

Lessons from the Tri-State to the Triangle:

Mitigating Environmental and Health Impacts from Transportation in Populous Regions

by

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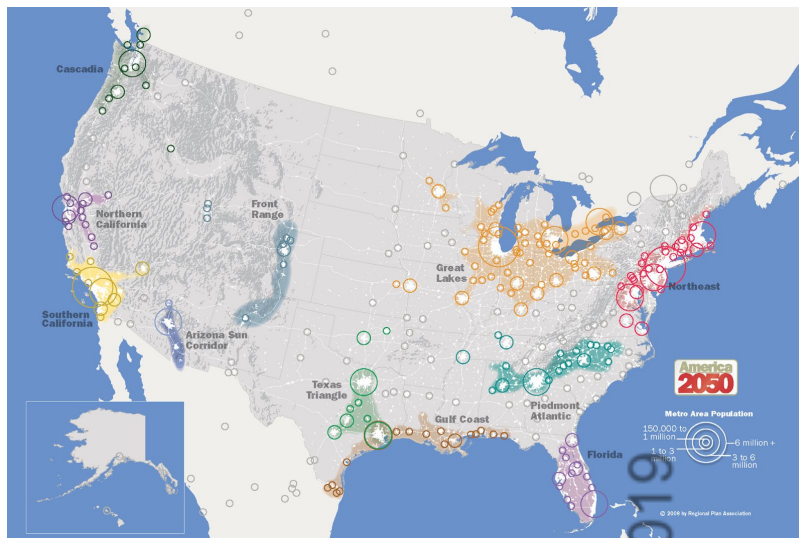
The health, well-being and prosperity of any region relies heavily on the transportation systems of the area. The ability to move goods and people efficiently while also protecting public health makes a significant impact on the economic and environmental vitality of a region.

The increasing disparities in income, residential racial segregation and concentrations of mobile source emissions in communities of color and low-income communities create significant challenges for the populous region extending along the eastern seaboard from North Carolina to New England.

Critical infrastructure investments can be made to ensure that megaregions provide access to economic opportunities while also improving the environmental, public health and quality of life benefits that millions of residents need. These investments have the potential to address historic inequalities and environmental injustices that continue to impact the region's most vulnerable communities while also contributing critically to climate mitigation.

The Megaregions Context

In 2004, a University of Pennsylvania study of opportunities to create more global markets in the United States by the year 2050 advanced the concept of megaregions as central to U. S. global competitiveness. Global markets are defined by characteristics such as world-class economies, education, and transportation. At the onset of the study, there were only two global cities in the United States, New York, NY and Los Angeles, CA. The challenge was to leverage the world-class characteristics of individual cities within a region to create an economic entity capable of competing in global markets.



"More than 70 percent of the nation's population, exceeding 237 million, and jobs are located in 11 megaregions identified by the Regional Plan Association (RPA), an independent, non-profit New York-based planning organization."
<http://www.america2050.org/content/megaregions.html>.
 Retrieved October 1, 2014.)

Map of U.S. Megaregions:

http://www.america2050.org/assets_c/2014/02/2050_Map_Megaregions2008-3663.html

Since the 2004 University of Pennsylvania study, follow-up studies have offered varying definitions of megaregions. Most relevant for an examination of transportation-related environmental and health impacts in populous regions is common natural and man-made infrastructure. "Interlocking economic systems, shared natural resources and ecosystems, and common transportation systems link these population centers together. The five major categories of relationships that define megaregions [are as follows]":

(<http://www.america2050.org/content/megaregions.html>)¹

Categories of Megaregion Relationships

- Environmental systems and topography
- Infrastructure systems
- Economic linkages
- Settlement patterns and land use
- Shared culture and history

As the geography of an economic center expands and the length of commutes within a megaregion increases, the need for fast, affordable, efficient, and clean transportation becomes more apparent. The multiple city and state solutions can be confined by constraints within political jurisdictions and corresponding budgets. There are lessons to be learned from intergovernmental bodies/collaborations that cross local and state jurisdictions.

"Across the nation, community leaders, businesses, and policymakers are confronted by challenges that affect their cities and neighborhoods, but which cannot be solved by actions taken solely at the city or metropolitan scale. One example is moving goods efficiently from

¹ Schned, Dan. "The Northeast Corridor Needs Critical Repairs & Upgrades Now." *Arizona Sun Corridor - America 2050*, Regional Plan Association, 10 June 2013, www.america2050.org/2013/06/the-northeast-corridor-needs-critical-repairs-upgrades-now.html#more.

coastal ports through congested metropolitan areas to reach inland destinations; or providing new jobs in the face of major economic restructuring to a post-industrial economy.”

<http://www.america2050.org/content/megaregions.html>

Transportation Planning in the Tri-State and Northeast Megaregion:

The Northeast Megaregion is characterized by a concentration of leading institutions of higher education, combined with the financial capital of New York, as well as medical institutions (eds and meds), and the political capital of Washington, DC. In recent years, the megaregion has grown to include the major cities of Boston, New York City, Philadelphia, Washington, D.C. and cities in northern Virginia.

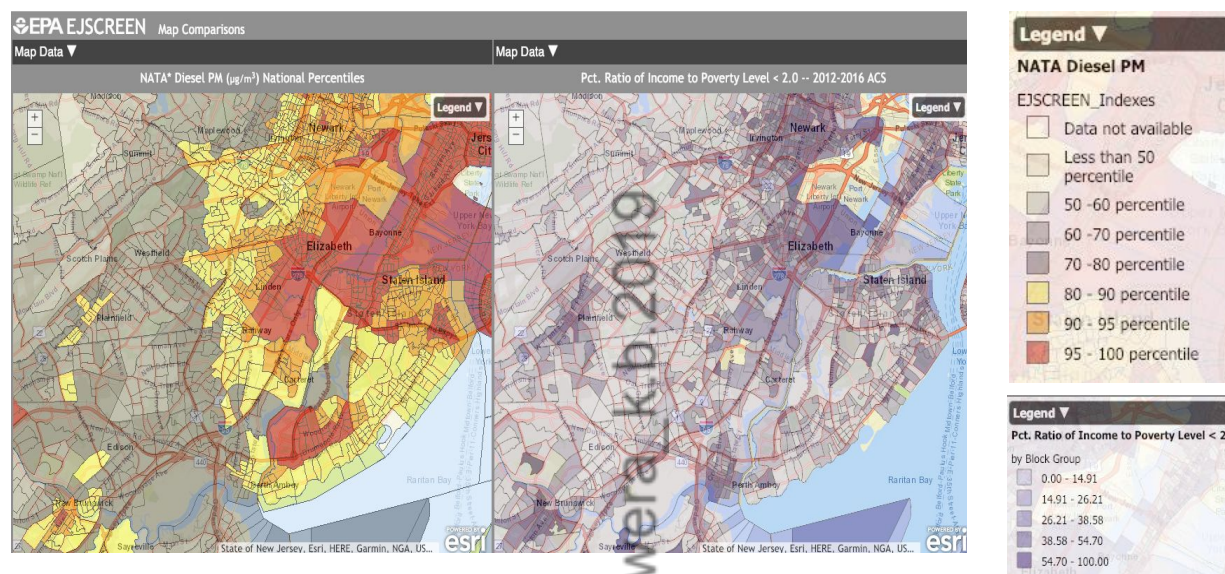
“Transportation is the backbone of the region’s economy. But years of population and job growth and underinvestment in both maintenance and new construction have led to congestion, lack of reliability, and major disruptions on a regular basis. New large-scale projects [are needed] to modernize and extend the subways and regional rail networks, as well as upgrade airports and seaports. These investments will have far-reaching positive effects on land use, settlement patterns, public health, goods movement, the economy, and the environment.

