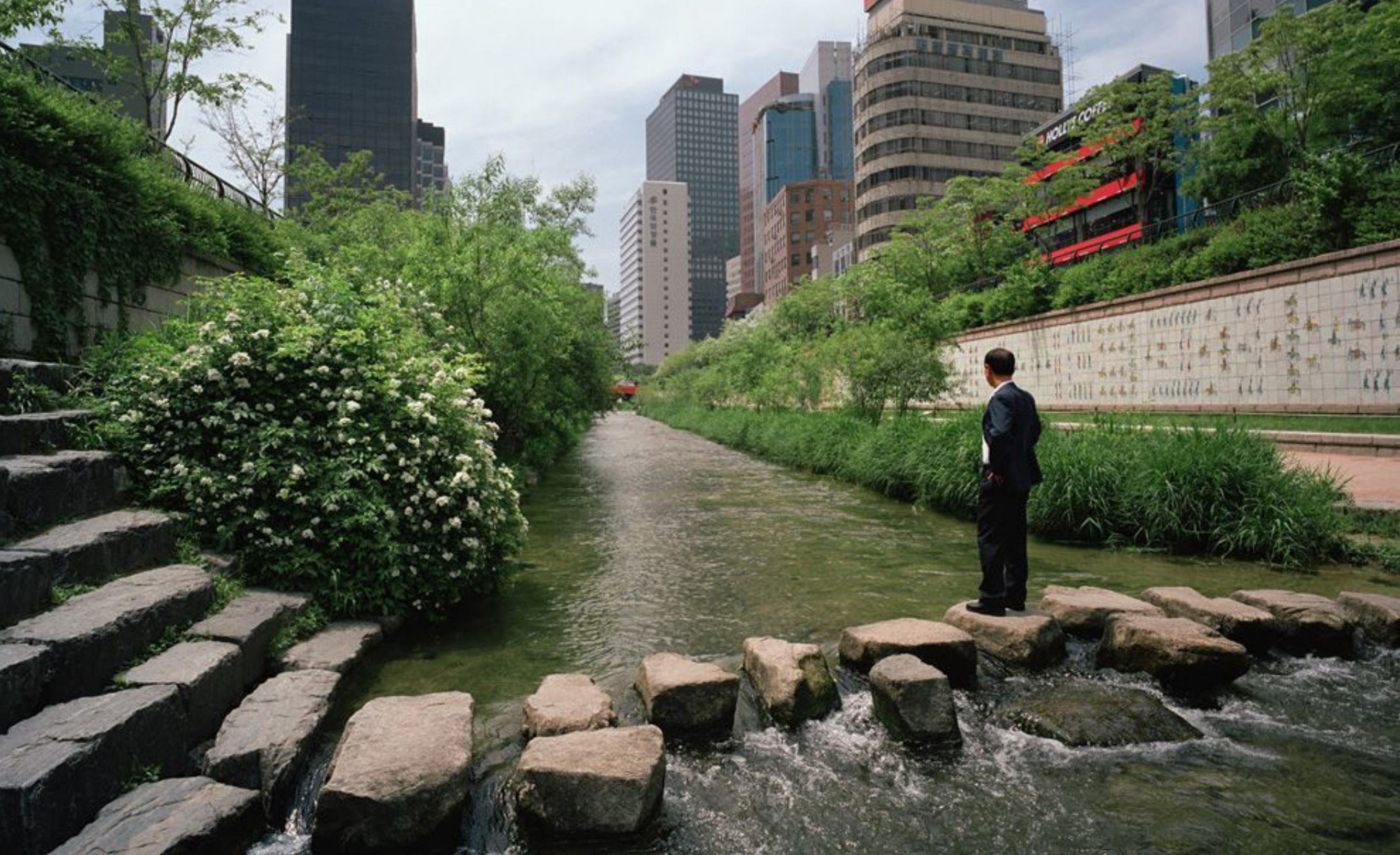
When the project was proposed it sparked predictions of traffic congestion throughout the city, as the expressway had previously carried 170,000 cars a day. In an effort to minimize the expected additional vehicular traffic, car use was discouraged in downtown Seoul and transit was expanded. Both bus and subway ridership increased, particularly in the area surrounding the new park.

