

Evaluating the Impact of Racially Biased Highway Infrastructure Developments on Black Communities Using Actor Network Theory

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Nana-Ayana Naja Tyree

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Advisor

Kathryn A. Neeley, Associate Professor of STS, Department of Engineering and Society

Introduction

“Negroes and whites don't mix. If we brought them into this development... it would depress all of the surrounding property” (Rothstein, 2017, p.106). This advice was from Frederick Ecker to the New York City Board of Estimate as he sought to fund his second mass housing development. Following the abolishment of slavery in 1865, the United States of America underwent a violent history of segregation, both *de jure* and *de facto*, that is perpetuated today. Post-Civil War, African Americans were deliberately removed from White communities. Some localities barred Black visitors after sunset. In the late 19th and early 20th centuries, there were explicitly exclusive housing policies, including the practice of segregated public housing by the local and federal governments. There was also federal cooperation with private entities to enforce further segregation policies. The mid-to late 20th century saw the Federal Housing Administration refusing to insure mortgage loans for Black buyers and prevalent racial zoning laws. Some pre- Brown vs Board of Education policies also found cities placing segregated Black schools in certain isolated areas, forcing families to move so that their children could receive an education.

This research seeks to understand the impact of a specific component of American policy and infrastructure development—highway construction-- on segregation and racial inequality that finds its roots in the Federal-Aid Highway Act of 1956. I noticed in my hometown, Atlanta, Georgia, that the White and Black areas of the city were divided evenly around Interstate 20 and wondered how that influenced disparities in income, education, economic outcomes, and quality of infrastructure.

As noted in *The Color of Law* (2017), residential integration is difficult for multiple reasons. Understanding the root causes of segregation and the impacts of actual physical barriers

such as interstates on communities is a critical step to moving forward. Integration of residential communities should ease the integration of schools, increase access to higher-paying jobs, and increase equity in African American homes. Case studies were conducted of impacted communities to better understand the history, and evaluate the changes inflicted by the addition of an interstate or some other major government-funded infrastructure project.

In this paper, I argue that racially biased infrastructure development decisions were used to segregate or destroy Black communities and negatively impact residential, social, and political outcomes for African Americans. In support of this claim, I examine the impacts of infrastructure development and policy decisions both preceding and following the Federal-Aid Highway Act in five cities. I then use actor network theory (ANT) to analyze these cases and explore how the community was impacted by political, organizational, technical, and cultural components.

Understanding the History of *de Jure* and *de Facto* Segregation and Its Impacts on American Cities

As noted in the introduction, the United States has a deep, violent history with segregation. This paper demonstrates how highway infrastructure negatively impacted Black communities and analyzes these projects using actor network theory. How did said 'Black Communities' come to be, and why do they persist? It stands to reason that if these neighborhoods had not been aggressively segregated in the first place, then the government would have been unable to target low-income Black communities for infrastructure projects. American segregation was perpetuated via multiple avenues by federal, state, and local governments; individual tactics; and racial violence. In this section, we will focus on how

government policy and infrastructure decisions - preceding the Highway Act - influenced the development of low-income Black neighborhoods.

One major contributing factor in the creation of segregated neighborhoods is public housing. In their paper, *Public Housing and the Concentration of Poverty*, Massey and Kanaiupuni report that “Because low-income projects were systematically targeted to Black neighborhoods in a discriminatory fashion... this institutional mechanism greatly exacerbated the degree of poverty concentration for one group in particular - Blacks.” (Massey and Kanaiupuni, 1999, p.120). Public housing did not begin this way though. Federal housing projects began to house defense workers in World War 1, and African Americans were initially excluded. However, the great depression and World War II exacerbated housing needs for working and middle-class Whites and Blacks, providing a need for a housing system for both races.

The New Deal initiated by President Franklin D. Roosevelt established segregated public housing for non - defense civilians. Black Americans were simply excluded from housing projects if not given segregated communities. The Public Works Association (PWA), established under the New Deal, sought to solve housing problems while creating construction jobs. Harold Ickess, Secretary of the Interior, established the neighborhood composition rule. This required projects to reflect the composition of the neighborhood in which they were established (Rothstein, 2017, pg 21). Black projects in Black neighborhoods, White projects in White neighborhoods and integrated neighborhoods could house both races. However, this was often used by localities to further enforce neighborhood segregation with the PWA designating certain integrated neighborhoods as either White or Black. The PWA also used this policy to create African American projects in low-income neighborhoods in major cities. Because of discrimination in the private housing market, African Americans found it difficult to find

housing while many White Americans were able to abandon their public housing assignments. Furthermore, the adoption of the 1949 Housing act allowed for continued segregation in public housing developments, further alienating African Americans from mainstream society (Rothstein, 2017, pg 32). In effect, public housing became overwhelmingly associated with African Americans. There was also a practice, preceding the Brown vs. Board of Education Supreme Court Ruling, of cities using school placement to further segregate communities. The only schools serving African Americans would be placed in specific locations with no access to transportation, forcing Black families to relocate as a sort of “incentive” forcing segregation (Rothstein 2017).

The Interstate System was the contrivance of President Dwight D. Eisenhower, who sought to rectify issues of congestion and loss of productivity due to travel time, increase the speed of delivery of products and goods, and increase the nation’s defense readiness (Karas 2015). The impact of the American Interstate Highway system on segregation can be summed up in the following quote by Joseph DiMento of the University of California, Irvine: “The cities were already segregated, and what happens is that these freeways can act as concretizing the barriers to integration that exist,” (Poon 2020). The highways built onto the previously established modes of segregation by providing an actual physical barrier to integration justified as “urban renewal”.

