

Financing and Building Wacker Drive, Chicago

DAVID DUNSTER

Introduction

One road is pretty much like another. As we drive or walk along them we generally pay more attention to the buildings than the surfaces between. In American cities, roads and streets were laid out before the buildings adjacent dominated them. But in the case of Wacker Drive in Chicago existing streets had to be removed for a new kind of thoroughfare, one which separated vehicles for freight from polite traffic. This double-decked drive parallel to the Chicago River was envisaged within the first major city plan of the twentieth century but took most of the century to finish (Fig 1). During the course of this, the function of Wacker Drive changed, and the way that it was paid for also changed.



Fig. 1 Plan of Chicago showing the route of Wacker Drive

Wacker Drive and the Plan of Chicago

The new street was built between 1920, when the Michigan Avenue Bridge opened¹, and 1975. Known as Wacker Drive² since 1927, it was constructed in four stages, a double-decked street on two sides of the Chicago Loop largely as foreseen in the Bennett and Burnham Plan of Chicago of 1909³. The history of its four phases of construction and of its financing raises many issues: the role of the City, County, State and Federal Government in city planning; changing ideas concerning the value of cities within a democracy; and, the relationship within a particular city between infrastructure (roads, water and power supplies) and superstructure (buildings and the sites upon which they sit)⁴.

How civil constructions are financed demonstrates the fragility of the functionalist paradigm prevalent in civil engineering. In architecture the functionalist paradigm can be summarised as a formula whereby a client first acquires a site for a development the client has in mind, then engages an architect who designs and details a building to the client's demands within the site area available and for a sum specified by the client. The antecedents of functionalism in this sense stretch back into the history of pragmatism. In civil engineering functionalism appears to hold sway within a profession that understands itself as primarily problem solving. If the transportation problems were what the Planners of Chicago interpreted as the main issue, their solutions made assumptions that were reasonable at the time but could obviously not deal with those which changing times and circumstances produced. These changes produce a surprising ambiguity in hindsight. How something built for one purpose can be adopted later for another is particularly noteworthy given the extraordinary cost of civil and civic engineering projects. Examining the financial regimes for building roads provides a focal point through which the rays of land speculation, property development, political issues and urban theories necessarily pass. Looked at in this way, the infrastructure necessary for the right to drive, which we take so much for granted, can be examined under a microscope resulting in an analysis that may contribute to a greater understanding of the urban problems which developed and less developed countries face.

The circumstances under which the Plan of Chicago was produced derived as much from popular imagery of Chicago as a money grubbing den of iniquity⁵, as from its prosperity, phenomenal growth, and commercial importance to the Eastern seaboard of the USA and Europe. In holding the 1893 Colombian Exposition, Chicago produced a White City to set against the dark soot covered city that rose from the ashes of the 1871 fire. The Exposition was directed by Daniel Burnham: eight years later, the Merchants' Club and then the more elite Commercial Club saw him as the man to provide a future urban template⁶. The Plan begun in 1906 graphically illustrated an orderly scheme for Chicago. It included a lakeside linear park stretching for over 20 miles; a fourfold increase in the size of the central business district; an axis of Chicago along a then insignificant street culminating in a vast new City Hall; boulevards and plazas based on Paris; and a set of new railroad stations linked into a radial road network laid over the grid of streets. Michigan Avenue fronting Grant Park was to be widened and extended north across the Chicago River into a widened Pine Street leading to Lincoln Park to form a new North-South boulevard connecting the two major city parks. The river itself was to be straightened, and its banks tidied up with subsidiary boulevards. These boulevards in the plan became the basis for Wacker Drive⁷.

Movement of people, traffic (horse drawn, mechanical and traction) and goods created horrific jams the greatest of which were on the north south bridge from Michigan Avenue below the river to Pine Street above it. The congestion at grade level between vehicles and pedestrian movement cost the city dearly.⁸ The river itself impeded traffic because water borne traffic had priority over land traffic⁹. While city engineers had already begun a programme for constructing faster opening bascule trunion bridges in place of the slower pivoted swing bridges across the river, traffic counts graphically identified congestion as a major Chicago problem. Moreover, at the turn of the century

and for the following 20 years, river traffic was more important than rail for transporting those goods for which Chicago had become the entrepôt between the mid-western plains, the East Coast and beyond¹⁰.

To deal with the problems of traffic and congestion, the Plan of 1909 (when car ownership stood at 7,110 automobiles register in the city, a ratio of 300 people to each car)¹¹ proposed vertical traffic separation between a lower level for goods and an upper level for shoppers and office workers into the Loop, where residences had been deliberately kept to a minimum. This separation was to extend over the northernmost part of the Loop along the river edge which the 1909 planners assumed, wrongly as it transpired, would continue in importance to the City's commerce. Thus when plans were laid for making the Plan real, the Chicago Plan Commission, till the 1950s a voluntary body unfunded by the City Council, worked with the City to develop the south bank of the river at two levels, and to bridge it with a widened Michigan Avenue. The bridge therefore itself would have to be two levels, and despite the exigencies of World War I that is how it was built. The artistic intentions of the Plan were modelled in the Bridge and its approaches, with architectural details and the layout of two small plazas on either side designed by Burnham's associate Edward Bennett¹². Bennett indeed was to continue a sometimes one-man crusade to preserve road layouts proposed by the 1909 Plan till his early retirement in 1936¹³. He was especially successful in fighting off all challenges to the route of Congress Street as the Axis of Chicago when a route was designated for the western Superhighway.

