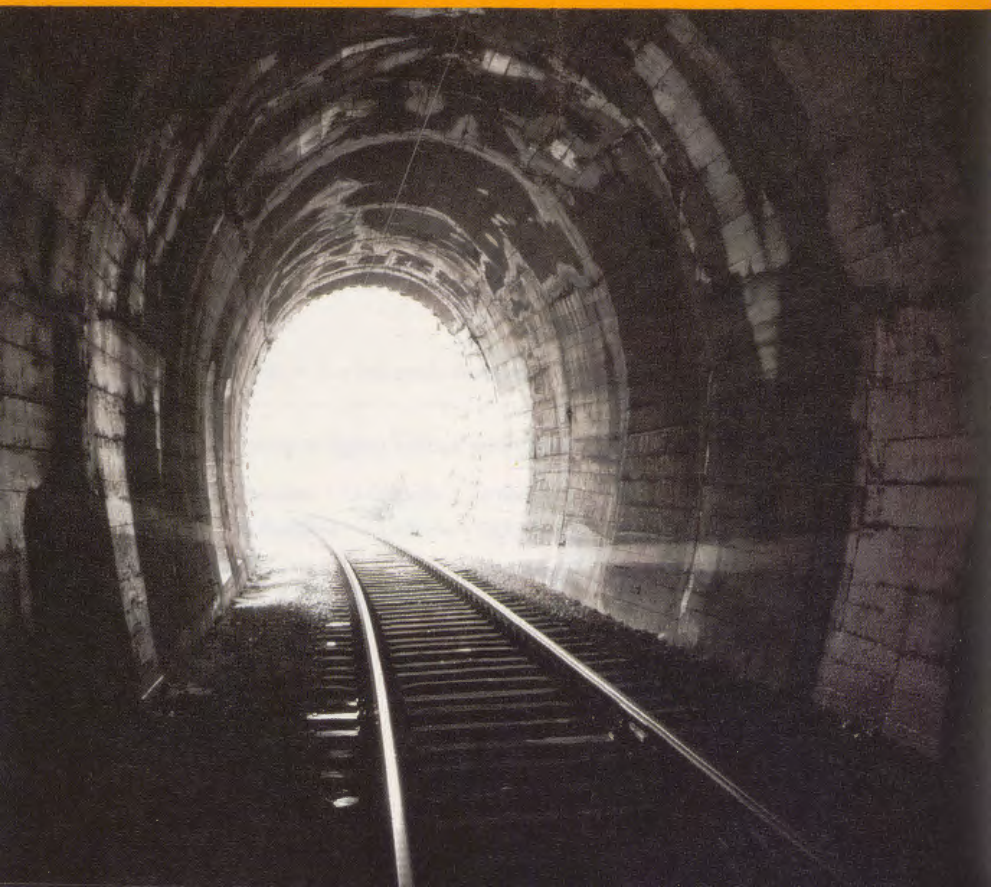
Lifting the Lid Off the Loop



Underground Development in Downtown Chicago

BY KATY E. ROSSING

I. Introduction

The *Chicago Reader* published this letter in 2009:

> In the *Dresden Files* books, which are set in Chicago, Jim Butcher posits an entire world beneath the present-day city called Undertown. He says Chicago, being built on marshy ground, kept sinking. A road would be built, then sink, and another would be built on top of it — often with a latticework over the old one, making a tunnel out of the original road. Buildings were supposedly built with this sinking phenomenon in mind, with a fancy entrance on the second floor called a Chicago entrance. As the building sank into the ground, the second floor would become the ground floor, and the old ground floor would become the basement. I assume this isn't really happening.

The columnist, Cecil Adams, responded that tales of a subterranean Chicago are "*mostly* fiction . . . But mostly isn't the same thing as all."[1]

1. Adams, Cecil, "Does Chicago's Undertown, as depicted in Jim Butcher's *Dresden Files* novels, actually exist?" *Chicago Reader,* 19 Mar. 2009.

Butcher's characterization of Chicago as a city sinking into a marsh is accurate. An intrepid explorer of Chicago's Loop can find examples for all of the phenomena described in the letter — and even more — beneath the streets.

Chicago is so famous for tall buildings that expansion in the opposite direction risks being forgotten (Figure 1). Most guidebooks include a brief treatment of "Chicago's Subterranean," describing it as a little-known secret for the more adventurous tourists, but the city's underground history keeps a low profile. *The Unofficial Guide to Chicago,* for example, warns its readers that the lower levels of Michigan and Wacker can be "a bit scary." (Even the keenest urban spelunker can appreciate that gleaming glass curtains make better postcards than gloomy tunnels.)[2]

Despite its low profile, the Loop's multilayered development features a complex, vibrant underground that uniquely illuminates Chicago's history, geographic setting, and civic character. Right below the sidewalk, the brightly lit, futuristic Pedway shelters commuters as they hustle from Metra trains to their office buildings downtown, while providing coffee shops, dry cleaners, and retail stores along the way. This piecemeal system of climate-controlled walkways provides a modern example of the classic Chicago tradition of public-private coalitions in city-building.

Chicago's multilevel streets are similar to the fictional "Undertown" mentioned in the letter. Although Lower Wacker Drive and Lower Michigan Avenue lie at the original ground level of the swampy shores of Lake Michigan, the nineteenth-century elevation of Chicago's streets and buildings creates an artificial underground space. Adams writes that "you feel like you've descended into the bowels of the earth" on the lower level of Lower Wacker Drive.[3] Originally conceived by Daniel Burnham in his

2. Hoekstra, David, Alice Von Housen, and Laurie Levy, *Unofficial Guide to Chicago* (New York: Macmillan, 1995), 109.

3. Adams, Cecil, "Does Chicago's Undertown, as depicted in Jim Butcher's *Dresden Files* novels, actually exist?" *Chicago Reader.*

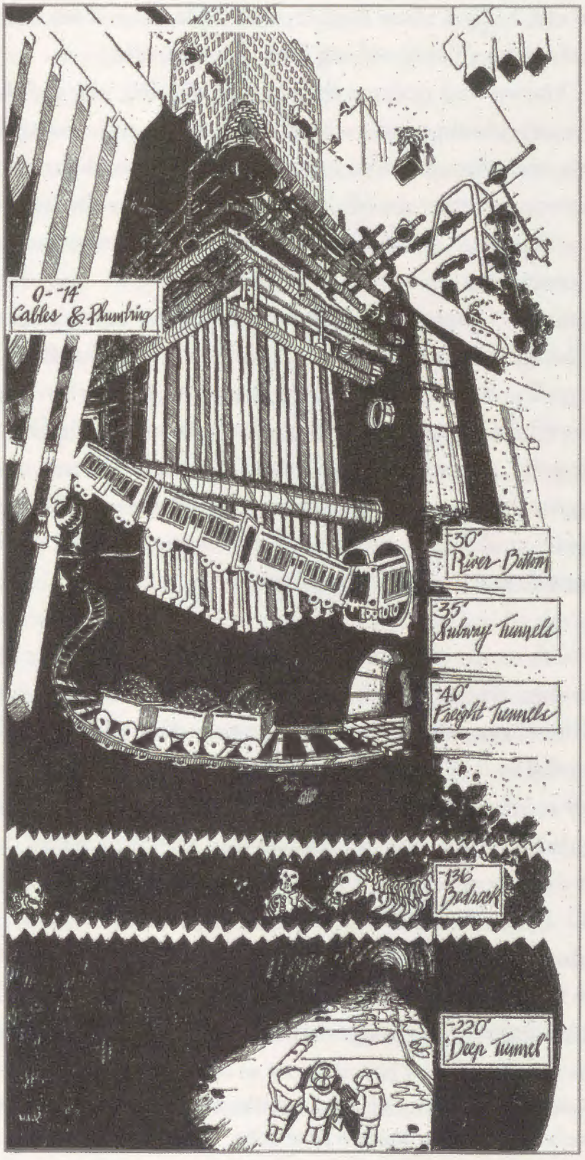


Figure 1. An illustration accompanying a *Chicago Tribune* article on underground Chicago.

1909 Plan of Chicago, these double- and triple-decked streets represent the city's era of headline-grabbing feats of engineering.

Least known and perhaps the most intriguing, the freight tunnel network honeycombing sixty miles of Loop streets is the best example of a forgotten underground city in Chicago. The network attracted widespread attention at the turn of the twentieth century for its innovation and scale, enhancing Chicago's reputation as a progressive and ambitious center of commerce.

In addition, Chicago has remnants of streetcar tunnels running under the Chicago River at LaSalle, Washington, and Van Buren streets, the Chicago Transit Authority subway lines with an excavated spur leading off to unfinished segments, under-sidewalk vaults, the Deep Tunnel Project, and Al Capone's small network of tunnels discovered underneath the Lexington Hotel in the 1980s.[4] Adams describes one city engineer's account of an unlikely left-over slice of old Chicago formed when a street was elevated to reach a bridge crossing the Chicago River:

> Not far from the river there is an ordinary manhole cover in the street that, when opened, leads down to a street from another era. There is an old granite cobblestone surface with a couple of manholes in it . . . Apparently the city's engineers didn't want to pay to rebuild the manholes, so they just left them in place, provided an open space over them and provided access down from the new street so the utility workers could still get in.[5]

This forgotten street is the closest approximation of the latticework, preserved stores, and sunken roads of Butcher's mythical Undertown. The Loop's subterranean passageways have inspired other novelists — for

4. "The Mystery of Al Capone's Vault," en.wikipedia.org/wiki/The_Mystery_of_Al_Capone%27s_Vault. Accessed 8 May 2010.

5. Adams, Cecil, "Does Chicago's Undertown, as depicted in Jim Butcher's Dresden Files novels, actually exist?" *Chicago Reader*.

example *Tunnel Vision* by Sara Paretsky, set in the freight tunnels — and filmmakers, who have chosen Lower Wacker Drive and the Pedway for chase scenes in *The Blues Brothers* and *Batman*.

Chicago's underground development is of particular interest due to its diversity, ambition, and future potential for expansion, spanning from the herculean effort of raising the entire young city in the mid-nineteenth century to the piecemeal, but expanding, twenty-first-century Pedway network. This essay attempts to answer the question of why the Loop's underground development exists, connecting the broader contexts of Chicago's history and civic character to the factors driving the construction of underground spaces in the Loop.

At the beginning of the twentieth century, when much of the underground development discussed here occurred, Chicago was an attractive site for enterprising investors eager to capitalize on its explosive growth. This is reflected in the impressive scale and technology of the underground developments. Reflecting the private interests that pushed these developments, each foray underground is marked by the machinations of its private boosters.

The Washington Street tunnel under the Chicago River set the tone for later developments. In 1866 the city made a $200,000 contract with a private company to construct the tunnel. The *Chicago Tribune* noted: "The earth was sold to other parties for a cost at least equal to the cost of excavating." Eventually, the tunnel was operated as a franchise, and the managing company charged a toll to tunnel users.[6]

Several structural themes are important to keep in mind. One is the geologic character of the Loop. Planning and engineering underground construction in Chicago's Loop has been both constrained and enhanced by the soft blue clay substratum underlying the area. While the instability of this foundation has lead to an increased potential for cave-ins and leakage, it is also easier to tunnel through than rockier soil (Figure 2).

6. "The Washington Street Tunnel," *Chicago Tribune*, 21 May 1867.

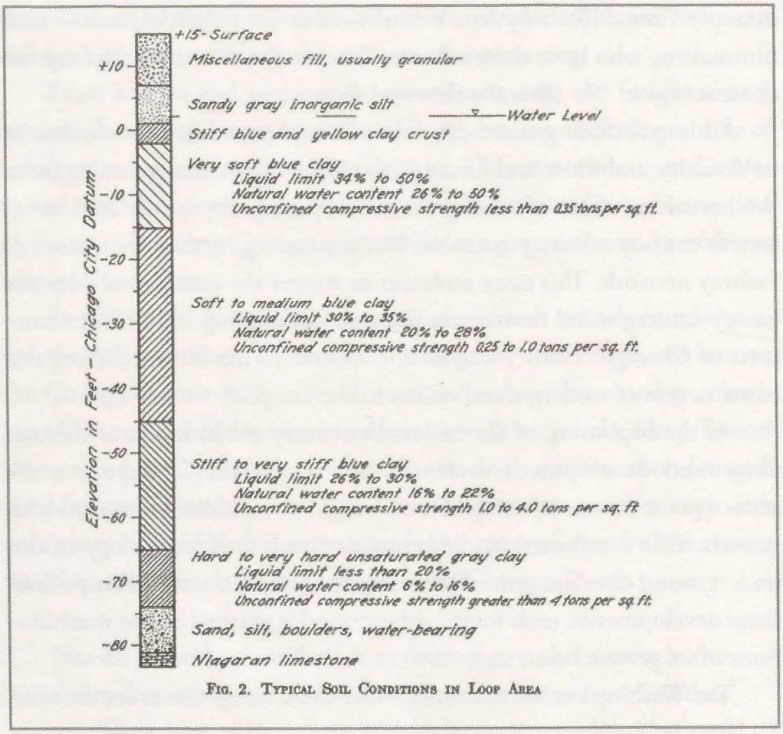


Figure 2. A diagram showing average underground geology in the Loop (note abundance of soft blue clay).

A second theme is the contrast between utility- and human-oriented spaces. The central purpose of the Loop's freight tunnels and lower levels of the multilevel streets was to hide and separate utility functions such as coal delivery from the human-oriented street space above. Their design constraints differ from the Pedway, which strives to create a pleasant underground space for people. As later sections discuss, the same interest groups drove both utility- and human-oriented underground development.

A third consideration related to underground construction is the definition of "underground." At forty-feet deep, the freight tunnels are

Figure 3. Artificial underground space on Lower Wacker Drive.

unmistakably underground. The lower levels of multilevel streets are *at* ground level, but the relationship between the lower and upper levels is analogous to being underground: cut off from daylight in a relatively closed environment (Figure 3). This essay will treat these "artificial" underground areas as if they were truly subterranean.

Let's descend!

II. Modernist Architecture Digs Deep

This section explores the planning history of multilevel and underground urban development, from its earliest conceptions to today. I attempt to account for the historical origins of underground space in city theory and planning, detailing its significance in modern architecture and postmodern visions of the city. I argue that visionary models are relevant to understanding Chicago's subterranean spaces due to Chicago's eagerness

to adopt new city-building technologies, the tradition of private-sector investment in public works, and the historic synchronism of modernist planning philosophies with Chicago's infrastructure investment.

The underground is a modern space. In the mid-nineteenth and early twentieth centuries, city planners began to construct significant underground networks, which were rooted in modernist planning and contemporary ideas about successful central business districts. Despite a brief period of fantastical (and unimplemented) proposals by modernist and futurist planners in the 1910s–1930s, underground development has only recently enjoyed significant popularity as planners search for affordable and sustainable ways to accommodate increasing densities.

The nineteenth century marked the emergence of underground space in mainstream consciousness. Science fiction literature and illustrations frequently considered human existence underground. Modernist scholar, David L. Pike, notes that the literature "remains merely representational, but there is an eerie correlation to actual conditions."[7] Nineteenth-century fictional ideas emerged in the modernist plans of architects such as Le Corbusier, with visions of multilevel cities dominating architectural discourse in the early twentieth century.[8]

In 2004, a competition solicited proposals for the World Trade Center site in New York City. Most projects contained elevated pedestrian corridors to create horizontal links between structures, evoking what architectural critics Vincent James and Jennifer Yoos term "multilevel cities in the sky." These ideas reflected an emerging trend in architectural planning: the "3-D City" model (Figure 5). For James and Yoos, "the [World Trade Center] competitors represent only the most public of a group of like-minded architects" advocating a reemergence of the 3D or layered cityscape. James and Yoos note a fifty-year history of "more ba-

7. Pike, David L., *Metropolis on the Styx: The Underworlds of Modern Urban Culture, 1800–2001* (Ithaca, NY: Cornell University Press, 2007), 12.

8. Real Virtual: "Representing Architectural Time and Space," learn.columbia.edu/ha/html/modern.html (accessed 8 May 2010).

nal" multilevel construction, but in fact, such experimentation has been happening in cities since the turn of the century.[9] Experimentation with urban layers may to be coming back into fashion among the architectural elite, but urban experimentation with multilevel and subterranean construction extends to at least the mid-nineteenth century. Chicago, for example, installed its first subterranean pedestrian corridors in 1869 to alleviate congestion crossing the Chicago River.

The Origins of Subterranean Space

The underworld is infused with an inherent spiritual or sacred quality. Preliterate people divided the world into the basic components of sky, earth, and underworld. Their spatial conception was of vertical rather than horizontal exploration.[10] Early Christianity's "Vertical Cosmos" defined the primary qualities associated with depth for several centuries (Figure 4). Good is found above, evil below.[11] Supernatural phenomena, evil and death, were relegated to the subterranean realm. For much of history, people occupied subterranean space sporadically and usually in adversity. Slaves or indentured laborers pursued activities, such as rudimentary tunneling, often in grueling conditions.

The popular emergence of the underground is often associated with the Industrial Revolution, first as the expansion of railroad and canal networks, and later with the explosive urbanization of the nineteenth century (Figure 7). Urban growth and crowding highlighted the vertical structure of society and the physical environment. "The city itself was beginning to reflect the timeworn metaphysics [of the vertical cosmos]," writes David Pike of the stratified city of the nineteenth century, "Infernal imagery was easily adaptable to an industrial revolution that saw

9. James, Vincent, and Jennifer Yoos, "The 3-D City," *Architecture* 93:5 (May 2004).

10. Williams, Rosalind H., *Notes on the Underground: An Essay on Technology, Society, and the Imagination* (Cambridge, MA: MIT Press, 2008), 8.

11. Pike, David, *Subterranean Cities*, 12.

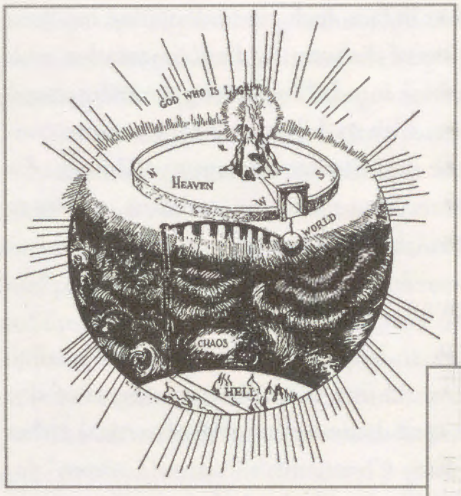


Figure 4. Vertical Cosmos structure.

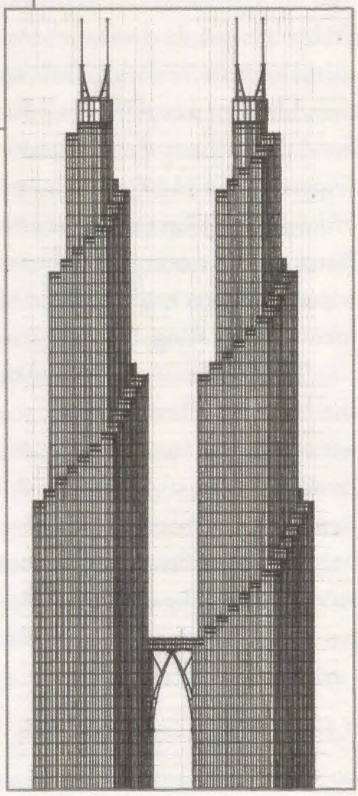


Figure 5. "The 3D City": a 2004 World Trade Center proposal.

wage laborers at work in mines and tunnels, or in factories that were underground in all but name."[12]

The expansion of transportation networks and sewers redefined descent as progressive and positive. Rosalind Williams writes, "the quest to recover the truth about the past by digging . . . was a central project of nineteenth-century science."[13] Sanitation networks promised improved living conditions, and the technological rationalization of the underworld hinted at a tantalizing ideal of an urban utopia premised on subterranean expansion.[14] In less urban areas, mid-nineteenth-century archeological excavation generated interest and excitement in the possibilities of underground space.