RPA Fourth Regional Plan, <http://fourthplan.org/about/executive-summary>²

² Regional Plan Association. “Executive Summary.” *The Fourth Regional Plan*, Regional Plan Association, Nov. 2017, fourthplan.org/about/executive-summary.

Lessons from the Tri-State

As the country's most densely-populated region, the Tri-State area (NY, NJ, CT) faces major challenges providing and maintaining adequate commuter and freight infrastructure. New Jersey is home to the largest seaport on the East Coast, the Port of Newark & Elizabeth. Along with related logistics infrastructure, the port is a major economic engine for the region; it is a source of both disproportionate benefits (profits and jobs) and burdens (severe environmental and quality of life impacts), as shown by several indicators of regional air quality.



NATA* Diesel PM map comparison with Income to Poverty Level Map
source: EPA EJScreen

The environmental and human health impacts from air pollution are several and growing (Xin Xu)³. In the Tri-State, and the greater Newark region in particular, there are many polluting industries (past and present) which contribute to poor air quality, along with contaminated soil and waterways (NJ Spotlight).⁴ As New Jersey's most populous city, Newark also serves as a major regional transportation hub with a seaport, an airport, a major mass transit center, and several major highway systems. This makes the city a prime regional asset at the center of international commerce, generating large profits for business and jobs for surrounding high-income areas, which include some of the most affluent counties in the nation (NJ.com).⁵

As seen in many major cities, much of the development and investment in Newark has been concentrated in the city-center or "Downtown" area, where most businesses cater to the influx

³ Xu, Xin, et al. "Environmental Pollution and Kidney Diseases." *Nature Reviews Nephrology*, vol. 14, no. 5, 2018, pp. 313–324., doi:10.1038/nrneph.2018.11.

⁴ Gurian, Scott. "Introducing 'Dirty Little Secrets,' a Collaborative Investigation in New Jersey." *NJSpotlight.com*, NJ Spotlight, 20 Oct. 2015, www.njspotlight.com/stories/15/10/19/introducing-dirty-little-secrets-a-collaborative-investigation-in-new-jersey/.

⁵ Desk, Star-Ledger Continuous News. "2 N.J. Counties among 10 Wealthiest in U.S." *NJ.com*, NJ.com, 21 Sept. 2012, www.nj.com/news/index.ssf/2012/09/2_nj_counties_among_10_weathie.html.

of weekday commuters, event-center patrons, and colleges and universities. This focus on the needs and interests of the transient population has a long history throughout the nation, known broadly as *place-building / place-making for visitors or outsiders* (D. Judd).⁶ In an environmental justice community like Newark, this model of development creates and maintains much of the inequality and environmental degradation that creates adverse socioeconomic conditions.

As one of the country's oldest cities, Newark was established as a major industrial corridor, with many factories, breweries, and other manufacturers dependent on commerce along the Passaic River close to New York City. Early on, the economic success of these companies in the North depended on goods sold to the antebellum South, just as the northern states profited from slavery and the wealth of the slave-owning class. Today the "old south culture" still challenges access for people of color communities and tribal areas that have suffered centuries of disparities related to growth and expansion for the "greater good."

By the early and mid-1800s, waves of Irish and German immigrants began to settle in Newark, and by the late 1800s through the 1920s Africans-Americans migrated to Newark in large numbers. African-American were restricted to substandard segregated housing, which would become progressively worse through the 1960s. After World War I, many of the nation's commercial centers like Newark experienced severe economic challenges, and race-based policies began to result in white-flight to the suburbs, spurred by government subsidies (i.e., the GI Bill) and redlining of the more desirable surrounding suburbs.⁷

In the 1950s, major new highway systems facilitated easy access between segregated suburbs and cities, destroying Newark's African-American neighborhoods, and later Puerto Rican neighborhoods as well. This was consistent with trends in cities throughout the U.S. as part of FDR's National Industrial Recovery Act. This pattern of displacing African-American neighborhoods was unofficially termed the "Negro Removal Act," which added to an atmosphere of existing racial and economic tensions. Pivotal events like the Newark Riots and Rutgers Conklin Hall Takeover marked the 1960s, and would be followed by decades of disenfranchisement, public divestment, and government neglect (WNET).⁸ Yet, Newark continued to serve as a major regional industrial center where polluting facilities and businesses continued to operate profitably, providing little or no benefit to most residents.

Throughout the late 20th century, infrastructure investments in toxic facilities continued, while private industry's power and influence grew. Even in the case of residential housing stock, approximately 1/5th of Newark residents are homeowners, which leaves an overwhelming majority of renters, and a large number of non-resident landlords/property owners wielding a great deal of influence. This power even extends to local publicly-owned lands that are

⁶ Judd, Dennis R. *The Infrastructure of Play: Building the Tourist City*. Routledge, 2015.

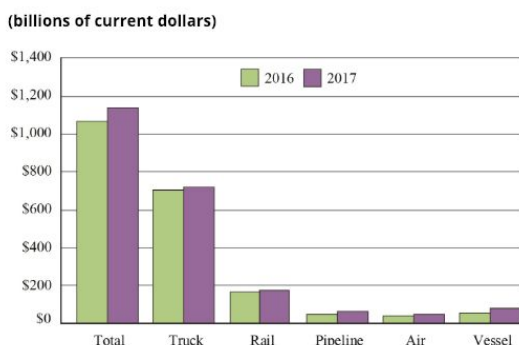
⁷ Ira Katznelson, *When Affirmative Action was White. An Untold Story of Racial Inequality in Twentieth-Century America*. New York, N.Y. and London, England: W.W. Norton & Company, 2005

⁸ "A Walk Through Newark. History. Industrial Revolution | Thirteen/WNET." *Thirteen.org*, WNET, 2002, www.thirteen.org/newark/history2.html.

managed and/or operated under the authority of higher levels of government or quasi-governmental entities (i.e., the Port Authority of NY & NJ).

The Port of Newark & Elizabeth is the epicenter of international commerce, where goods are moved by about 14,000 diesel drayage truck-trips per day along major highways and local roads to nearby warehouses, assembly facilities, and retailers (Coalition for Healthy Ports).⁹ In July 2018 the Port Authority of New York and New Jersey (PANYNJ) published a \$100 million plan to mitigate truck traffic, in anticipation of an estimate 68% increase in cargo traffic by 2045 (H. Morley).¹⁰

Figure 1: U.S.-North American Freight by Mode: 2016-2017



Source:

Bureau of Transportation Statistics, TransBorder Freight Data, <https://www.bts.gov/transborder> as of February 2018.

In port-adjacent communities all over the country, residents are disproportionately burdened by the pollution produced at multiple points in the processes of exporting, importing, storing, and distributing goods. Everywhere, diesel-powered trucks play a major role in moving goods into, out of, and around the country. According to the U.S. Department of Transportation, in 2017 trucks carried 69.1% of freight, measured by its value (Bureau of Transportation Statistics, 2018).