Two major problems appeared during the design of the Plan and continued to worry the Plan Commission: first, how to amalgamate more than 30 railroad companies into a handful of termini, and secondly how to move the wholesale food market on South Water Street and Market Street. The latter generated congestion from traffic between them and the termini, the river and the lakeside docks. Goods were offloaded at the riverside for local transit (and increasingly railway transit) criss-crossing pedestrian routes into the city from north of the river to commercial buildings then predominantly nearby in the north Loop. At the time of drawing up the Plan most vehicles were horse drawn; consequently problems of horse droppings added to food waste from the market in making that area noxious. The Plan separated freight on the lower level from pedestrians above. Little in Burnham's records indicates the source of the idea of separating different kinds of traffic. However, both Burnham and Root had married into Stockyard oligarchies, and built there. The Chicago Stockyards with their elaborate separation of animals from the many railways entering the district may well prove a more convincing source for the idea than other possibilities¹⁴.

When it opened in 1927, Wacker Drive connected the Michigan Avenue Bridge to Market Street at Lake. Its building involved the demolition of riverside storage and the removal of traders in S. Water Street to a new market west across the south branch of the Chicago River. From its new location, freight would be able to travel to and from the proposed Union Stations at grade on less congested Westside streets. Because of the construction of Wacker Drive freight could also travel within the Loop below grade to the Illinois Central Station at the northern head of Grant Park as well as to the north side railroad and the piers the Plan envisaged on the Lake front, roughly where Navy Pier was built. Thus, the double decking of the south bank of the river would relieve traffic congestion, promote more rapid circulation, civilise the northern blocks of the Loop, and promote a more beautiful and efficient Chicago. As the lawyer Walter Fisher had written, this could all be achieved within the powers of the city¹⁵.

Paying for The First Phase

Three methods were used to pay for this¹⁶. Firstly bonds were issued by the city in the mostly correct belief that such a civic improvement would lead to greater revenues through increased property taxes. Secondly owners of land that adjoined the new double-decked street were deemed

to have the value of their landholding improved. Thus they were subject to a one-off tax. Thirdly, the city by virtue of its power of eminent domain could force landowners whose property stood in the way to part with that property for a price. That price however could be contested at law, and was in the case of the widening of Pine Street to become Michigan Avenue north of the river. The city however could not use this police power to speculate in land. It could not appropriate more land than was necessary for the public good, because in so doing it would usurp the rights of private landowners to make money by speculating in land. The city in law was merely a tenant at will of the state, so Chicago was allowed to exist by the good grace of the State of Illinois¹⁷. This peculiar relationship between the largest city in the mid-West and the State of Illinois was mirrored in all other states and formed a fundamental problem for such cities causing them to increase their influence over the actions of the State by whatever means they could, since in voting urban interests would be outnumbered by rural and agricultural ones. Indeed it was not until the New Deal that the Federal Government spoke directly to Mayors preferring to follow the nineteenth century tradition of speaking only to State Governors. Not until the 1950s did Washington call a Mayors' conference equal in importance to the annual Governors' conferences. By this time both housing and highways had become matters of Federal concern and direct finance.

The city could however levy a one-off special rate on those adjoining landowners whose land would benefit in value from the public works. But that power to levy was restricted to those within two blocks of the improvement thus limiting the amount the city could raise. In this early form of a betterment levy the idea of an improvement depended upon the founding fathers of the constitution's view that land would be improved from scrub or prairie, for example, into agricultural land and urban sites. In the latter nineteenth century this meant connection to safe water supply and drainage, encouraged by a growing fear of water-borne disease, together with an obligation upon the Council to maintain the pavement (surface) of the road. In the case of street widening where existing properties had to be demolished, the Council could only use the basis upon which it levied property taxes to determine how much should be levied for the effect of the improvement. Such tax estimates could be manipulated in favour of those supporting the city's ruling majority and this might easily have happened. *The Chicago Tribune*, while it lost a case against Mayor William Thompson claiming such corruption through conspiracy, nevertheless produced convincing evidence but failed on the grounds that no conspiracy could be detected.

Thus the Michigan Avenue Bridge and the first phase of Wacker Drive were financed by the City of Chicago without any help from either the State of Illinois, or the Federal Government. Why should either higher power assist the city?¹⁸ The benefit of such improvements would accrue only to the individuals who owned or purchased land adjacent to the improvement, and to the citizens of Chicago through better internal transport connections. Neither Federal nor State government would in any serious or direct way benefit from such a specific improvement unless it could be argued that the maintenance and support of the great trade Chicago carried on was at stake. Since the improvements did not connect in any tangible way to anything that in the 1910s or 1920s could be construed as a national system, then no obligation could be felt at either Federal or State level. The counter argument that might now be advanced, namely that Chicago's importance was precisely as an entrepôt between the agricultural produce of the Plains states and the East, was not made. By 1917 the bonds had been issued and taken up, the special assessments all agreed through the courts, and work progressed first on the bridge then on the new Drive.