Popular enthusiasm for the underground is reflected in period literature (Figure 6). Williams writes that the idea of "living below the surface of the earth emerged along with modern science and technology."[15] Much of nineteenth-century literature envisions the underworld as fantastic or futuristic cities, drawing on ancient associations and mythologies to enhance their supernatural aura. Historians David Pike, Rosalind Williams, and Blanche Gelfant have written accounts of the explosion of fantastical underground-oriented literature. In "Life Below the Ground," Wendy Lesser's analysis of underground imagery in literature, she writes:

> The underground has always been situated oddly between the visible and the invisible — between that which one can see and touch in one's normal life, and that which one must accept on faith. This may explain in part, why the real underground...has given rise to so many fictional or imaginary undergrounds...The

12. Ibid., 5–6.

13. Williams, Rosalind, *Notes on the Underground*, 17.

14. Pike, David, *Subterranean Cities*, 11.

15. Williams, Rosalind, *Notes on the Underground*, 11.

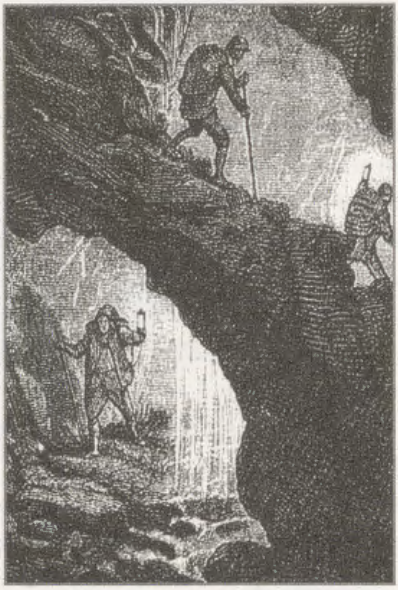


Figure 6. An illustration from Verne's *Journey to the Center of the Earth.*

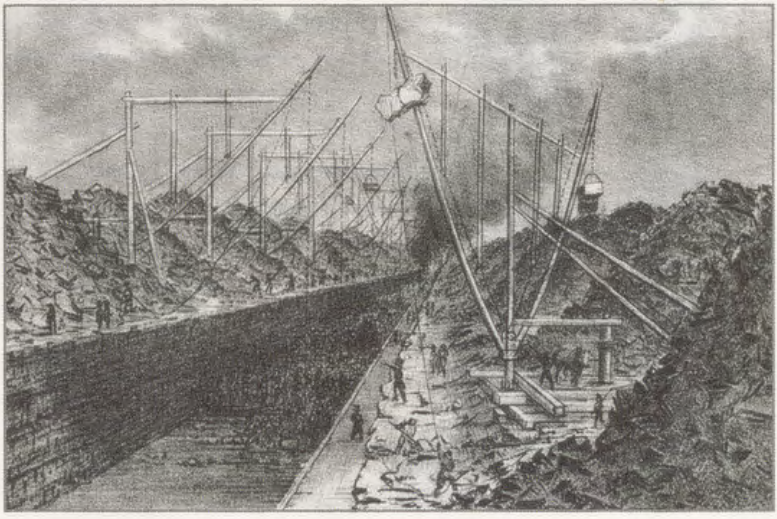


Figure 7. Nineteenth century canal excavation.

> notion of the underworld has always held something of a mystery and terror for the living,[16]

Jules Verne's *A Journey to the Center of the Earth* was published in 1864; H.G. Wells's 1895 *Time Machine* describes a futuristic underground society and critiques contemporary social problems; and Edward Bulwer-Lytton's 1871 *The Coming Race* depicts an underground city that "perfectly blends comfort, gadgetry, and beauty."[17]

These fantasies were the intellectual environment from which the modernist visions of the vertical city published in the early decades of the twentieth century emerged. The similarity of the plotlines between real and imagined subterranean exploration suggests a dialogue between technologically progressive city-builders of the early twentieth century and their fictionalized counterparts. "Technological events," writes Williams, "were informed by the storyline of the journey to the underworld in the quest of truth and power."[18] The planning documents and speeches by city-builders stop short of quoting Verne and Wells, but the relationship between the literature and the historical progress of underground exploitation is credible and alluring.

Modernist City Planning Champions Subterranean Space

The nineteenth-century city was chaotic, plague-ridden, and congested. Lewis Mumford proclaimed the congested metropolis "wasteful, inefficient, and technologically obsolete."[19] In Chicago, where the city's population increased by 26,400 percent between its 1837 incorporation

16. Sterling, Raymond, and John Carmody, *Underground Space Design* (NJ: John Wiley and Sons, 1993), 138.

17. Rosalind Williams, *Notes on the Underground*, 98.

18. Rosalind Williams, *Notes on the Underground*, 16.

19. Boyer, Christine, *Dreaming the Rational City: The Myth of American City Planning* (Cambridge, MA.: MIT Press, 1983), 192.

and 1890, the problems associated with laissez-faire urban investment were especially severe (Figure 8). Reacting against the Loop congestion and the "superabundant soot" of the city, Daniel Burnham's 1909 *Plan of Chicago* illustrated "twin obsessions": city beautification and traffic circulation.[20]

Burnham was not the only visionary urbanist of the time. Disillusioned with the nineteenth-century city — a vision of both sublime technological achievement and spectacular failure — planners offered a variety of utopian city schemes to confront the congestion, overcrowded slums, and sootiness of their cities. J. T. Noble Anderson declared: "The most important points to be observed in the Twentieth Century City will be the avoidance of dirt, dust, and smoke."[21]

Burnham and the Chicago Plan Commission, while not modernists, were great admirers the work of George-Eugène Haussmann. Chicago Plan promotional materials laud Haussmann as "the greatest city builder of all time" and frequently include Parisian examples as ideal models for Chicago.[22] Haussmann's rebuilding of Paris in the 1860s replaced narrow curving streets with wide straight boulevards and imposing views of state institutions (Figures 9 and 10). Haussmann designed roads with separate lanes for different traffic speeds, which were a predecessor of modernists' multilevel transportation systems. The Modernists' embrace of Baron Haussman earned the ire of Jane Jacobs in her pro-entropy treatise *Death and Life of Great American Cities*, which argued for the importance of the special ambience of mixing different purposes, people, and vehicles on city streets.

20. Draper, Joan, "Chicago: Planning Wacker Drive" in *Streets: Critical Perspectives on Public Space,* edited by Zeynep Çelik, Diane Favro, and Richard Ingersoll (Berkeley: University of California Press, 1994).

21. Reps, John W, "Urban Planning, 1794–1918: An International Anthology of Articles, Conference Papers, and Reports," library.cornell.edu/Reps/DOCS/homepage.htm (accessed on 8 May 2010).

22. Chicago Plan Commission, *Chicago's Greatest Issue: An Official Plan* (Chicago: Chicago Plan Commission, 1911), 81.

Figure 8. Chicago street congestion; Dearborn and Randolph, 1909.

Figure 9. Haussmann's transformation of the streets of Paris, with his changes noted in red.

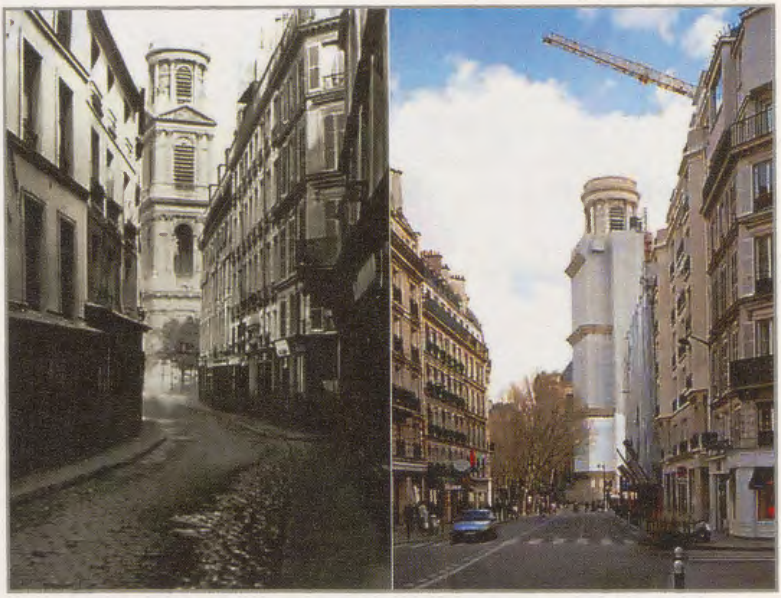


Figure 10. A Paris street, before and after Haussmann's transformation.

Figure 11. Paying tribute to Haussmann, an illustration from Burnham's 1909 Plan of Chicago.

Many plans appear to have taken cues from fictional subterranean narratives such as Bulwer-Lytton's blend of technology and aesthetics. Modernism's vertically layered metropolis inspired speculative films like Fritz Lang's *Metropolis* (1926, Figure 13). Many of these films critiqued the socioeconomic hierarchy imposed by a vertical city's physical structure. David Butler's *Just Imagine* (1930) showcased a utopian prediction, with efficient cavernous streets and magnificent brightly lit skyscrapers (Figure 12).[23]

Excited by the possibilities offered by new technologies, such as reinforced concrete, many speculative schemes intensified verticality, stretching cities toward the sky and deep into the earth. A common goal was the segregation of activities for improved efficiency or aesthetics. In "Death of the Boulevard," John R. Gold writes that multilevel transportation "became routine in modernist literature."[24] Most of these experimental visions were meant to inspire. As Gold writes in *The Experience of Modernism,* "paper is cheap." These experimental designs ignored practical consideration of costs and feasibility. Gold emphasizes the "critical and promotional dimensions" of modernist architects, who intended their drawings to comment on rather than solve contemporary urban problems.[25]

Nonetheless, these visions did influence architectural planning and had concrete results. "One consequence of this [the modernist] style of thinking," writes Gold, was "experimentation with multilevel, functionally defined circulation systems to replace the 'battleground' of the

23. Gold, John Robert, *The Experience of Modernism: Modern Architects and the Future City, 1928–53* (London and New York: E. & F.N. Spon, 1997), 28.

24. Gold, John R, "Death of the Boulevard," *Images of the Street: Planning, Identity, and Control in Public Space,* edited by Nicholas R. Fyfe (London: Routledge, 1998), 48.

25. Gold, John R, *The Experience of Modernism,* 10.

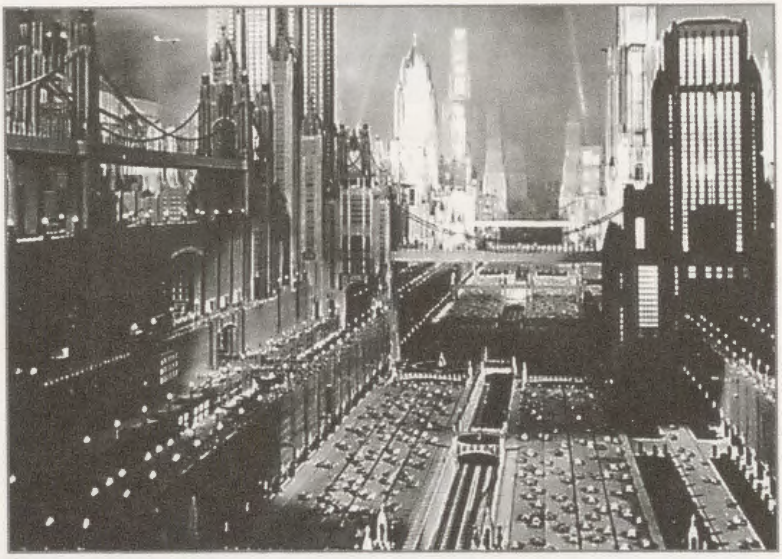


Figure 12. *Just Imagine* (1930): New York City, 1980.

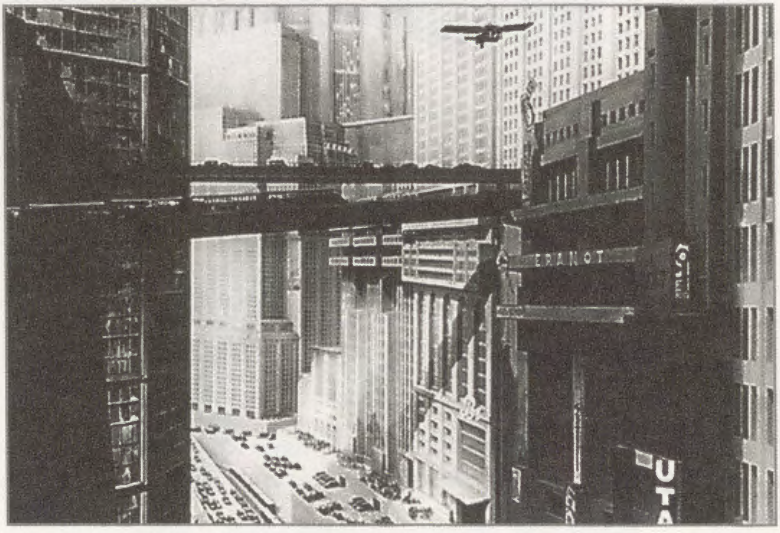


Figure 13. Fritz Lang's *Metropolis* (1927).

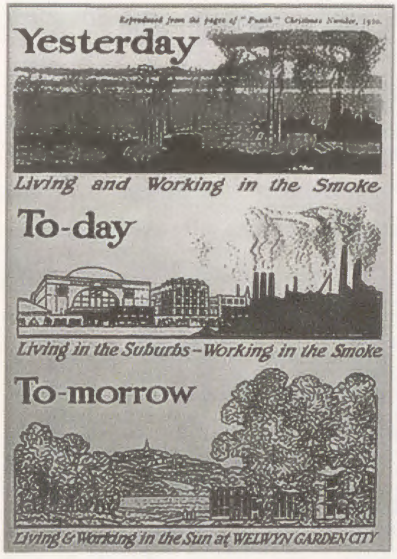


Figure 14.
Ebenezer Howard's Garden City.

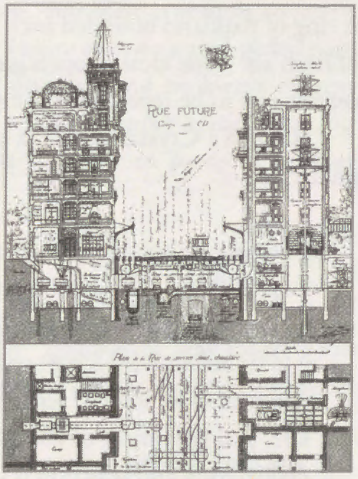


Figure 15. Eugene Hénard's multilevel street plan.

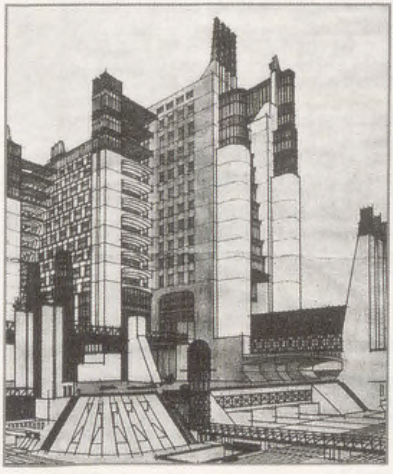


Figure 16.
A drawing by Antoine Sant'Elia.

traditional major urban street."[26] The early twentieth century spawned a variety of these visions, an array of skyscrapers linked by efficient multilevel corridors. In the next section, I will review the key proposals of modernist planning, with an emphasis on precursors to underground expansion.

The Garden City

Ebenezer Howard's Garden City model of 1895 proposed a metropolitan region with an administrative core surrounded by relatively autonomous sub-centers, distributing population and infrastructure across the region. A ring of parkland bounded each unit and offered the salubrious effects of fresh air. (This ideal of open green space and carefully planned urban centers was to be repeated in the modernist plans to come.)

Howard's Crystal Palace is the first imagined climate-controlled public space:

> Running all around the Central Park is a wide glass Arcade or Crystal Palace. This building is in wet weather one of the favorite resorts of the people; for the knowledge that its bright shelter is close at hand will tempt people into the park even in the most doubtful of weathers. Here manufactured goods are exposed for sale, and here most of the shopping which requires the job of deliberation and selection is done. The space is however a good deal larger than is required for these purposes, and a considerable part of it is used as a winter garden, and the whole forms a permanent exhibition of a most attractive character.[27]

A precursor to the modern shopping mall, a centrally located climate-controlled public corridor also anticipates the underground walkways and roads in later urban models, such as Chicago's Pedway and freight tunnel system.

26. Gold, John R, "Death of the Boulevard," 45.

27. Howard, Ebenezer, *Garden Cities of To-morrow* (London: S. Sonnenschein, 1902).

Eugene Hénard's Multilevel Transportation Corridors

Eugene Hénard's 1910 futurist plan, *City of the Future*, suggests layering entire cityscapes, pouring concrete over existing structures. Credited with the invention of the traffic roundabout, he suggested a number of visionary strategies to combat city congestion involving underground development or the creation of artificial underground space (Figure 15).[28] Multilevel roadways were designed to alleviate congestion by providing elevated express lanes. Hénard writes, "all the evil [of cities] arises from the old traditional idea that 'the bottom of the road must be on a level with the ground in its original condition.' But there is nothing to justify such an erroneous view."[29] *City of the Future* also separated pedestrians from automobile traffic by building underground walkways at busy intersections. Although Hénard was schooled under Haussmann, he stressed improving traffic circulation in order to preserve existing historic buildings.

"Storeys Deep into the Earth": Antoine Sant'Elia's *Citta Nueva*

The *New York Times* called Sant'Elia the "flamboyant holy roller."[30] His *Futurist Manifesto of Architecture* (1914) paints a bold portrait of the future:

> The street will no longer lie like a doormat at ground level, but plunge many storeys down into the earth, embracing the metropolitan traffic, and will be linked up for necessary interconnections to metal gangways and swift-moving pavements.[31]

28. Gold, John R, "Death of the Boulevard," 47.

29. Hénard, Eugene, "The City of the Future," *Transactions* (London: Royal Institute of British Architects, 1911), 345–367.

30. Goldberger, Paul, "Aintoine Sant'Elia," *New York Times*, 21 Feb. 1986.

31. Quoted in Gold, John R. "Death of the Boulevard," 47.

The New York Times also called him "a prophet of a much more general sort — an artist-architect who . . . wanted to proclaim the potential of twentieth-century technology to remake the world."[32] Sant'Elia's *Citta Nueva* sketches are the earliest and some of the most striking visions of thoroughly multilayered urban utopias.

Harvey Wiley Corbett's Futuristic New York City

Speaking of urban congestion and making his case for the multileveled city in a 1915 speech, Harvey Wiley Corbett said: "We are just like the man who has eaten too much, drunk too much and lived too high, and finally gets blood pressure." Corbett argued that congestion caused by skyscrapers would require at least three levels of traffic to accommodate commuters to the center city:

> We *are* going to have [three-level streets] and the subject of this talk should be 'What shall we do with [them]?' Not, "Do we want them?" We might as well say "Do we want radio announcers?" or "Do we want cigarette ads or vaccinations?"[33]

Corbett's 1913 drawings of a future New York City included overhead bridges linking the top floors of skyscrapers, elevated pedestrian walkways crisscrossing the surface-level street, which accommodated automobiles, and subways and freight railways running underground (Figure 17).[34] While not as radical in their re-imagination of streets' relationship with the built environment as later Modernist planners, Corbett's visions are significant in their scope, prescience, and directness in response to the problems of central city congestion.

32. Goldberger, Paul, "Antoine Sant'Elia."

33. Corbett, Harvey Wiley, "Do We Want Three Level Streets?" *Housing Problems in America* (New York: National Conference on Housing, 1911–29), 239.

34. Gold, John R, "Death of the Boulevard," 47.

Figure 17. Harvey Wiley Corbett's
hyper-layered vision for New York City.

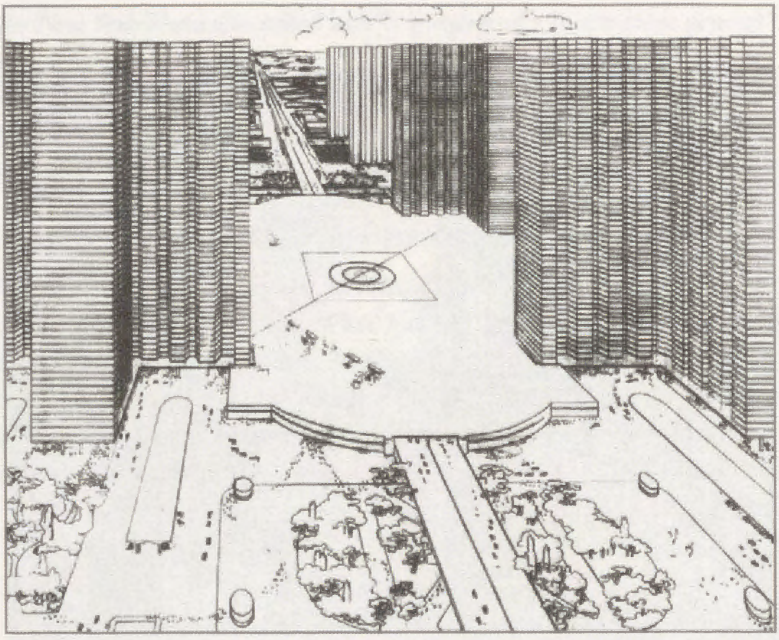


Figure 18. Le Corbusier's City of Tomorrow.

Le Corbusier

Le Corbusier is perhaps the most famous and ardent advocate of a multilevel city. Revolutionary and scientifically precise, his schemes are marked by human austerity and futuristic aesthetic. Le Corbusier's shared Hénard's enthusiasm for reinforced concrete and striated transportation schemes of over- and underpasses, but Le Corbusier, who once declared traditional streets "altogether disgusting" was more extreme than Hénard.[35] For traffic management, Le Corbusier's declares in *The City of To-Morrow* (1929, Figure 18): "Three kinds of roads are needed, and in superimposed storeys: Below ground there would be a street for

35. Ibid., 48.

heavy traffic. This story would consist merely of concrete piles, and between them large open spaces which would form a sort of clearing-house where heavy goods and traffic could load and unload."[36] He viewed the street as a complex apparatus (an "organ" or a "machine") that should efficiently sort its travelers: "the modern street should be a masterpiece of civil engineering and no longer a job for navvies."[37] His vision reflects the process of engineering required for Wacker Drive, situating its construction as a typical outcome of the prevailing ideology of early-twentieth century city design. Le Corbusier's designs also advocated separating pedestrian and automobile corridors. "To order is to classify," he wrote. His *Contemporary City* resembles a factory, with each element segregated according to its function, from superhighways to subways to pedestrian walkways.[38]

Postmodern Vision of the Underground City

One intriguing postmodern scheme of underground space was proposed by architects Ernst von Meijenfeldt and Marit Geluk in the avant-garde, *Below Ground Level* (Figures 19 and 20). Alluding to Chicago, and calling their proposal "Gotham City":

> Streets and squares would be dug up, bringing light and air underground. In this model, ground level no longer exists as a reference. It actually makes no difference what is above and below ground, since the whole programme can be positioned along a vertical axis. Tram rails would be suspended in the air in their original positions, like the elevated metros in cities like Chicago. Pedestrians would move around several levels. [. . .]