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Diesel pollution has been linked to asthma, lung disease, heart disease, heart attack, stroke, premature birth and adverse pregnancy outcomes (P. Verbanas).¹² In the U.S., some of the more far-reaching policies to mitigate truck pollution have included modernized engines with reduced emissions, as in the ports of Los Angeles and Long Beach, which require engines manufactured more recently than 2013 (J. O'Dell).¹³ The introduction of electric trucks is still in an early stage, with low market penetration and no regulations to spur mass replacement of existing diesel fleets. Other changes have included natural-gas powered trucks, which produce fewer exhaust emissions than diesel; unfortunately, production of natural gas creates severe

⁹ "Gubernatorial Ports Briefing." *Clean Water Action*, Coalition for Healthy Ports of NY & NJ, 27 June 2017, [www.cleanwateraction.org/sites/default/files/Gubernatorial Briefing Book.CHP_.final_.June 27 2017.pdf](http://www.cleanwateraction.org/sites/default/files/Gubernatorial%20Briefing%20Book.CHP_.final_.June%2027%202017.pdf).

¹⁰ Morley, Hugh R. "NY-NJ Port's \$100 Million Plan Targets Rail, Barge to Mitigate Truck Traffic." *Study Finds Wide Range in DC Operating Costs*, JOC Group Inc., 18 July 2018, [www.joc.com/port-news/us-ports/port-new-york-and-new-jersey/ny-nj-port%E2%80%99s-100-million-plan-target s-rail-barge-mitigate-truck-traffic_20180718.html](http://www.joc.com/port-news/us-ports/port-new-york-and-new-jersey/ny-nj-port%E2%80%99s-100-million-plan-target-s-rail-barge-mitigate-truck-traffic_20180718.html).

¹¹ "North American Transborder Freight Data." *Bureau of Transportation Statistics*, U.S. DOT, Mar. 2018, www.bts.gov/newsroom/2017-north-american-freight-numbers.

¹² Verbanas, Patti. "Rutgers Study Helps City Ban Large Trucks." *Rutgers Today*, Rutgers University, 27 Nov. 2018, news.rutgers.edu/news/rutgers-study-helps-city-ban-large-trucks/20181107#.XC2vys9Kgfn.

¹³ O'Dell, John. "Ports of L.A., Long Beach Are Ground Zero for U.S. Clean Truck Testing." *Trucks.com*, Trucks.com International, 20 Sept. 2018, www.trucks.com/2018/09/18/ports-la-long-beach-clean-truck-testing/?utm_referrer=https%3A%2F%2Fwww.google.com%2F.

adverse impacts disproportionately affecting communities of low-income and/or people of color. While federal policies to reduce diesel pollution in the U.S. lag, in the last year, Europe has seen an emerging trend in public policy with several nations banning the use of diesel vehicles, citing health concerns (H. Carvalho).¹⁴

In the planning and development of a growing community (i.e., housing and highways), an important natural resource that municipalities often overlook in short-sighted decision-making is vegetation; for example, trees are central to the health of the ecosystem and human quality of life. In February 2017, the City of Durham, NC published a report assessing the area's tree canopy, finding canopy covered 52% of the city. The study highlights the inverse relationship between tree canopy and surface temperature, as a means of heat mitigation, especially in public rights-of-way. The study concluded that Durham would need to plant a minimum of 500 trees per year through 2040 to keep tree canopy at its current level (SavATree Consulting Group).¹⁵

By comparison, in Newark, tree canopy covers only 20% in a city of over 11,000 people per square mile, and 70% of the city is covered with impervious surface. On the hottest days of the year, Newark may experience temperatures as much as 10 to 20 degrees higher than the surrounding suburbs. Beyond increased discomfort, these increased temperatures have critical consequences for quality of life, public health, and mortality. In many environmental justice areas, prevailing trends in economic development, which emphasize monetary costs and benefits, fail to assess consequences for community residents and the ecosystem. In Spring 2018, the Newark Office of Sustainability launched its *Trees Count Inventory* as a first step in addressing some of these issues. This initiative is ongoing (City of Newark).¹⁶

To mitigate summer heat, Newark has mandated the replacement of trees removed during new development. However, lack of transparency in decisions, industry lobbying influence, and variances have allowed commercial and industrial developments to circumvent this requirement. Further, as a general rule, young trees need time to grow in order to mitigate heat and air quality impacts as effectively as older, healthy trees, resulting in an overall deficit even when replaced.

Tree canopy coverage may also impact stormwater management and flooding issues, which are problems in Newark and throughout the eastern seaboard. As nature's green infrastructure, trees help to manage stormwater runoff and reduce soil erosion, while the roots assist in absorbing water, and the leaves provide surface area for rainfall (U.S. EPA).¹⁷ According to the National Oceanic and Atmospheric Administration (NOAA), temperature data from 1988-2017 show New Jersey is one of the fastest-warming states in the U.S., illustrating the long-term effects of short-sighted planning and a profit-centered approach to development. In contrast, an environmentally just approach would prioritize equity and human well-being as the primary

¹⁴ Carvalho, Heltonio. "The End of Diesel-Powered Cars?" *The Lancet Respiratory Medicine*, vol. 4, no. 1, 2016, doi:10.1016/s2213-2600(15)00475-0.

¹⁵ SavATree Consulting Group, Tree Canopy Assessment - City of Durham Tree Canopy Assessment - City of Durham (2017), <https://durhamnc.gov/DocumentCenter/View/17528/Tree-Canopy-Assessment---Durham-NC-2017?bidId=>.

¹⁶ "2018 Trees Count." *City of Newark*, City of Newark, 2018, www.newarknj.gov/card/2018-trees-count.

¹⁷ "Soak Up the Rain: Trees Help Reduce Runoff." *EPA*, Environmental Protection Agency, 30 Oct. 2018, www.epa.gov/soakuptherain/soak-rain-trees-help-reduce-runoff.

measurable outcomes for success. As much of New Jersey and some other areas in the northeast are expected to be completely developed by 2040,¹⁸ the path forward requires major course correction for current and future development, and aggressive investment to remedy past development missteps.