Wacker Drive began at Michigan Avenue Bridge where in fact it was three levels high, the lowest level used for parking (Fig 2). It led west to Lake Street, turning the corner where the river divides into a north and south branch. Lake Street in the Loop formed one side of the rectangle that came to give the name, the Loop, to the central area. This Loop collected all elevated lines into one circular terminus. Moreover, for Wacker to continue around the corner at Lake, an elevated spur on

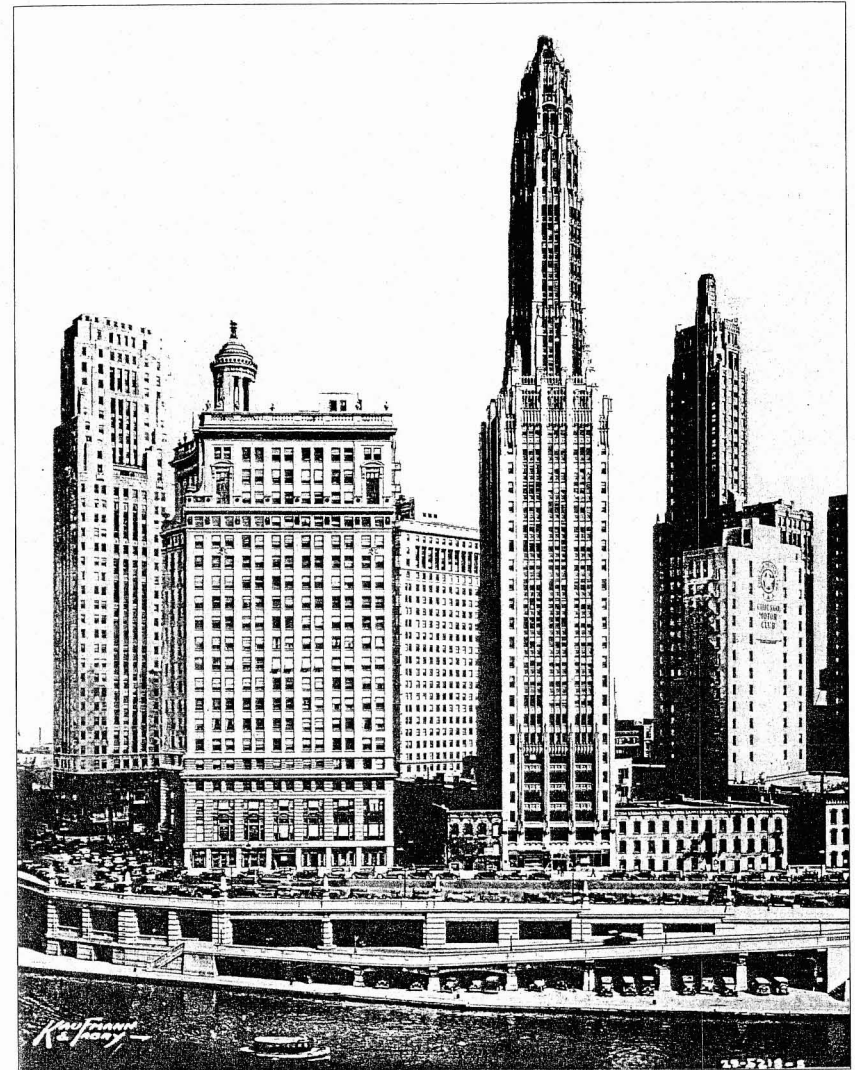


Fig. 2 Wacker Drive in 1928, showing the Jewellery Building centre right (Courtesy of the Chicago Historical Society).

Market used for storing trains would have had to be demolished. At that point the level of the river and clearance for ships on it had already dictated the height of the bridge at grade and of the elevated above. From Lake, the El ran to Oak Park, one of the more bourgeois suburbs. Wacker stopped at Lake for nearly twenty years as first the Great Crash and then the long years of the Depression followed by World War Two halted all urban construction.

At first Wacker was used as intended to separate goods from more polite traffic. But within two years the Crash brought Chicago as well as New York to the unwelcome embrace of financial disaster. Within three years photographs show the new problem that Chicago had to face. Despite the Depression the rise in car ownership was phenomenal: indeed it has been argued that the hire purchase plans advanced by Detroit to promote car ownership drained the American economy of money, money which had previously been saved in banks¹⁹. In any event the first use of Wacker was far from that intended by Burnham and his colleagues. All levels were used for parking. With the drop in consumer demand those sites which would have been perfect for department stores or new shops with delivery from lower Wacker Drive were suffering from the Depression. Both lower level and the ramps down to it were crowded with the cars now used to get those who had jobs into work.

