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The whole trouble comes from the old idea that the street should be laid out on the natural ground level. There is nothing to justify this way of thinking; in fact, if we begin with the opposite theory that sidewalks and roadway [sic] should be built at a height sufficient to allow space beneath them for all public service installations, the difficulties will entirely disappear. (1911)

—EUGENE HÉNARD, “The Cities of the Future”

In order to provide for changes of use, the elastic street has been suggested. Thus far the elasticity has been horizontal. There is no reason, however, to preclude vertical elasticity for a further segregation of street use in existing congested districts. Steps in this direction have already been taken in the construction of rapid transit lines upon elevated structures and in subways, thus removing one of the principal elements of street traffic. In a few instances, double level vehicle streets have been constructed. (1920)

—ERNEST P. GOODRICH, “The Urban Auto Problem”

IN THE LATE 1990S AND EARLY 2000S, pedestrians in Boston’s financial and waterfront districts found their pathways interrupted or changed on an almost daily basis. Throngs of residents and workers navigated temporary sidewalks flanked by plywood enclosures and crossed streets interrupted by metal plates protecting open wounds in the ground. Peeks through chain-link fencing and around construction barriers yielded views of a still-functioning elevated highway straddling more than a mile of construction and excavation sites. This scenario magnified the typical noise of an urban landscape, with the sounds of local and highway traffic competing for dominance with excavators, trucks, and jackhammers. As time went on, this scene changed, with wounds closed, paths rerouted, traffic from the elevated highway redirected into new tunneled highways, and the highway’s blighting metal structure removed. The city gradually transformed, all because of the need to remedy the impact of an elevated highway built barely fifty years earlier.

These events unfolded thanks to Boston’s famous “Big Dig,” the massive public works project that replaced the city’s overcrowded elevated highway with a new subterranean version topped by public parks, all while keeping the old highway functioning during the construction process. The genesis of this book resulted from observing and questioning Boston’s evolving landscape. Surely no one set out
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to create a problem for future generations by lacing an elevated highway through the city. What were the original intentions for this elevated highway, and how did its ultimate impacts differ from those envisioned by its creators? As I researched the answers to these questions, I found that Boston was actually one of several American cities that used the construction of elevated highways as bold assertions of economic, architectural, and transportation modernity in an era when it was not common to do so. Designed jointly by engineers, urban planners, architects, and municipal leaders, these skyward roads provided a solution to the particular challenges of adapting existing cities to fit changing patterns of urban growth and transportation. Their constructed nature necessarily defined the terms of their impact and reception. Soaring aboveground over sections of busy cities, elevated highways physically affected more people than just those who drove on them. They stood as tangible proclamations of the importance of automobility in the American city. Because of this, their design features and architectural impacts narrated a complex interweaving of early twentieth-century social, architectural, transportation, and urban design challenges.

The highways in this study occupy a specific time frame between the heyday of the railroad in the mid- to late nineteenth century and the advent of mass automobility in the mid-twentieth century. They serve as physical manifestations of the evolution from one transportation model to another. Their geographic and temporal locations testify to this connection, as they often evolved on the literal paths of defunct elevated railroad lines or addressed deficiencies in existing rail, street, or water transport networks. At the same time, the highways’ relationships to larger urban improvement efforts and trends in architectural style recount a parallel evolution in architecture and urban design. Designers projected elevated highways as the most cutting-edge solutions to urban traffic congestion, but their architectural iterations of these projects varied widely. This evinces the malleability of the notion of modern architecture and modern urbanism in the early twentieth century and positions elevated highways as visual evidence of this evolving dialogue.

