FREIGHT TRANSPORT AND HEALTH: A COMPREHENSIVE INVESTIGATION OF PLANNING AND PUBLIC PARTICIPATION WITHIN U.S. HOST COMMUNITIES

by

Natalie R. Sampson

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Health Behavior and Health Education)
in the University of Michigan
2013

Doctoral Committee:

Professor Amy J. Schulz, Chair
Professor Barbara A. Israel
Associate Professor Larissa S. Larsen
Professor Edith A. Parker, University of Iowa

The problem of constructing large-scale public works in a crowded urban setting, where such works impinge on the lives of or displace thousands of voters, is one which democracy has not solved.

- Robert Caro, *The Power Broker*, 1974

Residents came en masse to say, "No. You cannot build that bridge in our community." What was more surprising to me was the issue of race. No one said it. But, it was always implied, and it was implied to me…a code word, because they would get up and say things like, "Oh, they will not build a bridge in our community because we're good people." And I'm sitting there thinking to myself, *where are the bad people*? You know, *where in the hell was that line*? I want to know where that line starts that divides the good people from the bad people. So what is the implication when they say, "Don't do it in our neighborhood. Don't do it in our community because we are good people?"

- Resident and community organizer, Detroit, Michigan, 2012

We found out that we were referred to in Sacramento as the environmental sacrifice zone. It doesn't sound very friendly, does it? Basically, you know, well, okay, well that place is already ruined so let's just put everything down there. Let's not ruin other pristine areas. Let's just keep degrading the one that's already degraded. That phrase— environmental sacrifice zone. Well, who wants to live in an environmental sacrifice zone?

- Resident and community organizer, Long Beach, California, 2012

To JRS & LLS

ACKNOWLEDGEMENTS

This dissertation would not exist without the tireless work of environmental and social justice advocates in Long Beach, California and Southwest Detroit, Michigan. For me, data collection meant meeting many of my heroes over coffee and, in many instances, tacos or flan. You openly shared your time, files, space, stories, and ideas with me, and I am eternally grateful. I sincerely hope I have conveyed your truths accurately throughout this final product.

This dissertation would also not exist without the mentorship of my committee. Edith Parker, your genuineness gives me an ongoing example of both the kind of academic and person I strive to be. I cannot thank you enough for your loyalty and humor through this dissertation process and in all of our projects where you treated me like nothing less than a colleague. Amy Schulz, you have been vital in challenging me to think harder and in new ways each step of the way. Whenever I started to doubt myself, your pure, undying energy for public health and this project quickly revived me. Barbara Israel, thank you for being so present and thoughtful every time I came to you. You were once a public health celebrity to me, and now you are a trusted mentor. Larissa Larsen, of course, I am indebted to you for sharing your vast knowledge of planning, but also for your healthy sense of pragmatism. Your pedagogical strategies will also be my model for engaging students in lasting, real-world lessons. Finally, Marie O'Neill, while you were not involved in my dissertation, you and the 'heat team' have been absolutely invaluable in my learning at U of M, helping me to find my voice as a scholar. Collectively, the work you do to address inequities has left a permanent mark on public health, and it will continue to guide my life's work in immeasurable ways.

I am also forever grateful for the friends I have found along the way. Beth Becker, Allison Brenner, Rebecca Cheezum, Andrea Knittel, Ruti Levtov, and Minal Patel, you have kept me going more than you may know throughout this doctoral program. You provided direction, reassurance, feedback, and, most importantly, the laughs needed to survive this process. Much gratitude to Nate Barnes at Wayne State University as well. Thank you for freely giving so much of yourself to this project and for always showing me more places in Detroit to love. I look forward to lifelong relationships with each of you as my friends and esteemed colleagues.

To my family, above all, I cannot express my endless gratitude for your support, but I will try. John and Lise, thank you for teaching me to appreciate the mantra 'Go Blue' from an early age. You have never even once wavered in your role as strong, encouraging, and caring parents. I could not ask for anything better. Melanie, this dissertation is largely your fault—you bestowed upon me an unhealthy enjoyment of homework from a young age. I will always strive to be more like you when I grow up. Memere, I hope to work just a small fraction as hard as you have in your life. Your generosity remains unmatched by anyone I know, and I am among the luckiest to be born under your matriarchy. And, to the rest of my family: the Gagackis, the Kings, the Lazarz/Glufs, and the Winn-Zecchinis, you fill my life with love and remind me that Michigan is always home. Finally, thank you to my dearest Gagacki who has packed the last 15 years with endless adventures while somehow managing to keep me firmly grounded. Your unconditional love shows me time and time again what is most important in this world.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

CARB	California Air Resources Board
CBA	Community Benefits Agreement
CBC	Community Benefits Coalition
CEQA	California Environmental Quality Act
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DIFT	Detroit Intermodal Freight Terminal
DRIC	Detroit River International Crossing
EJ	Environmental Justice
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
GIS	Geographic Information Systems
HIA	Health Impact Assessment
IS-TEA	Intermodal Surface Transportation Efficiency Act
MAP-21	Moving Ahead for Progress in the 21st Century Act
MDEQ	Michigan Department of Environmental Quality

MDOT	Michigan Department of Transportation
MPO	Metropolitan Planning Organization
NEJAC	National Environmental Justice Advisory Committee
NEPA	National Environmental Protection Act 1969
NITC	New International Trade Crossing
PM 2.5	Particulate Matter (2.5 micrometers)
PM 10	Particulate Matter (10 micrometers)
POLA	Port of Los Angeles
POLB	Port of Long Beach
ROD	Record of Decision
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act
SCIG	Southern California International Gateway
SCAQMD	South Coast Air Quality Management
TEA-21	Transportation Equity Act for the 21st Century

ABSTRACT

Transportation-related air and noise pollution from heavy-duty freight engines is associated with respiratory and cardiovascular illnesses, cancer, diabetes, nervous system and cognitive effects, hospital admissions, sleep disruption, and premature mortality. Research is needed to understand how residents in host communities nearby freight gateways (e.g., ports, borders) experience and counter these impacts. With an environmental justice framework, I used: 1) spatial analyses to quantitatively describe the demographic composition of U.S. freight host communities, and 2) institutional ethnography to qualitatively investigate public participation in freight land use deliberations.

Quantitatively, I derived demographic descriptions of host communities by overlaying American Community Survey (2005-2009) tract-level data with buffered digitized images of freight gateways. At the 50 largest U.S. freight gateways, results from areally weighted analyses show that populations within 500 meters of a freight gateway have significantly higher proportions of persons of color, Hispanic ethnicity, without a high school diploma, and below the federal poverty level. Logistic regression models also compare 500-meter and 1-mile host communities to non-host communities, and overall results suggest that communities of color are disproportionately compromised by both transportation and industrial air pollution sources.

Qualitatively, I synthesized data from interviews, content analysis, and participant observations at two distinct case sites: the proposed New International Trade Crossing in Detroit, Michigan and the Port of Long Beach in Long Beach, California. Interviewees identify catalysts, barriers, and opportunities for addressing freight's local impacts through institutionally- and

community-led strategies. Macroeconomic forces often override local concerns, whereby freight-related development decisions are made in advance or outside of public participation opportunities. Still, host communities may shift deliberations by exposing overlooked risks, legally challenging assessment procedures, proposing site or project alternatives, advocating adoption of sustainable technologies, equalizing mitigation opportunities, or codifying innovative governance structures.

This study defines freight transport as an environmental justice issue. Results from quantitative analyses demonstrate patterns of exposure to well-documented freight-related health risks with implications for health equity. Qualitative inquiry enables deconstruction of theories and practices related to public participation and environmental assessment in freight host communities. Collectively, these findings inform cross-sector interventions to address global freight transport's local threats to public health.

CHAPTER 1

Global Freight Transport's Local Impacts: Background and Literature

This dissertation defines the goods movement, the globalized movement of market goods through freight vehicles including trains, planes, trucks, and ships, as a public health issue with local effects. Figure 1.1 illustrates a conceptual framework for broadly understanding and potentially addressing freight transport as a determinant of health in the U.S.—introduced in this chapter and dissected further throughout this dissertation. In this opening chapter, first, I explain the relationship between freight infrastructure, noise and air pollution, other environmental and economic stressors, and known health outcomes, as articulated by researchers through epidemiological studies and practitioners engaged in the environmental justice (EJ) movement. Second, identifying diverse historical, legal, and economic influences, I then describe the transportation decision-making process that determines freight-related land use in the U.S., acknowledging regulated environmental assessment procedures that generally organize this process. Finally, I define public participation in this decision-making process as a complex construct, recognizing the role of local and expert knowledge in its operationalization. From this synthesis of policies, practices, and literature, I clarify and present emergent research questions regarding *who* lives in communities that host major freight infrastructure and *how* host communities'[1] involvement in decisions may affect local impacts on health.

[1] Occasionally used in planning and environmental justice literature (Holifield, Porter, & Walker, 2010; Foster 1998; Been & Gupta, 1997), the term 'host community' was used by many participants in this study. While the geographic bounds of a host community are contextual (not unlike the term community (Minkler & Wallerstein, 2006), the term is used generally to describe those living near a major development. A host community *hosts* a development and its local economic, social, or environmental benefits or consequences; although these implications may extend to many

Freight Transport and Environmental Health

Freight Transport in the U.S.: A Brief Overview

In our increasingly globalized economy, U.S. international trade grew 8% annually between 1990-2008 (BTS, 2009). Included in this statistic, furniture, clothing, electronic products, building materials, auto parts, and other goods are built, placed onto cargo containers, and shipped long distances across national land and water borders. These goods are transferred between multiple modes of transportation at freight gateways[2] before their delivery to distribution centers or intermodal facilities and, eventually, to major retail outlets. According to the Bureau of Transportation Statistics, approximately $220 billion of international merchandise enters the U.S. through over 400 U.S. freight gateways annually (BTS, 2009). Approximately 78% of international trade is conducted at 50 freight gateways in the U.S., with 25% occurring at just five freight gateways: Port of Los Angeles in California, Port of New York/New Jersey, JFK International Airport in New York, Port of Houston in Texas, and the Ambassador Bridge connecting Detroit, Michigan and Windsor, Ontario.

Freight Transport and Air Pollution

Trains, trucks, airplanes, and ships associated with the goods movement use heavy-duty combustion engines, emitting diesel exhaust that diminishes air quality. These emissions include mixtures of compounds, entailing organic and black carbon (also called soot), toxic metals, particulate matter (PM), nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), carbon monoxide (CO), formaldehyde, acrolein, and polycyclic aromatic hydrocarbons (EPA, 2009). CO_2 and NO_x are considered greenhouse gasses, gasses which trap heat in the

---

others beyond this community as well. In a similar way, the term 'frontline' community is also used to describe those communities confronting multiple threats to environmental justice (Lerner, 2010).

[2] Freight gateway is a term used to describe areas where land use contains seaports, airports, rail yards, or border facilities to facilitate the movement of goods. Appendix A provides a glossary of key terms related to the goods movement given its interdisciplinary contexts in this dissertation.

atmosphere and warm the Earth's surface. Additionally, NO_x, CO_2, and VOCs contribute to creation of secondary pollutants that are also greenhouse gasses, such as ozone (O_3) (also known as smog). Greenhouse gasses, both naturally occurring and generated through anthropogenic sources, are the primary contributor to climate change (IPCC, 2007). PM (also referred to as aerosols) includes dust, soil, and liquid droplets from engine exhaust (Laden, Neas, Dockery, & Schwartz, 2000), and scientists divide this type of pollution into four categories by size: thoracic ($\geq$10 micrometers), coarse (10 > 2.5 micrometers), fine (2.5 > 0.1 micrometers), and ultrafine particles ($\leq$ 0.1 micrometers) (Brook et al., 2004) to measure variable fate and residence based on particle size.

Air quality in the U.S. has improved markedly in the last several decades, a trend attributable in large part to a variety of federal environmental policies and increasingly sophisticated evaluation measures and monitoring systems. When cities and states were unable to regulate air pollution sufficiently in the early twentieth century, the federal Clean Air Act of 1970 and its 1977 and 1990 amendments were drafted as the primary approach to addressing point source (i.e., stationary sources such as power plants, refineries and industrial sites) air pollution (Schneider, 2011). The Clean Air Act set National Ambient Air Quality Standards (NAAQS) measuring six criteria air pollutants including O_3, PM, CO, SO_2, NO_2, and lead. Still, many non-attainment areas exist, where one or more of these criteria are not met, particularly in urban, industrial areas. In 2007, the Supreme Court ruled that the U.S. Environmental Protection Agency (EPA) must also regulate greenhouse gas emissions from non-point, ambient sources, such as transportation. In 2009, EPA administrator Lisa Jackson issued an 'Endangerment Finding' and 'Cause or Contribute Finding' under the Clean Air Act, required prerequisites to emission standards, which legally acknowledge the public health effects of vehicle emissions.

Following this action, the EPA and National Highway Traffic Safety Administration established updated standards for light-duty vehicles in May of 2010, which began in 2012, and standards for heavy-duty vehicles in August 2011, which begin in 2014. Also, in relation to shipping ports, a North American Emission Control Area (NAECA) was implemented in August of 2012. Negotiated between the EPA and International Maritime Organization, the NAECA requires all ocean-going ships switch to lower sulfur fuel within 200 nautical miles of the U.S. shoreline, which could reduce SO_2 emissions most commonly associated with ship exhaust (Hricko, 2012; EPA, 2010).

Measuring air pollution from transportation-based sources is complex and modeling is constantly evolving to supplement insufficient data for regulatory purposes. Under State Implementation Plans, states are required to monitor overall ambient air quality to report compliance with the Clean Air Act. This entails a network of air monitoring stations collecting data on a variety of pollutants. Across the nation, monitoring is often in areas of highest concern or non-attainment so a spatially and temporally comprehensive overview of air pollution is often not available (Kelly, Fuller, Walton, & Fussell, 2011). Information from stationary sources is also reported from private polluters, such as coal-burning power plants and oil refineries, summarized in inventories such as the EPA's National Release Inventory, the Toxic Release Inventory, and the Greenhouse Gas Inventory. The EPA manages a variety of software tools to assist agencies tracking and reporting policy compliance efforts, including AERMOD and MOVES. AERMOD estimates the dispersion of air pollution from a source and is based on the Gaussian equation that accounts for height of an emissions source, speed of emissions, wind direction, wind speed, and other factors; although, many assumptions must be made (MPCA,

2002). MOVES estimates pollution specifically from transport sources based on vehicle miles traveled and vehicle population (EPA, 2010).

Freight-Related Health Outcomes

Transportation-related pollutants have many direct and indirect impacts on human health when absorbed dermally or through respiration, which researchers have documented for several decades (Watson, Bates, & Kennedy, 1988; Schlessinger, R. & Gearhart, J. 1987; Ehlrich, Ehlrich, & Holdren, 1977). In terms of PM, human bodies are adept at removing large particles. Yet, some coarse and fine particles containing a variety of pollutants enter the respiratory system, and some fine and ultrafine particles may surpass the lungs to enter the bloodstream, affecting both respiratory and cardiovascular functioning (Brook et al., 2004). Acute toxic levels of particle and gaseous pollution can irritate the lungs to affect pulmonary functioning immediately. In the general population, chronic transportation-related particle and gaseous pollutants have been associated with premature mortality (Brunekreef & Holgate, 2002), lung cancer (Kuo et al., 2006; Nawrot et al., 2006), breast cancer (Crouse et al., 2010), respiratory illness (Matsui et al., 2008), nervous system effects (Kampa & Castanas, 2008), cardiovascular disease (Kunzli et al., 2010; Diez-Rioux et al., 2008; Dvonch et al., 2005), increased hospital admissions, and all-cause mortality (Latza, Gerdes, & Baur, 2009; Chen, Hong, & Kan 2004). More recently, preliminary associations have been identified relating greenhouse gas emissions to birth defects, Sudden Infant Death Syndrome, and infant mortality (Ritz, Wilhelm, & Zhao, 2008; Tong & Colditz, 2004). Emergent research has also identified associations between transportation-related pollution and neurological disorders, such as autism (Volk et al., 2011). Hundreds of studies document respiratory effects of transportation-related pollution for children,

as a vulnerable population who, per unit body weight, respire more air than their adult counterparts (Gillespie-Bennett, 2011; Salvi, 2007; Fritz & Herbarth, 2001).

Freight transport is also a direct source of noise pollution with many physical and mental health consequences. Defined as "unwanted or disturbing sound," noise pollution is most commonly associated with noise-induced hearing loss (Berglund, Lindvall, & Schwela (e.d.s), 1999). Research also links this type of pollution to stress (van Kempen et al., 2006), high blood pressure (van Kempen et al., 2006; Babisch, Beule, Schust, Kersten, & Ising, 2005), myocardial infarction (Sorensen et al., 2012), speech interference (Stansfield, Haines, & Brown, 2000), diabetes (Sorenson et al., 2013), sleep disruption (Muzet, 2007; Griefahn & Spreng, 2004; Fidell, Pearsons, Tabachnick, & Howe, 2000) and lost productivity (Stansfield, Haines, & Brown, 2000).

Transportation-related air pollution can affect health through less direct pathways also. For instance, secondary pollutants created through reactive processes with NO_x, such as ground level O_3, further impair health in many of the aforementioned ways. Nitrate particles generated and dispersed as acid rain also diminish cardiovascular and pulmonary functioning in medically vulnerable populations (Hastings, Jarvis, & Steig, 2009; Townsend et al., 2003). Increased transportation emissions also contribute to climate change processes, of which many health impacts are predicted. This can occur through multiple pathways, such as 1) changes in the nitrogen cycle impacting the distribution of biodiversity and, subsequently the distribution and prevalence of infectious diseases including malaria or West Nile Virus (IPCC, 2007) or 2) further aggravation of existing cardiovascular and respiratory illnesses due to warmer air temperatures and predicted variations in air quality (IPCC 2007; Bernard et al., 2001).

Research on freight transport and health has advanced dramatically in the last several decades with the use of increasingly sophisticated place-based health research (Kawachi & Berkman, 2003) and air pollution modeling (Venkatram, Isakov, Seila, & Baldauf, 2009), but it remains challenged by the reality that humans are subjected to a natural laboratory of cumulative exposures in daily life. As indicated by a host of recent 'body burden' studies measuring pollution levels in people, humans host a variety of chemicals that likely interact in unknown, complex ways (Quinn & Wania, 2012). Depending on many factors, an 'unsafe' distance from an environmental hazard to live, work, or play within is not clear and may vary based on wind patterns, types of air mass, temperature, type of pollutant, compounding pollutants, and the source of the pollutant, as estimates from complex atmospheric dispersion models suggest. 'Near-roadway studies' consider specific distances to assess exposure and health outcomes within a buffer around a specific freight gateway, railway, or stretched along a portion of a transportation highway corridor (Batterman, Zhang, & Kononowech, 2009; HEI, 2010; Baldauf, 2008; Cho et al., 2009). A smaller number of studies have investigated how changes in land use lead to changed traffic and health outcomes (Cesaroni et al., 2011; Friedman et al., 2001). An elaborate literature review by the Health Effects Institute synthesizes hundreds of epidemiological studies between 1980 and 2008, identifying an "exposure zone within a range of up to 300 to 500 m from a highway or a major road as the area most highly affected by traffic emissions" (HEI, 2010).

Specific population-level prevalence rates for transportation pollution-related health outcomes are elusive given the lack of appropriate air quality or health data, tremendous amount of potential confounders, diverse exposure pathways, and the residence and fate of pollutant exposures that depend on complex chemical and meteorological processes. Some estimates exist,

however. For instance, in the American Public Health Association's (2010) report, *The Hidden Costs of Transportation*, authors estimate that the health costs of transportation-related pollution is in the range of 50 to 80 billion U.S. dollars annually. Corbett estimated that ship emissions were causing as many as 60,000 deaths from heart disease and cancer annually in 2007, and projected that number to increase by 40% by 2012 (Hricko, 2012; Corbett et al., 2007). Californians attribute 8,000 deaths per year to ambient air pollution (South Coast AQMD, 2005), in general, and near the Ports of Long Beach and Los Angeles, the local Air Quality Management District estimates a lifetime cancer risk of approximately 2,900 per one million people (South Coast AQMD, 2005). Reported in many environmental assessment documents at the Port of Long Beach, estimated annual statewide PM and O_3 health effects associated with the goods movement across California include: approximately 2,400 premature deaths, 2,800 hospital admissions for cardiovascular or respiratory causes, 62,000 cases of asthma or respiratory symptoms, 5,100 cases of bronchitis, 360,000 work days lost, and 1,100,000 school days lost (POLB, 2009).

Freight Transport as an Environmental Justice Issue

Given observable patterns relating transport land use and related health outcomes, some researchers, advocates, and policy-makers have started to deem freight transport an environmental justice issue. According to the EPA (1994), EJ is:

> …the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

Executive Order 12898 was signed by President Clinton in 1994 requiring all federal agencies to address EJ. President Obama restated this effort in 2011 when he signed the Memorandum of Understanding on Environmental Justice and Executive Order 12898. Both documents intended to formalize EJ commitments among all U.S. federal agencies. Under Obama's administration, various federal agencies initiated or revisited their EJ strategies and trainings (DHHS, 2012; DOE 2012; DOT, 2012).

The geographic relationship between environmental hazards and demographic factors has long been studied, gaining momentum and aligning with a larger national environmental movement beginning in the 1970's that continues today. Researchers started to report unequal distribution of air pollution based on social and economic factors in the 1970's (Asch & Seneca, 1978). The seminal United Church of Christ's (UCC) 1987 study is credited for EJ's beginning as a movement, reporting a spatial correlation between hazardous waste facilities and race in the U.S. In 2007, with improved spatial methodology, UCC researchers indicated that the correlation, in fact, might have been understated and likely increased in strength over two decades (UCC, 2007; Bullard, 2000). While several researchers have robustly shown that hazardous facilities (e.g., Toxic Release Inventory, Superfund) (Gibbs & Melvin, 2008; Stretesky & Lynch, 2002) are more likely to be located in low-income communities of color, there have also been some contradictory findings (Been & Gupta, 1997; Oakes, Anderton, & Anderson, 1996). Historically, there has also been much disagreement whether patterns of environmental injustice result from institutional discrimination in land use planning (Bullard, 2000; Cole & Foster, 2001), economies of agglomeration (i.e., clustering of related industries) (Bowen, 2008; Been & Gupta, 1997), or a historical combination of these forces (Pastor, Sadd & Hipp, 2001). Differing views on the cause of the unequal distribution of environmental burdens

may result in substantially different preventative or corrective interventions. More recently, the EJ field has opened extensively in practice and research beyond siting of hazardous waste sites to include green jobs, freight transport, access to green space, and other dimensions of sustainability.

Recently, researchers and advocates have noted that freight host communities are often EJ communities (EPA, 2009; Jerrett, 2009; Hricko, 2006). The term 'environmental justice community' is defined in many ways, and the EPA (n.d.) defines it as:

> To be classified as an environmental justice community, residents must be a minority and/or low income group; excluded from the environmental policy setting and/or decision-making process; subject to a disproportionate impact from one or more environmental hazards; and experience a disparate implementation of environmental regulations, requirements, practices and activities in their communities.

In general, these groups are also more likely to already have worse health outcomes in the U.S. largely due to social determinants of health, such as subpar housing and poor health care access (DHHS, 2010). While residents of host communities are expected to experience even higher, compounding health risks, it is challenging to determine the amount of variance in health outcomes specifically attributable to transportation-related exposures. Few known studies confirm demographic composition near U.S. freight gateways (Rosenbaum, Hartley, & Holder, 2011). The EPA has made recent mention of an exploratory, "initial screening" (p. 4) study at 47 marine ports and 33 rail yards, finding that at least 13 million people are "in the vicinity" (p. 4) of these facilities and they are disproportionately low-income, African-American, and Hispanic (EPA, 2009).

Methodological and theoretical dialogue is needed to continually advance our understanding of what it means, geographically or otherwise, to be an 'environmental justice community.' Several demographic variables have been used to characterize or predict the

location of disproportionate environmental burden: percentages of various racial and ethnic populations, percentage of persons below the federal poverty line, mean household income, mean housing values, percentage without a high school diploma, percentage with a college degree, percentage in executive management or professional occupations, and percentage employed in precision production or labor positions (Bowen, 2008; Mohai & Saha, 2006;Been & Gupta, 1997). A large number of relevant demographic predictors are available through basic U.S. census data. Others have calculated indices of structural disadvantage through factor analysis (Gibbs, & Melvin, 2008) or assigned segregation scores to U.S. Census tracts (Stretesky & Lynch, 2002). To understand the baseline health vulnerability of a community, a closer look at the spatial correlation between environmental health burden and existing health outcomes may be helpful; however, these health data are rarely available at the census tract level and may not include appropriate longitudinal information. To understand the role of economies of agglomeration and compounding hazards, measures of land use may also be helpful; although, this may be a difficult endeavor, as it likely requires seeking different data sets from multiple municipal agencies or regional planning organizations.

If residents of a geographic area are identified as an EJ community or are thought to experience an environmental *injustice,* we must also ask: what is justice? Justice has many frameworks (e.g., restorative, retributive), and two that are frequently applied to dialogue on EJ are procedural justice and distributive justice (Cole & Foster, 2001). In the context of EJ, procedural justice refers to the perceived fairness of the process of decision-making, and distributive justice refers to the perceived fairness of the outcomes of decision-making. Procedural justice is considered a necessary prerequisite and modifier of distributive justice (Amerasinghe, Farrell, Jin, Shin, & Stellies, 2008). Procedural justice has been measured as

representativeness, accurateness of information, and satisfaction with quantity and quality of participation opportunities (Webler & Tuler, 2002). Distributive justice is often the focus of EJ advocacy or studies assessing the distribution of hazardous waste sites in relation to variables of income or race, for instance. Attempts to measure both concepts are often controversial and contextual due to the subjective nature of what one considers fair and just.

Transportation Land Use Decision-making

To address the environmental health implications of transportation infrastructure, public health scholars and practitioners must familiarize themselves with the transportation decision-making process where threats to EJ may manifest. For public health, expanding understanding of related sectors, such as transportation planning, is consistent with a social determinants of health framework that emphasizes the role of living conditions as an influence on health (DHHS, 2010). This is reflected by recent cross-sector partnerships, such as the transportation and health subcommittee at the National Academies' Transportation Research Board, and many transdisciplinary reports from advocates, such as PolicyLink & the Prevention Institute's *Transportation Rx* (Bell & Cohen, 2009) and *Healthy, Equitable Transportation Policy: Recommendations and Research* (Bell & Cohen, 2009).

Transportation Decision-Making: The Role of the Federal Government

Complex decision-making processes determine design, siting, building, and maintenance of transportation infrastructure associated with the goods movement. Transportation infrastructure is often referred to as 'surface transportation' in U.S. policymaking and can include roads, bridges, ports, and rail yards, those at trade freight gateways or the networks that connect these gateways. Central to this infrastructure network, in 1956, the Federal Highway Act instigated the development of the initial 40,000 miles of our current interstate system. Today,

according to the Congressional Budget Office about 2.4% of the nation's gross domestic product is spent on transportation and water infrastructure, reported as a joint figure (CBO, 2010). This percentage and its rate of increase over time are much lower than other developed nations (International Transport Forum, 2011). Given the U.S.'s aging infrastructure, many are concerned there is insufficient funding for replacing or maintaining roads and bridges, of which many are becoming "structurally deficient" and unsafe (Transportation for America, 2011).

The federal government is responsible for the majority of U.S. transportation-related funding, but local regions have substantial flexibility and authority in deciding how their apportionment is applied (Craddock et al., 2009). Throughout the last few decades, surface transportation funding has been majorly defined by federal appropriation acts, including the Intermodal Surface Transportation Efficiency Act (IS-TEA) (1991-1997), the Transportation Equity Act for the 21st Century (TEA-21) (1998-2003), and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (2005-2009). The most recent transportation legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21) (2012-2014), passed with provisions particularly relevant to freight transport: the number of federal surface transportation grant programs was consolidated by two-thirds, the environmental review process was altered to allow for more categorical exclusions and enforce four-year review timelines with penalties for agencies that conduct longer reviews, and a national freight plan is underway (Lang, 2012). These acts rely heavily on gas taxes, promoting oil dependence to maintain transportation infrastructure and, some argue, this source of funding will be unreliable if the nation continues to move towards development of alternative transportation modes (TRB, 2006). Most federal transportation funds are directed through state departments of transportation (DOTs) and the nearly 400 Metropolitan Planning Organizations (MPOs) across the U.S., with

additional federal legislation and grants to mandate and fund specific projects.