Cheonggyecheon is now a popular destination for locals and tourists alike. It provides much needed and widely appreciated green public space in an otherwise heavily urban area, with added economic and environmental benefits including:

- ♦ mitigating the urban heat island effect;
- ♦ increasing nearby property values;
- ♦ increasing area biodiversity by over 600%;

- ♦ and reducing small particle air pollution.

The Cheonggyecheon Stream Restoration Project removed an elevated highway and successfully reunited the city center. It has become an internationally-known highway removal project, and is circulated widely as a powerful visual reminder of what can be done with space currently occupied by highways.







CHEONGGYECHEON (STREAM) BEING PAVED OVER FOR  
CONSTRUCTION OF THE ELEVATED FREEWAY



ELEVATED HIGHWAY OVER THE PAVED STREAM,  
1968-2003





TOURISTS AND LOCALS ENJOY THE COMPLETED  
CHEONGGYECHEON, OPENED IN 2005



# POMPIDOU EXPRESSWAY

## PARIS, FRANCE

Recent visitors to Paris, France have likely experienced the relatively new sidewalks bordering the Seine, which connect pedestrians to the river. The below-grade extra wide sidewalks are accessed via stairs down from street level, and are dotted with outdoor seating, cafes, street vendors, and small docks from which visitors can partake in boat tours of the city.

Those sidewalks didn't always exist. The concrete 'riverbanks' used to be a street called the Pompidou Expressway, built in the 1960s by then-President Georges Pompidou. Construction of the expressway paved over the grassy banks of the Seine running through downtown Paris, and built a two-lane road carrying 43,000 cars a day through the city. In the early 2000s, Paris Mayor Delanoë experimented with closing the expressway to cars and opening it only to pedes-

trians. He also introduced the wildly popular Paris Plages, a man made beach event on the 'banks' that has since become a recurring annual tradition in Paris and has garnered international attention.

The closure to cars was made complete and permanent by Mayor Anne Hidalgo in 2019 as part of the Paris Breathes initiative to minimize car use and air pollution. The pedestrianization of the Pompidou Expressway was noted as an act of Parisians "taking back the Seine" (Hickman 2019). The project is one of many Paris is implementing to reduce Parisian dependence on cars, including car-free days and a pledge to become a "15 Minute City" where residents can access all daily needs within 15 minutes of their homes (O'Sullivan 2020).

Paris' closure of the Pompidou Expressway is a testament to creating public space.







POMPIDOU EXPRESSWAY, 1960-2019



POMPIDOU EXPRESSWAY AFTER ITS CONVERSION TO A PEDESTRIAN AND BICYCLE PATHWAY, OPENED 2019





BIODIVERSITÉ  
ET ÉDUCATION  
EN FRANCE ET  
DANS LE MONDE

Ateliers de sensibilisation  
pour les enfants de 10 à 14 ans  
Tous les jours de 14h à 18h  
Inscriptions sur place



# HARBOR FREEWAY

## PORTLAND, USA

Portland, Oregon's Harbor Drive has been widely lauded as the first intentional urban freeway removal in the United States.

Opened in 1950, Portland's Harbor Drive was a four-lane highway dividing downtown Portland from the Willamette River waterfront. It started as a route for trucks to get through Portland, but as other highways were built, trucks could bypass downtown and Harbor Drive traffic subsequently decreased. In the late 1960s, the state Highway Department wanted to expand the freeway.

Then-Governor Tom McCall, a staunch environmentalist, supported removal of the freeway in favor of a park. He halted expansion and pushed for more citizen input in the project. Not without push-back from traffic engineers, Governor McCall and the citizen groups were eventu-

ally successful, the freeway was removed, and the park opened in 1978. In 1984, it was renamed the Tom McCall Waterfront Park - decades which

The park has since been expanded and now covers several miles of Portland's downtown waterfront, providing much-loved greenery in a heavily urban area. It is a major attraction and event site in the city, and has been credited with kickstarting the revitalization of downtown and the waterfront.