The New Deal

The explosion of car ownership witnessed in the 1920s brought forward new accommodation problems for cities. In Chicago the first issue to be tackled was the provision of enough car parking. Beneath Grant Park from the Art Institute at the eastern head of Adams up to Randolph became one vast underground car park. Buildings were even constructed in which a car park occupied the central core with offices ringing the core²⁰. The second issue was the improvement of urban transport. Recognising the poverty of cities whose tax base had been eroded, Roosevelt's administration proposed a New Deal that would provide work rather than welfare through public expenditure programmes and thereby return the country to economic progress. Central to the New Deal were programmes that made an impact on the future cities that would emerge after the Depression. Through the Works Progress Administration (WPA) and then the Public Works Administration (PWA) Federal money was made available for the first time to cities. Certainly the programmes struck a balance between agricultural and urban needs with Farm-to-Market roads taking priority. Increasingly however the provision of good urban transportation became a priority particularly when the President could see that this delivered votes²¹. In Chicago two major projects were undertaken - the construction of the Outer Drive, now known as Lake Shore Drive, and the construction of a new Subway system which was planned to take over from the elevated lines. Both had implications for the completion of Wacker.

The edge of Chicago on Lake Michigan was largely man-made²². When the Illinois Central Railway came to Chicago, its route from the south ran along the shoreline. It was allowed to build there only so that it provided a breakwater between the city and the lake. Debris from the Fire of 1871 was deposited on the lake edge both north and south of the river mouth forming the hard base of what would become Grant Park next to the Loop and to the north, the base of what became the land east of Pine Street. The Fire having thus provided a harder edge to the Lake, a road was constructed along the Lake to connect the military presence at Fort Sheridan between Evanston and Lake Forest to the City. Fear of urban insurrection and lack of confidence in the Police Department to contain riot urged the case for a useful but distant military presence. In the 1930s this, originally military, road was reconsidered as a great distributor and collector road that would enable people from the outer suburbs on the north to drive into the city. On land supervised by the semi-autonomous Chicago Park District, such a road was not allowed to carry heavy truck traffic but only private cars and public transportation.

The Outer Drive project was completed in 1938, running from Grant Park across the river on a new bridge opened by FDR and north to beyond Fullerton. As the road came out of Grant Park on the cross axis originating from Bennett's location of the Buckingham Fountain it made two right-angled bends, first turning right when it came to the river and then left onto the approach to the bridge. That part constructed alongside the river running west east was called Wacker Drive. However the two sharply angled bends, which had been argued to slow traffic down, turned into

death traps. Subsequent constructions smoothed these hairpins into a gentler 50 mph road. Wacker Drive however had had its second phase constructed as part of a New Deal project. The WPA administrator saw the project as highly significant:

*'The Chicago outer Drive improvement (one of the '2 most outstanding accomplishments, the other being 135,440 miles of farm-to-market roads grading and surfacing') has (sic) been conceived some years prior to the start of the WPA. The City at that time was struggling with an exceedingly difficult problem of automobile traffic between the central business district and the north and northwest sections of the City, and the suburban area along Lake Michigan to the north of the City. The main traffic artery was the Michigan Boulevard, Lake Shore Drive and Sheridan Road system which approximately paralleled the Lake Shore. Because of restricted capacity, this artery became so congested during rush hours in the morning and late afternoon that an average speed of approximately 5 mph. was the maximum which could be attained for a considerable distance north of the Central business district.'*²³

Such New Deal projects were constructed with 90% Federal money, the remaining 10% coming from either city or state. Where in the depression could such bodies match funding? From a growing source of revenue known as the Motor Fuel Tax, running at about 8% and varying from state to state. The Motor Fuel Tax if not welcomed by car-users was tolerated probably because revenue could only be spent upon constructing, improving and maintaining roads. The Motor Fuel Tax would in the coming forty years fund the Interstate Highway System before its revenues disappeared into the general pocket of the United States Treasury. As a not unpopular tax, it behoved City, State and Federal government to use it in ways that alleviated growing traffic congestion, with political and economic benefits apparently guaranteed - an almost classic win-win situation²⁴.

The second major New Deal project was the construction of a subway system in Chicago. This projects was financed through the Department of the Interior whose Secretary, Harold Ickes, had much experience of Boss politics in Chicago²⁵. WPA projects were administered by Harry Hopkins who realised the strength of the then Mayor of Chicago, Edward Kelly, in delivering the FDR vote at presidential selection congresses²⁶. Ickes for his part made sure that the engineers who supervised the design of the subway all came from New York, while Hopkins was rather more lenient with funding. It would be fair to say that the precise division of responsibility between them was the President rather wished to keep it unclear²⁷. In proposing the subway however, Ickes, with his personal knowledge of Chicago politics, used the grant agreement to tie the subway construction into the construction of a superhighway leading out on the Axis of Chicago - Congress Street.