36. Le Corbusier, *The City of to-Morrow and its Planning*, translated by Frederick Etchells (London: John Rodker, 1929), 168.

37. Ibid., 167.

38. Ibid., 190.

> Just as in Gotham City, accesses and connections could be created on many levels.[39]

Modernist architects and planners' idealistic plans were composed before the total ubiquity of the automobile, globalization, and suburban sprawl and lacked a detailed analysis of feasibility. Meijenfeldt and Geluk expanded on urban planning visions of the first half of the twentieth century, using Chicago as a model of what might be possible in reality.

Conclusion

Chicago has a history as a muse for visionary urban planners and progressive city building. The first traffic tunnels under the Chicago River and elevating the Loop — magnificent hotels intact — by eleven feet was followed by the 1893 Columbian Exposition, which set in motion the City Beautiful movement. "That the Exposition should be a natural growth and product of the Northwest offered a step in evolution to startle Darwin," Henry Adams reflected in 1918, "but that it should be anything else seemed an idea more startling still."[40] He referred to the City Beautiful's unlikely birth from a "city of superabundant soot," but acknowledged Chicago as a paragon of urban progress in the modernist era.[41]

Chicago's infrastructure investment between 1900 and the 1940s coinciding with the zenith of modernism, suggested that Chicago's civic character was the realization of modernist ideals. Chicago was heralded as an example of the city of the future; many representatives of other cities and nations visited during the construction of the triple-decked Wacker Drive to learn from Chicago's example. Newspaper articles

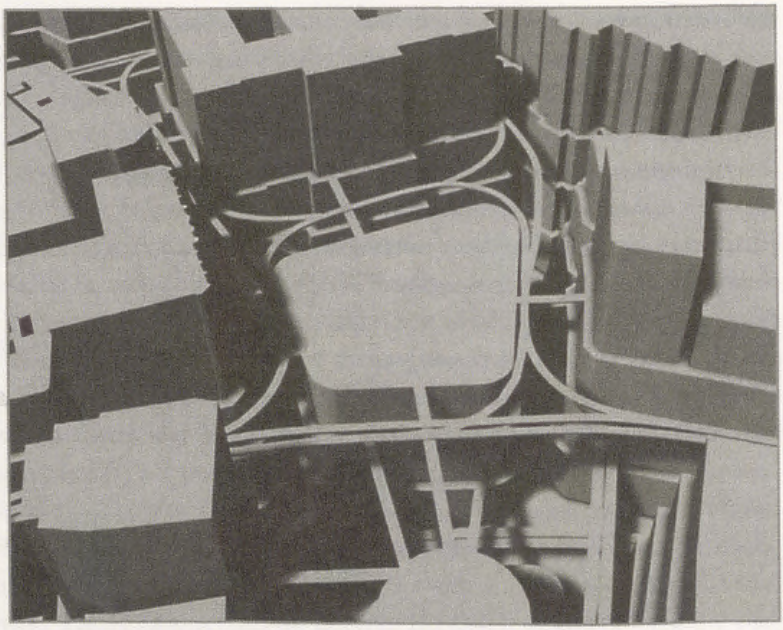
39. Meijenfeldt, Ernst von, and Marit Geluk. *Below Ground Level: Creating New Spaces for Contemporary Architecture* (Basel and London: Birkhäuser, 2003), 64.

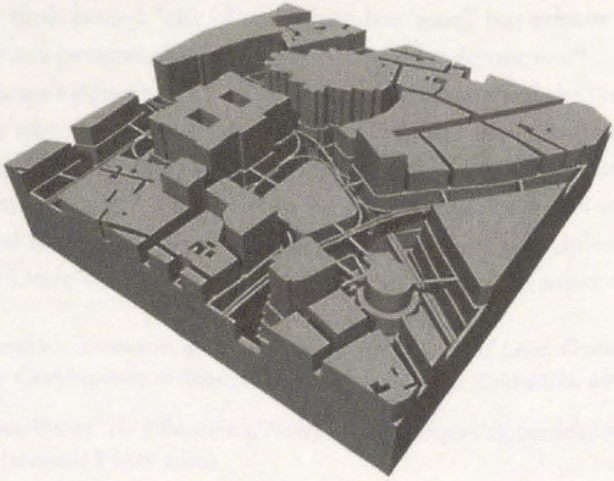
40. Adams, Henry. *The Education of Henry Adams*, Chapter 22, bartleby.com/159/22.html (accessed 8 May 2010).

41. Zueblin, Charles, and Helen Bernice Sweeny, *American Municipal Progress* (New York: Macmillan, 1916), 41.

celebrated the technological achievement and sublimity of the city's underground spaces, confirming the exceptionalism of Chicago's subterranean forays. *The New York Times* detailed Chicago's underground developments on at least two occasions: "The Catacombs of Chicago" (November 7, 1902) and "Chicago Tunnel Plans" (November 12, 1904).

It is difficult to prove causation between modernist and postmodernist utopias and Chicago's underground development, because planning documents often do not reveal ideological or aesthetic influences. However, Chicago built skyscrapers, a network of underground freight trains, an elevated passenger rail, and triple-decker streets that contained design elements consistent with Harvey Wiley Corbett's fantasy and Meijenfeldt and Geluk's Gotham City.





Figures 19 and 20. Postmodern underground: the Gotham City model.

III. Chicago Grows Up, and Burrows Underground

A frontier town! . . . But the city was growing up, digging new wonders below its surface.

—*Lloyd Lewis,* Chicago: A History of Its Reputation[42]

The cosmos of modern technology . . . has a vertical structure. As it reached upward in the shapes of skyscrapers, railway bridges, oil rigs, and missiles, it also sank into the earth in building foundations, railway tunnels, oil wells, and missile silos. The triumphs of modern industrial and urban life arise from connections buried below the surface of the earth.

—*Rosalind Williams,* Notes on the Underground[43]

This section connects the Loop's underground developments with Chicago's reputation for record-breaking constructions overhead. Density, congestion, and timing were three central factors driving underground development in the Loop. Skyscrapers that created unprecedented density required unprecedented excavation for their foundations. This encouraged an intricate network of tunnels for coal deliveries and multiple layers of transportation corridors to ease congestion of people and automobiles (Figures 21 and 22). Chicago's need for underground expansion occurred at the same time as modernist visions of multilayered cities and a period of general economic expansion encouraging private investment in urban infrastructure.

Skyscrapers

After the Great Fire of 1871 gutted the downtown area, Chicago's central business district became "an ideal location for architects of ambition."[44]

42. Lewis, Lloyd, and Henry Justin Smith, *Chicago: The History of its Reputation* (New York: Harcourt, Brace, 1929), 264.

43. Williams, Rosalind H, *Notes on the Underground*, 52.

44. Wikitravel, "Chicago Skyline Guide," wikitravel.org/en/Chicago_skyline_guide (accessed 8 May 2010).

Rising phoenix-like, skyscrapers erected in the late-nineteenth and early twentieth centuries became emblematic of the city on the lake.[45] Chicago's first skyscraper, the Home Insurance Building, was erected in 1885, not long after the 1870 Equitable Life Assurance Building in New York.[46] The advent of fire-proofed steel frames made possible even taller construction and Chicago became known for its willingness to push the limits of height; it was home to the world's tallest building between 1973–1998 and is currently home to the tallest and second tallest buildings in the United States.[47]

The equation of height with power in America has existed at least since John Winthrop preached to the pilgrims in 1630 about holding themselves up as examples of Christian charity as a city on a hill. In *City Levels*, architectural critic Nick Barley describes the visual power of skyscrapers: "It is difficult not to be seduced by all those thrusting blocks; by their audacity, the way they seem to express a very human ambition to make a mark, to punch strong steel, glass, and brick statements into the flat plane of the ground."[48] Although Barley addresses tall buildings worldwide, this passage could be speaking directly to Chicago's ambition and structural audacity on a "flat plane."

The structural steel frame liberated buildings from the load-bearing limitations of masonry, and the invention of innovative foundation techniques countered the destabilizing effects of the soft soil underlying

45. In 2010, Chicago ranks fourth in the world for both the "overall impressiveness" of its skyline and its total number of skyscrapers. "Skyscraper Rankings," Emporis.com, emporis.com/application/?nav=skyscrapers&lng=3 (accessed 8 May 2010).

46. Wikipedia.org, "Skyscraper," en.wikipedia.org/wiki/Skyscraper (accessed 8 May 2010).

47. "Skyscrapers" and "The Great Fire," Encyclopedia of Chicago, www.encyclopedia.chicagohistory.org.

48. Ireson, Ally, and Nick Barley, *City Levels* (Basel, Boston, and London: Birkhäuser, 2000), 6.

Figure 21.
Chicago as a Modernist City.

Figure 22. Encyclopedia of Chicago's illustration of layers of Chicago infrastructure.

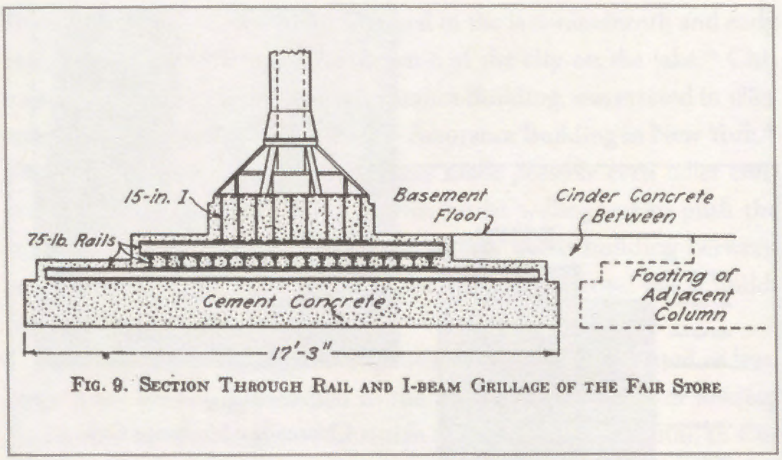


FIG. 9. SECTION THROUGH RAIL AND I-BEAM GRILLAGE OF THE FAIR STORE

Figure 23. Skyscraper foundation.

the Loop. One of the most famous was the "floating raft" foundation invented by architect John Root in the late-nineteenth century, allowing for a relatively small amount of actual material to support the heavy load of a skyscraper (Figure 23).[49] [50]

Early Tunnels Under the Chicago River

Predating the skyscraper, two tunnels under the main branch of the river eased traffic congestion at key crossings. Heavy traffic by masted ships kept the drawbridges connecting the Loop to the rest of the city at the North and West open for extended periods of time. In *The Chicago River: A Natural and Unnatural History,* Libby Hill writes that a "fierce warfare . . . raged between river navigators and those persons who were obliged to use the thoroughfares."[51] The first tunnel at Washington Street opened

49. Peck, Ralph B, "History of Building Foundations in Chicago," *University of Illinois Bulletin* 45 (1948), 11.

50. Ibid.

51. Hill, Libby, *The Chicago River: A Natural and Unnatural History* (Chicago:

on January 1, 1869; the second at LaSalle Street opened in 1871. Built by private franchises, these tunnels represented an early incursion of private interests and investment in public works. Lloyd Lewis writes of bribery and corruption at city hall related to the tunnel construction:

> Relations with City Council were very comfortable. When he needed the rights to a street, or a couple of tunnels under the river, he pressed a button . . . It was the "system." . . . the city owned all the streets and alleys, and could sell them wholesale or retail. [Companies] shopped for them in that smoke-filled Bon Marché, the City Hall.[52]

The tunnels were impressive feats of engineering. In 1869, T. D. Stetson wrote in the *Friends Review* that despite similar tunneling under rivers in New York and London, Chicago's tunnels were "the only instance where carriages actually drove through a tunnel under a navigable river."[53] The article includes an extensive description of the engineering of the first of the two tunnels (Figures 24 and 25).

The Washington Street Tunnel crossed a 220-foot expanse of the river with a sloping grade of about one foot drop per sixteen in length. Built approximately eighteen feet beneath the river's bottom, the tunnel's height was thirteen feet, with a width of approximately thirty feet. Three arched passageways served separate streams of carriage and foot traffic. Lit with gas, the interior was built of brick and cement. Like the sewer construction, the tunnel was not tunneled in the literal sense; rather, a cofferdam was put in place and a trench was dug out from the river bed, then covered over, with the stiff blue clay bed underlying the entire

Lake Claremont Press: 2000), 93.

52. Lewis, Lloyd, and Henry Justin Smith, *Chicago: The History of its Reputation* (New York: Harcourt, Brace, 1929), 242.

53. "The New Chicago Tunnel," *Friends' Review: A Religious, Literary and Miscellaneous Journal* 22 (1869).

Figure 24. East Entrance of the Washington Street Tunnel.

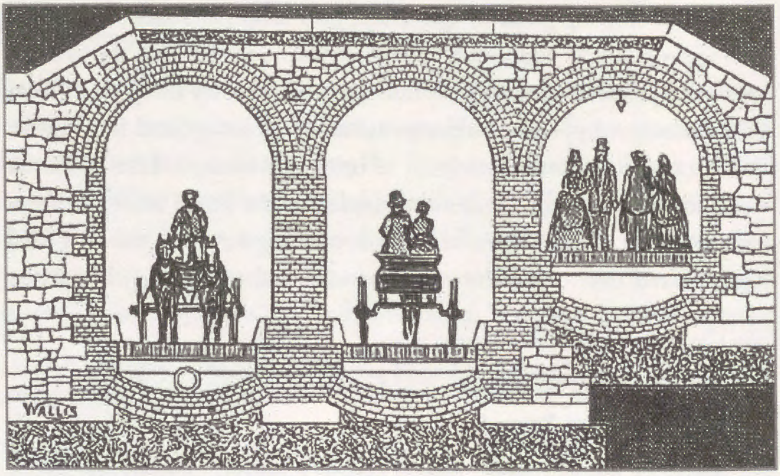


Figure 25. Cross-section of the LaSalle Street Tunnel.

Chicago Loop presenting some difficulty in excavation. *The New York Times* described the tunnel as presenting "quite a tasteful appearance" and noting that engineers had perhaps outdone themselves in providing ventilation: "the draught through the tunnel was, if anything, rather too strong."[54,55,56]

Operated as franchises, these tunnels were financially successful. Although the original costs where high — $517,000 for the Washington Street tunnel and $566,276.48 for the LaSalle Tunnel — the tunnels proved to be a popular mode of crossing the river for both pedestrians and carriages. They were also safe, with only one death reported in the *Chicago Tribune* for the duration of their existence.[57] During the Great Fire of 1871, they were a critical means of escape from the central business district. In the 1880s, they were taken over by cable car companies, whose cables were unable to cross the river's drawbridges. In 1892, the companies built a third tunnel at Van Buren Street for cable cars.[58]

The tunnels faced an uncertain future when the flow of the Chicago River was reversed in 1900. The Commission of Public Works decided that the street rail companies must bear the cost, a total of $818,000, to lower the tunnels beneath the reversed river.[59] The companies ultimately elected to finance the project, constructing larger replacements underneath the original tunnels. In 1911, electric street cars began service through the replacement tunnels. The LaSalle Street tunnel was closed

54. "The New Chicago Tunnel," 1869.

55. "A River Tunnel in Chicago," *The New York Times,* 26 Feb. 1869.

56. McClendon, Dennis, "Tunnels," Encyclopedia of Chicago, encyclopedia.chicagohistory.org/pages/1275.html (accessed 8 May 2010).

57. Moffat, Bruce, *The Chicago Tunnel Story: Exploring the Railroad "Forty Feet Below"* (Chicago: Central Electric Railfans' Association, 2002).

58. McClendon, Dennis, "Tunnels."

59. "Lowering Chicago's Tunnels," *The New York Times,* 15 Oct. 1899.

to traffic in 1924, but was retained as an emergency bypass route.[60] Construction of the Dearborn Subway closed the LaSalle Street Tunnel in 1939. The Washington Street Tunnel closed to traffic in 1954, despite attempts to convert it into a higher-level subway or bus way.[61]

Sewers, Streets, and Sidewalks

More pressing than the streets was the need for a comprehensive sanitation system. In 1854, cholera killed 5.5 percent of the population because sewage drained from the Chicago River into Lake Michigan, the source of most of the city's drinking water.[62] In 1855, the city installed a Board of Sewerage Commissioners and commissioned Boston engineer, Ellis Chesbrough, to serve as chief engineer. As with skyscrapers, Chicago was a pioneer in adapting a new technology — the comprehensive sewerage system — to the city's geology. Chicago was built two feet above river level, but the planned sewer system, based on gravity, would not drain into the river. To achieve effective drainage, Chesbrough decided to raise the city. The project was of a scope previously inconceivable; it may not have been attempted at all without the vigorous encouragement of downtown commercial and industrial interests who petitioned the city council to intervene.

Demonstrating its progressive and assertive nature, the city passed several ordinances between 1855 and 1857 to raise street grades between four and fourteen feet and eliminate muddy impassable streets built close to the Lake's water level. One often-cited joke remarked on the state of the streets:

60. Setty, Michael D., "Chicago," Public Transit. publictransit.us/index.php?id=24&option=com_content&task=view (accessed 10 May 2010).

61. Wikipedia.org, "Washington Street Tunnel," en.wikipedia.org/wiki/Washington_Street_Tunnel_%28Chicago%29 (accessed 10 May 2010).

62. Garcia, Marcelo H., "Hydraulics in the Time of Cholera: The Chicago River, Lake Michigan and Public Health," *Hydrology Days* (Fort Collins: Colorado State University, 2009).

Figure 26. Street grade raising in progress in Chicago's Loop.

> A gentleman, passing by a street, discovers a man buried up to his shoulders in mud. The gentleman asks the man, "Can I help you?"
>
> "No, thank you," the man replies, "I have a good horse under me."[63]

Brick sewers were constructed at the existing ground level and then covered, resulting in a raising of the city's street level (Figure 26).[64] The city left the decision to meet the new grade to individual owners: some moved smaller stores and houses; others converted their first story to a basement; and, the most impressively, others jacked up buildings to the new street level.

Building-raising became a brisk business between 1857–1864. George Pullman made his name in Chicago by jacking up large Loop buildings

63. Chicagology, "Raising Chicago," chicagology.com/raising (accessed 10 May 2010).

64. Cutler, Irving, *Chicago, Metropolis of the Mid-Continent* (Carbondale: Southern Illinois University Press, 2006), 33–34.

and building new foundations underneath.[65] The technique attracted worldwide attention, with sensational stories emerging of hotels being raised while the guests remained inside, drinking tea. Scottish tourist David McCrae noted that "the whole business of the hotel proceed[ed] without interruption" as the five-story building rose at a rate of twelve inches each day.[66] The *Chicago Tribune* covered building raisings, inviting the public to explore the sensational engineering triumph:

> Probably its parallel enterprise cannot be found the world over. It will be worth seeing tomorrow, and the contractors are, we learn, preparing to accommodate the public and give them an opportunity of looking and passing in among the forest of iron screws.[67]

Following the Great Fire in 1871, the grade was raised once more, with debris from the fire used as fill. Depending on the grade, fill estimates range from five to fourteen feet.[68]

Grade-raising and sewer installations aligned underground development with progress and technology. Grade-raising and sewer installations underscore the correlation between the upward direction of construction and the expansion of underground development. Large-scale grade-raising would not have been feasible or necessary without the densely populated, multistory buildings in Chicago's central business district. Had this area of the city been less developed, city planners may have either relocated

65. Cronon, William, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton, 1991), 58.

66. Mayer, Harold M., *Chicago: Growth of a Metropolis* (Chicago: University of Chicago Press, 1969), 96.

67. Chicagology, "20 March 1860," chicagology.com/raising.

68. Einhorn, Robin, "Street Grades, Raising," Encyclopedia of Chicago, encyclopedia.chicagohistory.org/pages/1202.html (accessed 10 May 2010).