Despite efforts to reduce diesel emissions and to mitigate summer heat, as the movement of freight increases, the warehousing industry grows apace. Goods are transported from ships to warehouses by diesel trucks, increasing the number of trucks moving through, and idling, in nearby communities. Warehouses tend to be located in environmental justice areas while employment opportunities often exist elsewhere. Further, warehouse-related jobs are largely non-union, temporary, part-time, and physically demanding; they may also present occupational risks and be ripe for exploitation and wage theft from undocumented and immigrant workers. One of the largest warehouse employers nationally and internationally is facing pressure from workers in the U.S. and Europe, demanding unionization, safe working conditions, and reduced production requirements (J. Harris).¹⁹

In North America, cities from coast to coast recently competed to be selected as the location for Amazon's second headquarters, offering record-high tax credits, land use concessions, expedited approvals, and other incentives. The City of Newark offered a total of \$7 billion in incentives, based on the promise from Amazon of 50,000 high-paying jobs and a \$5 billion investment. However, in Newark and many other cities, the perceived financial benefits were overvalued, and the adverse ecologic and public health impacts were overlooked. This contest between cities quickly became characterized as a "race to the bottom" in critically assessing the broader socioeconomic implications (E. Weise).²⁰

As climate change and global warming have become a major focus of national and international discourse, there is growing pressure to implement solutions. In December 2018, New Jersey, along with a coalition of 8 other states and Washington D.C., entered into an agreement to develop a "regional low-carbon transportation policy proposal," with plans to fund it through a cap and invest model (S. LeBlanc).²¹ The details of this proposal will be developed collaboratively over the next year, and once finalized each state will have the opportunity to formally adopt and implement it. At the same time, Smart Growth America just published its LOCUS National Opportunity Zones ranking report, which identified Newark as one of its top scoring cities, seen as among "the most vulnerable for accelerated gentrification without place

¹⁸ Urban Growth in the Northeast Megaregion. (2014, September 23). Retrieved from <http://www.rpa.org/article/urban-growth-in-northeast-megaregion>

¹⁹ Harris, John. "Workers' Rights? Bosses Don't Care – Soon They'll Only Need Robots | John Harris." *The Guardian*, Guardian News and Media, 17 Dec. 2018, www.theguardian.com/commentisfree/2018/dec/17/workers-rights-bosses-tech-amazon-profits-staff.

²⁰ Weise, Elizabeth. "Amazon Second Headquarters Search Has Become a Cultural Meme, a Year after it Began." *USA Today*, Gannett Satellite Information Network, 5 Sept. 2018, www.usatoday.com/story/tech/news/2018/09/05/amazon-hq-2-search-has-become-cultural-meme-year-after-began/1180525002/.

²¹ LeBlanc, Steve. "Coalition of States to Work to Curb Transportation Emissions." *Gloucester Daily Times*, Associated Press, 19 Dec. 2018, www.gloucestertimes.com/news/local_news/coalition-of-states-to-work-to-curb-transportation-emissions/article_f4497003-7dff-5038-9635-10b8890328aa.html.

and people-based policies to protect them” (Smart Growth America, 2018).²² This reflects some of the divisions between policy and practice, as most cities are catching up from behind in the fight against climate change, which often conflict with the desires of established business and industry.

RPA Fourth Regional Plan:

The Regional Plan Association (RPA), the metropolitan planning organization, recently completed the Fourth Regional Plan for Greater New York. RPA invited stakeholders from New York, New Jersey and Connecticut to participate and produced 61 recommendations. “RPA staff engaged in deep, multi-year collaborations with community organizations representing more than 50,000 low-income residents and people of color, which helped RPA staff hear a wide range of perspectives on affordability, jobs, transportation, and environmental justice.” RPA Fourth Regional Plan, <http://fourthplan.org/about/executive-summary>

Among the RPA’s transportation-related recommendations is the pricing of greenhouse gas emissions, a position opposed by environmental justice organizations representing low income communities and communities of color. Environmental justice organizations prefer mandatory emission reductions over market-based mechanisms, though some organizations advocate for a carbon tax over cap-and-trade. California-based environmental justice organizations opposed passage of the cap-and-trade mechanism, Assembly Bill 32: the California Global Warming Solutions Act (AB-32). Likewise, the New Jersey Environmental Justice Alliance (NJEJA) advocated for mandatory emission reductions over the Regional Greenhouse Gas Initiative. “The problem is that the primary policy mechanism currently being implemented and supported by environmental groups and policymakers to fight climate change is carbon trading and it doesn’t guarantee emissions reductions in EJ communities or from any specific facility. Instead, it largely allows the market to determine where reductions occur. However, we are urging that our mandatory emissions-reductions recommendation be part of any coherent climate-change mitigation state policy whether it is regulatory or market-based.” (Nicky Sheats, PhD).²³

Transportation Planning in the Triangle and the Piedmont Atlantic Megaregion:

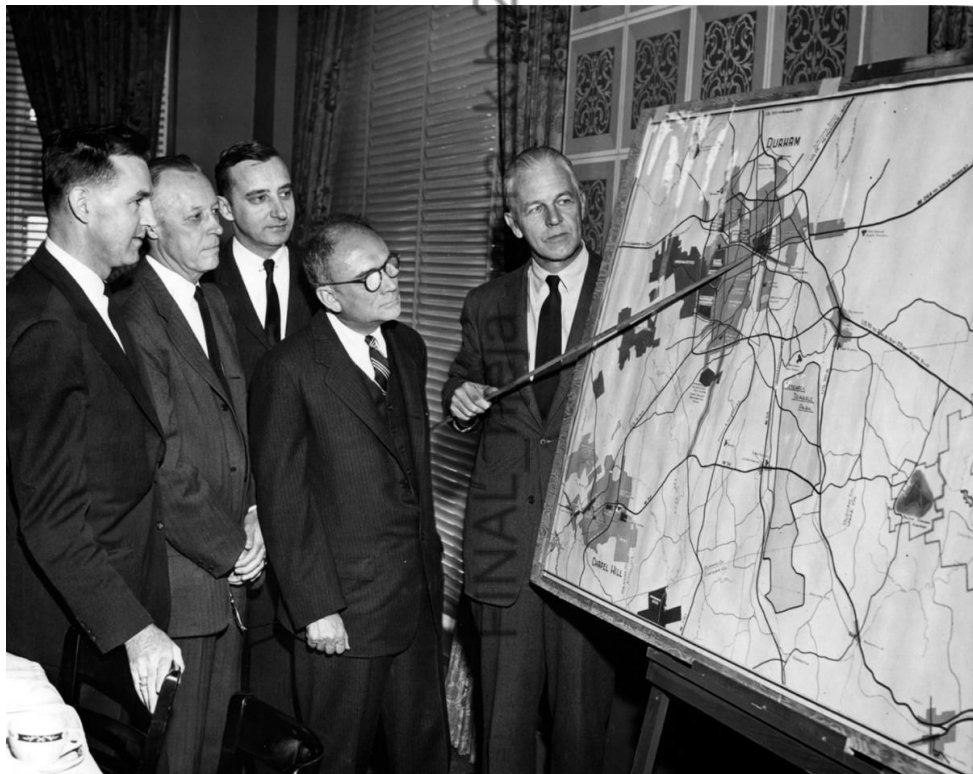
The Southeastern United States hosts the world’s busiest airport, Hartsfield-Jackson in Atlanta, GA, America’s third largest seaport in Savannah, GA, a robust banking economy in Charlotte, NC, and Research Triangle Park, NC, a research complex home to several multinational companies and federal agencies, like SmithKline, IBM and EPA. “The Piedmont Atlantic Megaregion includes the Atlanta, Birmingham, Charlotte, Memphis, Nashville, and Research Triangle (Raleigh-Durham-Chapel Hill) metropolitan areas, and generally follows the Interstate I-95 and I-85/40 corridors.”

²² “Opportunity Zones.” *Smart Growth America*, LOCUS Smart Growth America, Dec. 2018, www.smartgrowthamerica.org/program/locus/opportunity-zones/.

²³ Sheats, Nicky. “Op-Ed: Environmental Justice Is Key Aspect of Climate-Change Policy.” *NJSpotlight.com*, NJ Spotlight, 3 Nov. 2017, www.njspotlight.com/stories/17/11/02/op-ed-environmental-justice-is-key-aspect-of-climate-change-policy/.

