The Highway Comes to the American City: Automobility, Urbanity, and the Functioning of City Streets

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Infrastructure and local conditions

Dana Cuff has noted the militaristic origins of contemporary meanings of the term infrastructure (Cuff 2011, 19). Arising in post World War II Europe, infrastructure was a term used by the Western Alliance, the coalition that would become NATO, in 1949 to describe a system of airfields that was to be paid for and used by all alliance countries but physically located Belgium and France. Literally meaning “the structure underneath” or the “structure below”, infrastructure (Oxford English Dictionary) was focused on performative benefits delivered to partner countries while spanning geographic and political boundaries. This etymological focus on the functioning of the system at large tends to make infrastructures indifferent to local conditions – a distinct conceptual blindspot as one endeavors to blend a highway into a city, an task one reporter noted was as likely as, “‘blending’ a buzz saw into a Persian rug” (Mohl 2004, 693).

Examining an ngram graphing the use of the word infrastructure across all English language books (Fig. 1) we can see its transition from a specialized military term to its adoption in common parlance following the war. As infrastructure was gaining in popular usage, terms such as road, bridge, and street describing discrete elements of transportation systems, all experience a distinct dip in usage, while the more comprehensive term highway experiences a similar dip and is actually overtaken by infrastructure sometime in the mid 1980’s. These trends in usage point to attitudes that plagued the introduction of highways to American Cities throughout the twentieth century and particularly following World War II – coincident with these linguistic changes.

The first of these was a tendency to privilege the performance of the underlying mechanism over any local difficulties posed by individual parts of the system. This performative myopia would long blind decision makers to the harmful side effects of urban highways. Secondly, in keeping with the origins of the word infrastructure, the benefits of American urban highways often accrued to users who were geographically distant from the negative effects of the system, disincentivizing attempts for real reform when such difficulties arose.

Additionally, the search for workable urban highway typologies in the United States throughout the mid 20th century was burdened by American romantic notions of the highway that were largely rural and therefore incompatible with cities. Linked to notions such as individuality, outdoorsmanship, and manifest destiny; these romantic ideals would be of little assistance in developing urban forms.

American city streets in the early 20th century

At the turn of the 20th century American urban streets were vibrant public spaces that, while providing for transport and service functions within the city, were open to reinterpretation as an impromptu meeting space, a play area, or a marketplace. The recently discovered Miles Brothers film (Miles Brothers 1906) shot from
the front of a cable car as it traveled along San Francisco’s Market Street in 1906 provides an intriguing glimpse of an American city street of the era (Fig. 2). It shows ever changing flows of automobiles, cable cars, hacks, buggies, wagons, bicycles, and riders on horseback. The pedestrians include men, women, and children from seemingly all walks of life – policemen, paperboys,
women in extravagant dresses and hats, working men, and kids at play as they dart in and out of the traffic. While there is some semblance of order; for instance traffic generally remaining on the right side of the street with parking along the curb; it is certainly not the systematic interaction we would see along Market Street today. While prevalent, the motion, speed, and action of the automobiles in the film do not differ significantly from the other vehicles on Market Street. However, in just a few decades, the increasing speed and popularity of the automobile would lead to a struggle for the use of the street in the American City.

The fight over the place of the car in the street of American Cities had begun a few years before when on 13 September 1899 Henry Bliss stepped off of a horse-drawn street car at the intersection of Central Park West and 74th Street in New York City and was struck by a cab, becoming the first person in North America to be killed by an automobile (New York Times, 1899). His death was the tip of an iceberg that would become a significant public health crisis in the United States. By 1926 this crisis was in full force with 200 children killed by vehicles on the streets of Manhattan that year (Perry et al. [1929] 1974, 124). In 1921 alone 286 children were killed on the streets Pittsburgh, 97 on the streets of Washington, and 130 in Baltimore (Norton 2008, 41-44). This death toll was a ghastly barometer of the growing battle for the public space of American city streets.

In the early decades of the 20th century the death of children in city streets became a rallying point for crusaders who sought legal and social remedies for what they saw as an increasingly dangerous urban environment that put people into direct conflict with automobiles. In 1901 Connecticut became the first state to place legal limits on automobile speeds – 12 mph in the city, 15 mph in the countryside (National Geographic 2009). It would be the first of many attempts to control and systematize both vehicular and pedestrian traffic and limit their interactions – a very difficult task on crowded city streets.

