A FREEWAY-FREE SAN FRANCISCO

THE CONGRESS FOR THE NEW URBANISM

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EXECUTIVE SUMMARY

Of all North American cities, San Francisco is the most commonly cited example of how urban freeways can be removed successfully. The City by the Bay has earned high marks in using surface streets and transit in place of freeways to better move people, goods, and services, and improve the vitality of neighborhoods.

When the 1989 Loma Prieta earthquake inflicted heavy damages on San Francisco's double-decker Embarcadero Freeway, the California Department of Transportation (Caltrans) intended to rebuild the expressway, warning that the freeway's closure would generate chronic traffic congestion problems.

Then San Francisco Mayor Art Agnos proposed an alternative plan: demolish the elevated, decades-old Embarcadero and replace it with a pedestrian-friendly boulevard and streetcar line. Political support was consolidated, and the Embarcadero—along with parts of the similarly damaged Central Freeway—came down.

In both cases, the results were spectacular. Predicted traffic problems failed to materialize, and in some areas congestion actually improved. Meanwhile, thriving development filled in the newly available land, transit ridership increased, and the neighborhood's historic Ferry Terminal—a San Francisco landmark—was reconnected to its surroundings

A Freeway-Free San Francisco explores the following question: If the Embarcadero and Central Freeway demolitions achieved success, could the same benefits result from replacing other urban freeways? If San Francisco were to remove more freeways, what strategies will generate the most success—and which stretches of road might be removed first?

Today, cities across the world look to San Francisco as a model for strategic urban freeway removal. Vancouver, British Columbia, a city entirely without freeways in its urban core, offers a contrasting example. Vancouver lacks freeways but does boast twin mile-long viaducts—vestiges of a freeway system that was never built—that serve little practical purpose, divide neighborhoods, and limit waterfront access. Planning for their removal has offered Vancouver an opportunity to, once again, think differently about streets and infrastructure.

Building on the experiences of both cities, *A Freeway-Free San Francisco* outlines practical steps for replacing freeways with surface streets and how those steps could help San Francisco, and, by example, other cities. This report applies lessons from the Congress for the New Urbanism's extensive urban thoroughfares work, as chronicled in reports and books like *Civilizing Downtown Highways: Putting New Urbanism to Work on California's Highways* and *Designing Walkable Urban Thoroughfares: A Context-Sensitive Approach*.

When removing freeways, context-sensitive design and the reconnection of a fine-grained network of streets and blocks are critical. Multiway boulevards can be utilized to provide high-capacity travel lanes in the center and slow-speed, low-volume side lanes that support street life.

The phased freeway-removal strategy recommended by this report is designed to be realistic. Each step, beginning with the removal of the I-280 spur, will produce dramatic visible benefits that will build public momentum for the next. Technical and political feasibility are a high priority. Later phases are paired with recommendations for strategic transit investments, intended to improve regional connectivity and provide a backbone for infill development.

The people of San Francisco, who are lucky enough to reside in one of the most beautiful cities in the world, deserve a safer, healthier, and more livable urban future—without sacrificing affordability or neighborhood character. A Freeway-Free San Francisco is designed to help reconnect isolated neighborhoods, reduce pollution and congestion, and open new physical opportunities for market-rate and affordable development in the city's urban core. With these steps, San Francisco could position itself as a model of forward-thinking transportation policy for cities around the world.

INTRODUCTION

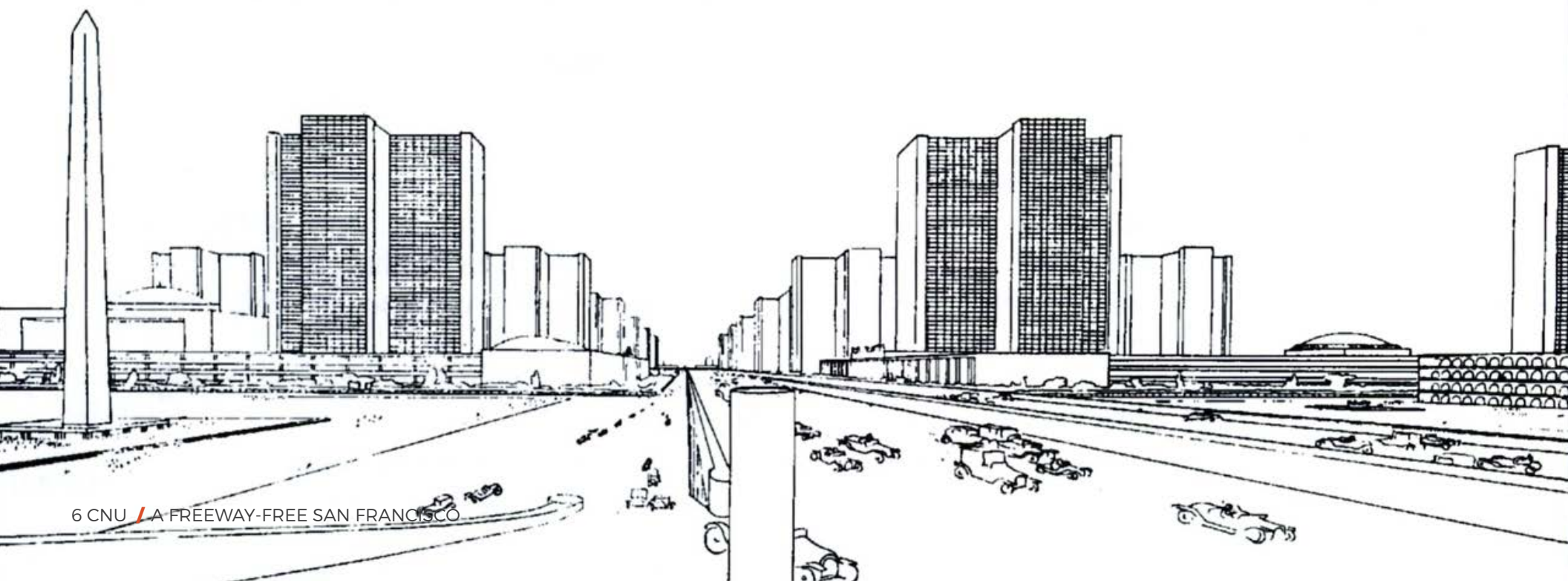
For Americans in the early 20th Century, driving a motor vehicle through a city without having to stop or even slow down must have been a thrilling idea. Le Corbusier, the famous architect and leader of the modernist design movement, even drew the grade-separated road into his "City of Tomorrow" plan for Paris.

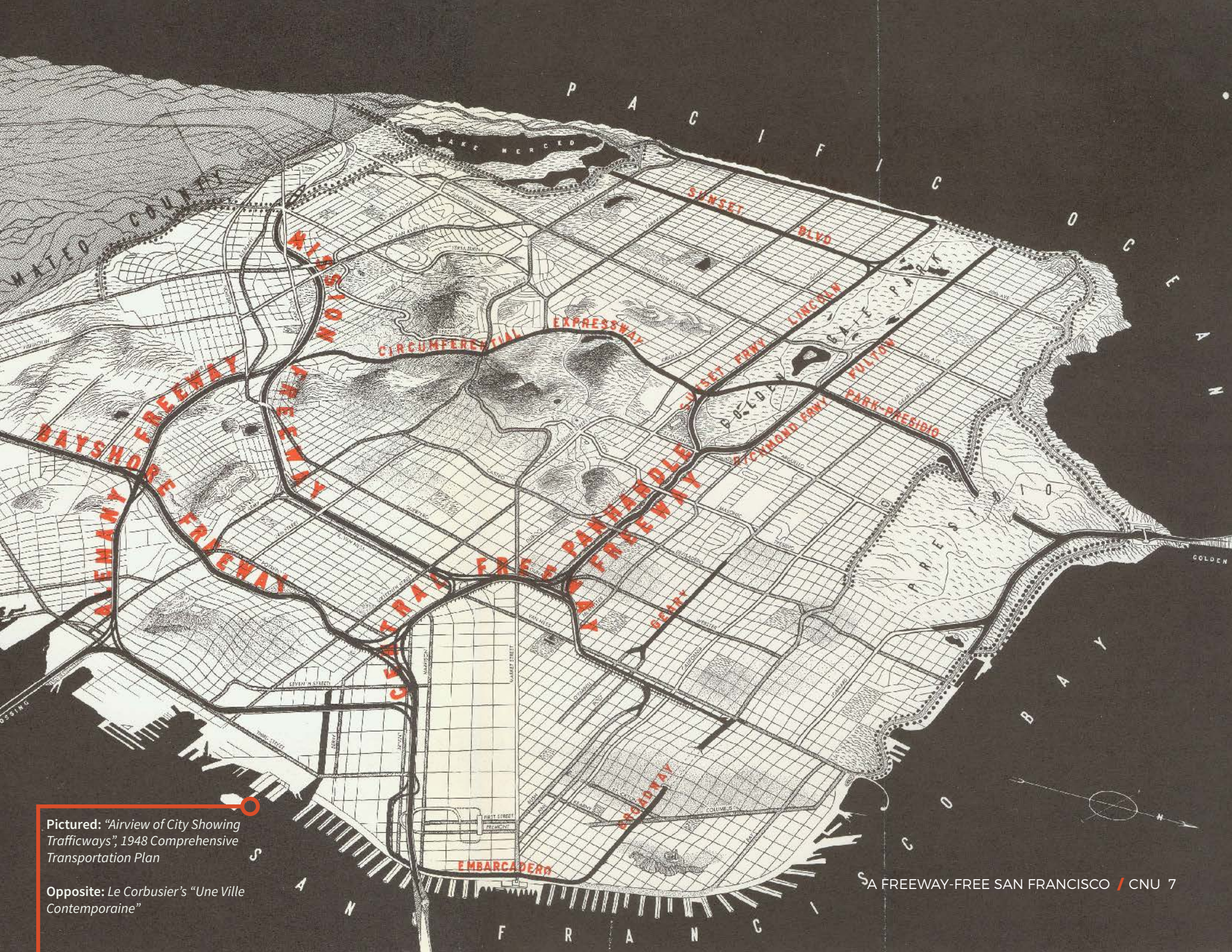
Accommodating two new forms of technology—the steel reinforced high-rise building and the automobile—Corbusier created a vision that eventually materialized worldwide and especially in the United States during the highway-building era of 1950s and 1960s. Traditionally, urban streets had served three purposes: movement, a setting for commerce, and social interaction. The new high speed, limited access roads reduced the purpose to just one: the movement of motor vehicles.