Impacts & Lingering Inequality in the Triangle

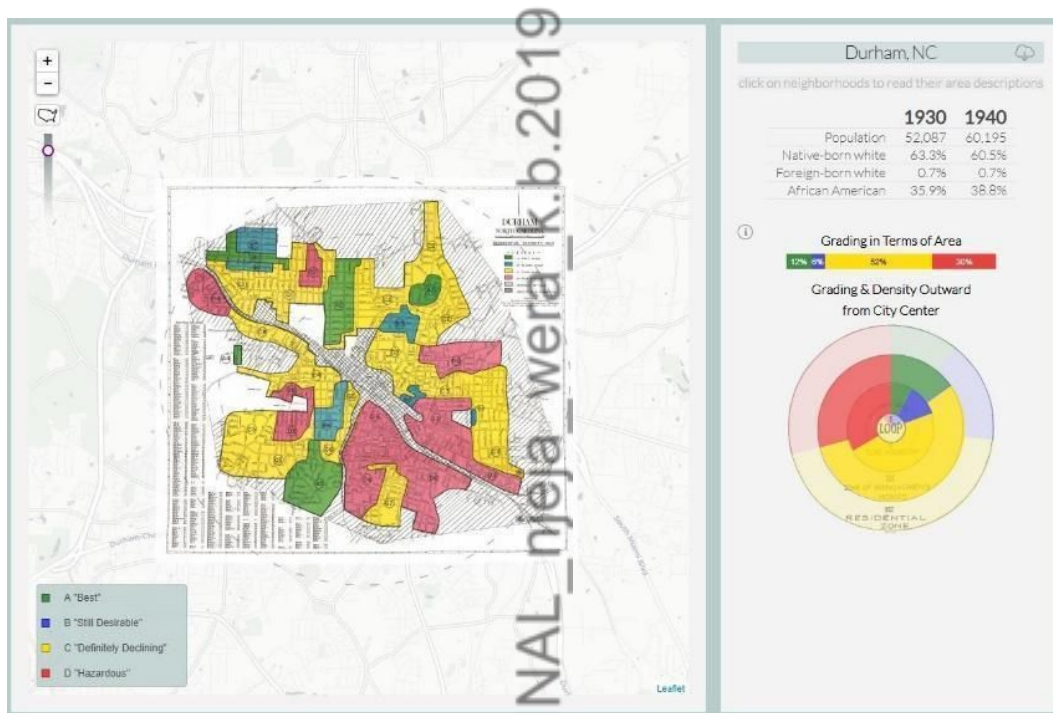
Facing a severe economic downturn in the late 1950's due to decline of textiles and tobacco, economic and political leaders in Central North Carolina made a bold proposal; remake their identity as a technology center "in the pines." This concept collectively rebranded the previous separate communities of Raleigh, Durham, and Chapel Hill into The Research Triangle. And thousands of acres largely between Raleigh and Durham became Research Triangle Park (Valdecanas, 2006). Combined with the research capacity of nearby universities, this bold step ignited explosive growth resulting in unprecedented population increases with people coming from all over the world for jobs and economic opportunity. However, Research Triangle Park continues to operate in the context of the political geography of the American South, a geography largely defined by the legacy of slavery and racial inequality. States' rights still override or suppresses federal laws on civil rights, public safety, and environmental protection.



Planning Research Triangle Park, 1958. Image credit: Research Triangle Park

Research Triangle Park required convenient freeway access connecting I-40 to I-85 through Durham. This was in part due to the commuter needs of thousands of future employees, but also included the logistics demands of technology companies. The routing of NC-147, also

known as the Durham Freeway, was incorporated into an urban renewal plan that destroyed the Hayti Community; Durham's oldest and most established African American neighborhood (Redevelopment Commission of the City of Durham, 1962). Previously, Hayti was a "Redlined community," designated by the Home Owners Loan Corporation (HOLC) as a place undesirable for economic investment due to its overwhelmingly black population (Harriss, 1951).²⁵ Later, it was designated as a slum and a candidate for urban renewal. Displaced populations dispersed across the city, but many migrated north into what is now Old East Durham. The displaced businesses never recovered. A small shopping area adjacent to the Freeway known as Phoenix Plaza (created more than 30 years after urban renewal) is currently home to a handful of local businesses. The Durham Freeway remains the most visible and symbolic element of transportation infrastructure in the region, dividing a booming downtown from its decidedly less prosperous neighbors.

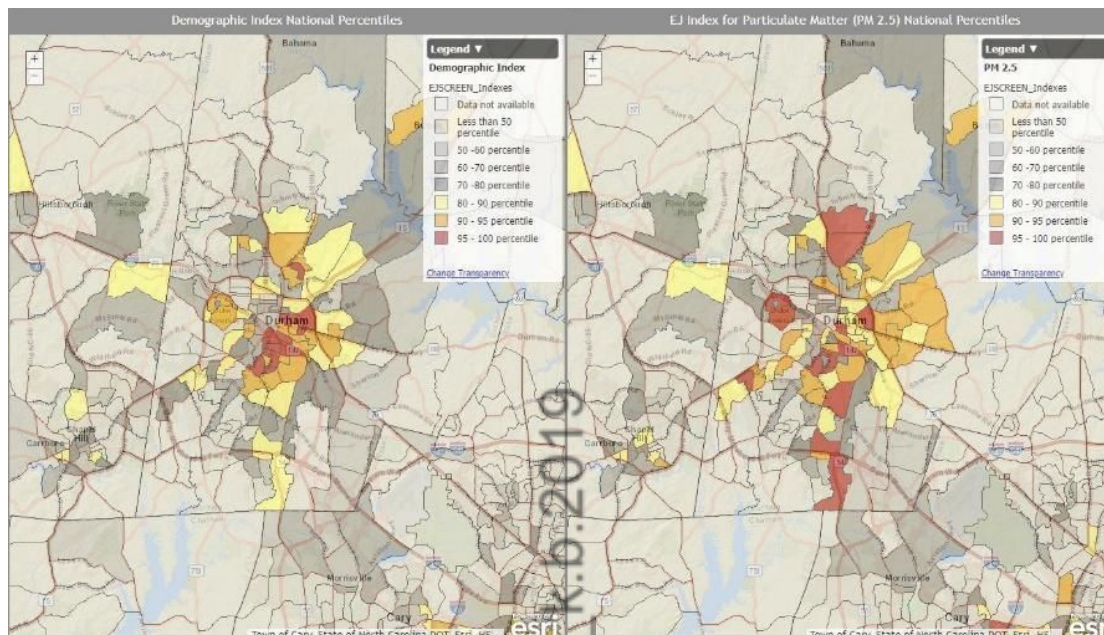


Durham, North Carolina Redline Map, Home Owners Loan Corporation. Image credit: Mapping Inequality

Durham began as an industrial and warehousing town, largely around textile mills and tobacco processing. Its rail lines and supporting industrial infrastructure predate environmental protections. East of Downtown, industry and noxious land uses dot predominantly black and low-income Old East Durham. Due to its industrial past and adjacency to the Durham Freeway and proximity to both Downtown and Research Triangle Park, Old East Durham is home to LULUs (Locally Unwanted Land Uses). Between Pettigrew Street and Angier Avenue, streets paralleling the rail line contain salvage yards (both legal and illegal), auto repair shops, and