These highways were promoted as a tool for revitalization, and they reduced commuting costs and connected suburban and urban areas. However, the routes of these federally funded systems often tore through urban Black communities as a tool to clear the slums which had become increasingly segregated over the years. In *The Color of Law*, Rothstein notes the intentionality of these designs. Beginning in the late 1930s, as the federal government began

considering aid for this interstate system, officials sought to eliminate “unsightly” areas from the cities and saw highways as an avenue for such demolition. These “unsightly” districts were overwhelmingly filled by Black and low-income residents in public housing and slums. Many local officials argued the case for a highway by stressing that districts would become Whiter, rather than insisting on the economic benefits alone. It was a way to undermine the unconstitutionality of segregation and racial zoning.

While highways were initially funded by state coffers and varied based on their community of implementation, the Federal-Aid Highway Act of 1965 provided a standardized approach, and eventually, federal aid contributed most of the highway funding. This shifted the process away from city and state transportation planners into federal hands, which likely played a role in the culturally insensitive developments that took place (Sherman 2014). Car ownership increased drastically in cities as they trended toward suburbanization, and Whites moved away from city centers.

The Case of Sugar Hill, Los Angeles

The Federal-Aid Highway act allocated funding for 1938 freeway miles in the state of California, the goals of include: increasing interconnected rural, suburban, and urban routes, serve the national defense, and connect suitable border points for Canada and Mexico (Faigin 2020). However, California planners seized the opportunity to engage in “slum clearance.” Planners, especially in Los. Angeles conveniently routed the freeways through predominantly Black or Hispanic low-income communities. The 10 freeway, for example, split the affluent North and somewhat struggling southern parts of the city, negatively impacting the well-off Black communities of Pico and Sugar Hill (Chiotakis 2020).

Sugar Hill, originally laid out in 1902, was formerly known as West Adams Heights, a Los Angeles neighborhood. It was home to multiple notable Black Americans in its time, including Norman Houston, co-founder of Golden State Mutual Life Insurance Company and Hattie McDaniel, a Black American actress. The neighborhood thrived, serving mostly upper-middle-class Black Americans (Hassan 2015).

However, Sugar Hill faced its demise in 1963, when the Santa Monica Freeway was run through the neighborhood (Smith and Stegall). Officials and White residents sought the dismissal of the affluent Black residents since their arrival and sought multiple avenues of destruction. The neighborhood association of the area sought to convince Black residents that they would be better suited to live elsewhere, and even tried to raise funds to buy the property but failed on both attempts. As more Black residents settled in the area, the case was taken to court, where it was ruled that the restrictive covenant violated the 14th amendment (Rothstein 2017 pg. 131). There were meetings and protests to this outcome, but the cries of Black Americans were often ignored, compared to their wealthy White counterparts in Pasadena and Beverly Hills who did successfully fight off freeway construction. It was the city engineer who dismissed the concerns of the Black residents of Sugar Hill, claiming they would have time to find new housing.

The Case of Miami, Florida

Colored Town was a community in South Florida composed of Black laborers and professionals. It formed from a semi-permanent encampment of Black laborers from 1896 who settled there to extend the railroad and build a hotel funded by entrepreneur Henry M. Flagler (Belcher 2000). The Black population of the community was composed of all trades and classes, as concentrated by Jim Crow era legislation. This neighborhood also provided access to the best education available to African Americans through the full curriculum at Booker T. Washington

high school (Belcher 2000). Colored town was the center of Black culture in Miami and was later known as Over Town.

Officials in Miami had been trying for two decades to utilize zoning ordinance laws to rid the city of this downtown-adjacent African American community of 40,000 (Rothstein, 2017, pg. 129). Florida routed Interstate 95 through the neighborhood in 1956, avoiding routing through an abandoned railway which would have displaced fewer residents, and effectively reduced the Black population of the community by 52,000. The forty blocks taken up by the interstate demolished some 10,000 homes and destroyed the Black business district (Mohl 2008).

In describing the physical obstruction and lasting impacts of I 95, Nathaniel Belcher writes:

“Just as the roadway once again becomes airborne it veers only yards from Booker T. Washington High School and forms a viaduct which slices through the remainder of Overtown and Miami’s Downtown business district and then travels south before it plummets to its end and bleeds into a four-lane tree lined roadway just before Coral Gables, one of the wealthiest Communities in South Florida. The buildings and neighborhoods left in the wake of the interstate often appear awkward, nervous and naked.” (Belcher 2000)

The highway was justified as a means of economic development, allowing the political and civic elite the opportunity to reclaim space belonging to racial minorities (Karas 2015).

The Case of Birmingham, Alabama

As mentioned earlier in this section, many cities faced segregation through isolated public housing and zoning laws. In the case of Birmingham, the zoning law of 1926 created extensive racial division and was unchallenged for 25 years. The public housing policies were aggressively at play in the city (Connerly 2002).

To avoid routing Interstate 59 through a predominantly White neighborhood, it was deviated from its typical path to bisect the predominantly Black East Birmingham neighborhood. This deviation required a sharp turn that was unfavorable from a traffic safety standpoint,

reducing the speed limit and leading to an uptick of accidents (Connerly 2002). This route also cut through the predominantly Black neighborhood of East Lake, taking yet another undesirable bend. A Birmingham organization fought against these routes in 1960s, asserting the desire to keep these neighborhoods intact. The preferred route would have lacked the twists and turns, been a straight-line route, and avoided the destruction of the Black communities. This route was abandoned in favor of keeping the predominantly White Woodlawn neighborhood intact instead (Connerly 2002).

I-59 also bisected the affluent Black neighborhood of Smithfield, much to the distaste of the politically active residents. It was noted by some residents that this was politically motivated, as the highway curved through the neighborhood despite an otherwise straight path. Other residents were in support of the highway but wished for more time and support in replacing their homes. The interstates were likely routed as such to maintain racial boundaries, separating Black neighborhoods from White ones such as College Hills and Fountain heights. These boundaries were long-established by racial zoning laws (Connerly 2002).