Early twentieth-century American cities provided the backdrops for these developments. Their dense cores, largely creations of the nineteenth century, offered modest masonry and wood buildings at a scale geared toward pedestrians, horses and carriages, and early mass transit options like the omnibus, the trolley, and the railroad. As the automobile gained in popularity, its technologically empowered materials, shapes, and speeds contrasted sharply with this physical fabric. Moreover, the automobile challenged the communal attitude of previous transit options and tested the capacity of urban thoroughfares. Automobiles compounded congestion on urban streets, where a cacophony of different types of users and vehicles already jockeyed for space. The automobile’s spatial requirements—both on and off the streets—proved problematic. Cars required significant infrastructural support in the form of filling stations, repair shops, and parking spaces. The dense nature of existing cities limited the possibilities for easily constructing such amenities. As such, the popularization of the automobile immediately highlight-
ed a disparity between emerging technological possibilities and existing physical landscapes.

Faced with this discrepancy, metropolitan leaders, architects, and urban planners began to imagine how they might recast cities to accommodate and match the modernity of the new technological age. Responses to this question varied widely. City Beautiful advocates offered visions of highly coordinated urban utility and beauty that relied on the machine age to create geometrically aligned streets, public plazas, and classically referenced architecture. Engineers and urban planners used quantitative evidence about current traffic, housing, transit, and business conditions to provide policy suggestions and long-term plans for redirecting urban growth. Avant-garde architects and design publications forecast entirely new urban landscapes that exploited skyscraper forms and embraced automobile-based transportation. But despite their divergent approaches, the resulting dialogue collectively reflected a new scale of urban planning and a broadening definition of modern American architecture. And most importantly for this study, all stakeholders included elevated highways and vertical traffic separations as central features of their futuristic visions.

This book positions three elevated highways in distinctly different urban settings—Chicago, New York, and Boston—with divergent stylistic approaches as evidence of a clear typology of urban elevated highways that united previous conceptions of urban design and transportation with contemporary definitions of modern architecture and automobility. The term “elevated highway,” as used here, reflects the constructed nature of the subject roads and their designers’ awareness of, and intentions for, impacting neighboring urban fabric. In Chicago, the subject road’s elevated nature was not immediately evident, as the project actually raised the surrounding area’s ground plane to match the top level of the new multitiered roadway. In New York and Boston, the subject roads showcased more obvious elevated superstructures built atop existing ground planes. While these are notable distinctions, the use of the term “elevated highway” seeks both to conjure immediate imagery for the reader and to assert designers’ shared visions for physically and architecturally constructing the urban landscape to make way for modern transportation. In Chicago, Wacker Drive (proposed 1909; built 1924–1926) redefined the Chicago River waterfront with a Beaux Arts multilevel roadway that simultaneously eliminated the city’s clogged and unsightly produce market, streamlined intermodal transportation, eased Loop congestion, and stimulated new development along the river (figs. I.1–I.2). The Art Deco forms of New York City’s West Side Elevated Highway (officially the Miller Highway; proposed 1924; built 1929–1937) brought high-speed automotive access to the Hudson River’s working waterfront after decades of stalled debates about improving freight and passenger transportation along this corridor (figs. I.3–I.4). Finally, Boston’s Central Artery (officially the John F. Fitzgerald Expressway; proposed 1930; built 1951–1959) provided a functional and visual retort to Boston’s waning status as a modern economic center by lacing the raw, engineered trusses of a combined
Figure 1.1  Wacker Drive, soon after completion, 1926. (Chicago Plan Commission, *Souvenir of Wacker Drive* [Chicago: Plan Commission, 1926], 15.Courtesy Herlihy Mid-Continent Construction Co.)

Figure 1.2  Riverside promenade, Wacker Drive, 1926. (Chicago Plan Commission, *Souvenir of Wacker Drive* [Chicago: Plan Commission, 1926], back cover. Courtesy Herlihy Mid-Continent Construction Co.)
regional highway and local bypass road through its urban core (figs. I.5–I.6). In all three instances, the physicality of the highways synthesized larger dialogues about economic vitality, civic beautification, transportation efficiency, and architectural modernity.