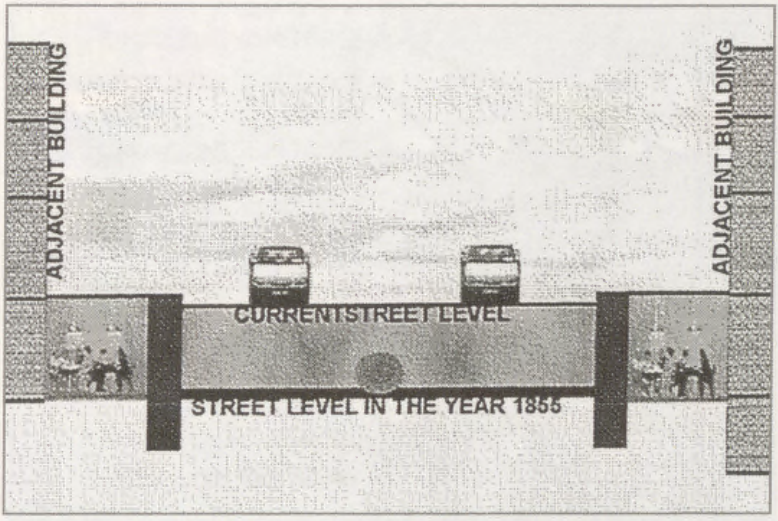


Figure 27. Street level before 1855 and after it was raised (vaulted sidewalks visible).

the city's center or torn down existing structures and built atop the rubble. The sheer scale of the existing multistory development rendered excavation and underground development an attractive option.

These early public works marked the beginning of a "power pattern repeated many times since" of Chicago's city government catering to the interests of downtown commercial and industrial interests.[69] The project of raising structures to the new street grade was expensive. Owners of large hotels or office buildings, who already had major financial stakes in the Loop, could manage this expense, but smaller property owners faced the hard choice of relocating or bearing the heavy cost of renovation.

While streets were built over solid fill, sidewalks were often constructed over retaining walls, leaving a hollow vault underneath (Figures 27, 28, and 29). Property owners often appropriated the space underneath the sidewalks for coal storage or an outhouse. In her 1936 book, *Tenements of Chicago*, Edith Abbott reported 242 tenements using an

69. Cutler, *Metropolis of the Mid-Continent*, 33.

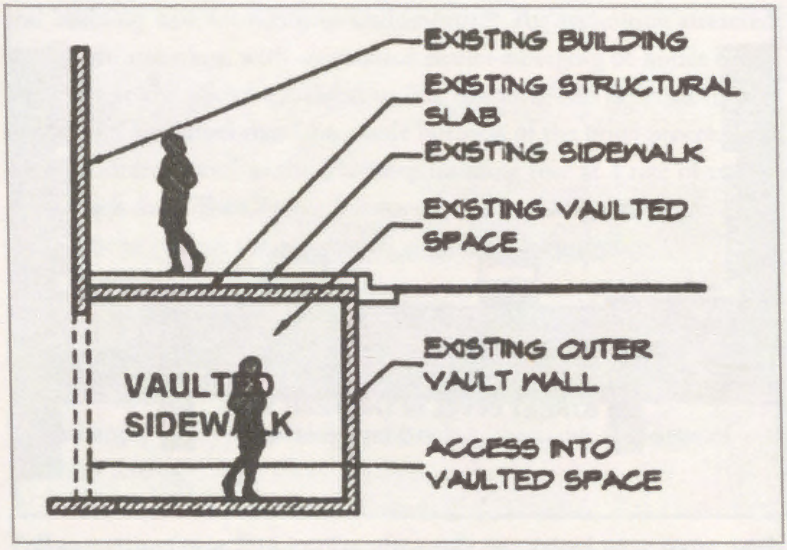


Figure 28. Structure of vaulted sidewalks.

"under-sidewalk toilet."[70] Today, due to the risk of collapse, the empty spaces are being filled in by the city's "Emergency Vaulted Sidewalks Program." As of 2010, as many as 2,000 vaulted sidewalks remain in the city, subject to special construction restrictions due to their lack of structural integrity.[71] The vaulted sidewalks mark the first instance of underground space above ground, prefiguring multilevel streets in the central business district.

Finally, Chicago required that all electrical wires be buried underground beginning in the 1880s. An 1887 article published in the trade journal *The Electrician and Electrical Engineer* praises this ordinance, writing that "Chicago is in advance of all other American cities in this

70. Abbott, Edith, *The Tenements of Chicago, 1908–1935* (Chicago: The University of Chicago Press, 1936), 215.

71. Gapers Block, "How Chicago Raised Itself Out of the Mud and Astonished the World," gapersblock.com/airbags/archives/city_streets_how_chicago_raised_itself_out_of_the_mud_and_astonished_the_world (accessed 10 May 2010).

Figure 29. A vaulted sidewalk is visible in the Loop during a construction project.

underground business," as "the only large city that has not suffered" from accidental deaths due to people coming in contact with electrical wiring.[72]

This section strove to establish the existence of a reciprocal relationship between upward and downward expansion in Chicago. It was the city's quest for height and increasing density in its core that created the need for much of the early sewers, street elevations, and foundation excavations. The elevation of street grades created artificial underground spaces used for a variety of purposes; later, skyscrapers required deeper excavations and multilevel transportation conduits to handle the increased street congestion. Although underground space may not be an immediately obvious association with Chicago's ever-increasing height, their relationship is clearly reciprocal in engineering and planning developments.

72. Brooks, David, "The Economy and Efficiency of Underground Electrical Conductors in Cities," *The Electrician and Electrical Engineer* (Mar. 1887).

IV. Forty Feet Below the Street: Chicago's Freight Tunnels

Chicago . . . has eschewed the convenience of subways, and kept her citizens where God put them, atop the earth.

— *Time*[73]

Two years after the completion of Chicago's elevated passenger rail in 1897, excavation of its mirror image began forty feet below street level. Albert G. Wheeler pointed out Chicago's unique model at a 1904 banquet celebrating the construction of these underground tunnels:

> Cities of the old world transport their passengers though tunnels under the streets. Chicago reverses the order of things, and the people are to be kept on the streets where they can enjoy the fresh air, while the freight traffic is to be sent through these tunnels.[74]

Human-operated trains offered an inventive twist to pneumatic tube transportation, which had had mixed success since the mid-nineteenth century. The Loop's history of freight tunnels — sixty-two miles of track, running 150 locomotives — is checkered and complex.[75] In 1899, the city council granted a thirty-year franchise to the Illinois Telephone and Telegraph Company to construct and operate an underground telephone system. "At least," cautions Bruce Moffatt, author of the authoritative history of the freight tunnels, *The Chicago Tunnel Story,* "that's what its promoters told the city fathers while they mined beneath the congested

73. "Bowels of Chicago," *Time* 22, 14 Aug. 1933.

74. Moffat, Bruce, *The Chicago Tunnel Story*, 1.

75. Ibid., 4.

streets of the Loop." In retrospect, it seems ludicrous that such sizeable tunnels were built simply for stringing telephone wires.[76]

Conception and Franchise

A biographical sketch of Albert Wheeler notes that "while present in [Chicago] on a business trip, the sad state of the city's freight transportation facilities appealed to him with that irresistible fascination which great difficulties always seem to exercise over genius," inspiring the underground network of freight tunnels.[77] The 1899 city council franchise allowed for the right to establish a system of "sounds, signals, and intelligence, by electricity or otherwise."[78] The tunnels' owners later argued that "intelligence" included newspaper and mail, which required a train system. It was a small step for Wheeler to extrapolate such a system for deliveries of merchandise and coal.

A group of St. Louis-based private investors financed the initial stages of tunnel construction in 1899. (By 1904 a second round of private investment was arranged by the National City Bank of New York City.) Investors saw potential for profit in the comprehensive, fully automated telephone system originally proposed. A few years later, backers hoped connection and delivery fees from major building owners could provide a substantial stream of income.

It is difficult to discern the intentions of company founders from the conflicting documents that remain. A paper presented by general manager and chief engineer of the IT&TC, George W. Jackson, in 1902 insisted that the decision to create larger tunnels was simply in the best interest of a nascent telephone company:

76. Ibid., 17.

77. Goodspeed, Weston A., and Daniel D. Healy, *History of Cook County*, Vol. 1 (Chicago: Goodspeed Historical Association, 1909), 841.

78. Ibid.

> Telephone companies in different cities have made a serious mistake by not building their conduit system large enough to accommodate their increased business from year to year . . . [furthermore] we found that the space was not to be obtained immediately below the surface, on account of the present congested condition below the streets . . . the space below the paving is almost completely taken up by water and gas pipes, sewers and conduits for other companies (Figures 30, 31, and 32).[79]

Jackson noted that the city restricted manholes for wire installation, because these would interfere with future plans to install a subway system. This necessitated larger tunnels for rolling cars with cable spool.[80]

Excavation and Construction

Born out of the greased hands of city councilmen and slippery contract language, excavation began in an appropriate location: the basement of the Powers & O'Brien Saloon, owned by Johnny Powers, a member of the "Gray Wolves" pack of aldermen. These aldermen formed a contingent of "old-time gang type" politicians who were notorious for corruption and bribery.[81] Excavation began in two directions, and trucks ferried away displaced earth under cover of darkness in an attempt to conceal the true scope of the project. "For years people saw the little elevator houses standing at such prominent street corners as Lake and State streets without having any idea of what they meant or for what purpose they were used," writes Currey in his history of Chicago, "Fully a dozen miles of the subway were entirely completed before one out of ten citizens of the city knew

79. Jackson, George W, "Scope, Extent, and Construction of the Underground Conduits of the Illinois Telephone and Telegraph Co. in Chicago," *Journal of the Western Society of Engineers,* 17. Sept. 1902.

80. Ibid., 438.

81. Smith, Alfred Emanuel, "Chicago's Municipal Ownership Fight," *New Outlook* 82 (3 Feb. 1906).

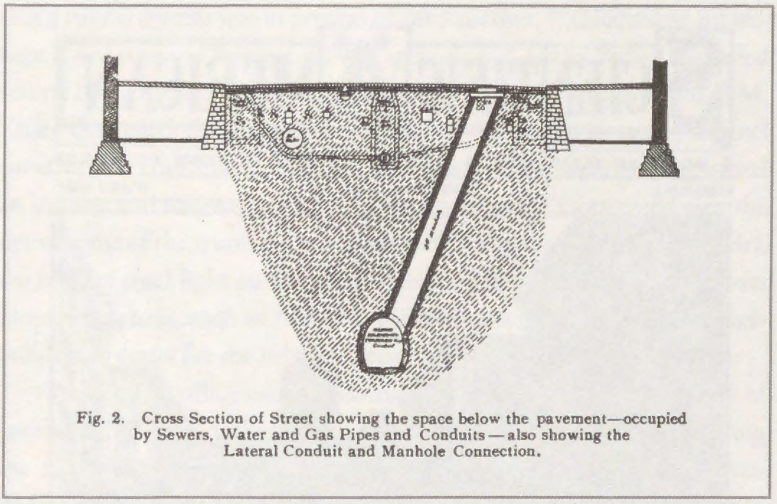
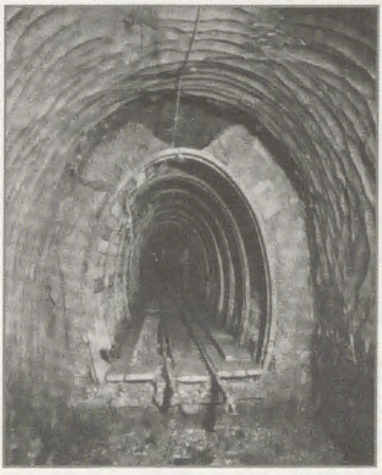


Fig. 2. Cross Section of Street showing the space below the pavement—occupied by Sewers, Water and Gas Pipes and Conduits—also showing the Lateral Conduit and Manhole Connection.

Figure 30. This illustration included in Jackson's 1920 paper is intended to demonstrate the "congested condition" below the streets, justifying the extent of the tunnel excavation.



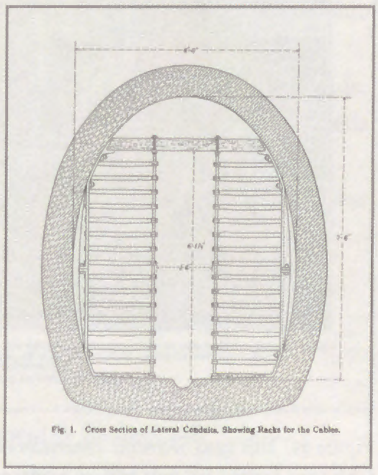


Fig. 1. Cross Section of Lateral Conduits, Showing Racks for the Cables.

Figures 31 and 32. Also reproduced from Jackson's paper, these illustrate the scale of the tunnels.

Figure 33. This 1910 *Scientific American* cover suggests a happy co-existence between Chicago's freight tunnels and an underground public transit system; in reality, the freight tunnels' literal undermining of geologic structural integrity would not have permitted such a design.

that a tunnel system was in process of construction."[82] (Nighttime subterfuge is not new to Chicago: railway speculator, Charles Yerkes, extended several of his elevated train lines at night in 1898; and Mayor Richard M. Daley destroyed the runways at Meigs Field at night in 2003.) Tunnel construction continued until 1902, when suspicious aldermen organized an inquiry and discovered sixteen miles of tunnels.[83] Concerned over the size of some of the trunk tunnels (fourteen feet high and twelve feet wide), the inquiry shed light on the true motives of the tunnel-builders; private property owners, such as Marshall Field, threatened to take the tunnel-builders to court for the infringement on his property line.[84]

The mayor's office halted construction in mid-1902 due to breach of contract. The press declared the construction a "'land grab,' . . . cheating the city and its citizens out of its rightful compensation. Some even advocated municipal ownership of the network" (Figure 34).[85] Concerns that the tunnels would preclude the installation of a passenger subway proved valid, and the original franchise agreement stipulated that tunnels should be no shallower than twenty-four and a half feet deep.[86] Although the first segment was excavated at a slightly shallower depth, the majority of the system was dug at a depth of forty feet, through the soft blue clay stratum, which simplified excavation and lessened cave-ins.[87,88]

Tunnels were seven feet six inches high and six feet nine inches wide. Light-rail trains with a two-foot gauge track ran through them at speeds

82. Currey, Josiah H., *Chicago: Its History and Its Builders, a Century of Marvelous Growth* (Chicago: S. J. Clarke, 1912), 120.

83. Moffat, Bruce, *The Chicago Tunnel Story*, 27.

84. Ibid., 52.

85. Ibid., 28.

86. Currey, Josiah H., *Chicago: Its History and Its Builders,* 238.

87. Ibid.

88. Moffat, Bruce, *The Chicago Tunnel Story*, 14.

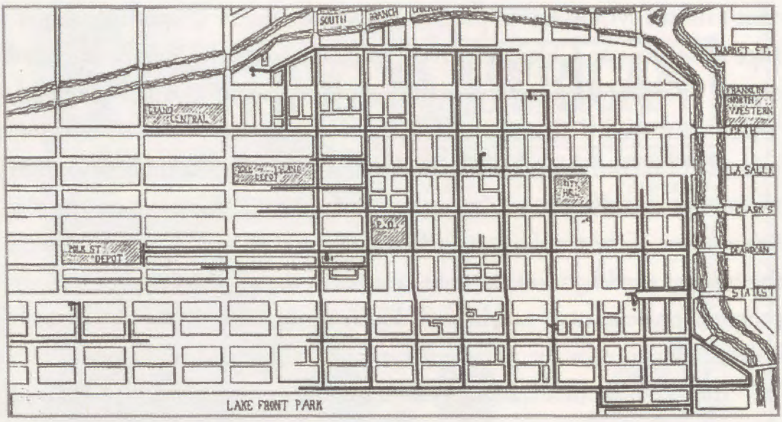


Figure 34. This 1902 map shows the earliest tunnel segments constructed.

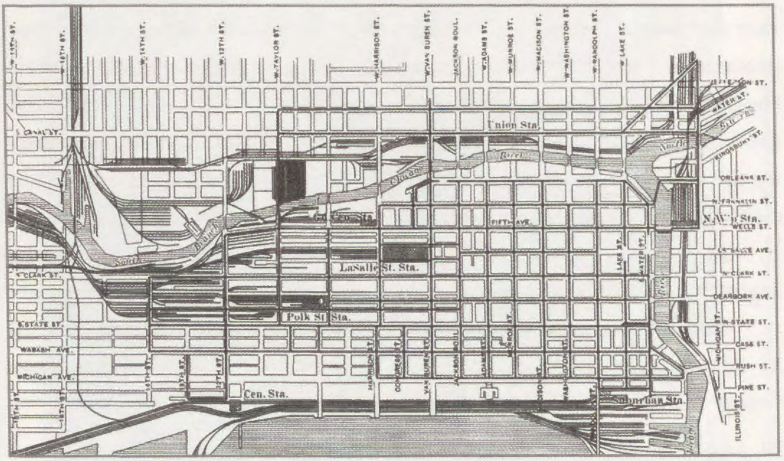


Figure 35. This map produced by the Chicago Tunnel Company supposedly shows the 1905 extent of tunnel development; optimistically, it shows plans for a few tunnel segments that were never built (for example, in the northwest corner of the Loop), revealing their ambitious early plans. It also may have overextended its estimate to support the Company's ongoing litigation with the City of Chicago.

between eight and twenty miles per hour, depending on the size of their load. Small electric locomotives, powered by overhead cables, pulled ten to fifteen freight cars, each of these four-feet wide and twelve-feet long. Each car could carry the same amount of goods as a motor truck, making them competitive with the most common above ground delivery method.[89]

Reorganization and Commencement of Freight Deliveries

In the aftermath of the discovery, the Illinois Telephone and Telegraph Company renegotiated its franchise and reorganized under a different name. On July 15, 1903, the city council passed an ordinance granting the Illinois Tunnel Company the right to construct "not only wires and electrical conductors as provided in said last mentioned ordinance, but also any appliance or apparatus for the transmission and transportation of newspapers, mail matter, packages, parcels or merchandise."[90] At the ordinance's expiration in 1929, ownership of all tunnels not located beneath private property would revert to the city. The city reserved the right to relocate any tunnel for construction of a subway system.[91]

Non-revenue trains began to run in 1904. To mark the beginning of revenue-generating deliveries in 1906, the Illinois Tunnel Company hosted an extravagant and somewhat peculiar banquet for investors, Loop property owners, and Chicago's Press Club inside the recently finished Jackson Boulevard Tunnel. With guests seated at a banquet table two city blocks in length, the event was accompanied by a small orchestra positioned under the LaSalle Street Station.[92]

89. Ibid., 13.

90. Chicago City Council, *Journal of the Proceedings of the City Council*, Vol. 2 (1908), 1241.

91. Ibid.

92. Moffat, Bruce, *The Chicago Tunnel Story*, 53.

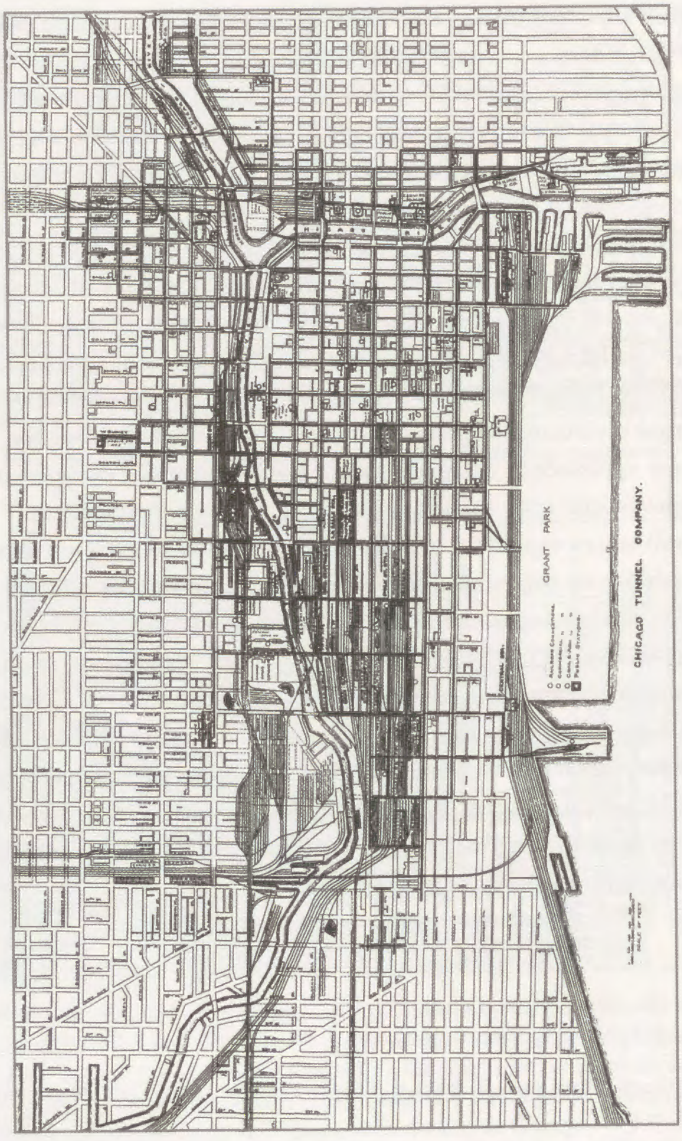


Figure 36. A map by the Chicago Tunnel Company revealing the freight tunnels' extent by 1914. Almost sixty miles had been built at this point.