For the superhighway to connect into the Loop, a vast cloverleaf junction was proposed at Wells that would have its main feeder from the north in the shape of an extended Wacker Drive. Thus the third part of Wacker Drive depended upon a condition of the grant agreement to fund the subway²⁸. The subway was 45% (or no more than \$18 million) paid for by the New Deal but was not entailed in financing the superhighway. Again world events intervened, except that in World War Two, the USA entered sooner than in World War One and with greater urgency. Construction of these projects was delayed until 1944.

Such massive undertakings were neither the work of a moment nor of a fiat. During the 1920s Edward Bennett had conducted a continuous campaign against suggestions and plans from the City Engineers that the westerly route of any new superhighway should straddle anything other than Congress Street. When the central US Post Office outgrew its premises on the Loop, a series of sites were examined before a site on Canal Street was finally agreed. Designed by the architects who

took over most of Burnham's work, Graham Anderson Probst and White, it blocked the Congress Street axis.²⁹ Referring to a 1914 City Council ordinance Bennett, via the Chicago Plan Commission, forced the architects to insert a hole wide enough to carry a six-lane highway through the building.

The third phase of Wacker, between Lake and Congress, was therefore predicated upon a 1914 ordinance which resurfaced in the late 1920s and was a condition of the subways' construction (Fig 3). Work began in 1944 and continued for four years. Wacker Drive's third extension was designed to connect the Loop to and from the first superhighway constructed in Chicago. In this function it possesses an almost Piranesian succession of ramps whereby car drivers can make a connection between the superhighway and the Loop's east-west streets. Additionally, drivers from the superhighway can continue around Wacker at lower level and arrive via lower level Michigan



Fig. 3 Aerial view of the Chicago Loop looking west in 1936, showing proposed connections with superhighways (from the Report of the Committee on West Side Superhighways).

Avenue Bridge at the near North Side. The final phase of Wacker was to connect it from Michigan Avenue Bridge to that first disastrous piece of the Outer Drive built in the 30s and thereby enable a direct connection from Lake Shore Drive to the Congress (now Eisenhower) Expressway (Fig 4).

However, phase three, Wacker from Lake to Wells, was constructed after the passage of the first Federal Highways Act in 1944 but before Washington had found an acceptable way to pay for highways or highway access roads. This phase was funded entirely from Motor Fuel Tax revenues of Illinois and the City of Chicago. The final phase, completed in 1975 east from Michigan Avenue Bridge toward the outer Drive was funded as part of the post 1956 Federal Highways Acts. Those other sections of highway, which now connect central Chicago to the Dan Ryan and Kennedy Expressways, are part of the Federal highways system and were detailed in the so-called Yellow

