

THE ROAD TO RACIAL JUSTICE: RESOLVING THE DISPROPORTIONATE HEALTH BURDEN PLACED ON COMMUNITIES OF COLOR BY HIGHWAY POLLUTION

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INTRODUCTION

The highway system in the United States—a sprawling web of roads spanning over 160,000 miles in total¹—allows Americans to travel far more miles via personal automobile than residents of other countries.² Few users of these roads, however, know that the strategic placement of highways was a prominent mechanism for racial discrimination,³ the effects of which disproportionately impact minority communities to this day.⁴

Highways in the United States expanded drastically after President Dwight Eisenhower signed the Federal-Aid Highway Act of 1956, which gave funding to the modern Interstate Highway System.⁵ In his State of the Union Address on January 6, 1955, President Eisenhower explained that “[a] modern, efficient highway system is essential to meet the needs of our growing population, our expanding economy, and our national security.”⁶ Following the establishment of the Interstate Highway System, the United States Department of Transportation lauded it as able to “sustain the economy and support international competitiveness” even as both the U.S. economy and the international economy underwent significant evolution.⁷

1. *Our Nation’s Highways: 2011*, U.S. DEP’T OF TRANSP., OFF. OF HIGHWAY POL’Y INFO. (Apr. 1, 2019), <https://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter1.cfm> [<https://perma.cc/EDV3-EZ37>].

2. In an international roundup of annual vehicle-miles traveled per capita in automobiles, the United States led the countries surveyed. Other countries in the survey included the United Kingdom, Canada, Mexico, Sweden, Germany, France, and Japan. The annual vehicle-miles traveled per capita in automobiles for the United States exceeded 5,500, more than seven hundred miles greater than those traveled in the second highest country, Canada. FED. HIGHWAY ADMIN., U.S. DEP’T OF TRANSP., *OUR NATION’S HIGHWAYS: SELECTED FACTS AND FIGURES 7* (1998), available at <https://www.fhwa.dot.gov/ohim/onh/onh98.pdf> [<https://perma.cc/3WWJ-7X6U>].

3. Alana Semuels, *The Role of Highways in American Poverty*, THE ATLANTIC (Mar. 18, 2016), <https://www.theatlantic.com/business/archive/2016/03/role-of-highways-in-american-poverty/474282> [<https://perma.cc/MX4C-GH3D>].

4. Oliver Milman, *U.S. People of Color Still More Likely to Be Exposed to Pollution than White People*, THE GUARDIAN (Sept. 14, 2017), <https://www.theguardian.com/environment/2017/sep/14/us-people-of-color-still-more-likely-to-be-exposed-to-pollution-than-white-people> [<https://perma.cc/4MCD-QYC9>].

5. *Id.*

6. Richard F. Weingroff, *Original Intent: Purpose of the Interstate System 1954–1956*, U.S. DEP’T OF TRANSP. (Jun. 27, 2017), <https://www.fhwa.dot.gov/infrastructure/originalintent.cfm> [<https://perma.cc/XD8D-KM78>].

7. *Id.*

At the same time that President Eisenhower signed the Federal-Aid Highway Act of 1956, the Civil Rights Movement was in full swing.⁸ In Montgomery, Alabama, just a year earlier, activist organization Montgomery Improvement Association launched a bus boycott in response to the arrest of Rosa Parks.⁹ Many activists resided in Oak Park, the only middle-class neighborhood available to Black residents of Montgomery.¹⁰ Under the Federal-Aid Highway Act, Alabama received federal funds to build a portion of the Interstate Highway System, I-85, near Montgomery.¹¹ At the time, Sam Engelhardt, whose business cards read “I Stand for White Supremacy and Segregation,” served as Alabama Highway Director.¹² Initial plans routed I-85 south of the city, but following civil rights protests, Engelhardt and other state officials ultimately rerouted the highway to run directly through Oak Park.¹³ The location of I-85 forced many residents to leave Oak Park, resulting in “a lot of vacancies” and the withering of commercial corridors.¹⁴

Even when not targeting Black activists, governments at the city, state, and federal level used “urban renewal” highway routing policies that disproportionately affected minority communities.¹⁵ “Urban renewal”¹⁶ meant elected officials could strategically use

8. See generally HENRY HAMPTON & STEVE FAYER, VOICES OF FREEDOM: AN ORAL HISTORY OF THE CIVIL RIGHTS MOVEMENT FROM THE 1950S THROUGH THE 1980S (1990) (outlining the history of the civil rights movement from the 1950s to the 1980s).

9. Leah Binkovitz, *How a Montgomery Highway Sought to Disrupt the Heart of the Civil Rights Movement*, KINDER INST. FOR URB. RSCH. (Jan. 28, 2019), <https://kinder.rice.edu/urbanedge/2019/01/25/how-montgomery-highway-sought-disrupt-heart-civil-rights-movement> [https://perma.cc/M7VU-8FLS].

10. *Id.*

11. See Rebecca Retzlaff, *Interstate Highways and the Civil Rights Movement: The Case of I-85 and the Oak Park Neighborhood in Montgomery, Alabama*, 41 J. URB. AFF. 930, 7 (2019).

12. *Id.* at 935.

13. *Id.* at 930. In doing so, the state ignored numerous other options, including a route that had been recommended by the state’s hired engineering firm. Binkovitz, *supra* note 9.

14. Binkovitz, *supra* note 9.

15. Joseph Stromberg, *Highways Guttled American Cities. So Why Did They Build Them?*, VOX (May 11, 2019), <https://www.vox.com/2015/5/14/8605917/highways-interstate-cities-history> (on file with the *Columbia Human Rights Law Review*).

16. Author James Baldwin, in a 1963 interview with Kenneth Clark, famously stated that urban renewal “means Negro removal” and that the federal government was “an accomplice to this fact.” The relevant portion of the interview is available online. Vince Graham, *Urban Renewal . . . Means Negro Removal*,

highways to eradicate so-called “slum areas,” which often contained large populations of people of color,¹⁷ or use highways to promote segregation.¹⁸ At the time, such actions were viewed positively.¹⁹ Cities utilizing “urban renewal” policies could raze “unhealthy” slum areas while encouraging the growth of the city.²⁰ City planners, when determining where to route highways, thus targeted predominately poor and minority population areas for removal.²¹

According to former U.S. Secretary of Transportation Anthony Foxx, bulldozing highways through where poor people lived was public policy in the mid-20th century.²² In Miami, for example, I-95 cut directly through the heart of Overtown, a then-thriving Black community.²³ In Seattle, I-5 was built through the city’s oldest blue-collar community.²⁴ In Detroit, historical neighborhoods with predominantly Black populations were torn down to make way for I-

YOUTUBE (June 3, 2015), <https://www.youtube.com/watch?v=T8Abhj17kYU> (last visited Jan. 2, 2021).

17. Semuels, *supra* note 3 (“[City planners in the 1950s] saw the crowded African American areas as unhealthy organs that needed to be removed . . . Why not use those federal highway dollars to also tear down blight and rebuild city centers?”).

18. For example, Interstate 20 in Atlanta, built in the late 1950s, winds along a route that was deliberately plotted to, in the words of then-Mayor Bill Hartsfield, establish “the boundary between the white and Negro communities” at that time. Kevin M. Kruse, *What Does a Traffic Jam in Atlanta Have to Do with Segregation? Quite a Lot.*, N.Y. TIMES MAG. (Aug. 14, 2019), <https://www.nytimes.com/interactive/2019/08/14/magazine/traffic-atlanta-segregation.html> (on file with the *Columbia Human Rights Law Review*).

19. *Id.*

20. Semuels, *supra* note 3 (stating that city planners believed that crowded areas with large minority populations “needed to be cleared and redeveloped,” but that “open-heart surgery on a city is expensive. Highway construction could be federally funded,” resulting in the increased use of highways to destroy minority communities.).

21. Ashley Halsey III, *A Crusade to Defeat the Legacy of Highways Rammed Through Poor Neighborhoods*, WASH. POST (Mar. 29, 2016), https://www.washingtonpost.com/local/trafficandcommuting/defeating-the-legacy-of-highways-rammed-through-poor-neighborhoods/2016/03/28/ffc5ae-f2a1-11e5-a61f-e9c95c06edca_story.html (on file with the *Columbia Human Rights Law Review*).

22. *Id.* (paraphrasing an interview with former United States Secretary of Transportation Anthony Foxx).

23. *Id.* By running the route through Overtown, city planners ignored a number of alternative routes—including one that ran along an abandoned railroad. Retzlaff, *supra* note 11.

24. Halsey III, *supra* note 21.

375.²⁵ And in New York City, the Staten Island Expressway has been called the “Mason-Dixon Line” for its effective segregation of people of color to the north of the Expressway.²⁶ Meanwhile, “relatively well-off, influential people in those cities were able to stop the urban highways that would have gone through their neighborhoods,” including residents of SoHo and Greenwich Village in New York City.²⁷

Those displaced from areas destroyed by highway construction moved to nearby neighborhoods, leading to overcrowding and increases in crime.²⁸ The presence of highways so close to these communities also discouraged businesses and investors from taking an interest in development.²⁹ In response, those with enough money fled to the suburbs.³⁰ The population remaining in areas directly around highways, without access to many goods and services, was therefore typically poor and predominantly minority.³¹ Vulnerable communities today continue to suffer the effects of the racially motivated placement of highways, including food deserts and lack of funding for community development.³² Recent research, however, has focused on an additional burden placed upon minority populations because of highway location—traffic-based air pollution. Such pollution causes numerous lifelong physical adverse health effects³³

25. Stromberg, *supra* note 15. The Black Bottom and Paradise Valley neighborhoods were demolished in the early 1960s. The business district of Black Bottom, which was thriving at the time, was bulldozed and not reconstructed. Parts of Black Bottom known to be slums were also bulldozed, with residents promised new public housing projects in replacement. However, although Black Bottom had a significant Black population, the new housing projects were neither affordable nor open to Black residents. See THOMAS J. SUGRUE, *THE ORIGINS OF THE URBAN CRISIS: RACE AND INEQUALITY IN POSTWAR DETROIT* 23, 24, 47, 62, 196 (rev. ed. 2005).

26. Halsey III, *supra* note 21.

27. Stromberg, *supra* note 15.

28. *Id.*

29. Former Secretary of Transportation Anthony Foxx, who himself grew up in a neighborhood in Los Angeles walled in by three highways, said about the effect of the highways on his neighborhood that “Businesses didn’t invest there. Grocery stores and pharmacies didn’t take the risk. I could not even get a pizza delivered to my house.” Halsey III, *supra* note 21.

30. *Id.*

31. *Id.*

32. *Id.*

33. See Tegan K. Boehmer et al., *Residential Proximity to Major Highways*, 62 *MORBIDITY & MORTALITY WKLY. REP.* 46, 46 (2013) (explaining that traffic-based air pollutants, including carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter (PM), are known or suspected causes of adverse health effects).

and even affects cognitive functions like productivity and impulse control.³⁴

This Note argues that the government at all levels must address the negative effects of highway pollution and its disproportionate impact on minority communities by implementing community development and public health measures. Part I of this Note will show that the location of minority communities mean that they disproportionately bear the brunt of adverse effects arising from highway pollution. Part II will analyze existing siting guidelines and legislation for several cities that are particularly affected by highway pollution due to population size and density of roadways. Such review will demonstrate the inaction by legislators to address a pressing health issue. Finally, in Part III, this Note will analyze several best practices to act as solutions, including citizen action under the Fair Housing Act if necessary, to ensure the future of the especially vulnerable minority communities that reside near highways.

I. HIGHWAY POLLUTANTS, HEALTH EFFECTS, AND HEALTH JUSTICE

Traffic-based air pollution has long been known to cause adverse health effects, but researchers are still discovering the full extent of the harm. All motor vehicles, with the exception of electric vehicles, emit pollutants as they run, and this problem is compounded by the large number of vehicles travelling on highways daily.³⁵ These pollutants include “large quantities of carbon dioxide (CO₂), carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), particulate matter (PM), and substances known as mobile-source air toxics (MSATs)”.³⁶ In places where leaded gasoline is still used, vehicles can emit harmful quantities of lead.³⁷ There are also

34. Tom Chang et al., *Particulate Pollution and the Productivity of Pear Packers* 3 (Nat'l Bureau of Econ. Rsch., Working Paper No. 19944, 2014).

35. See HEALTH EFFECTS INST., *TRAFFIC-RELATED AIR POLLUTION: A CRITICAL REVIEW OF THE LITERATURE ON EMISSIONS, EXPOSURE, AND HEALTH EFFECTS: EXECUTIVE SUMMARY 3* (2010) (explaining that population growth, expansion of metropolitan areas, and increased reliance on motor vehicles for travel to work has served to counteract the benefits of pollution control regulation and technologies).