The Case of Atlanta, Georgia

In the mid-1960s, the city of Atlanta was dubbed “the City too Busy to Hate”, as the Ivan Allen, Jr. administration supported legislation seeking to end discrimination and segregation. Compared to other major southern cities, Atlanta had been thought of as slightly more inclusive of the input of African Americans (Robinson 2012). However, a much different picture is painted by the implementation of the interstate system in the city. Atlanta was slowly becoming a Black residential hub with multiple neighborhoods forming throughout the city after the civil war. To control the location and number of this population, multiple racial zoning laws were enacted throughout the years, beginning in 1913 (Bayor 1988).

Another approach to segregation in Atlanta was the use of highway and interstate planning to displace Black Americans. The redirection of interstates through Black Atlanta neighborhoods was another episode of the “slum clearance” tactic - a means of justification to remove debilitating public housing projects which had become increasingly Black. This “economic revitalization” was also a tactic to create racial barriers, effectively creating White and Black sections of the city (Bayor 1988).

As the city's Westside became increasingly Black, at one point housing more than 40% of Atlanta's Black population, West View Parkway was suggested as a possible highway to navigate the area. The purpose of this highway was to stunt Black mobility and stop the domination of the Westside. Planning engineer Raymond W. Torras planned and supported the construction of such a gatekeeping development (Bayor 1988). Though this project never came to fruition, it laid the groundwork for Interstate 20, the major dividing line in the region.

The city's Black population continued to boom after World War II as racial violence was erupting through the city, targeting African Americans, and their homes and communities. Black Atlanta residents began organizing to designate safe areas for them to develop and reside, which was also supported by a growing Black political presence in the city. But the city still sought to control the Black expansion, and in doing so, the Atlanta Bureau of Planning reported that “approximately two or three years ago, there was an understanding that the proposed route of the West Expressway would be the boundary between the White and Negro communities” (Bayor 1988 pg. 8). Black developers were unable to build on the “White” side of the route, and it was common for White residents to request their officials plan highways as racial barriers. Black residents were often involved in these discussions, typically to avoid White violence.

Agreements made to satisfy White residents may also have provided Black residents with more land (Bayor 1988 pg.11).

The Case of Hamtramck, Michigan

Hamtramck, Michigan was a 2.1-mile enclave carved out from the city of Detroit wherein the population was overwhelmingly Polish (Zajac 2007). Hamtramck was incorporated in 1921 when Detroit was a majority White city. While sharing similarities such as initial racial composition and industrial demise, Detroit differed from Hamtramck in that by the mid to late 1900's it had switched from a predominantly White to a predominantly Black city, reflecting 'White Flight'. While Detroit went from 9.2 to 82% Black, Hamtramck increased from 6.7 only to 15% (Zajac 2007). This growth, inconsistent with its host city, is due to 'urban renewal', or Hamtramck residents using federal funding to destroy Black neighborhoods.

The plan was called the "program of population loss". It began with the demolition of African American homes for the expansion of a Chrysler Automobile manufacturing plant and continued with the destruction of more homes for the Chrysler Expressway (I-75) (Rothstein 2017 pg. 129). About 87% of the 4,000 displaced families were African American. Years later, a federal appeals court found that Housing and Urban Development (HUD) had deliberately bulldozed these homes on a racial basis and ordered that homes be built for the displaced African Americans.

Each of these five cases shows a different manifestation of the deliberately racist implementations of highways to either pave through Black communities under the guise of "slum clearance" or serve as an actual physical barrier of segregation. This paper will continue to analyze the sociotechnical factors at play using actor network theory. This will allow a deeper

understanding of the intersection of technological, cultural, and organizational aspects of the infrastructure developments, and how all components come together to create this racial divide.

Methods of Analysis - Actor Network Theory to Analyze Sociotechnical Systems

Actor network theory (ANT) serves as a synthesis and improvement upon previous social theories which sought to understand the intersections and interactions of technological developments with human beings and the society they created. Understanding the historical development of ANT from its predecessors allows one to grasp the gap the theory fills, its applicability, and its longevity. The synthesis draws its origins from Charles Singer with his “A History of Technology” which has its pitfall in that it was dedicated to the study of technology alone, with no political, social or philosophical context. Lynn White, Jr. went on with his concept of synergy which emphasized the linkages of technical innovations to organizational and cultural innovations, an improvement over Singer. Theories continued to evolve over the decades, with the conceptualization of technology as an evolving system, then as organizations, and with the considerations of interconnectedness, social construction, and sociotechnical systems.

This culminated in Michel Callon, Bruno Latour, and John Law, all playing significant roles in the evolution of social construction and socio-technical analysis creating what is now known as actor network theory. ANT examines the interconnectedness of heterogeneous political, cultural, and organizational actors within a system, each actor mutually influencing the development of another. It improved upon its predecessors by treating human and non-human actors as equal contributors, solving the problem of overemphasis on the social component of social construction, and including artifacts, scientists, and engineers in analysis.

In “Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts” Bruno Latour treats sociotechnical systems as being made up of people, organizations, institutions, and

actors. Latour analyses the interconnectedness of heterogeneous actors using examples to demonstrate the impact of organizations and individuals on the development of technology while simultaneously including the impact of technology on the development of organizations and individuals. Through continuous observation and improvement, humans and technology assist in the evolution of one another. This coevolution can also exemplify the negative human and cultural impacts of technological innovation. Latour highlights the negative impact of technology on human actors in some points of the door hinge analogy (Latour 153). The development of the door hinge is described in the context of coevolution of actors, with human actors translating the work they would have done to enter a building to the hinge. It was later necessary for the hinge to delegate the responsibility of operation to a human actor, the groom, who controlled the door to prevent it from remaining open. The lack of economic feasibility of a groom leads to the development of spring-loaded mechanisms that close themselves, but is it ethical to replace the groom with a non-human actor? How will the groom find work and feed their families?