Traditionally in the U.S., the government has relied on a "design-bid-build" (CBO, 2012, p.vii) approach to create transportation infrastructure using public dollars. Increasingly, in Canada and Europe in the early 1990's and in the U.S. more recently, public-private partnerships (P3) are an alternative funding mechanism where the private sector invests and relieves the public sector of financial risks (Abdel Aziz, 2007; Perez & March, 2006). Many examples of this approach exist, such as the building of the 183 Turnpike in Austin, Texas, Hiawatha light rail transit system in Minneapolis/St. Paul, Minnesota, and bus rapid transit development in Metro Denver, Colorado, among others (DOT, n.d.). While P3 projects are thought to enable more development in a cost-effective manner, they may also shift decision-making away from the public sector to private interests (CBO, 2012).

Public Participation in Transportation Decision-Making

As the U.S. Department of Transportation's *Guide to Transportation Decision-making* (n.d.) explains, the process of developing transportation infrastructure engages multiple stakeholders and requires public participation.[3] State and federal DOTs, local governments, and MPOs are charged to make decisions about infrastructure that are articulated through various documents, including environmental impact statements (EIS), regional transportation plans, and vision statements. Table 1.1 summarizes major policies requiring public participation in transportation decision-making, including two key acts: SAFETEA-LU and the National Environmental Policy Act of 1969 (NEPA). SAFETEA-LU formally integrated NEPA

[3] This dissertation uses the phrase 'public participation,' drawing from Arnstein (1969) and Davidoff (1965) ladder of citizen participation, defining public participation as the institutionally- or community-driven involvement or engagement of the public in deliberations associated with policies and programs that may affect the public's well-being. The 'public' may consist broadly of citizens and non-citizens; self-defined communities or neighborhoods; and those residing, playing, or working within politically defined geographic areas associated with these deliberations. Many different sectors, agencies, communities, and disciplines may use the terms 'citizen participation,' 'public involvement,' or 'public engagement' with similar connotations.

requirements into transportation decision-making processes.

Embedded in a risk assessment and management framework, NEPA requires any federal agency action that may "significantly affect the quality of the human environment" (NEPA, 1969), to prepare an Environmental Impact Assessment (EIA). The complex NEPA process is summarized in Figure 1.2. For a given project, a preliminary EIA determines whether an agency can declare a 'Findings of No Significance' (FONSI) or require a complete EIS. Through the EIS process, proposed actions and alternatives are anticipatorily evaluated. In addition to proposed alternatives, NEPA requires that planners assess the possibility of 'no build' where no development occurs. For all proposals, potential mitigation strategies for management of environmental risks must be described. Typically, in the context of transportation, lead government agencies hire consultants to conduct these assessments. Consultants and government staff members partner to report resultant information to the public in a Draft Environmental Impact Assessment (DEIS), soliciting and responding to public comments before government leaders publish a Final Environmental Impact Statement (FEIS) and come to a Record of Decision (ROD) to declare whether and where a project will be built.

As a tool to guide and inform deliberative processes, the effectiveness and potential of EIAs and EISs to protect human health have long been questioned. Early in NEPA history, scientists expressed concern that EISs offered, "massive amounts of incomplete, descriptive, and often, uninterpreted data" (as cited in Klopf, Wolff Culver, & Morton, 2007, p.38). More recently, studies have indicated that these assessments take 8.1 years, on average, (Todorovich & Schned, 2012) and often times more than 30 million dollars to complete (Laron et al., 2004; Canter & Clark, 1997) without offering iterative opportunities for risk assessment. Although, health is discussed in NEPA, it is minimally discussed in completed EISs, generally in the

context of toxic exposures, rather than cumulative impacts (Steinemann, 2001; Walker, 2010). Many public health practitioners argue the EIS process is an "unrealized opportunity" (p. 991) for health assessment (Bhatia & Wernham, 2008). Given the tremendous resources required to conduct these assessments, a better understanding of how host communities and decision-makers use this and other types of information, is needed to determine the most productive, successful decision-making processes for transportation infrastructure.

Local decision-makers and consultants often modify transportation decision-making in their local context within federal guidelines. This modification may include additional local NEPA-like standards or policies, "little NEPAs" with additional local regulations (Corburn, 2009, p. 61; Karkainen, 2001), as well as additional assessment tools such as Health Impact Assessments (HIAs). California, for example, requires all entities charged to fulfill NEPA requirements also fulfill California Environmental Quality Act (CEQA) requirements (CEQA, 1970). CEQA requires specific outreach strategies (e.g., publication in local newspapers) and that agencies adopt mitigation strategies for environmental damage, neither of which are required by NEPA. NEPA merely requires that mitigation strategies be identified. Another approach similar to EISs are HIAs, but unlike EISs, HIAs are voluntary tools focused on health indicators usually identified locally (Forsyth, Slotterback, & Krizek, 2010). HIAs are generally focused on social determinants of health and local issues of equity (Corburn, 2009). At the border of Oregon and Washington, for instance, a coalition of governments solicited input from 39 advisory committees to conduct a HIA in addition to their ongoing EIS to make decisions about the bridge and surrounding infrastructure for the Columbia River Crossing (ODOT & WSDOT, n.d.). In California, the proposed expansion of the I-710, a major highway connecting the Ports of Long Beach and Los Angeles to Southern California, is thought be the largest project with an HIA in

the U.S., instigated by community members living along the I-710 corridor working with decision-makers (Heller, 2012). Although, currently, decision-makers in these and other instances are not required to consider the findings of HIAs in their freight land use decisions.

Locally, community-driven public participation may also initiate or modify transportation decision-making processes in extraordinarily different ways, both formally and informally. For instance, in Charleston County, South Carolina a community-based advocacy group fundraised to hire their own planning firm to prepare an alternative plan for the Charleston Harbor when the EIS process produced what they deemed to be environmentally unfavorable options (Coastal Conservation League, 2010). Other communities have promoted the use of Community Benefits Agreements (CBA) such as the Community Benefits Coalition in Southwest Detroit, Michigan, a host community near a current development proposal site for a new international border crossing. CBAs are contracts between communities and developers or local government agencies that reflect collective bargaining in a development process. The first documented use of a CBA was during the building of Staples Center in Los Angeles in 2001 (Brieschke et al., 2007).

Public Participation: Frameworks and Measures

Local residents have perspective and information that experts may overlook or minimize during risk assessment without sufficient public participation opportunities (Corburn, 2009; Fischer, 2005). A wide gamut of research approaches highlight the role of local experts in defining and assessing threats to health, including: community-based participatory research (Israel, Schulz, & Parker (ed.s), 2005), participatory action research (Fals-Borda & Rahman (ed.s.), 1991), participatory mapping (IAPAD, 2009; PolicyLink, 2009), HIAs (Danneberg et al., 2008), and Photovoice (Wang & Burris, 1994). There are many practical, ethical concerns regarding distribution of scarce public resources to conduct interventions or decision-making

processes with public participation in a necessarily intensive manner (Buchanan, Miller & Wallerstein, 2007). Yet, recently, scholars have increasingly explicated how these processes have led to positive policymaking, decision-making, and advocacy outcomes in the context of public health and health equity (CTSA Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, 2011; Israel et al., 2010; Themba-Nixon, Minkler & Freudenberg, 2008; Minkler et al., 2008).

The field of planning, which encompasses transportation planning, has considered the role of public participants in depth and may have much to offer diverse stakeholders involved in decision-making related to freight transport and health. Dating to Davidoff (1965) and Arnstein (1969) with contemporary versions (IAP2, 2007), a 'ladder of citizen participation' was proposed as a mechanism for understanding levels of public participation and their potential outcomes, generally, in institutionalized planning processes. This ladder represents a spectrum from non-participation to complete citizen control, recognizing that public participation can be both institutionally- and community-driven.

Over the last century, a variety of theoretical approaches to public participation have developed, among them are rational planning, critical communication, and communicative and constructive learning models. In early 20th century, planners defined rational planning as a framework, relying on expert technical knowledge to make efficient, cost-effective decisions through a stepwise process (Flybjerg, 2005;Portugali, 2000). The steps of rational planning are still used today, as seen in the NEPA process, when a problem is defined and evaluated, then multiple solutions are proposed and evaluated to lead to a decision that is based on various criteria. In the 1980's, Forester (1980) introduced Habermas' critical communication theory (1981) to the dialogue, putting forth that, when planners engaged the public, this was a

reciprocal, power-laden communicative action (Innes & Booher, 2010). Today, with a post-positivist push from scholars and practitioners, the public's complex role in planning is frequently defined by complementary constructivist learning (Daniels & Walker, 2001) and communicative planning models (Innes, 1998). Constructivist learning models, epistemologically, recognize experiential knowledge of public participants as relevant to decision-making. These models are heavily interested in how empirical or expert information and local or experiential information is exchanged between and interpreted by the public and planners to make planning decisions. The term 'democratizing science' describes this process (Schensul, 2002) that honors collective lay knowledge rooted in a particular place (Geertz, 1983). Applying communicative planning models, planners are still experts facilitating decision-making, but they may also take on other roles by initiating task forces or consensus-building, identifying and including diverse stakeholders, or preparing documents for alternative forms of information sharing (e.g., policy briefs, committee talking points) (Innes, 1998).

Based on rational planning, communicative planning, and combinations of these models today, public participation in transportation planning-related decision-making remains variable throughout the U.S. There is evidence that many planners do not regard public participation worth the time or energy to the detriment of the outcomes (Callahan, 2007; Godschalk et al., 2003). And, it is noted that there may be a pro-participation bias in scientific literature, where scholars supportive of public participation in planning study it in a positive frame (Dietz & Stern (ed.s), 2008). Some argue that expert-driven, rational processes are advantageous over public participation by preventing the conflicts that inevitably come with political and emotional dialogue inherent to planning (Harwood, 2005; Golooba-Mutebi, 2004; Bonfiglioli, 2003). Yet, a large majority of planning literature on participation has come to normatively argue that rational

planners are not immune to subjective human valuation, and social problems materialize when community participation in planning decisions is disordered or overlooked (Innes & Booher, 2004).

For major public decisions, such as infrastructure development, variables to measure participation processes and outcomes vary substantially with local, national, and international context. Often, in the framework of EJ, the processes of participation are made analogous to procedural justice, and the outcomes of participation are assessed as distributive justice. Procedural justice may look like responsive decision-making, respectful processes, fair representation, recognition of local history and culture, early inclusion of public participants, and processes generally deemed fair by public participants (NEJAC, 2012; Amerasinghe, 2008; Lind & Tyler, 1988). Assessment of public participation processes and outcomes may vary on how an issue is framed, or who has initiated or is assessing the participation. For instance, a government agency staff may solicit public participation at meetings or comment periods under voluntary or regulatory mechanisms. Alternatively or in response, a community coalition may organize a town hall, draft press releases, or engage other strategies to create public participation opportunities around an issue.

Planning practices place tremendous value on public participation (Aitken, 2010), but few closely assess these processes in the context of transportation decision-making (APHA, 2009). Quantity and quality of participation are measured in multiple ways. Quantity may entail a count of public meetings, comments, press activity, or forums, as well as the number and types of individuals or groups involved (Stevens, Berke & Song, 2010;Walker, 2010). Quality of participation is harder to assess and may entail measuring how empowering a process is, how networks engage or deepen, representativeness of stakeholder groups, capacity of planners or

public participants, and level of involvement (Stevens, Berke & Song, 2010; Butterfoss, 2006). Planners and public administrators argue different levels and types of direct public participation are ideal for maximizing benefits, whether social, economic or environmental (Hibbard & Lurie, 2000).

The outcomes of participation cannot easily be measured in an objective, validated way, and the establishment of measurable outcomes may be a first necessary institutional step in decision-making deliberations (Reed, 2008). The measurable results of participation are complex and may manifest at the individual, community or systems level and may be positive or negative (Gaventa & Barrett, 2010). An outcome can be policy related (e.g., reduction in risk or cost, a completed project, clear decisions) or capacity related (e.g., increased knowledge or trust) (Webler & Tuler, 2002). Adding to the complexity, some processes may also be outcomes. For instance, community capacity to address an environmental health risk may drive the participation process, but the institutional process may also lead to increased community capacity to address related issues. A successful outcome for a community advocate may be different than a successful outcome for a decision-maker, for instance. In the example of transportation and air quality, advocates and decision-makers may have wildly different local or global economic, social and environmental goals or priorities for a freight gateway development. Some scholars advocate foregoing the study of causal links between participation and decision outcomes to better understand changes in attitude, behavior, or knowledge that may occur throughout a deliberation process with government agencies, community members and the private sector (Gaventa & Barrett, 2010; Rocha Menocal & Sharma, 2008).

Study Purpose

In the last several decades, interventions that may address health effects from freight transport have advanced tremendously, such as air and noise pollution control policies and technologies, zoning rules, and local environmental programs. Further, theories and policies have evolved to integrate public participation with environmental assessment in decision-making as a potential determinant of health. Still, few studies have described the host communities that may be most vulnerable to the disproportionate burden of local freight-related health outcomes, where threats to EJ are likely. Also, few studies have investigated how variable, complex decision-making processes work (and can potentially be improved) *from the perspective of public participants* in these host communities. Thus, such gaps motivate this dissertation guided by these research questions:

1) Who are the residents in host communities of major U.S. freight gateways? Are they demographically different than residents in non-host communities?
2) For host community residents, what is public participation in freight land use decision-making?
3) Specifically, how do host community residents participate in environmental assessment processes in freight land use decision-making?

In Chapter 2, I introduce quantitative and qualitative methods to address these questions. In Chapter 3, I address question one with quantitative findings derived from spatial analyses describing who residents in host communities are demographically and if there is a potential disproportionate distribution of environmental health burden. In Chapters 4 and 5, I describe two case studies to qualitatively address questions two and three, highlighting examples of procedural barriers and catalysts of public participation in transportation land use deliberations.

Finally, in Chapter 6, I present conclusions and wider implications of collective findings, including recommendations from study participants for better integration of local public health issues into global transportation decisions.

Figure 1.1 A Conceptual Model for Addressing Freight Transport as a Determinant of Health in the U.S. Host Communities

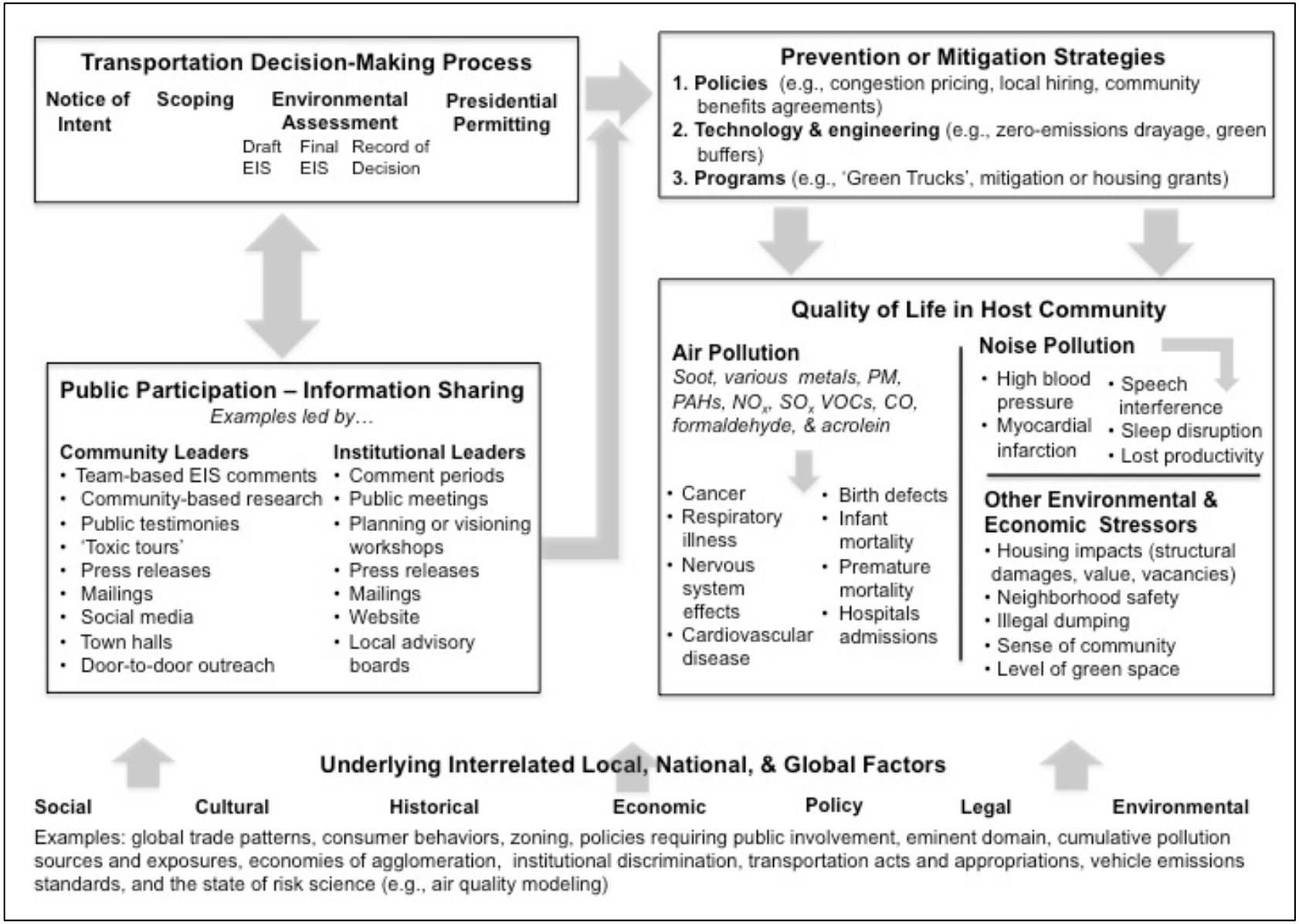
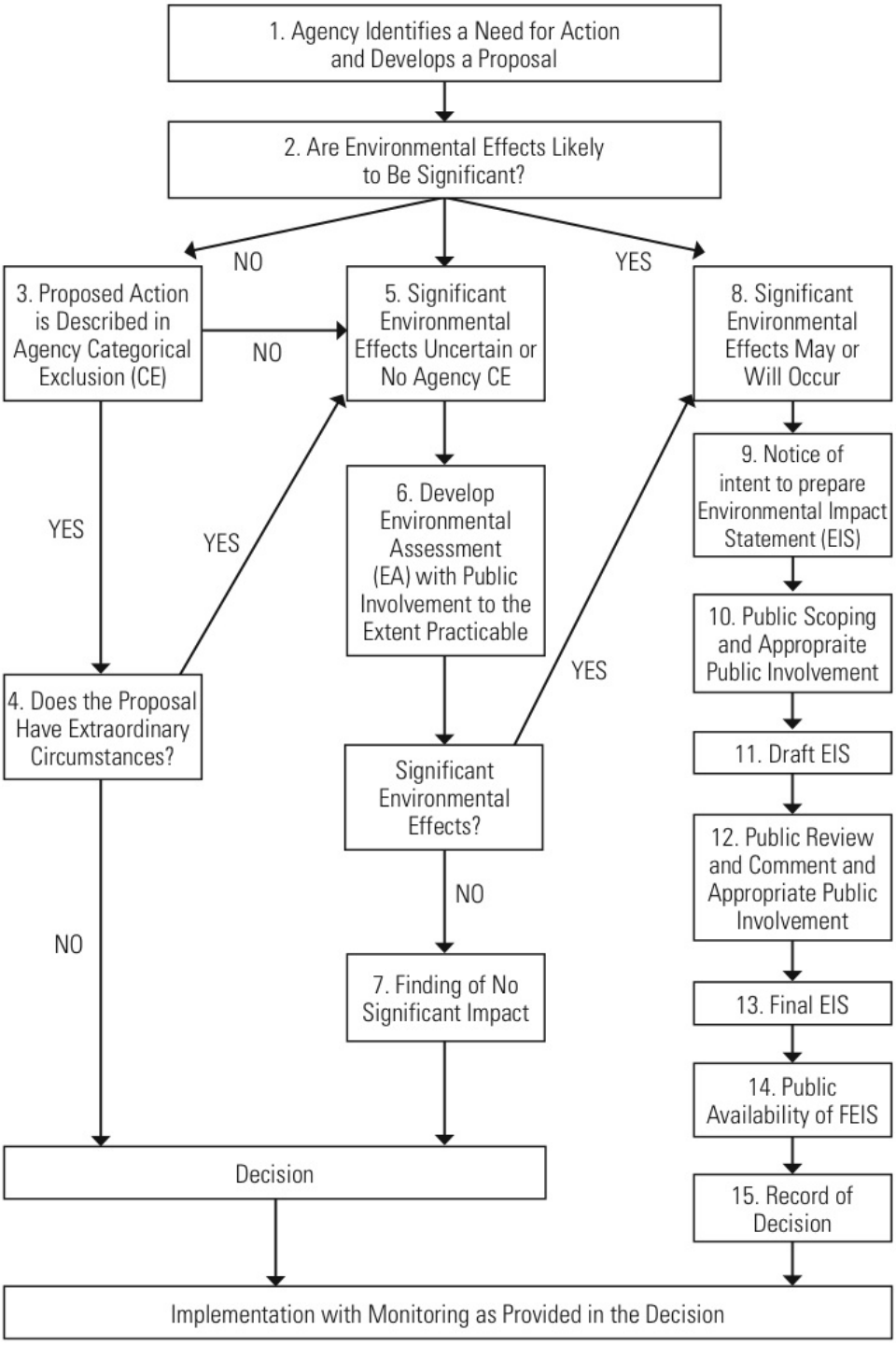


Table 1.1 Key Federal Rules Requiring Public Participation in Transportation Planning

Policy	Description of Public Participation Requirements
Safe, Accountable, Flexible, Efficient Transportation Efficiency Act (2005); U.S.C. Title 23, Parts 134, 135 & 450 (2005)	• Requires MPOs to develop participation plans, per Transportation Equity Act (1998) • Links transportation planning to NEPA regulations • Mandates that state Departments of Transportation & MPOs must conduct public meetings at convenient and accessible locations
Executive Order 13166 (2001)	• Orders that federally conducted programs and activities be accessible to persons with limited English proficiency
Executive Order 12898 (1994)	• Orders public participation in all federal programs and plans to achieve environmental justice
National Historic Preservation Act (1992)	• Defines format and types of cooperation required between States and Indian Tribal areas in long-term transportation planning
Intermodal Surface Transportation Efficiency Act (1991)	• Among first transportation policies to encourage & fund public participation • Increased flexibility of State's in planning processes
National Environmental Policy Act (1969)	• Requires public comment opportunities on draft environmental impact statements during draft phase, after alternatives have been identified and evaluated
Federal Highway Act (1962)	• Required urbanized areas with populations of 50,000 or more create state and local planning organizations to receive federal transportation funds

Adapted from: *Public Involvement Legislation, Regulations, and Guidance* (DOT, n.d.)

Figure 1.2 The National Environmental Protection Act (NEPA) Process (CEQ, 2007)



**Significant new circumstances or information relevant to environmental concerns or substantial changes in the proposed action that are relevant to environmental concerns may necessitate preparation of a supplemental EIS following either the draft or final EIS or the Record of Decision (CEQ NEPA Regulations, 40 C.F.R. § 1502.9(c)).*

CHAPTER 2

Methods: Quantitative and Qualitative Inquiry

Overview: Mixed Methods

This study was conducted between August 2011 and March 2013 using multiple methodological approaches to holistically unpack global freight transport as a public health issue with local impacts. I used both quantitative and qualitative methods in an isolated mixed methods approach (Yin, 2006), conducted separately but in a complementary manner. Readers should take note of the varying epistemologies and geographic and temporal scope indicated throughout, underlying each type of data collection and analysis for those results I report in Chapters 3 through 5. This combination of methods allows for comprehensive synthesis of local and national conclusions about public health and U.S. freight transport, provided in Chapter 6. The focus of this chapter is to describe methodologies selected to address this study's purpose, as well as institutional ethnography as the guiding framework for qualitative data collection and analysis.

To address the questions outlined in Chapter 1, I used spatial methods to derive quantitative data to address the 'who' of interest in research question one and qualitative methods to address the 'what' and 'how' of interest in questions two and three in the context of two case studies. Spatial analyses, often enabled by mapping software such as ArcGIS (Esri, 2011), allow researchers to generate placed-based data, identify potential geographic relationships between variables, and communicate information visually (Cope & Elwood, 2009). In this study, spatial analyses helped to produce basic demographic summaries, comparisons, and

models to describe freight host communities in the U.S. (that, if calculated, have not been previously disseminated widely). Qualitative research generally enables researchers to study in-depth processes, difficult to quantify concepts, and subjective experiences, while contextualizing statistical information or generating new hypotheses, theories, or conceptual models (Maxwell, 2005; Patton, 2002; Creswell, 1998). In this study, I used qualitative research to identify and describe residents' and decision-makers' experiences with public participation in decision-making and environmental risk assessment processes related to freight land use developments in the U.S.

In an iterative manner, qualitative findings informed data collection and analyses for spatial methods. For instance, in Chapters 4 and 5, residents participating in qualitative interviews described how truck traffic negatively affects noise levels, injury prevalence, air pollution exposure, household structure, and quality of life generally in their community. As a result, in some analyses, I included traffic routes to improve localized spatial analyses to reflect these broader concerns, and they were able to act as a proxy where air quality data were not available. In this same vein, interviewees expressed how transportation infrastructure was frequently located in industrial zones where cumulative exposures burden residents, and these findings motivated inclusion of data characterizing stationary sources of air pollution in national analyses. I also included employment status as a variable in national analyses based on qualitative themes relating unemployment and health and considering the role of local jobs as a deliberated issue in freight land use decisions.

The University of Michigan Institutional Review Board (IRB) approved this study in August of 2011, declaring it exempt under federal exemption category number two (1991). Quantitative methods relied on secondary data aggregated at the census tract or larger levels, and

there are exceptionally nominal risks to participants who cannot be identified in these publically available data sets. While exempt under IRB, qualitative data collection through interviews with study participants did include consent procedures and protection, as described below.

As Chapter 1 and Figure 1.1 illustrate, this study's research and interview questions and frameworks for analysis are meant to draw and build upon public health themes in literature, practice, and the experiences of study participants. However, given the nature of this cross-sector topic, economic, planning, environmental, and legal frameworks, among others, are also relevant and discussed. Deepening the study's cross-disciplinary perspectives and methods, a master's candidate in urban planning at Wayne State University in Detroit, Michigan assisted with data analysis.

Quantitative Inquiry

Overview

To better understand who lives near the largest U.S. freight gateways by trade value, quantitative inquiry entailed multiple spatial analyses. Nationally, this included three parts:

1. Descriptive demographic summaries of host communities[4] generated through areal weighting,
2. Using these areal weights, comparative demographic analyses of these host communities with the U.S. population, and
3. Logistic regression models, identifying demographic variables that may correlate with a census tract's host status.

Locally, this also entailed in-depth descriptive analyses at the current Ambassador Bridge and proposed New International Trade Crossing (NITC) in Detroit, Michigan and the Port of Long

[4] In description of methods and findings, the term host community more specifically refers to the area within a 500-meter or 1-mile buffer, as indicated, of a freight gateway. Further justification for a 500-meter buffer is included in 'Data Analysis.'

Beach in Long Beach (POLB), California and their surrounding transportation infrastructure. These localized analyses provide a nuanced description of host communities, complementing qualitative case studies at these sites.

Data Collection

Freight Gateways

Analyses began by focusing geographically on the 119 largest freight gateways by trade value,[5] listed in Table 2.1. This list includes 26 airports, 59 seaports, and 34 land border crossings (BTS, 2009). These 119 sites are representative of the U.S. freight transport network, comprising approximately 90% of trade by value. The 50 largest freight gateways on this list comprise nearly 78% of trade (US$2,641,600 millions) and include 25 airports, 12 seaports, and 13 land border crossings. The ten largest freight gateways comprise nearly 43% of trade (US$1,331,661 millions), and they include Los Angeles International Airport; Port of New York/New Jersey; John F. Kennedy Airport; Port of Houston; Detroit, Michigan; Laredo, Texas; Chicago, Illinois; Port of Long Beach; Port Huron, Michigan; and Buffalo- Niagara Falls, New York.

The Bureau of Transportation Statistics maintains a database of geo-referenced points of freight gateways, but no comprehensive agency maintains a database of polygon shapefiles[6] necessary for more refined summaries and comparisons. An extensive process was necessary to compile existing and create new polygon shapefiles to depict the 50 largest freight gateways, as a

[5] This analysis started with the Bureau of Transportation Statistics' list of the largest 125 freight gateways by trade value (2009), but only entailed study of 119. Sites in Puerto Rico and the Virgin Islands were excluded, given that transportation planning may be affected by unique local policies. This analysis included more than 125 physical sites, however, where the Bureau of Transportation Statistics may include multiple sites for ranking a given freight gateway. For instance, the seventh largest freight gateway by trade value, Chicago, Illinois, accounts for trade at two sites, both Midway and O'Hare International Airports. Thus, overall, there are 151 points used to run analyses.