For a variety of reasons, European governments tended not to build grade-separated highways within the dense complexity of the city, but rather built them between cities. Thus, the autobahn connects Hamburg and Berlin, but as it approaches the city center it disperses into the city's network of surface avenues and streets.

In America, highways, freeways, expressways, and interstates have penetrated all major cities—some more than others. In places like Cincinnati, Atlanta, and Dallas, urban freeway building encountered little resistance. As expressways and interchanges rose, many saw their population and tax base decamp to the suburbs.

Meanwhile, a few older cities—New York, Baltimore, Milwaukee, Memphis, Boston, and Portland—saw fit to limit their urban highway-building. The most resistant of all was San Francisco: Even as federal aid for building new and big highways boomed, the city's leaders and citizens alike questioned the value of speeding traffic through their dense, historic urban core.





Pictured: *"Airview of City Showing Trafficways", 1948 Comprehensive Transportation Plan*

Opposite: *Le Corbusier's "Une Ville Contemporaine"*

FREEWAYS IN THE CITY

In the 1950s, the City of San Francisco and State of California transportation authorities presented plans to build a total of nine freeways within the city's 49-square mile area. Residents of San Francisco rose in protest and—through two influential Board of Supervisors decisions in 1959 and 1966—succeeded in blocking most of the proposed routes.

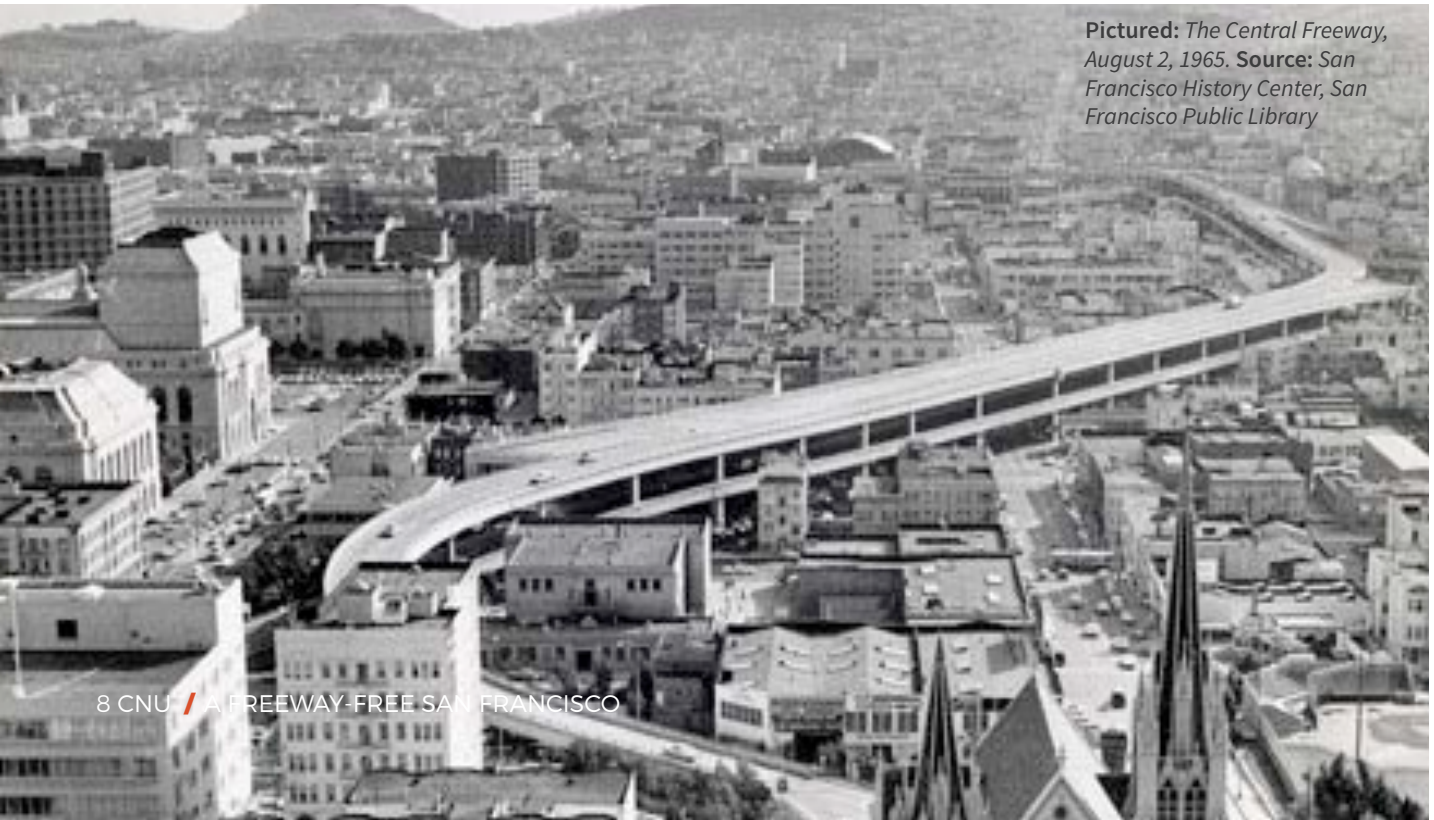
Perhaps because of San Francisco's beautiful location on seven hills overlooking the Pacific Ocean, resistance to freeway building developed more quickly there than in other cities. Much of the early argument focused on the freeways damaging the City's views of San Francisco Bay. Republican California Assemblyman Casper Weinberger, later President Reagan's Defense Secretary, represented the area around the Embarcadero and predicted the freeway would reduce property values.

He lost his fight against the freeway, but was delighted in 1991 when the decision was made to remove it.

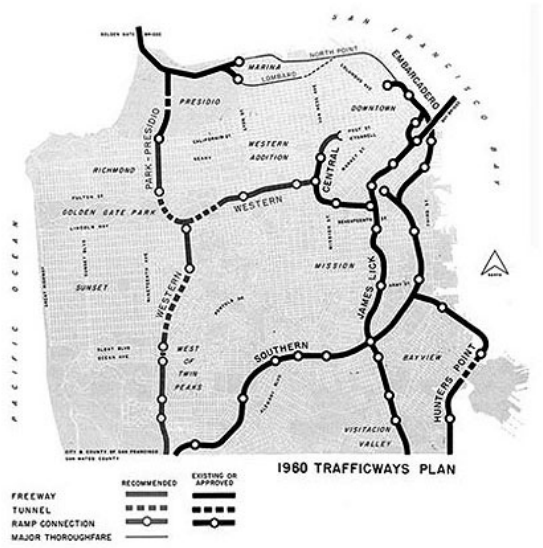
Opposition to San Francisco freeways reached a crescendo in 1974 when Mayor Joseph Alioto testified before the US Senate Committee on Public Works that San Francisco was beautiful and people should slow down and enjoy it.

Portions of the freeway system were built. The Embarcadero and Central Freeway were started but then stalled. Specifically, the double-decked Embarcadero was intended to connect the Golden Gate Bridge with the Oakland Bay Bridge, mostly following the contours of the waterfront. In the end, only 1.2 miles were ever built, but the damage was great and left the city mostly severed from its waterfront.