In “Using Actor-Network Theory to Analyze E-Government Implementation in Developing Countries,” Carolyne Stanforth frames ANT as a method of analyzing how power distribution impacts socio-technical developments and implies that system implementation is more political than one would assume. Stanforth stresses the importance of cautious analysis of e-governance programs due to the unpredictability of the impact on political and organizational processes. ANT is applied to understand how the interplay of social and technical factors can reduce or increase the rates of failure of the project (Stanforth 38). This brings the question: what constitutes the failure of a project? In engineering, a project is unsuccessful if it does not meet objectives and operate within the assigned constraints. However, analysis of an engineering

project's impact on a community using ANT can reveal that, while the project may have succeeded in meeting the objectives, it may have failed in indiscriminately serving the people.

Thus, it is vital to create an understanding of the interconnectedness of technical, cultural, and organizational aspects of a technological project. The organizational aspects of technology are often prioritized by political forces and tend to comprise activities of designers, engineers, technicians, production, and concerns of consumers. The technical aspect, prioritized by many, encompasses machines, techniques, knowledge, and engineering activity. The cultural aspect includes the ideology, values, and technique of designers, inventors, and other human actors (Pacey 1983 pg 17). Pacey summarizes this in his Technical, Organizational, and Cultural (TOC) triangular diagrams that map all of the actors at play.

In this paper, I first use the co-evolution emphasized in Latour's writing to develop a model for tracking the mutual influence of technology on societal outcomes, and the impact of societal needs on technological development. This is applied to the analysis of the impact of the federal interstate system on Black communities, rather than on individual case studies. This analysis will allow the contextualization of the problem with industrialized racism on a national scale, preceding the precise definitions and categorizations of specific actors within the system. A visualization of this diagram is depicted in Figure 1 below.

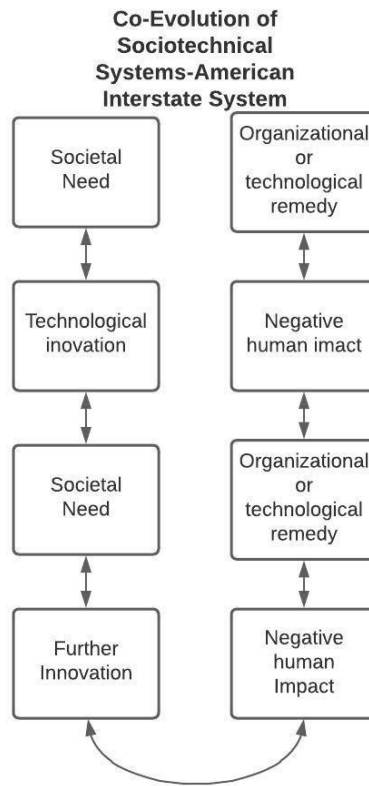


Figure 1: Visualization of the Co-Evolution of Sociotechnical Systems This figure demonstrates the continuous cooperative development of both humans and technology but emphasizes the negative impacts that can result from further information or from organizational actors.

I then utilize Arnold Pacey’s TOC model to define the principal actors within the systems designing roadway infrastructure for each of the five cities highlighted. A visualization of the TOC model is pictured in Figure 2.

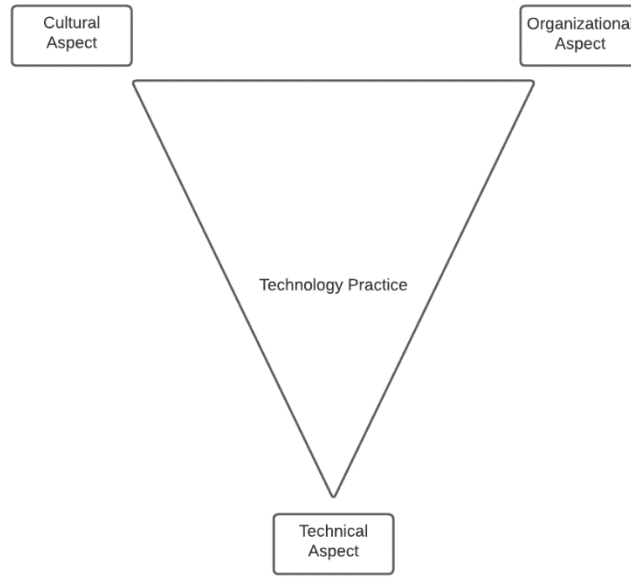


Figure 2: Technical, Organizational, and Cultural (TOC) Diagram This replica of Pacey’s TOC diagrams seeks to understand and analyze the interactions between cultural, organization, and technical actors within a technological practice.

After explicit categorization of the actors at play, I apply Stanforth’s method of ANT analysis of sociotechnical systems to understand the avenues of failure of the projects. Failure in the context of this paper is a project that did not indiscriminately consider the needs of impacted communities, even if it was technically and organizationally successful. I then synthesize the new understandings of the interactions of these actors and relative failure and success of projects with documented negative impacts on Black communities.

Supporting Argument 3: Results

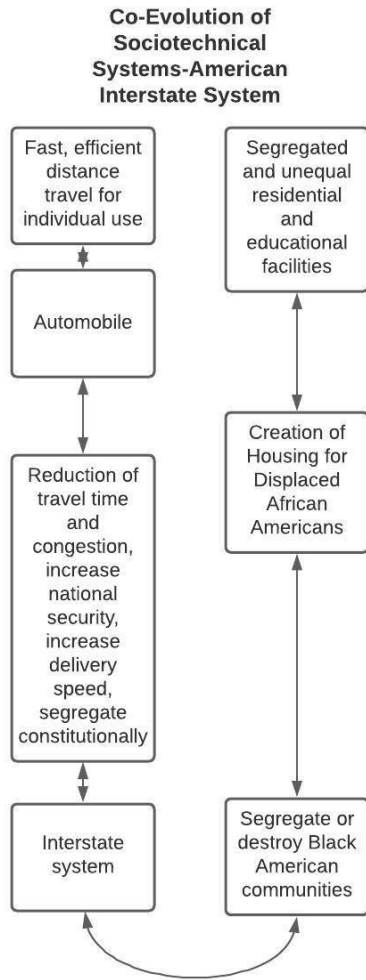


Figure 3: Co-Evolution of Sociotechnical Systems – The American Interstate System
 This figure deploys an experimental usage of Figure 1 as a tactic to understand the negative impacts of the Interstate System through ANT.

