



Are US cities and regions overbuilding roadway in the post- Interstate era?

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16. Abstract This research project examines a series of interwoven questions about how, where, and why state and federal governments finance and construct large arterial and highway projects and whether the benefits of these projects tend to outweigh their financial, social, and environmental costs. Answering these questions contributes to a larger inquiry into whether US cities, metropolitan areas, and megaregions have too much roadway. The focus is on large arterial, highway, and freeway investments, where most urban travel occurs and where state and federal investment policies have the largest influence on travel behavior, economic development, and urban growth. Although aspects of the research touch on transit investments, which are particularly well studied, the benefits of transit depend largely on the state of road infrastructure in US urban areas. The emphasis is on roadway construction since 1992, shortly after the completion of the interstate highway and the signing of federal Intermodal Surface Transportation Efficiency Act, which announced a major departure from earlier roadbuilding practices. This report provides an introduction summarizing the work that will be published in a book title <i>Overbuilt</i> to be published by Island Press in Spring 2025.					
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Overbuilt

“In his Grand Plan, President Eisenhower envisioned each level of government contributing to the upgrade of the Nation’s entire road network. His goal was the creation of a system to improve safety, reduce traffic jams, increase economic efficiency, and provide for the national defense.”-Richard Capka, Administrator of the Federal Highway Administration (2006-2008), Remarks to Congress

Like many Americans, I grew up in the distant wake of Interstate and other highway construction. My family slowly moved from an old mill town off Massachusetts Interstate 495, to an even older manufacturing town off Route 128, to a town just west of Cambridge, and eventually to an old German brewer’s home off a linear park that had been cleared for a federally funded highway through southwest Boston. That Interstate 95 and Route 128 were the same road felt like a local quirk. No different from the locals knowing that a frappe comes with ice cream, but a milkshake does not. Going to the see the Bruins and Celtics, my dad and I would walk under the shadows of the Central Artery, one of America’s first major elevated expressways, in an environment that felt like something out of one of the darker versions of Batman’s Gotham City. The structures looked old, dark, and eternal.

Sitting in traffic on a highway that erased one neighborhood, a billboard for apartments on the site of another erased neighborhood announced that if we lived there, we’d be home now. After high school, my closest friends moved into a house together in a neighborhood that was nearly razed to build another urban expressway. A mural by what would become my neighborhood grocery store a decade later showed heroic neighbors and activists facing down federal bulldozers. At the time, I did not realize that a freeway had been planned to run through the neighborhood. The neighborhood was convenient and filled with a rich diversity of houses

and shops. The idea of spending hundreds of millions of dollars to replace it all with just another highway seemed crazy. There already seemed to be plenty of roads and highways to get around.

It was not until graduate school that I learned how much damage urban highways had done or the callous disregard in which state and federal highway officials had built them. Class readings and lectures on slum clearance and urban highways played a part in my growing understanding. More than anything Fred Salvucci, former Massachusetts Secretary of Transportation and MIT professor, telling the story of how his grandmother's home was taken to build the Mass Turnpike changed my connection to my built environment. Like so many others during the time, the 70-year-old widow was given a dollar and told she had to vacate her house for a highway project.ⁱ Officials sent a letter assuring her that the government would assess her home's value and reimburse her later. The only analysis that had been done to justify her home's taking was a rudimentary traffic flow study predicting how many people were likely to drive on the roadway. These types of stories permeate and linger on the structures, buildings, and monuments of the cities and towns of my childhood and adult life.

Decades of reforms would force the highway builders to treat people and the environment with some respect. Many highway builders resented these new social protections. Some continue to resent them. Most would reflect that the Interstate system could not have been built with protections in place. The first Federal Highway Administrator Bertram Tallamy lamented three decades later, "The only observation that I see and I am sure everybody knows, that the red tape that is involved now by the federal government, by the state government, by the local agencies, hinder actual accomplishment ... [W]e could not build the Interstate today."ⁱⁱ

The assumption is that all the destruction from building highways—including the disproportionate impact on Black, Brown, immigrant, and low-income communities—was worth

it. The Interstate system and the hundreds of thousands of miles of supporting state highways and arterials are frequently hailed as a marvel and triumph of engineering, the world's largest public works investment visible from space, a critical component of the American way of life, and a fundamental component of economic competitiveness.ⁱⁱⁱ Politicians frequently hail President Eisenhower's 1956 Interstate Highway Act and subsequent highway acts as models of successful bipartisanship. Federal Highway Administrator Richard Capka's reference to Eisenhower's *Grand Plan* (capital G, capital P) imbues the highway program with a mythic, near religious status.^{iv} Some eggs were broken. Society benefits from the omelet.