The introduction of the Model T Ford in 1908 had signaled the beginning of widespread automobile in the United States. By the time significant concerns over urban pedestrian safety emerged in the mid 1920s it was near the end of its production run. Yet, the proliferation of cars into American culture would continue unabated, achieving a penetration of one car for every four inhabitants by 1938 (Haas-Klau 1990, 24). Despite romantic notions of the open road and some attempts at stitching together transcontinental highways in the early part of the century, the wave of personal automobile ownership was mostly absorbed by the nation’s urban areas (McShane 1994). Quite simply the money for the purchase and maintenance of cars and the roads for their operation were largely in and around cities. The increasing concentration of ever faster vehicles was pushing the streets of American cities to their breaking point.

Searching for solutions

Efforts to alleviate these conflicts had both legal and design manifestations. Throughout the first half of the 20th century American cities sought to increasingly systematize the interaction of pedestrian and vehicular traffic – limiting speeds, controlling conduct at intersections, dissuading children from using the streets for play, painting crosswalks and compelling pedestrians to use them. By the 1920s Sir Bernard Partridge’s 1909 Punch magazine drawing of a boy scout leading Britannia (Fig. 3) had morphed into the well known trope of a scout helping an elderly woman safely, and properly, across the street (Partridge 1909; Burton 1914; New York Times 1923;
By the 1930s the term *jaywalking*, was gaining popular usage – a jay being an unsophisticated rube, the only type of person who would not know to properly use the crosswalk (Norton 2008, 65-104). Much of the city street had been effectively removed from the pedestrian’s public realm.

Alongside these legal and cultural strategies, design solutions to pedestrian/vehicular conflicts were also explored. The so called town for the motor age, Radburn, New Jersey designed by Stein and Wright in 1929 featured careful segregation of pedestrian and vehicular corridors. (Haas-Klau 1990, 101-108) This strategy, which had its roots in the garden city movement and recalled Olmstead and Vaux’s segregated circulation in their 1858 design for Central Park (Haas-Klau 1990, 12; McShane 1994, 32-34), relied on horizontal manipulation of the systems and therefore required significant space – real estate that was hard to come by in pre-existing, densely populated cities. While there would be some later attempts to retrofit cities using similar horizontally manipulated strategies, such as a scheme by Paul and Percival Goodman for creating pedestrian and vehicular hierarchy within the Manhattan city grid (Goodman and Goodman 1961, 304-311), by the interwar period most efforts to accommodate highways within the fabric of the city focused vertical manipulation or grade separation – a strategy that was also used in Central Park whenever the segregated systems intersected. Grade separation was seen by most urban thinkers of the interwar period as the key to providing a place for the highway within the crowded plan of the city. The pressing urban design problem of reconciling pedestrian safety, automobile efficiency, and useful densities inspired a myriad of utopian schemes at the time. While some combination of horizontal and vertical manipulation would be part of nearly every one of these plans, it was grade separation that would lead to the most interesting proposals, the most heated debates, and, eventually, to a wave of urban highway construction.

Searching for space in the section of the city

The vertically integrated [or segregated] city was a prominent theme of the early 20th century. Numerous serious, though sometimes fantastic, proposals for grade separated cities were made at the time. The notion also began to pervade the media culture, as in Fritz Lang’s masterpiece, *Metropolis.* The idea of vertical organization was influential both in popular images of the city and in built form. Nearly always, whether actual or fictional, the permeations of this concept were explicitly linked to the sectional segregation of modes of transport such as the zeppelin mooring mast added to the top of the Empire State Building as it neared completion in 1929. (Reis 2009, 81-94) There is little doubt that these dreams of escaping the limitations of the dense urban plan and finding, in the sky, a place for the high speed geometries of the car and other forms of transport were spurred by the increasingly crowded streets that characterized cities of the day.

During the interwar period, utopian schemes that sought to negotiate a detente between the city...
and the infrastructure of the car were advanced by many prominent architects and planners. Most notably these proposals included Corbusier’s Plan Voisin/City of To-Morrow (1925-1929), Hugh Ferriss’ Metropolis of Tomorrow (1929), Frank Lloyd Wright’s Broadacre City [its first incarnation in 1932], Corbusier’s Radiant City (1935), and Norman Bel Geddes’ Futurama (1939-1940). While nearly all of these schemes sought to expand urban form horizontally creating space between structures for the insertion of limited access highways, they all relied on grade separation whenever pedestrians or slower vehicular traffic threatened to impede highway traffic. For these designers grade separation was required for the integration of the highway and the city. In their minds the critical design question was the disposition and nature of the separation. While Bel Geddes and Ferriss, for instance, saw an inevitable future where the ground plane was dedicated to the automobile with pedestrians raised above, Corbusier called such a notion, “madness, madness, madness... the bottom of the pit, a gaping error: the end of everything.” (Corbusier [1933] 1967, 123) Accordingly, his urban schemes lifted high speed motorways above the ground plane with the promise of creating vast park spaces for the people below. Despite these formal and programmatic differences, these interwar utopians agreed on the need for sectional manipulation in support of the systematic functioning of highway infrastructure in urban conditions.  