²⁵ Harriss, C. L. (1951). History and Policies of the Home Owners' Loan Corporation. Retrieved from <http://www.nber.org/books/harr51-1>

other noxious uses. These environmental justice areas endure several exposure risks including fine-particle air pollution and groundwater contamination (Sorg, 2016).²⁶



Durham, NC EJ SCREEN. Demographic Indicators on the left, Exposure risk to particulate air pollution on the right. Old East Durham is the red area in the center of each diagram. Image credit: EJSCREEN

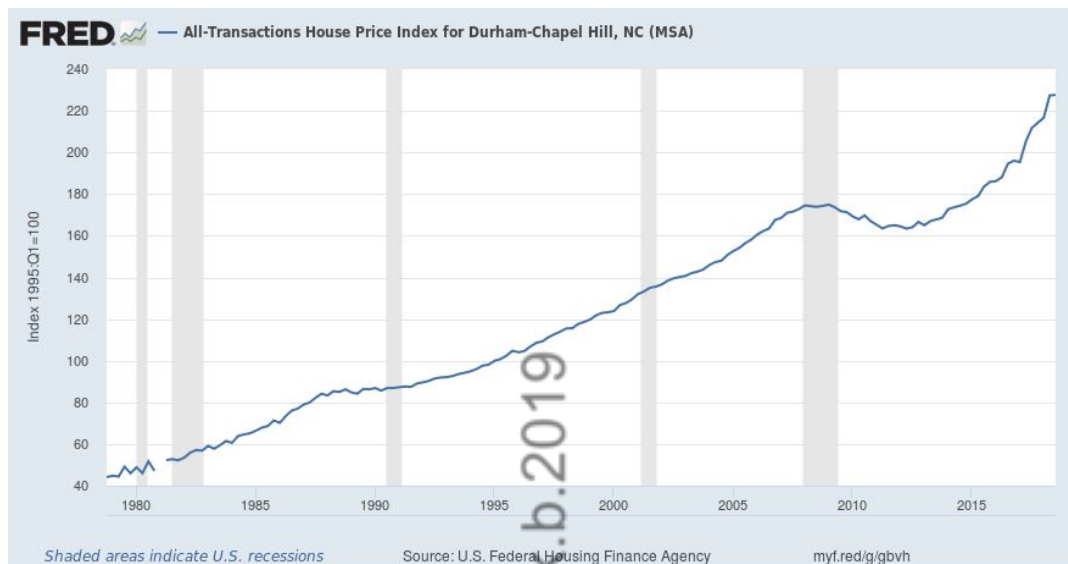
Because communities of color and low-income communities exist near industrial and transportation infrastructure, they offer affordable housing on the fringes of Downtown and Research Triangle Park. Generally, the most affordable housing is in Old East Durham. A contributing factor to this affordability is that homeowners and renters tolerate a degraded urban environment riddled with industrial uses. However, this is changing. As more affluent and white residents are being priced out of other parts of Durham and near Research Triangle Park, they are moving into these neighborhoods. Along with greater wealth and privilege, they have more political and economic agency. Accordingly, political officials and economic development investors are transforming the neighborhood. Bakeries, coffeeshops, pizza parlors, and other amenities have emerged recently (Sorg, 2016).²⁷ And perhaps more importantly, the renovation of existing homes has had profound impact on property taxes and property values. In some areas, home values have increased over 400 percent in less than a year (Vaughan and Eanes, 2018).²⁸ This has not displaced many homeowners, but the area is predominantly a renter

²⁶ Lisa Sorg, "In East Durham, new rules on air permits are environmental justice issue," *Bull City Rising*, January 15, 2016 accessed via web at <https://www.bulldcityrising.com/2016/01/in-east-durham-new-rules-on-air-permits-are-an-environmental-justice-issue.html>

²⁷ Lisa Sorg, "In Old East Durham, anxiety over proposed restaurant, gentrification + Nosh owners get \$100k grant for new restaurant on West End", *Bull City Rising*, June 07, 2016 accessed via web at <https://www.bulldcityrising.com/2016/06/in-old-east-durham-anxiety-over-proposed-restaurant-gentrification-nosh-owners-get-100k-grant-for-ne.html>

²⁸ Dawn Baumgartner Vaughan and Zachary Eanes, "Story of My Street': Gentrification and neighborhood change in Durham", *Durham Herald Sun*, April 24, 2018 accessed via web at: <https://www.heraldsun.com/news/local/counties/durham-county/article204694739.html>

community, so many renters are being displaced. Ironically, the forces producing the transformations that could increase local quality of life for existing residents are also causing their displacement.



Housing price increases in Durham-Chapel Hill, NC 1980-2016. Image Credit: FRED Federal Reserve Bank

Although it may be too late to redress previous community impacts in Durham, the City, in partnership with community groups, can plan for a more equitable future. The City of Durham has initiated a Racial Equity Task Force charged with analyzing all City policies in search of equitable solutions (Absaroka Mann-Wood, 2018).²⁹ Although not freight-related, the City's Department of Transportation has been more proactive about racial equity in non-motorized transportation, specifically promoting complete streets with a priority on low-income/high-pedestrian areas like East Durham. Additionally, the planning process of The Durham Beltline, a 1.7-mile urban greenway, resulted in a Mayor's mandate to create an equitable development plan to address the potential economic displacement adjacent to the Beltline (a former rail line) (Nonko, 2018).³⁰ While these initiatives do not directly address freight transportation, they do provide many transportation precedents that could be leveraged to address Durham's, and the Region's, challenging Environmental Justice legacy.

²⁹ Absaroka Mann—Wood, "Durham's Racial Equity Task Force Takes Shape", IndyWeek, June 19, 2018 accessed via web at <https://indyweek.com/news/archives/durham-s-racial-equity-task-force-takes-shape/>

³⁰ Emily Nonko, "Durham's New Blueprint for Equitable Community Engagement", NextCity, December 5, 2018 accessed via web at <https://nextcity.org/daily/entry/durhams-new-blueprint-for-equitable-community-engagement>

Infrastructure Expansion: Federal and Local Legal Actions in Megaregions and Beyond

In 2018, the Environmental Defense Fund (EDF) approached West End Revitalization Association (WERA) in Mebane, NC, to request their participation for a federal lawsuit concerning diesel truck pollution impacts, which was supported by North Carolina Attorney General Joshua H. Stein and 15 other states. WERA's Co-founder and President, Omega R. Wilson contributed a ten page "declaration," to the effort, and on July 24, 2018, the U.S. Court of Appeals for the Washington, D.C. Circuit suspended an EPA loophole that would allow more super-polluting freight trucks that present a serious and urgent threat to human health onto our roads. National co-filers of the lawsuit with EDF are the Center for Biological Diversity, and Sierra Club. (*U.S. Court of Appeals District of Columbia Circuit – No. 18-1190: Environmental Defense Fund, Center for Biological Diversity, and Sierra Club vs USEPA – July 17, 2018*) and (EDF Press Release – July 27, 2018: *EPA Withdraws Unlawful and Dangerous Loophole for Super-Polluting Diesel Freight Trucks; Action Follows Court Suspension after Legal Action by 16 States, EDF and Allies*)