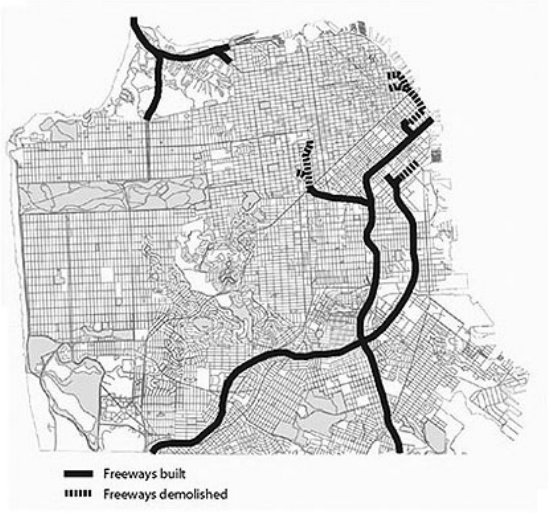
The Central Freeway (also double-decked) spurred off of US-101 but was never completed. In total, just 1.8 miles were built (Billings, Garrick, & Lownes, 2012). The main road from the south through the city (Interstate 80) and across the Bay to Oakland was completed. Interstate 280 was partially completed. Many more were planned but never built (see map, right).



Pictured: *The Central Freeway, August 2, 1965.* **Source:** *San Francisco History Center, San Francisco Public Library*



... AND WHAT WAS ACTUALLY BUILT AND DEMOLISHED.



Over the years, Bay Area residents grew accustomed to the incomplete freeway system. In 1989, the Loma Prieta earthquake delivered a wake-up call, badly damaging the Embarcadero and Central Freeways, and dispersing its traffic throughout city streets. After several referenda, the decision was made to remove part of the Central Freeway and all of the Embarcadero Freeway, setting San Francisco on a new course.

At the time, Mayor Art Agnos fought hard to seize the opportunity created by the earthquake to not rebuild the Embarcadero Freeway. Months of public debate finally led to enough support behind the mayor's plan. Eventually, the Embarcadero was replaced with a beautiful urban boulevard with a streetcar line running down the center and connecting Fisherman's Wharf, Downtown, and the Castro District. Once the elevated Embarcadero was felled, the number of transit trips in the corridor increased 75%. The number of people living and working near the new Embarcadero boulevard also jumped. The rehabilitation of the Ferry Building is one of the more iconic transformations in the wake of the earthquake.

Opposite: "1960 Trafficways Plan" showing San Francisco's planned freeway system

Top: *The elevated Central Freeway crossing Market Street. The figureground graphic shows the freeway's path through the city's historic urban fabric.* **Source:** *San Fransico Chronicle.*

Bottom: *Octavia Boulevard, built in the footprint of the former Central Freeway. The red in the figureground graphic shows new construction in the Central Freeway's footprint.* **Source:** *Elizabeth MacDonald.*

The northern portion of the Central Freeway was similarly damaged and its future similarly debated. After much community deliberation, enough support was garnered to convert a portion of the Central Freeway north of Market Street into a multiway boulevard designed by noted UC Berkley professors and urban designers Allan Jacobs and Elizabeth Macdonald. Octavia Boulevard, as it is known, made the adjacent residential neighborhood a more pleasing environment to walk and live in, while still moving large amounts of traffic though the corridor.

Traffic nightmares predited by Caltrans and others failed to materialize. In the case of the Embarcadero, traffic actually improved without the freeway. The network of local streets, underutilized with the construction of the freeways, was able to absorb a great deal of traffic capacity. Property tax base for the city increased and thousands of units of affordable housing were added. The Embarcadero boulevard has prospered with added jobs, increased retail sales, and new housing, including thousands of affordable units.

The transformation of the Hayes Valley around Octavia Boulevard has been remarkable. What was once considered a high-crime, depressed area of San Francisco is now thriving. Home values have risen considerably while the supply of affordable housing has also increased, thanks in large part to the progressive Market & Octavia Plan, implemented by the Mayor's Office of Economic and Workforce Development. The plan's urban design requirements and affordable housing provisions have helped the neighborhood grow incrementally over the past decade.

Traffic coming off the remaining section of the Central Freeway can seem like a fire hose and sometimes overwhelm Octavia Boulevard's first few blocks. This is an inherent problem with freeways: they concentrate traffic. A highly connected grid of streets, avenues, and boulevards absorbs and disperses traffic—like how a wetland absorbs and distributes rainwater. In fact, the U.S. Army Corps of Engineers has learned from experience in places like the Florida Everglades that channelizing streams can actually create more problems than it solves. In much the same way freeways channelize traffic, overwhelming the streets and roads meant to carry it.

San Francisco's freeway revolt helped the city avoid much of the devastation that visited other North American cities that embraced high-speed travel on grade-separated highways. One North American city that was even more successful than San Francisco at resisting highway construction is Vancouver, British Columbia. Today, Vancouver is one of the world's most livable cities, and it has many lessons to teach other North American cities.

Top: *Anti-freeway protesters in San Francisco City Hall, circa 1960.* **Source:** *San Francisco History Center, San Francisco Public Library*

Bottom: *The Embarcadero Freeway obscuring access to the waterfront and Ferry Terminal Building.*

Opposite: *The Ferry Terminal Building today.* **Source:** *Wikimedia*


SAN FRANCISCO
PORT OF

VANCOUVER: FREEWAY-FREE

Like San Francisco, Vancouver initially grew out of a mid 19th century gold rush. It also became a seaport and center of banking, insurance, and other commerce. As it gained population in the ensuing decades Vancouver became an innovation center for arts, culture, and business.

Like many North America cities, Vancouver faced pressure in the mid 20th Century to build a robust urban freeway system that would have heavily damaged its historic neighborhoods and urban fabric. Citizens, fighting for their right to remain in their homes and businesses, revolted. Today, Vancouver has no freeways piercing its core. It is lauded internationally for its livability. Planning decisions, rooted in the freeway revolts of the 1950s and 1960s, set the course for Vancouver to be freeway-free.

STOP THE FREEWAY

In the late 1950s, city planners began to encourage the building of high-rise residential towers in Vancouver's West End, subject to strict requirements for setbacks and open space to protect sight lines and preserve green space. Like Paris with its newly attached district La Defense, Vancouver embraced high-rises, but tried to harmonize their presence with the walkable pre-existing city.

For almost a decade through the 1950s and 1960s, real estate, business, and political interests had been lobbying for an east-west freeway connection to the city's core. These interests thought a freeway was the key to ending the business district's economic stagnation—the destruction of a few people's homes to build it would be a small price to pay, they argued.

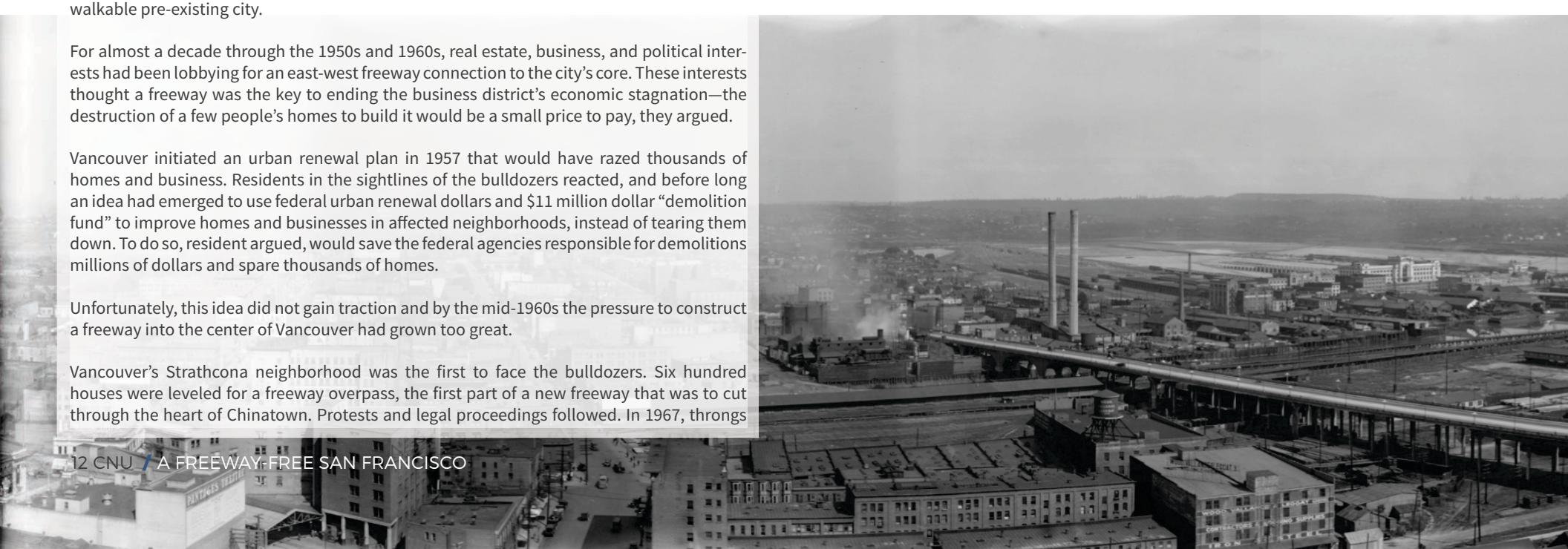
Vancouver initiated an urban renewal plan in 1957 that would have razed thousands of homes and business. Residents in the sightlines of the bulldozers reacted, and before long an idea had emerged to use federal urban renewal dollars and $11 million dollar "demolition fund" to improve homes and businesses in affected neighborhoods, instead of tearing them down. To do so, resident argued, would save the federal agencies responsible for demolitions millions of dollars and spare thousands of homes.