**Early urban highways**

Set against the background of interwar utopian thinking, planners in the United States were creating their own schemes for urban highways, though without the utopians’ advantage of being able to start from a blank page. Working within limitations that included existing buildings and underground utilities, the raised highway became the much preferred option for grade separation in cities; largely winning out over schemes for depressed highways. As early as the 1920s several larger US cities floated proposals for raised urban highways. These early schemes, such as Boston’s Central Artery (Fig. 4) typically aligned with significant urban boulevards and assumed the more or less continued normal functioning of these streets once the raised highway was in operation.

When the West Side Highway slid along the Hudson River in New York City in 1930 it was heralded by many as the beginning of the integration of the highway and the American City (Fig. 5). In fact, it literally brackets the interwar utopian schemes. Frederich Etchells in his 1929 introduction to the English language version of Corbusier’s *The City of To-morrow and its Planning* references a rendering of the West Side Highway. Bel Geddes in his 1940 book *Magic Motorways*, that elucidated the ideas of the Futurama, includes a photograph of the West Side Highway. Both referred to the road as an example that lent credibility to their utopian ideals. Yet, the beginning of the Great Depression that coincided with the construction of the West Side Highway would put similar expensive projects on
hold and bring to an end what Jeremy Rifkin has called the juvenile phase of the Second Industrial Revolution – the coming together of centralized electricity, the oil era, the automobile, and suburban construction (Rifkin 2011, 19).

However, what did continue across the country during the Depression was the less expensive and less politically difficult construction of limited access, high speed, large geometry highways close to but not into large city cores. Examples include Lake Shore Drive in Chicago in 1937, the Merritt Parkway in Connecticut in 1938, and the Arroyo Seco Parkway in Los Angeles in 1938. Following World War II, the presence of such

Fig. 6: Proposal for an urban highway system for Baltimore from Toll Roads and Free Roads.
highways adjacent to city centers would generate additional pressure for their introduction into the urban core.

**Cities and federal highway planning**

Planning also continued. The federal government through the Bureau of Public Roads (BPR) released a pair of reports that roughly bookended the war (Weingroff). Though issued as the work of committees, the reports were largely written by Herbert Fairbank, the Bureau’s Deputy Commissioner of Research. The 1939 report, *Toll Roads and Free Roads*, includes a map of a conceptual urban highway system for Baltimore (Fig. 6). The map and accompanying text are significant for at least two reasons. First, Fairbank introduces the vocabulary of throughways, ring roads, and connecting spokes that would come to characterize the urban segments of the U.S. interstate highway system. Second and more importantly, the map documents the political methods that would come to overcome the problem of horizontal, or planar, integration of highways into cities. The first of these was to align the highways with pre-existing roads or geographic features—often a waterfront as with the West Side Highway. The second was to target land that was either already controlled by the government or would be easy targets for imminent domain efforts. The map locates the proposed highway system with respect to existing federal housing tracts and city blocks containing properties having tax liens against them.

Fairbank’s 1944 report, *Interregional Highways*, was more explicit about each of these strategies—again emphasizing the use of grade separation through both raised and depressed highways, holding out East River Drive in New York as a prototype that, “may be desirable” in large cities, and stating explicitly that urban highway construction would “aid in the efficient assembly and appropriate redevelopment of large tracts of blighted urban land” (Weingroff). The report opened the door for federal highway planning efforts to be incorporated into city planning agendas thus using the construction of highways as a tool in what would come to be known as urban renewal.