The American Interstate System, much like the door hinge introduced as an analogy by Latour, developed mutually and continuously as non-human actors alongside human actors.

Figure 3 depicts the co-evolution of the system. The need began in the late nineteenth and early twentieth century with the necessity of fast efficient long-distance travel for individuals and families. This societal need led to the development of the automobile. With the advent of the automobile came the need to reduce time loss through the reduction of travel time and congestion, increase speeds of delivery, and provide avenues to increase national security. This led to the implementation of the national interstate system, funded mainly through federal resources. However, like the hinge, these developments had negative impacts on

human and cultural actors.

In a time plagued by racial violence, racial zoning laws, private housing discrimination, and deteriorating public housing, Black Americans were also set to experience further discrimination with interstate developments. With public housing and racial zoning laws confining Black Americans to segregated areas, localities used the excuses of urban renewal and slum removal to run highways through projects to destroy communities and cut off Black residents from mainstream society. Often officials would blatantly route highways along racial

zoning lines to uphold the segregated status quo. Some cities later acknowledged these atrocities, demanding that displaced African Americans be rehomed, but those placements were often in already Black communities. Continued segregation has had negative impacts on outcomes for African Americans. Segregated schools give Black children unequal access to funding and resources. Black workers have inadequate access to high-paying jobs. Black families tend to live in food deserts, lacking access to supermarkets for healthy foods and perpetuating health problems such as obesity, diabetes, and heart disease. Figures 4-8 depict the TOC diagrams for each of the cities studied.

The case of Los Angeles, California

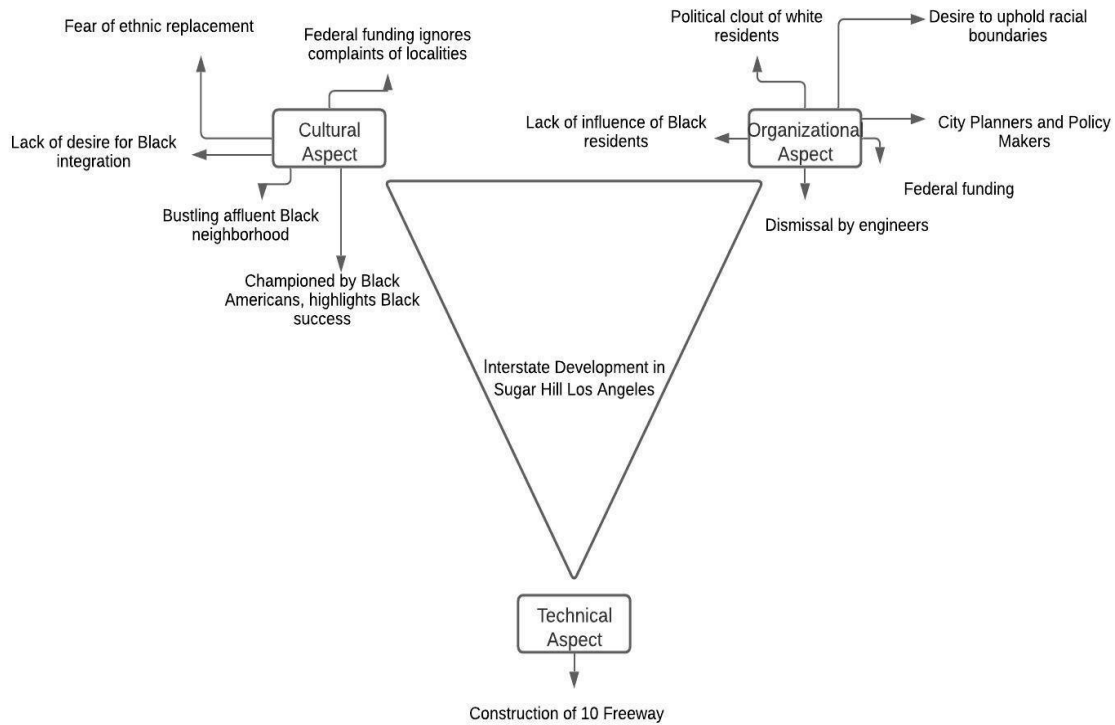


Figure 4: TOC Diagram for Interstate Development in Los Angeles Figure depicts a TOC model to analyze interstate development in LA through the frame of ANT. The model analyzes the connections between the technical, organizational and cultural actors. The major actors are the freeway, political influence and federal funding, and desire for continued segregation.

Though many of the Black neighborhood destruction and racial zoning tactics via interstate implementation are characterized as victimizing low-income neighborhoods, many of the impacted neighborhoods of LA were affluent. Sugar Hill was notable for its occupants, who embodied Black excellence, success, and economic hopes at the time - solidifying itself as significant to Black culture. White residents, though, were not happy with what was seen as an invasion. The organizational success was found by White residents who sought multiple avenues of negro removal, as affluent Black Americans were not as susceptible to limitations placed by public housing. Black residents found organizational failure as they simply did not have as much political pull as did their White counterparts.

The construction of this freeway was a success in that it upheld segregation in Los Angeles, connected suburban, urban, and rural areas, and decreased traffic congestion. However, to the extent that an engineering failure is defined for our purposes, the 10 Freeway was unsuccessful. While it achieved its technical goals, it failed to do so in an inclusive manner. The benefits were seen mostly in affluent White LA communities.