Unfortunately, this idea did not gain traction and by the mid-1960s the pressure to construct a freeway into the center of Vancouver had grown too great.

Vancouver's Strathcona neighborhood was the first to face the bulldozers. Six hundred houses were leveled for a freeway overpass, the first part of a new freeway that was to cut through the heart of Chinatown. Protests and legal proceedings followed. In 1967, throngs of local residents showed up at important public meetings to express their disapproval of the plans (Harcourt & Cameron, 2005). Before the third phase of construction could commence, the city council folded to the residents' pressure. Author Taras Grescoe writes of the event:

> *"Immediately, protest came from every part of the city, and a crowd of 800 people gathered in City Hall to shout down the consultants' proposals. The Chairman of the city's planning commission resigned on the spot, and a year later, the plan was scrapped. Apparently, the spirited editorializing of the local papers in favor of cutting out civic blight with a concrete knife had influenced no one but a handful of architects. (1967: Strathcona rejects a freeway)."*

The opposition argued for preservation and improvement of existing homes and businesses over complete destruction—and they won. A city blighted by an extensive elevated freeway was not a city they wanted to live in. Though plans for an east-west freeway were nixed, the construction of two twinned viaducts moved forward.



GEORGIA & DUNSMUIR VIADUCTS

Vancouver has no freeways penetrating its urban core—and the only major freeway within city limits is Highway 1, which runs along the northeastern corner of the city. In lieu of freeways, the city did build two elevated roads: the Georgia and Dunsimir Viaducts, which connect the Eastern Core area to downtown Vancouver. These twinned "mini-bridges" were built at a time when public opinion of freeways had soured and the 1960s freeway system was being abandoned.

The Georgia Viaduct was originally built in 1915 to bypass the tidal waters, rail lines, and industry below. In 1971, the Georgia Viaduct was rebuilt and twinned with the Dunsmuir Viaduct, as the first piece of a proposed freeway system that was planned but never built. As a result, the viaducts never functioned as planned—they handle just 750 vehicles per lane per hour, instead of the 1,800 for which they were built. During the past 15 years, traffic volumes have actually decreased during peak periods while downtown population and jobs have risen significantly.

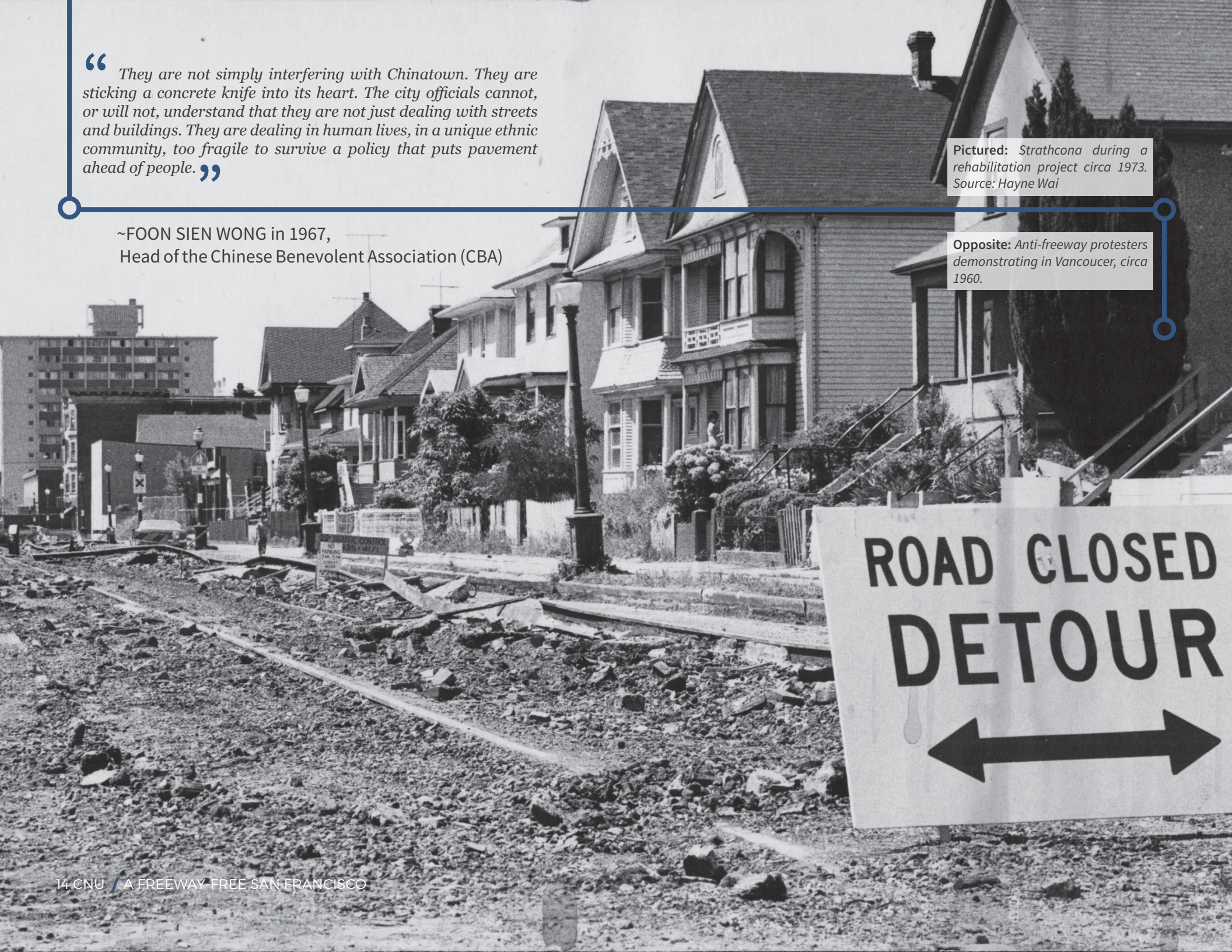
Today, the viaducts act as a barrier, separating neighborhoods from each other and from the False Creek waterfront. Now more than four decades old (about half the design life of the twin spans), they cost the City of Vancouver heavily for maintenance—even though the structures operate well under capacity and duplicate the purpose of existing urban street grid. Moreover, the land underneath is nearly unusable. In addition to separating neighborhoods, the viaducts cut Main Street in two.

In 2011, the City of Vancouver commenced a public ideas competition called re:CONNECT to solicit urban design ideas for the viaducts and adjacent Eastern Core. This led to a series of public outreach meetings that looked at alternative scenarios. The guiding principles included "create a vibrant district", "rebalance movement modes", and "repair the urban fabric." Ever since, the City has debated the usefulness of the viaducts and the potential their removal presents for the city (City of Vancouver, 2012).

Unlike many North American cities grappling with urban freeway replacement, Vancouver recognizes removal is an opportunity to think differently about streets and infrastructure. In October 2015, Vancouver City Council laudably approved a measure to remove the viaducts, a decision that "not only creates a more resilient, reliable street network, but also opens up new opportunities for better connections through neighbourhoods, a new 13-acre park along False Creek, and more community benefits, including affordable housing." (Viaducts Study, 2015).

Pictured: *Panorama of the Georgia Viaduct in Vancouver, 1921.* **Source:** *City of Vancouver*

> *“They are not simply interfering with Chinatown. They are sticking a concrete knife into its heart. The city officials cannot, or will not, understand that they are not just dealing with streets and buildings. They are dealing in human lives, in a unique ethnic community, too fragile to survive a policy that puts pavement ahead of people.”*
>
> ~FOON SIEN WONG in 1967,
> Head of the Chinese Benevolent Association (CBA)



Pictured: *Strathcona during a rehabilitation project circa 1973. Source: Hayne Wai*

Opposite: *Anti-freeway protesters demonstrating in Vancoucer, circa 1960.*

These demonstrators were part of the group protesting Vancouver's freeway plans

Anti-freeway group harasses Vancouver mayor

UNDERSTANDING CONGESTION

Vancouver proves a city can function, and function better, without freeways. "Vancouver learned that a big mistake moving from the 50s forward," suggests Larry Beasley, retired Chief Planner of the City of Vancouver, "was the thought that you should focus traffic into a few access routes and that ultimately creates the demand for the freeways. Instead, we are dispersing traffic over a variety of routes, so there are many ways in and out of the city; they are normalized boulevards, normalized streets. There's a very careful hierarchy of streets and really we try to use the entire network to move automobiles around."

While the number of cars in Vancouver has steadily increased with population growth, the rate of car ownership and the average distance driven by daily commuters have fallen since the early 1990s. Vancouver is the only major Canadian city seeing these trends. Importantly for the fate of the Georgia and Dunsmuir Viaducts, truck traffic has declined for almost two decades.