[6] The term shapefile refers to a type of file. As defined by Esri (n.d.), a shapefile is "A vector data storage format for storing the location, shape, and attributes of geographic features. A shapefile is stored in a set of related files and contains one feature class." In this study, shapefiles of freight gateway look like digital map drawings of property comprising each the airport, seaport, or land border crossing.

feasible scope and reasonable representation for assessing potential trends. First, I located polygon shapefiles of airports in Esri's ArcGIS 10.0 (Esri, 2010). These include boundaries of airports and their runways. Next, I created polygon shapefiles of seaports and land border crossings through digitization[7] within ArcGIS. It is difficult to differentiate official freight gateway property from related private facilities. Thus, I took steps to validate standard boundaries used by government agencies for planning. To validate seaport digitization, I obtained screenshot images from consultants at ICF International used during a similar EPA study focused on exposure at seaports (Rosenbaum, Hartley, & Vutukuru, 2008). To validate digitization of land border crossings, I compared shapefiles to images in documents posted online by the General Services Administration, the independent U.S. agency responsible for acquisition, use, and disposal of government land property. As secondary references, I also referred to images in environmental assessment documents and Google Earth software (2012) to ensure boundaries were as accurate as possible. Digitized polygons likely provided conservative underestimates of exposed populations given that core infrastructure are frequently surrounded by expansive private transportation facilities.

To offer methodological context and allow for replication of this study, Appendix B contains resulting screenshots of the largest 50 freight gateways. Also, because no comprehensive dataset was available for this study, I prepared a geodatabase file containing all 50 shapefiles and a metadata[8] file to share the digitized images with interested researchers.

[7] The term digitize refers to the process of creating spatial data, by drawing a polygon in a computer program, for instance. As defined by Esri (n.d.), digitizing is "The process of converting the geographic features on an analog map into digital format using a digitizing tablet, or digitizer, which is connected to a computer."

[8] Metadata is a term frequently referred to as 'data about the data.' As defined by Esri, metadata is, "Information that describes the content, quality, condition, origin, and other characteristics of data or other pieces of information. Metadata for spatial data may describe and document its subject matter; how, when, where, and by whom the data was collected; availability and distribution information; its projection, scale, resolution, and accuracy; and its reliability with regard to some standard. Metadata consists of properties and documentation. Properties are derived

Census Tracts

I obtained census tract shapefiles from 2000 from the U.S. Census's national database, Topologically Integrated Geographic Encoding and Referencing (TIGER) (U.S. Census Bureau, 2010). Shapefiles from 2000 correspond spatially with 2005-2009 demographic data from the American Community Survey (ACS).

Demographics

Table 2.2 summarizes the ACS variables I used for these analyses, from which I derived % persons of color, % Hispanic, % with less than a high school diploma, % unemployed, % below the poverty level, and % vacant homes. ACS 2005-2009 5-year estimates at the census tract level (U.S. Census Bureau, 2012) were the most appropriate national demographic data set for timely analysis. The 2010 U.S. Census did not entail collection of information about household income or unemployment and other versions (e.g., 1-year or 3-year estimates) of the ACS were not available for some of the freight gateway geographies where population is too small. Thus, I did not choose these potential data sets. Further, while block groups may be the most ideal unit of analysis, many estimates for variables of interest were not available across sites at this block group unit at the time of this study. I also pulled national-level data from the ACS 2005-2009 estimates to standardize comparative analyses.

Hazardous Sites

To determine if stationary air pollution sources spatially relate with freight gateway locations, I acquired data on industrial facilities. I obtained data from federal environmental programs that track air pollutants, particularly the Toxic Release Inventory (TRI). The TRI is a database containing geo-referenced information on approximately 650 chemicals released at over

---

from the data source (for example, the coordinate system and projection of the data), while documentation is entered by a person (for example, keywords used to describe the data)."

23,000 industrial facilities, and is accessible through a downloadable application called TRI.Net (EPA, 2008). There is potential for biases underlying these data, as they are reported directly to the EPA by private polluters and indicate mean levels of pollutants rather than extremes.

While data noting the simple presence of a hazardous site is informative from an EJ perspective, more detailed risk information provided by EPA's Risk-Screening Environmental Indicators (RSEI) Model may be more meaningful. RSEI attempts to score and rank[9] chemicals reported in the TRI, indicating levels of risk at each site based on the reported discharges. The EPA model assigns risk values to over 400 chemicals at over 50,000 facilities reporting over 22 years, and I included values for 2010 in descriptive analyses.

Local Transportation Data

Finally, I obtained truck route shapefiles provided by the Michigan and California Departments of Transportation to prepare localized analyses, complementing qualitative case studies related to the NITC in Detroit, Michigan and the POLB in Long Beach, California.

Data Analysis

In the context of this spatial inquiry, I defined host communities using 500-meter and 1-mile buffers. From the findings of the Health Effects Institute's meta-analysis, the "exposure zone within a range of up to 300 to 500 meters from a highway or a major road as the area most highly affected by traffic emissions" (2010). No known research offers such an evidence-based exposure buffer for airport related pollution, but studies indicate that pollution from aircrafts

[9] As described at length in an EPA report, *Developing the Risk-Screening Environmental Indicators* (n.d.), composite scores were assigned using the following formula:

$$CS_i = (O_i * 3 + RDN_i * 1 + C_i * 2 + E_i * 2) * (Release_i/Production_i)$$

where:
CS_i = Composite score for chemical *i*
O_i = Oncogenicity concern for chemical *i*
RDN_i = Reproductive, developmental, neurotoxicity concern for chemical *i*
C_i = Chronic toxicity concern for chemical *i*
E_i = Ecological toxicity concern for chemical *i*

immediately surround runways and may continue further downwind given that aircraft emissions may contain higher levels of ultrafine particles that other types of vehicles (Hu et al., 2005). While there is a not a comparable noise-specific zone in the literature, it is clear that noise pollution and traffic will affect quality of life and health of those adjacent to freight gateways (van Kempen et al., 2006; Muzet, 2007; Griefahn & Spreng, 2004; Fidell, Pearsons, Tabachnick, & Howe, 2000;Stansfield, Haines, & Brown, 2000). My use of 500-meter buffers is not meant to determine or support a specific distance-based threshold, as local baseline air quality, topography, and meteorology uniquely moderate what may be a 'safe' distance to live, work, or play near each freight gateway. Still, a 500-meter buffer enables analyses to generate a basic understanding of populations most immediately vulnerable to freight-related air and noise pollution and other potential impacts on quality of life. Qualitative findings and examples in literature ((Mohai & Saha, 2006; Ringquist, 2005; Maantay, 2002; Taquino, Parisi, & Gill, 2002) encouraged analysis at 1-mile buffers also, given that health effects at freight gateways generally expand beyond the footprint of a bridge, port, or airport to the nearby transportation corridor.

Initial decisions about geographic coordinate systems and map projections are also necessary to accurately conduct demographic spatial analyses (Price, 2009). For this study, I selected the North American Datum 1983 (NAD 1983) as the geographic coordinate system because it is among the primary systems used in the United States. I then selected the Universal Transverse Mercator (UTM) System as the projection for analysis. The UTM entails 60 global north and south zones, with 10 zones in the continental U.S. and nine additional zones including Alaska and Hawaii. Different projections have different strengths and limitations, and the UTM is ideal for representation of area and angles for small shapes within zones (Price, 2009), which was essential to this study. For each freight gateway, I ran areal weighting based on the most

appropriate UTM zone.

1. Demographic Summaries of Host Communities

Drawing on methods used extensively in EJ research at hazardous sites (Mohai & Saha, 2006; Ringquist, 2005; Maantay, 2002; Taquino, Parisi, & Gill, 2002) and pollution exposure studies (Maantay, Maroko, & Porter-Morgan, 2008; Pastor, Sadd, Morellow-Frosch, 2002; Zanobetti & Schwartz, 2000), areal weights (Langford, Macguire, & Unwin, 1991) enable us to estimate characteristics of a geographic area based on information about the larger unit. In this study, this entailed creating 500-meter and 1-mile buffers around freight gateways and intersecting these with census tract shapefiles in ArcGIS10.0 (Esri, 2010). Weights are calculated by dividing area of intersected segments of tracts within the buffer by the total original area of these tracts. I applied these weights to demographic data for each tract. I then summed these weighted data for all segmented or full tracts comprising a host community. This type of analysis relies on the assumption that census tracts are relatively homogenous in demographic composition. These population estimates cannot necessarily inform conclusions about magnitude of EJ (Baden, Noonan, & Rama Mohana, 2007), as a complex social construct.

2. Comparative Demographic Analyses

Using the above summaries generated through digitizing and areal weighting of demographic data at the 50 largest freight gateways, I tested the following hypothesis with host community as the unit of analysis:

Ho: For all demographic variables, $p_1 \neq p_2$, where 'p' represents the population proportion, '1' represents host communities, and '2' represents the nation.

I hypothesized, for instance, there is no difference in the proportion of the population that is unemployed or below poverty in host communities than nationally. To conduct comparative

demographic analyses and test this hypothesis, I conducted independent t-tests in SPSS 20 (IBM, 2011). During this procedure, I assessed host community data for each demographic comparison to ensure the data were normally distributed.

3. Logistic Regression Models

In this component of data analysis, also in SPSS 20 (IBM, 2011), I tested logistic regression models to assess correlation between various demographic variables with host tract status near the 50 largest freight gateways, where census tracts were the unit of analysis. Based on aforementioned analyses, census tracts were categorically assigned as host ('1') and all others were assigned as non-host ('0'), as the dependent variable of analysis. To assess methodological and geographic differences, I tested four definitions of host community as versions of the dependent variable: 1) tracts that intersect or are contained within a 500-meter buffer of freight gateways, 2) tracts where at least 50% of their area are contained within a 500-meter buffer of freight gateways, 3) tracts that intersect or are contained within a 1-mile buffer of freight gateways, and 4) tracts where at least 50% of their area are contained within a 1-mile buffer of freight gateways. Highlighted in Table 2.2, several demographic variables (e.g., race, ethnicity, poverty, education, employment status) were the independent variables of analysis. I tested the following hypothesis:

> Ho: $\beta_1 = \beta_2 = ... = \beta_k = 0$, where 'β' is the coefficient of each independent variable, '1' is all tracts in host communities and '2' is all tracts in non-host communities.

In other words, as an example with the independent variable 'race,' there is no correlation between the proportion of persons of color in a tract and whether or not a tract falls in a host community. I tested the aforementioned demographic variables, as independent variables, in a

stepwise process. I also assessed variables for multicolinearity and to ensure a normal distribution.

4. Additional Localized Analyses

I ran additional spatial analyses and created maps to understand how demographic and environmental health variables might be related in the context of the NITC and POLB deliberations. Using local demographic, traffic routes, and TRI data, these analyses included:

- Local Demographic Summaries – I extend national areally weighted analyses to also estimate local demographic composition around the NITC and POLB's transportation corridors (e.g., intermodal facilities, major highways), drawing comparisons with city, county, and state demographic composition. While national analyses contribute to larger dialogues about EJ, these localized analyses provide examples for the types of data visualizations that may inform local decision-making.
- Hot Spot Analyses – I also conducted several exploratory hot spot analyses in ArcGIS 10.0 (Esri, 2010) to see if NITC and POLB are located in areas that have statistically significant, non-random distributions of various variables (e.g, higher ranking TRI facilities, proportion low-income). Hot spot analysis allows us to look at characteristics of areas in relation to surrounding areas using a Getis-Ord statistic, show in Figure 2.1. The Getis-Ord statistic is a Z-score that measures standard deviation, indicating 'hot' and 'cold' spots and statistical significance.

Qualitative Inquiry

Epistemological Framework

Institutional ethnography, as an epistemological approach, guided qualitative inquiry in this study. Institutional ethnography, a sociological framework rooted in critical feminist theory

and popularized by Dorothy Smith (Babbie, 2010; Smith 2006), investigates institutions as experienced from the standpoints of public participants. Here, I broadly define institution to mean "complex social forms that reproduce themselves such as governments, the family, human languages, universities, hospitals, business corporations, and legal systems" (Miller, 2011). As institutional ethnographers explain, texts (e.g., policies, forms, ads, images) communicate and mediate institutional frameworks and processes by presenting, implementing, and perpetuating ways of writing, thinking, speaking, or acting. Institutional ethnography is interested in individuals (e.g., community members interested in issues related to the goods movement), their doings (e.g., participating in town hall forums), and how they are coordinated (e.g., solicitation for public comments). As Campbell and Gregor (1998) explain:

> Investigations which use this method of inquiry begin with the following three assumptions. First, people are experts in how they live their own lives. Second, subjects are located in sites throughout society (local settings). And third, powerful outside (translocal) forces shape how people live and experience their everyday lives. (p. 22)

This approach allows refined analysis and translation of how complex institutions, as systems and networks, and their texts are experienced from the perspective of those most affected such as residents, clients, or some other specific group. Using this epistemological framework, researchers are equipped to understand where changes may be necessary to meet the everyday needs of those affected by institutional procedures such as decision-making in host communities related to freight transport infrastructure.

Case Selection

Guided by institutional ethnography as an epistemological framework, this study's qualitative inquiry focused on two cases for data collection and analysis: the proposed NITC in Detroit, MI and the POLB in Long Beach, CA, as noted earlier. In research, the nearly universal

definition of a case is a ‘bounded system’. More specifically, it may be a bound event, time, process place, or group of people (Creswell, 1998). In particular, this inquiry focused on deliberations at these case sites related to freight transport. As defined by Fearon in Abelson et al. (2003)’s text on deliberative democracy, deliberation is a specific type of discussion that involves the thoughtful weighing of reasons for and against a proposition. Deliberations, in this study, are government decision-making processes related to current freight land use or development within a host community.

Justification for using a site and its deliberations as the unit of analysis to address these research questions was threefold. First, deliberations at a single site provided an appropriate unit of analysis for investigating public participation, where the exchange of information through texts and interactions was bound. Second, deliberations at a single site allowed us to see how diverse participants (the public and decision-makers) interact and exchange information, unlike if an alternative unit of analysis was selected, such as an agency, organization, or coalition where interactions between stakeholders may be overlooked. Finally, some study participants may draw on their various public participation experiences related to the freight gateway in their community over time given that public participation frequently fluctuates with one’s resources and interests (Christens, 2010). Thus, including the possibility of *multiple* deliberations at a single site is necessary. For instance, in Detroit, Michigan, when residents were asked about the proposed NITC, they also frequently discussed deliberations for an existing border crossing and intermodal rail yard.

I used purposive sampling to select these cases to best address this study’s research questions. To ‘purposively’ select a case may mean selecting based on deviation, intensity or urgency of a given context, political importance, typicality, or a variety of other characteristics

(Fyvbjerg, 2006; Patton, 2002). I based initial selection on criterion sampling where I defined and applied several criteria to potential cases. Maximum variation sampling was then used to select two cases that were overtly different by geography and context, a selection strategy that allows for identification of crosscutting themes that may emerge despite maximum variation (Patton, 2002).

I developed the following inclusion criteria and rationale to help assess and select the most appropriate deliberations:

- Relevance to freight and health - As rationalized in Chapter 1, this study is most interested in the freight transport, as a potential threat to environmental health and justice (Hricko, 2008). Much research has been done to understand EJ in the context of point source pollution, historically focused on toxic hazardous sites (UCC, 2007; Cole & Foster, 2001). However, fewer studies have investigated the community response and institutional processes when siting railroads, ports, bridges and roads (and their ongoing developments) in an increasingly globalized economy.
- Marginalized communities potentially affected - Hazardous or high polluting infrastructure is disproportionately sited in marginalized communities, and this has been documented in hundreds of studies with a range of methods, as described in Chapter 1. To understand how and why this occurs, this study's guiding research questions are applied in the context of low-income communities of color to specifically understand how they participate in decision-making.
- Government required public participation - This study's questions are asked in the context of the U.S.'s major transportation infrastructure that must be approved and funded by institutions, including large federal, state, and local agencies. As part of these decisions,

nearly all projects (those that may "significantly" (NEPA, 1969) impact human health) require an environmental assessment. To understand public participation generally, it is important to recognize this process that often dictates the timing and minimum requirements for public participation. This study is not an evaluation of NEPA regulations, however, and also sought to understand public participation within local frameworks, procedures, or assessments.

- Currency - This study's research questions were best addressed with exploration of current institutional and community practices. The richest data likely emerges from recent recall and observations, rather than interviewee discussion on deliberations that occurred several years ago (Creswell, 1998). Federal policies on public participation in agency decision-making processes are continually evolving and may also be worth evaluating longitudinally in other additional studies.
- Feasibility - As an institutional ethnography, sites that were physically and financially accessible were selected to allow for frequent researcher involvement in institutional procedures and community participation. To meet feasibility requirements for this study, this meant I would be able to set up interviews and observations in a short (e.g., one week) or a few short visits in all sites outside of Southeast Michigan.

Documented in Table 2.3, I identified several sites nationwide based on their ongoing deliberations that matched many of these criterion. These deliberations were identified with assistance of many reports and databases: the EPA's Environmental Impact Statement (EIS) database; University of California—Los Angeles' Health Impact Assessment (HIA) Clearinghouse; EPA's National Environmental Justice Advisory Council's recommendations report, *Reducing Air Emissions Associated with Goods Movement: Working Towards*

Environmental Justice; social networking sites for EJ activist groups; and a participant list from the 2010 Impact Project's conference, *Moving Forward Together*, attended by government, industry and community representatives interested in air quality, EJ, and the goods movement.

The selected case study sites, the proposed NITC and the POLB, sufficiently met these criterions, while offering maximum variation. In this study, maximum variation encouraged identification of deliberations at sites in different regions of the U.S. guided by federal policy, but approaching public participation and environmental assessment in a variety of ways. During case selection, maximum variation emerged through a variety of key features: 1) the proposed NITC is a land freight gateway in the Midwest, while the POLB is a seaport on the West Coast, 2) the proposed NITC is not built, but under deliberation, while the POLB has existed since 1911 and has entailed ongoing developments, and 3) while both freight gateways are in regions of the nation struggling with nonattainment of the federal NAAQS, the POLB has taken steps to become a 'Green Port' implementing a Green Port Policy and Clean Air Action Plan. Chapter 6 also summarizes the similarities and differences across sites that emerged throughout this study.

Data Collection

Institutional ethnographic research relies on multiple forms of data collection. Studying the NITC and POLB, this investigation primarily entailed semi-structured, open-ended interviews and content analysis, complemented by participant observation. Described in detail below, these multiple data collection methods enable triangulation (Maxwell, 2005) as a strategy for validating findings across types of data. Triangulation reduces the bias and limitations resulting from use of a single data source.

Semi-Structured Interviews

Semi-structured interviews helped to address research questions two and three by

offering opportunities to understand institutional texts and procedures from the perspective of interviewees engaged in public processes. As shown in Table 2.4, I identified a total of 56 interviewees, including 1) community members and leaders, including residents, local business owners, or staff members of community-based organizations identified by residents and 2) decision-makers including planners, consultants and local, state, and federal government staff or appointed or elected officials. Community members and leaders selected interview locations, often restaurants, coffee shops, or homes, and these interviews lasted approximately 75 minutes on average. I gave community members and leaders $25 (U.S.) for their time. I also held interviews with decision-makers at their preferred location, frequently an office or coffee shop, lasting approximately 55 minutes on average. I did not give decision-makers financial compensation, as most participated as a part of their employment. All interviewees consented to participate, and 53 consented to being audiotaped. I conducted three of the 56 interviews by phone due to schedule or travel constraints of participants, and the remaining were in person.

Institutional ethnography begins with everyday people's experience in institutional processes (Smith, 2006), and data collection temporally reflected this sequence with progression through interviews beginning with community members and leaders in case sites to gain their perspective followed next by decision-makers. Typically in institutional ethnography, participants are identified during data collection (DeVault & McCoy, 2006), similar to snowball sampling (Patton, 2002), and I used this progressive recruitment process in this study. I identified initial participants through a variety of sources, such as key informants, online comments of public documents pertaining to deliberations, and social networking group sites engaged in deliberations. I conducted nearly all community members and leader interviews between September and December of 2011. I conducted nearly all interviews with decision-makers

between January and May of 2012. While data collection in Detroit was ongoing during these timeframes, data collection in Long Beach took place for two weeks in October 2011 and two weeks in February 2012.

Interviews were semi-structured and open-ended with two separately prepared protocols for community members and leaders and decision-makers, as seen in Appendices C and D. I asked participants questions to best understand "how things work" (p. 23), as is a central goal in institutional ethnographic interviews (DeVault & McCoy, 2006). Questions focused on their participation in institutional decision-making processes, their strategies for participating, the role of the community and expert knowledge, and experience with institutional texts such as environmental assessments. I questioned decision-makers about evaluation of participation, the role of the public in decisions, barriers and catalysts to public participation, and how information is exchanged with the public. I asked both groups to offer advice—community members and leaders to decision-makers and decision-makers to community members and leaders—for how public participation could be improved.

I tested and refined both interview protocols before I used them. I distributed questions to several researchers representing public health and urban planning disciplines, as well as two leading EJ activists for general feedback. Also, to ensure questions were understandable for each protocol, I conducted pilot interviews with two community members and one decision-maker engaged in related deliberations. Pilot interviews provided an opportunity to review recruitment materials, practice interview protocol, identify questions requiring revision, and recognize need for additional questions, improving study validity (Maxwell, 2005; Frankland & Bloor, 1999). For instance, one pilot interviewee did not immediately see herself as someone who could speak to the study topic when invited to participate in an interview on transportation and health. She

associated this frame (Goffman, 1974) with topics she did not regularly engage with such as physical activity and pedestrian or transit access. Yet, given her experiences as a community activist working on air quality issues, her responses directly addressed this study's research questions. Thus, I edited recruitment and interview scripts to begin more generally, asking about an interviewee's involvement with the 'bridge' or the 'port' before moving into specific questions about the overarching institutional processes for public participation and environmental assessment.

Content Analysis

This study also entailed close reading of texts, which coordinate and explain institutional processes (Smith, 2006). Content analysis is a method that enables researchers to systematically assess communication, usually of written documents such as policies, press releases, or educational materials (Patton, 2002). In this study, content analysis illustrated how residents or representatives of host communities participate through textually mediated processes. This method enabled identification of the types of information that were exchanged and informed interview questions about how interviewees use this information to participate in deliberations. Texts were also an opportunity to compare local processes in cross-case analysis to see how national policies requiring and guiding public participation and environmental assessment are implemented in NITC and POLB deliberations.

At both sites, I collected the following documents for analysis: 1) Draft Environmental Impact Statements (DEIS) and Final Environmental Impact Statements for NITC and the Pier S Marine Terminal and Backchannel Improvement Project at the POLB (their most recent deliberation), 2) related public comments, and 3) any additional texts participants deemed relevant (e.g., related HIAs). For instance, in the context of the NITC, this included transcripts

from early public meetings related to project scoping. Also, EISs are extremely long. For instance, the EIS for the NITC entails hundreds of pages with many technical appendices describing complex engineering procedures related to physical design of a proposed bridge. To narrow in, data collection included EIS executive summaries, all public comments, and all EIS appendices or sections related to the environment, air quality health, or public participation. To prevent overlooking relevant content that may be in other sections, I took two steps, 1) a basic 'find' search was done to identify if the terms environment, justice, health, air quality, or participation appear in other sections and 2) interviewees were asked if there are additional, pertinent sections relevant to this study.

Participant Observations

I conducted participant observation at both case sites. Participant observation is a methodology where the researcher immerses him or herself in a social setting to engage, observe, understand, and analyze processes related to their research questions (Emerson, Fretz, & Shaw, 1995). By participating in such activities or events, researchers learn new information to guide interview questions and contextualize interview and document data (Becker & Geer, 1957). In this study, I selected events and locations for observation based on political importance and opportunity during the data collection timeframe. Observations occurred before, during and after interview data collection as an iterative process. I identified opportunities during interviews, through government and community Listservs, and on public social networking sites. These observations included attendance or participation at state senate hearings, four windshield tours of transportation infrastructure and affected communities, community meetings, door-to-door flyering with community leaders about community organized events, large community town hall events, community clean-ups, and government-organized information sessions on deliberations

and new EJ strategies. In all of these instances, I participated openly, sharing my role and interests as a researcher when engaging with others. I also compiled extensive field notes during and after each event to capture additional observations and researcher reflexivity (Paterson, 1994). Reflexivity can be both self-reflection of a researcher's beliefs and bias, as well as reflection of data in the context of existing models and theories (Tsekeris, 2010).

Data Analysis

To understand how public participation and environmental assessment works for residents in freight host communities, I sought frameworks, themes, event chronology, stories, and policy recommendations to present holistic case studies of deliberations at the two major case sites. Grounded in the words of interviewees, these are presented separately in Chapters 4 and 5. Cross-case themes also emerged and are reported in Chapter 6, alongside overall implications of this entire study.

Thematic Analysis and Process Mapping

Thematic analysis, facilitated by systematic coding (described below), was the principal method I used to analyze interviews and documents. As Bowen cites Morse and Fields (2006)

> Thematic analysis involves the search for and identification of common threads that extend throughout an entire interview or set of interviews. Themes are usually quite abstract and therefore difficult to identify. Often the theme does not immediately "jump out" of the interview but may be more apparent if the researcher steps back and considers. "What are these folks trying to tell me?" The theme may be beneath the surface of the interviews but, once identified, appears obvious. Frequently, these themes are concepts indicated by the data rather than concrete entities directly described by the participants...Once identified, the themes appear to be significant concepts that link substantial portions of the interviews together. (p. 2)

To accompany this analysis, I mapped timelines to generate a graphical illustration of how institutional processes unfold for participants (Ritzer, 2011). Turner (2006), an institutional ethnographer who studied municipal planning processes, used similar procedures to indicate

potential points of intervention for improving public participation processes.

While inquiry was heavily inductive, sensitizing concepts (Blumer 1954; Schwandt, 2007) assisted this thematic analysis. Sensitizing concepts are "loosely operationalized notions" (Patton, 2002, p. 278) or well-defined social constructs that may have additional unrealized interpretations or meanings. They act as both starting points and opportunities to note researcher bias and may later become redefined after conducting interviews or observations. In this study, primary sensitizing concepts were related to public participation and environmental assessment, and many others also guided the study (e.g., mitigation, eminent domain, and quality of life).

Reflexive Iteration

I began data analysis shortly after data collection began, relying on reflexive iteration to corroborate findings, reduce bias, and increase study validity (Tsekeris, 2010; Srivastava & Hopwood, 2009). This reflexive iteration included collection of fieldnotes during events and interviews; drafting of memos after interviews, while coding, or as they emerge in analysis otherwise; discussions with study participants about emergent themes during participant observations or at other opportunities; regular (ranging from bi-weekly to monthly between November 2011 and September 2012) debriefs of emergent themes, anomalies and general findings by the primary investigator and research assistant; presentation of preliminary findings in two presentations at national conferences to encourage additional or alternate conclusions; member checking (Morse, Barrett, Mayan, Olson, & Spiers, 2002) by sharing of preliminary findings with community members and leaders; and ongoing informal reflection with various colleagues and mentors. Member checking continues, entailing the generation of a brief summary report for each case site, presentation to a subset of NITC community members and leaders, and emailing the summary report to study participants in both sites. Feedback has not

altered findings, but did assist framing and content of discussion content in the following chapters to best reflect the perspective of participants in the tradition of institutional ethnography.

Concurrent data analysis and collection allowed for development of additional questions for new interviewees, as well as clarification on unclear processes or timelines. Over the course of earlier interviews, new related questions emerged from interviewee responses, regarding the relevance of EJ as a framework used by the EPA in the context of freight transport and how they describe the relationship between transportation and public health. Additionally, after several community members in both case sites spoke about how they were involved in determining mitigation strategies to improve air quality, I asked remaining interviewees to discuss their knowledge and opinions on mitigation strategies in the context of their community. Many follow-up questions regarding specific deliberative details emerged during data analysis, and I addressed these as the study progressed, such as: Which development decisions fall under authority of state or local departments, and which must be legislated by elected or appointed officials? When do negotiations for mitigating measures occur, with decision-makers or private developers?

The Coding Process

To enable thematic analysis, I took many steps to manage the large amounts of qualitative data in this study, which are typical in case study approaches. I used ATLAS.ti 6.2 (2010), a qualitative data management software, to organize, store, and manage coding processes of interview transcripts, field notes, and documents for content analysis. A professional transcriptionist transcribed audio files and converted them into Microsoft Word documents. I kept all audio files on a password-secured University of Michigan Sitemaker website. Once de-

identified, I entered transcripts into an ATLAS.ti master file and backed them up on a password-secure Dropbox website for sharing among research team members.