36. MSATs include benzene, formaldehyde, acetaldehyde, and 1,3-butadiene. *Id.*

37. *Id.* Leaded gasoline is currently banned in on-road vehicles in the United States but can still be used in off-road situations including in aircraft, racing cars, farm equipment, and marine engines. *Gasoline and the Environment*, U.S. ENERGY INFO. ADMIN. (Jan. 2, 2019), <https://www.eia.gov/energyexplained/>

secondary by-products, such as ozone, and aerosols, such as nitrates and both inorganic and organic acids.³⁸ All these chemicals cause adverse effects on human health and the environment.³⁹ In some cases, awareness of these health detriments have led to the removal of highways and the creation of green spaces.⁴⁰ However, elected officials and business groups across the country still argue that restricting the growth of highways and removing current highways is impractical and unnecessary.⁴¹ Notably, these groups of people overwhelmingly do not belong to the constituencies that suffer most from highway pollution. Much like the use of highways in city planning to target minority communities, emitted highway pollution affects minority populations significantly more than it affects white populations—in large part because of similar discriminatory policies.⁴²

gasoline/gasoline-and-the-environment-leaded-gasoline.php [https://perma.cc/JL5T-Q7C5]. However, even “unleaded” gasoline contains 0.05 grams of lead per gallon. Although that amount may seem small, inhalation still has serious effects on the health and development of children. Yvette Cabrera, *There’s Still Lead in Your Unleaded Gasoline—and It May Be Putting Kids at Risk*, THINKPROGRESS (Apr. 13, 2017), <https://thinkprogress.org/theres-still-lead-in-your-unleaded-gasoline-f0124ebdcb17/> [https://perma.cc/N7FR-3P8R]. Furthermore, communities near highways still retain high levels of lead in soil due to legacy lead deposited before lead in gasoline was fully phased out. *See, e.g.*, Mark Hafen & Robert Brinkmann, *Analysis of Lead in Soils Adjacent to an Interstate Highway in Tampa, Florida*, 18 ENV’T GEOCHEMISTRY & HEALTH 171, 177 (1996) (“Hazardous levels of lead were found at most [midpoint between interchange] locations.”)

38. HEALTH EFFECTS INST., *supra* note 35.

39. *Id.*

40. Examples of cities that have done so are San Francisco, Seattle, Portland, and Milwaukee. Alissa Walker, *Atlanta’s I-85 Highway Should Have Been Torn Down Instead*, CURBED (May 11, 2017), <https://www.curbed.com/2017/5/11/15625520/atlanta-highway-repair-interstate-85> (on file with the *Columbia Human Rights Law Review*).

41. Tony Barboza & Jon Schleuss, *LA Keeps Building Near Freeways, Even Though Living There Makes People Sick*, L.A. TIMES (Mar. 2, 2017), <https://www.latimes.com/projects/la-me-freeway-pollution/> (on file with the *Columbia Human Rights Law Review*).

42. A 2017 study funded in part by the Environmental Protection Agency looked specifically at exposure to NO₂, a gas associated with highway pollution that has been linked with adverse health effects like cardiovascular arrest. Milman, *supra* note 4. The study “found that overall exposure to NO₂ among all Americans dropped between 2000 and 2010. But Black and Hispanic people experienced 37% higher exposures to the pollutant than white people in 2010—only a slight decrease from the 40% gap in 2000.” *Id.*

A. The Connection Between the Highway System and the Location of Minority Populations

1. Continued Highway Expansion Despite Known Health Effects

Despite the known adverse health effects of highway pollution, neither highway expansion nor building near highways has stopped. Between 2000 and 2016, the United States added an average of 30,427 lane miles of roadway per year.⁴³ In many cases, city residents have only succeeded in preventing new highways from being built when they have the wealth and resources to do so. In the wealthy Brooklyn Heights neighborhood, residents spent “more than \$100,000 of their own money on consulting experts and lobbyists” to successfully prevent the rebuilding of the Brooklyn-Queens Expressway through their neighborhood.⁴⁴

Cities have also continued issuing permits for building near highways. For example, the Los Angeles Air Resources Board issued permits for building 4,300 homes within five hundred feet of highways in 2015, and issued permits for building three thousand homes within five hundred feet of highways in 2016.⁴⁵ This decision was in spite of a recommendation from that very same Air Resources Board that advised against “siting new sensitive land uses within five hundred feet of a freeway”⁴⁶ in 2005.⁴⁷ Housing is one of the “sensitive

43. *Frequently Asked Questions*, AM. RD. & TRANSP. BUILDERS ASS'N (Apr. 26, 2019), <https://www.artba.org/about/faq/> [<https://perma.cc/MQ6V-48WB>]. As of 2016, approximately 45 million people in the United States lived, went to school, or worked within three hundred feet of a roadway with heavy traffic. *Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality*, ENV'T PROT. AGENCY (Aug. 2016), https://www.epa.gov/sites/production/files/2016-08/documents/recommendations_for_constructing_roadside_vegetation_barriers_to_improve_near-road_air_quality.pdf [<https://perma.cc/C8K6-2V2W>].

44. Amy Chester, *BQE and the Road to New York's Future: Highways that Split Neighborhoods Are Things of the Past*, DAILY NEWS (Apr. 25, 2019), <https://www.nydailynews.com/opinion/ny-oped-chester-20190425-rl7c5dlwijyfmvudsrf42zhi-story.html> [<https://perma.cc/66RT-LWHS>].

45. Barboza & Schleuss, *supra* note 41. Five hundred feet is the number used by the Environmental Protection Agency (EPA) in its recommendations. U.S. ENV'T PROT. AGENCY, EPA-100-R-15-001, BEST PRACTICES FOR REDUCING NEAR-ROAD POLLUTION EXPOSURE AT SCHOOLS at 2 (2015).

46. As a matter of terminology, all freeways are highways, but not all highways are freeways. See CA. ENV'T PROT. AGENCY AIR RES. BD., AIR QUALITY AND LAND USE HANDBOOK 4 (2005) (recommending that policymakers “avoid

land uses” included within the recommendation.⁴⁸ Notably, in 2015 and 2016, a large portion of the permits issued by city officials for building near highways were to subsidized affordable housing developments.⁴⁹ The Southern California Association of Governments, a regional planning agency, has projected that the population in Los Angeles, Ventura, Orange, Riverside, San Bernardino, and Imperial counties living within five hundred feet of a highway will increase by a quarter million people by 2035.⁵⁰

2. Communities of Color Are Disproportionately Near Highways

In 2013, the estimated percentage of the population with their place of residence within approximately five hundred feet⁵¹ of a major highway was 3.7% of the 308.7 million people in the United States, amounting to 11.3 million persons total.⁵² However, a breakdown based on race and ethnicity showed a stark difference between minority and white populations. Estimates ranged from 3.1% for non-Hispanic whites to 5.0% for Hispanics, 4.4% for Blacks, and 5.4% for

siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.”)

47. *Id.* at 3. However, in 2017 the Air Resources Board shifted their stance about the need to build more than five hundred feet away from highways, emphasizing the use of anti-pollution features rather than distance. The change was due in part to the officials acting with their hands tied, as they needed to give policy-makers the latest options to reduce pollution exposure “at a time when the state [was] encouraging home construction near transit lines that are often next to freeways and other high-traffic corridors.” The new regulations do not override the previous guidelines. See Tony Barboza & David Zahniser, *Regulators Warned Against Housing Near Freeways Due to Health Risks. Now They're Warming to It*, L.A. TIMES (Dec. 27, 2017), <https://www.latimes.com/local/lanow/la-me-ln-freeway-pollution-advisory-20171227-story.html> (on file with the *Columbia Human Rights Law Review*).

48. CA. ENV'T PROT. AGENCY AIR RES. BD., *supra* note 46, at 1.

49. Barboza & Schleuss, *supra* note 41.

50. *Id.*

51. This number was given as 150 meters in the report, which amounts to 499 feet. The number was changed to feet for ease of understanding and because relevant scientific research and guidelines use feet as the unit of measurement. For example, five hundred feet is the number used by EPA in its recommendations. U.S. ENV'T PROT. AGENCY, *supra* note 45, at 2.

52. Percentages of state populations residing within five hundred feet of a major highway varied drastically, ranging from 1.8% in Maine to 5.6% in New York. These differences between states raise questions about which unique solutions to highway pollution can be applied where. Boehmer et al., *supra* note 33 at 47.

Asians and Pacific Islanders.⁵³ Calculations were performed by determining the percentage of persons of each race or ethnicity living within five hundred feet of a highway out of the total number of persons of each race or ethnicity in the United States. Beyond disproportionately living closer to sources of pollution, Hispanics and Blacks also disproportionately live farther away from regulatory air quality monitoring sites compared to the overall population of the United States.⁵⁴ This creates a reality where air pollution is not being sufficiently monitored for the groups who need monitoring the most.

This correlation persists when looking at specific exposure to traffic-based air pollutants and detrimental health effects.⁵⁵ Nitrogen oxides, in particular nitrogen dioxide, are a “key transportation-related pollutant.”⁵⁶ A study funded in part by the Environmental Protection Agency found that the overall exposure of Americans to nitrogen dioxide decreased between 2000 and 2010.⁵⁷ However, Hispanic and Black individuals still experienced 37% higher exposure than white individuals in 2010.⁵⁸ A separate study conducted by the University of Washington concluded that if people of color had faced the same level of exposure to nitrogen dioxide as whites in 2010, approximately five thousand premature deaths from heart disease in communities of color could have been prevented in just that year.⁵⁹

53. *Id.* Differences by race and ethnicity are therefore more drastic than disparities by educational attainment (where the “estimated percentage of the population living near a major highway varied from 3.4% for high school graduates to 4.1% for those with less than a high school diploma”) and by poverty status (where the “estimated proportion of the population living near a major highway was 4.2% for those in the poor category, 3.7% for those in the near-poor category, and 3.5% for those in the nonpoor category”). *Id.* at 47–48.

54. Amy Stuart et al., *The Social Distribution of Neighborhood-Scale Air Pollution and Monitoring Protection*, 59 J. AIR & WASTE MGMT. ASS’N 591, 591 (2012) (finding that Blacks and Hispanics were “disproportionately living closer to sources of air pollution and further from regulatory air quality monitoring sites compared with the overall county population” but that whites were “disproportionately living away from sources [of air pollution] and near monitoring sites”). The study did not consider Asians and Pacific Islanders. *Id.*

55. *See, e.g.*, Milman, *supra* note 4 (reporting that exposure to nitrogen dioxide, a key traffic-based air pollutant, is significantly influenced by race).

56. *Id.*

57. *Id.*

58. *Id.*

59. *Id.*

This disparity raises significant equity concerns, particularly due to the phenomenon of “triple jeopardy.”⁶⁰ First, minority groups suffer from negative health effects based on social and behavioral determinants of health, such as poor nutrition and inadequate access to healthcare.⁶¹ Second, members of minority groups are also at higher risk of negative health effects because of their residential proximity to highways.⁶² Finally, evidence suggests that the aforementioned factors interact multiplicatively, such that minority populations consequently experience disproportionately larger adverse health effects from exposure to air pollution.⁶³

As a whole, minority groups also suffer an unfair share of the burden of traffic-based air pollution compared to the amount they contribute to it. As the Minnesota Pollution Control Agency addressed in a study:

Our results highlight the environmental equity aspects of the transportation infrastructure. Low [socioeconomic status (“SES”)] and non-white populations tend to own fewer cars, drive less, and commute by walking or transit. Other work has shown that poor[er individuals] tend to live close to city centers in large part because of better access to public transportation. Despite driving less, low SES and non-whites bear disproportionately high air pollution impacts from all sources—especially transportation sources. In contrast, both white and high SES populations tend to have higher rates of car ownership and to drive more while the air pollution impacts at their homes tend to be lower.⁶⁴

Notably, the study observed larger disparities for indicators of minority status than for indicators of socioeconomic status, indicating that the highway pollution problem should not be relegated to a

60. Michael Jerrett et al., *A GIS-Environmental Justice Analysis of Particulate Air Pollution in Hamilton, Canada*, 33 ENV'T & PLAN. A: ECON. & SPACE 955, 970 (2001).

61. *Id.* at 971 (explaining that disadvantaged groups face “first, increased risks from social and behavioral determinants of health”).

62. *Id.* (explaining that minority groups face, “second, higher risks from high ambient pollution exposure”).

63. *Id.*

64. Gregory C. Pratt et al., *Traffic, Air Pollution, Minority and Socio-Economic Status: Addressing Inequities in Exposure and Risk*, 12 INT. J. ENV'T RES. PUB. HEALTH 5355, 5367 (2015).

socioeconomic issue.⁶⁵ Such disparities extend to schools as well. Schools with more minority students were far more likely to be located near a highway than schools with more white students.⁶⁶

B. Adverse Health Effects Resulting from Highway Pollutants

Many of the health defects linked to traffic-based air pollution are permanent and lead to a lifetime of health problems.⁶⁷ Although traffic density as low as ten thousand vehicles per day⁶⁸ is sufficient to result in adverse health effects,⁶⁹ as exposure to pollution increases, so does the number and severity of adverse health effects experienced.⁷⁰ Such exposure to pollution is highest where there is a glut of vehicles.⁷¹ Thus, living close to highways—which can experience traffic density of up to 374,000 vehicles per day⁷²—can

65. *Id.* at 5366. “Minority status” indicators include race and ethnicity, nativity, and language spoken at home, while “socioeconomic status” indicators include poverty level and educational attainment. Boehmer et al., *supra* note 33.

66. Jamie Hopkins, *The Invisible Hazard Afflicting Thousands of Schools*, CTR. FOR PUB. INTEGRITY (Feb. 20, 2017), <https://publicintegrity.org/environment/the-invisible-hazard-afflicting-thousands-of-schools/> [<https://perma.cc/QCE4-U4YZ>] (“15 percent of schools where more than three-quarters of the students are racial or ethnic minorities are located near a busy road, compared with just 4 percent of schools where the demographics are reversed.”).