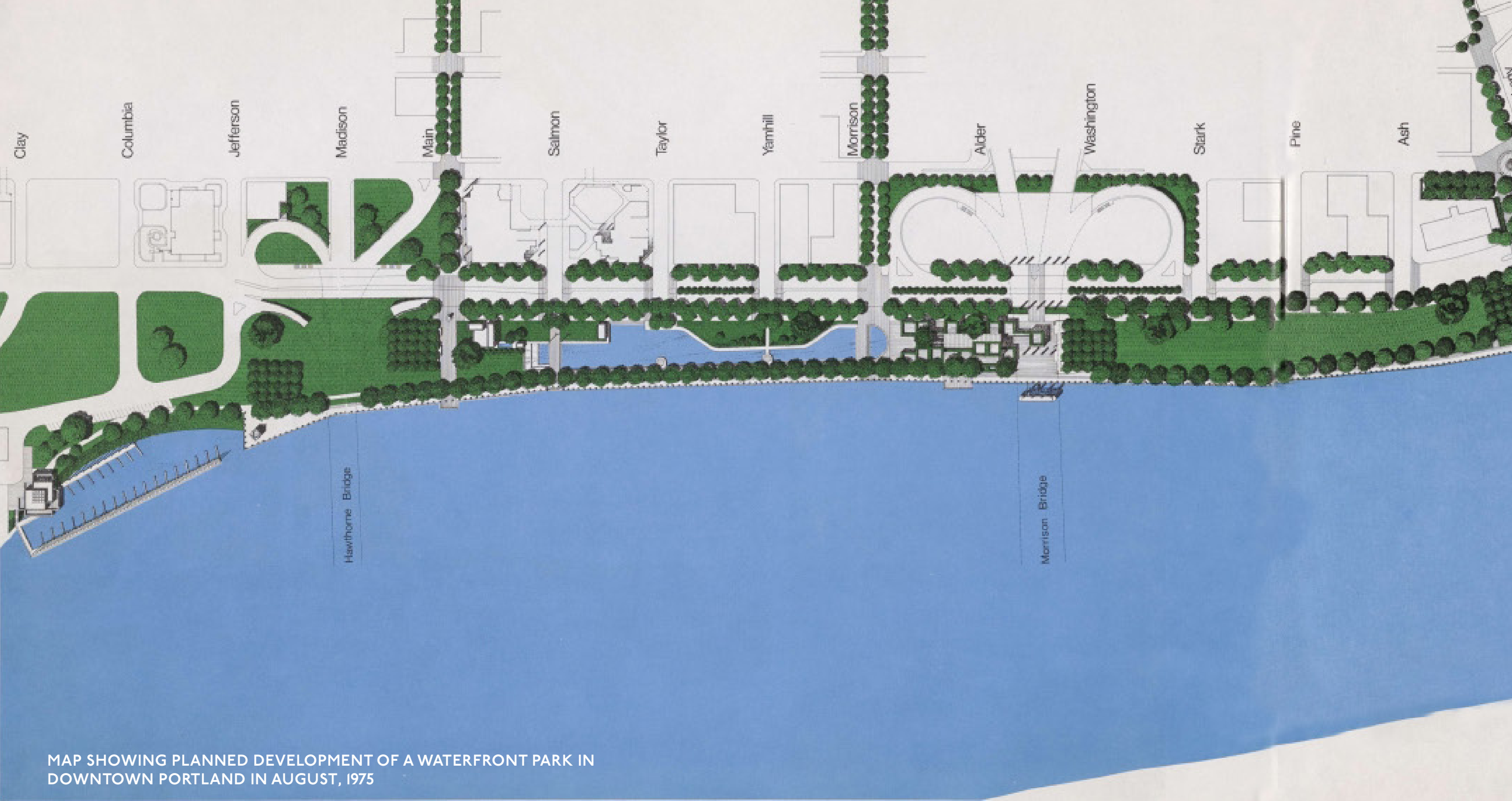
Portland's Harbor Drive was the first intentional removal of a major highway in the US. It was revolutionary, setting the stage for later highway removals at a time when most interstate and urban highways were still being constructed. Mid-century highway construction had little to no regard for the communities in which highways were built. Portland saw the dam-

age this caused, and fought back to save their city. Their foresight gave them decades to enjoy the Tom McCall Waterfront Park - decades which would otherwise have been clouded with pollution, traffic, and safety issues along the freeway.