Conversations about the effects of the original program also ignore that the finance, governance, and construction models established by the 1956 Interstate Highway Act continue to influence what gets built today. Of the total roughly \$2.5 trillion inflation-adjusted dollars spent on highways from the Highway Trust Fund since its inception in 1956, about 60% has been spent since completing the last bit of the originally planned Interstate in 1992.^v About 75% has been spent since the system was supposed to have been completed in 1969. States and local governments have spent trillions more on capital road investments and repairs over the same period.

Though fewer homes and businesses are destroyed, highway planners are still breaking eggs to make omelets. Extremely expensive omelets. There are nearly twice as many lane miles of urban Interstate today as there were in 1990. There are 55% more secondary highways and arterials. Few Americans have a sense of how much the government spends on roadways or how, why, or where roads get built. The better informed generally understand that the federal government and states raise dedicated transportation funds through a gas tax. And these funds are primarily spent to build, widen, upgrade, and maintain major highways and arterials.

Many citizens likely understand that highway planners and politicians largely promoted the Interstate system for national defense, interstate commerce, and even abstract concepts like promoting American family life. Few probably know that the engineers, planners, and administrators who designed and built the system, by contrast, focused on building roads that encouraged more driving to raise additional gas tax revenues. There is a reason that highway planners bulldozed their way through cities before focusing on connecting them. Those urban highways would carry the most traffic and generate the most revenues. Fewer still probably realize just how unsuccessful highway builders have been at reducing congestion or improving traffic safety, the two primary stated goals of nearly every large federal and state funding package since the Interstate Act.

Despite all the spending and stated policy goals, congestion and traffic deaths remain endemic. One popular source indicates that Americans now spend three times as much time in traffic as they did in 1991. The average time spent in traffic per car commuter increased from 29 hours in 1991 to 54 hours in 2019.^{vi} More than a million people have died on America's roads since completing the Interstate Highway System. The US traffic fatality rate is two-to-four times higher than in Canada or wealthy European countries and has improved much more slowly over time than in peer countries. At an average economic cost of \$1.5 million per fatality, fatal traffic collisions have cost nearly \$2 trillion dollars in lost wages and medical expenses since 1992.^{vii} Millions more crashes involving serious and moderate injuries cost hundreds of billions more. These estimates generally ignore the social and personal costs of millions of shattered lives, lost loved ones, and traumatized families.

Perhaps the biggest effect of the past three decades of highway investments has been to make the US ever more car dependent. Residents and visitors have driven around 90 trillion

miles since 1992, producing more carbon emissions than any other country barring China from the transport sector alone. Outside of a handful of cities, Americans without cars—due to income, health, age, or other reasons—struggle to access employment, shops, hospitals, and other daily needs. Losing a car due to changes in life circumstances, like a crash or mechanical failure, is associated with decreases in income, happiness, health, and employment. As a result, people go to great lengths to maintain access to a personal car, taking on debt, driving without insurance, or purchasing an older poorly maintained vehicle that is not only less safe but contributes substantially to local air pollution. After housing, US households spend more on transportation than any other type of expenditure, including food, health, or education.^{viii} This leaves many families and the overall economic vulnerable to even modest increases in gas prices.

Looking across cities and urban areas, the legacy of the past decades of road investments is unimpressive. The places that seem to be doing best in terms of economic efficiency, traffic safety, social equity, and environmental sustainability are frequently the places with the fewest highways and major arterials per capita. These towns and cities are much likelier to be more densely populated and have grown less around freeways and large auto-oriented arterials. They are also the places where having a car is less of a prerequisite for everyday access to basic economic and social opportunities. While good accessibility is hardly universal, many more people can and do get to work and other important destinations by bus, train, foot, and bike.