67. *See* Boehmer et al., *supra* note 33, at 46. The harms of highway pollution are especially evident in children. Researchers at the University of Southern California conducted a two-decade long study of children residing in Southern California. The researchers measured the lung capacity of thousands of school children over that period of time and found higher rates of asthma and other respiratory illnesses, as well as permanent deficits in lung function, of children growing up near major roadways. The results of the study are summarized in an L.A. Times article. *See* Barboza & Schleuss, *supra* note 41.

68. The vast majority of highways experience more than ten thousand vehicles per day; 77% of rural interstates experience more than ten thousand vehicles per day while more than 72% of urban interstates, freeways, and other expressways experience more than thirty thousand vehicles a day. Boehmer et al., *supra* note 33, at 47.

69. *Id.* at 46 (“In terms of traffic density, several studies have reported adverse health effects associated with residential proximity to roads with average daily traffic volume as low as 10,000 vehicles per day.”).

70. *See, e.g.*, Pratt et al., *supra* note 64, at 5355 (finding that “[h]igher levels of nearby traffic increase exposure to air pollution and adversely affect health outcomes”).

71. *Id.* at 5365.

72. Per data collected in 2008 and published in 2010, the most traveled highway in the United States was the I-405 in California. The I-405 experienced annual average daily traffic of 374,000 vehicles. U.S. DEPT OF TRANSP., OFF. OF

lead to both more significant health effects and an exacerbation of existing health problems.⁷³

The adverse health effects stemming from highway pollution are especially relevant in light of the COVID-19 pandemic. Exposure to particulate matter, specifically PM_{2.5}, has been linked to increases in COVID-19 death rate; a study conducted by researchers at the Harvard T.H. Chan School of Public Health found that a “small increase in long-term exposure to PM_{2.5} leads to a large increase in the COVID-19 death rate.”⁷⁴ The study concluded, to a statistically significant level, that an increase of only 1 $\mu\text{g}/\text{m}^3$ of PM_{2.5} was associated with an 8% increase in the COVID-19 death rate.⁷⁵ That level of highway pollution is minimal compared to the amounts currently permitted under federal guidelines, but its effects on health are devastating.⁷⁶

Aside from being linked to a higher COVID-19 mortality rate, traffic-based air pollution is linked to numerous other negative health effects. Pollutants cause children in particular to suffer.⁷⁷ Research suggests a causal connection between exposure to traffic-based air pollution and the onset of childhood asthma, especially when the child resides near a “major roadway” like a highway.⁷⁸ In many cases, the increased onset risk is for a particular type of asthma called

HIGHWAY POLY INFO., MOST TRAVELLED URBAN HIGHWAYS AVERAGE ANNUAL DAILY TRAFFIC (AADT) at 1 (2010).

73. Pratt et al., *supra* note 64, at 5365 (“Across all demographic groups, on-road mobile sources contributed the highest cancer risks The high cancer risks from on-road mobile sources suggest that emissions from this source category are more likely to affect locations where people are living.”).

74. Xiao Wu et al., *Exposure to Air Pollution and COVID-19 Mortality in the United States 2* (Apr. 27, 2020) (unpublished manuscript) (on file with the *Columbia Human Rights Law Review*). PM_{2.5} is known as “fine particulate matter” that is approximately “one-thirtieth the width of a human hair.” Chang et al., *supra* note 34, at 142. It is one of many traffic-based air pollutants. See HEALTH EFFECTS INST., *supra* note 35.

75. Wu et al., *supra* note 74, at 2.

76. As discussed in greater detail in Section II.A.1 of this Note, the EPA National Ambient Air Quality Standards (NAAQS) permit an annual PM_{2.5} mean of 12.0 $\mu\text{g}/\text{m}^3$. *NAAQS Table*, ENV'T PROT. AGENCY, <https://www.epa.gov/criteria-air-pollutants/naaqs-table> [<https://perma.cc/U9VU-HZBL>].

77. Barboza & Schleuss, *supra* note 41.

78. *Id.*; see also Boehmer et al., *supra* note 33, at 46 (stating that there is “suggestive evidence of a causal association for onset of childhood asthma, nonasthma respiratory symptoms, impaired lung function, all-cause mortality, cardiovascular mortality, and cardiovascular morbidity” as a result of “exposure to traffic-related air pollution”).

chronic obstructive pulmonary disease, which, unlike other types of asthma, cannot be reversed.⁷⁹ Dr. Anthony Moretti serves as chairman of pediatrics at White Memorial Medical Center in Boyle Heights, a Los Angeles community closely surrounded by highways. He described the effects of living next to highways on children by stating that “children who live close to freeways are among those who most frequently land in the emergency room struggling to breathe and in need of treatment for asthma and other respiratory diseases.”⁸⁰ He noted that these children can end up in the emergency room up to six times over a six-month period.⁸¹ The Center for Disease Control and Prevention has also stated that there is evidence of a causal connection between exposure to traffic-based air pollution and asthma exacerbation.⁸² Both adults and children suffer from non-asthma respiratory symptoms as well, including impaired lung function.⁸³

In addition, air pollution has been linked to increased incidence of cardiovascular disease⁸⁴ and greater risk of

79. Am. Lung Ass’n Sci. and Med. Ed. Rev. Panel, *Living Near Highways and Air Pollution*, AM. LUNG ASS’N (Apr. 20, 2020), <https://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/highways.html> [https://perma.cc/6M2X-GLAC]. According to the National Heart, Lung, and Blood Institute, a branch of the United States Department of Health and Human Services, chronic obstructive pulmonary disease “has no cure yet, and doctors do not know how to reverse the damage to the lungs.” Nat’l Heart, Lung, & Blood Inst., *COPD*, U.S. DEPT OF HEALTH & HUMAN SERVS., <https://www.nhlbi.nih.gov/health-topics/copd> [https://perma.cc/T3W4-JCF3].

80. Barboza & Schleuss, *supra* note 41.

81. *Id.*

82. Boehmer et al., *supra* note 33, at 46 (“Taking into consideration the entire body of evidence on primary traffic emissions, a recent review determined that there is sufficient evidence of a causal association between exposure to traffic-related air pollution and asthma exacerbation . . .”).

83. Boehmer et al., *supra* note 33, at 46. Researchers investigated the association between residential exposure to traffic and eight-year lung-function development using Children’s Health Study cohort data. The study showed “residential proximity to freeway traffic is associated with substantial deficits in lung-function development in children.” In particular, researchers highlighted the connection between deficits in lung-function and residential distance from a freeway, stating that residential distance is associated with “significant” deficits. William Gauderman, et al., *Effect of Exposure to Traffic on Lung Development from 10 to 18 Years of Age: A Cohort Study*, 369 LANCET 571, 574–75 (2007).

84. Barbara Hoffman et al., *Residence Close to High Traffic and Prevalence of Coronary Heart Disease*, 27 EUR. HEART J. 2696, 2698 (2006) (stating that “[t]his study demonstrates an association between the long-term residential exposure to traffic and prevalence of CHD,” where CHD refers to chronic heart disease).

cardiovascular mortality, particularly as a result of long-term exposure to nitrogen dioxide and particulate matter.⁸⁵ Those who live close to heavy traffic also have a higher risk of dementia, particularly those who lived close to the traffic their entire lives.⁸⁶ Pregnant women may suffer additional danger, as traffic-based air pollution is connected with adverse reproductive outcomes, including preterm births⁸⁷ and harm to prenatal development.⁸⁸

Finally, exposure to traffic-based air pollution can cause developmental and behavioral problems in both children and adults. Children living near sources of air pollution perform worse on tests than otherwise similar students living in less polluted areas⁸⁹ and suffer from increased developmental delays in both verbal and nonverbal communication.⁹⁰ For adults, research shows that exposure to pollution, particularly in areas downwind of highways, leads to behavioral problems manifested in a long-term tendency to commit

85. Ulrike Gehring et al., *Long-Term Exposure to Ambient Air Pollution and Cardiopulmonary Mortality in Women*, 17 EPIDEMIOLOGY 545, 549 (2006) (“Our study provides evidence that living within a 50-meter buffer of a major road and exposure to elevated concentrations of NO₂ and of PM₁₀ are associated with an increased risk of death from cardiopulmonary causes.”).

86. Am. Lung Ass’n Sci. & Med. Ed. Rev. Panel, *supra* note 79.

87. See Takashi Yorifuji et al., *Residential Proximity to Major Roads and Preterm Births*, 22 EPIDEMIOLOGY 74, 74 (2011).

88. Am. Lung Ass’n Sci. & Med. Ed. Rev. Panel, *supra* note 79.

89. The test metric used in the study was the Florida Comprehensive Assessment Test (FCAT) in math and reading. The test is administered annually in grades three through ten. Researchers tracked the average of the math and reading FCAT scores. Jennifer Heissel et al., *Does Pollution Drive Achievement?* (Nat’l Bureau of Econ. Rsch., Working Paper No. 25489, 2019).

90. Nicholas Bakalar, *Living Near a Major Highway Tied to Developmental Delays in Children*, N.Y. TIMES (Apr. 11, 2019), <https://www.nytimes.com/2019/04/11/well/family/living-near-a-major-highway-tied-to-developmental-delays-in-children.html> (on file with the *Columbia Human Rights Law Review*) (“[Researchers] found that compared with children living more than 1,000 meters away from a highway, those living within 500 meters were twice as likely to fail in the verbal and nonverbal communication domain.”).

violent crimes⁹¹ and in short-term impacts on cognition and productivity throughout a workday.⁹²

Recent research on the effects of highway pollution has focused on particulate matter due to its unique dangers. Particulate matter is a pollutant from freshly emitted vehicle exhaust that, when measured near highways, can reach five to ten times higher than in non-traffic areas.⁹³ Unlike most of the other emissions from traffic on highways, particulate matter consists of tangible, physical chemical-laden particles.⁹⁴ In theory, that should make particulate matter easier to capture with pollution controls or filters.⁹⁵ However, these particles are ultra-fine, invisible, and can measure less than one-thirtieth the width of a human hair; as such, pollution filters and controls have a very difficult time capturing them.⁹⁶ As a result, particulate matter can “easily penetrate” buildings.⁹⁷ Scientists suspect that ultra-fine particles are able to pass through the lungs and into the bloodstream, where they may cause significant harm to

91. Evan Herrstadt & Erich Muehlegger, *Air Pollution and Criminal Activity: Evidence from Chicago Microdata* 23 (Nat'l Bureau of Econ. Rsch., Working Paper No. 21787, 2015) (“Our results suggest that pollution . . . may influence individual behavior in more subtle ways [than] previously considered We estimate that the downwind side of interstates experience 2.2 percent more violent crimes than when the wind is blowing the opposite direction.”).

92. A 2014 study conducted by the National Bureau of Economic Research found that “a 10-unit change in PM_{2.5} significantly decreases worker productivity by roughly 6 percent. Importantly, PM_{2.5} begins to affect productivity at levels well below current US air quality standards.” Chang et al., *supra* note 34, at 163–64. As previously mentioned, PM_{2.5} is known as “fine particulate matter” that is approximately “one-thirtieth the width of a human hair.” *Id.* at 142. Additional research regarding particulate matter is discussed later in this Note.

93. Barboza & Schleuss, *supra* note 41. The previously cited study on productivity and cognition of workers throughout a workday focused in particular on effects resulting from particulate matter. See Chang et al., *supra* note 34.

94. Barboza & Schleuss, *supra* note 41.

95. Tony Barboza, *L.A. Requires Air Filters to Protect Residents Near Freeways. Are They Doing the Job?*, L.A. TIMES (July 9, 2017), <https://www.latimes.com/local/lanow/la-me-ln-freeway-pollution-filters-20170709-story.html> (on file with the *Columbia Human Rights Law Review*) (“[T]he crux of [Los Angeles officials’] efforts to protect people’s lungs is a requirement that developers install air filters.”).

96. *Id.* (“But even the highest-quality filters capture only some of the dangerous ingredients of car and truck exhaust, and to be effective, experts say, they must be frequently replaced and the building’s ventilation system must run virtually full time with all doors and windows closed.”).

97. Chang et al., *supra* note 34, at 142.

the heart, brain, and other organs.⁹⁸ As mentioned previously, exposure to these ultra-fine particles have recently been linked to an increase in COVID-19 death rate.⁹⁹

Despite the number of well-documented health effects related to highway pollutants and to particulate matter specifically, the expansion of highways and the construction of buildings near highways has not stopped. Government officials continue to build structures, especially units designed as residences for disenfranchised individuals such as subsidized affordable housing.¹⁰⁰ The number of individuals impacted by highway pollution has only grown, to the particular detriment of people of color that reside in communities near highways.¹⁰¹ It is therefore all the more important to examine existing legislation and guidelines surrounding both highway pollutants and air quality.