Chicago’s iteration of this conundrum derived from its industrial roots, burgeoning downtown, and strong fear of civic inferiority. The city’s key geographic location on the banks of Lake Michigan and along the Chicago River had long established its importance as an industrial and trading center, and the expansion of the railroad in the nineteenth century had confirmed this role. The city’s downtown core, ringed by the elevated railroad, was slightly south of the river and lacked a clear relationship to this, the city’s defining geographic feature. Moreover, the areas directly bounding the river reflected the shabbier side of old Chicago commerce, most notably the chaotic and congested South Water Street produce market. Fearing the growth limitations of these conditions and wary of keeping pace with older East Coast cities, Daniel H. Burnham and Edward H. Bennett envisioned systematically recasting Chicago’s organizational, functional, and architectural systems to produce a coordinated image of civic grandeur. Their ideal plan of 1909, the so-called Plan of Chicago, positioned a triple-decked, Beaux Arts roadway skirting the southeastern shore of the Chicago River as a critical piece of the city’s organizational and aesthetic renovation. The elevated nature of this new road was to be invisible from the south, as the elevation of surrounding streets would rise to meet the road’s upper deck. Views from the river’s northern shore, however, would reveal the functional complexity of the new thoroughfare. Its multiple constructed levels were designed to simultaneously ease access to and along the riverfront, separate local from long-distance vehicles, and replace the visual and experiential chaos of the existing riverfront with an architecturally unified civic space. Though it would take almost twenty years for this design to be realized as Wacker Drive, its approach represented all that was modern about contemporary urban design, traffic planning, and architecture.

In contrast to Wacker Drive’s origins within Chicago’s comprehensive city plan, New York’s West Side Elevated Highway evolved as a specific revision to a well-established landscape. Manhattan’s Hudson River waterfront had long been an important railroad corridor and shipping venue with a dense infrastructure of piers and railroad yards. However, the monopoly of the New York Central and Hudson Railroad complicated operations along the waterfront, necessitating convoluted transfers between water, rail, and street vehicles. The on-grade path of the railroad not only provided visual and auditory disruptions to city streets but also posed real dangers to the vehicles and pedestrians sharing them. Moreover, waterfront shipping interests found it ever more difficult to get their goods to and through the city as increasing automobile usage compounded Manhattan street congestion. All of these conditions compelled mounting discussion of west side transportation improvements between the 1890s and the early 1920s. While the New York Central and Hudson Railroad and the City of New York repeatedly failed to reach
Figure I.3 West Side Elevated Highway, New York City, looking north. (Borough President of Manhattan, and Triborough Bridge and Tunnel Authority, *Miller Highway West Side Elevated Improvement*. [New York: n.p., February 4, 1957], 5. Courtesy NYC Municipal Archives.)
agreement on a solution, their debates birthed the idea for an elevated highway along the west side. Manhattan borough president Julius Miller adopted this idea and successfully lobbied for its realization in the early 1920s. The result was an Art Deco-ornamented elevated expressway running down the middle of existing waterfront streets between Canal Street and Seventy-Second Street. It simultaneously bypassed local north-south congestion, provided regional north-south access, and proclaimed a new streamlined visual identity for the waterfront.

Boston shared the congestion and economic concerns faced by Chicago and New York yet struggled with an entirely different landscape as its design canvas. Limited by its amoeba-shaped peninsula and narrow connection to the mainland, Boston’s city plan had developed organically in response to the natural features of its landmass. This made for dense development and irregular street patterns, neither of which proved particularly hospitable to new modes of transportation. Railroads struggled with this issue in the nineteenth century, as the two main stations—at the northern and southern poles of the city—lacked street or rail connections between them. Improvement plans sponsored by the railroads and the city each envisioned new rail or street connections between the two, but nothing came of these ideas. As automobiles further complicated urban movement, the notion of more direct north-south access reemerged as the centerpiece of a comprehensive thoroughfare plan for the city. Statistician-turned-traffic-planner Robert H. Whitten envisioned an elevated express road threaded through a new corridor in the city’s urban fabric. Like the West Side Elevated Highway, it would function both as a means to bypass local street congestion and a high-speed artery for through traffic. This idea

**Figure I.4** West Side Elevated Highway, looking north at Gansvoort Street, 1974. (Library of Congress, Prints and Photographs Division, Historic American Engineering Record, Reproduction number HAER NY, 31-NEYO,88-1. https://www.loc.gov (accessed December 5, 2019)).
Figure I.5 Central Artery weaving through downtown Boston, looking west, 1962. (TC4.03 1186x Box 1 Boston Central Artery September 18, 1962. Massachusetts State Archives.)