In this book, I argue that the US roadway system is overbuilt. There are so many high-capacity urban interstates, highways, and arterials that the costs of adding new roadway capacity generally outweigh the benefits. This is a somewhat controversial claim. Transportation is necessary for a functioning modern society and economy. Without streets and highways, there is severely constrained access to employment, food, and other necessities. Businesses have a

difficult time attracting employees and receiving or shipping goods. However, too much roadway is also problematic. The inverse of a dysfunctional place without streets or highways is a somewhat absurd place comprised entirely of streets and highways. Roadways connect places but they also replace other land uses, like houses, businesses, parks, and schools. Somewhere between no roadway and only roadway lies some optimum. Below this optimum, a roadway system is underbuilt. New investments in highways and arterials will tend to spur economic activities, improve accessibility, and produce social and economic benefits. The first major roadway connecting through a city, for example, confers enormous benefits. Each new roadway investment will tend to confer smaller and smaller benefits. While there is a fair amount of disagreement over the absolute benefits of highway investments in the US, there is generally consensus that newer investments produce fewer benefits than the older ones. At a certain point, the fiscal, environmental, and social costs of road investments outweigh the benefits. The road system becomes overbuilt. New investments have smaller benefits and tend to distort and shuffle economic activities rather than produce new ones.

While the optimal amount of roadway will vary by geography, culture, and economy, the US roadway system is well beyond the optimal level of investment. Most national transportation problems stem from having too much road infrastructure rather than too little. The desired increased economic activity or reduced congestion from building more highways or expanding existing ones rarely materialize. More than anything, more highways lead to more driving, which produces more pollution, more traffic fatalities, and more auto-centric cities and towns that require more driving to participate in basic civic, social, and economic activities.

Even narratives about crumbling infrastructure and a diminishing highway trust fund stem from this more fundamental problem. As the national highway system has expanded and

aged, the annual costs of repaving, repairing, and rebuilding roads, bridges, and interchanges have also skyrocketed. The original Interstate Highway Act had never envisioned these kinds of ongoing costs. There are more highways and major roads than anyone really cares to pay to maintain or reconstruct. There is also so much road infrastructure that new transit, bicycle, or pedestrian investments do little to shape overall national or even local travel behavior. The 2021 Bipartisan Infrastructure Law announced the largest ever federal spending package on public transportation. While many of these investments may be beneficial, they will do nothing to resolve the fundamental problem of an overbuilt national roadway system. And still, policymakers, planners, and engineers continue to prioritize building and upgrading road infrastructure.

Over the course of this book, readers will learn about how the country's roadway system became overbuilt, how public policy continues to encourage overbuilding, what the scale and consequences of overbuilding are, and how policymakers can stop and begin to correct overbuilding. The emphasis is on urban highways. Fully half of the initial interstate financing and most of the early construction projects went into cities. Gas tax revenues from urban traffic then financed the rural parts of the system. The largest social, economic, and environmental effects of the highway system, moreover, have happened in cities and their suburbs. Urban areas account for just under half of Interstate lane-miles but more than two-thirds of Interstate vehicle travel. While early arguments for subsidizing highways often emphasized connecting the country and making it easier for farmers to get goods to market, just 17% of US residents live in rural areas today. By the time construction began on the first miles of the Interstate system, planners and engineers had abandoned their rural emphasis and instead focused on eliminating urban congestion and facilitating car travel.

The national propensity to build roadways is no longer official or intentional policy. Instead, overbuilding stems from the institutions, finance mechanisms, and evaluation metrics developed in the first half of the twentieth century to finance and build the interstate system and roughly 4-million miles of supporting highways, arterials, and secondary roads that comprise the Federal-Aid Highway network. In the leadup to the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), the first major federal transportation law focused on transportation policy in the post-Interstate era, policymakers recognized the need for a drastic shift in highway policy. As President George H.W. Bush framed the issue, “We've got to take full advantage of our present opportunity to create a surface transportation program that will meet our present and future needs, not our past problems.”^{ix} Indeed, ISTEA (pronounced like the beverage) opened with lofty statements about economic efficiency, environmental soundness, energy efficiency, fiscal responsibility, multimodality, and the mobility needs of the poor, elderly, and physically disabled.

Despite ISTEA’s stated transformative aims, federal and state policy still focus on raising dedicated revenues through gas taxes to fund new highways and major arterials and maintain existing ones. While more funds are set aside for transit, walking, biking, and beautification, the investment paradigm has not changed. Further, planners and engineers have not adjusted the tools they use to determine which roads should be built, rebuilt, or widened and why. Despite having too much roadway, the country is still operating in construction mode, using the same basic approach used to finance and build the interstate system quickly. Contrary to President Bush’s claim on signing ISTEA, we have yet to create a surface transportation program that addresses present and future needs instead of past problems. The country is still in desperate need of a national transportation policy that can help address traffic safety, climate change,

accessibility, and new forms of economic development. Everyone has eaten. The kitchen is getting more and more expensive. But the restaurant keeps serving omelets.