The case of Miami, Florida

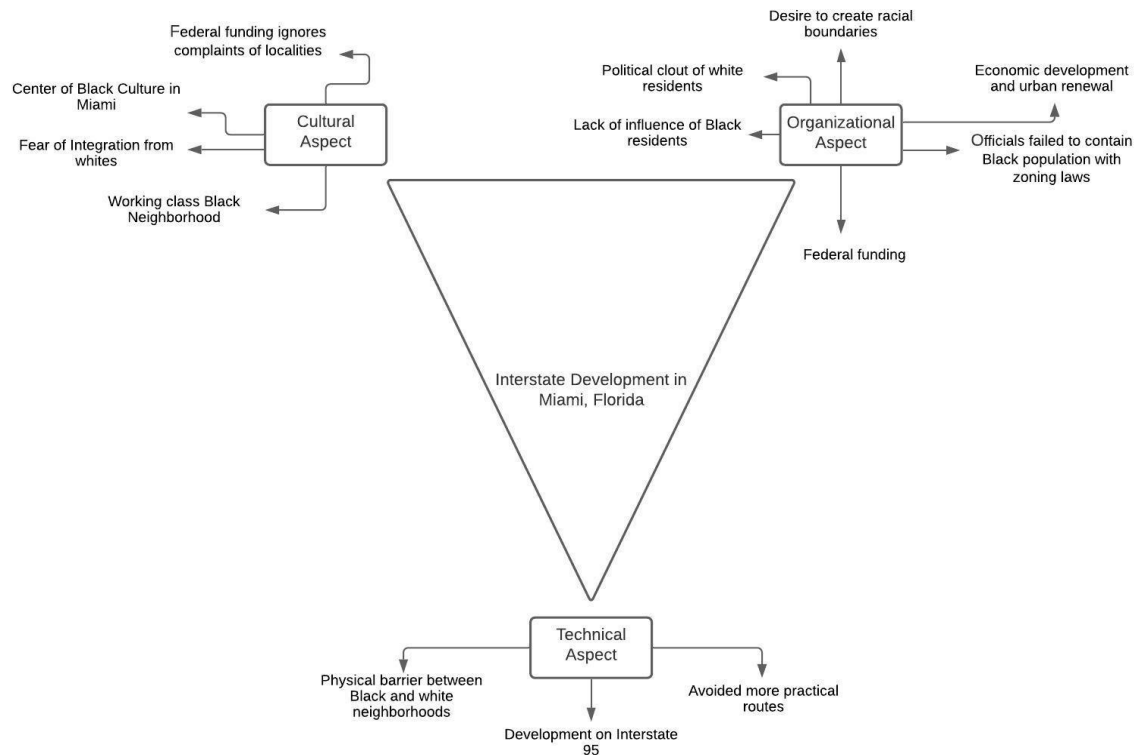


Figure 5: TOC Diagram for Interstate Development in Miami Figure depicts a TOC model to analyze interstate development in Miami through the frame of ANT.

Unlike the case of Los Angeles, Black Miami residents were working class. Job opportunities in the area created a burgeoning Black community which, unlike other cases, was often uncontrolled by racial zoning laws. Instead of maintaining racial boundaries, city officials sought to *create* them. Here, planners avoided more practical routes and bulldozed through the downtown adjacent Black Miami community. Miami was a bustling center of Black culture at the time and was important to Black residents.

The development of I-95 was technically an organizational success as it achieved the goal of displacing and segregating a bustling Black community. It was a technical success in that the highway achieved the overarching goals of the Federal-Aid Interstate Act. The project failed to

indiscriminately consider *all* cultural implications, ignoring the cultural significance of the community to Black residents while considering the desires of White residents.