Next, my research assistant and I organized interview data from 56 interview transcripts into higher-level themes and subthemes through open and focused coding. Open coding is a generally inductive process, where codes (or themes) are identified *in vivo*, but may also be based on a theoretical lens (Schwandt, 2007). The research team scanned transcripts for codes related to participation, health, transportation planning, the role of various stakeholders, and the exchange of information. Both researchers open coded the same randomly selected two community member and leader transcripts, one representing each case site. This led to the generation of a list of over 150 codes. By repeating this process with two decision-maker transcripts with additional open coding of community leader transcripts, we refined this list to 106 codes (as seen in Appendix E). We developed a complete codelist with examples to promote consistency in "definitional clarity" (Miles & Huberman, 1994, p. 63). Then, we focus-coded the remaining transcripts by applying the codelist of open codes to all interview texts (Zimmerman et al., 1995). By double coding the first 10 transcripts, we ensured that codes were consistently applied. Also, double coding encouraged discussion when we did not apply codes consistently to determine if we were interpreting participants' responses differently.

I then generated coding reports. Using ATLAS.t.i, researchers can highlight and cull out all text corresponding to a specific code or set of codes in a coding report. We did this to understand subthemes. For instance, for the theme 'public health interventions,' all text where participants discussed or suggested a relevant public health intervention in the context of freight development were coded as such, compiled into a report, reviewed, and summarized with subthemes. Some subthemes included air filtration in schools and nursing homes, trainings and

workshops for families living near freight development, and health education by community health workers. The results I present in Chapters 4 and 5 rely heavily on this overall coding process.

In content analysis, entire documents are combed for content to better understand context, language, and new information related to address research questions (Hsieh & Shannon, 2005; Riley & Hawe, 2010). Applying the same codelist, we reviewed relevant sections of EISs and related public comments also using ATLAS.t.i. In addition to formal content analysis of EISs and public comments, we collected supplementary documents to provide context for each case, but they were not systematically coded. These included environmental assessment documents, training curriculum on the goods movement and health, informational handouts, a children's coloring book, a high school curriculum package on freight transport, and news articles. These documents, in addition to field notes from participant observations, also enabled the development of timelines and event sequences presented in Chapters 4 and 5 to simplify and articulate local public participation and environmental assessment processes.

Figure 2.1 Getis-Ord Statistic to Conduct Hot Spot Analysis (Esri, 2011)

The Getis-Ord local statistic is given as:

$$G_i^* = \frac{\sum_{j=1}^{n} w_{i,j}x_j - \bar{X}\sum_{j=1}^{n} w_{i,j}}{S\sqrt{\frac{\left[n\sum_{j=1}^{n} w_{i,j}^2 - \left(\sum_{j=1}^{n} w_{i,j}\right)^2\right]}{n-1}}} \quad (1)$$

where x_j is the attribute value for feature j, $w_{i,j}$ is the spatial weight between feature i and j, n is equal to the total number of features and:

$$\bar{X} = \frac{\sum_{j=1}^{n} x_j}{n} \quad (2)$$

$$S = \sqrt{\frac{\sum_{j=1}^{n} x_j^2}{n} - \left(\bar{X}\right)^2} \quad (3)$$

The G_i^* statistic is a z-score so no further calculations are required.

Table 2.1 125 Largest U.S. Freight Gateways by Trade Value, 2008

Rank by Trade Value	Name of Freight Gateway	Type of Freight Gateway (Airport, Seaport, Land Border)	Total International Imports & Exports ($ US Millions)
1	Los Angeles, CA	Water	243,910
2	Port of New York/New Jersey, NY/NJ	Water	185,385
3	John F. Kennedy, NY	Air	167,966
4	Houston, TX	Water	147,695
5	Detroit, MI	Land	120,168
6	Laredo, TX	Land	115,759
7	Chicago, IL	Air	97,180
8	Long Beach, CA	Water	91,537
9	Port Huron, MI	Land	81,223
10	Buffalo-Niagara Falls, NY	Land	80,838
11	Los Angeles, CA	Air	78,292
12	Charleston, SC	Water	62,332
13	Savannah, GA	Water	58,987
14	Norfolk, VA	Water	53,950
15	San Francisco, CA	Air	52,758
16	New Orleans, LA	Water	49,765
17	New Orleans Customs District, LA	Air	49,585
18	El Paso, TX	Land	48,174
19	Baltimore, MD	Water	45,312
20	Philadelphia, PA	Water	43,176
21	Anchorage, AK	Air	41,443
22	Miami, FL	Air	40,036
23	Seattle, WA	Water	39,989
24	Dallas-Fort Worth, TX	Air	39,488
25	Oakland, CA	Water	38,698
26	Morgan City, LA	Water	38,503
27	Tacoma, WA	Water	35,322
28	Atlanta, GA	Air	32,335
29	Otay Mesa Station, CA	Land	31,801
30	Cleveland, OH	Air	30,812
31	Corpus Christi, TX	Water	29,685
32	Gramercy, LA	Water	24,261
33	Champlain-Rouses Point, NY	Land	23,585
34	Jacksonville, FL	Water	22,970
35	Texas City, TX	Water	22,726
36	Port Everglades, FL	Water	22,572
37	Miami, FL	Water	22,183
38	Hidalgo, TX	Land	22,149
39	Beaumont, TX	Water	21,338
41	Pembina, ND	Land	19,853
42	Nogales, AZ	Land	19,115
44	Blaine, WA	Land	18,433
45	Washington, DC	Air	17,475
46	Port Arthur, TX	Water	17,352
47	Portland, OR	Water	16,805
48	Portal, ND	Land	16,515
49	Sweetgrass, MT	Land	15,827
50	Freeport, TX	Water	15,785
51	Philadelphia, PA	Air	15,349
52	Lake Charles, LA	Water	15,201
53	Boston Logan, MA	Air	14,787
54	Newark, NJ	Air	14,621
55	Houston, TX	Air	13,545
56	Seattle-Tacoma, WA	Air	13,489
57	Baton Rouge, LA	Water	13,231
58	Eagle Pass, TX	Land	12,830
59	Brownsville, TX	Land	12,605
60	Alexandria Bay, NY	Land	12,387
61	Pascagoula, MS	Water	12,223

62	Mobile, AL	Water	12,208
63	Boston, MA	Water	11,630
64	Chester, PA	Water	11,566
65	Richmond, CA	Water	11,475
66	Calexico-East, CA	Land	11,288
67	International Falls/Rainer, MN	Land	10,691
68	Wilmington, DE	Water	9,371
69	Eastport, ID	Land	9,363
70	El Segundo, CA	Water	8,145
72	Great Falls, MT	Land	7,258
73	Philadelphia, PA	Air	7,216
74	Tampa, FL	Water	7,197
75	San Diego, CA	Water	7,183
76	Brunswick, GA	Water	6,940
77	Salt Lake City, UT	Air	6,851
78	San Francisco, CA	Water	6,446
79	Galveston, TX	Water	6,059
80	Highgate Springs/Alburg, VT	Land	5,973
81	Honolulu, HI	Water	5,939
82	Port Hueneme, CA	Water	5,911
83	Nashville, TN	Air	5,433
84	Providence, RI	Water	5,403
85	Wilmington, NC	Water	4,835
86	Cincinnati-Lawrenceburg, OH	Air	4,625
87	Denver, CO	Land	4,493
88	Ogdensburg, NY	Land	4,454
89	Kalama, WA	Water	4,446
90	Perth Amboy, NJ	Water	4,319
91	Detroit, MI	Water	4,313
92	Newport News, VA	Water	4,200
93	Vancouver, WA	Water	3,797
94	Calais, ME	Land	3,623
95	Panama City, FL	Water	3,435
96	Bellingham, WA	Water	3,419
97	Anacortes, WA	Land	3,249
98	Louisville, KY	Air	3,121
99	Sault Ste Marie, MI	Land	3,038
100	Memphis, TN	Land	3,037
101	Detroit, MI	Air	2,969
102	Anchorage, AK	Water	2,895
103	Del Rio, TX	Land	2,821
104	Minneapolis-St. Paul, MN	Air	2,796
106	Honolulu, HI	Air	2,752
107	Huntsville, AL	Air	2,747
108	Gulfport, MS	Water	2,681
109	Sumas, WA	Land	2,672
110	Houlton, ME	Land	2,576
111	Toledo, OH	Land	2,514
112	Derby Line, VT	Land	2,490
113	Portland, WA	Air	2,455
114	Richmond-Petersburg, VA	Water	2,124
115	Burlington, VT	Land	2,092
116	New Haven, CT	Water	2,076
117	Portland, ME	Water	2,075
118	West Palm Beach, FL	Water	1,881
119	Port Townsend, WA	Land	1,881
120	Martinez, CA	Water	1,772
122	Port Huron, MI	Water	1,694
123	Chicago, IL	Water	1,601
124	Carquinez Strait, CA	Water	1,595
Top 125 above for air, land, and water gateways			**3,108,750**
TOTAL U.S. overall—all modes			**3,400,661**
Top 125 as share of all U.S. gateways (percent)			**91.4**

(Source: BTS, 2009)

Table 2.2 Selected Variables from the American Community Survey, 2005-2009, 5-year Estimates

	Definition	Additional Description of Variable from Technical Documentation (U.S. Census Bureau, 2010)
Total Population	Total number of individuals in the tract	---
Race	Total number of individuals for each race category; Summary variable for 'minority' (all non-White counts)	The U.S. Office of Management and Budget requires five minimum categories (White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander) for race. The ACS include a sixth category, "Some Other Race," added with OMB approval.
Ethnicity	Total number of individuals reporting as Hispanic or Latino	Hispanics or Latinos who identify with the terms "Hispanic," "Latino," or "Spanish" are those who classify themselves in one of the specific Hispanic, Latino, or Spanish categories listed on the questionnaire ("Mexican," "Puerto Rican," or "Cuban") as well as those who indicate that they are "another Hispanic, Latino, or Spanish origin."
Educational Attainment	Total number of individuals ≥ 18 with < high school diploma or equivalent; Total number of individuals ≥ 18 with high school diploma or equivalent; Total number of individuals ≥ 18 with some college; Total number of individuals ≥ 18 with secondary degree	For this analysis, a secondary degree includes any advanced degree behind high school (e.g., associate's, bachelor's or graduate degree).
Poverty Status by Age	Total number of individuals living below the federally recognized poverty level for their household	Poverty status was determined for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old. These groups were excluded from the numerator and denominator when calculating poverty rates.
Unemployment Status	Total number of civilians 16 years old or over in the work force who are not employed	This category includes all civilians 16 years old and over who either (1) were "at work," that is, those who did any work at all during the reference week as paid employees, worked in their own business or profession, worked on their own farm, or worked 15 hours or more as unpaid workers on a family farm or in a family business; or (2) were "with a job but not at work," that is, those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons.
Housing Units	Total number of housing units in tract	A housing unit may be a house, an apartment, a mobile home, a group of rooms or a single room that is occupied (or, if vacant, intended for occupancy) as separate living quarters.
Vacancy Status	Total number of vacant housing units in tract	A housing unit is classified as occupied if it is the current place of residence of the person or group of people living in it at the time of interview, or if the occupants are only temporarily absent from the residence for two months or less.

Table 2.3 Case Selection: Deliberations Identified through Criterion Sampling

Potential Deliberations	Government Participation Processes	Relevance to Goods Movement	Currency	Feasibility
1. New International Trade Crossing	U.S. Federal Highway Administration, Transport Canada, the Ontario Ministry of Transportation & the Michigan Department of Transportation http://www.partnershipborderstudy.com/	International land border crossing	Record of Decision 1/09	No travel required
2. Port of Long Beach - Middle Harbor Redevelopment Project	Port of Long Beach, City of Long Beach, CA http://www.polb.com/about/projects/middleharbor.asp	International marine terminal	Record of Decision 3/10	Extensive travel required
3. Charleston County, South Carolina – I-526 Expansion	South Carolina Department of Transportation http://www.scdot.org/I526/default.shtml	Freight corridor connected to international marine terminal	Draft EIS published 7/10	Extensive travel required
4. I-25/Paseo del Norte Interchange Project, Albuquerque, Bernalillo County, NM	New Mexico Department of Transportation http://www.northi25.com/index.html	Major freight corridor	Intention to conduct DEIS rescinded 4/12	Extensive travel required
5. Port of Entry Project, City and County of San Diego, CA from the State Route I-125 Interchange to the US-Mexico Border	CalTran & San Diego, CA http://www.dot.ca.gov/dist11/departments/planning/pdfs/systplan/26-TransportationBorderCongestionReliefProgramApplicationSR90512 5InterchangeOtayMesaPOE.pdf	International land border crossing	Record of Decision 7/04	Extensive travel required
6. Detroit Intermodal Freight Terminal	Michigan Department of Transportation http://www.michigan.gov/mdot/0,1607,7-151-9621_11058_26215---,00.html	Intermodal rail yard	Record of Decision 5/10	No travel required
7. Columbia River Crossing, Portland, OR & Vancouver, WA	Oregon Department of Transportation & Washington Department of Transportation http://www.columbiarivercrossing.org/	Interstate bridge and major freight corridor	Record of Decision 12/11	Extensive travel required
8. Illinois I-290 Project	Illinois Department of Transportation http://www.dot.il.gov/i290/index.html	Major freight corridor	Purpose & need report under development 10/11 (pre-EIA)	Minor traveled required

Table 2.4 Number and Type of Interviewees by Case Site

	New International Trade Crossing	Port of Long Beach	Total
Community members & leaders	15	17	32
Decision-makers	12	12	24
Total	27	29	56

CHAPTER 3

Results and Discussion of Quantitative Inquiry: Who Lives near America's Freight Gateways?

Reporting results derived from various spatial and statistical analyses, in this chapter, I show how populations near major freight gateways are demographically different than the general population of the U.S. and where there may be instances of cumulative pollution exposures. First, I outline who lives near U.S. freight gateways by using a variety of EJ analyses, each with their methodological advantages and limitations. Next, I draw on additional national environmental health indicators to explore potential compounding air pollution issues in host communities further. Finally, I delve into two case study sites to provide a brief localized understanding of potential EJ issues in Detroit, Michigan near the proposed New International Trade Crossing (NITC) and in Long Beach, California near the Port of Long Beach (POLB) and their respective surrounding transportation corridors.

Describing Host Communities Across the Nation

According to estimates generated using areal weighting of American Community Survey Data (2005-2009) in census tracts near digitized polygon shapefiles of freight gateways, approximately 575,000 people live within 500 meters of the U.S.'s 50 largest freight gateways (Table 3.1). As shown in Table 3.2, persons of color comprise approximately 36.75% of the U.S. population compared to 58.12% in host communities; persons who identify as Hispanic comprise approximately 16.67% of the U.S. population compared to 36.55% in host communities; persons with less than a high school diploma comprise approximately 14.10% of the U.S. population

compared to 20.26% in host communities; persons in poverty comprise approximately 15.91% of the U.S. population compared to 20.21% in host communities; and unemployed persons comprise 10.30% of the U.S. population compared to 9.68%, in host communities. Assessed using one sample t-tests (Table 3.3), by race ($t(50)=4.08$, $p < .000$), ethnicity ($t(50)=3.09$, $p =.003$), level of education ($t(50)=2.84$, $p = .007$), poverty status ($t(50)=3.10$, $p = .003$), and home vacancy rates ($t(50)=2.51$, $p = .015$), 500-meter host communities are statistically different than the U.S. population, whereas there is no statistical difference by employment status ($t(50)=-.964$, $p =.304$).

Given that five of the 50 largest freight gateways are in communities bordering Mexico, a large proportion of freight host community populations may identify as Hispanic by nature of geography. These border communities include: El Paso, Texas; Hidalgo, Texas; Laredo, Texas; Nogales, Arizona; and Otay Mesa Station, California. I conducted additional one sample t-tests to assess whether 500-meter host communities and the U.S. general population remained different when these sites were removed. These analyses showed that the remaining 500-meter host communities stayed statistically different by race ($t(45)=3.01$, $p = .004$) and poverty ($t(45)=2.21$, $p = .032$). However, these 500-meter host communities were no longer statistically different from the U.S. general population by education ($t(45)=1.75$, $p = .087$) or Hispanic status ($t(45)=1.87$, $p = .069$), which are highly correlated variables (Pearson's $r= .604$, $p < .000$).

Across all variables, differences between the general U.S. population and 500-meter host communities become even greater when assessing demographic variables at the top 10 freight gateways in the U.S. These 10 communities are worth a narrowed analysis (Table 3.3), as they are comprised of over 334,000 residents, or 58.12% of the 500-meter host community population at the 50 largest sites. Further, nearly 40% of all trade in the U.S. enters and exits through these

10 sites. Thus, the potential for environmental health impacts are likely increased in these, relatively speaking, population dense locations: Los Angeles, California; New York City, New York; Houston, Texas, Detroit, Michigan; Laredo, Texas; Chicago, Illinois; Long Beach, California; Port Huron, Michigan; and Buffalo, New York. In sum, of the persons in these 500-meter communities, 63.25% are persons of color, 47.61% identify as Hispanic, 20.35% have less than a high school education, 27.99% live below poverty, and 10.67% are unemployed. Respectively, these rates are 26.50%, 30.94%, 6.25%, 12.08%, and .37% higher at these 10 sites collectively than in the general U.S. population. While this sample size was small, tests for statistical significance indicated that these ten communities are demographically different than the U.S. by race ($t(10)=2.27$, $p=.049$), Hispanic status ($t(10)=3.78$, $p=.004$), education ($t(10)=3.20$ $p=.011$), and poverty ($t(10)=2.60$ $p=.029$), but again not by employment status ($t(10)=1.75$, $p=.114$).

Table 3.4 summarizes the results of binary logistic regression analyses to compare host and non-host communities. Considering the implications of methodological and geographic factors, I tested four definitions of host community as versions of the dependent variable: 1) tracts that intersect or are contained within a 500-meter buffer of freight gateways, 2) tracts where at least 50% of their area are contained within a 500-meter buffer of freight gateways, 3) tracts that intersect or are contained within a 1-mile buffer of freight gateways, and 4) tracts where at least 50% of their area are contained within a 1-mile buffer of freight gateways. All four models are statistically significant at $p < .000$ based on their chi-square goodness of fit tests. Results show:

1. In the model assigning ‘host’ status to all tracts that intersect with or are contained within 500-meter buffers of freight gateways, only % persons of color (ß = 1.47, $p < .000$) and %

Hispanic (ß = 2.19, p < .000) are statistically significant and correlated with host community status, also exhibiting a statistically significant constant (ß = -5.93, p < .000). According to this model, when % persons of color increases by 1%, the odds of having host community status increases by a factor of 4.43, and when % Hispanic increases by 1% the odds of having host community status increases by a factor of 8.89.

2. In the model assigning 'host' status to all tracts that intersect with or are contained by 50% of their area or more within 500-meter buffers of freight gateways, % persons of color (ß = 1.43, p < .000), % Hispanic (ß = 2.30, p < .000), and % vacant homes (ß = -2.36, p = .040) are all statistically significant and correlated with host community status, also exhibiting a statistically significant constant (ß = -7.18, p < .000). According to this model, when % persons of color increases by 1% the odds of having host community status increases by a factor of 4.18, when % Hispanic increases by 1% the odds of having host community status increases by a factor of 9.92, and when % vacant homes decreases by 1% the odds of having host community status increases by a factor of 11.11.
3. In the model assigning 'host' status to all tracts that intersect with or are contained within 1-mile buffers of freight gateways, % persons of color (ß = 1.93 p < .000), % Hispanic (ß = 1.91, p < .000), % less than high school diploma (ß = -1.20, p = .001), % below poverty (ß = 1.08, p = .001), and % unemployed (ß = -2.64, p < .000) are statistically significant and correlate with host community status, also exhibiting a statistically significant constant (ß = -5.069, p < .000). According to this model, when % persons of color increases by 1% the odds of having host community status increases by a factor of 6.87, when % Hispanic increases by 1% the odds of having host community status increases by a factor of 6.76, and when % below poverty increases by 1% the odds of having host community status increases by a

factor of 2.95. However, when % less than high school education decreases by 1% the odds of having host community status increases by a factor of 3.33 and when % unemployed decreases by 1%, the odds of having host community status increases by a factor of 14.29.

4. In the model assigning 'host' status to all tracts that intersect with or are contained by 50% of their area or more within 1-mile buffers of freight gateways, % persons of color (ß = 2.00 $p < .000$), % Hispanic (ß = 2.07, $p < .000$), % less than high school education (ß = -1.26, $p = .009$), % below poverty (ß = 1.54, $p < .000$), and % unemployed (ß = -3.15, $p < .000$) are statistically significant and correlate with host community status, also exhibiting a statistically significant constant (ß = -5.73, $p < .000$). According to this model, when % persons of color increases by 1% the odds of having host community status increases by a factor of 7.35, when % Hispanic increases by 1% the odds of having host community status increases by a factor of 7.91, and when % below poverty increases by 1% the odds of having host community status increases by a factor of 4.65. However, when % less than high school education decreases by 1% the odds of having host community status increases by a factor of 3.57 and when % unemployed decreases by 1%, the odds of having host community status increases by a factor of 23.26.

Results: Assessing Cumulative Pollution Exposures

Spatial analyses also provide an opportunity to explore how transportation infrastructure may relate to patterns of air quality in the U.S. Table 3.5 and Figures 3.1-4 show how major freight gateways in the U.S. relate to National Ambient Air Quality Standards (NAAQS) nonattainment areas. While 45 (39%) of the 119 major freight gateways are located in areas fully in compliance with NAAQS standards, many are located in areas dealing with non-attainment for O_3 (54, 47%), CO (38, 33%), PM 2.5 (24, 21%), PM10 (12, 10%), NOx (5, 4%), and SOx (4,

3%). Four major freight gateways are in nonattainment for 5 NAAQS: Los Angeles International Airport, the POLA, the POLB, and Cleveland Hopkins International Airport. Port of New York/New Jersey and Detroit's Ambassador Bridge are located in regions with nonattainment for 4 NAAQS.

Described in-depth in Chapters 4 and 5, community members and leaders in the NITC and POLB host communities suggested that transportation infrastructure is often coupled with other industrial sites as compounding sources of air pollution in their communities. To assess this relationship, I looked at spatial patterns of sites reporting air releases to the EPA's Toxic Release Inventory (TRI) and each site's risk value assigned by the EPA's Risk-Screening Environmental Indicators (RSEI) scoring model based on toxicity and pounds of pollutants released. There were approximately 20,927 TRI facilities nationwide in 2011, of which 14,877 report air releases (other facilities may be reporting only waste or water releases). By calculating a Moran's Index summary in ArcGIS, there is less than 1% likelihood that the dispersed pattern of these 14,877 TRI sites in the U.S could be the result of random chance, where there is a statistically significant systematic pattern (Moran's Index= -.06, z=-7.61, $p < .000$) likely reflecting economies of agglomeration, local regulatory frameworks, and historical patterns of industrialization. Figure 3.5 displays the location of these sites with air pollution releases in relation to the largest 119 freight gateways in the U.S. This figure also shows the results of a national hotspots analyses of these TRI facilities based on ranked RSEI scores (i.e., toxicity x pounds). Toxic air releases are above average in Florida, where there are many coal-fueled power plants, and below average in the Southwest and much of the West Coast, where there are generally newer, less polluting facilities and stronger regulations.

As Figure 3.5 shows, while not true for some land border crossings, areas of the country where TRI sites with air releases are located or clustered tend to host major freight gateways also. Within 500-meter host communities of the largest 50 freight gateways, 201 TRI facilities release approximately 11,700,130 pounds of air pollutants with approximate sum and mean RSEI scores of 4,471,303,155 and 22,245,289, respectively (standard deviation = 90,333,706.33). These 500-meter freight host communities are 1.64 times more likely to also host a TRI facility with air releases than non-freight host communities. Within 1-mile host communities, 302 TRI facilities release approximately 17,629,274 pounds of air pollutants with sum and mean RSEI scores of 6,791,082,214 and 22,487,027, respectively (standard deviation = 88,304,079). One-mile freight host communities are 1.36 times more likely to also host a TRI facility with air releases than non-freight host communities. This compares nationally, where the overall 14,877 facilities with air releases emit 798,865,454 lbs with sum and mean RSEI scores of 505,206,495,578 and 33,961,179, respectively (standard deviation = 60,7143,483). Based on one-sample t-tests, air release toxicity from TRI facilities within 500-meters ($t(201)=.279$, $p=.780$) and 1-mile ($t(302)=.336$, $p=.737$) of major freight gateways are not statistically different from TRI facilities elsewhere.

Describing Case Study Host Communities

<u>New International Trade Crossing – Detroit, Michigan</u>

I pursued additional localized spatial analyses in Detroit, Michigan to complement the case study I present in Chapter 4, which investigates the experiences of community members and leaders and decision-makers participating in a deliberation for the proposed NITC. To enable a fuller picture of the local transportation corridor, I included depiction and analyses near major

highways, 30 intermodal facilities, the Ambassador Bridge, the Detroit Intermodal Freight Terminal (DIFT), the Port of Detroit, and the proposed NITC site.

Figures 3.6 through 3.12 display hot spot analyses to illustrate demographic patterns in relation to the transportation corridor across the city. By conducting hot spot analyses, one can quickly see how specific variables are distributed, where high counts (hot spots) or low counts (cold spots) of a variable cluster spatially based on a standard z-score. From these maps, a population hot spot is apparent in the tracts surrounding the DIFT and near proposed NITC. Further, these two freight gateways are in distinct hot spots based on % with less than a high school diploma and % Hispanic. Conversely, these freight gateways are located in cold spots based on % persons of color, and they are near average for % unemployed and % in poverty. Home vacancies have changed in the city over the last decade during the NITC deliberation, and upwards of 250 homes have become vacant in tracts near the proposed NITC and the Ambassador Bridge (U.S. Census, 2010). However, in one tract southwest of the proposed NITC, there were approximately 20 fewer vacant homes in 2010 than 2000 (U.S. Census, 2010).

Table 3.6 extends the previously reported national 500-meter and 1-mile analyses, which included the Ambassador Bridge as the fifth largest U.S. freight gateway by trade value, to include the other aforesaid sites in Detroit's transportation corridor. Using areal weighting methods described in Chapter 2, this table characterizes the population near these components of the transportation corridor relative to Detroit, Wayne County, and Michigan. Overall, there are notably higher proportions of Hispanic residents than in the city overall (6.8%) within 500-meter buffers of intermodal facilities (23.65%), the Ambassador Bridge (63.77%), the DIFT (58.02%), and the proposed NITC site (56.42%). There are also higher proportions of residents without a high school diploma than the city overall (22.9%) within 500-meter buffers of major highways

(24.14%), intermodal facilities (34.75%), the Ambassador Bridge (37.76%), the DIFT (49.78%), and the proposed NITC site (39.53%). Similar patterns persist in 1-mile buffers where the proportion of residents that identify as Hispanic and without a high school diploma are higher for all components of the city's transportation corridor. Due to the nature of areal weighted data, tests to compare host tract-level to population-level statistics would be misleading. Still, I report the estimated demographic composition of host communities aside population-level estimates given their prominent differences.

Figure 3.13 illustrates potential cumulative air pollution exposures, visually relating the transportation corridor and the location of TRI facilities reporting air releases in Detroit. As the map illustrates, 17 (39.53%) of Detroit's 43 TRI facilities with air releases are also within 500 meters of the transportation corridor, and 37 (86.05%) are within one mile, suggesting those neighborhoods hosting freight infrastructure may also be hosting industrial facilities. Statistical tests to compare mean toxicity show that facilities within 500 meters are not statistically different than those farther from the transportation corridor ($t(17)=-1.173$, $p = .258$), according to each facility's RSEI score. However, in terms of toxicity, facilities within one mile are statistically different than those farther from the transportation corridor ($t(37)=-12.604$ $p <.001$).

POLB – Long Beach, California

I also pursued additional localized spatial analyses in Southern California to complement the case study I present in Chapter 5, which investigates the experiences of community members and leaders and decision-makers participating in deliberations related to the POLB. To set a meaningful scope that reflects the concerns of community members and leaders outlined in Chapter 5, I selected a study area that contains the 14 cities surrounding the I-710 corridor from its base at the POLB and POLA. I included depiction and analyses near major highways, the I-

710 corridor, 38 intermodal facilities, the POLB, the POLA, and the proposed Southern California International Gateway site.