Not everyone sees this decline positively. In 2013, the Texas Transportation Institute (Texas A&M) classified Vancouver as having the "worst" traffic congestion in North America, supplanting Los Angeles. Interestingly, Vancouver is consistently ranked as one of the most livable in the world.

Vancouver has used congestion to its advantage, to intensify its urbanism and create a better city: "We like to say congestion is our friend," says Beasley, "because it causes people to ask: What can I do differently in my own life? The biggest thing that tens of thousands of households have decided is why don't we move closer to where we work, or where we go to school, or where the major attractions of our life have been?"

Vancouver chose not to build freeways for a number of reasons. First, the city's topography is hilly and cut up with bays, inlets, and peninsulas. This made road construction an expensive, daunting endeavor.

Second, the conceived plans for a Vancouver freeway network were designed to cut through the city's important historic neighborhoods. These neighborhoods were well organized to resist. This led to an election of a reform-oriented city council that scrapped plans for a major east-west freeway. The City sold the land that was purchased for it and essentially said that freeways would not be built in Vancouver.

The third reason was cost. Unlike the United States, the Canadian federal government did not incentivize freeway construction by offering to cover up to 90% of freeway construction costs. This prevented cities like Vancouver from "taking the bait" and building freeways through their urban cores. Even today, the Canadian government rarely involves itself in financing road infrastructure–this is a provincial and local matter.

Vancouver's successful defense against the highway incursion set the stage for a more livable city. The development pattern that followed, also known as "Vancouverism" or "The Vancouver Model", focused on creating a series of urban town centers connected by transit and a more proactive plan for the inner city.

This pivot toward smarter growth—increasing downtown housing and jobs, protecting rural agricultural areas, investing in transit and pedestrian facilities instead of freeways—has reinforced Vancouver's livable image. Moreover, as cities like Detroit, St. Louis, and others fought a losing battle against congestion, Vancouver learned to embrace it (Millar, 2006).

TOWARD A FREEWAY-FREE FUTURE

Vancouver proves that a North American city can thrive without freeways inside its center city.

Creating a freeway-free future for the city of San Francisco is not a small undertaking. But the first steps have already been taken. The removal of the Embarcadero from the shore of the Bay and the Central Freeway from Hayes to Market proved to San Francisco and the world that freeway removal is possible and can be done successfully.

These projects were catalyzed by an act of nature that forced city leadership to think critically about San Francisco's future. The next steps would need to be proactive, based on compelling evidence that freeway removal will meet the needs of residents and visitors, improve transportation, and boost the economy.

What does the future of San Francisco look like? It is forecasted that San Francisco employment will double by the 2035, adding 240,000 new jobs. Downtown and South of Market (SoMa) neighborhood will absorb the majority (ARUP). It should be noted that the City of San Francisco has numerous restrictions on new development, specifically higher density construction along the waterfront. In the already built up downtown, new, higher density construction will hit barriers. However, the SoMa neighborhood has land available for future development for employment and housing—and even more, potentially, if the spur of I-280 is removed (See Step 1).

In 2011, member-supported nonprofit San Francisco Planning and Urban Research (SPUR) reported on the coming challenges for Bay Area travel. Today, about 600,000 commuter trips take place between East Bay and San Francisco every weekday. There are 4 ways to make the trip:

- Drive a car over Bay Bridge
- Drive a bus over Bay Bridge
- Use Rail transit via the Transbay Tube
- Board a Ferry

The mode share points to some interesting inequities. Of the 600,000 trips, 440,000 make the trip in a car. Just 12,000 cross via bus and 150,000 cross via BART.

Depression era federal bonds built the Bay Bridge. The bridge is near capacity, but increasing car lane widths is not an option.

Strategic investment in transit will help alleviate that pressure. Since BART was built in 1972, no additional rail transit has been built between the East Bay and San Francisco, despite the region having grown 4.6 million in 1970 to over 7.3 million today. The Bay Area is expected to grow by 1.7 million more residents by 2035, with San Francisco proper projected to gain 160,000 gain new residents. (SPUR 2011). How will the city accommodate these new jobs, residents, and commuters?

Freeway removal could play a key role. The idea of removing a road—particularly a big road that carries a lot of cars—to meet transportation needs is perhaps counterintuitive. Yet cars are only one component of what constitutes traffic. Transit, walking, and cycling, if properly planned for, are viable ways to move through urban spaces—and these modes add to street vitality. When San Francisco built the double-decked Embarcadero along its waterfront, it claimed the space for cars and little else. When the Embarcadero was removed, people returned to the area and today co-exist with the streetcar, buses, and cars.

So if transit, housing, and employment are considered holistically, San Francisco can take cues from Vancouver on how to understand and manage the challenge of traffic congestion.

Many other cities where the commitment to freeway building was unfettered in the name of fighting congestion have seen almost all their populations decline precipitously, retail assets disappear, and their job based spread thinly across the metropolitan periphery. Reversing such decline will take awhile—maybe a century or more. Luckily, the City of San Francisco has remained relatively intact and the opportunity to undo much of the lingering damage of the highway-building era is closer at hand—most of the damage was avoided and some has already been reversed, like the removal of the Embarcadero.

Today, a plaque at the Embarcadero plaza reads: "The freeway that brooded over the Embarcadero with all the grace of a double decked prison wall is finally gone. In its place is a sweep of air, fog, October sunlight, piers, ships, and the silver Bay Bridge."

The following strategy will enable the City of San Francisco to remove the walls that still remain—the burdensome decades-old legacy of misguided urban transportation policies. One stretch at a time, through the phases of this plan, the city's leaders can knit its neighborhoods back together, open precious new land to walkable development, and unstrangle one of the country's truly breathtaking waterfronts.

This is a vision for a freeway-free San Francisco.

Below: *Regional Bay Area freeways with traffic flows. I-280 stub in orange.*
Source: *CP 248 Urban Design Studio, UC Berkeley , Spring 2014*

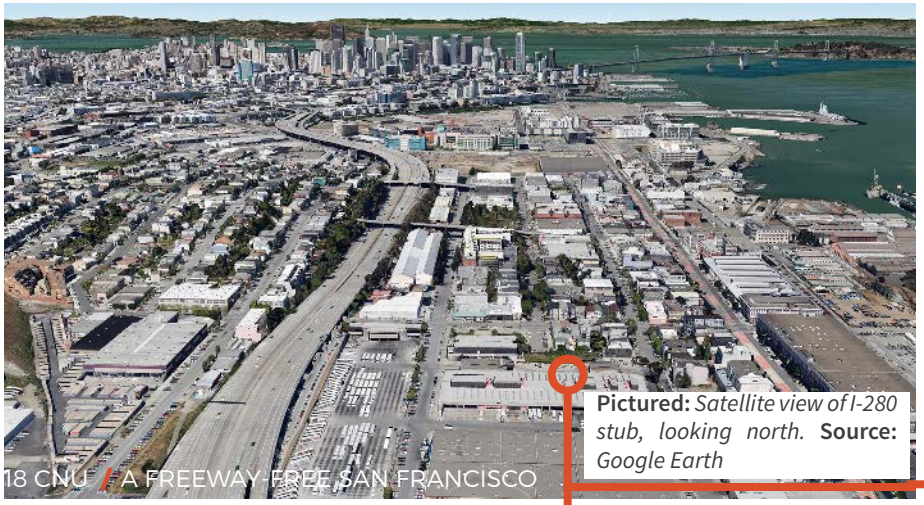
Below: *San Francisco US 101, I-80 and I-280 freeways with traffic flows and district acess.* **Source:** *CP 248 Urban Design Studio, UC Berkeley , Spring 2014*

STEP 1 REMOVE I-280 SPUR

The first step in the succession of removal efforts is to take down the spur of Interstate 280 from 16th Street northward. The spur should be replaced with a landscaped multiway boulevard, a proposal endorsed by San Francisco Mayor Ed Lee and explored by a number of groups, including Bay Area non-profit SPUR and the Spring 2014 graduate design studio at UC Berkeley, led by architect and professor John Ellis. In the scheme of freeway removals, spurs are easy to remove. They tend to already disperse traffic into the local street network without much issue, typically because traffic volumes near the spur's end are fractions of what they are elsewhere on the road.

Importantly for San Francisco, the removal of this spur will create better connections between Mission Bay, Potero Hill, and SoMa. Land that was once undesirable adjacent to the freeway would be opened up to new housing and development opportunities. In order to remain affordable, one expects redevelopment to adopt many of the mechanisms that make the Market & Octavia Area Plan so extraordinary; namely, a diversity of housing types and mixed-use buildings that are well designed and fit into the established character of the neighborhood. The Market & Octavia Area Plan has succeeded at retaining local businesses and building affordable housing into Hayes Valley.