II. FEDERAL, STATE, AND CITY LAWS LACK REGULATION OF HIGHWAY POLLUTANTS

Due to increased awareness of the problems caused by highway pollutants, many officials at all levels of government have put into place legislation or guidelines to combat these harmful effects. Existing legislation and guidelines, however, focus primarily on children— regulating how close to highways schools can be constructed, for instance.¹⁰² Siting of new developments other than schools is not well regulated, and while research suggests a plethora of ways to reduce the impact of traffic-based air pollution, such as methods involving community development, governments have largely ignored these possibilities. This Part will discuss some of the current regulations and legislation around highway siting and pollution—both federal, in Section II.A, and state, in Section II.B. Nevertheless, as existing legislation and guidelines have failed to meaningfully resolve adverse health effects arising from highway

98. Barboza & Schleuss, *supra* note 41.

99. Wu et al., *supra* note 74, at 2.

100. Barboza & Zahniser, *supra* note 47.

101. Pratt et al., *supra* note 64, at 5356–57.

102. See, e.g., CAL. EDUC. CODE § 17213; CAL. PUB. RES. CODE § 21151.8.

These provisions in the California Code incorporate a 2003 bill, discussed in greater detail in Section II.B.1, that banned the building of new primary and secondary schools near a highway. 2003 Cal. Legis. Serv. ch. 668 (S.B. 352) (West).

pollution, Part III will offer currently unutilized and underutilized solutions.

A. Federal Legislation and Guidelines

Although there is no federal legislation addressing siting near highways, there is air quality legislation through the National Ambient Air Quality Standards.¹⁰³ The Environmental Protection Agency has also released recommendations related to school siting.¹⁰⁴

1. National Ambient Air Quality Standards and a Lack of Enforcement

The National Ambient Air Quality Standards (“NAAQS”) are established by the Environmental Protection Agency (“EPA”) under authority of the Clean Air Act.¹⁰⁵ The NAAQS have six criteria air pollutants: sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.¹⁰⁶ Each of the standards have been updated at different times, with various standards set in 2008, 2010, or 2015.¹⁰⁷ Particulate matter for purposes of the NAAQS is divided into two categories based on size, PM_{2.5} and PM₁₀.¹⁰⁸ The standards for each are different as well; per the guidelines for PM_{2.5}, a geographic region can exceed the set standard as long as the mean quantity averaged over three years is met, while, per the guidelines for PM₁₀, a geographic region can exceed the set standard only once per year on

103. See *Clean Air Act (CAA) and Federal Facilities*, ENV’T PROT. AGENCY, <https://www.epa.gov/enforcement/clean-air-act-cao-and-federal-facilities> [<https://perma.cc/6GYM-6BET>].

104. See ENV’T PROT. AGENCY, OFF. OF CHILDS.’ HEALTH PRO., SCHOOL SITING GUIDELINES (2011), available at https://www.epa.gov/sites/production/files/2015-06/documents/school_siting_guidelines-2.pdf [<https://perma.cc/B8AT-XBSJ>].

105. The Clean Air Act can be found at 42 U.S.C. §§ 7401 et seq. (1990). The EPA “sets the health-based National Ambient Air Quality Standards (NAAQS) for pollutants that are emitted from on-road mobile sources and has recently required that air quality monitors be placed near high-traffic roadways for determining compliance with the NAAQS for NO₂, CO, and PM_{2.5}.” *Near Roadway Air Pollution and Health: Frequently Asked Questions*, ENV’T PROT. AGENCY 3 (2014), https://www.epa.gov/sites/production/files/2015-11/documents/42Of14044_0.pdf [<https://perma.cc/428Q-AYDB>].

106. ENV’T PROT. AGENCY, *supra* note 76. Three of these pollutants (nitrogen dioxide, carbon monoxide, and particulate matter) overlap with pollutants from highway emissions. *Id.*; HEALTH EFFECTS INST., *supra* note 35, at 3.

107. ENV’T PROT. AGENCY, *supra* note 76.

108. *Id.*

average over three years.¹⁰⁹ EPA last considered the particulate matter NAAQS in December 2020, whereupon it chose to retain the existing NAAQS.¹¹⁰

If an area is not in compliance with the NAAQS, EPA categorizes it as a “nonattainment area.”¹¹¹ The “nonattainment” designation is declared for specific pollutants, so an area may be compliant for one pollutant but be “nonattainment” status for another.¹¹² After such a designation, state and local governments are required to establish and implement a plan within three years to meet the standard.¹¹³

The Clean Air Act gives EPA significant power over ensuring that federal facilities conform to Clean Air Act standards. Its enforcement authority comes in the form of penalties,¹¹⁴ compliance

109. *Id.*

110. *Administrator Pruitt Signs Memo to Reform the National Ambient Air Quality Standards Review Process*, ENV'T PROT. AGENCY (May 10, 2018), <https://www.epa.gov/newsreleases/administrator-pruitt-signs-memo-reform-national-ambient-air-quality-standards-review> [<https://perma.cc/Y9VD-CHXB>] [hereinafter *Pruitt Memo*] (“The memo [signed on May 10, 2018 by EPA Administrator Scott Pruitt] . . . requires that the [EPA] complete its review of the particulate matter NAAQS by December 2020.”); *EPA Finalizes NAAQS for Particulate Matter*, ENV'T PROT. AGENCY (Dec. 7, 2020), <https://www.epa.gov/newsreleases/epa-finalizes-naaqs-particulate-matter> [<https://perma.cc/QE34-YZ6J>] (explaining that EPA decided “to retain the existing [NAAQS] for particulate matter set by the Obama-Biden Administration without changes”).

111. ENV'T PROT. AGENCY, *supra* note 104, at 95.

112. *Attainment Versus Nonattainment*, IDAHO DEP'T OF ENV'T QUALITY, <https://www.deq.idaho.gov/air-quality/monitoring/attainment-versus-nonattainment/> [<https://perma.cc/5Z5E-VBRZ>].

113. *NAAQS Designations Process*, ENV'T PROT. AGENCY, <https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process> [<https://perma.cc/6KMM-FUN8>] (“Once designations take effect, state and local governments must develop implementation plans on how areas will attain and maintain the standards by reducing air pollutant emissions.”). EPA further writes that the time period in which to do so is “three years.” Env't Prot. Agency, *U.S. EPA Nonattainment Areas and Designations*, DATA.GOV, <https://catalog.data.gov/dataset/us-epa-nonattainment-areas-and-designations> [<https://perma.cc/NLX7-K352>] (last updated May 22, 2019).

114. ENV'T PROT. AGENCY, *supra* note 103 (“EPA may assess civil administrative penalties of up to \$37,500 per day, per violation against federal agencies for noncompliance. . . . EPA may also issue field citations against federal facilities. A field citation up to \$7,500 per day per violation may be assessed in these cases, and are generally issued for minor infractions.”).

orders,¹¹⁵ and criminal enforcement.¹¹⁶ However, states still have the “primary responsibility for assuring the air quality within their geographic region is in compliance with the NAAQS.”¹¹⁷ States may set emission requirements for facilities, both federal and otherwise, to achieve attainment of the NAAQS.¹¹⁸ They may further issue compliance orders for noncomplying federal facilities,¹¹⁹ or seek other forms of injunctive relief and assess administrative penalties.¹²⁰ Finally, the Clean Air Act contains a citizen suit provision, which allows “any person” to “file a civil action against any person, including the United States (EPA), for violations of emission standards or limitations.”¹²¹ However, the citizen suit provision of the Clean Air Act is generally used to challenge unpermitted increases in emissions rather than existing highway emissions.¹²²

EPA is mandated under the Clean Air Act to set standards that are “requisite to protect public health” and “accurately reflect the latest scientific knowledge.”¹²³ As such, the NAAQS are subject to

115. *Id.* (“The [Clean Air Act] authorizes EPA to issue a unilateral compliance order or negotiate a compliance agreement with noncomplying federal facilities.”).

116. Note that, unlike the other methods of enforcement, criminal penalties are assessed against an individual defendant. *Id.* (“EPA may seek sanctions against individual employees of federal facilities for criminal violations of the [Clean Air Act]. Fines and punishment, including imprisonment, for several types of criminal violations are specified in the [Clean Air Act].”).

117. Env’t Prot. Agency, *supra* note 113. In some cases, “a designated nonattainment area can include portions of 2, 3, or 4 states rather than falling entirely within a single state.” *Id.* Breakdowns in communication between the states themselves and between the states and EPA can lead to delays in action even if NAAQS are not met, ranging from lengths of several months to more than two years. *Id.*

118. *Id.* (“States have the authority to establish emission requirements for facilities in order to achieve attainment of the NAAQS. Federal facilities are subject to these limits, and other requirements set by the state in which they are located.”).

119. *Id.*

120. *Id.*

121. *Id.*

122. *See, e.g.,* *Sierra Club v. Okla. Gas & Elec. Co.*, 816 F.3d 666, 669 (10th Cir. 2016) (challenging defendant’s modification of a boiler at a coal-fired power plant without an emission-regulation permit under the citizen suit provision of the Clean Air Act).

123. Bernard Goldstein, *The Latest Chapter in EPA vs. Environmental Science Saga*, THE HILL (Dec. 11, 2018), <https://thehill.com/opinion/energy-environment/420888-the-latest-chapter-in-epa-vs-environmental-science-saga> [<https://perma.cc/Z9NW-3NFB>]. Dr. Goldstein is a former chair of CASAC and

periodic five-year review.¹²⁴ Part of the five-year review involves hearings in front of the Clean Air Scientific Advisory Committee (“CASAC”), a seven-member committee appointed by the EPA administrator.¹²⁵ Due to the CASAC’s size, it has limited capacity¹²⁶ and therefore each of the standards usually has additional subcommittee panels consisting of a greater number of experts.¹²⁷ Members have included researchers, doctors, and others with specific expertise on the pollutant at issue.¹²⁸ While the existence of CASAC is mandatory under law, the use of the panels is not.¹²⁹ As a result, in 2018, EPA stated that the twenty-person Particulate Matter Review Panel would not be reconvened in 2019.¹³⁰ Instead, CASAC would take over the work of the Panel.¹³¹ This had been of especial concern to scientists leading up to December 2020 because of the EPA plan to review and revise the particulate matter guidelines,¹³² and continues to be a concern for future revisions. CASAC has fewer members than the Particulate Matter Review Panel, and must divide its attentions between particulate matter standards and the other NAAQS. Scientists worry that any new particulate matter standard will be insufficient to protect the health of constituencies. A former member of both CASAC and the Particulate Matter Review Board, Dr. Lianne Sheppard, stated that the decision to not reconvene the Particulate

served as EPA Assistant Administrator for research and development under former President Ronald Reagan.

124. *Id.* (“[The Clean Air Scientific Advisory Committee] is mandated under the Clean Air Act to be an integral part of the required five year review of each National Ambient Air Quality Standard (NAAQS).”).

125. *Id.*

126. *Id.* (explaining that because CASAC only has seven members, it “clearly does not have the breadth and depth of expertise to . . . distill the growing body of knowledge about increasingly complex and changing processes that lead to the effects of air pollutants,” leaving it reliant on input from larger subcommittees of experts).

127. Lisa Friedman, *E.P.A. to Disband a Key Scientific Review Panel on Air Pollution*, N.Y. TIMES (Oct. 11, 2018), <https://www.nytimes.com/2018/10/11/climate/epa-disbands-pollution-science-panel.html> (on file with the *Columbia Human Rights Law Review*).

128. *Id.*

129. Goldstein, *supra* note 123.

130. Friedman, *supra* note 127.

131. *Id.*

132. *Pruitt Memo*, *supra* note 110 (“The memo [signed on May 10, 2018 by EPA Administrator Scott Pruitt] . . . requires that the [EPA] complete its review of the particulate matter NAAQS by December 2020.”).

Matter Review Board “will result in poorer-quality scientific oversight.”¹³³

Despite the protective guidelines in place, the NAAQS have little teeth. Geographic regions have three years to formulate plans that meet compliance standards, and implementation of the plans take even longer before positive effects are realized.¹³⁴ There is also a clear lack of enforcement for NAAQS nonattainment. The EPA compiles lists of nonattainment counties for all criteria pollutants. In data as of December 31, 2019, there are portions of 304 distinct counties currently not in compliance with some part of the NAAQS.¹³⁵ Many of these standards were set by the EPA as early as 1987, 2006, and 2008,¹³⁶ meaning that regions have known the requirements for more than a decade and have still not followed them. There are also a number of counties that are repeat offenders year after year.¹³⁷ Therefore, mechanisms beyond the unenforced NAAQS are necessary to ensure that highway pollutants do not continue to cause dangerous health effects.

133. Friedman, *supra* note 127.

134. NAAQS Designations Process, ENV'T PROT. AGENCY, <https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process> [<https://perma.cc/6KMM-FUN8>] (“Once designations take effect, state and local governments must develop implementation plans on how areas will attain and maintain the standards by reducing air pollutant emissions.”) EPA further writes that the time period in which to do so is “three years.” Env't Prot. Agency, *supra* note 113.

135. Many of these counties are nonattainment for multiple NAAQS standards. Data about counties not in compliance with NAAQS standards are contained in an EPA Green Book. *Current Nonattainment Counties for All Criteria Pollutants*, ENV'T PROT. AGENCY (Dec. 31, 2019), <https://www3.epa.gov/airquality/greenbook/ancl.html> [<https://perma.cc/C8HF-PBUP>].

136. *Id.*

137. For example, nine counties in the Denver area were designated “nonattainment” by EPA back in 2004, and all nine of those counties remain “nonattainment” as of the end of 2019. Chase Woodruff, *SIPs, NAAQS and Today's Big EPA Hearing on Denver Air Quality Explained*, WESTWORD (Sept. 5, 2019), <https://www.westword.com/news/sips-naaqs-epa-decision-on-denver-air-quality-explained-11472669> [<https://perma.cc/YN2S-X53J>]. Similarly, a county in Michigan was designated “nonattainment” in 2004, and remained “nonattainment” through 2019. *History of Air Quality in West Michigan*, W. MICH. CLEAN AIR ACTION, <https://www.wmcac.org/projects> (on file with the *Columbia Human Rights Law Review*).