Figures 3.14 through 3.20 display hot spot analyses to illustrate demographic patterns in relation to this transportation corridor across the city. Relative within this region, the POLA, POLB, and proposed SCIG are in areas with average or less than average population levels. A relatively smaller proportion of persons of color live near the ports, whereas a higher proportion is in Compton bound by the 110, 105, 405, and 710 highways. From these maps, it also becomes clearer that the POLB and proposed SCIG, which are situated between West Long Beach, Wilmington, and Carson, are hot spots with relatively higher rates of unemployment and poverty. Higher home vacancy rates are also notable in central and east regions of Long Beach, as well as at the north end of the I-710 corridor near Central Los Angeles.

Table 3.7 extends the previously reported national 500-meter and 1-mile analyses, which included the POLA and POLB, to also include these other components of the regional transportation corridor in Southern California. Using areal weighting methods described in Chapter 2, this table characterizes the population near these components of the transportation corridor relative to the cities of Long Beach and Los Angeles, Los Angeles County, and California. Overall, there are notably higher proportions of persons of color than in Long Beach (47.2%) and the county (47.0%) residing within 500-meter buffers of the POLB (85.50%), the POLA (81.21%), the major truck network (57.83%), the I-710 corridor (58.61%), and the proposed SCIG site (60.80%). There are also notably higher proportions of Hispanic residents than in Long Beach (40.9%) and the county (47.8%) residing within 500-meter buffers of the POLB (64.73%), the POLA (63.11%), the major truck network (65.36%), the I-710 corridor (76.39%), intermodal facilities (80.57%) and the proposed SCIG site (55.59%). Further, there are

notably higher proportions of residents without a high school diploma than in Long Beach (21.3%) and the county (19.2%) residing within 500-meter buffers of the POLB (32.83%), the POLA (32.00%), the major truck network (37.35%), the I-710 corridor (45.41%), intermodal facilities (44.02%) and the proposed SCIG site (31.77%). Finally, there are also notably higher proportions of residents living in poverty than in Long Beach (20.0%) and the county (15.5%) residing within 500-meter buffers of the POLB (27.17%), the POLA (27.00%), and the proposed SCIG site (26.83.%). Similar patterns persist in 1-mile buffers of the regional transportation corridor. Again, due to the nature of areal weighted data, tests to compare host tract-level to population-level statistics would be misleading, but I report the estimated demographic composition of host communities aside population-level estimates given their prominent differences.

Figure 3.21 illustrates potential cumulative air pollution exposures, visually relating the transportation corridor and the location of TRI facilities reporting air releases in this freight-heavy region of Southern California. As the map illustrates, 55 (40.74%) of the region's 135 TRI facilities with air releases are also within 500 meters of the transportation corridor, and 126 (93.33%) are within one mile, suggesting those neighborhoods hosting freight infrastructure may also be hosting industrial facilities. Statistical tests to compare mean toxicity show that facilities within 500 meters are not statistically different than those farther from the transportation corridor ($t(55)=.815$, $p=.416$), according to each facility's RSEI score. Similarly, in terms of toxicity, facilities within one mile are not statistically different than those farther from the transportation corridor ($t(126)=1.049$ $p=.296$).

Discussion

In these spatial investigations, I sought to identify visual, descriptive, or correlational relationships that may distinguish freight gateway host and non-host communities in the U.S. demographically or by siting of other pollution sources. From t-tests, we see there are distinct differences by demographic variables, except employment status. From regression analyses, I found a more complex pattern where, regardless of geographic or methodological alternatives, % persons of color and % Hispanic are positively correlated with host community status. Additionally, using 1-mile buffers, a positive correlation exists between % poverty with host community status, while a negative correlation exists between both % unemployed and % less than high school diploma with host community status. Residents of freight host communities are likely to host additional pollution sources, illustrated by TRI air release sites, which are 1.64 times more likely to appear in 500-meter freight host communities and 1.33 times more likely to appear in 1-mile freight host communities. Finally, brief study near the proposed NITC and POLB and their transportation corridors highlighted the potential of nuanced, localized analyses to further unpack these national findings for local decision-makers.

Demographic Patterns

Suggesting inequitable exposure to environmental exposures with well-documented health risks, these demographic patterns near freight gateways are comparable to those seen elsewhere in the EJ literature. As seen for similar studies near toxic waste sites, income, race, and ethnicity are most strongly associated with host community status. For instance, in the UCC's *Toxic Waste and Race at Twenty* (2007), researchers used 2000 Census data to report that 1-kilometer waste site host communities were comprised of 47.7% persons of color, 23.1% persons of Hispanic ethnicity, and 20.1% persons living in poverty, compared respectively to

58.12%, 36.55%, and 20.21% in this study of freight host communities. Further, their logistic regression models generated similar results for race and ethnicity variables, whereas they reported in 3-kilometer host community (using tracts with >50% area within the buffer) that a 1% increase in the African American population increased the odds of having host community status by a factor of 5.77 and a 1% increase in the Hispanic population increased the odds of having host community status by a factor of 9.22. Respectively, this compares to factors of 4.18 and 9.92 in this study's 500-meter host communities (using tracts with >50% area within the buffer) and 7.35 and 7.91 in this study's 1-mile host communities (using tracts with >50% area within the buffer). Such comparisons should be made carefully, however, as demographic composition is characterized using related but different variables; the UCC report refers to one-, three-, and five-kilometer buffers rather than 500-meter and 1-mile buffers; and the underlying U.S. population in 2000 looked quite different than the overall poorer and more diverse U.S. population summarized in the 2005-2009 American Community Survey. Despite these differences, the key findings of both studies suggest unequal distribution of air pollution sources by race, ethnicity, and income in the U.S.

Persons of color and those who identify as Hispanic are more likely than white, Non-Hispanic persons to live within both 500 meters and one mile of a transportation freight gateway. However, within one mile of freight gateways, poverty also positively correlates with host community status. This difference between 500-meter and 1-mile freight communities raises additional questions about potential institutional racism embedded in structural factors (Phillips, 2011), given that the greatest health effects are likely for those living closest to noise and air pollution sources (Health Effects Institute, 2010). Local decision-makers should consider the

implications and context of these findings, as each community's racial and ethnic composition is the result of a variety of economic, political, historical and social processes.

Further, six of the 50 largest freight gateways in the U.S. are located in Texas, whose population is approximately 38% Hispanic, where 20% of residents do not have a high school diploma (U.S. Census, 2010). This study suggests that transportation and public health professionals in Texas, among other places, should pay particular attention to EJ issues near freight gateways where the proportion of host community residents who are Hispanic and without a high school diploma is extremely high, as seen respectively near the Port of Houston (68.28%, 42.32%), Laredo border crossing (98.61%, 46.61%), El Paso border crossing (96.83%, 62.91%), Port of Corpus Christi (69.71%, 37.60%), Port of Texas City (36.65, 33.43%), and Hidalgo border crossing (96.70%, 51.76%). The hot spot analyses for Detroit in Figure 3.8 and 3.10 demonstrate this same pattern visually for the proportion of host community residents who are Hispanic and without a high school diploma (63.77%, 37.76%) near the Ambassador Bridge when compared to Michigan (4.4%, 11.6%). Further, both local and population estimates are likely miscalculations that do not account for the large number of undocumented individuals who may live in these communities and experience additional health risks. While there are many factors contributing to high asthma and cardiovascular prevalence among Hispanic populations in the U.S. (Adler & Rehkopf, 2008; Wright & Subramanian, 2007; Krieger et al., 2003), residence near freight gateways coupled with poor education are likely contributing risk factors.

Freight gateways are thought to negatively impact quality of life for host community residents, but they may, in fact, improve economic opportunities in a way that may promote population health. In this study, unemployment did not appear to differ between host and non-host freight communities nationally, and lower unemployment was correlated with host

community status in 1-mile buffers. This may reflect that, according to the Bureau of Transportation Statistics (2012), approximately 3.3% of the U.S. labor force, or 4,322,000 individuals, work directly in transportation industries.[10] In the case of POLB, their website boasts that one in eight Long Beach residents are employed in some role at the POLB. Panning in, Tables 3.6 and 3.7 indicate that host communities near the Detroit and Southern California I-710 transportation corridors are generally comprised of communities of color with less education and higher poverty in relation to their city and county, but unemployment is not necessarily higher. In some freight host communities, there are high proportions of residents in poverty and without a high school education, but unemployment remains low or at least comparable to national patterns. This is true in communities near the Port of New York/New Jersey, JFK International Airport, Port of Baltimore, Dallas/Fort Worth International Airport, Otay Mesa Station Border Crossing, Port of Texas City, Port of Port Arthur, Nogales Border Crossing, and Port of Beaumont. However, these jobs may not always go to who are closest to freight gateways, within 500-meter buffers, where regression analyses did not indicate the same relationship as within 1-mile buffers. Figure 3.19 illustrates a hot spot, suggesting that residents closest to the POLA, POLB, and SCIG may experience higher unemployment relative to others in the I-710 corridor. In the case of the NITC, Chapter 4 explores job opportunities related to the proposed border crossing further, as residents advocate for employment as a community benefit. From a public health perspective, such economic opportunities may be protective to one's health, as an extensive body of evidence suggests (Minton, Pickett, & Dorling, 2012; Ross & Mirowsky, 1995). Although temporary employment, such as that associated with construction of freight

[10] According to the Bureau of Transportation Statistics (2012), "These data include workers employed in transportation industries but not necessarily in a transportation occupation, such as a lawyer working for a trucking company. Moreover, these data exclude workers in transportation occupations employed by non-transportation industries, such as a truck driver employed by a retail company (p. 58)."

gateways, may perpetuate psychological morbidity given its pending instability or termination (Virtanen et al., 2005).

Vacancy, as a community characteristic, did not appear to consistently correlate with host community status, even though many postindustrial, 'shrinking' cities contain major freight gateways (Dewar & Manning-Thomas, 2012). Vacancy status was higher for 500-meter host communities near the 50 largest freight gateways than for non-host communities, but negatively correlated with host community status in the model assigning 'host' status to all tracts that intersect with or are contained by 50% of their area or more within 500-meter buffers of freight gateways. In weighted estimations, vacancy rates at sites such as Detroit, MI (26.48%); Buffalo, NY (27.46%); Everglades, FL (28.27%); Nogales, AZ (24.87%); Miami, FL (45.13%); and Sweetgrass, MT (33.33%) may skew the overall mean (15.12%) given their high rates range beyond 1.5 standard deviations. Thus, national patterns were somewhat indiscernible. Decision-makers should also interpret census data on home vacancies with caution (Silverman, Yin, & Patterson, 2012; Hollander, 2010), where local longitudinal studies of land use and ownership may be more insightful. According to the U.S. Census, 'vacant' indicates a standing structure and does not include abandoned lots or homes that are partially burned down, which are frequent occurrences in Detroit, for instance (Dewar & Manning-Thomas, 2012). Thus, a decreased change in the number of vacant homes southwest of the NITC may reflect the institutional removal or arson of homes. Related to housing, interviewees extensively discussed displacement, sense of place, and community-level impacts of freight gateways, warranting additional attention in Chapters 4 through 6.

Environmental Assessment

The National Environmental Policy Act (NEPA), Executive Order 12898[11] and, in the context of transportation projects, the U.S. Department of Transportation's Order to Address Environmental Justice in Minority Populations and Low-Income Populations[12] require similar demographic assessments of EJ to those presented here for major federal projects and activities. At the POLB, for instance, the Final Environmental Impact Review (FEIR)/Final Environmental Impact Statement (FEIS) for their Middle Harbor Redevelopment Project[13] reports the total population, proportion of minority residents, and proportion of low-income residents for each block group within one mile of the "planning area and selected additional areas." The POLB staff also provides the public with a 13-page report in the FEIR/FEIS of proposed EJ impacts for each alternative related to air quality, noise, and any other additional considerations. In the case of the NITC in Detroit, the Michigan Department of Transportation provides similar information. They include an eight-page report in the FEIS that summarizes and compares the study area, City of Detroit, and the corresponding Metropolitan Planning Agency's seven-county jurisdiction by total population, gender, age, race, ethnicity, and poverty rate. They also include a paragraph in the FEIS acknowledging that "the proposed practical alternatives will have an adverse effect on

[11] In 1994, President Clinton issued Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Executive Order 12898 calls upon federal agencies to make EJ part of their mission, assessing and addressing environmental and human health effects of federal actions on minority and low-income populations under each major program, policy, and activity. In 2011, President Obama issued a Memorandum of Understanding on Environmental Justice and Executive Order 12898. This signified renewed attention to formalizing the commitment of federal agencies to EJ.

[12] In the context of transportation, the U.S. Department of Transportation issued an agency wide Order to Address Environmental Justice in Minority Populations and Low-Income Populations in 2012 (6640.23a), an updated replacement of the 1998 version of this Order (6640.23). Order 6640.23a outlines the process that the Office of the Secretary and each Operating Administration must use to integrate the goals of Executive Order 12898 into existing programs, policies, and activities to make assessment of EJ common practice.

[13] Approved by the POLB Board of Harbor Commissioners in April 2009, the Middle Harbor Redevelopment Project is a nine-year, $1.2 billion project to modernize two existing port terminals to reduce air pollution

all EJ/Title VI[14] populations (2009, p. 4-3)" and how mitigation measures will address these adverse impacts.

These required EJ assessments have spatial and longitudinal limitations that more nuanced analyses in Figures 3.6-3.21 and Tables 3.6-7 may overcome. Given that transportation deliberations may take a decade or more from scoping to construction, neighborhoods may change significantly over time in ways that traditional NEPA EIS analyses may not capture. The POLB and NITC relied on demographic data from 2000, where the POLB began construction for the Middle Harbor Redevelopment Project in 2011 and the U.S. State Department approved the Presidential Permit for the NITC in 2013. Further, by selecting a regional geographic scope, agencies may distort the experiences of populations living closest to freight gateways. For the NITC deliberation, for instance, the EIS 'study area' entailed 27 square miles, including Detroit's Vernor Junction, Springwells Village, and Delray neighborhoods, as well as parts or the entirety of nearby cities including Dearborn, Melvindale, River Rouge, and Ecorse. Presented in Chapters 4 and 5, community members and leaders describe how these respective FEISs disregard immediately local impacts by declaring regional improvements to air quality that enable project approvals.

This study also begins to indicate how a variety of pollution sources, including industrial sites, may burden freight host communities. Descriptive data from the TRI database and visual data from the NAAQS tracking supported this hypothesis that emerged through interviews with community members and leaders. Environmental assessment studies for freight infrastructure projects are required to study cumulative impacts per NEPA's 1973 amendment and its 1978 revision. Research shows that, for the decades following this mandate, cumulative impact

[14] 'Title VI' refers to Title VI of the Civil Rights Act of 1964 states that federal agencies must ensure that no person is discriminated against on the basis of race, color, or national origin, under any federally supported program or activity. Title VI is often discussed as one mechanism for upholding Executive Order 12898.

assessments were disregarded or minimally addressed (Schultz, 2012; Bass, Herson, & Bogdan 2001; Cooper and Canter 1997; Herson & Bogdan 1991), where it was unclear what they should entail (Canter & Kamath 1995; Kamaras 1993). Agencies often lack the resources and data to accomplish this sufficiently, resulting in lawsuits (Smith, 2005), but this study reinforces the need for these types of assessments.

Local interagency efforts may assess these cumulative EJ burdens better, whereas project-specific EIS analyses in freight deliberations often rely on outdated statistics or misleading geographic scope. Such efforts may entail maintenance of current demographic analyses using block group or tract-level data in regions that already experience threats to EJ. For instance, the Michigan Environmental Justice Coalition is currently working with the Michigan Department of Environmental Quality to design crosscutting EJ metrics with plans to engage the state's housing, transportation, and health departments in identifying communities most likely experiencing compounding threats to EJ requiring interagency interventions. Ongoing, interagency efforts may also enable inclusion of diverse data and local knowledge for more accurate depictions of the decision-making context (Corburn, 2007).

Limitations

Areal weighting is one productive way to estimate population characteristics, and there are many other spatial methods that have been debated at length (Baden, Noonan, & Rama Mohana, 2007). Areal weighting addresses limitations of commonly used unit-hazard coincidence methods (Mohai & Saha, 2006), which may indicate that two people in the same census tract are categorically exposed to a pollutant. However, one person may live next to the emitting source, while the other person may live several miles away. Bias emerges, however, where this study likely underestimates population totals using areal weighting. For instance, in

Portal, North Dakota, census tracts are relatively larger than those in denser urban areas, and a large proportion of residents in these tracts live closest to the Portal border crossing. In such instances, the assumption that census tract populations are generally homogenous may not hold true, demonstrating how weighted estimates near freight gateways in rural regions may particularly underestimate the total population nearest to a border crossing. Despite these limitations, this study estimates baseline descriptive not reported elsewhere.

The proposed regression models are insightful, but are not flawlessly specified in their use of American Community Survey data. As expected, there is some multi-colinearity between demographic variables in national-level data, where the following pairs of variables are highly correlated: % less than high school education and % below poverty (Pearson's $r = .614$, $p < .000$), % unemployed and % below poverty (Pearson's $r = .568$, $p < .000$) and % Hispanic and % less than high school education (Pearson's $r = .604$, $p < .000$). Further, while the U.S. Census Bureau thoughtfully defines variables, no measure is a perfect representation of such social constructs. Thus, it is worth noting that 95% of individuals who select 'some other race' when completing the U.S. Census (contributing, in this study, to % persons of color) also identify as Hispanic (Rodriguez, 2000). Additionally, there were missing data for 839 census tracts (1.1%), and this was addressed in analysis by casewise deletion. Given that 72,218 tracts remained in the study and missing data did not appear to occur systematically, the expected threat for study bias due to casewise deletions was minimal (Allison, 2001; Roth, 1994).

Also, when comparing dependent variables for logistic regression—any tracts contained or intersecting the buffer versus only tracts that have at least 50% of their area contained or intersecting the buffer—nearly all relationships remain consistent in their direction and significance or non-significance. Although, in the 500-meter models, increased % vacancy only

correlates with host community status when only tracts with 50% or greater of their area in the buffer are included. Vacancy patterns are, perhaps, not homogenous across census tracts, particularly in post-industrial cities (e.g., Buffalo, Cleveland, and Detroit) where local social and economic factors can contribute to neighborhood disinvestment, foreclosures, and abandonment in ways that national data cannot fully capture (Mallach, 2006). Ultimately, the difference indicated by these two models may be a reminder that, while national analyses are helpful for recognizing potential patterns, localized analyses or weights based on locally informed assumptions are also needed.

Hot spot analyses can be deceiving, where viewers may lose sense of their relative nature. When conducted at the county level for Detroit's Wayne County, for instance, distinctly different patterns emerge. Detroit becomes a single large hot spot for % poverty, % persons of color, % without a high school diploma, and % unemployed, where the rest of the county is a shade of blue, indicating a cold spot. In the case of Southern California, hot spots may be less meaningful for discussing EJ given that air pollution sources densely decorate the I-710 corridor and it is difficult to visually sort out patterns. Further spatial statistical analyses may be useful. Just as residents were concerned with scope of EIS study areas for the NITC and POLB deliberations, as described in Chapters 4 and 5, there may be other ways to conduct these hot spot analyses with more locally meaningfully geographies.

Finally, host communities and decision-makers may find additional studies beneficial during freight development deliberations. Local analyses that consider pollution sources, fate and transport of pollutants, and atmospheric and meteorological factors can offer a better depiction of health risks at each freight gateway. In particular, future studies may need to include air dispersion models rather than 500-meter and 1-mile buffers as done by Rosenbaum, Hartley, and

Holder (2011) that use EPA's AERMOD model. This air dispersion modeling is a component of regulated NEPA assessments, but findings are not directly integrated with or spatially overlaid on demographic analyses. However, air pollution is not the only environmental burden associated with freight infrastructure, and 500-meter buffer proxies in these analyses capture other environmental stressors as part of a larger story for host community residents.

Conclusion

There are inequitable patterns of exposure to freight-related air and noise pollution in the U.S. Freight host communities, both 500-meter and 1-mile, are more likely comprised of persons of color or Hispanic ethnicity than Non-Hispanic white Americans. Additionally, 1-mile host communities are more likely comprised of those living below poverty than those with wealth. Overall, however, individuals in these 1-mile communities may have equal or better opportunities for education and employment. The distribution of freight-related health risks is complex and inequitable in many ways.

Overall, these spatial analyses are limited but telling, and this study provokes further research. For example, to better understand the relationship between freight gateways and housing vacancy, researchers must draw on data capturing home vacancies, foreclosures, and abandoned homes, moving beyond census data. In another instance, this study motivates future near-freight gateway epidemiological studies that include consideration of interactive exposures nearby intermodal facilities or industrial sites also. While more work may be necessary to confirm and disentangle overall findings, this study introduces distinct baseline patterns that expand the recent discourse on freight as an EJ issue.

A range of local and federal decisions underlie the inequitable patterns outlined here, calling for interagency, community-informed responses. Next, in Chapters 4 and 5, sharing the

perspectives of community members and leaders and decision-makers in two host communities, I offer context for the numbers and maps in this chapter. From interviews, content analysis, and participant observations in these communities, I also cull potential community- and institutionally- driven interventions to address these inequitable patterns. Policy-makers are unable to easily relocate the nearly 576,000 people living near freight gateways in the U.S. or shut down these economic centers of global trade but, as seen in the following chapters, interventions that mitigate pollution exposures are possible and necessary to protect the health of marginalized communities.

Table 3.1 Estimated Total Population Residing within 500 meters of 50 Largest Freight Gateways in the U.S.

1	Los Angeles, CA	44,068.08	27	Tacoma, WA	4,201.76
2	Port of NY/NJ	155,991.60	28	Atlanta, GA	8,316.90
3	John F. Kennedy, NY	24,484.29	29	Otay Mesa Station, CA	77.13
4	Houston, TX	42,010.63	30	Cleveland, OH	1,886.26
5	Detroit, MI	2,246.77	31	Corpus Christi, TX	11,104.34
6	Laredo, TX	2,869.36	32	Gramercy, LA	797.79
7	Chicago, IL	32,528.11	33	Champlain-Rouses Point, NY	68.19
8	Long Beach, CA	23,176.26	34	Jacksonville, FL	8,069.29
9	Port Huron, MI	2,993.60	35	Texas City, TX	1,582.58
10	Buffalo-Niagara Falls, NY	3,667.41	36	Port Everglades, FL	4,805.25
11	Los Angeles, CA	22,217.83	37	Miami, FL	1,098.61
12	Charleston, SC	4,235.86	38	Hidalgo, TX	263.49
13	Savannah, GA	4,621.71	39	Beaumont, TX	1,888.02
14	Norfolk, VA	11,644.92	40	Pembina, ND	2.31
15	San Francisco, CA	5,729.57	41	Nogales, AZ	448.40
16	New Orleans, LA (water)	10,965.79	42	Blaine, WA	108.58
17	New Orleans, LA (air)	8,223.20	43	Washington, DC	10,650.02
18	El Paso, TX	5,695.38	44	Port Arthur, TX	2,963.34
19	Baltimore, MD	6,427.58	45	Portland, OR	15,758.47
20	Philadelphia, PA	33,029.70	46	Portal, ND	0.54
21	Anchorage, AK	3,650.19	47	Sweetgrass, MT	0.19
22	Miami, FL	8,376.66	48	Freeport, TX	4,191.70
23	Seattle, WA	28,310.80	49	Philadelphia, PA	600.38
24	Dallas-Fort Worth, TX	214.54	50	Lake Charles, LA	2,482.51
25	Oakland, CA	5,332.29	**TOTAL**		**574,708.62**

(Source: American Community Survey, 2005-2009)

Table 3.2 Estimated Proportion of Population by Demographic Characteristics Residing within 500 meters of 50 Largest U.S. Freight Gateways in the U.S.

		% Persons of Color	% Hispanic	% Below Poverty	% < HS Diploma	% Unemployed	% Vacancy
1	Los Angeles, CA	81.21	63.11	27.00	32.00	11.73	6.86
2	Port of NY/NJ	70.27	39.69	19.97	14.27	9.79	9.71
3	John F. Kennedy, NY	72.94	14.91	8.14	14.27	8.25	6.82
4	Houston, TX	7.46	68.28	21.36	42.32	13.21	12.99
5	Detroit, MI	79.61	63.77	44.94	37.76	28.00	26.48
6	Laredo, TX	99.17	98.61	39.86	46.61	16.06	17.84
7	Chicago, IL	32.03	50.38	10.80	23.44	9.09	6.15
8	Long Beach, CA	85.50	64.73	27.17	32.83	13.63	10.90
9	Port Huron, MI	12.67	4.25	21.45	8.83	13.15	8.15
10	Buffalo-Niagara Falls, NY	54.92	32.62	39.48	19.75	11.28	27.46
11	Los Angeles, CA	52.83	31.93	12.07	10.49	5.43	5.63
12	Charleston, SC	46.02	0.79	23.21	13.34	6.47	17.43
13	Savannah, GA	65.23	9.09	37.27	17.60	13.63	18.46
14	Norfolk, VA	49.16	7.27	18.03	9.25	7.68	17.40
15	San Francisco, CA	77.33	43.98	12.40	14.98	9.20	4.51
16	New Orleans, LA (water)	50.47	6.77	18.55	14.25	10.71	16.00
17	New Orleans, LA (air)	64.02	16.78	22.55	12.58	17.73	13.15
18	El Paso, TX	98.36	96.83	62.91	54.35	7.94	12.41
19	Baltimore, MD	55.54	9.30	21.33	32.33	9.16	10.67
20	Philadelphia, PA	33.37	6.01	20.58	11.92	8.19	11.89
21	Anchorage, AK	34.94	7.15	4.34	5.90	6.79	5.58
22	Miami, FL	87.53	85.12	14.14	19.44	7.48	12.55
23	Seattle, WA	28.41	5.76	17.55	5.87	6.20	10.25
24	Dallas-Fort Worth, TX	57.27	28.57	19.95	15.10	8.40	16.29
25	Oakland, CA	81.10	23.80	26.79	19.47	12.97	18.19
26	Morgan City, LA	40.38	12.17	31.48	34.67	12.29	14.50
27	Tacoma, WA	45.80	12.17	17.72	13.78	9.77	7.75
28	Atlanta, GA	83.65	27.14	27.50	18.21	19.30	25.46
29	Otay Mesa Station, CA	96.20	73.91	22.87	27.97	8.09	18.14
30	Cleveland, OH	28.24	7.58	10.99	9.21	9.15	7.17
31	Corpus Christi, TX	80.43	69.71	34.17	37.60	11.81	15.1
32	Gramercy, LA	46.3	0.39	23.01	15.56	19.92	3.38
33	Champlain-Rouses, NY	4.89	0.02	11.99	11.54	11.59	16.33
34	Jacksonville, FL	52.37	2.84	4.11	24.93	9.71	17.13
35	Texas City, TX	70.20	36.68	30.55	33.43	9.96	22.2
36	Port Everglades, FL	26.18	15.2	10.90	6.78	7.10	28.27
37	Miami, FL	45.42	37.69	13.89	4.80	5.22	45.13
38	Hidalgo, TX	96.70	96.70	60.68	51.76	14.36	11.39
39	Beaumont, TX	69.84	7.15	30.66	26.66	11.05	20.89
40	Pembina, ND	4.42	0.78	7.06	3.59	0.80	10.51
41	Nogales, AZ	94.07	92.96	30.10	29.95	5.74	24.87
42	Blaine, WA	16.18	6.94	9.81	7.56	1.64	2.96
43	Washington, DC	46.17	11.11	3.99	4.24	4.17	15.95
44	Port Arthur, TX	60.88	37.63	25.57	30.87	10.38	22.84
45	Portland, OR	31.63	12.54	18.00	9.60	7.53	8.3
46	Portal, ND	3.70	0.27	5.56	3.45	0.00	20.00
47	Sweetgrass, MT	5.26	0.00	10.53	0.00	0.00	33.33
48	Freeport, TX	71.58	61.27	14.67	26.16	5.53	16.49
49	Philadelphia, PA	15.89	0.24	13.37	1.25	10.07	10.28
50	Lake Charles, LA	32.97	3.34	15.90	12.25	2.55	13.65
50 Sites combined (s.d.)		**58.12 (28.09)**	**36.55 (30.73)**	**20.21 (12.85)**	**20.26 (13.43)**	**9.68 (5.15)**	**15.12 (8.22)**

(Source: American Community Survey, 2005-2009)

Table 3.3 Comparison of Proportions of Demographic Factors in Largest 500-meter Host Communities with the General U.S. Population