Dozens of lawsuit contributors were recruited to join the historic, successful legal action against EPA to protect the health of children, the elderly, other vulnerable populations throughout the nation. During the same period EPA Administrator Scott Pruitt resigned under pressure for unethical practices, and on his last day, in early July 2018, made a unilateral decision to allow more production of "glider" diesel trucks. "Gliders" new truck bodies with old, polluting engines that cannot meet modern emission standards. Mr. Pruitt's decision raised new ethics concerns about undue industry influence because some "glider" truck manufacturers supported Donald Trump's presidential campaign. (*U.S. Court of Appeals District of Columbia Circuit – No. 18-1190: Environmental Defense Fund, Center for Biological Diversity, and Sierra Club vs USEPA – July 17, 2018*)

The lawsuit asked the U.S Court of Appeals to suspend Mr. Pruitt's glider truck decision. There are glider truck manufacturers in North Carolina. An EDF-commissioned analysis supports research that the addition of more glider trucks could result in more than 1,700 premature deaths in the United States during the life of the vehicles. EPA testing found that "gliders" can emit lethal particulate pollution up to 450 times the amount from "modern" or "new" engines. (*U.S. Court of Appeals District of Columbia Circuit – No. 18-1190: Environmental Defense Fund, Center for Biological Diversity, and Sierra Club vs USEPA – July 17, 2018*)

These are issues that WERA has fought since its founding. After learning from U.S. Department of Justice (DOJ) officials that every taxpaying community is entitled to basic amenities guaranteed by law, homeowners organized WERA to challenge a planned federally-funded eight-lane interstate highway corridor.

WERA serves residents, homeowners, and landowners of five African American communities in Alamance and Orange Counties, where Chapel Hill is located. In 1994, when the North Carolina Department of Transportation (NCDOT) revealed plans for the construction of a 27-mile highway to Danville, VA through two historic African American and Native American heritage communities (West End and White Level) in Mebane, residents mobilized to protect their families from the negative effects of this proposed development.³¹ For decades, homeowners had been denied access to basic amenities, such as safe drinking water, clean groundwater and

³¹ West End Revitalization Association, *History*, available at <http://www.wera-nc.org/history.htm> (last accessed Apr. 18, 2018). (hacked during the 2018 midterm elections)

a functioning sewage system. The proposed NCDOT 119-bypass/overpass highway project would cause even more degradation to homes, forest, streams, and wetlands.³²

In 2016, the NCDOT proceeded with construction of the 119-bypass/overpass highway corridor, but with a mitigated path around most of West End. WERA's legal action saved dozens of homes, churches, and a community cemetery dating back to slavery. Part of the justification for the highway expansion is to facilitate freight shipping from a Mebane area industrial park, the North Carolina Industrial Center (NCIC),³³ which includes a Ford Motor Company facility and nearby distribution centers for Walmart (\$100-million construction cost for the Walmart's largest distribution center in the USA), and Lidl of Germany (\$125-million construction cost for its distribution center adjacent to Walmart distribution center in Mebane, NC).



North Carolina Department of Transportation planned construction path for interstate highway 119-bypass /overpass was modified in 2009 to go around the West End Community to mitigate displacements and saved dozens of homes, a church founded by freed slaves in 1865, and community cemetery dating back into slavery. WERA filed USDOJ complaints in 1999 that resulted delays in highway construction until 2016.

Diesel-powered traffic will increase to and from the NCIC and the North Carolina Commerce Park (NCCP), which are located between N.C. 119 and Trollingwood-Hawfields Road, and

³² See EPA, *Failing Septic Systems and Contaminated Well Waters: African-American Communities in Mebane, North Carolina* (Dec. 20, 2002), available at http://www.wera-nc.org/News/epa/epaej_1202.htm (last accessed Apr. 18, 2018) (hacked during the 2018 midterm elections).

³³ North Carolina Department of Transportation, NC 119 Relocation Record of Decision, at 4 (Dec. 2009), available at <https://www.ncdot.gov/projects/nc119relocation/download/ROD.pdf>

between U.S. 70 and Interstate 40/85 in Mebane.³⁴ These North Carolina “dry land port” construction projects on the east coast of the United States for national and international growth will increase diesel vehicle movement and emissions to and from air, rail, and marine ports twenty-four hours a day.

In 1999, WERA developed a list of public health disparities and submitted administrative complaints to the U.S. Department of Justice (DOJ) under Title VI of the Civil Rights Act of 1964³⁵ and Environmental Justice Executive Order 12898 of 1994.³⁶ DOJ requested federal government agencies to investigate their lack of oversight of civil rights laws, public health, and environmental protection statutes during the interagency highway planning process that had been going on for 16 years without opportunities for public input. That included DOJ’s own Civil Rights Division, EPA, the U.S. Department of Housing and Urban Development (HUD), the U.S. Department of Agriculture, and the U.S. Department of Commerce. Following the WERA administrative complaints, a moratorium was placed by DOJ on NCDOT 119-bypass and overpass construction from 1999 until 2016, to ensure mitigation of the potential impacts of the construction. Federal block grants to fund some essential infrastructure were finally provided to the West End Community in Alamance County. Sewer lines were installed for 104 homes; underground petroleum storage tanks were removed from nearby commercial properties; and homes were rehabbed, sidewalks installed and dirt streets paved for the first time. Even so, over 400 homes still lack these basic amenities under the authority of the City of Mebane, Alamance County, and Orange County. (*U.S. Court of Appeals District of Columbia Circuit – No. 18-1190: Environmental Defense Fund, Center for Biological Diversity, and Sierra Club vs USEPA – July 17, 2018*)

Since 2000, Omega Wilson and WERA provided input to the North Carolina Environmental Justice Network (NCEJN), and from 2007 to 2010 Wilson was appointed as a “community perspective” member of EPA’s National Environmental Justice Advisory Council (NEJAC), under both the Bush and Obama Administrations. During his tenure, he served on the NEJAC workgroup “Reducing Air Emissions Associated with Goods Movement: Working towards Environmental Justice,”³⁷ which submitted recommendations in November 2009 that were adopted in July 2010 under Federal Advisory Committee Act (FACA) guidelines.³⁸ President Barack Obama’s Environmental Justice Memorandum of Understanding-2011 referenced an area of focus to be “impacts from commercial transportation and supporting infrastructure.”³⁹

³⁴ For example, the German company, Lidl, has built a 900,000-square-foot distribution center at the N.C. Commerce Park. See The Times-News, Chasing commerce: Industrial parks continue to grow (January 2017), available at <http://www.thetimesnews.com/news/20170121/chasing-commerce-industrial-parks-continue-to-grow>.

³⁵ West End Revitalization Association, *History*, available at <http://www.wera-nc.org/history.htm> (last accessed Apr. 18, 2018).

³⁶ See Executive Order 12898 of February 11, 1994; Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7629 (Feb. 16, 1994).

³⁷ See e.g. National Environmental Justice Advisory Council, Reducing Air Emissions Associated With Goods Movement: Working Towards Environmental Justice (2009), available at <https://www.epa.gov/sites/production/files/2015-02/documents/2009-goods-movement.pdf>.

³⁸ Pub. L. 92-463, 86 Stat. 770, enacted October 6, 1972.