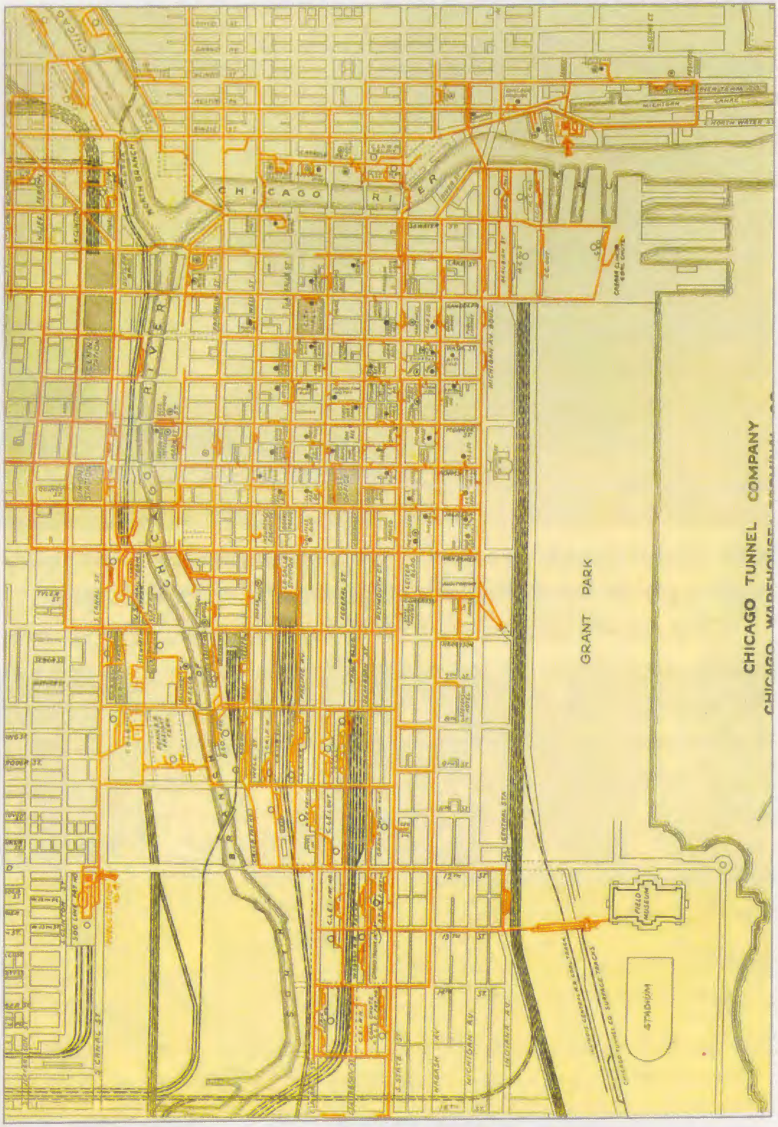


Figure 37. A map by the Chicago Tunnel Company made in 1932. Very little expansion had occurred since the 1914 map.

Freight Delivery and Other Uses for the Tunnels

The tunnels were used for coal delivery and ash disposal, shipping merchandise and mail, removal of excavation debris, and as a cooling source for several theaters. The company had secured forty customers and built forty-five miles of track by 1906.[93] The tunnel network reached fifty-eight miles in 1909 under nearly every street in the Loop. A dispatching system operated on a telephone platform, coordinating as many as six hundred trips each day by 1915.[94]

Merchandise shipments accounted for approximately 76 percent of the system's revenue at $600,894 in 1913.[95] The tunnels connected with twenty-six railroads and two boat lines. Freight-train shipments were transferred to the smaller tunnel trains by elevator. The company also operated four "universal" stations located outside of the Loop where customers with small shipments could pick up or drop off merchandise to be shipped through the tunnels. Thirty-six companies, including every major department store, built direct connections with the tunnels.[96]

Coal delivery accounted for the second-largest source of income: $130,575 according to the 1913 report. The tunnel system operated two coal receiving stations and one station devoted exclusively to ash and spoil disposal.[97] Surface rail cars dumped coal into bins below their track and into the tunnel cars below. In 1914, twenty-two buildings had built tunnel connections for coal delivery.

93. Williams, Arthur, "Municipal Ownership: Electronic Freight Service in Chicago Tunnels," *Electrical Age* 37 (c. 1906).

94. Wikipedia.org, "Chicago Tunnel Company," en.wikipedia.org/wiki/Chicago_Tunnel_Company (accessed 10 May 2010).

95. "Thirty-Sixth Day, Exhibits A to M, 3," *Five Per Cent Case: Letters from the chairman of the Interstate Commerce Commission*, Vol. 3 (Washington, DC: Government Printing Office, 1914), 2572–2593.

96. Ibid.

97. Ibid.

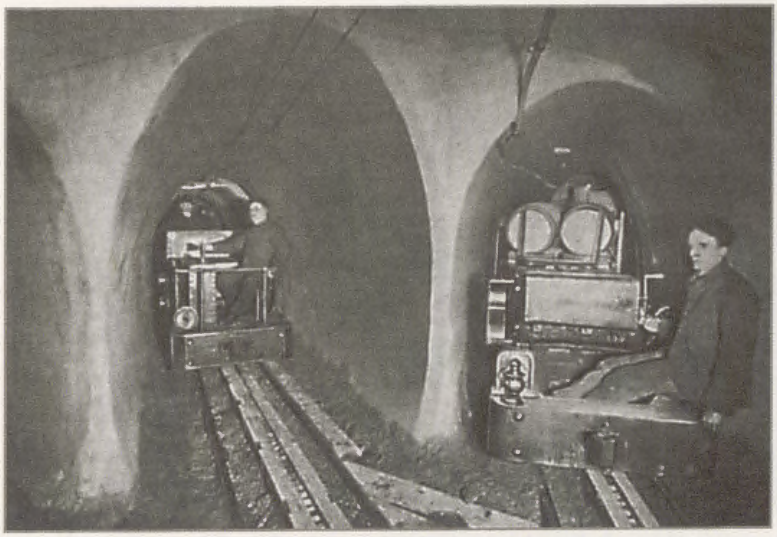


Figure 38. Two Morgan Locomotives posed for a publicity photo in 1904 at State and Randolph. Superintendent George W. Jackson is at the controls on the left.

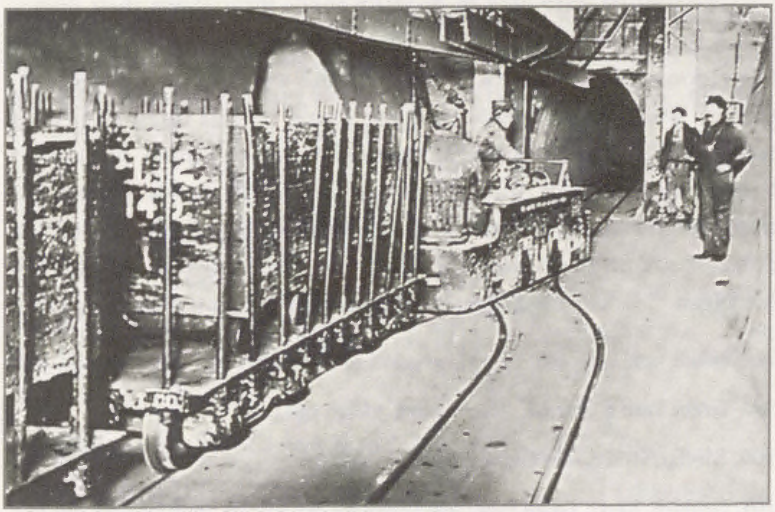


Figure 39. A loaded freight train leaving the Marshall Field's basement.

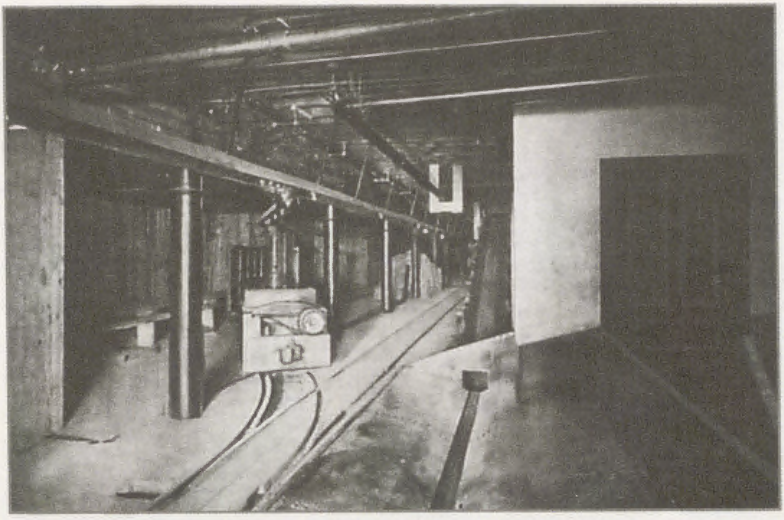


Figure 40. Coal delivery facilities in the basement of a building in the Chicago Loop, with a bin to receive coal and a conveyor belt system leading to the boiler room.

The tunnels were used to excavate spoils throughout their operation.[98] Beginning in 1904, the Chicago Tunnel Company disposed of excavation debris as infill for Grant Park. This was a pet project of Montgomery Ward, who declared the park would be "the finest city resort contiguous to business districts possessed by any city in the world."[99,100] Between 1908 and 1913, dumping in the Grant Park site was prohibited, and George Jackson designed a system of disposing of ash and spoil in dump scows on the Chicago River, which disposed of debris in Lake Michigan.[101] Lakefront disposal recommenced in 1913 with a new tunnel

98. Ibid.

99. "Grant Park is Started" *Inter-Ocean*, 5 Oct. 1904.

100. Moffat, Bruce, *The Chicago Tunnel Story*, 52.

101. Grinnell, Max, "Grant Park," Encyclopedia of Chicago, encyclopedia.chicagohistory.org/pages/538.html (accessed 10 May 2010).

extension; the land under the Field Museum, Soldier Field, and McCormick Place was created from this infill.[102]

The reduced costs of merchandise and coal delivery by trucks "left the company in the ash removal business for the last ten years of operation."[103] Mail delivery also failed. The Illinois Tunnel Company built connections to post offices and passenger stations for the sole purpose of mail delivery and won an annual contract of $172,600 from the post office in 1906. Service was slow, and mail service was terminated at the end of the two-year contract. The Tunnel Company submitted another proposal for mail delivery in 1953, claiming potential savings of $1,500,000 annually for the U.S. Post Office. The *Tribune* reported that interest in the deal was heightened by growing congestion in the Loop.[104] However, postal officials ultimately declined.

The cool subterranean air of the tunnels, fifty-five degrees year round, was a natural cooling source. As many as twenty Loop buildings, including major theaters, took advantage of their coal-delivery connections for cooling.[105] The last innovation for tunnel use was steam heating. In 1933, investors considered running steam tunnels through the tunnels, similar to other major cities such as New York. At the time, one out of ten Chicago buildings were heated by steam from the Illinois Maintenance Company.[106] A steam service operated between late 1933 and 1939, but eventually proved unprofitable.[107]

102. Ibid.

103. Ibid.

104. "Use of Tunnel to Haul Mail in Loop is Urged," *Chicago Daily Tribune,* 25 Jun. 1953, D7.

105. Moffat, Bruce, *The Chicago Tunnel Story*, 175.

106. "Bowels of Chicago," *Time,* 14 Aug. 1933.

107. Moffat, Bruce, *The Chicago Tunnel Story*, 174.

Insolvency and Closure of the Tunnel System

Financial problems began early in the tunnels' history. Exhibiting an "if you built it, they will come" mentality, the company built the tunnels first and looked for customers later. This strategy avoided protest from property owners over land-use infringement or building settlement; Moffat describes Marshall Field's first visit to the underground tunnels, when the department store owner remarked: "It was fortunate I did not know what you were doing down here. For I certainly would have fought you in the courts."[108]

Network overextension included segments beyond the Loop to neighborhoods with less demand for freight tunnel connections (for example, the discontinued extension southwest toward the Union Stock Yards).

The original 1899 franchise agreement expired in 1929, and the Chicago Tunnel Company was the only bidder on a new thirty-year contract. The Tunnel Company resisted relinquishing its tunnels to city ownership as stipulated in the original contract, but was forced to surrender all tunnels existing beneath city streets and alleys without compensation. The city reserved the right to order removal or relocation of tunnels that blocked subway construction and required the company to pay a debt of $710,000 from the previous agreement.[109]

The 1930s were not kind to the Tunnel Company. Trucking undermined its customer base, especially for coal delivery. Trucks dumped coal through chutes directly into buildings' boiler rooms, eliminating the need for the imperfect conveyor belt system required by tunnel delivery. Further depressing demand on the freight tunnels for coal delivery was the increasing number of buildings switching to natural gas. By 1948, coal delivery had ceased.[110]

108. Ibid., 52.

109. Ibid., 174.

110. Ibid.

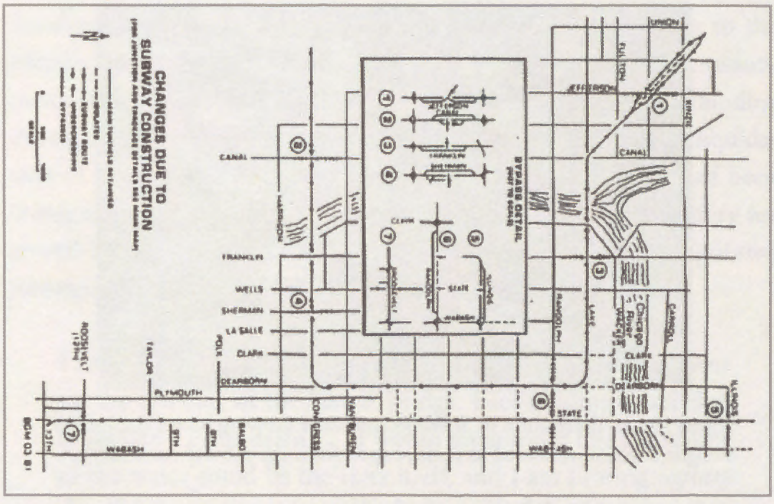


Figure 41. A map showing where the freight tunnel system was truncated due to subway construction.

Discussion of a Chicago subway system began in the early 1900s, and the position of the freight tunnels caused concern as early as 1903.[111] Company engineers argued that their tunnels were built deep enough for a subway to be constructed atop them; nevertheless, subways crossed the tunnel network at key junctures. The company lost a lawsuit in 1943 that sought compensation for the interruptions in their network.[112] Moffat reports that the initial six years of subway construction (between 1938–1944) amputated 10 percent of the system's tunnels.[113] The tunnel system declined from fifty-nine miles in 1933 to forty-seven miles in 1959.[114] Many of the abandoned segments constituted the busiest and most profitable of the

111. Ibid.

112. Ibid.

113. Ibid., 130.

114. Ibid., 140.

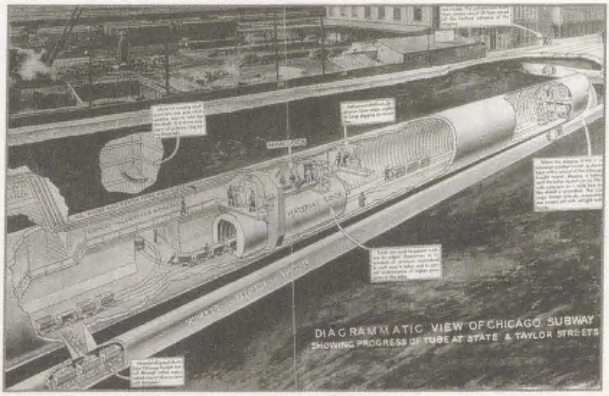


Figure 42. An illustration in *Scientific American* showing how the Chicago Freight Tunnels were used to remove spoil from the subway construction.

system (Figure 41). Sowing the seeds of their own demise, the freight tunnels were used to haul away spoil from subway excavations (Figure 42).

Despite attempting to diversify operations, tunnel traffic steadily declined. While 404,948 tons of cargo were shipped through the tunnels in 1933, in 1939 annual tonnage had declined to 177,945.[115] By 1959, operating losses averaged $9,000 per month, and the tunnels were abandoned, stripped of saleable materials, and sealed.[116]

The Flood of 1992, Current Usage, and Future Plans

The end of freight shipping did not signal the end of the tunnels' use. Reverting to municipal control, the city has over the past decades leased tunnels to communications companies for utility lines. The tunnels have appeared in films and novels, for example, Sara Paretsky's *Tunnel Vision* and Jim Butcher's *The Dresden Files*.

In 1992, workers driving a pile under the Kinzie Street bridge accidentally punctured an abandoned tunnel, resulting in widespread

115. Ibid., 142.

116. Ibid., 171.

flooding. Many buildings in the Loop had portal connections to the tunnels that had been bricked over but not waterproofed after abandonment. (Waterproof iron portal doors which had guarded against flooding during the tunnels' active use had been removed during the 1959 liquidation of saleable tunnel property.) Because the tunnel system had been consigned to oblivion, the source of the flood remained a mystery for several hours. A radio reporter, Larry Langford, ultimately pinpointed its origin, announcing over the air on WMAQ:

> I have found something very interesting in the Chicago River on the east side of the Kinzie Bridge. I see swirling water that looks like a giant drain . . . I would say it looks like the source of the water could be the river itself, and I am hearing reports that fish are swimming in the basement of the Mart just feet from the swirl! I do not see any emergency crews near this spinning swirl, but I think they may want to take a look. In fact, I think someone should wake up the Mayor![117]

Following the flood, remaining tunnel connections near the river were sealed. The flood cost an estimated $1.95 billion, impairing business for three days.[118]

Alternative uses for the tunnels range from the practical to the absurd: detention for political protestors, mushroom farming, and bomb shelters. They remain largely unoccupied, save for fiber-optic and utility cables. They stand as testament to the exceptional technical innovation and capital investment in infrastructure that marked late nineteenth- and early-twentieth-century Chicago.[119]

117. Wikipedia.org, "Chicago Flood," en.wikipedia.org/wiki/Chicago_Flood (accessed May 10, 2010).

118. Ibid.

119. Moffat, Bruce, *The Chicago Tunnel Story*, 178.

Figure 43. As this set of maps reveals, most multilevel streets are located in the Loop. In the map above right, the area in orange is composed completely of multilevel streets.

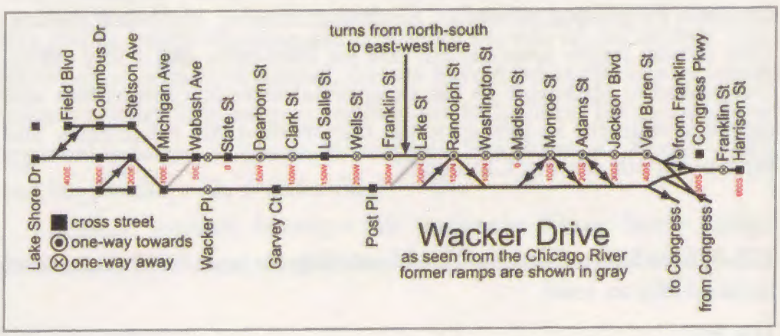


Figure 44. The complexity of multilayered streets: connections and levels of Wacker Drive as seen from the Chicago River.

V. Multilevel Streets: Stacking Space for People and Utilities

The multilevel streets lining the Chicago River are not underground, but they do create an underground environment by stacking buildings and corridors on top of one another. The lowest levels of Wacker Drive and Michigan Avenue are at ground level, but they are described as "underground" in newspaper coverage and guidebooks, because of the artificial lighting, abandoned sidewalks, and utilitarian loading docks. This section focuses on Wacker Drive (named South Water and River streets before 1926), the first segment of the multilevel street system to be completed.

Wacker Drive and other multilevel streets represent a transition in the use of underground space. Like the freight tunnels, multilevel streets preserve the surface streets for people and conceal the dirt and traffic of freight operations underground.[120] However, the lower level of these streets is accessible to the general public in a way the freight tunnels never were. As public spaces, multilevel streets invite controversy and contest over occupation. The situation is reversed between the two structures: multilevel streets are public property, but private interests have encroached upon them; the private freight tunnels occupied public property with shaky legal justification, but were ultimately subordinated to public-interest development with the construction of the subway.

Conception and Planning

Along with lakefront parks, Wacker Drive and Michigan Avenue are visible incarnations of Daniel Burnham and Edward Bennett's 1909 *Plan for Chicago* (Figure 45). The Plan, Burnham's last major planning effort,

120. McClendon, Dennis, "Tunnels," *Encyclopedia of Chicago*, http://www.encyclopedia.chicagohistory.org/pages/1275.html (accessed on 8 May 2010).

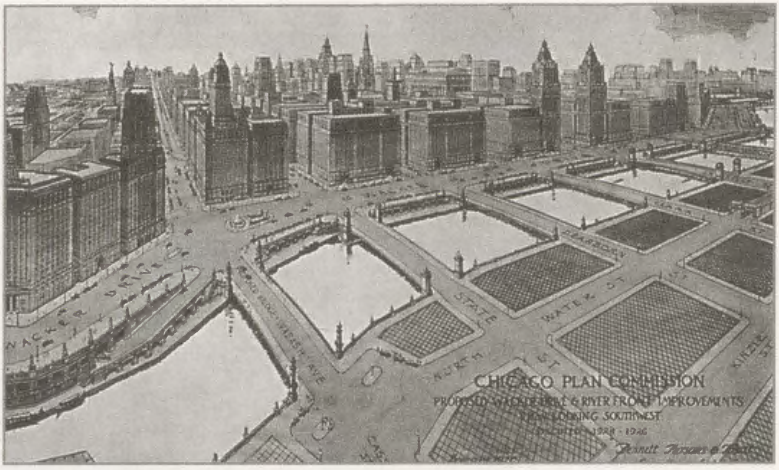


Figure 45. A diagram of the proposed Wacker Drive development from the Chicago Plan Commission; note the Haussmann-esque uniformity of the building façades along Wacker Drive (this would later prove to be a point of controversy).