	U.S.	50 Largest Host Communities				10 Largest Host Communities			
Total estimated population	314,615,300	574,709				334,000			
		%	*Difference from U.S.*			*%*	*Difference from U.S.*		
		(sd)		*t-stat*	*sig.*	*(sd)*		*t-stat*	*sig.*
Persons of color (%)	36.75	58.12 (28.09)	21.37	4.08	.000	63.25 (31.80)	26.50	2.27	.049
Hispanic (%)	16.67	36.55 (30.73)	19.88	3.09	.003	47.61 (27.91)	30.94	3.78	.004
< High school diploma (%)	14.10	20.26 (13.53)	6.16	2.84	.007	20.35 (12.97)	6.25	3.20	.011
< Poverty (%)	15.91	20.21 (12.72)	4.30	3.10	.003	27.99 (12.31)	12.08	2.60	.029
Unemployed (%)	10.30	9.68 (5.17)	-.62	-.96	.304	10.67 (5.64)	.37	1.75	.114
Vacant homes (%)	12.20	15.12 (8.22)	2.92	2.51	.015	9.79 (7.99)	-2.41	.45	.664

(Source: American Community Survey, 2005-2009)

Table 3.4 Logistic Regression Analyses Comparing Effect of Demographic Variables on Host Community Status for the 50 Largest U.S. Freight Gateways[a]

	500-meters Host Community (intersected or contained tracts) n=484			**500-meters Host Community** (tracts with >50% area within buffer) n=147			**1 mile Host Community** (all intersected or contained tracts) n= 1044			**1 mile Host Community** (tracts with >50% area within buffer) n= 604		
	ß	**Exp (ß)**	**Sig.**	**ß**	**Exp (ß)**	**Sig.**	**ß**	**Exp (ß)**	**Sig.**	**ß**	**Exp (ß)**	**Sig.**
% Persons of color	1.47	4.34	.000*	1.43	4.18	.000*	1.93	6.87	.000*	2.00	7.35	.000*
% Hispanic	2.19	8.89	.000*	2.30	9.92	.000*	1.91	6.76	.000*	2.07	7.91	.000*
% Less than HS	-.64	.53	.233	.15	1.16	.870	-1.20	.30	.001*	-1.26	.28	.009*
% Poverty	.42	1.53	.372	1.16	3.20	.152	1.08	2.95	.001*	1.54	4.65	.000*
% Unemployed	-.93	.40	.325	-.380	.815	.684	-2.64	.07	.000*	-3.15	.043	.000*
% Vacant homes	.88	2.40	.061	-2.36	.09	.040*	.628	1.86	.055	.67	1.95	.119
Constant	-5.93	.00	.000*	-7.18	.00	.000*	-5.07	.01	.000*	-5.73	.00	.000*
Model chi-square	260.03	---	.000*	137.06	---	.000*	538.33	---	.000*	378.3	---	.000*

*Indicates statistical significance

(Source: American Community Survey, 2005-2009)

Table 3.5 Non-attainment of National Ambient Air Quality Standards at 119 Largest U.S. Freight Gateways

		PM 10	PM 2.5	CO	O_3	NOx	SOx
1	Los Angeles, CA	X	X	X	X	X	
2	Port of New York/New Jersey, NY/NJ	X	X	X	X		
3	John F. Kennedy, NY		X	X	X		
4	Houston, TX				X		
5	Detroit, MI	X	X	X	X		
6	Laredo, TX						
7	Chicago, IL			X	X		
8	Long Beach, CA	X	X	X	X	X	
9	Port Huron, MI		X		X		
10	Buffalo-Niagara Falls, NY				X		
11	Los Angeles, CA	X	X	X	X	X	
12	Charleston, SC						
13	Savannah, GA						
14	Norfolk, VA				X		
15	San Francisco, CA			X	X		
16	New Orleans, LA						
17	New Orleans Customs District, LA						
18	El Paso, TX	X		X			
19	Baltimore, MD		X		X		
20	Philadelphia, PA		X	X	X		
21	Anchorage, AK			X			
22	Miami, FL						
23	Seattle, WA			X			
24	Dallas-Fort Worth, TX				X		
25	Oakland, CA			X	X		
26	Morgan City, LA						
27	Tacoma, WA			X			
28	Atlanta, GA		X		X		
29	Otay Mesa Station, CA			X	X		
30	Cleveland, OH	X	X	X	X		X
31	Corpus Christi, TX						
32	Gramercy, LA						
33	Champlain-Rouses Point, NY						
34	Jacksonville, FL						
35	Texas City, TX				X		
36	Port Everglades, FL						
37	Miami, FL						
38	Hidalgo, TX						
39	Beaumont, TX				X		
41	Pembina, ND						
42	Nogales, AZ	X					
44	Blaine, WA						
45	Washington, DC		X	X	X		
46	Port Arthur, TX				X		
47	Portland, OR			X			
48	Portal, ND						
49	Sweetgrass, MT						
50	Freeport, TX				X		
51	Philadelphia, PA		X		X		
52	Lake Charles, LA						
53	Boston Logan, MA			X	X		
54	Newark, NJ		X	X	X		
55	Houston, TX				X		
56	Seattle-Tacoma, WA			X			
57	Baton Rouge, LA				X		
58	Eagle Pass, TX						
59	Brownsville, TX						
60	Alexandria Bay, NY				X		
61	Pascagoula, MS						
62	Mobile, AL					X	

63	Boston, MA			X	X		
64	Chester, PA		X			X	
65	Richmond, CA			X	X		
66	Calexico-East, CA	X			X		
67	International Falls/Rainer, MN						
68	Wilmington, DE		X		X		
69	Eastport, ID						
72	Great Falls, MT			X			
73	Philadelphia, PA		X		X		
74	Tampa, FL						
75	San Diego, CA			X	X		
76	Brunswick, GA						
77	Salt Lake City, UT	X		X			X
78	San Francisco, CA			X	X		
79	Galveston, TX				X		
80	Highgate Springs/Alburg, VT						
81	Honolulu, HI						
82	Port Hueneme, CA				X		
83	Nashville, TN				X		
84	Providence, RI				X		
85	Wilmington, NC						
86	Cincinnati-Lawrenceburg, OH		X		X		
87	Denver, CO	X		X	X		
88	Ogdensburg, NY						
89	Kalama, WA						
90	Perth Amboy, NJ		X	X	X		
91	Detroit, MI		X	X	X		
92	Newport News, VA				X		
93	Vancouver, WA						
94	Calais, ME						
95	Panama City, FL						
96	Bellingham, WA						
97	Anacortes, WA						
98	Louisville, KY		X		X		
99	Sault Ste Marie, MI						
100	Memphis, TN			X	X		
101	Detroit, MI		X	X	X		
102	Anchorage, AK			X			
103	Del Rio, TX						
104	Minneapolis-St. Paul, MN			X			X
106	Honolulu, HI						
107	Huntsville, AL						
108	Gulfport, MS						
109	Sumas, WA						
110	Houlton, ME						
111	Toledo, OH				X		X
112	Derby Line, VT						
113	Portland, WA			X			
114	Richmond-Petersburg, VA				X		
115	Burlington, VT						
116	New Haven, CT			X			
117	Portland, ME				X		
118	West Palm Beach, FL						
119	Port Townsend, WA						
120	Martinez, CA			X	X		
122	Port Huron, MI		X		X		
123	Chicago, IL	X	X		X		
124	Carquinez Strait, CA			X	X		

(Sources: Bureau of Transportation Statistics, 2010; U.S. Environmental Protection Agency, 2011)

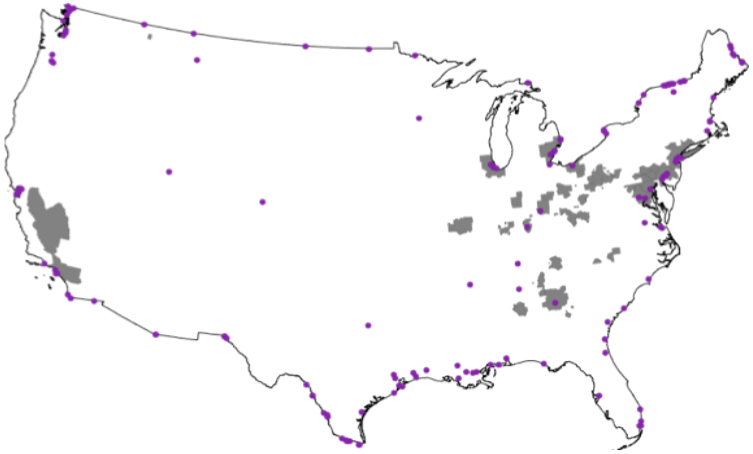


Figure 3.1 Largest 119 U.S. Freight Gateways and PM 2.5 Nonattainment Areas

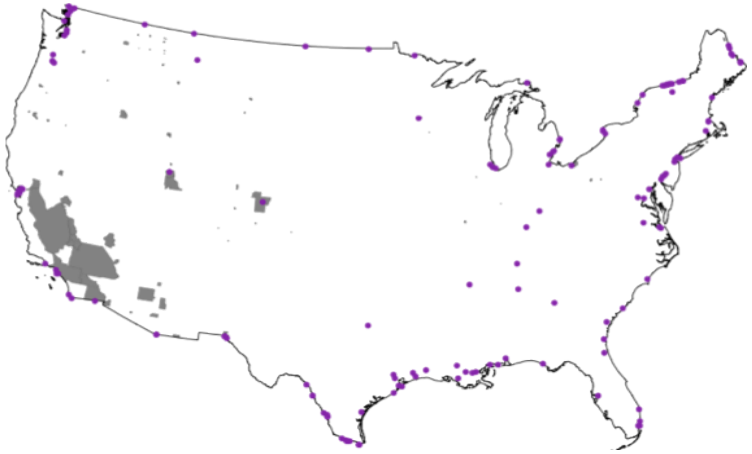


Figure 3.2 Largest 119 U.S. Freight Gateways and PM10 Nonattainment Areas

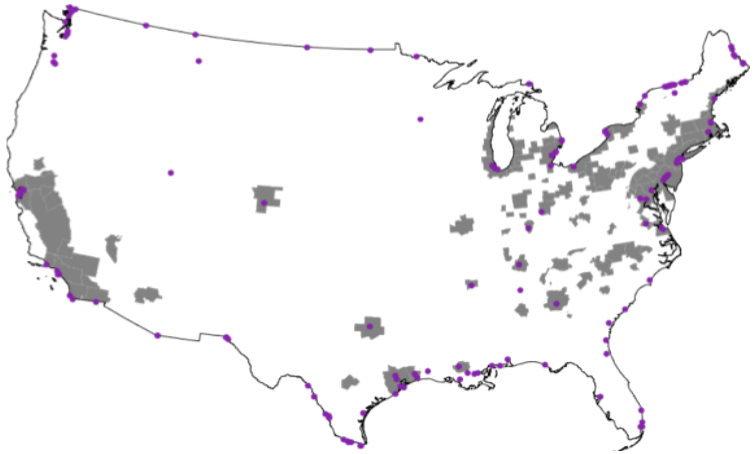


Figure 3.3 Largest 119 U.S. Freight Gateways and Ozone Nonattainment Areas

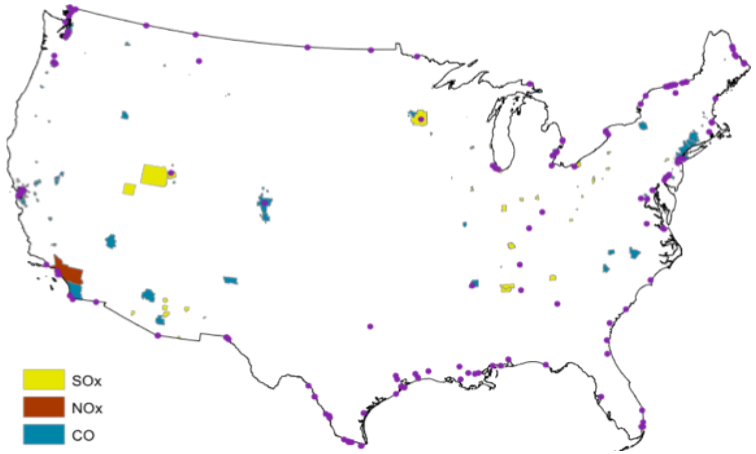


Figure 3.4 Largest 119 U.S. Freight Gateways and SOx, NOx, and CO Nonattainment Areas

(Sources: Bureau of Transportation Statistics, 2010; U.S. Environmental Protection Agency, 2011)

Figure 3.5 Air Pollution Sources in the U.S.: Freight Gateways and Industrial Sites

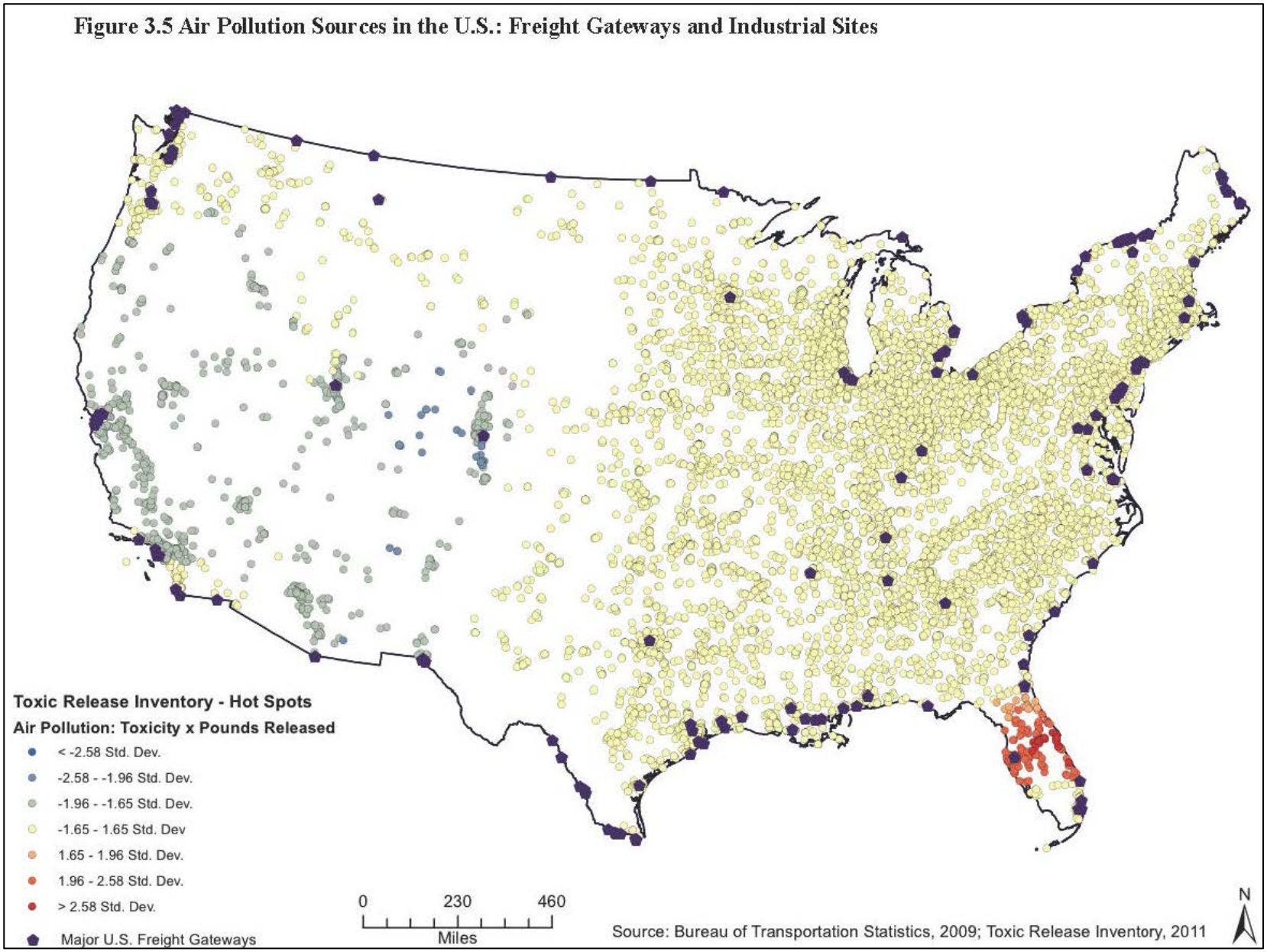


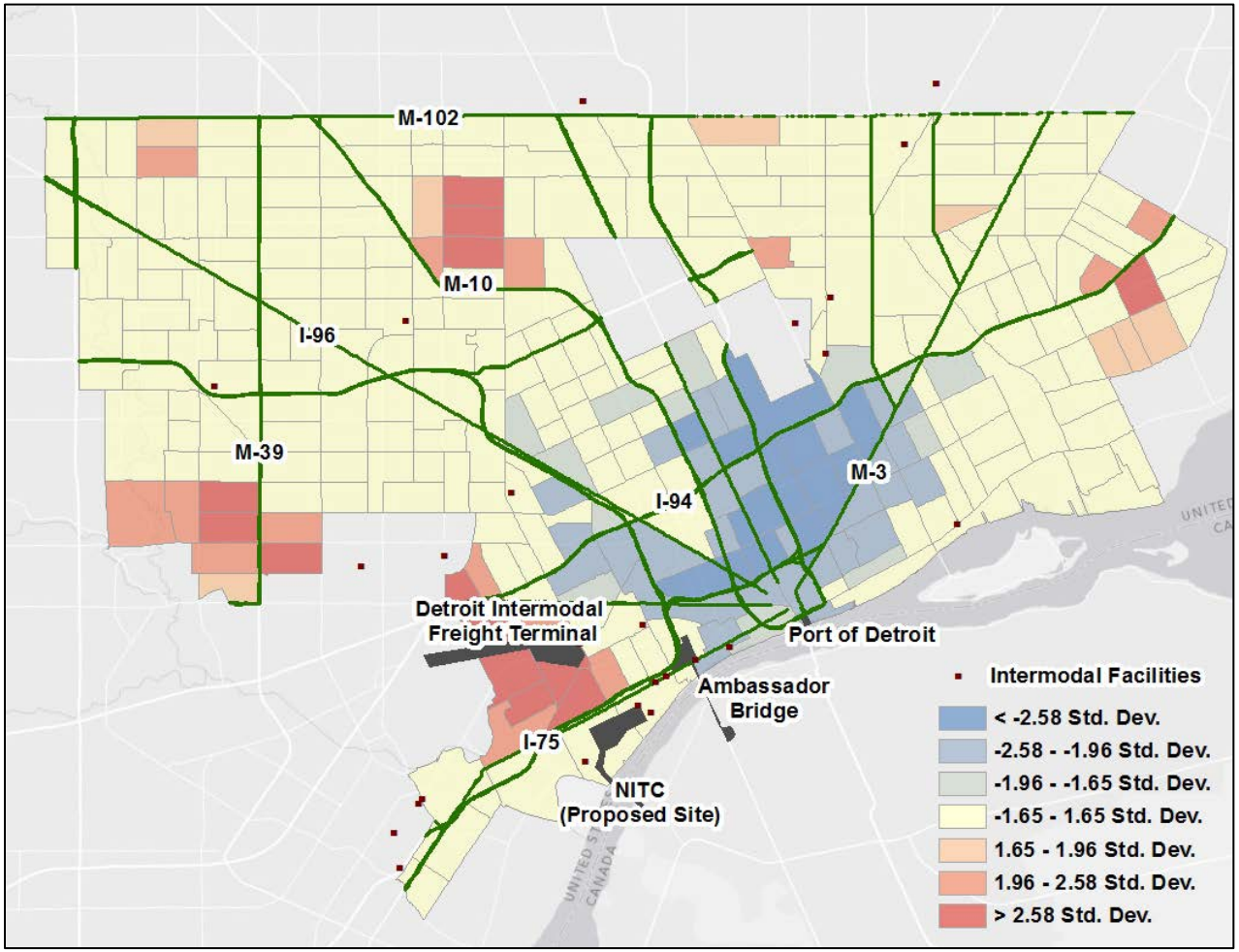
Table 3.6. Estimated Demographic Composition Near Detroit's Transportation Corridor

Within 500 meters of…	**Major Highways**	**Intermodal Facilities (n=30)**	**Ambassador Bridge**	**Detroit Intermodal Freight Terminal**	**Proposed NITC Site**	**Port of Detroit**
Total population	391,725	19,605	2,246	54,300	2,435	1,172
% Persons of color	83.87	70.64	79.61	41.75	60.62	72.71
% Hispanic	7.08	23.65	63.77	58.02	56.42	.03
% Living in poverty	33.97	34.06	44.84	34.17	36.11	21.63
% < High school education	24.14	34.75	37.76	49.78	39.53	18.22
% Unemployed	22.67	23.36	28.00	18.72	29.44	14.64
% Vacant homes	22.10	21.88	18.41	15.92	18.94	18.20
Within 1 mile of…	**Major Highways**	**Intermodal Facilities (n=30)**	**Ambassador Bridge**	**Detroit Intermodal Freight Terminal**	**Proposed NITC Site**	**Port of Detroit**
Total Population	817,761	194,481	16,587	66,465.72	27,401	11,467
% Persons of Color	84.27	73.22	52.26	45.47	46.39	69.16
% Hispanic	7.56	20.84	56.38	59.07	66.77	.04
% Living in Poverty	33.54	34.08	36.01	34.81	39.17	31.25
% < High school education	24.26	31.89	46.42	49.29	51.55	14.01
% Unemployed	22.60	22.11	21.74	18.77	22.81	9.43
% Vacant homes	21.40	22.01	20.10	17.72	17.47	20.84

In comparison to…	**Detroit, Michigan**	**Wayne County, Michigan**	**Michigan**
Total Population	706,585	1,792,365	9,876,801
% Persons of Color	89.4	45.7	21.1
% Hispanic	6.8	5.4	4.4
% Living in Poverty	36.2	22.7	15.7
% < High school education	22.9	16.5	11.6
% Unemployed	29.3	19.1	13.1
% Vacant	21.5	13.2	14.7

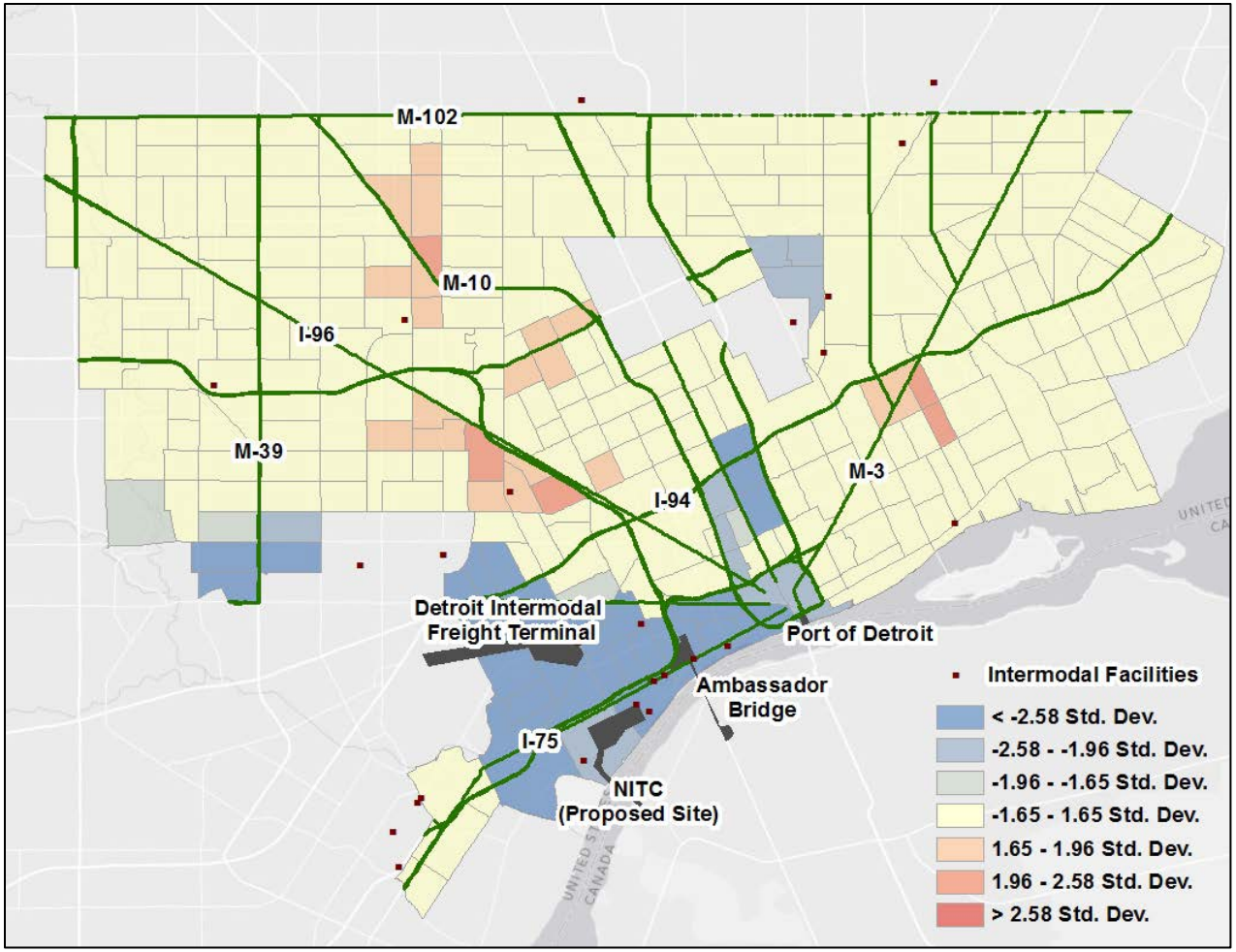
(Source: American Community Survey, 2005-2009)

Figure 3.6 Hot Spot Analysis of Detroit's Transportation Corridor: Total Population by Census Tract



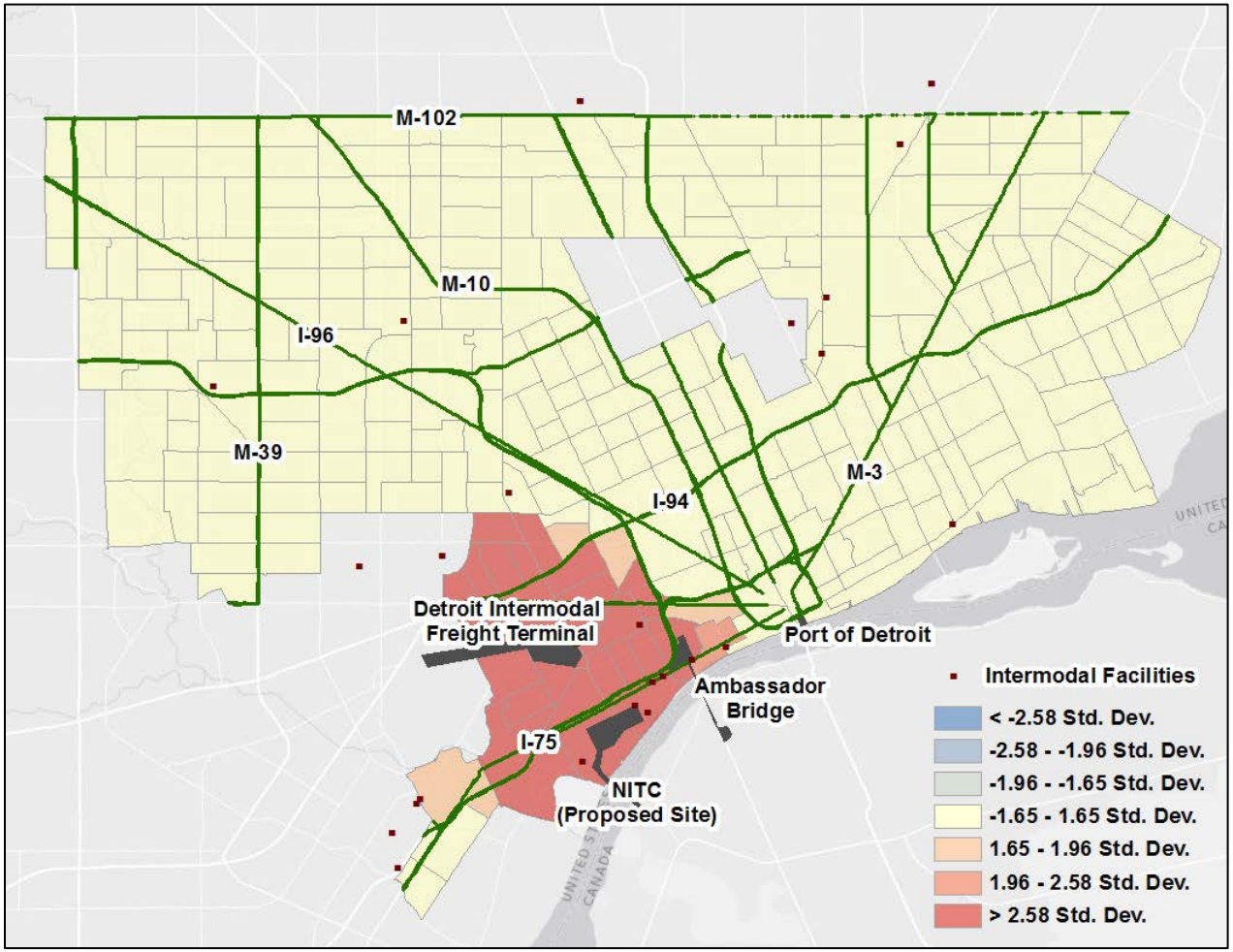
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.7 Hot Spot Analysis of Detroit's Transportation Corridor: Persons of Color as Percent of Total Population by Census Tract