Fairbank’s two reports and the few built precedents, like the West Side Highway, set the stage for a spate of post war urban highway construction. Boston’s Central Artery, a vision since the 1920s, was completed in 1951, the Alaskan Way Viaduct in Seattle in 1953, and San Francisco’s Embarcadero Freeway in 1955 (Fig. 7). During this period, the raised highway typology and the strategy of aligning highways with existing roadways or geographic features became the standard for such operations. Though calibrated for minimal disruption to city structure, these highways created visual and auditory barriers within the center city and surrounding neighborhoods that were difficult to overcome, despite the earlier assertion by the BPR that the highways would actually help neighborhoods by clearly defining their edges (Weingroff). The American Association of State Highway Officials (AASHO) would eventually concede that, “the elevated freeway provides a visual barrier that may be objectionable in certain settings” while adding unconvincingly that “a carefully designed viaduct [raised] freeway can add needed interest and orientation to the cityscape” (AASHO 1973, 146-147).

**Resistance and dispersal**

Yet, these “minimally” invasive strategies had their limits. In order for the systems to work the highways eventually had to move away from carefully selected corridors and link up with cross...
town connectors or spawn entry and exit ramps that consumed numerous city blocks. Ultimately, as disruptive and imposing as the raised waterfront highways were, it was intrusion into the urban cores that would incite popular protest against urban highways and stop or significantly delay many of them. In the decades following World War II urban leaders largely heeded the BPL’s advice and steered highway construction to areas of what was considered less than desirable housing. By the late 1960’s it was estimated that highway construction was eliminating over 62,000 units of housing per year (Mohl 2004, 679). In the wake of the Embarcadero, San Francisco’s plan served as a turning point of sorts with protestors successfully halting urban highway construction in the city in 1959 (Mohl 2004, 678).

The urban highway revolts of the 1950s and 60s necessarily involved issues of social, economic, and racial disenfranchisement. When targeting neighborhoods of substandard housing and communities with little political power, city leaders inevitably had African-American neighborhoods in their sights. In Washington D.C. for instance, a mid-1960s protest saw the distribution of a flier demanding, “no more white highways through black bedrooms” (Mohl 2004, 679). Yet, the crux of the issue, whether in African-American or other neighborhoods, was one of a conflict of infrastructures. The infrastructure of the car, the highway, had begun to bump into the “gentle infrastructures,” such as sidewalks, neighborhood parks and old buildings.

As with the abdication of the city street earlier in the century, the car now threatened the means by which entire groups of citizens enacted their lives in cities, but now it threatened to claim whole blocks and neighborhoods at a time. Urban highways were seen in different light depending on one’s point of view. For the elite they represented ease of movement and connection to the growing suburbs and were thus coated with the patina of romanticism. While, “urban residents, and other excluded from Interstate policy decisions, objected to the non-user costs of new highways that disrupted neighborhood ties, made for an unbalanced transportation system, and precipitated urban sprawl” (Kemp 1986, 777). The apex of the conflict between the advocates and detractors of urban highways of the era came with the showdown over Robert Moses’ proposed Lower Manhattan Expressway in 1962 (Fig. 8). The plan was ultimately defeated by a cadre of protesters led by Jane Jacobs who had published *The Death and Life of Great American Cities* just the previous year, making a strong case for the intricate functioning of urban neighborhoods.

However, while in the larger American cities the political opposition to urban highways was maturing, the passage of the 1956 Federal Aid Highway Act, which signaled the beginning of what we now know as the Eisenhower Interstate System, again shifted focus to the functioning of the system as a whole and began widespread introduction of highways into small and midsized cities across the country – cities that were less inclined and less able to oppose them. Thus, the locus of the clash between highway infrastructures and urban form was dispersed and reinvigorated.

![Fig. 8: Proposal for Mid-Manhattan Expressway, circa 1962.](image)
Notes

1. Ngrams were generated using Google’s ngram viewer at http://books.google.com/ngrams.
2. Peter D. Norton in Fighting Traffic offers a detailed account of these struggles and goes on to describe the social and legal attempts to systematize the interaction of pedestrians and urban traffic.
3. For an examination of these utopian schemes in terms of their attempt to reconcile highways and urban form see Shelton T. 2011. Automobile Utopias and Traditional Urban Infrastructure: Visions of the Coming Conflict, 1925-1940.
4. There was a contrarian school of thought during the interwar period that held highways should simply not come into contact with cities at all. This idea was most notably advanced by Mackaye, Mumford, and other members of the Regional Planning Association of America. As these ideas were not ultimately influential in urban highway design and construction, they are not explored here.

Reference list


Burton, J.C., 1914. Safety First – Safety Always: an Appeal to Every Man be he Motorist or Pedestrian. Motor Age XXV (7), 7.