The case of Birmingham, Alabama

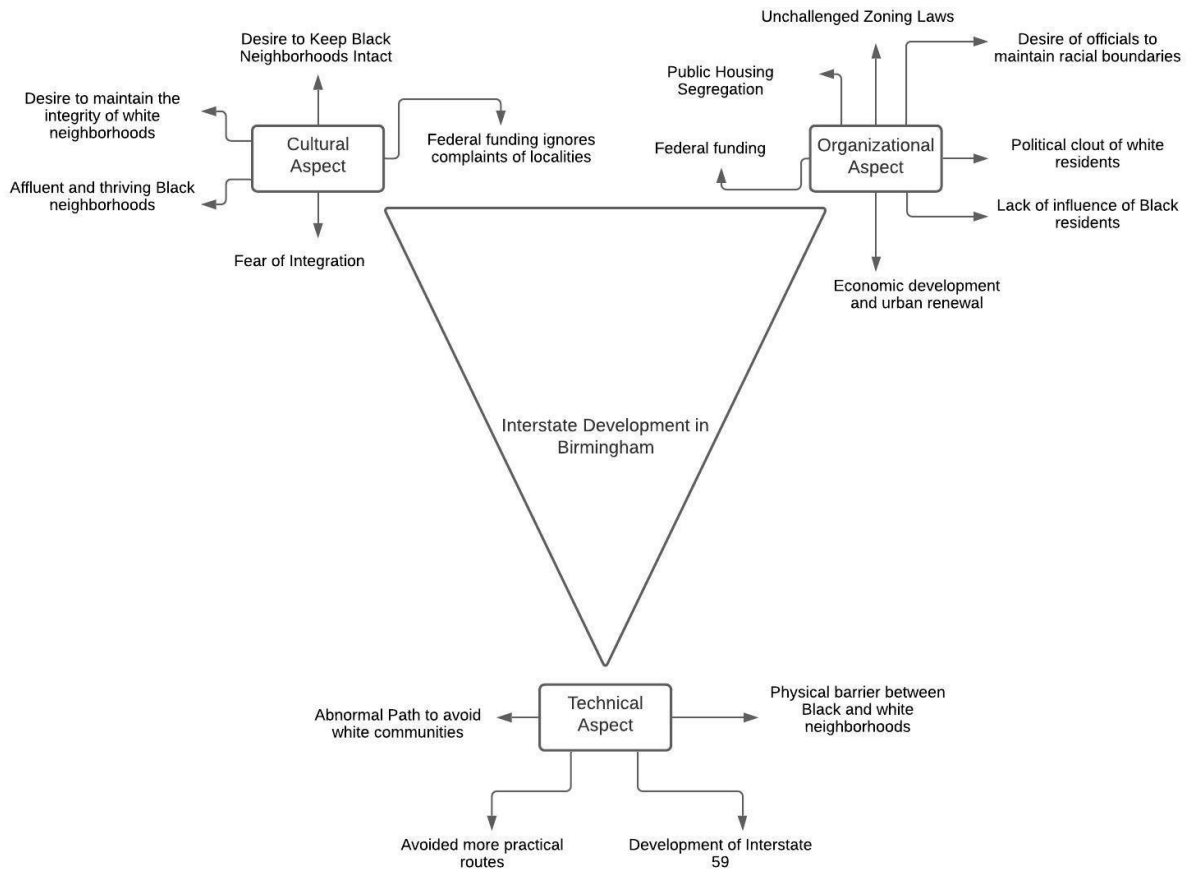


Figure 6: TOC Diagram for Interstate Development in Birmingham Figure depicts a TOC model to analyze interstate development in Birmingham through the frame of ANT.

Birmingham is a particularly interesting case of interstate development, with its blatantly abnormal paths which very pointedly bisect a multitude of Black communities while simultaneously serving as a barrier between the Black neighborhoods that survived the destruction and the untouched White neighborhoods. Interstate 59 also very pointedly avoids predominantly White neighborhoods. Organizational actors contributing to the relative success of this interstate include the largely unchallenged racial zoning laws, which created a deeply

segregated city. With Black residents having less political clout than their White counterparts, this meant that those residing in Black neighborhoods did not have the same capacity to speak against the blatant destruction and segregation. The project was also a technical success, meeting all its obligations. However, once again, engineers and policymakers ignored the cultural aspects of the design allowing it to serve White communities while dislocating Black households.

The case of Atlanta, Georgia

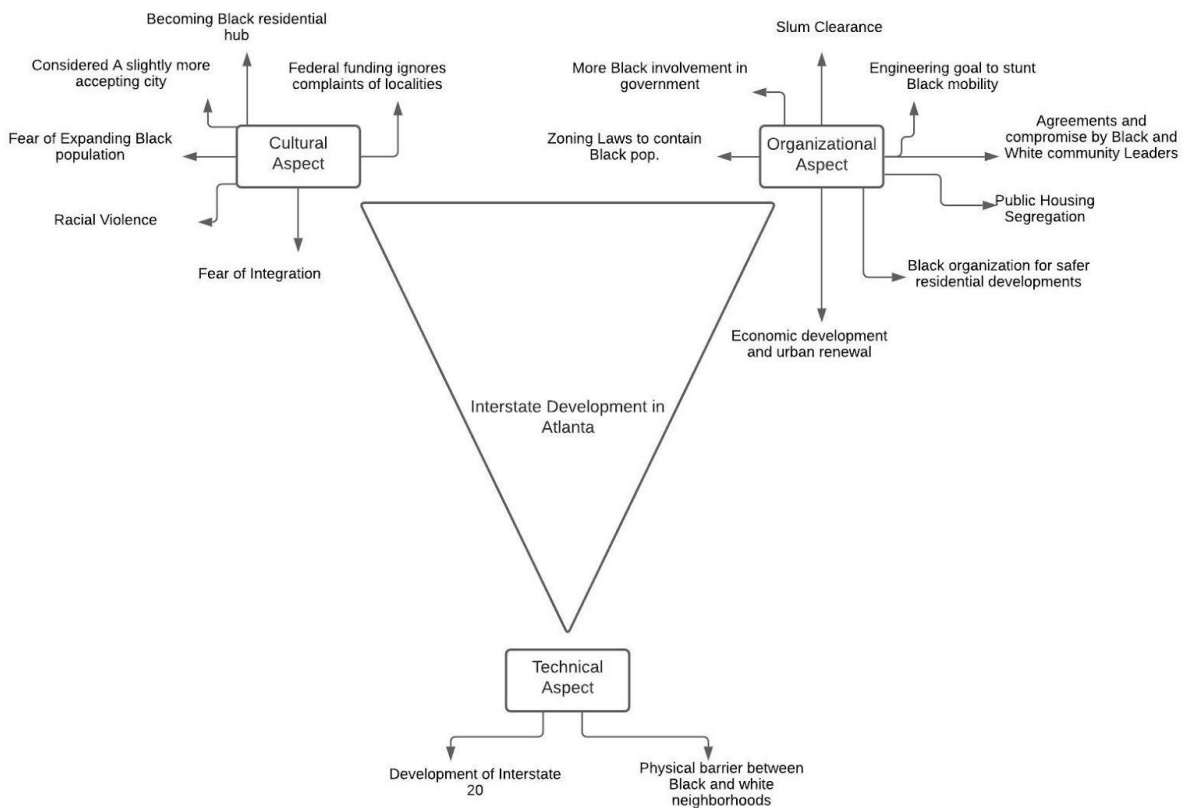


Figure 7: TOC Diagram for Interstate Development in Atlanta Figure depicts a TOC model to analyze interstate development in Atlanta through the frame of ANT.