³⁹ *Id.* at 3.

By speaking and writing as President of WERA, Wilson has highlighted the fight for environmental justice in rural North Carolina. Two of his relevant publications for further reading includes “Lack of Basic Amenities: Indicators of Health Disparities in Low-Income Minority Communities and Tribal Areas” in the *North Carolina Medical Journal* (May 2011),⁴⁰ and “The West End Revitalization Association (WERA)’s Right to Basic Amenities Movement: Voice and Language of Ownership and Management of Public Health Solutions in Mebane, North Carolina” co-authored in the *Progress in Community Health Partnerships Journal* by The Johns Hopkins University Press⁴¹.

As one of the country’s fastest growing regions, The Triangle has experienced precipitous development, with corresponding changes to the landscape and geography. A growing population has created a larger demand for natural resources, goods, and services. As the current and future planning of communities occurs, the necessary changes in transportation are likely far more than adaptations in commuter transit (the movement of people), as regions will also have to mitigate against increased pollution and infrastructure impacts from freight (the movement of goods). Beyond economic metrics, measures of viable and sustainable development and population growth, must include ecological conditions and impacts on human health.

“The Piedmont Atlantic is the fastest growing megaregion in the United States. Mayors, businesses, and academic professionals have organized the Piedmont Alliance for Quality Growth to help address the challenges of a growing population, increased traffic congestion, and inadequate infrastructure. They have called for less competition between cities and metropolitan areas in the same region, and a stronger and more cohesive ability to work together to compete on the global scale.”
<http://www.america2050.org/megaregions.html>

Conclusion: Let Experience Be Our Teacher

Historically, throughout the US, there has been an imbalance as benefits for the public good have put disproportionate burdens on lower-income people and people of color. The combined impacts of these burdens, rapid regional growth, quality of life factors, and various public policies, which often result in disenfranchisement and/or displacement of impacted populations, have to be evaluated for risks versus rewards in both the Tri-state and the Triangle.

Moving forward, responsible and sustainable development must be assessed within a cumulative impacts framework. Every decision in the process of planning and designing communities is best made through comprehensively understanding impacts to the social, natural, and built environments. It is the overlap of these spaces that determine quality of life. A cumulative impacts approach looks at the interplay of multiple pollution sources and socioeconomic realities that collectively affect humans and the ecosystem. Traditionally,

⁴⁰ Omega Wilson, Lack of Basic Amenities: Indicators of Health Disparities in Low-Income Minority Communities and Tribal Areas, 72(2) N C Med J. 145 (2011).

⁴¹ Omega R. Wilson, et al., The West End Revitalization Association (WERA)’s Right to Basic Amenities Movement: Voice and Language of Ownership and Management of Public Health Solutions in Mebane, North Carolina, 2 Progress in Community Health Partnerships 237 (2008).

projects are assessed through a narrow lens or vacuum that leaves several blind spots in understanding the full implications of such decisions.

Policy development whether through government, or coalitions must include early invitations to meaningful participation, across demographics, industry sectors, and geographies as necessary. There are examples of open and meaningful participation processes that facilitate a sustainable path forward for overburdened and underserved communities. In December 2018, WERA was invited by Senator Bernie Sanders' staff to share comments on the pros and cons of goods movement corridors and highway infrastructure, near and through communities of color and tribal areas, in order to strengthen Senator Sanders' multi-layer interagency "Green New Deal" draft bill. It went on to be introduced as a House Resolution with more than 65 legislative co-sponsors, with much support from environmental organizations throughout the nation. Because no single legislative action will serve as a cure-all or address the specific concerns of every community, NJEJA and WERA remain committed to advancing justice in equity as an essential component for a sustainable world.

Fortunately, NJEJA, as the only statewide organization in NJ that focuses on EJ, has been successful bridging national policy to local implementation as well as connecting local organizing to national campaigns, especially around cumulative impacts. In 2016 the City of Newark adopted an Environmental Justice and Cumulative Impacts ordinance, the product of years of legal development and organizing led by the New Jersey Environmental Justice Alliance (NJEJA) and supported by its partners. The ordinance was passed as an amendment to the City's master plan, adding an additional level of oversight in the planning and zoning process that requires important disclosures from new commercial and industrial projects, such as expected pollution impacts. The ordinance also mandated the development of an inventory of local natural and environmental resources, which may be used in planning to understand the impacts of development on existing conditions.

In 2017, NJEJA recommended that the New Jersey Governor enact environmental justice and cumulative impacts legislation to protect EJ and overburdened neighborhoods by decreasing existing levels of pollution while preventing additional pollution. "The legislation should require the use of a cumulative impacts tool in environmental permitting, resource allocation, and other relevant state agency decision making. The New Jersey Department of Environmental Protection's (NJDEP's) nascent cumulative impacts screening tool should be used in an EJ and environmental screening of these neighborhoods" (Ana Isabel Baptista, PhD).⁴²

New Jersey Governor Phil Murphy signed an Environmental Justice Executive Order in 2018, and has committed to working with NJEJA to achieve the outcomes proposed in the order. In the same year, New Jersey Senator Cory Booker sponsored the Environmental Justice Act of 2017, designed to: codify federal Executive Order 12898 on EJ; address cumulative impacts; address poor infrastructure in EJ communities; restore a private right of action under Title VI of

⁴² Baptista, Ana. "Op-Ed: NJ's Next Governor Should Champion Environmental Justice." *NJSpotlight.com*, NJ Spotlight, 12 Oct. 2017, www.njspotlight.com/stories/17/10/11/op-ed-nj-s-next-governor-should-champion-environmental-justice/.

the 1964 Civil Rights Act; and preserve important aspects of the National Environmental Justice Advisory Council. NJEJA convened national calls with more than 30 environmental justice organizations, including West End Revitalization Association, to review and comment on the Act; facilitate a vast range of EJ voices and concerns to shape the contents of the Act; and ensure that the Act reflects what communities want and need.

In all current and future planning and development of transportation infrastructure investments, decision-makers must continue to let experience be our teacher. While recognizing the need to move goods and people efficiently, it is essential to prioritize the protection of public health and the ecosystem. If carbon emissions exacerbate global warming, then emission reductions must be central to any earnest and effective public policy adopted.

Prevailing policies generally aim to address the impoverished conditions in overburdened communities, highlighting the equity component of sustainability in various projects, but only as an ancillary benefit to economic and environmental goal attainment. That approach is not sustainable or equitable, and only perpetuates the thinking that created overburdened communities.

In acknowledging the socioeconomic inequity, there is an urgent need to challenge conventional transportation strategies whose primary objective is framed within the myopic lens of being profitable and expedient; rather than need-driven and therefore effective. As we chart the course ahead, the promotion of personal electric vehicles is part of the solution, although larger emissions reductions can be achieved faster through systemic approaches like: clean transportation fleets operated by government, private commerce, and institutions; accessible and affordable clean public transit; alternative modes of transportation, such as biking and walking, through complete streets; and job creation in communities overburdened and underserved, for example local hiring for EV charging station installations and maintenance, from entry level to entrepreneur. Finally, decision-makers must be accountable and transparent by quantifying the social impact that any strategy purported to advance environmental justice, just as they are expected to estimate the economic or environmental outcomes.