2. Environmental Protection Agency Guidelines and Their Gaps

Unlike air quality standards, there is currently no federal legislation enacted to specifically address siting near highways. However, EPA has issued two reports on the problem, one addressing frequently asked questions regarding roadway air pollution¹³⁸ and the other on building schools near highways.¹³⁹ The report on general roadway air pollution states that roadways can influence air quality within about five hundred to six hundred feet downwind from the roadways and explains that there is ongoing EPA research on highway pollution.¹⁴⁰ However, there are no actionable guidelines provided.

On the other hand, while the EPA report on schools does provide guidelines, they remain woefully insufficient to address the overall impact of highway pollution on vulnerable populations. First, they only cover siting for schools, which ignores the problems faced by minority communities, including children, in their home living circumstances. Second, the report recommends, as a best practice for siting, that state and local authorities consider “many factors in evaluating locations for new schools,” with “distance from major transportation facilities” as only one factor amongst others, including convenience of the location.¹⁴¹ Furthermore, the guidelines only briefly touch upon strategies related to community development, site location, and design.¹⁴² Such guidelines thus downplay the importance of limiting exposure to highway pollution. Ironically, EPA does acknowledge within the report that siting schools within five hundred feet of a major roadway is a significant health risk.¹⁴³ It also

138. *Near Roadway Air Pollution and Health: Frequently Asked Questions*, ENV'T PROT. AGENCY, https://www.epa.gov/sites/production/files/2015-11/documents/420f14044_0.pdf [<https://perma.cc/428Q-AYDB>].

139. *See* ENV'T PROT. AGENCY, *supra* note 51.

140. *Id.* at 4 (“EPA has a near-roadway program to investigate emissions, exposures, health impacts and ways to reduce air pollution near major roadways and high traffic areas . . . results will assist federal and state regulators, community and transportation planners, and the public with making sound decisions to protect public health.”)

141. *Id.* at 11.

142. *See id.*

143. *Id.*; *see also* Alex A. Karner et al., *Near-Roadway Air Quality: Synthesizing the Findings from Real-World Data*, 44 ENV'T SCI. TECH. 5334, 5334 (2010) (“Using an edge-of-road normalization, almost all pollutants decay to background by 115–570 m from the edge of the road; using the more standard background normalization, almost all pollutants decay to background by 160–570

acknowledges the existence of restrictive guidelines that would mitigate such a danger—for example, those promulgated in California requiring a distance of at least five hundred feet between school sites and highways¹⁴⁴—without making such a recommendation itself. Finally, the EPA guidelines focus on ventilation, filtration, actions of the building occupants, and transportation policies.¹⁴⁵ However, ventilation, filtration, and other mitigating strategies of this sort are insufficient to prevent harm from traffic-based air pollution, especially particulate matter, without additional measures such as design solutions.¹⁴⁶

The EPA guidelines do offer some insight into design solutions through discussion of roadside barriers, such as sound walls and vegetation.¹⁴⁷ Sound walls are solid barriers located downwind of a roadway and can be very effective in reducing exposure to highway pollution;¹⁴⁸ as of 2010, more than 2,748 miles of barriers had been constructed in the United States and its territories.¹⁴⁹ Vegetation works similarly to sound walls by providing a physical barrier between schools and roadways, and also has the added benefit of “filtering particles as they pass through and accumulate on leaf surfaces.”¹⁵⁰ Compared to sound walls, the reduction effects of vegetation vary more throughout the seasons and by type of

m from the edge of road.”). 115 meters is equivalent to 377.297 feet and 160 meters is equivalent to 524.934 feet.

144. The California Air Resources Board has recommended that new schools not be located within five hundred feet of major roadways, defined as roadways with more than fifty thousand vehicles a day. The California recommendations are discussed in more detail in Section II.C.2.

145. See ENV’T PROT. AGENCY, *supra* note 51, at 3 (“This document addresses the following mitigation strategies that can be implemented by local school authorities: ventilation, filtration, actions for building occupants, transportation policies, site location and design, and the use of roadside barriers.”).

146. Ultra-fine particulate matter cannot be filtered. Evelyn Larrubia, *Schools Still Rise Close to Freeways*, L.A. TIMES (Sept. 24, 2007), <https://www.latimes.com/archives/la-xpm-2007-sep-24-me-freeways24-story.html> [<https://perma.cc/X3X7-JV7Y>] (“The assessment did not discuss ultra-fine particles, which cannot be filtered.”).

147. ENV’T PROT. AGENCY, *supra* note 51, at 12.

148. *Id.* at 11.

149. FED. HIGHWAY ADMIN., U.S. DEP’T OF TRANSP., SUMMARY OF NOISE BARRIERS CONSTRUCTED BY DECEMBER 31, 2010 (2012) (“Through the end of 2010, 47 [state departments of transportation] and the Commonwealth of Puerto Rico have constructed over 2,748 linear miles of barriers . . .”).

150. ENV’T PROT. AGENCY, *supra* note 51, at 12.

vegetation.¹⁵¹ Use of these barriers in accordance with best practices can provide a great method for reducing the effects of highway pollution.¹⁵² However, the EPA report neither recommends nor requires the use of either of these solutions. Rather, it refers to them only as potential options.

B. State and City Legislation and Guidelines

At the statewide level, only California has passed legislation limiting siting near highways.¹⁵³ Within California, Los Angeles in particular has been active in enacting additional guidelines and regulations.¹⁵⁴ Along with Los Angeles, the policies of two other cities, New York City and Boston, will be reviewed in this Section, as well as any respective guidelines issued at the state level. These locations were chosen because communities of color in those cities are particularly affected by highway pollution due to population size, location, and density of roadways.

1. California as a Problem-Riddled Example

Although California is the state that has promulgated the most legislation and guidelines regarding highway pollution, its focus has remained on schools. As early as 2005, the California Air

151. *Id.* Research has shown that the amount of removal depends significantly “on season, plant species, leaf size and density, and pollutant type.” *Id.* Other factors can be the density and height of the greenery and the maturity of the vegetation (where mature vegetation “tends to be more effective”). In particular, vegetation with “needle-like” greenery is more effective than broad-leaved trees. *Id.*

152. *Id.* EPA cites a study that measured concentrations of particulate matter in the open area adjacent to a highway and compared that amount to the measured concentrations of particulate matter in the lee of a noise barrier an equivalent distance from the highway. The study found the concentration at the lee of the noise barrier to be “~60% of the concentrations of the open area.” George E. Bowker et al., *The Effects of Roadside Structures on the Transport and Dispersion of Ultrafine Particles from Highways*, 41 *ATMOSPHERIC ENV'T* 8128, 8137 (2007).

153. CAL. EDUC. CODE § 17213.

154. *See, e.g.*, City News Serv., *LA City Council Seeks New Regulations for Developments Near Freeways*, NBC (Aug. 15, 2018), <https://www.nbclosangeles.com/news/la-city-council-seeks-new-regulations-for-developments-near-freeways/176092/> [<https://perma.cc/Z6AP-J8DL>] (illustrating Los Angeles’ efforts to seek new regulation for residents of freeway-adjacent developments).

Resources Board advised¹⁵⁵ in its Air Quality and Land Use Handbook that no new schools be located within five hundred feet of major roadways, where major roadways were defined to include freeways, urban roads with one hundred thousand vehicles per day, and rural roads with fifty thousand vehicles per day.¹⁵⁶ School districts within California, such as the Los Angeles Unified School District—the largest school district in California by number of students¹⁵⁷—then promulgated similar recommendations.¹⁵⁸ The California Department of Education went one step further by recommending that schools be located “at least 1,500 feet from roads where gasoline, diesel, propane, chlorine, oxygen, pesticides, or other combustible or poisonous gases are transported.”¹⁵⁹

The California legislature passed a law in 2003 that banned the building of new primary and secondary schools within five hundred feet of a freeway.¹⁶⁰ Although this was an important step forward, the bill contained a loophole that permitted a school district to still build schools within five hundred feet if it could determine either that students’ health would not be significantly affected or that the benefits of the location would outweigh its risks.¹⁶¹ These determinations could be conclusory and are left to the discretion of the school district,¹⁶² which often has incentives to build the school on as cheap land as possible. The bill also did not cover Head Start preschools, non-profit providers, and individuals licensed to provide care from their own homes.¹⁶³ The number of schools that have sprung up in California within five hundred feet of freeways even

155. The California Air Resources board specifically wrote that “[t]hese recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.” CAL. AIR RES. BD., *supra* note 46, at 4.

156. *Id.*

157. In the 2018–2019 school year, the Los Angeles Unified School District had 607,723 enrolled students. That amounted to 9.82% of the total enrolled students in California, and was almost five times the size by number of enrolled students of the next largest school district, the San Diego Unified School District, with 124,105 enrolled students. *Largest & Smallest Public School Districts*, CAL. DEPT OF ED. (Sept. 25, 2019), <https://www.cde.ca.gov/ds/sd/cb/ceflargesmalldist.asp> [<https://perma.cc/VR5G-MQTL>].

158. ENV’T PROT. AGENCY, *supra* note 51, at 12.

159. *Id.*

160. CAL. EDUC. CODE § 17213.

161. CAL. PUB. RES. CODE, § 21151.8(3).

162. *Id.*

163. *Id.*

after the bill demonstrates the problems with the existing law.¹⁶⁴ School districts have used the loophole in the law and stated either that student health would not be significantly affected or that the benefits of the location outweigh the risks in order to receive permits to build the new schools.¹⁶⁵ These new schools are in addition to the large number of existing ones, about 150,¹⁶⁶ unaffected by the 2003 legislation, that are located within five hundred feet of a highway.¹⁶⁷

The continued exploitation of this loophole in the law is especially unfortunate because the California legislature's reasoning for passing the bill was in part the "disproportionate number of economically disadvantaged pupils" at increased risk from highway pollution.¹⁶⁸ The tie between minority communities and economically disadvantaged communities in California is clear; a 2003 study of the state found that overall, children of color were three times more likely than their white peers to live in highly-trafficked areas.¹⁶⁹

164. In the Los Angeles Unified School District alone, which faces unique difficulties because of its urban location, there have been five new schools built since the enactment of the 2003 law. One site, for example, was built approximately ninety feet from the 10 Freeway, a major thoroughway in Los Angeles. Larrubia, *supra* note 146.

165. CAL. PUB. RES. CODE, § 21151.8(3)(B)(iii).

166. Deepa Fernandes & Aaron Mendelson, *Polluted Preschools: 169 LA Childcare Centers Are Too Close to Freeways*, S. CAL. PUB. RADIO (Mar. 29, 2016), <https://www.scpr.org/news/2016/03/29/58878/pollution-near-preschools-is-impacting-nearly-10-0/> [<https://perma.cc/N6T5-5KXS>].

167. Larrubia, *supra* note 146 ("According to the South Coast Air Quality Management District, 2.3% of California public schools—about 170—are located within 500 feet of high-traffic roads, those that carry more than 50,000 vehicles per day.").

168. S.B. 352, 2003 Leg., Reg. Sess. (Cal. 2003) (enacted) ("The Legislature finds and declares . . . A disproportionate number of economically disadvantaged pupils may be attending schools that are close to busy roads, putting them at an increased risk of developing bronchitis from elevated levels of several pollutants associated with traffic.").

169. A study found that:

The total number of children in the state was 6,647,645 . . . White children were 45% of the total child population, but only 21 and 7% of the child population in high-traffic and high-traffic/low-income block groups, respectively. Hispanic children showed the opposite trend with 35% of total population, but 56% of those in high traffic density block groups and 71% of children in high-traffic/low-income block groups.

Robert B. Gunier et al., *Traffic Density in California: Socioeconomic and Ethnic Differences Among Potentially Exposed Children*, 13 J. EXPOSURE SCI. & ENV'T EPIDEMIOLOGY 240, 243 (2003).

In Los Angeles specifically, the Los Angeles City Council in 2018 directed city staff to develop a proposal for new guidelines on building near highways.¹⁷⁰ The guidelines contain an update to the city's Freeway Adjacent Notice for Sensitive Uses.¹⁷¹ All developers of new or expanded projects located within one thousand feet of a freeway¹⁷² are told "of negative health impacts that are a concern to the city."¹⁷³ The Notice specifically recommends that "efforts be made to mitigate air quality impacts through design features or other internal measures."¹⁷⁴ It also advises developers to take certain measures to minimize exposure to freeway pollutants, including planning open space areas as far from the freeway as possible,¹⁷⁵ prioritizing non-habitable uses nearest the freeway,¹⁷⁶ and screening the site with some type of barrier.¹⁷⁷ Since the propagation of the guidelines in 2018, there is no evidence that developers have taken those words to heart. Residential construction, including a tower called "The Grand" with 20% of its units set aside as low-income housing, has continued within one thousand feet of freeways.¹⁷⁸ The Grand has no solid barriers between it and the two nearby highways, the twelve-lane 110 Freeway and the six-lane 101 Freeway.¹⁷⁹ It

170. City News Serv., *supra* note 154 ("On a 10-0 vote, the council directed city staff to take a number of actions, which include developing proposed new guidelines—aimed at protecting public health—for schools, daycare facilities and senior care centers within 1,000 feet of a freeway.").