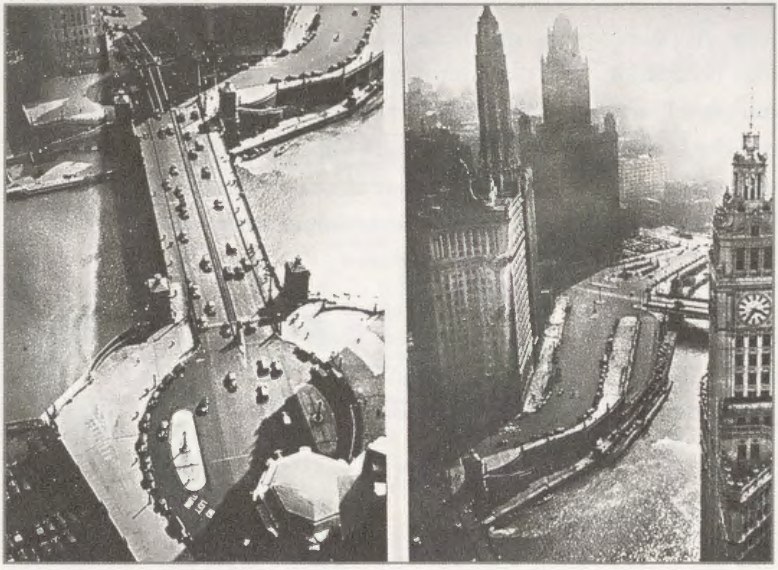


Figure 46. Aerial photographs of Wacker Drive taken in 1926.

Figure 47. Congestion on South Water Street.

was a "labor of love."[121] The Commercial Club of Chicago underwrote the Plan; in a 1910 speech its president, Theodore W. Robinson, declared: "the Plan has been called a dream. It is a dream; but a dream of businessmen for whose disinterested effort there can be no reward than the satisfaction of good citizenship. It is a dream [of how] Chicago shall grow... into the model City of the world."[122] In order to achieve its ascension, "good order, cleanliness, and beauty" must be brought to the city, "saving time, doing away with the smoke, evil, noise, and dirt."[123] Multilevel streets were an attempt to fulfill these ideals.

Multilevel boulevards drew on modernist ideals of separating functions, the City Beautiful movement, and Haussmann's rebuilding of Paris

121. Draper, Joan, *Edward H. Bennett, Architect and City Planner, 1874–1954* (Chicago: Art Institute of Chicago, 1992), 13.

122. Commercial Club of Chicago, *The Presentation of the Plan of Chicago: The Broader Aspects of City Planning* (Chicago: Commercial Club of Chicago, 1910), 3.

123. Moody, Walter Dwight, *Teacher's Hand Book: Wacker's Manual of the Plan of Chicago; Municipal Economy* (Chicago: H.C. Sherman, 1912), 17.

Figure 48. South Water Street.

in the mid-nineteenth century. Burnham and the Chicago Plan Commission admired Haussmann's work, referring to him in promotional materials as "the greatest city builder of all time," frequently including Parisian examples as ideal models for Chicago (Figures 47 and 48).[124] Builders of the Loop's multilevel streets wanted these avenues to enhance the growth and glory of Chicago, and they anticipated that Wacker Drive would be "the Park Avenue of Chicago" when it was built.[125]

The alternative to a multilevel drive was a new harbor facility on the main branch of the Chicago River for its existing wholesale market. Historian Joan Draper points out that the harbor received inconsistent federal funding, which was exacerbated by the shift from freight transportation by water to rail or truck. When the state legislature supported a deep water harbor in Calumet in 1921, the elimination of port facilities

124. Ibid., 45.

125. Smith, M.J.P., "So Bigger," *Inland Architect* 64 (c. 1926).

from the plan for Chicago's River had no opposition.[126] After the construction of Wacker Drive in 1926, docking facilities in Chicago's central business district were limited to passenger and pleasure crafts.[127]

Draper argues that the drive succeeded due to the quasi-public nature of its boosters. Unlike harbor opponents, the Commission mounted extensive public relations campaigns, including the *Chicago's Greatest Issue* mailing and *Wacker's Manual* in the public schools. Furthermore, the Plan's clearly defined goals, and the absence of competition with similar agencies, gave it a tactical advantage against opposition. Draper points to the Plan's historical timing as support for the harbor diminished and land use in other parts of the central business district shifted away from wholesale and warehousing.[128] Chicago's zoning and land-use maps confirm this trend.[129]

Draper's essay is a case study in the early twentieth century urban building process. In retrospect, it may be viewed as a cohesive, rational plan, but in reality the building process was marked by unpredictability and the fragmentation of power. This interpretation of Wacker Drive's origins skirts the question of its construction as the fulfillment of either a private or public goal, arguing that it was due to the failure of public works agencies to realize their own goals as much as the initiative of private interests represented in the Chicago Plan Commission.

Construction

The construction of the Michigan Avenue bridge between 1917–1920 replaced the Rush Street bridge and became the first multilevel road

126. Draper, Joan, "Planning Wacker Drive," 272.

127. Ibid., 267.

128. Ibid, 272.

129. City of Chicago Zoning Survey Maps, 1922, http://www.lib.uchicago.edu/e/su/maps/chigov/G4104-C6G4-1922-C5-index1.html; (accessed 8 May 2010); Department of Development and Planning, *Chicago Land Use Atlas* (1970); W.P.A., Chicago Plan Commission, *Chicago Land Use Survey* (1941).

structure in the Loop. Its technical name is a mouthful: a bi-level, double-leaf trunnion bascule bridge. A bascule bridge uses counterweights to balance the leaves of the bridge as they swing upward; trunnion refers to the pin and bearing forming the bridge's hinge. Engineering allows a small amount of power to move the heavy leaves: only two 108-horse-power motors open and close the 3,750-ton bridge leaves.[130] The bridge's lower level was opened in 1926, to connect with the lower level of Wacker Drive. The opening of Wacker Drive marked the completion of the first bi-level street in the world (Figure 46).[131] The original construction of Wacker Drive was limited to the Main Branch of the Chicago River; it expanded south to Harrison Street in 1954 and east to Lake Shore Drive in 1975 (Figure 49).[132]

The scope and scale of the engineering project was extraordinary. Construction employed twenty-four hour crews.[133] Newspaper articles recounted impressive statistics: the new drive was 5,740 feet long; 23.7 acres in total area, representing 34,400 square yards of asphalt and 34,400 square yards of granite block pavement; the amount of dirt excavated during construction could form a 75-foot-tall pile covering one entire city block.[134] It set a world record by pouring 1,080 cu yd of structural concrete in eighteen hours.[135] Construction cost $21,584,576 in total.[136]

130. McCormick Bridgehouse and Chicago River Museum, "About the Bridge," bridgehousemuseum.org/about/the-bridge (accessed 10 May 2010).

131. "Skyscrapers," *Popular Mechanics* 43:2 (August 1924), 228.

132. Smith, M.J.P., "So Bigger," 67.

133. "Full Length of Wacker Drive to Open Oct. 20," *Chicago Tribune,* 17 Oct. 1926.

134. "Dedication Fete to Open Wacker Drive Wednesday," *Chicago Tribune,* 15 Oct. 1926.

135. Zeyher, Allen, "Reviving a Landmark," *Roads and Bridges* 39:10 (Oct. 2001).

136. Draper, Joan, "Planning Wacker Drive," 260.

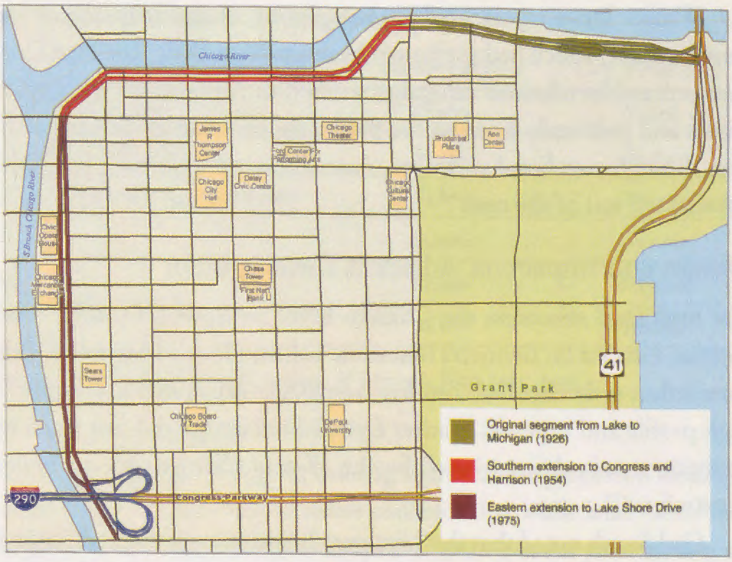


Figure 49. Wacker Drive's extensions since 1926.

Figure 50. A rendering of the proposed interchange with Congress Parkway for "Revive Wacker Drive, Part 2." The proposal embodies Modernist planning ideals by creating new green spaces over buried parts of the interchange.

Wacker Drive represented a turning point in the financing of road improvement, which had previously been a private affair. The Plan Commission's public relations campaign stressed the benefits for the city as a whole and politically finessed the public shouldering 48 percent of the cost through two bond measures. Assessment on adjoining properties covered the rest of the cost.

Design and Impact on Adjacent Development

The multilevel streets on the Chicago River are known for their lovely façades. Edward H. Bennett's limestone balustrades and bas-relief sculptures reflect early twentieth century Beaux-Arts urban ideals. Despite the high profile and expense, Wacker Drive's final design did not reach the aesthetic standards envisioned by the *Plan of Chicago*, due to budget constraints.[137]

Carl Smith noted that the "*rive vues,* limestone pylons, and green-lit lower level which promised below-grade service entrances [to] the drive proved so attractive to developers that a list of buildings emplaced along Wacker since 1960 would resemble a civic booster's brochure."[138] The southern branch of Wacker Drive is home to such high-profile residents as the Willis Tower and Chicago's Civic Opera. As its builders predicted, Wacker Drive's construction increased land values of adjacent lots. A 1928 newspaper article estimated that the Drive added $65 million to land values, distributed among only 200 owners. The article cites 17 West Wacker Drive, which sold in 1921 for $15.99 per square foot; by 1928, it was valued at $200 per square foot.[139] Not every owner was happy; in 1959 American National Bank and Trust sued the city, charging that its first floor had been "buried" when they raised the grade of Wacker by six

137. Smith, Carl S., *The Plan of Chicago: Daniel Burnham and the Remaking of the American City* (Chicago: University of Chicago Press, 2006), 13.

138. Smith, M.J.P., "So Bigger," 2.

139. Hewitt, Oscar, "Wacker Drive Adds Millions to Land Values," *Chicago Tribune,* 29 Jan. 1928, B1.

Table 1. Land Values in Chicago's Loop

Year	N. Wacker Lot Value	Loop Blocks (est.)
1921: Pre-Wacker Drive	$2,000	~$5,000
1925: Construction begins	$2,750	~$6,000
1926: "Wacker Drive" appears on map	$3,875	~$8,000
1927	$5,000	~$9,000
1928	$5,000	~$10,000
1929	$5,500	~$10,000

Source: Olcott's Land Values Blue Book of Chicago, Years 1921–1929.

feet during the 1958 extension, causing significant depreciation of its fair market value.[140] *Olcott's Land Values* confirms that while land values rose throughout the Loop, Wacker lots spiked in value in the years leading up to Wacker's construction (Table 1).

An advertisement alongside the 1926 map in *Olcott's Land Values*, "Perry Ulrich at 1810 Chicago Temple BLDG. Specializing in Wacker Drive/Real Estate investments," indicates that developers were specifically targeting Wacker Drive.

Land use changed as well. The City of Chicago's land-use maps reveal a shift from industrial and manufacturing to commercial buildings. The 1922 map shows South Water Street lots being used almost exclusively for the wholesale market, warehouses, and manufacturing.[141] A 1941 WPA-project map reveals that 67 percent of the lots are classified as commercial occupations and 20 percent have become parking lots. Some "commercial-industrial" use remains, but it no longer predominates.[142] By 1970, the

140. Franke, Jeanne, "City 'Buried' First Floor of Building, Bank Charges," *Chicago Tribune*, 17 Sep. 1959, N6.

141. Government Maps of Chicago in the 1920s, http://www.lib.uchicago.edu/e/su/maps/chigov/G4104-C6G45-1942-C51.html. (accessed on 8 May 2010).

142. Chicago Plan Commission's 1941 Land Use Survey Map of Chicago.

Chicago Land Use Atlas lists the Wacker lots as primarily offices and retail, with a small amount of wholesale trade and warehouses.[143] By 1990, commercial establishments dominate the entire length of Wacker.[144]

The 1906 Sanborn Fire Insurance Map and its 1944 corrections confirm the shift from wholesale merchandising and manufacturing to high-value commercial enterprises. Most buildings along South Water Street in 1906 were listed as being between one and four stories, generally with a storefront. They are identified alternately as "various manufacturing," bulk warehouses, or cold storage (Figure 47). A survey of specific occupations includes a butter factory, wholesale grocery, a wallpaper plant, and a wholesale hardware store. In the 1944 corrections, the lots along Wacker Drive were dominated by parking lots and commercial buildings with parking garages, such as the Times Building, the LaSalle-Wacker Building, the Pure Oil Building, and the Lincoln Tower Building. The map notes that Wacker Drive is "double decker, trucks and team traffic on lower level, auto traffic on upper level."[145]

Wacker Drive Today

Upper Wacker Drive remains a busy thoroughfare for drivers and pedestrians. Delivery docks of some buildings still receive as many as eighty deliveries a day.[146] Lower Wacker and associated streets, though, are no longer solely the haunt of delivery trucks. Savvy commuters and cab drivers use lower levels to avoid Loop traffic.[147] Wacker Drive's extension

143. Chicago Land Use Atlas, 1970.

144. "Chicago Loop Land Use, 1990," Northeastern Illinois Planning Commission and University of Chicago Map Collection, January 2003.

145. Bell and Howell Informational Learning, Chicago Digital Sanborn Maps, 1867–1970.

146. Zeyher, Allen, "Reviving a Landmark."

147. Leroux, Charles, "Lower Wacker Drive," *Chicago Tribune,* 7 Sept. 2005.

east to Lake Shore Drive in 1988 and south to the Eisenhower Expressway in 1958 added to its popularity as a commuter shortcut. In 2002, this street carried about 60,000 vehicles a day.[148]

In 2001–2002 Wacker Drive was restored, and in 2005 the pedestrian-friendly Riverwalk was added (Figure 52). The restoration brought the Drive up to twenty-first century weight-bearing, lane width, and height-clearance standards. The project manager for the Chicago Department of Transportation (CDOT) declared the Drive "old, outdated, and geometrically obsolete."[149] Thick concrete supports and a 1925 traffic pattern created dangerous conditions, with one notorious column occupying the center of a traffic lane.[150] As a temporary measure, CDOT imposed a fifteen-ton weight limit on trucks and installed shoring towers to hold up sections of the upper level that were in danger of collapsing. Wacker Drive's critical location in the Loop's traffic pattern complicated the restoration. The Drive carried 60,000 cars daily, and the same number of pedestrians. It intersects eight bascule bridges, two elevated transit lines, freight and subway tunnels, utility mains, gas, water, sewer, and electric lines, and fiber optic cables. An engineer working on the project compared it to solving a Rubik's cube.[151]

The Wacker Drive restoration took two years and cost $200 million.[152] Thomas Walker, the transportation commissioner for the CDOT, objected to the federal government's minor contribution of $25 million:

148. "Tight Focus, New Mix Puts Wacker Drive Back in the Loop," *Engineering News-Record* 248:1 (7 Jan. 2007).

149. "Congress Snubs Chicago's Wacker Drive Rehab Plan," *Civil Engineering* 69 (Mar. 1999).

150. Zeyher, Allen, "Reviving a Landmark."

151. Wilson, Bill, "Complexity Cubed." *Roads and Bridges* 39:10 (Oct. 2001)

152. "Chicago Works to Revive Wacker Drive," *Construction Writers Association,* Oct. 2001.

"The condition of Wacker Drive is of national importance" due to its vital location within the Chicago central business district.[153]

From April 2010 to December 2012, phase two of the renovation will rebuild the 1955 north-south extension of Wacker Drive to Congress Parkway, aiming to improve visibility, ventilation, and lane clearances. Plans call for installation of decorative light fixtures and creation of three acres of parkland between Franklin and Wells streets by moving two exit ramps; there will be "meadow grass, flowering trees, evergreen trees, deciduous shade trees, perennials and shrubs in this area, which will be publicly accessible" (Figure 50).[154]

Although the 2002 reopening of Wacker Drive fell short of the 1926 crowd of 75,000, "Revive Wacker Drive" attracted a substantial amount of national press coverage, from the *New York Times* and National Public Radio. Promotional materials couched the restoration in terms of historic preservation, frequently referring to the Drive's legacy as an incarnation of Burnham's plan. A *Roads and Bridges* article acknowledged the significance of Wacker Drive's distinctive façade, noting that engineers viewed the project "as part of a mission to beautify Chicago and make better use of the river front . . . contractors labeled and catalogued the location of each original Indiana limestone piece so it could be reinstalled on the same location." Period light fixtures restored the Drive to its 1926 appearance.[155]

Buildings along multilevel streets have received special attention in Chicago's history. In 1926 Mayor Dever proposed that buildings along Wacker should agree on a cohesive aesthetic design. Wacker's designer, Edward H. Bennett, called for "a form element that will bind the blocks

153. "Congress Snubs Chicago's Wacker Drive Rehab Plan," *Civil Engineering* 69.

154. Revive Wacker Drive Part 2, "Green Elements," wackerdrive.org/green_elements.cfm (accessed on 10 May 2010).

155. Zeyher, Allen, "Reviving a Landmark."

Figure 51. Fencing restricting pedestrian access on Lower Wacker Drive in response to the homeless encampments.

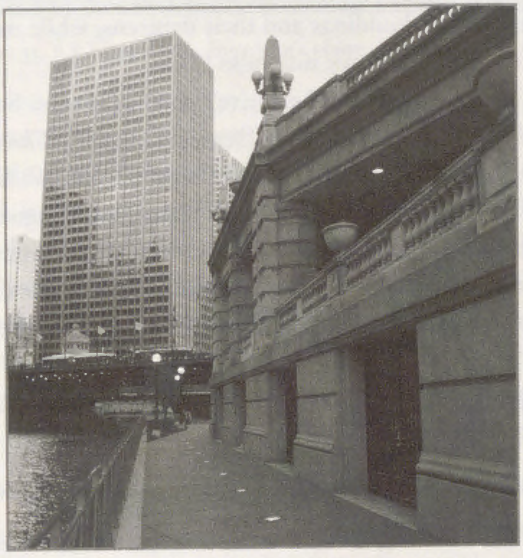


Figure 52. The Chicago Riverwalk.

and the entire street into a whole . . . [and] sweep the buildings upward."[156] However, American individuality carried the day. The *Tribune* ultimately conceded: "The jagged skyline [is] thoroughly American," but did object to "cheap and ugly materials" on Wacker façades and argued for a uniform height of window cornices.[157] Concerns about the grandeur and uniformity of building style along Wacker have persisted in late-twentieth-century development: an architect of 77 West Wacker (1992) expressed the desire "to fit into the fabric of Wacker Drive." To this end, some contemporary buildings continue to use setbacks required in 1926.[158]

Public Space, Private Service: Contesting the Use of Wacker Drive

The structure of multilevel streets invites a critical reading of its social impact, which emerged in the era of modernist planning. In tracing building development along Wacker Drive, architectural critic, M. J. P. Smith, refers to the "layered society" proposed in Chicago's Loop, "out of Fritz Lang's or Hugh Ferriss's 'Metropolis,' where elevated decks and walkways served new buildings and their denizens, while mere mortals were relegated to the shadowy sidewalks below."[159]

First is the contest over the Drive's original name, South Water Street, a relic from the days of Fort Dearborn. A 1924 *Chicago Tribune* editorial disputed naming the new street after Charles Wacker, arguing to preserve Chicago's earliest roots: "Old names in Chicago are too few, and the descriptive homeliness of South Water Street is a line of color in the city's terminology that we can ill afford to lose. It recalls the early village, the slow stream, and the prairie where wild onions grew, and that

156. "Visions Wacker Drive Buildings of the Future," *Chicago Tribune,* 29 Dec. 1926, 13.

157. "Uniformity on Wacker Drive," *Chicago Tribune,* 25 Aug. 1926, 8.