Figure I.6 Completed section of Central Artery, near Haverhill Street, November 2, 1954. (TC4.07 1277x Box 5 Photo no. 179 November 2, 1954. Massachusetts State Archives.)
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languished on paper for nearly twenty years as the Depression and World War II redirected attention and funds. In the postwar era, leaders returned to this scheme as critical to the city’s resurgence in the wake of waning economic fortunes. When finally realized as the Central Artery in the 1950s, and despite a modified path, the road closely resembled the functional and aesthetic model cast by Whitten decades earlier. It followed an inland route bordering the central business district and offered high-speed automotive access within and through downtown Boston. Its steel superstructure, sporting horizontal banding and prominent rivets, rendered a dramatically modern, new presence in the city’s landscape.

Together, the Central Artery, West Side Elevated Highway, and Wacker Drive illustrate the far-reaching implications of the automobile on transportation, urban form, and architecture during the first half of the twentieth century. Their evolutions detail the marked contrasts between existing urban environments and the mechanized forms, hastening speeds, and related freedoms of the new automobile age. Boston, New York, and Chicago faced similar problems in the early twentieth century, despite different geographic landscapes and local histories. Their responses to these conditions embraced similar visions of automotive, architectural, and urban modernity even as the nuances of each project varied. It is the physicality of the completed highways that sets them apart from on-grade highways, civic beautification efforts, or individual buildings. These roads impacted cities in multiple realms, affecting those driving on them as well as those moving around and near them at ground level. Their underpinnings, sometimes plain steel trusses and other times articulated with stylized embellishments, edified the arrival of the automobile in the modern urban landscape.

The focus on these three cities is informed by three circumstances. First, well-established cities like Chicago, New York, and Boston faced a different set of challenges in incorporating automobiles into their landscapes than did younger cities, where less density and more available land afforded greater malleability of the urban landscape. Design ideas like vertical traffic separations and elevated highways had particular appeal to cities where density and expansion opportunities already seemed limited. Because of this, the construction of elevated highways had particularly dramatic ramifications.

Second, the continuity of circumstances in these three locations provides a framework for evaluating and understanding the proliferation of elevated highways in other American cities in the pre-Interstate era (before 1956). As automobiles became more popular, smaller or less dense cities faced many of the same challenges as their larger counterparts, and countless cities considered or planned elevated-highway solutions, including Detroit, St. Paul, St. Louis, and Philadelphia. Comparable built examples include the Pulaski Skyway in New Jersey (1930–1932), the Gowanus Parkway in Queens (1941), Buffalo’s Skyway (1953), and Seattle’s Alaskan Way Viaduct (1953).

Third, the relevance of the Chicago, New York, and Boston examples is heightened by subsequent additions to, and reevaluation and revision of, each example.
Chicago extended Wacker Drive, first on its western end in the 1940s and then east to Lake Michigan in the 1970s. The ideological underpinnings and aesthetic treatment of these sections proved far different from those of Burnham and Bennett’s original roadway. In 2002, Chicago completed a $200 million reconstruction, restoration, and cleaning program for the original east-west portion of Wacker Drive. Then, between 2009 and 2016, the city improved Wacker Drive’s public appeal by adding new walkways, benches, public art, and shops and restaurants to create the so-called “Chicago Riverwalk.” Additional similar improvements east of Michigan Avenue are still ongoing. These projects have reframed Wacker Drive’s significance to focus on its multitiered streetscape and civic engagement instead of its singular efficiency as an automotive thoroughfare.  