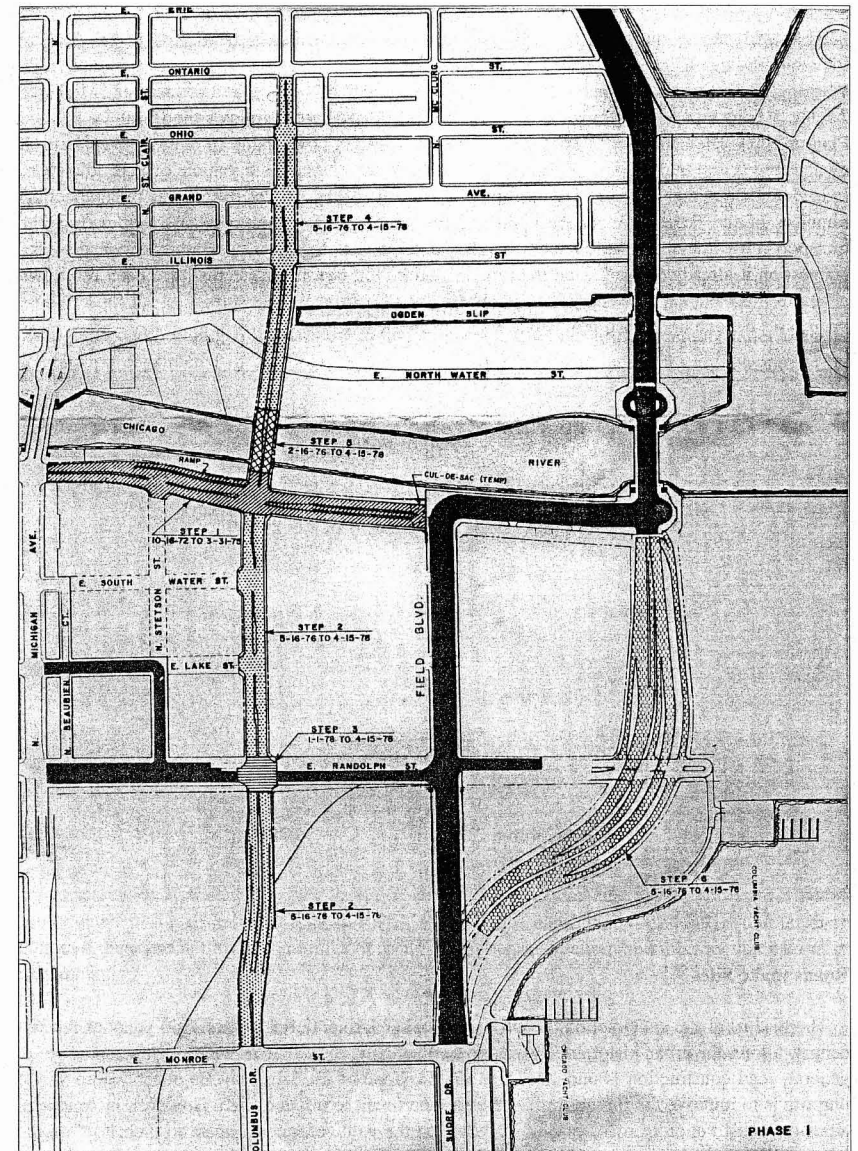


Fig. 4 The final, fourth phase of Wacker Drive, from Michigan Avenue to Outer Drive Bridge, built in 1972-6. The black indicates previous Outer Drive connections, grey shows new sweep connections (courtesy of the Dept. of Public Works, City of Chicago).

Book in which the entire system was mapped. Lower level Wacker Drive became two edges of a quadrilateral edging the Loop with higher speed roads immediately connected to the Federal Interstate system (Fig 5). Only therefore in its second and fourth phases was it funded from Washington, that part of it which runs along the south branch of the river and connects the Michigan Avenue Bridge to the Outer now Lake Shore Drive. In its route this follows the Burnham Bennett Plan of 1909. They could not have foreseen the growth in car ownership (though Bennett himself owned three cars) but perhaps neither he nor his boss saw the car as a vehicle of mass transport. Indeed neither of them saw the Plan serving the interests of the masses. But it was the democratic impulses of the Federal Government through its adoption of highways as a major part of the transport infrastructure of the States which assisted the growth of car ownership impelled by the congestion it already created. That the railway and public transport systems have been run down generally may or may not enjoy the characteristics of a financial conspiracy of all those whose businesses depend upon road provision.

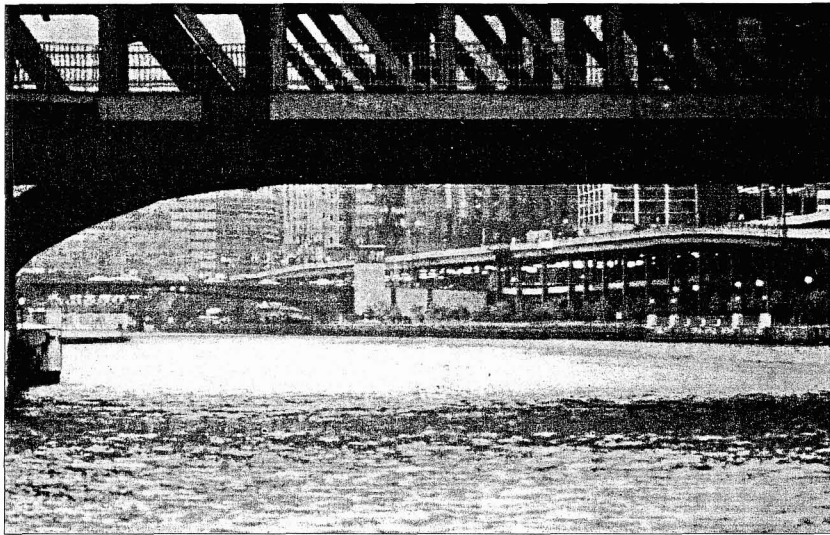


Fig. 5 The final phase of Wacker Drive, seen from beneath Michigan Avenue Bridge (David Dunster).

Roads make Sites

The history of the construction of one road, Wacker Drive, during the first 60 years of the last century allows the urban historian to examine the history of the city from a different perspective. In general, road construction is understood as the province of the Highway Engineer whose single purpose is to improve the flow of traffic: it is not pertinent to urban design. However, in American cities the construction of roads powerfully affected the value of land adjacent to them. Before the Interstate Highway System was constructed urban roads were paid for from levies upon adjacent landowners as well as bond issue by the city council. The value of land therefore was understood to be increased by proximity to a properly paved street. Indeed the location of the new or widened road was often a matter of hot debate between those who would profit and the civic interest. Further the precise location would often create sites which by their prominence or dominance then became

more valuable. In Chicago the widening of Michigan Avenue adjacent to the Loop and the proposal in the Burnham Plan to construct a new bridge replacing what was then known as the Rush Street Bridge encouraged exactly such a development. This was the Wrigley Building, famous more for its colour and position than for any single architectural feature. The site stood at the head of Michigan Avenue as it headed north out of the Loop, and this location decided William Wrigley that the building should never host any advertising - its location, scale and surface detail in his eyes were enough to advertise his gum. By visually closing off the apparently endless grid which is Chicago, Wrigley thereby set his building against other buildings in Chicago which likewise blocked the grid - Richardson Shepley Bullfinch's Art Institute at the eastern terminus of Madison, and the Board of Trade Building which terminates La Salle Street.³⁰