158. Smith, M.J.P., "So Bigger," 67.

159. Ibid.

Figure 53. A Chicago gem, Burnham's vision: Wacker Drive, 2010.

is worth remembering."[160] A flurry of letters to the editor over the next several months debated the name. One writer said "today Wacker Drive, as improved, is famous throughout the world," arguing that "it would be an outrage to change that name, which has really become historical as well as nationally famous."[161] Another wrote, "as a resident of Chicago for sixty-three years I cannot reconcile myself to an act which will destroy a historic link in the city's history."[162]

A second dispute concerned parking on the Drive's lower levels. Wacker Drive created 2,000 new parking spots on its lower levels,

160. "Keep Our Historic Place Names," *Chicago Tribune,* 10 Jun 1924, 6.

161. "Wacker Place," *Chicago Tribune,* 16 Aug. 1928, 10.

162. "History of South Water," *Chicago Tribune,* 13 Oct. 1924, 8.

accessible to any driver.[163] Disputes over sub-street parking spots began as early as January 1928, when the *Tribune* reported that the city council "began casting about for means of utilizing the vast and valuable parking space under the drive."[164] One commissioner wanted to bar the public and reserve the lower level for city vehicles and the First Ward headquarters. In February 1928, the *Chicago Tribune* reported that Wacker Drive was being "exploited at the expense of automobile owners," with "more or less official no-parking signs or reservations for privileged persons." At one point, "the city street department blocked off an area large enough for two hundred cars on the lower level . . . workers in neighboring buildings accustomed to parking there were met by a police officer and told to move on. Inside the restricted space were three private cars, each bearing an 'official' city star." One sign installed by the Pure Oil Building garage blocked several available spots, directing drivers instead to their privately operated basement parking.[165] Less than a month later, the *Tribune* reported that the police commissioner was considering whether the self-appointed "parking space salesmen" should receive badges to legitimize their profession. The article described the disorganized "gloom" of Lower Wacker and the watchmen as extortionists, who damaged cars when drivers refused to tip. Should the badge system be implemented, the *Tribune* asserted that the privilege of issuing badges would be "passed out to petty politicians," describing the system as a "racket."[166] During the debate, Alderman Bowler declared that he intended to "find out to

163. "Alderman Raps Wacker Drive Parking Racket," *Chicago Tribune,* 21 Feb. 1928, 15.

164. "Badges Planned to Make Parking Racket Dignified," *Chicago Tribune,* 22 Feb. 1928, 16.

165. "Council to Lift Special Parking on Wacker Drive," *Chicago Tribune,* 25 Oct. 1929, 24.

166. "Badges Planned to Dignify Wacker Drive Parking Racket," *Chicago Tribune,* 16.

whom Wacker drive belongs — the public or somebody else."[167] In October 1929, the city council voted to remove special parking restrictions on Wacker Drive, hoping to prevent further "discontent . . . aroused among the citizens." Bowler testified that the space should be "thrown open for the public," citing numerous petitions from voters.[168]

The parking controversy continued in later decades. A 1949 *Tribune* letter to the editor asserted that "a tour of lower Wacker Dr. on any business day is revealing to taxpayers who paid for this engineering marvel," describing the occupation of various "loading zones" by private cars with special privileges and official city cars preemptively occupying dozens of parking spots for the benefit of high-ranking, later-arriving city officials.[169] Lower-level street parking is still set aside for special city events: in 2009, a sign posted on the lower-level of Lower Wacker declared a zone "No Parking," except for attendees of "Mayor Daley's Fishing Festival."

This ongoing contestation did not occur on Upper Wacker. The unique structural environment of an artificial underground invites appropriation, perhaps because of reduced visibility. Lower-level space may be less public because it is duplicate or surplus space, thus able to be appropriated for personal use. Also, the lower level resembles a building or a parking garage, perhaps contributing to the perception of the parking spaces as only semipublic.

Homeless Occupancy of Lower Wacker Drive

The same lack of visibility makes Lower Wacker appealing for appropriation as a residential shelter. The perception of the space as surplus or forgotten makes it appealing for those barred from visible spaces such as sidewalks, public parks, or semipublic corporate plazas. Bob Harris refers to this "forgotten space" aspect of Wacker Drive in an article chronicling

167. "Alderman Raps Wacker Drive Parking Racket," *Chicago Tribune*, 15.

168. Ibid., 15.

169. "Lower Wacker Drive," *Chicago Tribune*, 23 Oct. 1949, 26.

his period of homelessness in Chicago for *Mother Jones* magazine: "Just steps from high-falutin' storefronts of the famed Magnificent Mile, there lies a different city. It's a city where there are no addresses...Between the bright lights of the city above and their reflection on the river below lies Lower Wacker Drive."[170] A homeless population further contributes to a street's marginalization, as planning author, Gerald Daly, argues: "Streets occupied by homeless, though centrally located, are characterized as peripheral because of their stigma."[171]

During the Great Depression, thousands of homeless individuals occupied Lower Wacker, nicknaming it "the Hoover Hotel."[172] More recently, smaller, but still entrenched groups of homeless residents occupied the space. Removing the homeless population from Lower Wacker reflects the motivations of the Drive's original architects: enhancing the visual appeal of downtown to investors and tourists. In *The Right to the City,* Don Mitchell argues that removing homeless populations is an effort to "redefine public space of the city as a landscape, as a privatized view suitable only for the passive gaze of the privileged."[173] During the Democratic Convention, Charles Brown, a homeless resident of Wacker Drive, remarked, "It's just like the World Cup. They put us up in hotels for three weeks, then it was back on the streets. They don't want the world to see they got people in Chicago living under the streets."[174]

In 1999, Chicago officials ordered the homeless population to vacate Lower Wacker, erecting fencing around loading docks and parking spaces

170. Harris, Bob, "Homeless in Chicago: the Not-So-Magnificent Mile," *Mother Jones,* 1 Feb. 1999.

171. Gold, John R. "Death of the Boulevard," 125.

172. Fidler, Eric, "Reconstruction Puts Chicago's Shadowy Wacker Drive in Spotlight," *Ludington News,* 26 Nov. 2002.

173. *The Right to the City,* 190.

174. Wilson, Terry, "On Eve of World Cup, City Removes Homeless," *Chicago Tribune,* 16 June 1994.

(Figure 51). Mayor Richard J. Daley claimed the fences were built in response to property owners' concerns about illegally parked cars; however, the city contacted advocates and lawyers for the homeless in advance, warning them that any campers would face arrest.[175] The fence reasserts the city's control over the marginalized space, embodying Mike Davis's "architectural policing of social boundaries."[176] The fence also blocks sidewalks, preventing pedestrians from using major sections of the lower level. The fence may have decreased the homeless population, but the prohibitions are difficult to enforce in a public space rife with forgotten nooks and crannies. The city's outreach efforts continue to target Lower Wacker as a primary location of encampments.[177]

VI. Chicago's Pedway: The Postmodern Pedestrian Underground

The city's most recent underground network is the Pedway, a system of underground pedestrian passageways linking major buildings and public transit stations in the Loop. Over the past fifty years, Chicago's Loop has increasingly become an environment of interlaced separate spheres. In dozens of American downtowns, an enclosed network of pedestrian corridors has insinuated itself in the urban fabric: "On the outside — both physically and, often, socially — are streets, pavements (sidewalks), plazas, and parks, while inside, 'eligible' citizens encounter skywalks, tunnels, concourses and atria."[178]

175. "City Says Homeless Must Vacate Popular Spot," Associated Press, 29 Jan. 1999.

176. Davis, Mike, *City of Quartz: Excavating the Future in Los Angeles* (London and New York: Verso, 2006), 231.

177. "To a Roof Over Their Head," *Chicago Sun-Times,* 31 Jan. 2007.

178. Pacione, Michael, *Urban Geography: A Global Perspective* (London and New York: Routledge, 2001), 160.

Open-air streets and sidewalks fulfill the urban ideal of the public street, long synonymous with possibility and public expression. The Pedway, on the other hand, links specific origins and destinations for a particular population of users. "Have you seen any cold Chicago politicians lately?"[179] the *Chicago Tribune* asked in 1967, drawing attention to the low-profile Pedway links converging beneath city hall. The *Tribune* revealed the functional distinction between Pedway and open-air street. These grade-separated spaces redefine patterns of interaction between activities and segments of the population; they strengthen distinctions between day and night activities, workweek and weekend, inside and outside.

This model of grade-separated spaces embodies much of the debate over public and private space in the city. Inevitably, one is less accessible than the other; more easily policed and exclusionary. Underground space tends to be controlled by private-sector interest groups or coalitions, while the municipal government generally assumes responsibility for streets, sidewalks, and parks. (This might be changing; Chicago recently privatized parking meters, but streets and sidewalks have long been understood as universally accessible spaces.) In considering the increasing privatization of American downtowns, urban geographer Jack Byers writes: "In a sense, the downtown environment is turned inside out, or, perhaps more appropriately, outside in. Groups that once shared the same city streets are now spending their days in environments that rarely intersect."[180]

179. Siddon, Arthur, "Warm Politicians Walk Paths Below Cold Loop Streets," *Chicago Tribune,* 22 Jan. 1967, 7.

180. Byers, Jack, "The Privatization of Downtown Public Space: The Emerging Grade-Separated City in North America," *Journal of Planning Education and Research* 17 (1998).

Figure 54. Photo accompanying *Tribune* coverage of first Pedway link. Providing maps and other navigation aids may have started off strong, but it didn't last!

The First Underground Pedestrian Passageway

In 1951, the city constructed a link between the Dearborn and the State Street subways, using a WPA grant.[181] Work commenced in 1938, but was delayed by World War II. The State Street subway was able to open in 1943 and the Dearborn line in 1951. Within a decade, two short links connected stations of the two lines and government and office buildings within two blocks (Figures 54 and 56).[182]

In the 1960s, Loop stakeholders sought to attract shoppers to Chicago's downtown as its core population drained to the suburbs and the Loop's

181. Gapers Block, "Subterranean City: A Tour of Chicago's Pedway," chicago=gapersblock.com/detour/subterranean_city_a_tour_of_chicagos_pedway_part_1 (accessed on 8 May 2010).

182. Wille, Lois, *At Home in the Loop: How Clout and Community Built Chicago's Dearborn Park* (Carbondale: Southern Illinois University Press, 1997), 5.

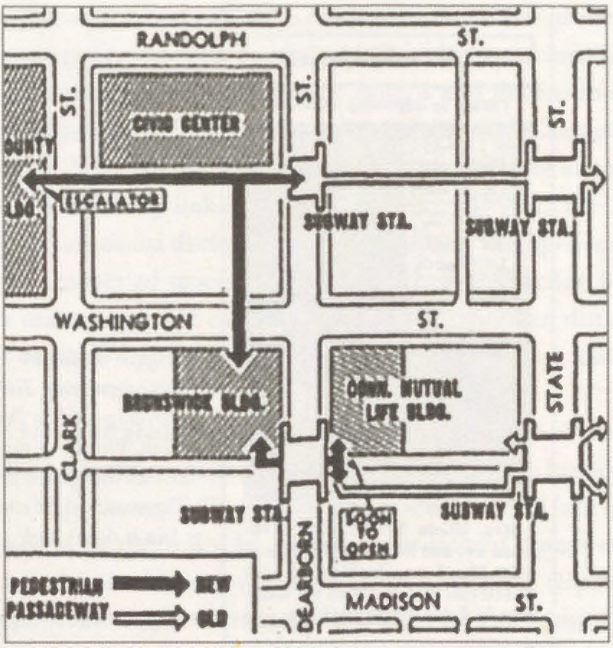


Figure 55. The Pedway system in 1966.

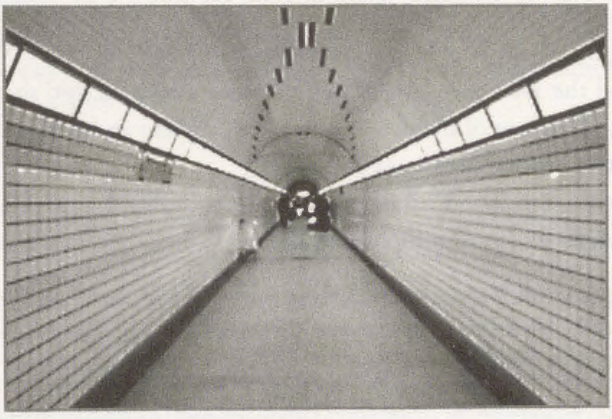


Figure 56. The first link, opened in 1951.

shopping corridor declined. Lois Wille comments that the unofficial motto of the decade seemed to be, "Don't let Chicago become another Detroit," prompting a flurry of reinvestment construction projects.[183]

Plans for Expansion

By 1966, interest in a more extensive Pedway emerged (Figure 55), which coincided with proposals to bury the elevated Loop railways. A group of interested Chicago Loop investors — including a member of the Chicago Central Area Committee (CCAC), a community development group focused on the Loop — traveled to Montreal to study recently constructed underground walkway complexes. They noted the aesthetic charm Montreal's walkways, with "new and profitable locations for shops" and the separation of pedestrians from traffic. The *Tribune* reported that Carson Pirie Scott and the Continental Illinois National Bank expressed interest in financing extensions of the pedestrian tunnels. The article reported plans to link the Federal Building to the existing subway lines, with the Federal General Services administration agreeing to finance the extension.[184]

In April 1967, the *Tribune* reported that another group of Chicago's civic leaders had visited Montreal, "searching for new ideas to be used in the Loop." The trip was organized by the Chicago Association of Commerce and Industry's director, Carl Varadian, and attended by members of CCAC. The director of the city's Commission of Public Works, Milton Pikarsky, participated in the trip and began to pursue opportunities tying subway stations with underground shopping plazas. A Montreal planner emphasized that success was "achieved with help of public and private sectors of the civic economy."[185]

183. Ibid.

184. Buck, Thomas, "Three Here Laud 'Sub' Plazas in Montreal," *Chicago Tribune,* 7 Aug. 1966, A1.

185. Griffin, Eugene, "Chicagoans Tour Subway in Montreal," *Chicago Tribune,* 3 Apr. 1967, C7.

Figure 57. Pedway as power play: Marshall Field's executive vice president, Chicago's Public Works Commissioner, and Mayor Harold Washington attend the launching of Pedway construction in 1985.

The turning point for Pedway expansion came in 1973. The Chicago Central Area Committee released the Chicago 21 Plan "to restore the historic role of the center city and to preserve what is unique about Chicago."[186] Historian Carl Smith writes that the plan "confronted what it saw as the continuing deterioration of the central city, especially for purposes other than work."[187] It recommended the creation of Dearborn Park, the redevelopment of the Ogden Slip (today the North Pier), the extension of the El to the O'Hare Airport, the creation of the State Street Mall, a failed attempt to compete with suburban malls, and expansion of the Loop's Pedway system. Like the mayor's 1972 proposal to limit car traffic in the Loop, the plan downplays the role of the automobile.

186. Smith, Carl, *The Plan of Chicago,* 20.

187. "Interpretive Digital Essay: The Plan of Chicago," encyclopedia.chicagohistory.org/pages/10417.html (accessed 10 May 2010).

Figures 58 and 59. The Illinois Center, interior and exterior showing incorporation of multilevel street pattern.

One significant part of the Chicago 21 Plan was Illinois Center. A 1984 *Tribune* article highlighted the futuristic quality of the multilevel development, located east of the Loop on railroad property: "It's the life-style envisioned by science fiction writers of the 1950s — a self-contained underground city . . . a $2 million version of the future on stilts," noting that although most of the development was technically at ground level, it "has a subterranean feeling because the streets are elevated." The article noted that the underground retail concourses were intended to draw shoppers from the busy Michigan Avenue district just to the north.[188]

188. Ibata, David, "Illinois Center Growing into Futuristic City Within a City," *Chicago Tribune,* 11 Nov. 1984, N1.

A *Time* magazine article focusing on the plan discusses this effort:

> "Nothing destroys the community fabric, the neighborhood focus, more than highways," says Harold Jensen of Illinois Center Corp. Instead, a feeder subway line will be built, plus new parking lots at terminal points of mass transit lines . . ." We tried to give the city not to cars but back to the people."[189]

This reflects the goal of many underground developments to reinvigorate central business district retail by attracting shoppers from malls. Today, Illinois Center is one of the most extensively developed parts of Chicago's Pedway system, with a food court, retail shops, and climate-controlled access to its residential towers, offices, and hotels (Figures 58 and 59). Adjacent to multilevel streets such as Wacker Drive, Illinois Center is the most elaborately multilayered real estate development in Chicago, if not the entire country.

The Pedway was also mentioned in *Chicago Metropolis 2020* in relation to public transit: "One of the best ways to improve the attractiveness of transit is to provide connections between high activity centers: adding pedways from the Northwestern and Union stations to the CTA and the existing pedway system."[190]

The Piecemeal Development Pattern

A loose coalition of individual property owners and the city constructed the Pedway in a piecemeal fashion. Maps of the system reveal its disjointed character (Figures 61 and 62). Chicago's position on underground pedestrian development — permission and low-key encouragement — contrasts with St. Paul and Houston, whose climate-controlled

189. "Environment: Chicago 21," *Time,* 2 Jul. 1973.

190. Johnson, Elmer W., *Chicago Metropolis 2020: The Chicago Plan for the Twenty-First Century.* (Chicago: University of Chicago Press, 2001), 80.

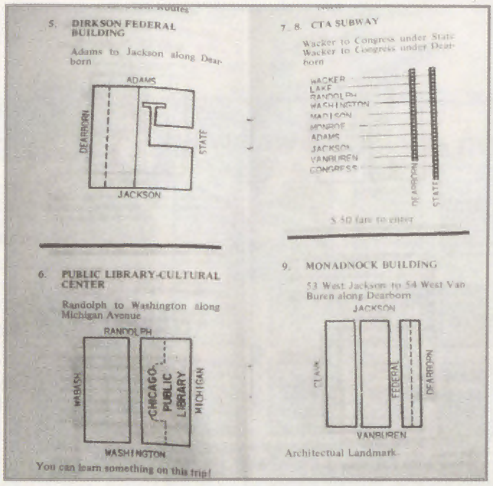


Figure 60. This piece-by-piece representation of the Pedway in the 1976 guidebook *Underground Chicago* reflects its disjointed construction.

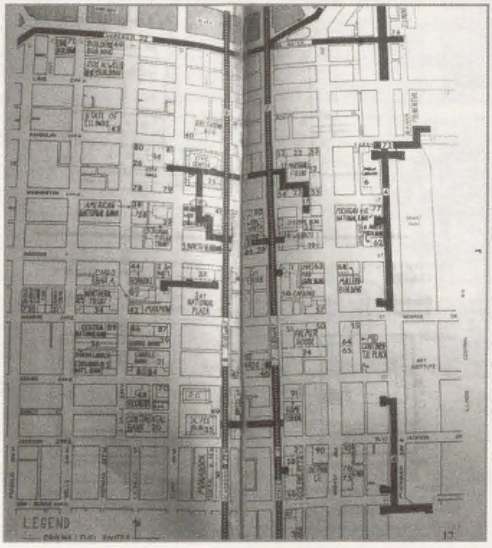


Figure 61. 1976 extent of the Pedway (note that Wacker Drive is included as a "Lower Level Route").

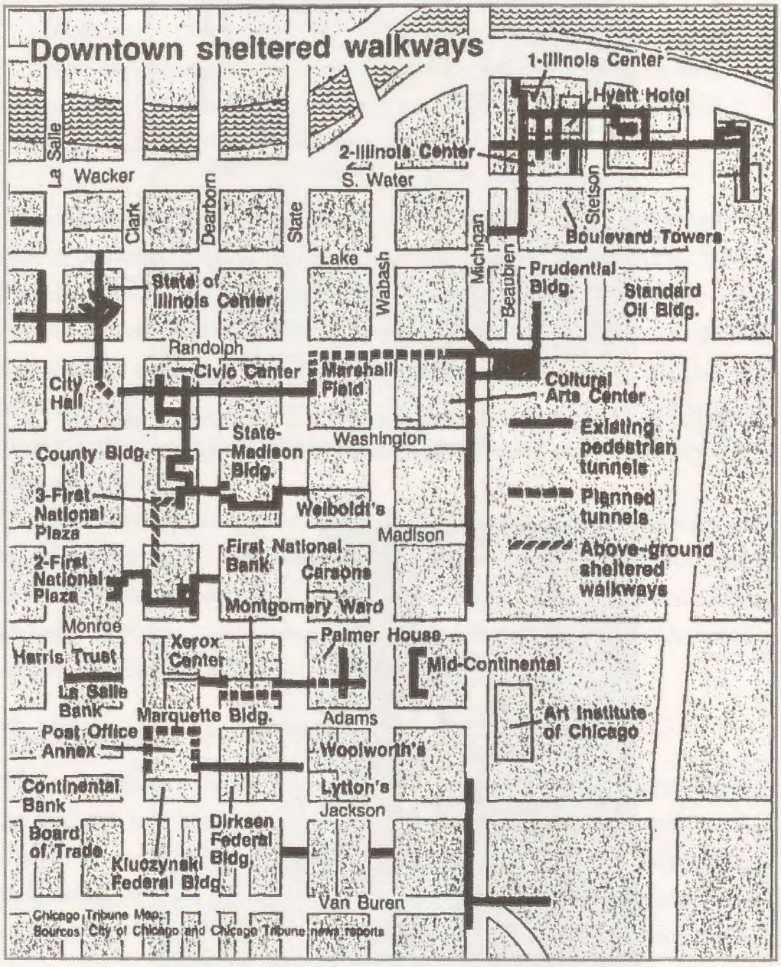


Figure 62. By 1985, the Pedway had expanded considerably.