HARBOR FREEWAY, 1950S







MAP SHOWING PLANNED DEVELOPMENT OF A WATERFRONT PARK IN DOWNTOWN PORTLAND IN AUGUST, 1975



AFTER

BEFORE







**MADRID RÍO**  
MADRID, SPAIN

Madrid Río is perhaps the closest international example to Reconnect Austin's proposal for I-35, and has been wildly successful.

In the 1970s, the M30 ring motorway was built through downtown Madrid. Construction of the motorway had the twofold effect of dividing downtown and separating residents from the Manzanares River waterfront.

The Madrid Río project was officially launched in 2008, and opened to the public in 2015. It lowered the M30 highway underground and capped it with a 10 km long park, much like Reconnect Austin imagines for I-35 in downtown Austin.

Madrid Río is now a much loved destination in the center of Madrid. The massive new park has 17 playgrounds for kids, trails for bikes, pedestrians & rollerskaters, food and drink vendors,

and a 'beach' area. The park contains thousands of new plants, giving the people of Madrid massive, green public space in urban downtown. "Where before there was noise, pollution, and cars, now you'll find miles and miles of walkways lined with trees, flowers, and shrubs" (ACCIONA).

Perhaps the greatest beneficiaries of the project are residents living along the newly restored riverfront, who are no longer suffering from the M30's air and noise pollution.

Madrid Río successfully reunited the city across its former highway barrier and created green public space by lowering and capping the M30.







BEFORE



En virtual del entorno del Parque de la  
la, realizada por el equipo Río de la  
Madrid Río, y pendiente de aprobación  
del proyecto de urbanización.

AFTER







# GATEWAY ARCH NATIONAL PARK

## ST. LOUIS, USA

One of the most recent highway renovation projects in the US is St. Louis, Missouri's Gateway Arch National Park, completed in 2018.

The new park built upon and revitalized the Jefferson National Expansion Memorial, which included St. Louis' most famous landmark: the Gateway Arch. The Arch was built in 1965 as the "Gateway to the West" to celebrate the Louisiana Purchase and Lewis & Clark's explorations into the Western United States.

The original location of the Gateway Arch was platted in the 1940s, and construction was completed in 1965. During that time, the western border of the park (Third St) was developed into Interstate 70 (now I-44). The highway was justified as a way to increase tourism from out-of-town visitors to the Arch. Construction of I-70 hurt downtown greatly, dividing it from

the Mississippi River waterfront and bulldozing historic neighborhoods for construction.

Even at the time of construction it was clear that dividing the park from downtown with a highway would damage the area. In 1976, Ada Louise Huxtable wrote that "cars come and go...with block-long garages filling and emptying, but no one lingers...because there is nothing to linger for. It is a dull, desolate, computerized commercial landscape" (Lange 2018). Until 2018, I-70 cut off downtown St. Louis from the Gateway Arch and the surrounding park. The below-grade section of the highway next to the Arch could be crossed at the surface by only two small pedestrian footbridges.

In 2018, the revitalized Gateway Arch National Park was opened. It included a cap over the section of the highway

(now I-44) next to the park, creating a wide land bridge for pedestrians and keeping high-speed traffic separated from park visitors.

The new park covers 91 acres and includes 5 miles of trails for visitors to explore. New trees and greenery create a lush natural environment around the arch. The old parking garage was turned into an amphitheater for public events held at the park. Dan Kiley, the landscape architect for the Jefferson National Expansion Memorial in the 1960s, wanted the park to "break down the monumentality [of the Arch] to the human scale, to the pedestrian scale," but for many years was overruled (Lange 2018). Thankfully, as of 2018, his vision was realized.