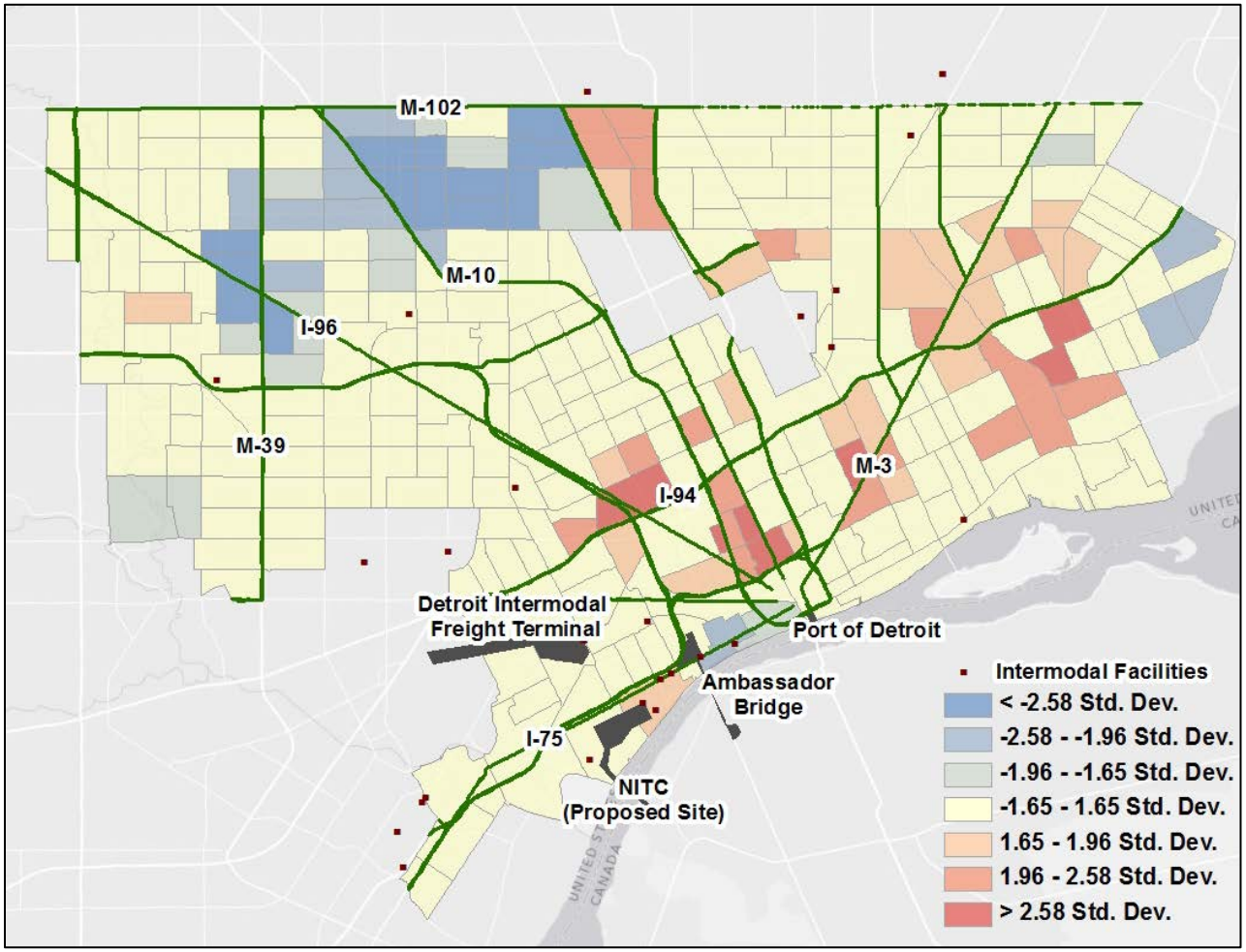
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.8 Hot Spot Analysis of Detroit's Transportation Corridor: Hispanic Population as Percent of Total Population by Census Tract



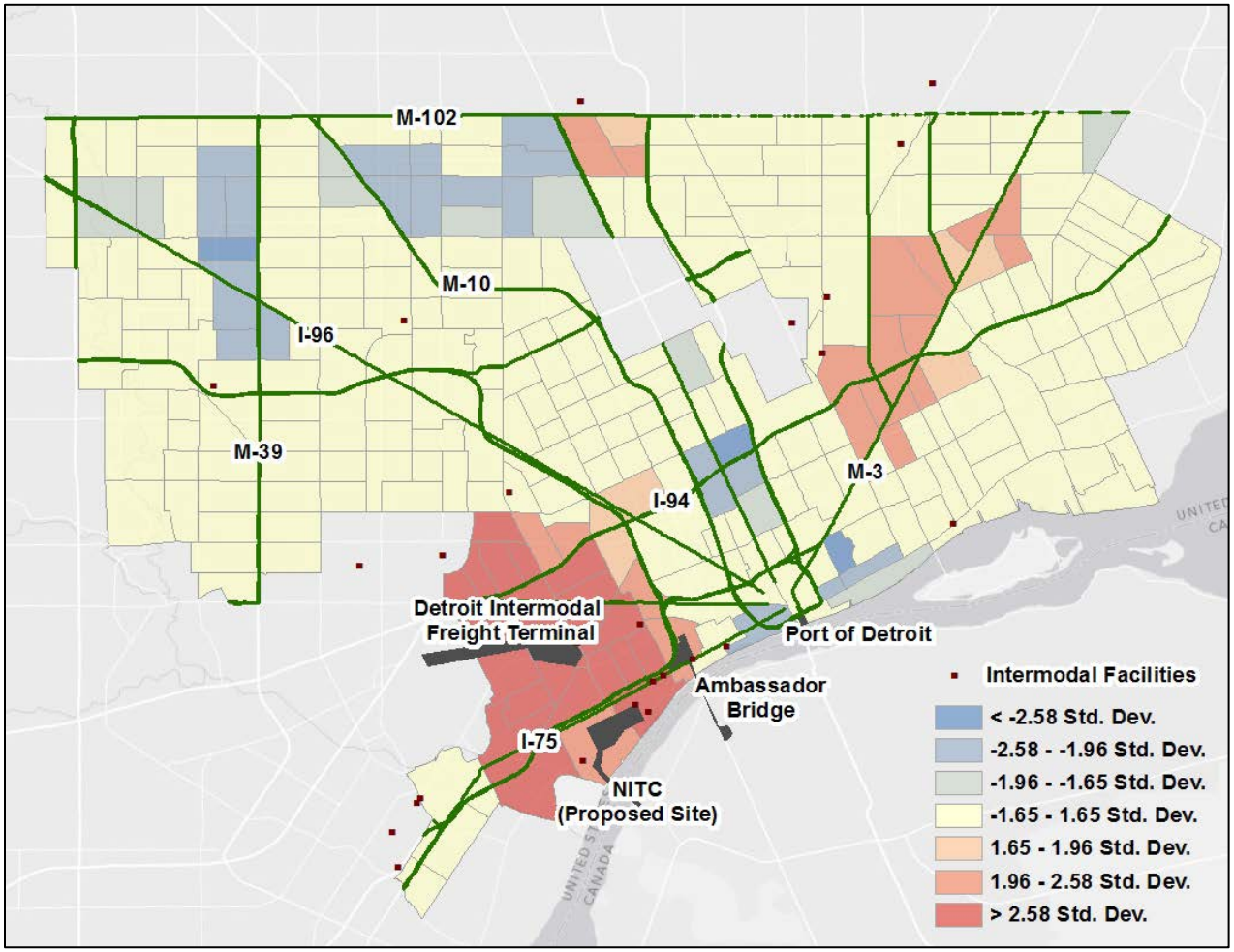
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.9 Hot Spot Analysis of Detroit's Transportation Corridor: Persons Living in Poverty as Percent of Total Population by Census Tract



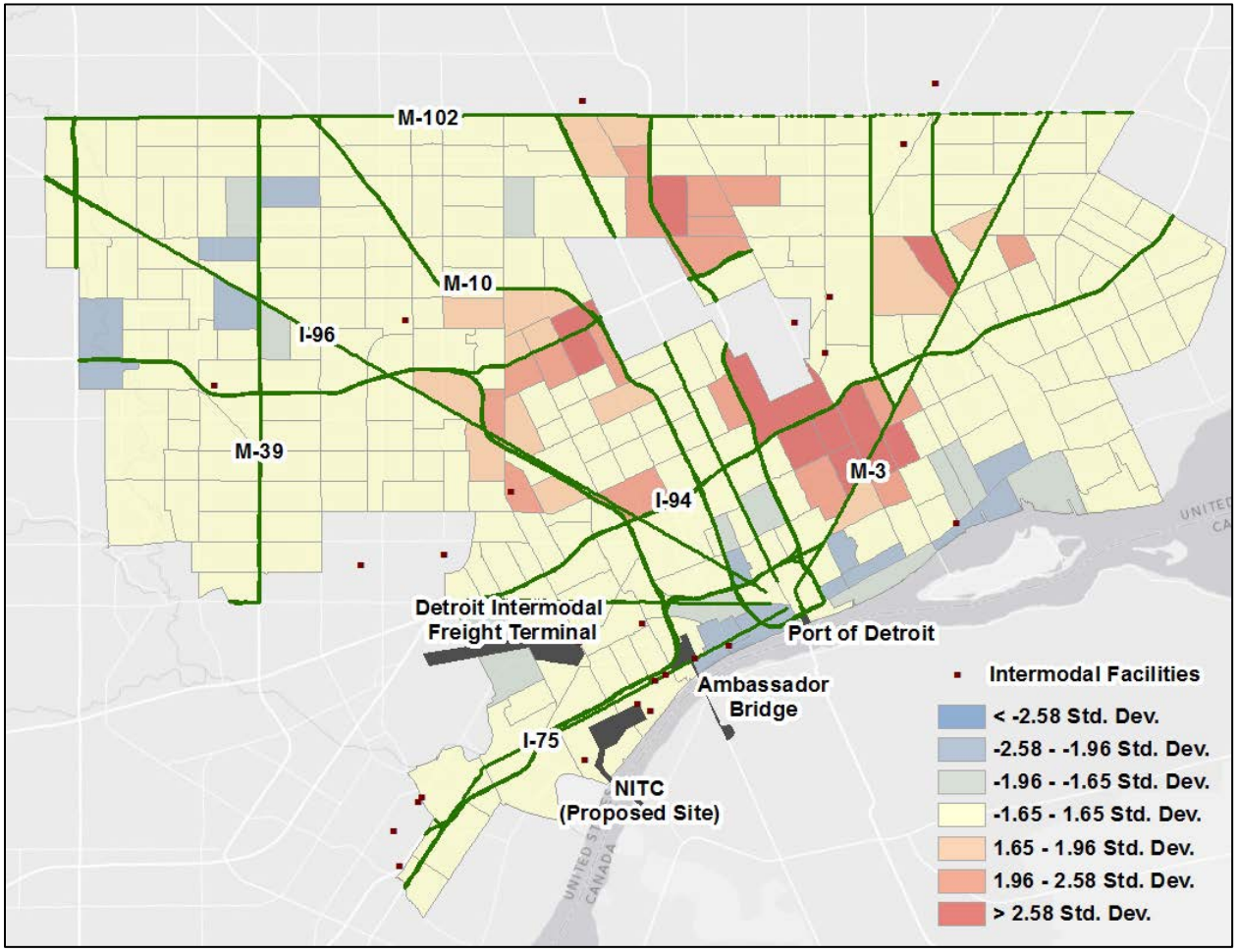
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.10 Hot Spot Analysis of Detroit's Transportation Corridor: Persons with Less than High School Diploma as Percent of Total Population over 25 Years of Age by Census Tract



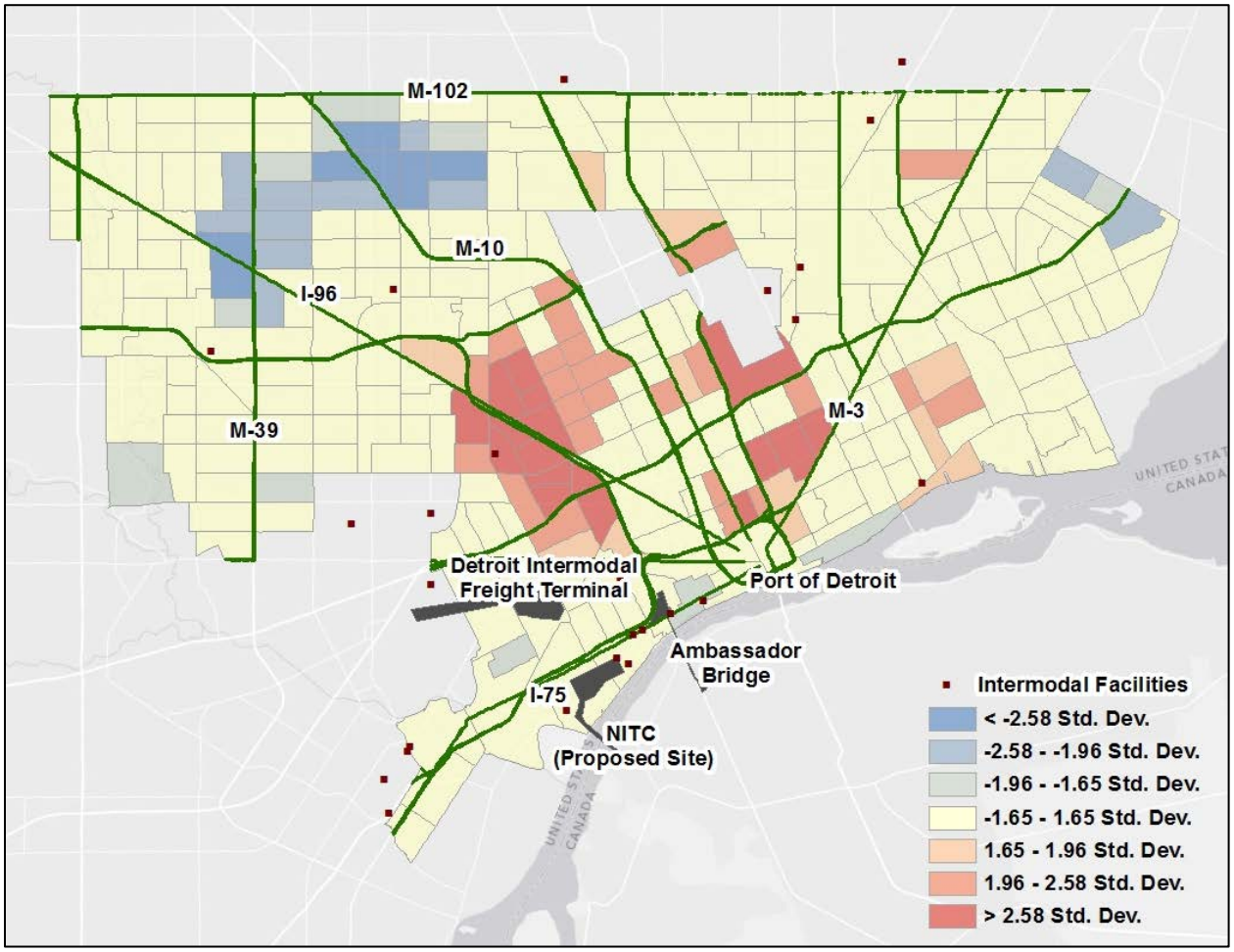
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.11 Hot Spot Analysis of Detroit's Transportation Corridor: Unemployed Persons as Percent of Civilian Workforce over 16 Years of Age by Census Tract



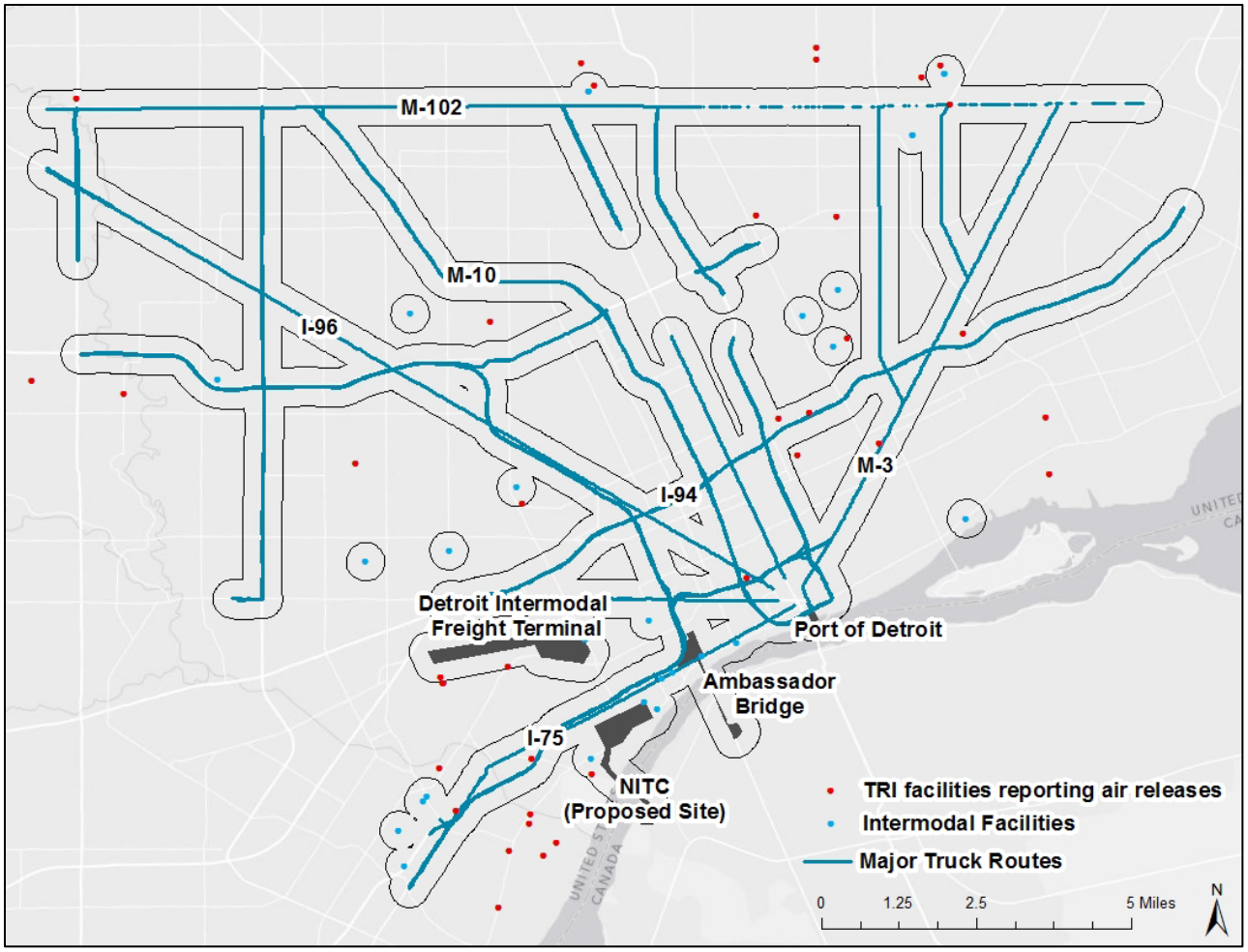
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.12 Hot Spot Analysis of Detroit's Transportation Corridor: Vacant Homes as Percent of Total Households by Census Tract



(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.13 Cumulative Air Pollution Exposures: Industrial Sites Reporting Air Releases to the U.S. EPA's Toxic Release Inventory within 500-meters of Detroit's Transportation Corridor



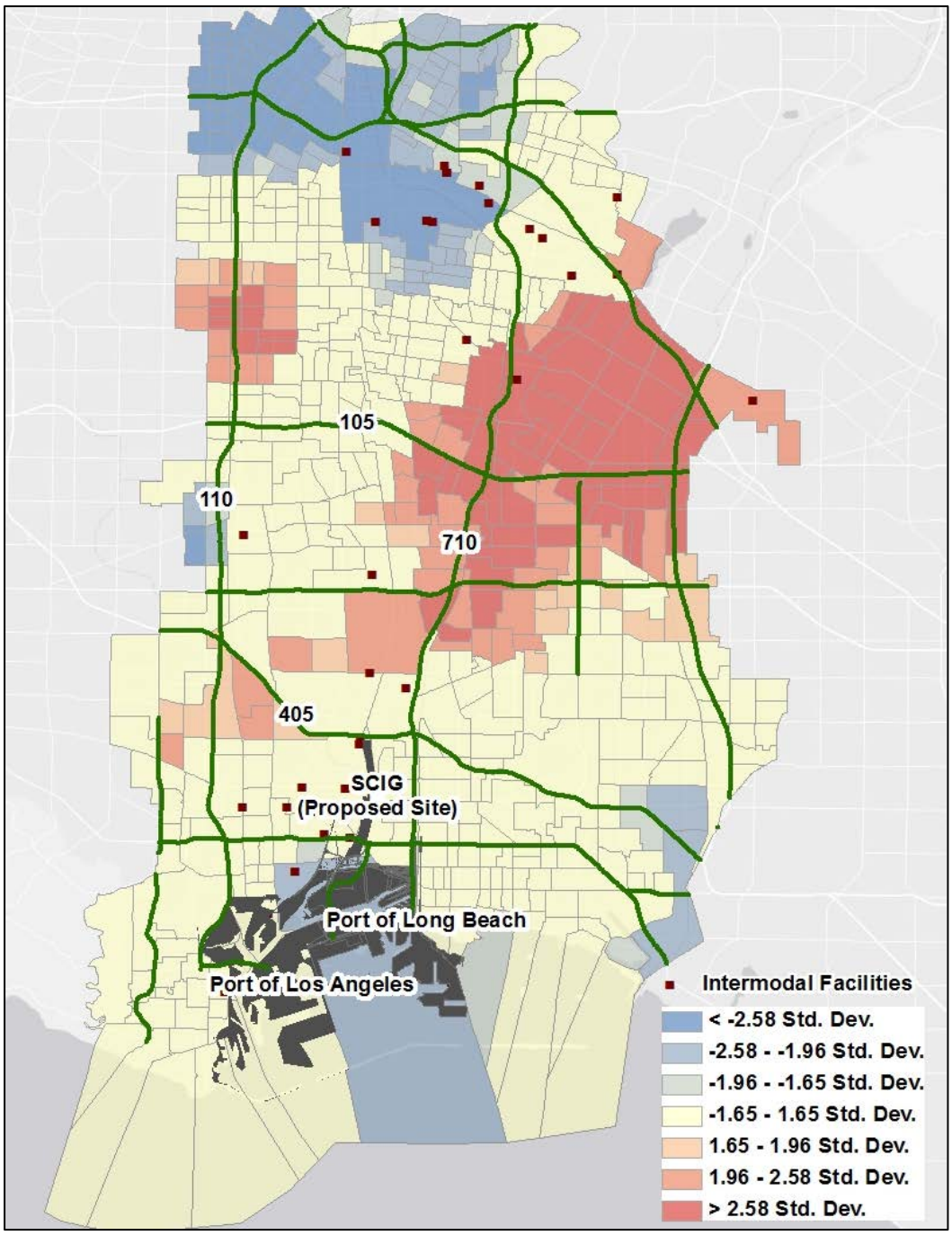
(Sources: Bureau of Transportation Statistics, 2010; U.S. Environmental Protection Agency, 2011)

Table 3.7 Estimated Demographic Composition Near Long Beach's Transportation Corridor

Within 500 meters of…	Port of Long Beach	Port of Los Angeles	Caltrans Truck Network	I-710 Corridor	Intermodal Facilities (n=38)	Southern California International Gateway
Total population	23,176	44,068	771,007	98,202	35, 491	3,812
% Persons of color	85.50	81.21	57.83	58.61	48.98	60.80
% Hispanic	64.73	63.11	65.36	76.39	80.57	55.59
% Living in poverty	27.17	27.00	21.91	20.43	21.36	26.83
% < High school education	32.83	32.00	37.35	45.41	44.02	31.77
% Unemployed	13.63	11.73	9.14	9.35	9.42	12.77
% Vacant homes	10.34	5.87	5.57	4.43	4.90	2.20
Within 1 mile of…	**Port of Long Beach**	**Port of Los Angeles**	**Caltrans Truck Network**	**I-710 Corridor**	**Intermodal Facilities (n=38)**	**Southern California International Gateway**
Total Population	104,643	129,614	1,951,786	436,850	399,392	28,076
% Persons of Color	56.19	48.41	57.26	56.68	51.94	60.55
% Hispanic	63.75	63.24	64.48	76.63	78.81	56.39
% Living in Poverty	27.24	20.27	22.54	21.15	21.59	20.50
% < High school education	36.06	33.53	37.62	44.59	43.20	34.01
% Unemployed	11.04	9.23	9.12	9.41	9.06	10.41
% Vacant homes	9.44	4.91	6.06	5.67	5.14	3.13
In comparison to…	**Long Beach, California**		**Los Angeles County, California**		**California**	
Total Population	463,344		9,834,410		37,330,448	
% Persons of Color	47.2		47.0		37.6	
% Hispanic	40.9		47.8		37.7	
% Living in Poverty	20.0		17.2		15.5	
% < High school education	21.3		23.9		19.2	
% Unemployed	12.9		11.8		12.1	
% Vacant homes	7.5		5.7		8.2	

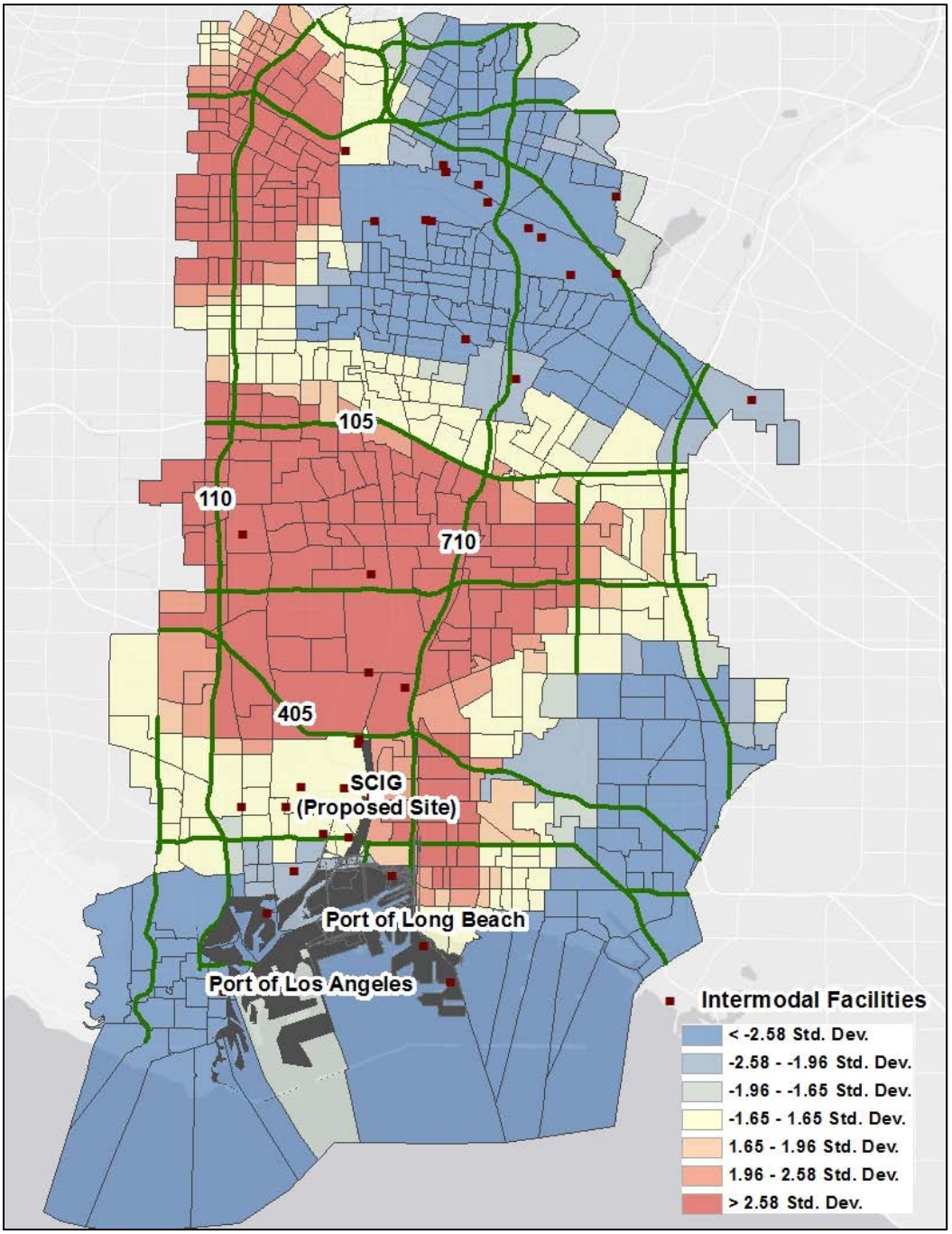
(Source: American Community Survey, 2005-2009)