171. *See id.*

172. City of L.A. Dep't of City Plan., *ZI No. 2427 Freeway Adjacent Advisory Notice*, ZIMAS (Sept. 17, 2018), <http://zimas.lacity.org/documents/zoneinfo/zi2427.pdf> [<https://perma.cc/AL29-WWFN>].

173. City News Serv., *supra* note 154.

174. *Id.*

175. The Freeway Adjacent Notice states that developers should locate "occupied open space areas (play areas, courtyards, patios, balconies, etc.) as far from the freeway sources as possible when the size of the site permits." City of L.A. Dep't of City Plan., *supra* note 172.

176. The Notice states that developers should "[p]rioritize the location of non-habitable uses, such as parking structures and building areas not calculated in floor area, nearest the freeway." *Id.*

177. The Notice states that developers should "[s]creen the project site with substantial vegetation and/or a wall barrier." *Id.*

178. "The Grand" development includes a 39-story residential tower with 436 units on the corner of First Street and Grand Avenue. Notably, the residential tower will have 20% of units set aside as low-income housing. Sean Thomas & Nicholas Slayton, *19 Projects to Watch in 2019*, L.A. DOWNTOWN NEWS (Jan. 2, 2019), http://www.ladowntownnews.com/news/projects-to-watch-in/article_d0ea4f4c-0d24-11e9-9f5e-17bea6ad8573.html [<https://perma.cc/6DMP-4UW5>].

179. The satellite imaging offered on Google Maps as of January 18, 2020 is illuminating as to the surroundings of the construction. Google Maps Image of the

remains to be seen whether these suggestions will be effective in the long run, but the evidence suggests that for the change to occur, mandatory rules may be necessary. Furthermore, although adverse health effects will be reduced if developers screen the site with barriers, it is unlikely that such actions will be wholly effective. Barriers are most effective when a sound barrier is used,¹⁸⁰ and sound barriers are typically implemented by states, funded in part by the federal government.¹⁸¹ Even in California, most protections against highway pollution are guidelines at best, and the only statewide regulation is for schools.

2. New York and Its Need for Change

New York, particularly New York City, faces many of the same difficulties as California regarding highway pollution. A 2019 report by the Citizens Budget Commission stated that New York State has over 115,000 lane-miles of roads, and that motorists annually travel more than 120 billion miles on such roads.¹⁸² The density of major roadways¹⁸³ throughout New York City present great difficulty in making sure populations are kept away from high amounts of highway pollutants. Like California, data from New York focuses on schools. A 2019 report found that New York City itself has 244 city schools within five hundred feet of highways, and the city

Grand and Surrounding Area (on file with the *Columbia Human Rights Law Review*).

180. See Rich Baldauf et al., *Impacts of Noise Barriers on Near-Road Air Quality*, 42 *ATMOSPHERIC ENV'T* 7502, 7504–07 (2008).

181. Philip Langdon, *Noisy Highways*, *ATLANTIC MONTHLY* (Aug. 1997), <https://www.theatlantic.com/magazine/archive/1997/08/noisy-highways/376925/> [<https://perma.cc/A4M2-QDLQ>] (stating that since 1968, “a total of forty-one states have built highway noise barriers, generally with 75 to 90 percent of the cost paid the U.S. Department of Transportation”).

182. JAMISON DAGUE, *CITIZENS BUDGET COMM'N, BUILDING A SOUND FISCAL FUTURE FOR NEW YORK'S HIGHWAY AND MASS TRANSIT SYSTEMS 2* (2019), available at https://cbcnyc.org/sites/default/files/media/files/REPORT_VMT_03192018_2.pdf [<https://perma.cc/KZA9-EZEJ>].

183. New York City uses specific terminology to refer to different types of highways. Per the New York State Department of Transportation, “Highways that carry commercial traffic are called Expressways (including Interstate Highways). Other highways limited to non-commercial traffic are called Parkways . . . and Drives . . .” *Region 11 at a Glance*, N.Y. STATE DEP'T OF TRANSP., <https://www.dot.ny.gov/regional-offices/region11/general-info> [<https://perma.cc/G4AK-DMA2>].

plans to open many more.¹⁸⁴ However, unlike California, New York State has no official laws or regulations on the books regarding highway pollutants. New York State also does not have its own general air quality regulations, relying instead on the NAAQS set by EPA.¹⁸⁵ The New York State Department of Environmental Conservation does require mandatory motor vehicle emissions inspections annually and whenever the vehicle changes ownership,¹⁸⁶ but a motor vehicle that passes an emissions inspection will still release pollutants.

What regulation there is in New York State focuses on schools. One of the only existing rules regarding building near highways applies if an environmental impact study at a potential school site indicates that “air pollution levels are a concern.”¹⁸⁷ If the School Construction Authority, the agency that decides the location of new school buildings in New York City, chooses that site, the school must then be equipped with an air filtration system.¹⁸⁸ The rule offers insufficient protection for three main reasons. First, it applies only to schools in New York City.¹⁸⁹ Second, as there is no definition of how

184. Valeria Ricciulli reports that in Queens, “P.S. 398, a new school in Jackson Heights, will open this week, just 200 feet from the [Brooklyn Queens Expressway (“BQE”)]. In East Elmhurst, I.S. 419, slated to open in 2021, sits near the entrance to Grand Central Parkway. In Brooklyn, P.S./I.S. 746 in Sunset Park, expected to open in a year, will sit near the BQE, while P.S./I.S. 667 in East New York, will open near high traffic corridors.” Valeria Ricciulli, *Many NYC Schools Are Located Near Major Highways, Raising Pollution Concerns: Report*, CURBED N.Y. (Sept. 3, 2019), <https://ny.curbed.com/2019/9/3/20847417/back-to-school-nyc-public-doe-pollution-highways> (on file with the *Columbia Human Rights Law Review*).

185. Air, N.Y. DEPT OF ENV'T CONSERV., <https://www.dec.ny.gov/chemical/281.html> [<https://perma.cc/2F5U-RHNZ>].

186. *Motor Vehicle Inspection and Maintenance (I/M) Programs*, N.Y. DEPT OF ENV'T CONSERV., <https://www.dec.ny.gov/chemical/8391.html> [<https://perma.cc/Q7T2-PAYV>].

187. Michael Elsen-Rooney, *Rooms Near the Fumes: Analysis Shows Nearly 250 City Schools Sit Near High-Pollution Highways*, N.Y. DAILY NEWS (Sept. 1, 2019), <https://www.nydailynews.com/new-york/education/ny-schools-pollution-highways-20190901-uqmoivcwgva5rittifrlvmjaq-story.html> [<https://perma.cc/4QQG-H98Q>].

188. A spokesperson for the School Construction Authority stated that the agency conducts “rigorous environmental impact studies” that included air pollution tests at each potential site and that if air pollution levels were of concern, schools were equipped with air filtration systems. *Id.*

189. This is because the School Construction Authority is only responsible for school sites in New York City. See *id.*; *School Construction*, NYC DEPT OF EDUC., <https://www.schools.nyc.gov/about-us/planning-and-buildings/school-construction> [<https://perma.cc/9RLV-G46G>] (“The School Construction Authority

high air pollution levels must be to constitute a “concern,” the School Construction Authority might deem as not a concern levels of air pollution experienced by sites within five hundred feet of a highway, even though these levels are known to cause significant health effects.¹⁹⁰ Finally, while air filtration systems are an important way to combat the effects of air pollution, they cannot fully catch some of the most dangerous highway pollutants—including particulate matter.¹⁹¹

3. Massachusetts and the Beginnings of a Community-Based Approach

Similar to New York, Massachusetts has no official legislation or guidelines relating to building near freeways. However, a 2019 Massachusetts study highlighted the risks of highway pollutants and their disproportionate effect on residents of color.¹⁹² The study stated that “Asian American residents in Massachusetts are exposed to PM_{2.5} concentrations from on-road transportation that are, on average, 36 percent higher than the exposure of white residents. Black residents are exposed to 34 percent more vehicle pollution than are white residents, and Latino residents to 26 percent more.”¹⁹³ In the areas with the highest amount of pollution—more than 200% of the state average—there were the lowest percentages of white residents.¹⁹⁴ The analysis further found that “exposure inequalities are more pronounced between racial and ethnic groups than between

(SCA) designs and constructs safe, attractive, and environmentally sound public schools for children throughout New York City’s many communities.”).

190. Part I of this Note contains an in-depth discussion of the adverse health effects experienced by both children and adults as a result of highway air pollution.

191. See Barboza, *supra* note 95.

192. See UNION OF CONCERNED SCIENTISTS, *INEQUITABLE EXPOSURE TO AIR POLLUTION FROM VEHICLES IN MASSACHUSETTS* 5 (2019), <https://www.ucsusa.org/sites/default/files/2020-05/inequitable-exposure-to-vehicle-pollution-ma.pdf> [https://perma.cc/DJK4-Y68T].

193. *Id.* at 1.

194. In cases where PM_{2.5} concentrations were more than two times the Massachusetts average concentration, white residents made up “just 56 percent of the population,” even though about 75% of residents in the state were white. In areas where PM_{2.5} concentrations were below the state average, however, white residents made up 81% of the population. The study found that “[a]lmost 70 percent of all white residents live in areas with concentrations below the state average.” *Id.* at 2.

income groups,”¹⁹⁵ indicating once more that exposure to highway pollutants cannot be written off merely as a socioeconomic concern.

In Boston, a 2016 study by researchers at the Tufts University School of Medicine and Boston University School of Public Health spurred action by city officials.¹⁹⁶ Following that study, city officials recommended measures to mitigate the effects of pollution to contractors. These included cleaning and resealing ducts, adding new windows, and improving filtration systems. An additional study in 2017 of Reggie Wong Park, located at the intersection of two highways in Boston, raised further concerns about highway pollution.¹⁹⁷ The concerns raised about the park led to state plans to move the park elsewhere.¹⁹⁸

The relocation of Reggie Wong Park is an extremely promising move forward, as it reflects a community-based approach. Citizen activists from the Chinese Progressive Association sponsored the Reggie Wong Park study,¹⁹⁹ demonstrating the power of community engagement to resolve the risks raised by highway pollutants. State officials have also been open to hearing from activists, and the parties are now working together to design the new park in a way that will more appropriately minimize exposure to highway pollution.²⁰⁰ In some workshops with the state, for example, the Chinese Progressive Association and other activist groups have discussed how to use “physical barriers and landscaping to make [Reggie Wong Park] safer.”²⁰¹ The emphasis placed on design rather than secondary mitigation strategies such as air filtration devices is a

195. *Id.* at 4.

196. A study of Boston residents “who live or spend a significant amount of time near Interstate 93 and the Massachusetts Turnpike” found that “their exposure to microscopic metals and chemicals spewed from vehicles increases their chances of suffering a heart attack or stroke.” David Abel, *New Evidence of the Dangers of Living Near Highways*, BOS. GLOBE (Apr. 13, 2016), <https://www.bostonglobe.com/metro/2016/04/13/new-evidence-dangers-living-near-highways/hVYqTnY4iyn9YRoNSwWtGI/story.html> [<https://perma.cc/7D5L-GS5X>].

197. Reggie Wong Park is located in Boston’s Chinatown areas, which lies at the junction of the Massachusetts Turnpike and the I-93 Expressway. The park itself is between the highway and off-ramp. MATTHEW SIMON ET AL., A STUDY OF THE REGGIE WONG PARK IN CHINATOWN 2 (2017), available at <https://sites.tufts.edu/cafeh/files/2011/10/Reggie-Wong-Park-report-2.pdf> [<https://perma.cc/S298-VURC>].

198. Abel, *supra* note 196.

199. *Id.*

200. *Id.*

201. *Id.*

public health best practice²⁰² that has rarely been utilized by other officials in the United States. However, Reggie Wong Park is only the beginning, as it is one of numerous public areas in Massachusetts exposed to high levels of air pollutants from highways. Persistent change is needed.

An examination of regulations and legislation at the federal and state levels shows the inability of existing policies to successfully combat the problem of highway pollution. At the federal level, although the NAAQS address highway pollution, there is not an effective system in place for enforcement when such standards are violated. EPA has guidelines related to highway pollution and siting, but they constitute only advisements and address only school sites. At the state level, a review of the regulations and legislation in three states—California, New York, and Massachusetts—shows that states have not successfully addressed the problem of building near highways and the resulting adverse health effects from highway pollution. California is the only state that limits building within five hundred feet of highways, and that legislation applies only to school sites. Even the official recommendations of three major cities where highway pollution is particularly severe—Los Angeles, New York City, and Boston—lack many of the best practices to reduce the effects of highway pollution. Despite recent research making clear the pressing nature of adverse health effects from pollutants, there is no legislation promulgated by government officials in any of these three states regarding building residential sites near a highway—or, for that matter, any of the fifty states. Part III will explain what the best practices to combat highway pollution are, as well as barriers to their implementation. Section III.C.1 will further offer a legal mechanism, the Fair Housing Act, as a method to compel government officials to take action and finally make headway on fixing the highway pollution problem.