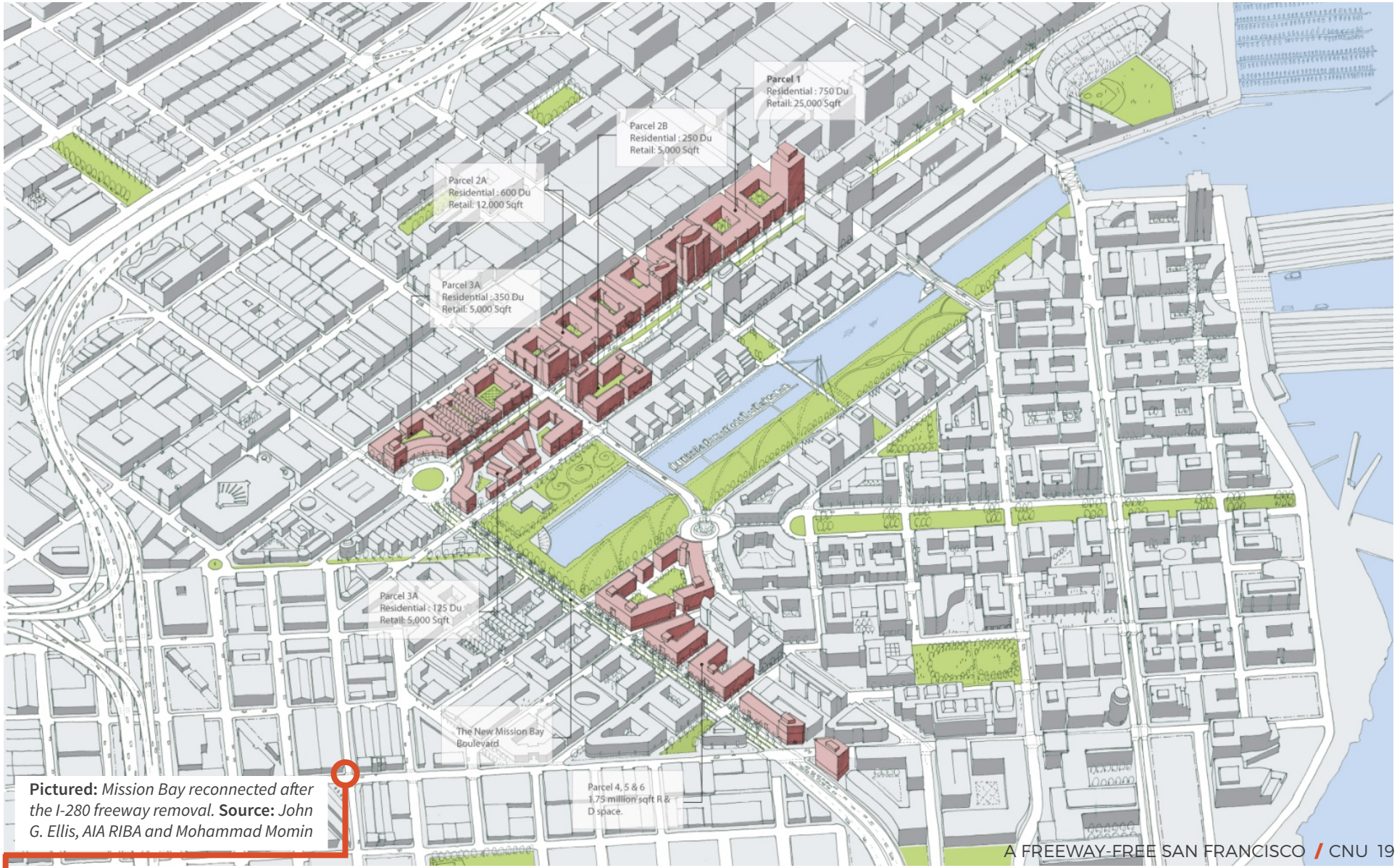
Moreover, the removal of the spur is a catalyst for transformative projects such as the forthcoming Transbay Transit Center and possible high-speed rail connections at the heart of where I-280 terminates. Removal of the spur is a critical first step, because the political will to make this project succeed already exists and the city anticipates significant return on investment from this project. The Railyard Alternatives and I-280 Boulevard Feasibility Study is underway to study this removal as of March 2015.



Pictured: *Satellite view of I-280 stub, looking north.* **Source:** *Google Earth*

Pictured: *Map of San Francisco freeway network, with I-280 stub removed.*

STEP 1: REMOVE I-280 SPUR



Pictured: *Mission Bay reconnected after the I-280 freeway removal.* **Source:** *John G. Ellis, AIA RIBA and Mohammad Momin*

STEP 2

ROLL BACK THE CENTRAL FREEWAY

More than a decade ago, the ballot measure to remove the section of the Central Freeway north of Market just narrowly passed. The removal and subsequent revitalization has transformed the Hayes Valley. Today, few would vote to restore this section of freeway.

Yet traffic problems still persist. On any given day, the Central Freeway stops abruptly at Market Street, funneling 45,000 drivers directly onto the intersection at Market Street and Octavia Boulevard. Having to stop at a light is a frustration for drivers who are trying to hurry home or to work. This inundation of cars into residential neighborhoods of Hayes Valley poses significant threats to the safety of residents and visitors and some have blamed the removal of the freeway or faults in the design of the boulevard for some of the annoyances drivers and residents encounter at this intersection. (Of course, before the Central Freeway was shortened drivers experienced the same frustration only a half a mile further north. But thanks to the removal, after just a few blocks the traffic disperses and the neighborhood experiences a calm it hadn't known since the 1950s.)

Removing the remaining 1-mile stretch of the Central Freeway all the way to I-80 would address these traffic concerns, by reducing the high volume of vehicles flowing onto Octavia Boulevard.

The serpentine section of the now northernmost portion has a hefty right-of-way—between 100 and 130 feet. With the stub of the Central Freeway already transformed into a multi-way boulevard, what remains of the highway can be replaced with an extension of the boulevard from I-80's current interchange up to Market Street.

Opposite, right: *Map of San Francisco freeway network, with Central Freeway fully removed.*

Opposite, far right: *San Francisco's Central Freeway and Octavia Boulevard corridors with new development.* **Source:** *Solomon ETC Architects*

Pictured: *Octavia Boulevard today.*
Source: *MIG, Inc.*

STEP 2: ROLL BACK THE CENTRAL FREEWAY

STEP 3 PHASED REMOVAL OF REMAINING I-280

Delivering a fire hose of traffic coming off of I-280 to 16th Street or Mariposa serves no important purpose. Instead, I-280 could be rolled back through the half a dozen or so neighborhoods it punctures to where it crosses the 101, and eventually, all the way to John Daly Boulevard in Daly City—outside San Francisco's municipal boundary.

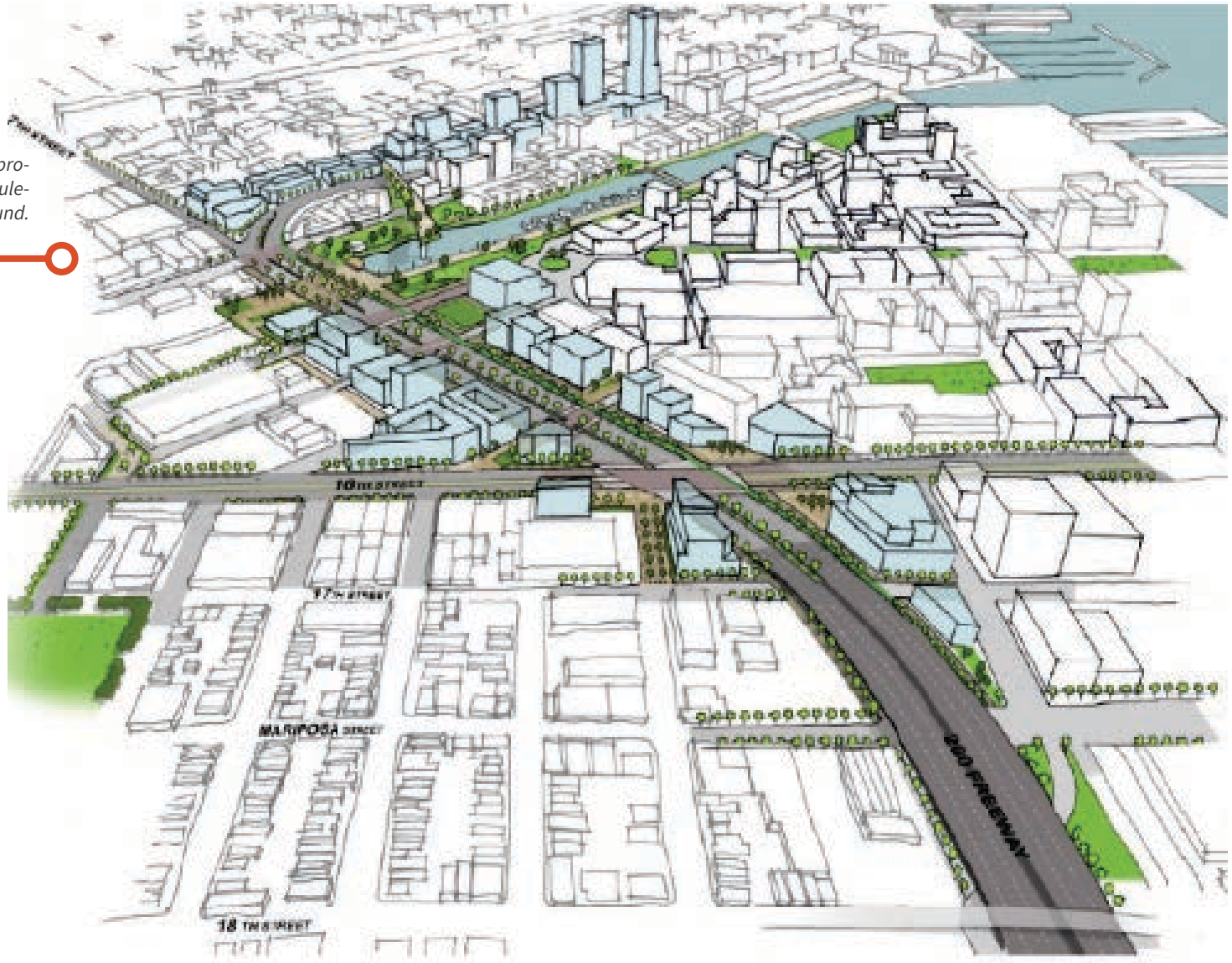
This step would best be completed in phases. Interstate 280, already removed to 16th Street in Step 1, could then be rolled back to Cesar Chavez Street in the first phase, then to the 101 in the second phase, and finally outside of San Francisco in the third phase.