Organization

Over the remaining ten chapters of *Overbuilt*, I explore: the history and contemporary role of the federal government in justifying, promoting, and eventually building urban highways; an examination of the costs of overbuilding; and an exploration of interrelated investment and regulatory approaches to move beyond the legacy of the interstate highway system and develop a more financially, environmentally, and socially sustainable transportation system.

In the early chapters, I draw in part on primary planning documents from highway agencies, interviews with highway planners from the Public Works Historical society, several histories of the Interstate system, and personal and ethnographic accounts of citizens interacting and fighting with state and federal highway builders over the siting and construction of urban highways. Whereas the great histories of the interstate, such as Tom Lewis' *Divided Highways* and Mark Rose and Raymond Mohl's *Interstate*, tend to conclude with or shortly after the completion of the Interstate system, *Overbuilt's* emphasis is on federal policy over the past 30 years. The institutions, policies, finance mechanisms, and evaluation metrics developed since the creation of the Federal Highway Administration's predecessor in 1893 continue to directly influence how, where, and how much states, cities, and towns invest in highways.

These chapters also position the Interstate highways more appropriately as a single but important component of the larger and broader system of highways and arterials subsidized and regulated by federal policy. For example, the Federal-Aid Highway Act of 1921, the first to mention an Interstate system, allocated 40% of funds and nearly 60% of mileage to secondary highways and arterials. Federal policy currently subsidizes the construction, reconstruction, and

maintenance of a wide array of roadways and roadway types. These chapters show how the roughly 40,000 miles of Interstate highway are historically, fiscally, and functionally related to the broader 160,000-mile National Highway System and 4-million-mile Federal-Aid Highway system. The Interstate highways may get the most attention, but they do not function without a much broader system of highways, arterials, and local roads.

In the middle chapters, I draw on contemporary scholarship focused on the costs and benefits of roadbuilding. Somewhere between a city with no roads and a city comprised entirely of roadway lies a theoretically optimal amount of roadway for a given city. The field of economics provides a general framework for finding this theoretical optimal: the point where the additional benefits of a new road investment are equal to the additional costs. If the costs of new investments tend to outweigh the benefits, there is too much roadway. If the benefits tend to outweigh the costs, there is probably not enough. Factoring in external costs, like pollution and traffic fatalities, would tend to move the overall equation in favor of producing less roadway.

In the final chapters, I focus on how changes in finance and transportation evaluation measures can help start to undo six decades of transportation policy that has focused primarily on increasing traffic speeds and roadway capacity. While state and local highway and land use policies will continue to vary from place to place, shifts in federal policy have the potential to reshape urban transportation systems in the coming decades. Unfortunately, there are no silver bullets and reversing the effects of an overbuilt road system will take decades. Congestion pricing, gas-tax alternatives, vehicle automation, and new transit technologies have a role to play in future urban transportation systems but will do little-to-nothing to resolve the fundamental problem of an overbuilt transportation system whose expansion state and federal policy continues to subsidize and encourage.

Cars, of course, will continue to play the primary role in getting people to and from work, school, church, ball fields, restaurants, and residents' many other destinations in both metropolitan areas and throughout the country. The goal of federal transportation policy should be to help make these trips safer, shorter, and less economically and environmentally damaging. Living without a car—whether due to preference, income, or disability—should not exclude residents from basic social, economic, and recreational activities. Moving slowly in these directions will require moving past the finance and evaluation mechanisms that built the Interstate. These mechanisms are not just dated and unresponsive to the country's 21st Century transportation needs, they are moving the country in the wrong direction. President Bush's call to focus on future needs instead of our past problems remains as salient today as it was in 1991. The originally planned Interstate was completed more than three decades ago. It is time to move on.

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ⁱ (Salvucci 2002)

ⁱⁱ (Mertz 1988, 57, 60)

ⁱⁱⁱ (Federal Highway Administration 1988, 1; Swift 2011, 7; "Celebrating 50 Years: The Eisenhower Interstate Highway System" 2006, 1–3)

^{iv} ("Celebrating 50 Years: The Eisenhower Interstate Highway System" 2006)

^v (Federal Highway Administration, n.d.)

^{vi} (Schrank et al. 2021)

^{vii} (Center for Disease Control 2020)

^{viii} (U.S. Bureau of Labor Statistics 2020; Duranton and Guerra 2016)

^{ix} (1991)