As a result of this observation, the real estate agent's tag location, location, location takes on some important urban sense. Within a grid of streets there are very few spatial tactics which distinguish one building from its surrounding buildings. It could be considerably taller than its neighbours, constructed in a different style or using different materials from its neighbours, be distinguished at street level by décor, or in the later twentieth century set back to create a public forecourt. Or it could encompass the whole city block. But most significant of all would be a site location, which blocked the grid. In this respect the urban layout begins to assume a representational significance in purely formal terms whereby difference or significance is established simply by location. This is of course a planning lesson well known from the fifteenth century on, where royal or ecclesiastical buildings occupy such sites often concluding an axis. But in Europe this tactic generally came with some perspectival control of access. In the American democratic city such hierarchical performances were not welcome. Neither north - south nor east - west alignments were privileged but were understood to be equal in importance. As cities grew in population and economic power their expansion beyond the six-mile by six-mile original land grant meant that expansion could be controlled but in a way that was entirely different from European practice. First the Americans would build the road, and then the buildings followed if market forces showed interest.

The construction of Wacker Drive originally had such a purpose but it was also intended to cover over the unsightliness of South Market Street where farmers brought their produce into the city. Its construction meant that the Farmers' Market was forcibly moved out of the Loop. Not until the 1950s did Wacker Drive surround two sides of the Loop. Congress was extended to become the westerly superhighway out of the city but not until the 1950s. The story of that decision deserves another paper. The final area of interest is that time lag between the first ideas for the construction of Wacker Drive and the completion of it as part of the Interstate Highway System finally promulgated in the Eisenhower Act of 1956. In terms of urban history, the longest time span is exhibited therefore not by the buildings of a city but by its road pattern and the way that pattern is constructed.

Correspondence: Professor David Dunster, The Liverpool School of Architecture and Building Engineering, Leverhulme Building, Abercromby Square, Liverpool L69 3BX

References

1. Edward Bennett reported in his diary of 1920:
May 6, 'walked across the new bridge at Michigan Avenue this a.m.'
May 14 'Opening of the Michigan Avenue Bridge -complete only as to steel work'.
These diaries are part of the Bennett Archive in the Art Institute of Chicago, Burnham and Ryerson Library.