Atlanta also deviates from the standard of slum removal and urban renewal in that Black residents are more active actors culturally and organizational - making this TOC diagram heavy with organizational actors. Public house segregation and zoning laws meant to control the burgeoning Black population served to create a situation in which African Americans were

forced into separate neighborhoods, thus having different levels of political clout. However, in Atlanta, there was a higher involvement in government and local organizations by Black residents. Amidst fear of racial violence from White Georgians and of the destruction of their hard-earned homes, many Black residents were able to make deals with local officials and White residents, allowing them their desired segregation in return for rewards like more land for Black communities. Interstate 20 accomplished its federally implemented technical goals and is successful on that front. One could also argue that the construction was successful with the consideration of organizational and cultural actors, as Black community leaders did tend to have some say. However, I would not consider this a success: a true success would have been integration. As mentioned in the general overview, this segregation had negative effects on educational and economic outcomes for Black residents for decades.

The case of Hamtramck, Michigan

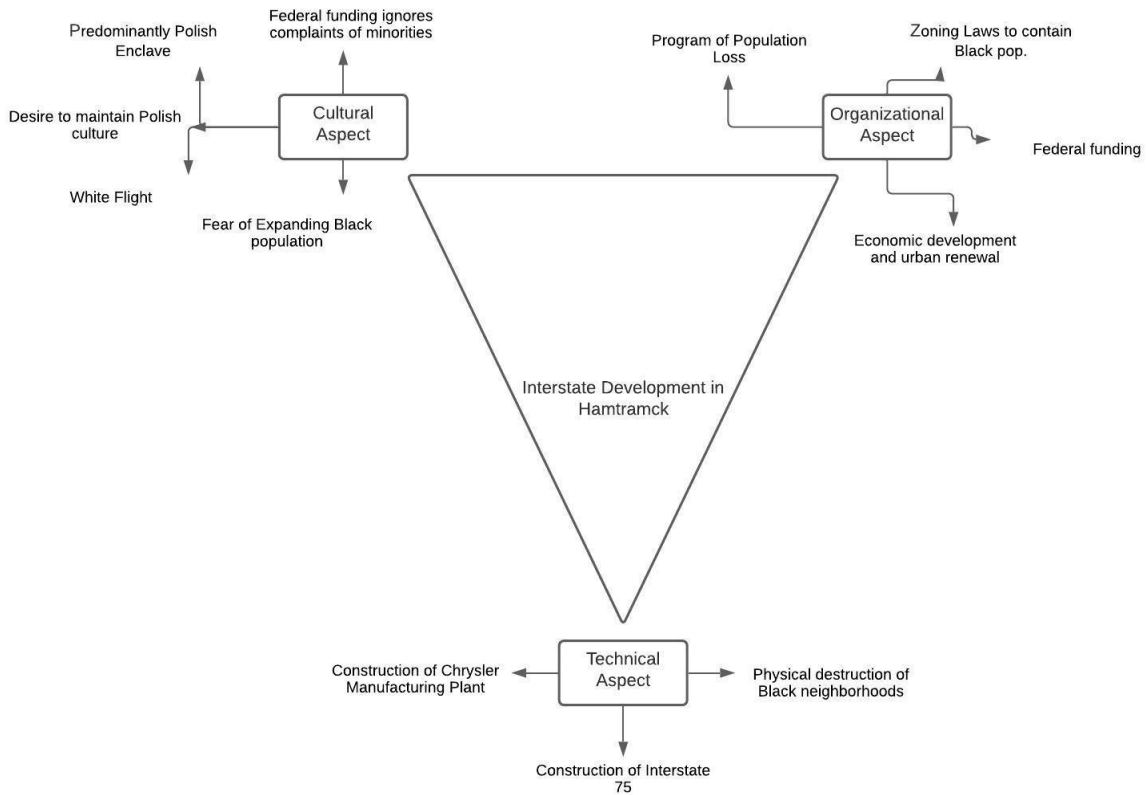


Figure 8: TOC Diagram for Interstate Development in Hamtramck Figure depicts a TOC model to analyze interstate development in Hamtramck through the frame of ANT.

Hamtramck was a unique case of forced segregation through interstate development, as it was ruled in court that the practices were intentionally racist. This case is most interesting in its consideration of cultural actors, which went on to influence movements of organizational actors to implement technical changes. Detroit was undergoing a period of “White Flight” where the population demographics effectively flipped. Hamtramck was vigilant in the preservation of its culture and fear of an expanding Black community with the implementation of the program of population loss. The Chrysler Manufacturing Plant and Interstate 75 were successful in the creation of jobs for Hamtramck’s residents and in providing means of access to said jobs.

However, it did not include the cultural input of the town's minority Black population, deliberately targeted for neighborhood destruction.

Conclusion

I examined the negative impacts of racially biased interstate infrastructure on Black communities in America in this paper. I specifically sought to prove that interstates and highways were used to either physically segregate or destroy Black communities and negatively impacts outcomes. I used Actor-Network theory to identify the cultural, organizational, and technological factors at play and how they interacted to create a failed engineering project, with failure being highlighted in the cultural sense.

Though interstates were not the sole source of either de Jure or de Facto segregation, nor were they the original, they still serve to perpetuate segregation to this day. These interstates and highways continue to serve as segregation barriers in multiple cities, bisecting cities into White and Black localities. Upper-middle-class and wealthy Black neighborhoods in Los Angeles were paved over or ran through with no regard to the desires or complaints of the Black residents, resulting in regional segregation in the city. This phenomenon is seen in the cases of Miami, Atlanta, Birmingham, and Hamtramck as well. This segregation was undoubtedly intentional, with policymakers deliberately placing highways along with pre-established racial barriers, in inconvenient routes that cut through Black neighborhoods, and through thriving cultural centers.

The above discussions align with the central claim of this paper. The understanding of the impacts of infrastructure projects on the cultural and human actors within the host communities is one of the first steps that an engineer can take to play a role in dismantling racially-biased structures in America. Actor network theory is an indispensable tool for considering many heterogeneous actors who both impact and are impacted by these developments. This study is

limited in that there is a research gap in the direct connection between highways/interstates and political, social, and educational outcomes in Black communities. It is recommended that studies follow willing study participants who can link displacement due to interstate construction to their socioeconomic position.

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