III. RECOMMENDATIONS TO REMEDY HIGHWAY POLLUTANT INEQUALITY

In light of the severe problems that persist as a result of highway pollutants, and general inaction by local, state and federal officials, activists should push government agencies at all levels to adopt best practices. The majority of best practices center on community development via infrastructure and planning. There are

202. Barboza, *supra* note 95.

also prevention mechanisms that government officials can mandate building owners utilize in buildings close to highways. Based on the available research and the recommendations put into place by EPA,²⁰³ the greatest danger from harmful highway pollutants is within five hundred feet of a highway. Therefore, while there is risk from highway pollutants at farther distances, this Part will focus on solutions to address the health hazards arising from sites within five hundred feet.

A. Necessary Changes to Siting Regulations, Transportation Infrastructure, and Community Development

1. Large Shifts: Housing Siting Requirements and Community Development

The ideal prevention technique is to ensure housing developments are at least more than five hundred feet from a heavily trafficked road. Essentially, this would be similar to the five hundred feet requirement for school sites in California.²⁰⁴ However, there are some major obstacles to this approach. First, there are often already existing structures within five hundred feet of highly trafficked roads. Even if developers built on sites further away from highways in the future, the vulnerable populations currently residing near highways are still at risk. Second, in many places, particularly large cities with dense roadways, ensuring that buildings are more than five hundred feet away from a highway may be impossible. The California statewide regulation requiring that schools not be sited within five hundred feet of a highway²⁰⁵ provides an illustration of what would likely happen should other states or cities promulgate five hundred feet laws. Even though the burden of siting primary and secondary schools is significantly less than siting all housing development, as fewer schools are built than housing developments, numerous new California schools have still been opened within the distance of five

203. See U.S. ENV'T PROT. AGENCY, *supra* note 51.

204. 2003 Cal. Legis. Serv. ch. 668 (S.B. 352) (West). This bill, discussed in more depth earlier in Part II, is a 2003 California state law that banned the building of new primary and secondary schools within five hundred feet of a highway.

205. *Id.*

hundred feet.²⁰⁶ California school districts have established these new schools by sidestepping the requirement with a finding that either the student's health would not be significantly affected, or that the benefits of the location outweigh its risks.²⁰⁷ But even if this loophole were closed, the larger problem may simply be that there are no feasible alternative locations for new school sites.²⁰⁸ That problem would only be amplified in the context of housing sites, as generally there is significantly more housing development than school development. Therefore, applying the concept of five hundred feet to housing may not be a uniformly fruitful course of action.

An alternative that government officials should consider is redeveloping communities by completely removing highways running through high-density population areas. Such a large-scale undertaking may not seem feasible, especially considering the ubiquity of highways in daily life, but cities are doing so in ever-increasing numbers.²⁰⁹ One of the primary reasons to tear down or transform parts of highways is cost reduction.²¹⁰ The immense costs of repairing dilapidated highways are reflected in a 2017 report issued by the American Society of Civil Engineers, which estimated that U.S. roads and bridges need \$2 trillion in federal funding to deliver necessary improvements.²¹¹ The budget for the entire Federal Highway Administration in that fiscal year was a little over \$51.5 billion.²¹² Thirty-nine times that annual budget would be needed to

206. Five new schools have been built by the Los Angeles Unified School District within five hundred feet of a freeway since the passage of the California statewide law. Larrubia, *supra* note 146.

207. 2003 Cal. Legis. Serv. ch. 668 (S.B. 352) (West).

208. Larrubia, *supra* note 146.

209. Many cities around the United States, including Portland, Rochester, Milwaukee, Boston, and San Francisco, are tearing down or transforming parts of dilapidated interstates rather than repairing them. According to Rob Steuteville of the nonprofit Congress for New Urbanism, the redevelopments "are largely happening because old highways are costly to rebuild." Leanna Garfield, *American Highways Are So Expensive That Cities Are Tearing Them Down—Here's What They're Turning Into*, BUS. INSIDER (May 6, 2018), <https://www.businessinsider.com/highway-closing-city-transformation-2018-5> [<https://perma.cc/J55L-JJ8X>]. Transformations have included the creation of new parks, such as the Tom McCall Waterfront Park in Portland, Oregon, and of new boulevards, such as the Riverwalk in Milwaukee, Wisconsin. *Id.*

210. Garfield, *supra* note 209.

211. Thomas Frank, *Civil Engineers Say Fixing Infrastructure Will Take \$4.6 Trillion*, CNN (Mar. 9, 2017), <https://money.cnn.com/2017/03/09/news/infrastructure-report-card/index.html> [<https://perma.cc/BA4F-9VYL>].

212. U.S. DEP'T OF TRANSP., BUDGET HIGHLIGHTS FISCAL YEAR 2017, at 4 (2017).

reach the two trillion dollar mark. Removing portions of existing highways would not necessarily impede transportation, either, as massively polluting highways could be converted into smaller, pedestrian-friendly boulevards or into public transportation such as light rail.²¹³ Still, even when governments are tearing down or transforming parts of highways, such action is taken incrementally, one small section at a time, and reprieve from highway pollution is slow. Smaller changes and mitigation options, while less ideal, should be implemented simultaneously while large-scale change is occurring.

2. Small Shifts: Diesel Truck Bans

A short-term infrastructure change recommended by researchers is a ban on diesel trucks for certain stretches of highways.²¹⁴ The targeted stretches would be those nearest to areas of risk; that is, where there are particularly vulnerable sites, such as schools or a dense concentration of residences.²¹⁵ A government diesel vehicle ban for certain stretches of highway, however, still raises equity concerns for already marginalized communities. Modern highways are often built through more minority neighborhoods because those contain residents frequently lacking the resources or ability to advocate for themselves.²¹⁶ Without oversight, a similar problem could occur with a ban of diesel vehicles, and white neighborhoods could disproportionately reap the benefits of reduction in highway pollution. A diesel vehicle ban also addresses only the areas deemed most at risk.

B. Necessary Mitigation Best Practices

Changes to infrastructure can take years, if not decades. In the meantime, shorter term mitigation best practices should be used to reduce the impact of pollutants on communities near highways.

213. Rachel Dovey, *Tampa Residents Look for Alternatives to State DOT's Highway Plan*, NEXT CITY (Apr. 26, 2017), <https://nextcity.org/daily/entry/tampa-highway-plans-push-back-state-dot> [<https://perma.cc/T6C7-JXFC>].

214. See Hopkins, *supra* note 66 (explaining how diesel truck bans can reduce highway pollution in the short-term).

215. *Id.*

216. See, e.g., Chester, *supra* note 44 (explaining that a rebuild of the Brooklyn-Queens Expressway that would have passed through Brooklyn Heights was deferred to a panel to discuss alternatives because wealthy residents of Brooklyn Heights spent “more than \$100,000 of their own money on consulting experts and lobbyists to fight [the rebuild]”).

These practices include sound and vegetation barriers, as well as air pollution filters.

1. Sound and Vegetation Barriers

The EPA's 2015 report on reducing pollution near schools briefly mentions both sound and vegetation barriers.²¹⁷ These options lead to quick results because they do not require a shifting of infrastructure; instead, they accommodate for the presence of any existing highway. Researchers have primarily focused on these two types of barriers when studying how to mitigate highway pollution.²¹⁸ The most common form of barrier is the sound wall, with over 1,938 miles built across the United States and its territories as of 2010.²¹⁹ While originally assembled to prevent loud highway noise from carrying to areas near a highway, sound walls also have substantial success in containing highway pollutants. Research shows that "reductions in downwind pollutant concentrations within approximately five hundred feet of a highway in the presence of a well-designed sound wall can be on the order of 15% to 50%."²²⁰ Sound walls are most effective when built within two hundred feet of a highway²²¹ and constructed from material that is rigid and dense.²²² Existing sound walls have all been funded by the government.²²³

Federal law mandates that states must consider building a sound wall when a certain threshold of noise is reached, in order to receive federal funding for construction or reconstruction of a highway.²²⁴ Unfortunately, there are many stretches of highway

217. ENV'T PROT. AGENCY, *supra* note 51, at 11.

218. *Id.* at 12–13 (discussing sound and vegetation barriers as two types of roadside barriers that can reduce and limit highway pollution).

219. U.S. DEP'T OF TRANSP., SUMMARY OF NOISE BARRIERS CONSTRUCTED BY DECEMBER 31, 2010 (2012), https://www.fhwa.dot.gov/environment/noise/noise_barriers/inventory/summary/sintro7.cfm [<https://perma.cc/JZ6S-EGJC>].

220. Baldauf et al., *supra* note 180, at 7507 ("With winds directionally from the road, concentrations of CO and PM number generally decreased between 15 and 50% behind the noise barrier.").

221. U.S. DEP'T OF TRANSP., HIGHWAY TRAFFIC NOISE BARRIERS AT A GLANCE, https://www.fhwa.dot.gov/Environment/noise/noise_barriers/design_construction/keepdown.cfm [<https://perma.cc/JZ6S-EGJC>].

222. Material should have a density of at least twenty kilograms per square meter. *Id.*

223. *Id.*

224. U.S. DEP'T OF TRANSP., HIGHWAY TRAFFIC NOISE, available at <https://www.fhwa.dot.gov/Environment/noise/> [<https://perma.cc/6MSX-CBV3>].

where noise does not meet the set threshold but there is significant pollution, and states have taken little initiative on their own to expand sound walls beyond required areas.²²⁵ In many cases, such inaction has been because of associated cost.²²⁶ Although governments aim to save costs when constructing sound walls,²²⁷ sound walls can still be expensive. According to the Federal Highway Administration in 2010, the average cost of building a sound wall is \$30.78 per square foot.²²⁸ In one state, Ohio, the average cost per mile of sound wall is \$1.8 million, and the state has spent \$375.6 million in total on its 232 miles of sound walls.²²⁹ Government officials often balk at these perceived overlarge costs. The Environmental Administrator for the Ohio Department of Transportation, Tim Hill, stated in an interview that he wishes he “could change” the need for sound walls and that with the money for sound walls freed up, he could “fill a lot of potholes.”²³⁰ The Ohio Department of Transportation is currently attempting to find cheaper noise barriers, like earthen berms, which would not be as effective in preventing the spread of highway noise pollutants.²³¹

However, while the upfront costs to combat highway pollution can be large, studies indicate the cost of ill health and lost lives is significantly larger. One U.S. study reported that the health costs of vehicle related air pollution in 1990 was, on the low end of a yearly

(“Compliance with the noise regulations is a prerequisite for the granting of Federal-aid highway funds for construction or reconstruction of a highway.”).

225. Duane Pohlman, *Investigating the Benefits, Cost of Sound Walls*, WKRC (Oct. 30, 2018), <https://local12.com/news/investigates/investigating-the-benefits-cost-of-sound-walls> [<https://perma.cc/T9J9-7M5G>].

226. *Id.*

227. Patty Watanabe, a landscape architect for Los Angeles and Ventura counties in Southern California, said regarding the sound barriers she constructs that, “You’re going to see a lot of the same things . . . because those are the things that are in stock in the maintenance yards. And if you have to get something different then it’s more costly. We’re trying to be good stewards of the public funds.” Nate Berg, *Muting the Freeway*, MEDIUM (Dec. 1, 2014), <https://medium.com/re-form/muting-the-freeway-e18ee195bd38> [<https://perma.cc/Q7PB-KGHX>].

228. Prices to construct sound barriers do not seem to have varied significantly, as the average over the past 10 years has been \$30.56 per square foot. U.S. DEP’T OF TRANSP., *supra* note 219.

229. This number can be smaller in cases where there are fewer metropolitan areas—Kentucky, for example, has spent only \$25.4 million on sound walls. Pohlman, *supra* note 225.

230. *Id.*

231. *Id.*

estimate, \$54.7 billion.²³² More recent studies from other countries suffering from the same highway pollution related health effects have estimated health costs to be in the billions as well.²³³ As the situation stands, while sound walls cannot eliminate adverse health effects, the severity of harm to health caused by highway pollution is clear²³⁴ and the necessary government funds should be diverted towards building these barriers.

Vegetation barriers serve a similar noise reduction purpose to sound barriers,²³⁵ but if the climate is correct can be even more successful in catching certain types of pollutants, including particulate matter.²³⁶ The best type of vegetation barrier to use depends on the environment in which the barrier is being built. Thick vegetation with full coverage typically catches the most pollutants, but sound barriers can be more effective depending on the density of vegetation based on climate and weather.²³⁷ Although there is less research done on vegetation barriers than on sound walls, the information available suggests that implementation of both barriers simultaneously is the best way to combat the spread of highway pollutants. EPA has reported that “the combined use of vegetation and sound walls has shown promise in reducing vehicle pollution downwind of roadways by up to 60%.”²³⁸

232. Donald R. McCubbin & Mark A. Delucchi, *The Health Costs of Motor-Vehicle-Related Air Pollution*, 33 J. TRANSP. ECON. & POL’Y 253, 266 tbl.2 (1999). Note that air quality in the United States has improved since 1990, but that particulate matter concentration—adverse health effects from which accounted for the bulk of health costs in the study at a low-end estimate of \$52.1 billion—has been reduced by less than 50% since 1990. *Air Quality—National Summary*, ENV’T PROT. AGENCY, <https://www.epa.gov/air-trends/air-quality-national-summary> [<https://perma.cc/U2KZ-UA84>].

233. See, e.g., Tanjima Pervin et al., *Societal Costs of Air Pollution-Related Health Hazards: A Review of Methods and Results*, 6 COST EFFECTIVE RES. ALLOCATION 19, 31 (2008) (finding that a study estimated that “pollution-related damage cost was about 2.8% of GDP for Germany, 4.4% for Italy, 3.9% for the Netherlands, and 2.0% for the UK”).