2. As of September 2000, the City of Chicago will shortly embark on a major refurbishment of the Drive. It was named after Charles Wacker, Chairman of the Chicago Plan Commission when the first phase was completed in 1927.
3. Daniel Burnham and Edward Bennett, *The Plan of Chicago* (Chicago, 1909). Burnham died in June 1912. That the authorship of the plan is joint appears unique in Burnham's output and suggests that the Plan was at least, and possibly more, 50% the work of the much younger Bennett.
4. Within the geo-political structure of America, the supreme political authority is the Federal Government. Below this are the States, within which counties are established. Cities are then embedded within Counties. In practice the individual State can and could control much of what occurred provided that that control, or police power, did not exceed the Constitution of the Federal Republic to which it has always been subservient. Indeed cities themselves are tenants at will of the individual state in legal terms. Such tenants were often larger in population than the rest of the state, and in most instances the major cities that are commonly known were not the capitol of that state. In Illinois, Springfield is the state capital, Chicago is not. State capitals were often chosen because they occupied the balance point of the lamina, considering the State as a flat plate. The four levels then, the Federal, the State, the County and the City each play a part in financing, in political life and in demand for highways as they did during the 19th century and the boom in railroad construction.
5. See Bessie Louise Pierce (ed.), *As Others See Chicago* (Chicago, 1933) which includes accounts by amongst others Rudyard Kipling; and William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York, 1993).
6. Still the clearest exposition of Burnham's role within the fair is in Thomas Hines, *Burnham of Chicago: Architect and Planner* (Oxford, 1974), chapters IV and V.
7. The most recent publication on the Plan of Chicago is the catalogue of an exhibition at the Art Institute of Chicago in 1989, with essays by Sally Ann Chappell and Robert Bruegmann. Ms Chappell's list of the major features is of course, as is mine, a matter of opinion.
8. *Better Roads and Streets*, January 1916, p.9 et seq. reported the 'First Traffic Census of the Central Business District of Chicago'.
9. Because the Chicago River gave onto Lake Michigan finally connecting to the Atlantic, the waterway came under the control of the US military. Their fear of foreign invasion dictated that such waterways must give priority to waterborne traffic over land traffic because they believed that an invasion would come by sea rather than by land.
10. William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York, 1993) advances the dramatic thesis that Chicago and the Mid-West grew as functions of each other, and that Chicago did not exist solely because of the agricultural wealth of the Great Plains
11. As reported by R. Stephen Sennot, 'Forever Inadequate to the Rising Stream: Dream Cities, Automobiles and Urban Street Mobility in Central Chicago'; in *Chicago Architecture and Design 1923-1993*, ed. John Zukowsky (Chicago, 1993) p.54.
12. Burnham himself died in 1912.
13. Bennett's diaries, now in the Burnham and Ryerson Library of the Art Institute of Chicago, come to an abrupt halt in 1936. Bennett continued to practice as an architect but withdrew from his civic design role. Personal discussion with Bennett's son, November 1990.
14. Further research will examine the relationship between the Stockyards and the Plan of Chicago.
15. See *The Plan of Chicago* (1909), Appendix: The Legal Aspects of the Plan by Walter K. Fisher.
16. George A. Quinlan, 'Cook County Highways Planned Ahead for Traffic Increase', *Highway engineer and Contractor*, vol 14, no 4, (1913), pp. 43-48, reports that the State of Illinois enacted a law returning to the counties all revenues received from motor vehicle license fees which together with each county raising the same amount the combined funds should be used for the construction of county highways according to plans and specifications of the State highway department. Such improved roads to be maintained by the state. Such state-aided highways should not exceed 25% of the total county mileage. Thus Cook County, between 1913 and 1918 constructed 50 miles of improved highways, an average of 10 miles each year at a total cost of \$865,000. This was not enough to service needs and two bond issues of \$2million in 1915 and \$1 million in 1917 were made. Co-ordination of roads was a priority and the county highway system was co-ordinated with that of Chicago through the Chicago City Plan Commission.
17. See Gerald Frug, *City Making: Building Communities without Building Walls* (Princeton, 1999).
18. The sole intervention in road construction had to do with roads over which US Mail would be delivered: see Mark H. Rose, *Interstate: Express Highway Politics 1941-1956* (Lawrence, Kansas, 1979) p. 8: and Gary T. Schwartz 'Urban Freeways and the Interstate System' in *Southern California Law Review*, vol. 49, no 3 (March 1976) p. 412. Congress approved the first program of continuing federal aid for highways in the Act of July 11, 1916, ch 241, Stat.355. It apportioned funds amongst states for half the construction costs, excluding acquiring rights of way, 'of rural post roads' - those over which mail was carried. 'In 1916, Congress authorized expenditure of \$75 million over a five-year period for road construction, provided that states matched on a dollar for dollar basis and that state governments administer federal funds through a highway department. By 1917 every state had created a road agency.' (Rose.)
19. James J. Flink, *The Car Culture* (MIT, 1975), especially Chapter 6, pp.177-181.
20. James Fenton, *Hybrid Building: Pamphlet Architecture no. 11* (Princeton, 1985) p.13, describes the Pure Oil Building, 1924, designed by Theilbar and Fugard, architects with Glaver and Dinkelberg, engineers, which had a car park core rising nearly 20 stories surrounding on all sides by accommodation. The building, at 35 East Wacker, still exists though the car park has been remodelled. Because of the security this arrangement provided, jewellers tended to congregate there, hence its nickname - the Jewellery Building.
21. Flink, p. 181, notes that the automobile industry could hardly have wished for a more anti-car President than Roosevelt.
22. For a discussion of the formation of the Lake front, see Lois Wille, *Forever Open Clear and Free: the Struggle for Chicago's Lakefront* (Chicago, 1972).
23. April 30, 1943, Final Report 1935-43, Federal Works Agency Work Project Administration of Illinois, Chas. B. Casey, State administrator, p. 97.
24. See Rose, *Interstate*, pp. 4-5 and pp. 30-36 for a discussion of the growing number of cars and the taxes imposed upon their fuel; as well as attitudes at Federal level to tax and how it was not hypothecated.
25. Harold Ickes, *The Secret Diaries of Harold L. Ickes: The First Thousand Days* (New York, 1953) p. 493
26. Roger Biles, *Big City Boss in Depression and War: Mayor Edward J. Kelly of Chicago* (Chicago, 1978) p. 81 et seq.
27. T. H. Watkins, *Righteous Pilgrim: the Life and Times of Harold Ickes 1874-1952* (New York, 1990), pp. 309 -310.

28. The Grant Agreement was read into the Journal of the City Council of Chicago on October 28th, 1938, (pp. 7156-7166). Under Special Conditions to Government's Obligations Hereunder, the eighth condition seeks the reconstruction of the State Street Bridge over the Chicago River and the tenth (j) reads:
'Unless the applicant shall, on or before July 1, 1939, or such later date as the Administrator may approve, have submitted to the Administrator a comprehensive plan for the extension of the subway system which shall include provision for the widening of E. Congress St., and W. Congress St, from S. Michigan Ave. westward and for the construction of a subway in W. Congress from S. Dearborn St. Westward and shall in the event that the State of Illinois shall make available for such construction the proceeds of the motor fuel tax collected from users in the City of Chicago, or an adequate part thereof, or other monies adequate for said purpose, have proceeded promptly with such construction and carried on the same as rapidly as possible according to plans and specifications approved by the PWA Commission'.
29. The location of the enlarged US Post Office, arguments over its position, and the battle to preserve the Axis of Chicago deserve fuller treatment.
30. The changing value of lots within the Loop, and therefore the history of how the commercial centre shifted from south of the river to the State Street corridor can be easily deduced from Homer Hoyt, *100 Years of Land Values in Chicago* (Chicago, 1933).