The area is served by transit but could use more frequent service. The Third Street line of San Francisco's BART is the first major expansion of the city's transit system since the construction of freeways fifty years prior. Today, the southern neighborhoods of Bayview and Dogpatch are now better connected to SoMa and downtown via this light rail line.

With the projected influx of new residents and hundreds of thousands of new jobs by 2035, the linkage between jobs and housing will become increasingly important. If the City of San Francisco can leverage the removals of the I-280 spur and Central Freeway to accommodate the amount of housing and jobs projected, and if these areas are well-served by transit, the need for commuting via car—and thus, via highway—is reduced substantially.

Pictured: *Map of San Francisco freeway network, with I-280 fully removed.*

STEP 3: PHASED REMOVAL OF REMAINING I-280



Pictured: *San Francisco-based SPUR's proposal replacing I-280 with a surface boulevard, routing CalTrains tunnels underground.*
Source. *SPUR, rendering by AECOM*

STEP 4 A SECOND TRANSBAY TUBE

In densely developed cities like San Francisco, significant commitments to public transit are needed to make freeway removal practical and successful. Construction of a new Transbay tube that connects Mission Bay to Alameda to Oakland would reduce reliance on car travel and support infill development on both sides of the Bay.

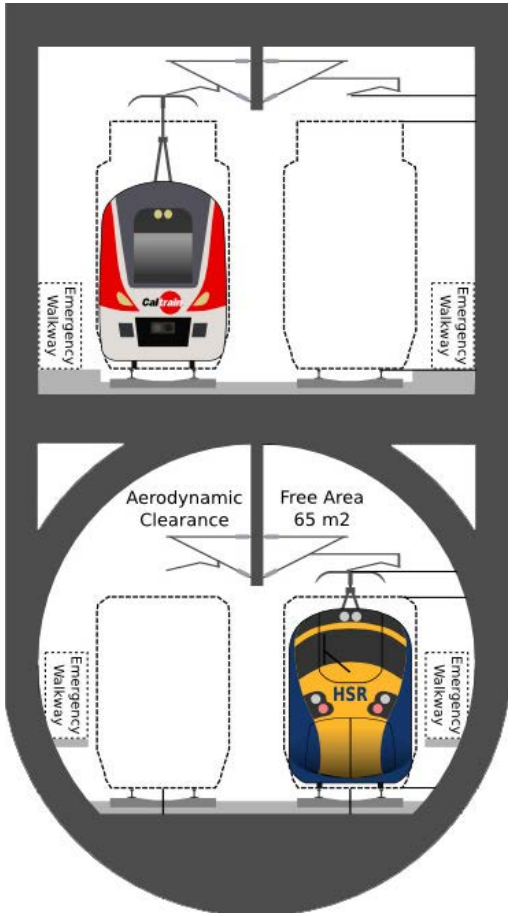
To draw a comparison, New York's East Side Access project is similarly ambitious. The plan includes a second tunnel under the East River for the Long Island Rail Road, connecting Grand Central Station, Sunnyside, and Queens.

A second Transbay tube could transform the Bay Area by decking BART tracks on the top and Caltrain tracks on the bottom. Doing so would not only increase local penetration of the transit system but also make commuter trains from Sacramento to Palo Alto a reality, principally important as California's push for high-speed rail intensifies.

Another parallel is found in London's Crossrail, a 70 mile, mostly new, railway that runs east to west, greatly enhancing commuter access to Greater London and relieving pressure on existing transit lines and roadways. Currently, it is the largest infrastructure project in Europe. Once complete, the line will connect Heathrow, Canary Wharf, and further flung villages to Central London via high-frequency commuter trains. Experts expect an estimate 200 million commuters per year on the Crossrail, most switching from cars to transit. The system will relieve congestion on roadways in and outside of the capital, allowing current and new residents to move about the city and region in an inexpensive, sustainable way. Public officials view investment in transit as the best way to accommodate and continue to attract new population and job growth, over 35% of which is expect in Central London, Canary Wharf, and the West End alone (Crossrail Ltd, 2014).

Similar long-term thinking would benefit the Bay Area. A second Transbay tube is a significant, long-term investment that would directly relieve pressure on existing roadways and transit systems. It is the kind of investment needed for San Francisco to continue to grow affordably and sustainably.

Other improvements to San Francisco's transit system are worthy of study. In 2012, Bay Area cartographer Brian Stokle mapped "a possible future" for a comprehensive Bay Area regional transit network (see opposite page). This vision goes a long way to create the amount of accessibility possible for a critical mass of Bay Area residents to shift from cars to transit and walking.

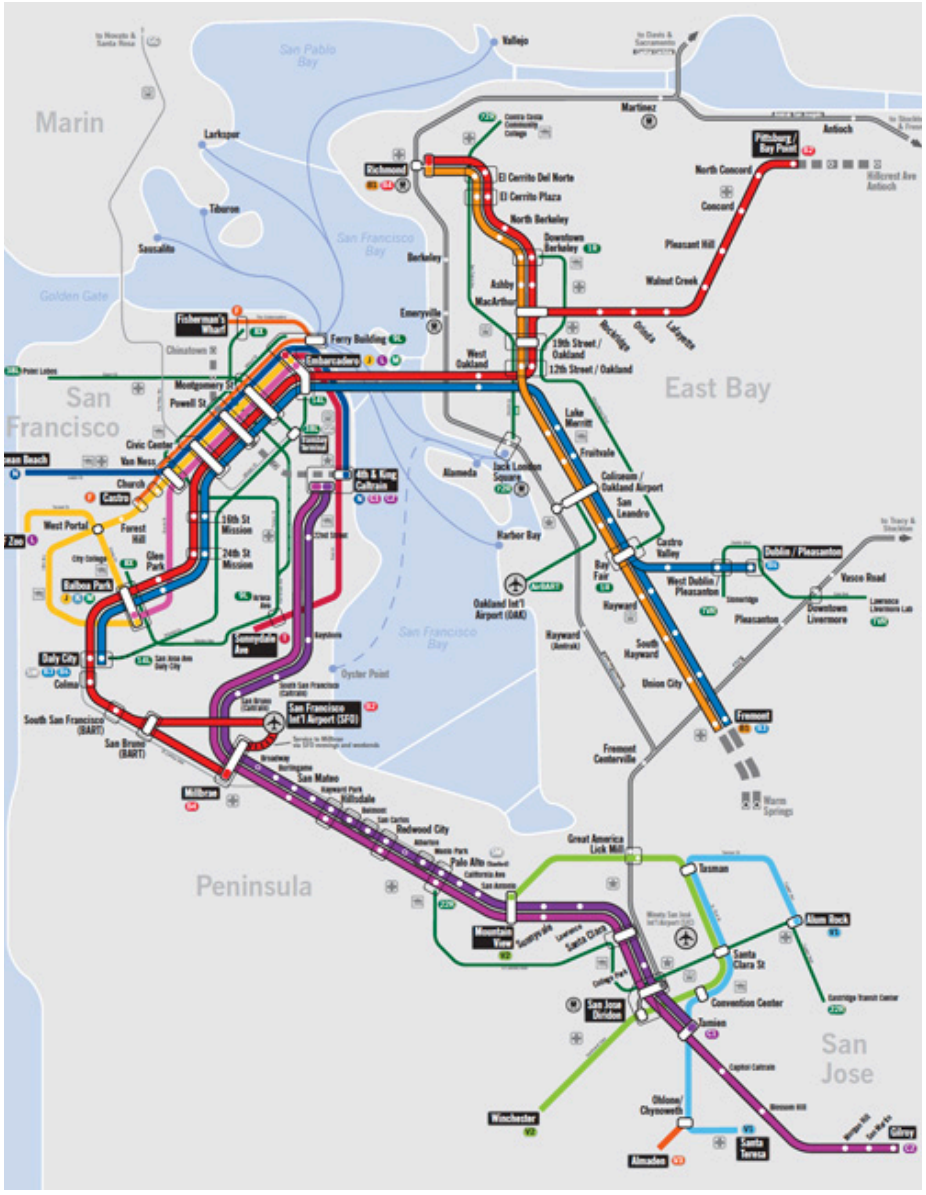


Left: *Cutaway of a double-decker Transbay tube, with local trains on top tracks, and commuter trains on bottom tracks.*

Opposite, right: *Existing Bay Area transit network.* Source: *Brian Stokle, SPUR's Urbanist, 2013.*

Opposite, far right: *Proposed Bay Area transit network with second Transbay tube.* **Source:** *Brian Stokle, SPUR's Urbanist, 2013.*

STEP 4: A SECOND TRANSBAY TUBE



STEP 5 RECONSIDER I-80 AND 101

Recent trends suggest that the number of miles traveled by car per person in the United States has been declining since 2005. This downward trend in driving is an opportunity for cities to reconsider how people can and should move through urban spaces, including what to do with aging freeway infrastructure. And even though San Francisco is looked to as model for the benefits of urban freeway removal, many lessons are to be learned from other cities as well.