234. See *supra* Part I (discussing research regarding the adverse health effects resulting from highway pollutants in detail).

235. U.S. ENV’T PROT. AGENCY, *supra* note 51, at 13.

236. Zheming Tong et al., *Roadside Vegetation Barrier Designs to Mitigate Near-Road Air Pollution Impacts*, 541 SCI. OF THE TOTAL ENV’T 920, 926 (2016) (demonstrating that a wide vegetation barrier or vegetation-solid barrier combinations, such as trees next to solid barriers, mitigate roadside particulate matter).

237. ENV’T PROT. AGENCY, *supra* note 51, at 3.

238. *Id.* at 13. The EPA cites a study that measured concentrations of particulate matter in the open area adjacent to a highway and compared that

2. Air Pollution Filters

A final best practice recommendation is the use of air pollution filters in buildings themselves. Air pollution filters vary by grade; one of the highest-grade air pollution filters currently available are high-efficiency particulate air (HEPA) filters.²³⁹ HEPA filters, unlike other pollution filters, target particulate matter and have shown some efficacy in filtering particulate matter out.²⁴⁰ Air pollution filters have already been used to combat highway pollution in some instances,²⁴¹ but face difficulties in seeing widespread use in residential properties, again because of cost. A survey of HEPA filters sold in the United States shows that filters effective for the space of just one room typically cost six hundred dollars or more, without counting additional energy usage costs. The filter must also be replaced regularly.²⁴² EPA notes that replacement may be required as frequently as sixty to ninety days.²⁴³

Even HEPA filters cannot catch all particulate matter, and research has been inconclusive as to whether the amount of particulate matter the filters catch is enough to alleviate symptoms from respiratory problems like asthma and chronic obstructive pulmonary disease or to prevent other respiratory-related issues.²⁴⁴ Therefore, action taken by governments cannot just be limited to requiring air pollution filtration units, and must extend to the broader infrastructure changes previously mentioned.

amount to the measured concentrations of particulate matter in the lee of a noise barrier an equivalent distance from the highway. The study found the concentration at the lee of the noise barrier to be “~60% of the concentrations of the open area.” Bowker et al., *supra* note 152, at 8137.

239. Intermountain Med. Ctr., *Indoor HEPA Filters Significantly Reduce Pollution Indoors When Outside Air Unhealthy, Study Finds*, SCIENCE DAILY (Sept. 25, 2018), <https://www.sciencedaily.com/releases/2018/09/180925110030.htm> [<https://perma.cc/QNH3-XBP7>].

240. *Id.*

241. One instance includes schools exposed to high levels of air pollution in New York City. Elsen-Rooney, *supra* note 187.

242. ENV'T PROT. AGENCY, GUIDE TO AIR CLEANERS IN THE HOME 3 (2018), available at https://www.epa.gov/sites/production/files/2018-07/documents/guide_to_air_cleaners_in_the_home_2nd_edition.pdf [<https://perma.cc/P59Z-8Z2U>].

243. *Id.* at 7.

244. Intermountain Med. Ctr., *supra* note 239.

C. Legal Mechanisms to Force Action: The Fair Housing Act

1. Fair Housing Act and its Application to Existing Highways

If legislators fail to adopt the necessary changes and mitigation measures described in Sections III.A and III.B of this Note—which seems likely based on past conduct—an alternative that has not yet been explored fully is for residents to file lawsuits under the Fair Housing Act to hold the government accountable. The Fair Housing Act, also known as Title VIII of the Civil Rights Act of 1968, is enforced by the United States Department of Housing and Urban Development (HUD).²⁴⁵ It prohibits discrimination on the basis of, amongst other protected characteristics, race and color²⁴⁶ and allows HUD, the Department of Justice, and private persons to bring civil actions. The Fair Housing Act requires that “[a]ll executive departments and agencies shall administer their programs and activities relating to housing and urban development . . . in a manner affirmatively to further the purposes of [the Fair Housing Act].”²⁴⁷ The Supreme Court has also held that disparate impact cases are permissible under the Fair Housing Act.²⁴⁸

No actions regarding highway pollution have been brought under the Fair Housing Act before.²⁴⁹ Nevertheless, the clear differences between communities of color and white communities in exposure to highway pollution and the degree of detrimental health effects experienced make for a potential disparate impact claim. In *Texas Department of Housing and Community Affairs v. The Inclusive Community Project*, the Supreme Court examined a case where the Texas Department of Housing and Community Affairs allegedly “continued segregated housing patterns by its disproportionate allocation of tax credits” by granting too many credits in inner-city areas and too few in suburban neighborhoods, thus discouraging

245. 42 U.S.C. § 3612; 42 U.S.C. § 3602(a).

246. Fair Housing Act of 1968 § 804, 42 U.S.C. § 3604.

247. 42 U.S.C. § 3608(d).

248. See *Tex. Dept. of Hous. & Comm. Affs. v. Inclusive Comm. Proj.*, 135 S. Ct. 2507 (2015).

249. Terenia Urban Guill, *Environmental Justice Suits Under the Fair Housing Act*, 12 TUL. ENVTL. L.J. 189, 232 (1998) (explaining that although no Fair Housing Act highway pollution claims had yet been made in 1998, the “I-49 inner city extension in Shreveport, Louisiana may provide a testing ground for an argument for a broad interpretation of the reach of the Fair Housing Act.”).

construction of low-income housing in primarily white suburban areas.²⁵⁰ For the first time, the Supreme Court ruled that disparate impact cases were cognizable under the Fair Housing Act. It made its holding based on two primary factors. First, the Court looked to the similarity of the results-oriented language of the Fair Housing Act compared to Title VII of the Civil Rights Act and the Age Discrimination in Employment Act of 1967, both of which permitted disparate impact claims.²⁵¹ Second, the Court explained that permitting disparate impact claims was “also consistent with the [Fair Housing Act’s] central purpose,” which was to “eradicate discriminatory practices within a sector of the Nation’s economy.”²⁵²

However, it limited the potential for a disparate impact claim by holding that a claim “that relies on a statistical disparity must fail if the plaintiff cannot point to a defendant’s policy or policies causing that disparity.”²⁵³ Justice Kennedy, writing for the Court, also stated that disparate impact claims under the Fair Housing Act had a “robust causality requirement.”²⁵⁴ In doing so, some scholars argue that he diverged from longstanding disparate impact precedent that finding a sufficient causal link between the challenged practice and the disproportionate harm to a protected class was enough.²⁵⁵

Following the Supreme Court opinion in *Texas Department of Housing and Community Affairs*, HUD, under the Obama

250. *Tex. Dept. of Hous. & Comm. Affs.*, 135 S. Ct. at 2514.

251. *Id.* at 2518–20 (holding that the results-oriented “otherwise make unavailable” phrase in the Fair Housing Act “refers to the consequences of an action rather than the actor’s intent” just like the “otherwise adversely affect” language in Title VII and the Age Discrimination in Employment Act does).

252. *Id.* at 2521.

253. The Court reasoned that only by setting such a limit could it protect a defendant from “being held liable for racial disparities they did not create.” *Id.* at 2523.

254. *Id.*

255. Sidney Pierce, *Property Tax Foreclosure Policies Under the Fair Housing Act: Lessons From Morningside*, 90 TEMP. L. REV. ONLINE 1, 14 (2018) (“While the *Inclusive Communities* decision officially recognized that the FHA does allow for disparate impact claims, it also has altered how the disparate impact doctrine functions in the FHA context. In fact, the decision articulates heightened standards a complainant must meet to successfully shift the burden to the defendant.”). Several courts, however, have rejected the argument that the Supreme Court was imposing a higher standard for a Fair Housing Act disparate impact claim to succeed. Jamie L. Crook, Nat’l Low Income Housing Coal., *Disparate Impact*, in 2019 ADVOCATES’ GUIDE 7-8, 7-8–7-10 (2019), https://nlihc.org/sites/default/files/AG-2019/07-03_Disparate-Impact.pdf [<https://perma.cc/ACL2-X3LY>].

Administration, promulgated the 2015 Affirmatively Furthering Fair Housing rule.²⁵⁶ Affirmatively furthering fair housing, per the rule, meant “taking meaningful actions that, taken together, address significant disparities in housing needs and in access to opportunity.”²⁵⁷ To do so would involve “replacing segregated living patterns with truly integrated and balanced living patterns, transforming racially and ethnically concentrated areas of poverty into areas of opportunity, and fostering and maintaining compliance with civil rights and fair housing laws.”²⁵⁸ However, in July 2020, the Trump Administration announced that the Affirmatively Furthering Fair Housing rule was to be rescinded and replaced with the Preserving Community and Neighborhood Choice rule.²⁵⁹ The Preserving Community and Neighborhood Choice rule defines affirmatively furthering fair housing to mean any action rationally related to promoting housing that is “affordable, safe, decent, free of unlawful discrimination, and accessible under civil rights laws.”²⁶⁰ While the Fair Housing Act itself is not affected by the rollback of the 2015 Affirmatively Furthering Fair Housing rule, the lowered standard of what amounts to “affirmatively furthering fair housing” in the Preserving Community and Neighborhood Choice rule will almost certainly make for a difficult argument in court. In part, the Preserving Community and Neighborhood Choice rule lacks the forward-looking “transforming” concentrated communities of color in poverty to “areas of opportunity.”²⁶¹

256. 24 C.F.R. § 5.150.

257. 24 C.F.R. § 5.152.

258. *Id.* At the time the rule was promulgated in 2015, it required more than 1,200 jurisdictions receiving HUD block grants and housing aid to analyze their housing stock. The jurisdictions then had to submit a plan, called the Fair Housing Assessment, to address patterns of segregation and discrimination. If HUD decided that the Assessment was not sufficient, the city or county would have to rework the plan or risk losing funding. Juliet Linderman & Hope Yen, *HUD Seeks to Roll Back Obama Rule on Housing Desegregation*, AP NEWS (Jan. 7, 2020), <https://apnews.com/d46eb016f7ed3d9eae9a5e5de5c1bde4> [<https://perma.cc/6QHL-N7JE>].

259. Press Release, U.S. Dep’t. of Hous. & Urb. Dev., Secretary Carson Terminates 2015 AFFH Rule (July 23, 2020), https://www.hud.gov/press/press_releases_media_advisories/HUD_No_20_109 [<https://perma.cc/B7LN-TLAN>].

260. *Id.*; *see also* Preserving Community and Neighborhood Choice, 85 Fed. Reg. 47,899, 47,905 (Aug. 7, 2020) (to be codified at 24 C.F.R. pt. 5, 91, 92, 570, 54, 576, 903) (“The phrase ‘fair housing’ . . . means housing that, among other attributes, is affordable, safe, decent, free of unlawful discrimination, and accessible as required under civil rights laws.”).

261. 24 C.F.R. § 5.152.

As a disparate impact case under the Fair Housing Act about highway pollution has never been heard before, it is impossible to predict if or how a court would entertain such a case. An ideal private plaintiff for a case under the Fair Housing Act regarding exposure to highway pollutants would likely be of minority status, residing within five hundred feet of a highway. Such a case would rely upon the statistical disparities between the degree to which minority communities are exposed to highway pollutants compared to white communities.²⁶² The plaintiff would then need to point to a specific policy or policies that caused such a disparity. Here, a potential avenue of attack would be the deliberate policies of state and local governments, when highways were first established, to route these highways through minority communities. However, there will not be explicit evidence of such policies in all jurisdictions.

There are certainly weaknesses, like a potentially tenuous link between a specific governmental policy and the resulting statistical disparity. However, if such a case does succeed, the plaintiff could receive compensatory damages or injunctive relief.²⁶³ Ultimately, even if the case does not succeed in the courtroom, it could shine the spotlight on the disparate impact of highway pollution. When the Affirmatively Furthering Fair Housing rule was still in place, jurisdictions receiving federal funding were required to make and implement a plan to “overcome historic patterns of segregation . . . and foster inclusive communities that are free from discrimination” in their housing stock.²⁶⁴ If HUD then determined that disproportionate exposure of minority communities to highway pollution based on the location of highways and the siting of housing constituted a pattern of discrimination, it could force jurisdictions to propagate solutions to mitigate highway pollution—the best practices discussed, such as barriers coupled with filtration units—or risk losing federal funding. However, that option is no longer currently available to communities of color bearing significant health burdens as a result of disproportionate exposure to highway pollution. Such a situation makes it all the more important that a clear disparate impact mechanism be available in order to further the goals of the Fair Housing Act and, most importantly, further the progress of housing justice in the United States.

262. *See supra* Part I (discussing such disparities in detail).

263. 42 U.S.C. § 3613(c)(1).

264. 24 C.F.R. § 5.150.

CONCLUSION

The United States highway system is ubiquitous in daily life, but its users often are unaware of the racial motivations behind its construction—motivations that have passed through the decades to disproportionately impact minority communities to this day. This Note has brought into focus the connection between highway siting and location of minority populations, as well as discussed the extent of health effects resulting from highway pollutants. It is time to recognize highway pollutants as the public health crisis they entail and to contextualize the siting of highways as a civil rights issue. Federal, state, and city officials all must take action to implement necessary best practices ranging from large shifts in infrastructure to smaller mitigation practices such as built barriers. Ultimately, the health of vulnerable communities should be a priority in the eyes of all—citizens and government officials alike.