St. Louis' Gateway Arch National Park is a beautiful, open urban park serving residents and tourists alike. Half a cen-

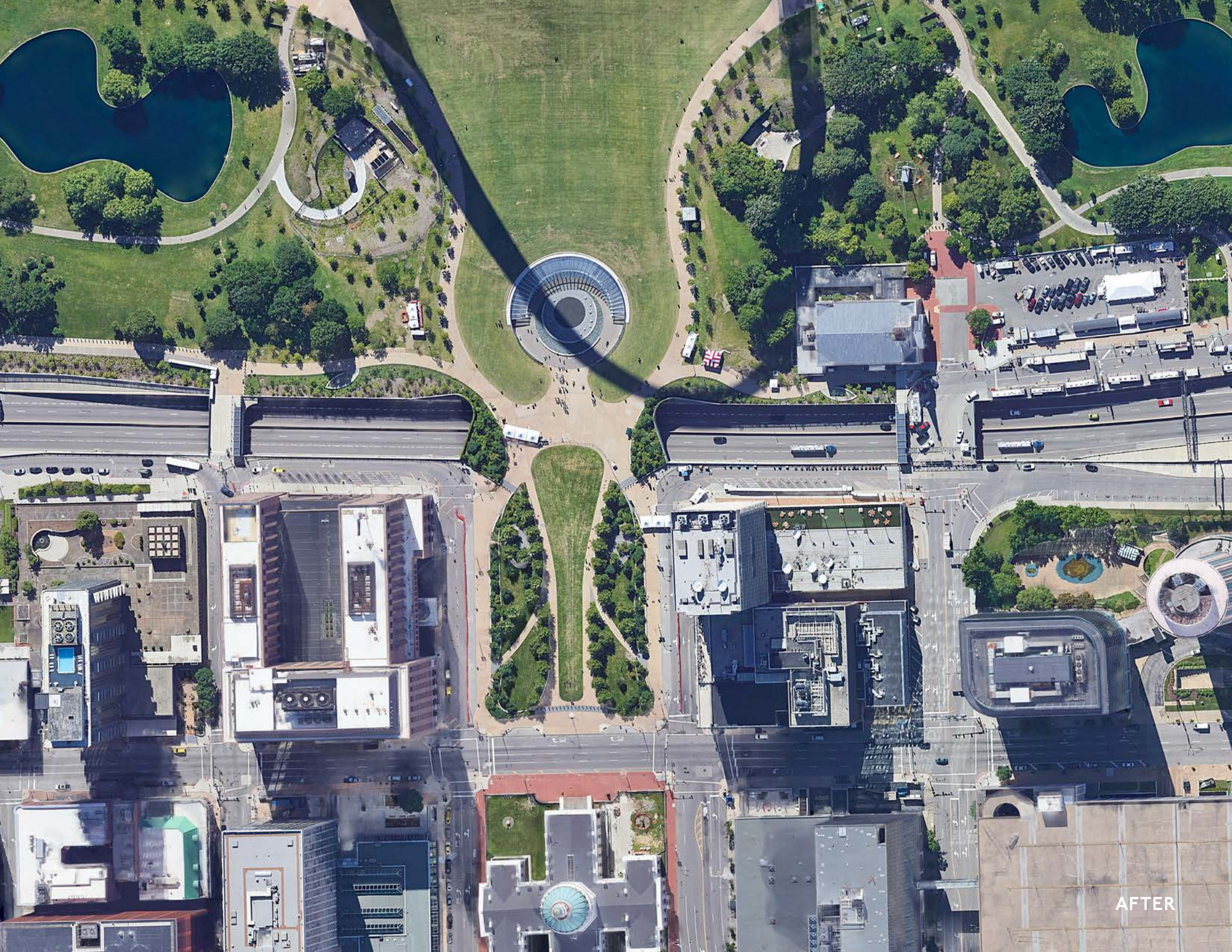
tury later, it finally achieved its goal of creating monumental space at a human scale - by promoting pedestrian infrastructure instead of vehicle infrastructure. It was clear in the 1970s that building a highway through downtown St. Louis was harmful, and they built it anyway. 50 years later they covered the highway in favor of public park space. St. Louis demonstrated that it is never too late to make the right choice.







BEFORE



AFTER







# KLYDE WARREN PARK

## DALLAS, USA

Klyde Warren Park was built on a three-block cap of the below-grade Woodall Rodgers Freeway in downtown Dallas. Opened in 2012, it spans 3 city blocks and connects downtown Dallas to Uptown and the Arts District. Construction required capping the section of the Woodall Rodgers Freeway that would become the park, effectively creating a tunnel for that section of the highway.