In New York, after a section of the West Side Elevated Highway collapsed in 1973, the city demolished much of the elevated roadway, citing its deteriorated condition as a liability both for drivers and the city. Ensuing controversy about how to reconstruct the western waterfront and a new iteration of the highway dominated public discourse for much of the rest of the century. It finally culminated in the construction of an on-grade highway along the waterfront, with elevated portions remaining only at the road’s northernmost reach. The new West Side Highway was completed in 2001.  

In Boston, revisions to the Central Artery and its new corridor of parks reached completion in 2007. Soon after the highway’s original dedication in 1959, traffic volumes on the road far surpassed its projected capacity. This new traffic problem, paired with increasingly popular antielevated highway sentiments from laypeople and planning officials alike, encouraged local disdain for the road. The purported solution to these concerns was the Central Artery/Tunnel Project (the “Big Dig”), outlined earlier. Built between 1991 and 2007, it removed the auditory and physical disruption wrought by its predecessor. 

Together, these recent revisions underscore the connection between our contemporary landscape and the historical pattern of urban elevated highways. Instead of staid projects with limited lifespans, these highways significantly affected subsequent development patterns in each city and ultimately have posed major challenges to contemporary designers. They are also distinctly different from the elevated highways built after 1956 using federal Interstate funding, a cadre whose government sponsorship dictated and homogenized their forms. Understanding the sequence of these design iterations helps to explain America’s current urban landscapes.
chitectural history to figure prominently in evaluating the design significance and impact of these early automotive constructs.

In *The Machine in the Garden*, Leo Marx established nineteenth-century industrialization as the glaring challenge to America’s pastoral ideal. Marx contended that “progress,” as a persuasive and pervasive ideal in nineteenth-century America, eventually overran the equally powerful infatuation with the country’s natural landscape. He positioned the railroad’s intrusion onto the American frontier as the quintessential harbinger of the condition of modernity as it directly impacted the public’s view and use of the American landscape. This book builds on Marx’s pivotal model by positioning the rise of the automobile and its representation of machined progress as the twentieth-century equivalent of his paradigm. It maintains that elevated expressways pierced the ideological and aesthetic character of American cities, imposing a new image of modern transportation, architecture, and urban life. The chapters that follow will chart this path.

Part I, “The Problem of Congestion,” establishes the national context of existing urban conditions, modern architecture, and growing automobility in the late nineteenth and early twentieth centuries, and chronicles the resulting myriad ideas for controlling urban growth and urban traffic across the country, including Chicago, New York, and Boston. Part II, “Elevated Expectations,” traces the design processes for Wacker Drive, the West Side Elevated Highway, and the Central Artery. Within the context of the three cities’ widely divergent landscapes, planning processes, and design vocabularies, these chapters reveal the cities’ parallel problems, shared hopes for revitalization, and common selection of elevated highways as redemptive solutions. Part III, “Bridges and Divides,” presents the implementation of the three main subject roads and their immediate aftermaths, and then traces the afterlives of all three highways, first through the replication of their typology via the federal Interstate program and then through the specific lifespans of, and subsequent changes to, each example.

In the twenty-first century, our planet finds itself on the brink of environmental disaster, thanks in no small part to America’s dependence on and exploitation of automotive transportation. Since architecture and urban design record and edify social change, our current built environment reveals well-intentioned design concepts that have been exponentially expanded and replicated to their detriment. The history and development of urban elevated highways provides one medium for tracing this pattern. Early elevated highways marked the start of a massive shift in American city-building, one that began to adapt the urban environment to suit the automobile. Constructed roads uniquely offered both engineering utility and architectural presence, making them harbingers of both transportation trends and architectural fashion. As such, the elevated highways discussed in the following pages are important on two levels: as historical artifacts with complex and as-yet-unaddressed design histories, and as references for subsequent development approaches that have largely determined our contemporary American landscape.