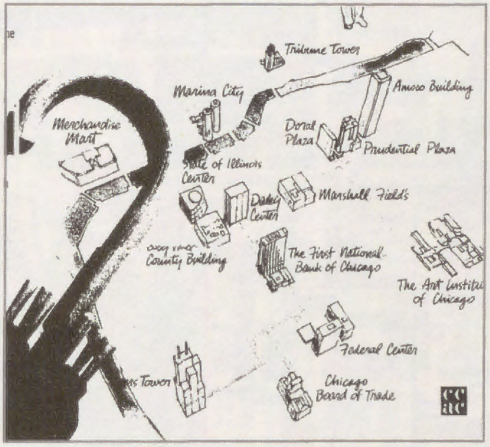


Figure 63. A symbolic map published in a 1986 pamphlet from the Chicago Central Area Committee notes the "who's-who of Chicago"-type of buildings connected to the Pedway system.

pedestrian corridors received active financial and planning support.[191] A rare comprehensive guide to the Pedway system, *Underground Chicago*, published in 1978, dealt with the fragmented nature of the system by dividing each two-building connection into a separate tiny map, presenting the system as a set of shortcuts rather than a navigable whole (Figure 60). Tony Burroughs notes in the introduction: "In most cases, you need only cross a street in order to connect one route with another" (Figure 61).[192]

Unlike comprehensive maps of public streets or the Chicago Transit System, the Pedway's lack of unified oversight has lead to a gap in its cartographic representation. Some maps are published by individual buildings for their residents or customers, showing only Pedway segments connected to their premises, and Pedway enthusiasts display maps

191. Byers, Jack, "The Privatization of Downtown Public Space."

192. Burroughs, Tony, *Underground Chicago: Downtown Walking Routes to Avoid Severe Weather* (Chicago: Positive Company, 1987), 3.

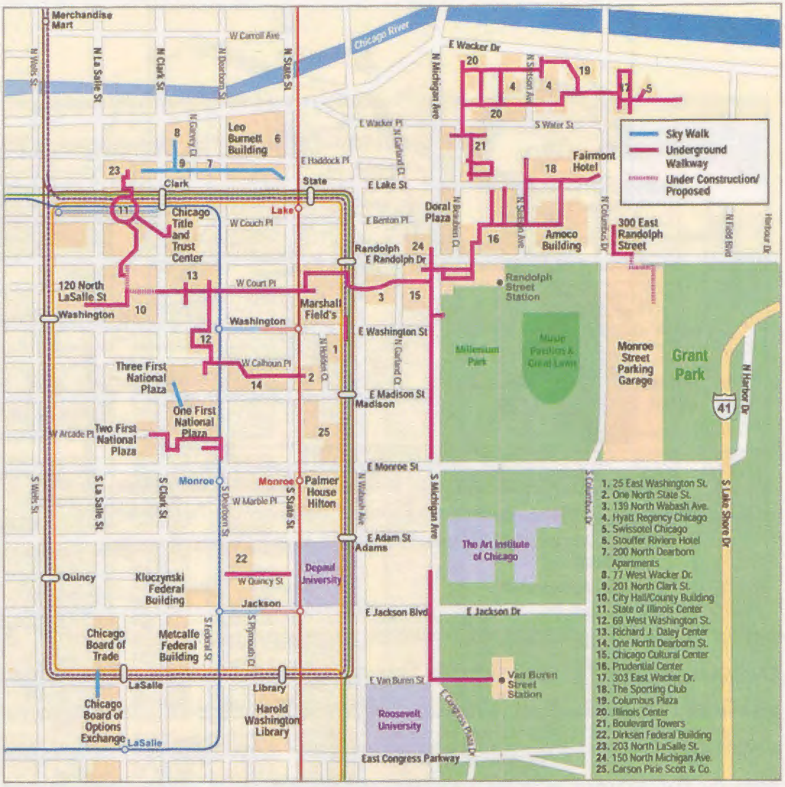


Figure 64. This late-2000s map published online by a private citizen/ Pedway enthusiast, Mark Speigl, has been hailed as one of the most reliable—even more so than the City of Chicago's (exact date unknown).

on their Web sites (Figure 64). The city has begun to promote the Pedway with newer maps, displaying several key points in the system (Figure 65). Tourist maps erected in the Loop since 2009 indicate Pedway entrances with a distinctive compass logo. This effort responds to decades of criticism about the lack of navigation aids.

The city financed the Pedway's first link between the Dearborn and State Street subways, but private developers built much of the system to enhance the attractiveness of their buildings. Building incentives offered

Figure 65. Finally up-to-date: the most recently provided Pedway map from the City of Chicago.

by the city, such as additional floor allowances, encourage developers to consider Pedway connections.[193] The city and developers or the federal government will collaborate on the construction of a single segment if it connects government and private structures.

Decentralized construction affects maintenance, appearance, and accessibility. Most sections have a security guard, either privately or publicly employed. Much of the Pedway is open twelve hours a day for shoppers, but sections that serve office workers close earlier. Privately operated sections of the Pedway may shut down without notification as was the case during the Block 37 redevelopment.[194]

In 2010, the Pedway comprises just over five miles of climate-controlled pedestrian passageways, about a third of which are at or above ground level and includes five overpasses.[195] It offers florists, access to Metra train stations, a marriage court, a driver's license bureau, coffee shops, restaurants, apparel stores, clock repair, and climate-controlled access to the interior of major Loop buildings including the Chicago Cultural Center, the Illinois Center, and the Federal Building.

Designing the Pedway

The 2002 movie *Waydowntown*, set in Calgary, Canada, concerns four office workers who live and work in the city's interconnected, climate-controlled walkway system, the Plus 15 (Figure 66). They bet a month's salary on who can stay indoors the longest using the Plus 15.

Waydowntown's portrayal of the psychological effects of long-term

193. *Municipal Code of Chicago* (American Legal Publishing Corporation, 2010). 17–4–1021, amlegal.com/nxt/gateway.dll/Illinois/chicago_il/municipalcodeofchicago?-f=templates$fn=default.htm$3.0$vid=amlegal:chicago_il (10 accessed May 2010).

194. Chicagoist.com, "Pedway, First Store Open at Block 37," chicagoist.com/2009/11/21/pedway_first_store_open_at_block_37.php (accessed 10 May 2010).

195. "The Pack-Donkey's Way," *Lumpen Magazine,* disorderlyfuture.blogspot.com/2009/09/pedway-tour-is-in-current-issue-of.html (accessed May 10, 2010).

Figure 66. Underground disorientation: a scene from *Waydowntown* (2002).

occupancy of indoor places is confirmed by research. Raymond Sterling writes: "The predominately negative imagery associated with underground space is based on true primitive conditions of the underground [caves] and the power of the underground metaphor for the mysterious and unknown," which persists despite bringing plentiful light and ventilation to subterranean spaces.[196] Wendy Lesser in "The Life Below the Ground" explores the underground as a metaphor: "With Christianity the subterranean began to be equated with evil — a connotation which carries through to the present. The word 'underground' is associated with poverty, with criminal activity, with the socially unacceptable."[197] A Japanese study found that office workers consider underground working space unappealing even when comfortable. Sterling writes: "Underground places do not provide as much stimulation; thus, *imagery*, which

196. Sterling, Raymond, and John Carmody, *Underground Space Design*, 139.

197. Ibid., 138–139.

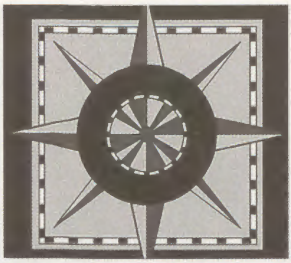


Figure 67. The Pedway's compass logo, introduced in 2008 to improve its visibility.

would not be an issue in other environments, is a consideration in underground spaces."[198] A 1974 American study by Robert Sommer found "time loses meaning" in underground offices. Employees reported higher rates of anxiety and depression than their above-ground counterparts.[199] Criticism of Chicago's Pedway emphasizes a similar disorienting effect. On the popular internet review service, Yelp.com, users find the Pedway hard to navigate.[200] The Pedway must overcome the stereotypes of underground space as dark, damp, and dreary.

To counteract real and perceived effects of underground spaces, Sterling recommends extensive navigational aids, such as posted maps, signs indicating the names of streets passing above, and visual cues such as orienting lines integrated into the design. Bright illumination mimicking natural light and visible means of ventilation add to the perceived safety and comfort of underground spaces.[201] The Pedway's newer segments integrate many of these qualities. For example, the Millennium Station Pedway mimics the outdoors with abundant light, orienting lines built into the ceiling and floor, and a gentle sloping grade that provides a sense

198. Ibid., 140.

199. Ibid., 143.

200. Yelp.com, "Chicago Pedway," yelp.com/biz/chicago-pedway-chicago (accessed 10 May 2010).

201. Sterling, Raymond, and John Carmody, *Underground Space Design*, 139.

Figure 68. Design of Millennium Station Pedway: note the orienting lines overhead and underfoot, sloping floor, and ceiling light fixtures.

of direction (Figure 68). Other stations feature navigational aids such as tiled compasses (Figures 70 and 71). The Chicago Department of Transportation's 2009 campaign to improve Pedway usability and visibility may improve the navigational weaknesses of the system. Overall, the lighting and interior design creates a successful underground environment.

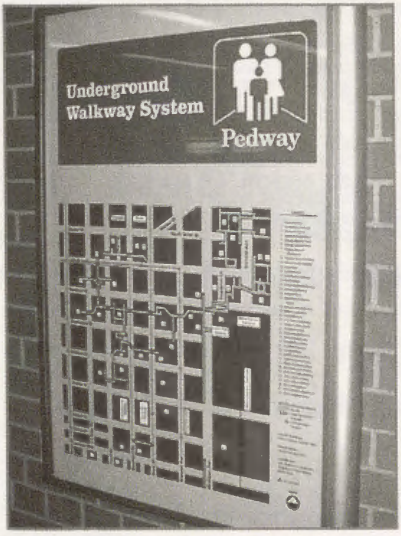
Comparing the Pedway to Similar Climate-Controlled Pedestrian Passageways

To better understand Chicago's Pedway, it is useful to compare it with similar climate-controlled networks in midwestern urban areas (Figure 72).

Calgary, Alberta, Canada

The Plus 15 ten-mile skyway network in Calgary is the most extensive in the world. Unlike Chicago, Calgary's municipal government planned Plus 15's development (Figure 73). Designed between 1966 and 1969, and

Figure 69. Chicago Pedway Bridge connecting 200 N. Dearborn condo building to The Shops at Leo Burnett.



Figures 70 and 71. A posted map (out of date) and tiled navigation aid in the underground Pedway.

Figure 72. Grade-separated pedestrian networks in North America.

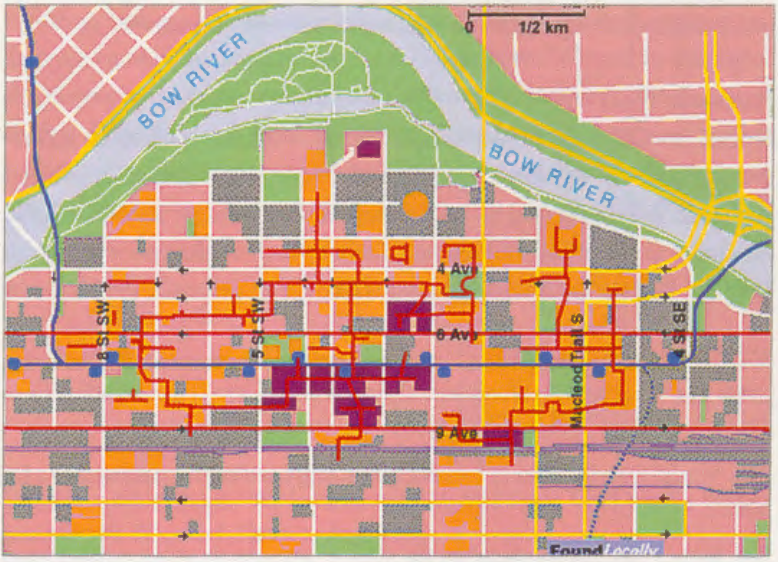


Figure 73. A map of Calgary's Plus 15.

opened in 1970, Plus 15 was part of a popular strategy to revitalize downtown areas. Instead of underground tunnels, Plus 15 is a network of climate-controlled pedestrian bridges fifteen feet above ground.[202] The central connections include Calgary's flagship department stores and major office buildings. New developments were required to connect to the existing system; like Chicago, the city offered floor-area-ratio incentives to developers who connected to the Plus 15. Calgary's Plus 15 has been criticized for undermining downtown street life in Calgary.[203]

Minneapolis, Minnesota

A major motivation for the Minneapolis Skyway construction is protection from Midwest weather. Unlike Chicago, the Skyway is mostly elevated, connecting buildings with glass walkways rather than underground tunnels. Although the Minneapolis Skyway is continuous, suggesting central planning, most segments are owned by individual buildings and accessibility may vary. Another drawback, shared with the Pedway, is the lack of maps; although above-ground navigation does poses fewer challenges than its below-ground counterpart.[204]

Houston, Texas

Similar to Chicago, Houston's pedestrian walkway system is underground and was not centrally planned. Most of the system is private, with each link controlled by individual building owners. Some segments are closed to the public and restricted to building employees or residents. Like the Pedway (and underground walkways in general), the Houston

202. The City of Calgary, "Plus 15," calgary.ca/portal/server.pt/gateway/PTARGS_0_0_766_234_0_43/http%3B/content.calgary.ca/CCA/City+Transportation/Get+Around+Calgary/Walking/Plus+15.htm (accessed 10 May 2010).

203. Wikipedia.org, "Plus 15," en.wikipedia.org/wiki/%2B15 (accessed 10 May 2010).

204. James, Clara, "Minneapolis Skyway System," minneapolis.about.com/od/travelweather/a/skyways.htm (accessed 10 May 2010).

walkways are criticized for poor navigational aids. *The New York Times* observed that Houston's hot summers make the underground walkways successful: "It's extremely difficult to be a Class A building without being on a tunnel."[205]

Self-styled Pedway tour guide Hui-min Tsen described the Pedway as a telling piece of Chicago's narrative:

> When I stumbled across the Pedway I saw in it my Atlantis, a trace of this Mythic City I had been looking for. I began exploring it looking for secret passages and connections and the possibilities of what lay at the other end. At the same time, I began researching the origins of multilevel walkways and ideal, built environments. The more I explored, the more the Pedway seemed to tell a story with a beginning and end.[206]

Tsen's description of the Pedway as a story with a beginning and an end is fitting, because its history reaches back to the nineteenth-century pedestrian tunnels crossing under the Chicago River. Viewed in this light, the Pedway represents a continuation of several Chicago traditions traced in this essay: forward-thinking urban planning, public-private growth coalitions, and layering levels of development in the downtown core — an urban amenity that is eminently Chicago.

205. Blumenthal, Ralph, "It's Lonesome in This Old Town, Until You Go Underground," *The New York Times,* 21 Aug. 2007.

206. Tsen, Hui-min, "Pedway Tours," *Lumpen Magazine* 112 (Apr. 2008).

VII. Onward and Upward: Conclusions on Chicago's Subterranean Loop

It took 150 years of engineering feats, most of them underground, to tame this swamp at the foot of Lake Michigan . . . [Chicago's] underground world exists both because and in spite of its incommodious setting.[207]

—*Alex Marshall,* Beneath the Metropolis *(2006)*

This essay has traced sub-grade development in Chicago's Loop. It began with city engineers' ambitious solutions to problems of building a city on a swamp, then traced the wily schemes of the underground freight trains and the heroic construction of multilevel streets, and concluded with the Pedway network.

The density and congestion of Chicago's downtown, factors common to most cities with underground networks, pushed much of this development. However, its characteristic originality and ambition — the only underground freight tunnel network in the world, the first-ever multilevel street in the world — are characteristic of Chicago. The personality, setting, and age of this city coalesced to produce its multilayered Loop.

Chicago's flat swampy setting encouraged multilayered development, such as the initial elevation of the city to achieve drainage for the sewer system and arguably the drive to build some of the tallest buildings in the world along the shores of Lake Michigan. Chicago's "coming of age" in terms of intense investment in downtown construction coincided with that of modernist planning and architecture, which viewed multilevel transit corridors and central business districts as critical to future urban vitality.

Chicago has been praised as resilient, hard-working, and a pioneer of city-building. One pithy resident summed it up as "Chicago = Thinking big, civic pride, irreverence, commerce, architecture." Historians have called it the "city of the future" and the "birthplace of

207. Marshall, Alex, *Beneath the Metropolis: The Secret Lives of Cities.* (New York: Caroll & Graf, 2006), 35.

modernism."[208,209] The city's image as a testing ground for the cutting-edge owes much to Daniel Burnham's Plan of 1909. Elements of this plan correspond to ideals of modernist planning and architecture, illuminating the zeitgeist for underground expansion at the beginning of the twentieth century when much of Chicago's underground infrastructure expansion occurred.

Another aspect of Chicago's personality, especially at the beginning of the twentieth century, was the cooperation between private and public interests. Chicago, with its explosive population growth and auspicious location at the nexus of rail traffic, was enticing for enterprising investors. The elevated transit lines, multilevel streets, and underground freight tunnels were conceived, promoted, and financed by private interests looking to make a profit from building infrastructure in the promising city.

With horizontal and upward vertical expansion fully saturated, these private interests were attracted to multilevel and underground development schemes. The underground represented the last possibility to exploit and expand an unregulated frontier in desirable downtown public space. Sterling notes that "when urban space is fully utilized, underground space becomes one of the few development zones available,"[210] and Moffatt described the freight tunnel construction as a "land grab."[211] In the case of the freight tunnel system, physical obscurity and enclosure hid the extent of the development from city regulators who may have quashed the plan or demanded recompense. Backers of Wacker Drive envisioned enhanced property values and the possibility of exploiting the lower level as a weather-protected retail corridor. For

208. Castex, Jean, *Chicago 1910–1930, Le Chantier De La Ville Moderne.* (Paris: Editions de la Villette, 2009), 20.

209. Marshall, Alex. *Beneath the Metropolis,* 35.

210. Sterling, Raymond, and John Carmody, *Underground Space Design,* 6.

211. Moffat, Bruce. *The Chicago Tunnel Story,* 28.

Figures 74 and 75. These mock-ups of a transportation center proposed by the City of Chicago in the West Loop would combine Union Station and Ogilvie Terminal, creating a single facility connecting Amtrak, Metra, and the CTA's elevated trains. It would also provide a platform for buses and light-rail. Aesthetically similar to the Pedway, and including commercial and entertainment facilities such as restaurants and shopping, the West Loop Transportation Center would establish an unprecedented level of layered transportation corridors and underground development in Chicago's Loop.

developers of the Pedway, physical enclosure allows developers a degree of control over ostensibly public space. By excluding undesirable users, the physical enclosure of the Pedway enables investors to offer a sanitized corridor for building occupants. Protection from traffic and the weather also enhanced property values. Finally, there is the futuristic mystique of underground space, best evoked by the nineteenth century science fiction novelists, that makes it an attractive option for investors looking to enhance property values with ultramodern amenities.

The physical characteristics of underground space contribute to its contestation. The ongoing contestation of space on Wacker Drive has focused exclusively on its lower levels. The absence of similar controversy on Upper Wacker, or elsewhere in the open-air streets in the Loop, suggests that an artificial underground space invites appropriation by private interests. This could be due to the reduced public visibility, as was the case with the freight tunnel construction, or the perception that underground space is somehow less public because it duplicates public space that already exists on the upper level, making the underground surplus and available for private use. Underground space resembles a building and contributes to the semiprivate perception because buildings are often not publicly accessible, or are accessible only for a fee.

While underground development is not unique to Chicago, it does enjoy a particularly rich and diverse local history. More developments such as the popular Illinois Center and the Pedway's expansion suggest that subterranean space will continue to play an important role in Loop morphology. Sterling writes that underground construction tends to have a reinforcing impact — expansion begetting even more users and services — so Chicago's current incarnation of underground development in the Pedway is likely to reinforce itself in the future. Other plans are already in motion for expanding underground and multilevel facilities in the Loop. For example, proposals for a high-speed rail network in the Midwest envision a multilevel, modernist-style transportation hub in Chicago's central business district (Figures 74 and 75). Facilities such as this would reinforce the Pedway's vitality and encourage expansion.

Optimism about future expansion of the underground Loop brings up an important concern: the planning and rationing of underground space. Underground space should be considered a civic resource, a fact that is too often forgotten in the eagerness to encourage private investment in the downtown core. Chicago does have an Office of Underground Coordination, but its focus lies in utility lines and sewer construction. While this is a step in the right direction, the Chicago Planning Office could benefit from both engineers and planners focused exclusively on responsible expansion of underground facilities. This office might explore utilizing the freight tunnel system as something more than a conduit for fiber optic cables, perhaps developing the network as a tourist attraction. Finally, the Pedway is in desperate need of improved maps and enhanced visibility at its entrances and exits. The success and full extent of the campaign addressing these concerns launched in 2009 remains to be seen. ■

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