The West Side Highway, an elevated highway along the Hudson River at the tip of Manhattan in New York City, collapsed in 1973, leaving most of the route completely closed to traffic.

Officials and commuters feared traffic chaos. It never materialized. Some drivers chose alternative routes within the rich complexity of New York's street network and/or other highways. Others switched to transit. And others simply did not make the trip. In years following, traffic studies pre- and post-collapse revealed that 53% of the traffic simply "disappeared."

Eventually, by 1989, the remnants of the highway were completely removed. Today, it is a surface boulevard on the very streets that existed prior to the construction of the elevated highway in the mid 20th century (Kruse, 1998).

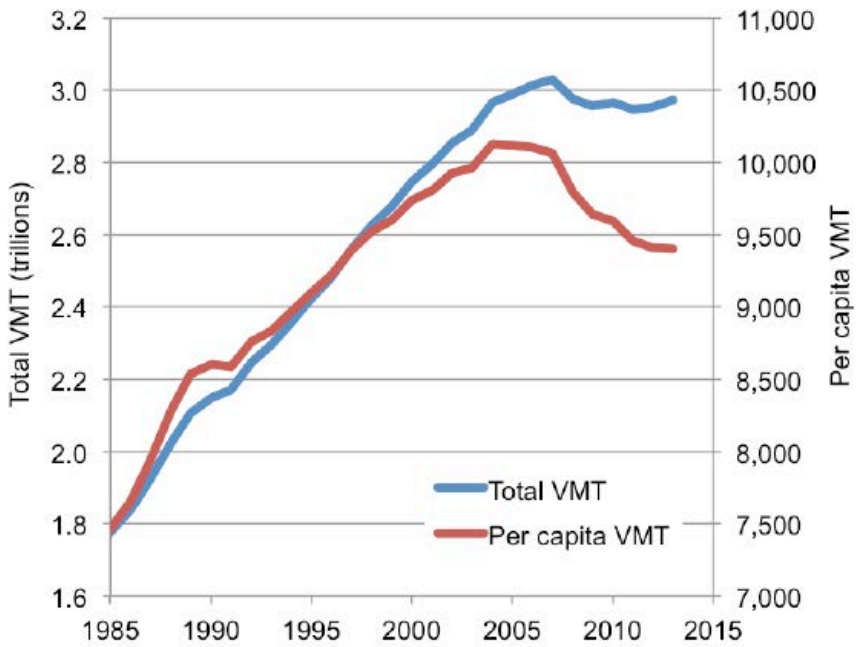
More ambitious was the removal of the Cheonggyecheon Expressway and subsequent restoration of the Cheonggye stream in central Seoul, Korea. The expressway carried nearly 170,000 vehicles per day at its peak. The roadway, built over a natural stream, was removed between 2003 and 2005, reestablishing the waterway within a brilliant 3.6 mile linear park flanked by surface streets and an efficient BRT route (Seattle Mobility Plan, 2008).

Seoul removed the heavily traveled expressway through a dense central city in order to improve air quality and restore a remnant of a natural ecology. The removal was not precipitated by a natural disaster but rather the hope for a more livable city. In fact, Seoul has made a policy of removing freeways, electing more sustainable options in urban mobility. Since 2002, Seoul has razed 16 urban expressways and overpasses (Mesmer, 2014).

San Francisco will have tough choices to make. In order for something as controversial as removal of I-80 and 101/Bayshore Freeway to happen, a long—probably intense and heated—community process is needed. Fears of "traffic chaos" and "carmageddon" will be difficult to overcome; yet with each successful removals outlined above, this argument becomes increasingly less salient, especially if the downward trend in driving continues and San Francisco makes the significant commitments to regional transit, also outlined above.

Pictured: Map of San Francisco freeway network, with a reconnected downtown street grid.

STEP 5: RECONSIDER I-80 & 101



In San Francisco, critics often raise fears of displacement, rising costs, and gentrification—no idle threat in the Bay Area where there is high demand for a limited supply of housing. Those fears often lead to limits on new development.

But San Francisco has proven that by employing aggressive affordable housing strategies as was done with the Embarcadero and Octavia Boulevard, neighborhoods in freeway removal corridors can gain economic strength while helping to meet growing housing demand in locations convenient to jobs and urban amenities.

San Francisco remains unaffordable to many. This is a challenge the city must tackle, and it calls for creative problem solving. Reconsidering the role of the city's freeway infrastructure—from the amount of the land it occupies to the kind of lifestyle it facilitates—can help inform solutions.

Top left: *A downtown trend in vehicle miles traveled (VMT).* **Source:** *SSTI*

Top right: *Map of a freeway-free San Fransisco.*

OAKLAND & THE BAY AREA

The City of Oakland's transportation network presents nearly as many challenges as San Francisco's. The same earthquake that struck down the Embarcadero and the northern portion of the Central Freeway felled a 1.25-mile section of Interstate 880 in West Oakland. The collapse claimed the lives of 42 people. As in San Francisco, residents opposed reconstructing the freeway through residential areas. In the end, Caltrans rebuilt the freeway close to the water's edge, and a new parkway was laid where the toppled freeway sections once stood.

Oakland has a unique identity and a value to the region as a productive city with one of the United States' most active ports. This history is tied to the legacy of the freeways that still crisscross it. Could Oakland ever be freeway-free? Like San Francisco and other Bay Area cities, the future of Oakland need not be tied to the mid-20th century transportation planning.

Just as recommended for San Francisco, an aggressive affordable housing plan can ensure that Oakland reaps the benefits of freeway removal while remaining affordable. A network of boulevards, parkways, and surface streets in the place of freeways could be enjoyed by long-time residents. Moreover, all cities around the Bay area would do well to re-examine their highways to determine if they actually add value to the community.

Pictured: *Mandela Parkway in Oakland, built in the footprint of the collapsed Cypress Street viaduct.*
Source: *52walks.wordpress.com*

CONCLUSION

Today, San Francisco enjoys a high quality of life and is one of America's most beautiful, walkable, and vibrant cities.

The city owes its prominent status to the courage and hard work of its past residents—including those who spoke out against ruinous freeway plans throughout the mid-20th Century.

In contrast, North American cities that embraced freeway building without reservations have paid dearly for their choice. Across the country, urban freeways have demolished and isolated historic neighborhoods, impacted air quality, and run up expensive maintenance bills on municipal budgets.

But disinvestment is not forever. Our work has shown that whenever an urban freeway has been removed, adjacent neighborhoods tend to improve. The traffic chaos that is nearly always predicted rarely materializes. Few residents would advocate for putting these freeways back.

The steps laid out in *A Freeway-Free San Francisco* are proposed in the spirit of the San Franciscans who worked to stop the march of urban freeways. If San Francisco is better off without freeways that were never built, why accept those that were built as inevitable parts of the city today?

The proposals outlined in this report are designed to be incrementally feasible. Each requires thorough public deliberation, careful research, and creative problem solving. Social and political leadership will be needed to make further transformation a reality.

Replacing freeways with surface streets has gained recognition as both a practical alternative to rebuilding expensive expressways and as a means to restore and revitalize communities. San Francisco's political and community leaders should seize this opportunity to transform their aging freeways into productive land, multi-modal boulevards, and reconnected urban neighborhoods.

ABOUT CNU

The Congress for the New Urbanism (CNU) is an international nonprofit working to build places people love—thriving, prosperous communities where people have diverse choices for how they live, work, shop, and travel. Our mission is to help create more great places. We do this by changing the practices and standards of urban design and development to support healthy regions and diverse, complete neighborhoods.

CNU advocates for replacing urban freeways with surface streets, boulevards, and avenues as the most cost-effective, sustainable option for cities faced with rising infrastructure costs and aging roads. Please join us in our efforts to change the conversation and reform transportation by visiting cnu.org/highways.

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Cover photo: *San Francisco Golden Hour.*
Source: *flickr, Daniel Parks (parksdh)*

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