The highway was built below-grade in the 1960s. It was a feat of engineering to successfully cap an already below-grade highway, because typically when highways are cut and capped, the highway depression is designed with a cap and support structures in mind. Building the new cap on an already depressed highway required creative solutions for supporting the weight of the cap above the freeway with limited infrastructure and matching grade

elevations between the park and the frontage roads, which were necessary to “eliminate the barrier of the highway trench” (Nielsen 2012).

The cap also had to deal with supporting the weight of park trees, soil, water and gas lines, telephone lines, and so forth. Root repellent was used to minimize tree root growth, which if undeterred could create cracks in the concrete support structure.

The area “has changed from an inhospitable, no-man’s land to a pretty comfortable space” (Nielsen 2012). A variety of plants help minimize air and noise pollution, and mitigate the urban heat island effect. The park attracts over a million visitors annually, including tourists and Dallas residents. It has transformed downtown Dallas, bringing foot traffic and economic development to the area. And TxDOT was instrumental in its

construction.

The park was funded by a masterful public-private partnership, which included bonds from the City of Dallas, highway funds from TxDOT, federal stimulus funds, and private donations. Klyde Warren Park is proof that TxDOT can support projects that benefit cities and help repair the damage done by urban highways. With TxDOT’s help, Klyde Warren Park reunited downtown Dallas over the barrier trench of the Woodall Rodgers Freeway.













# CONCLUSION

The phrase “urban highway” is an oxymoron. A highway can never truly be urban. There is an inherent conflict between the existence of a highway and the existence of a safe, walkable, friendly neighborhood. Thankfully, cities around the world are learning how to mitigate the damage caused by highways in urban areas. Seoul has repurposed existing highway infrastructure in ways that prioritize pedestrians and transit users; Madrid and St. Louis have shifted highways underground so that the surface area can be reclaimed as safe, friendly, and walkable for visitors and tourists alike.

It is easy to pretend that highways in urban areas have always existed, and that they are necessary. Over and over again, the world learns that they are not. Fears of “Via-doom” in Seattle failed to

materialize precisely because highways are not necessary when transit and multimodal transportation options exist. The world is undergoing a paradigm shift in how we think about and value “urban” highways. The projects collected in this report demonstrate that highways in urban areas are not permanent, necessary, or the only option for high capacity transportation. There are alternatives to highways that are safer, more efficient, more interesting, more sustainable, more environmentally friendly, beneficial to the surrounding neighborhoods, and that support multimodal infrastructure. As we contemplate building new highways and repairing existing ones, let’s embrace this opportunity to truly rethink if a highway is what is best for our cities. We can make a different set of choices. Portland learned early on that a

highway cutting through their city would only cause damage, and 50 years later they continue to benefit from that lesson and the subsequent actions taken. We have an opportunity to do better. Let’s take it.





**BUFFALO**  
ROUTES 5 & 98



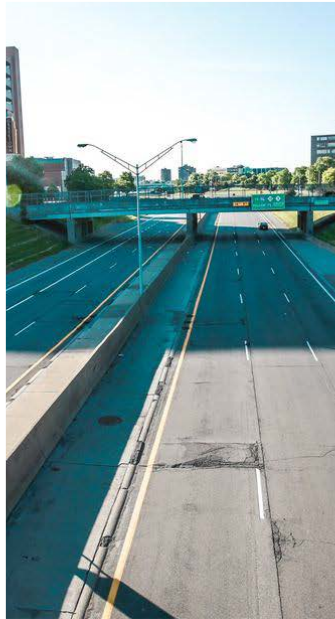
**DALLAS**  
I-345



**DENVER**  
I-70



**DETROIT**  
I-375



**OAKLAND**  
I-980



**PASADENA**  
ROUTE 710



**NEW YORK**  
INNER LOOP ROCHESTER



**SAN FRANCISCO**  
I-280



**NEW YORK**  
IS-81



**TRENTON**  
ROUTE 29



**DALLAS**  
WOODALL RODGERS FREEWAY





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