Figure 3.14 Hot Spot Analysis of Long Beach's Transportation Corridor: Total Population by Census Tract



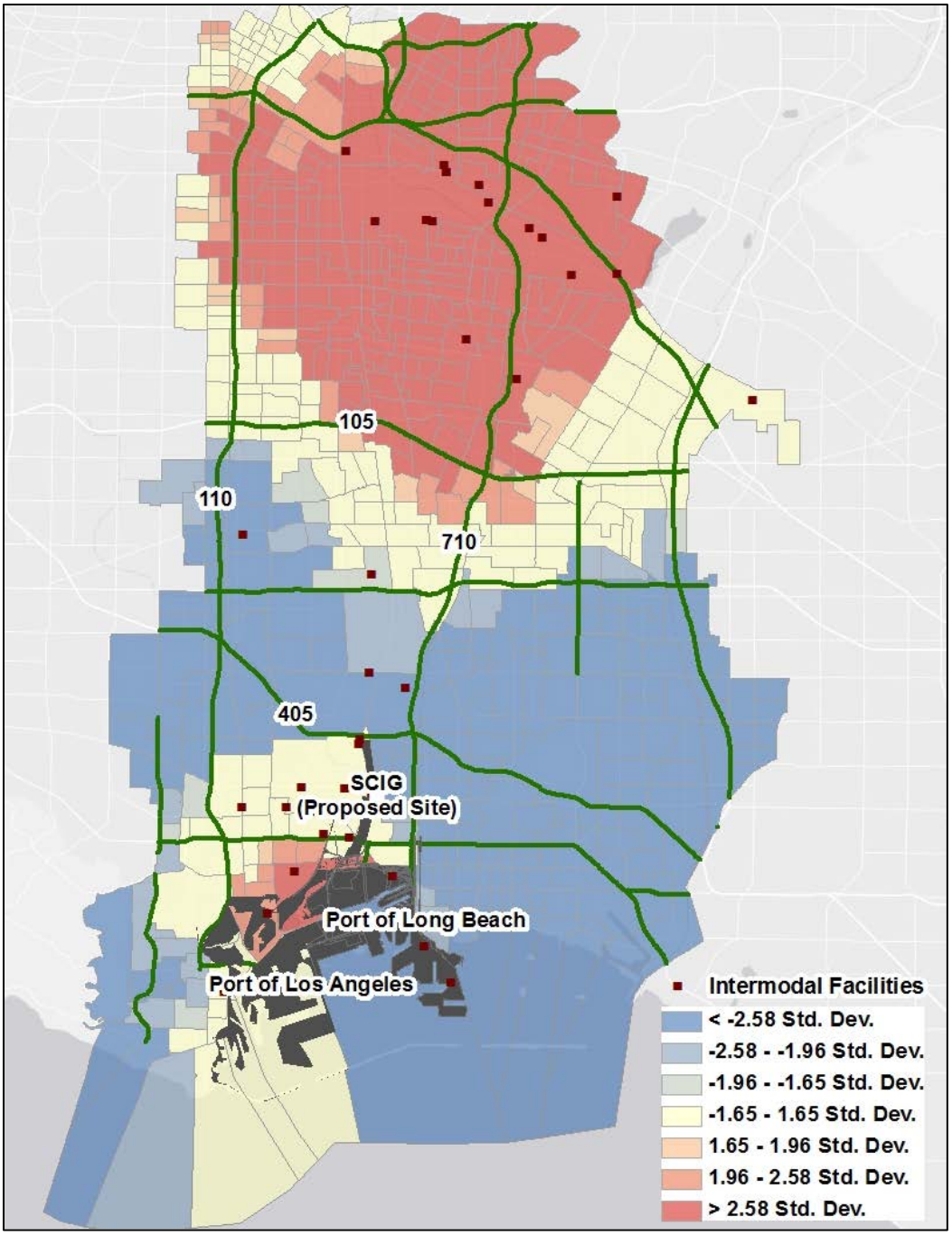
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.15 Hot Spot Analysis of Long Beach's Transportation Corridor: Persons of Color as Percent of Total Population by Census Tract



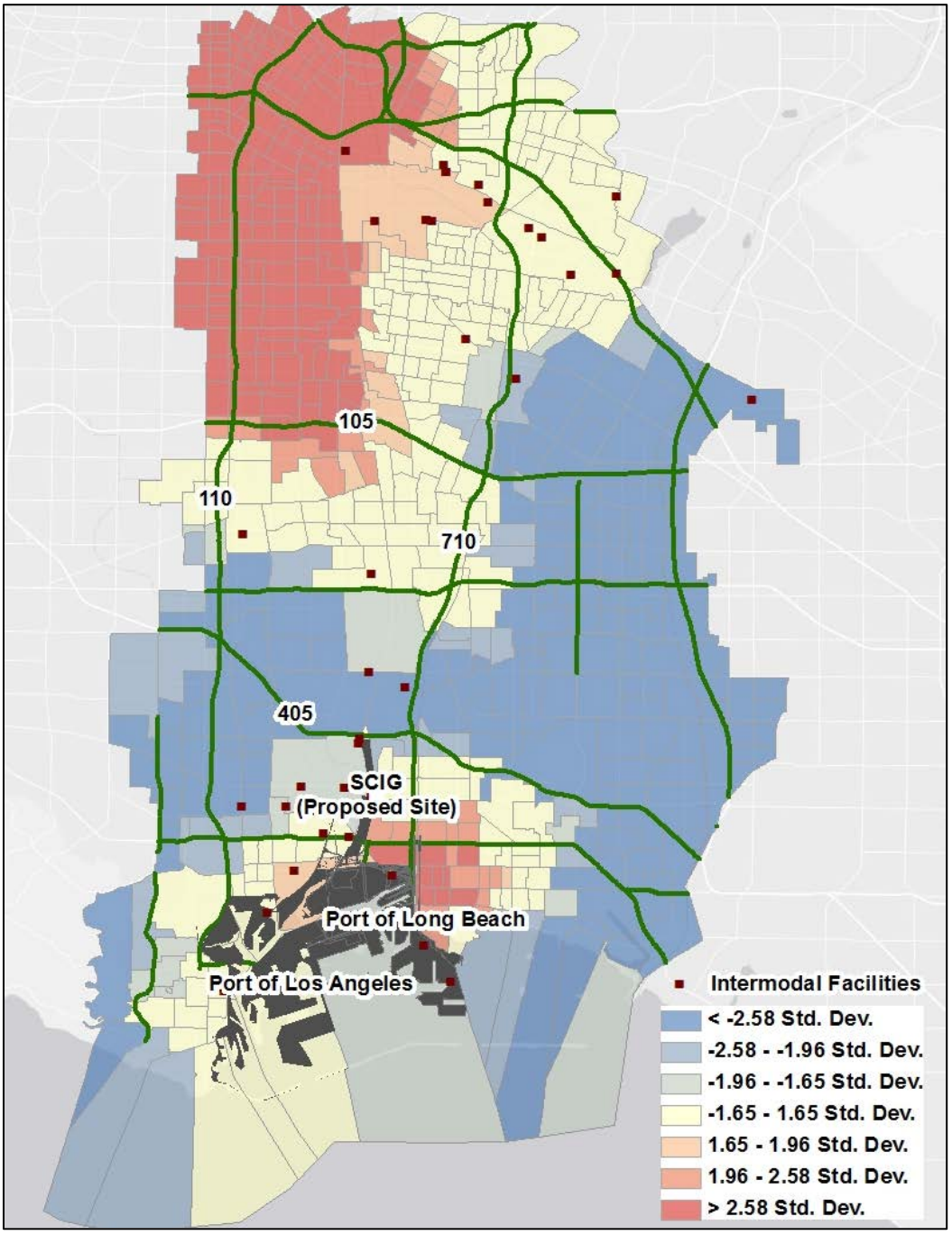
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.16 Hot Spot Analysis of Long Beach's Transportation Corridor: Hispanic Population as Percent of Total Population by Census Tract



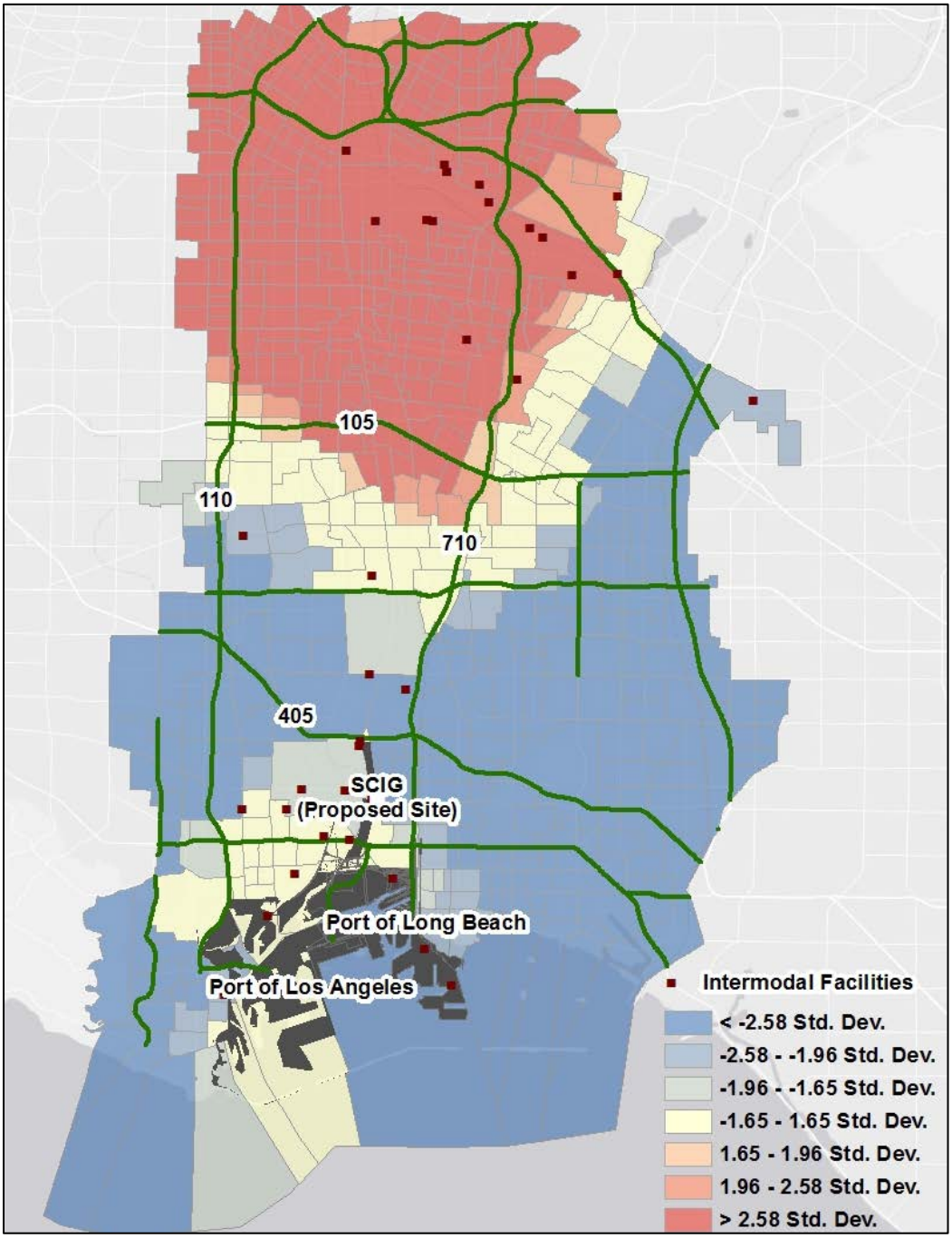
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.17 Hot Spot Analysis of Long Beach's Transportation Corridor: Persons Living in Poverty as Percent of Total Population by Census Tract



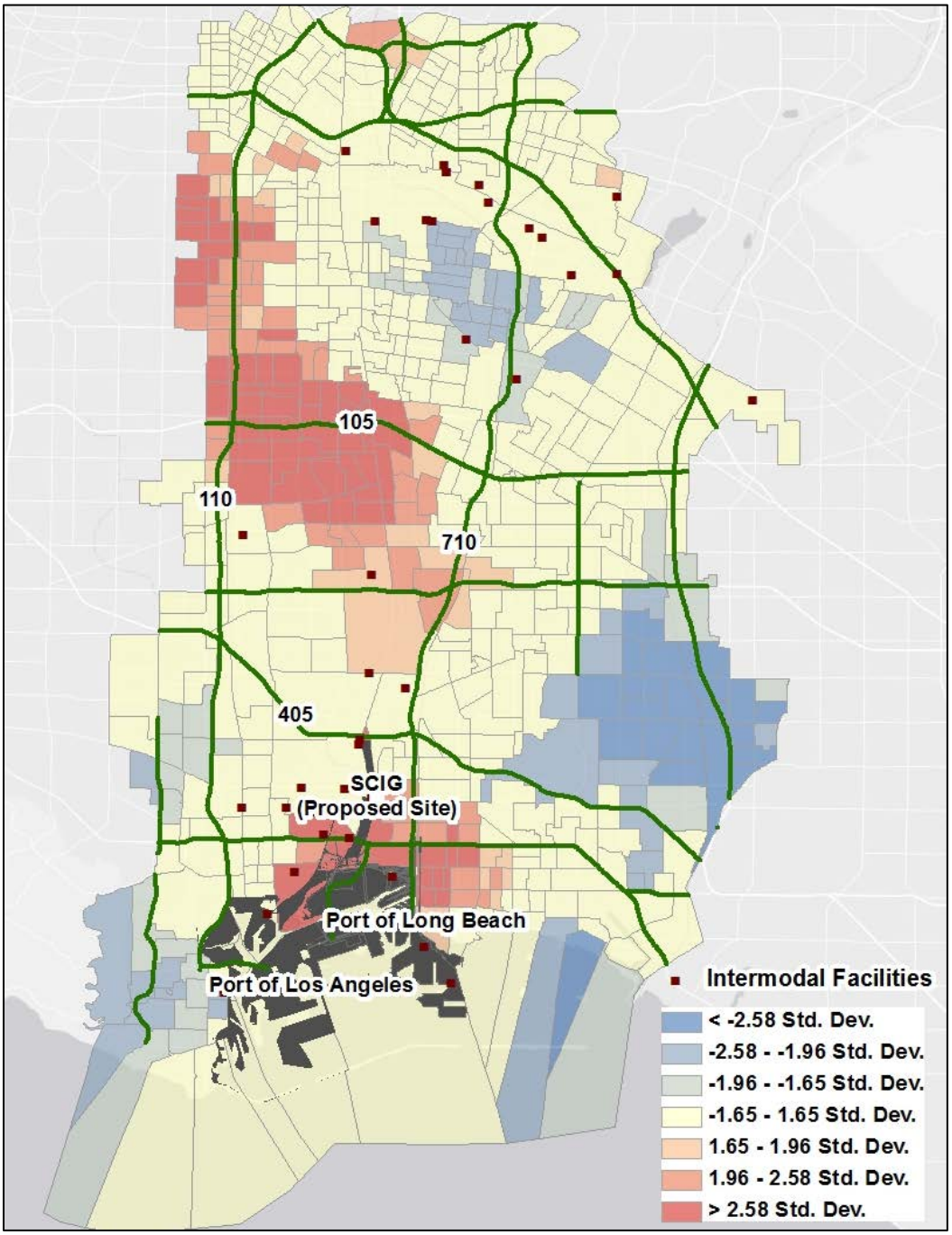
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.18 Hot Spot Analysis of Long Beach's Transportation Corridor: Persons with Less than High School Diploma as Percent of Total Population over 25 Years of Age by Census Tract



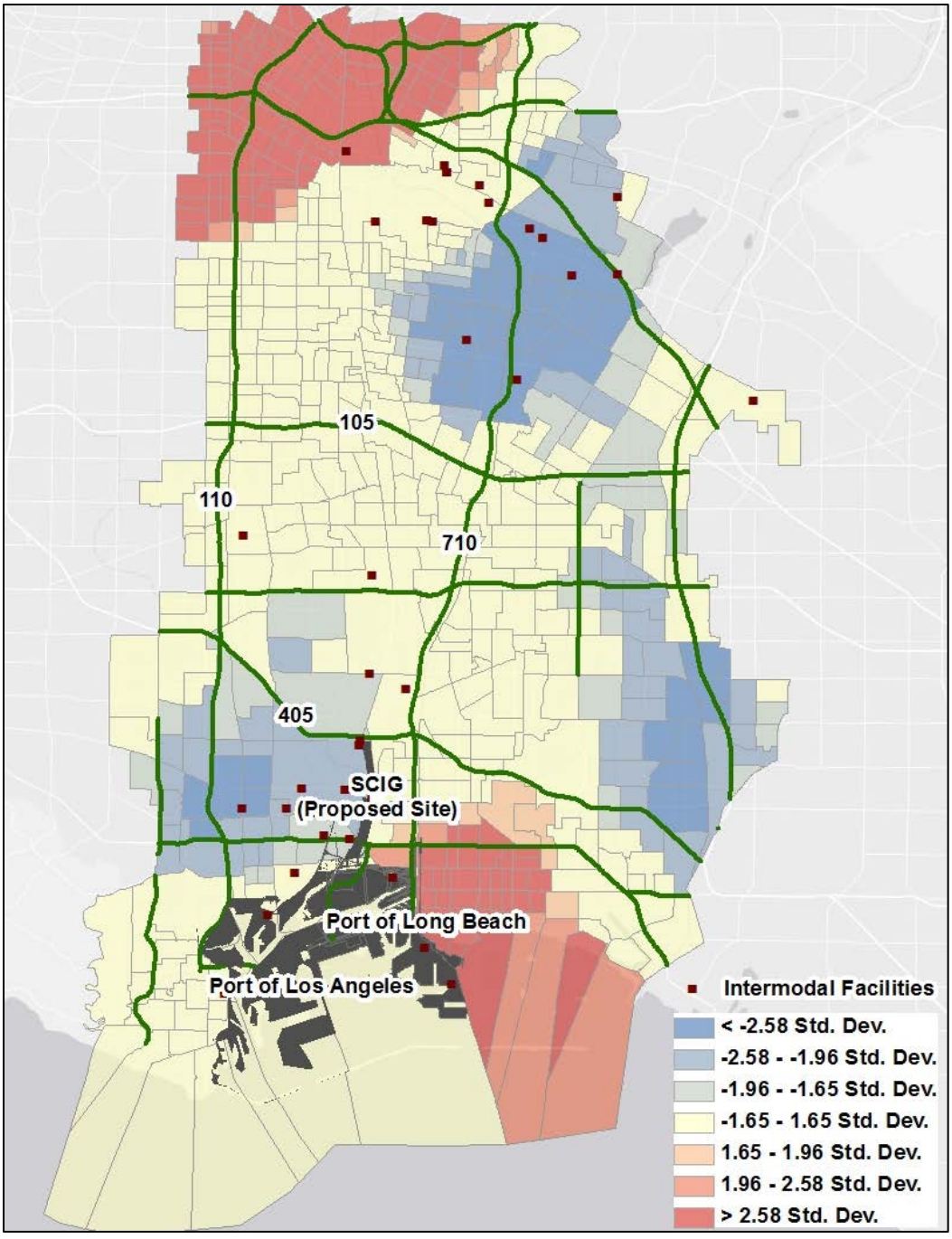
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.19 Hot Spot Analysis of Long Beach's Transportation Corridor: Unemployed Persons as Percent of Civilian Workforce over 16 Years of Age by Census Tract



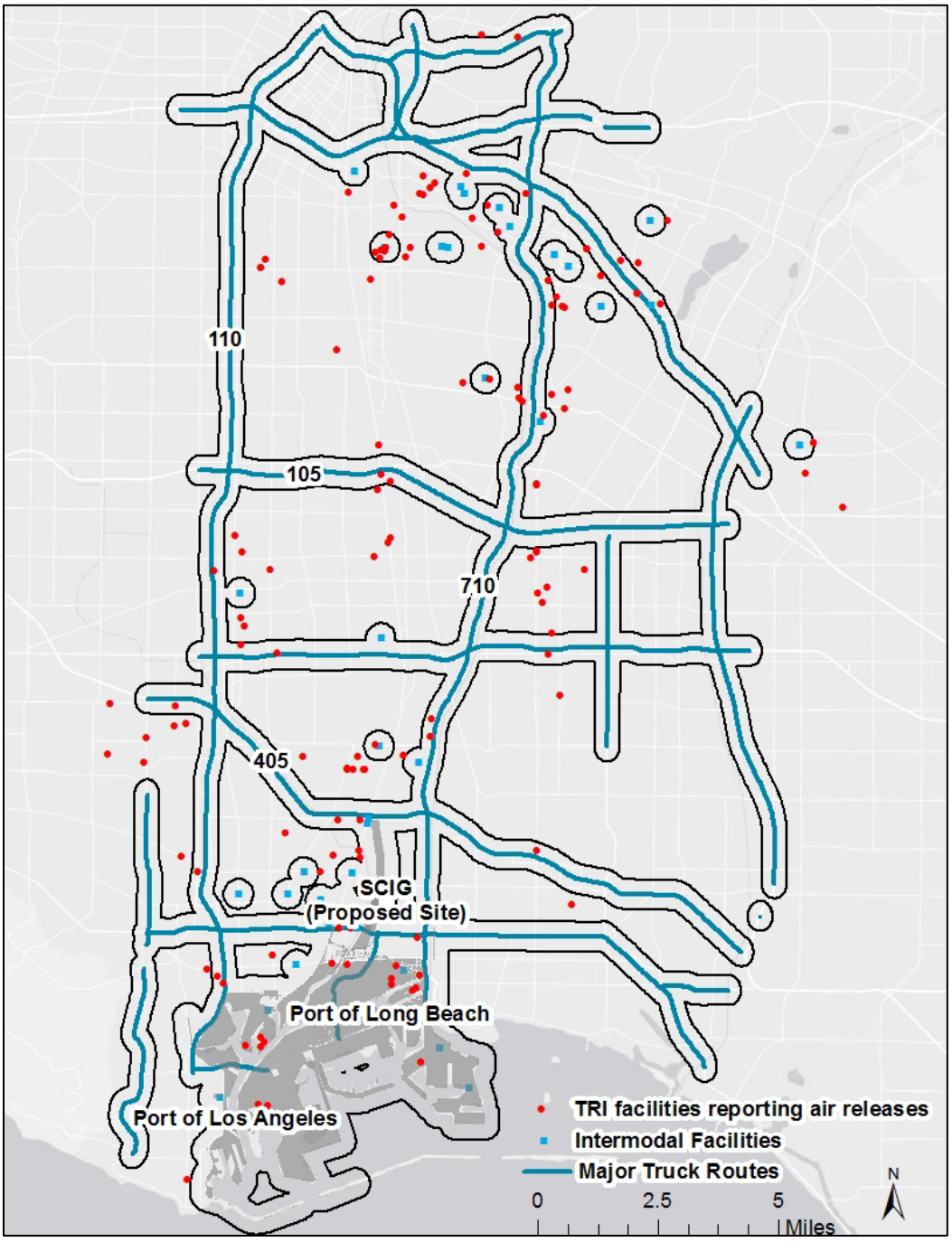
(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.20 Hot Spot Analysis of Long Beach's Transportation Corridor: Vacant Homes as Percent of Total Households by Census Tract



(Sources: American Community Survey, 2005-2009; Bureau of Transportation Statistics, 2010)

Figure 3.21 Cumulative Air Pollution Exposures: Industrial Sites Reporting Air Releases to the U.S. EPA's Toxic Release Inventory within 500-meters of Southern California's I-710 Transportation Corridor



(Sources: Bureau of Transportation Statistics, 2010; U.S. Environmental Protection Agency, 2011)

CHAPTER 4

Case Study: New International Trade Crossing (NITC), Detroit, MI

In this chapter, I summarize public participation and environmental assessment processes as described by those involved in the New International Trade Crossing (NITC) deliberation in the U.S. The NITC is the proposed development of a bridge border crossing between Southwest Detroit, Michigan in the United States and Windsor, Ontario in Canada. This development is sometimes referred to as the Detroit River International Crossing (DRIC), which was the official name of the project before 2011. This deliberation continues to proceed from its beginnings around 2002 to the present. To offer context, first, I provide an overview of Southwest Detroit, particularly the host neighborhood of Delray in Southwest Detroit, and a descriptive timeline of the overall deliberation, summarizing key proceedings, players, and proposed policies. Then, I describe the experiences, barriers, and catalysts of public participation in the NITC deliberation, including those related to government- and community-initiated activities. Next, I describe the public experiences assessing and mitigating environmental health risks at each decision-making step, from determination of project need to scoping to the environmental assessment process. I draw key themes largely from the words of community members and leaders—mainly those currently or formerly living in Delray and community leaders working throughout Southwest Detroit—supplemented with the words of decision-makers and clarifying information from policies, various media sources, environmental assessment documents, and other relevant materials. Finally, I include a discussion and key recommendations, offering interpretations of

these findings as they relate to literature and practice and identifying larger implications for transportation planning and health.

About the Delray Neighborhood and Greater Southwest Detroit

As the focus of this case study, the NITC may become a major feature of the Delray community, likely also affecting those living along the transportation corridor that extends through the greater Southwest Detroit region. Southwest Detroit is a region of the city comprised of many neighborhoods, including Boynton, Delray, Hubbard-Richard, Oakwood Heights, and Springwells Village. Located on the Detroit River, Delray is arguably the most industrial neighborhood in this region and the city overall. The Michigan Department of Transportation (MDOT) officially presented the Delray neighborhood in Southwest Detroit in Wayne County, Michigan to the public as the preferred U.S. crossing location for the NITC in a Final Environmental Impact Statement (FEIS) approved by the Federal Highway Administration (FHWA) on November 26, 2008.

Demographic Shifts

Table 4.1 summarizes the demographic composition of those census tracts comprising Delray and Southwest Detroit over three points in time, 1950, 1980, and 2010,[15] suggesting

[15] There is no agreed upon map indicating administrative or political boundaries comprising Detroit neighborhoods. Three years, 1950, 1980, and 2010, were selected because U.S. Census data was readily available, and they allowed for a comparison over three equidistant points in time. To estimate demographic variables for the Delray neighborhood and Southwest Detroit, shapefiles of census tracts for 1950, 1980, and 1990 were downloaded from the National Historical Geographic Information System (2012). These were overlayed with a shapefile map from the Detroit Data Collaborative (2012) of Detroit neighborhoods to identify which tracts fell within Delray and the collective of Southwest Detroit neighborhoods. For this analysis, the Delray neighborhood includes the following census tracts: 0051-0056 (1950), 5235-5237 (1980), and 5249 and 5250 (2010), and greater Southwest Detroit includes: 0002-0008, 0051-0063, 0065, 0067-0076, 0801, 0803, 0804, 0820, 0822, 0839, and 0840 (1950), 5209-5214, 5231-5248, 5735, 5742, 5770, 5771, 5785, 5786, 5791, and 5793 (1980), and 5211, 5213, 5214, 5231-5234, 5238, 5240-5243, 5245, 5247-5250, 9853 (2010). Census data for each year was extracted from Social Explorer (2012). Data were generated based on secondary analysis of decennial U.S. Census in 1950, 1980, and 2010. However, in 2010, 5-year estimates from the American Community Survey were used to generate data on income, education, and employment, as the 2010 Census did not include these variables. Due to changes in census tract boundaries over time, reported data should not be considered counts, but mere estimates to approximate overall community composition.

major demographic changes in the population over the last 60 years. Similar to patterns seen throughout Detroit, the population of the Southwest Detroit region decreased by approximately 40% between 1950 and 1980 and, of those who remained, by another 60% between 1980 and 2010 with approximately 46,050 remaining residents today. The population of Delray decreased by approximately 70% between 1950 and 1980 and, of those who remained, by another 60% between 1980 and 2010, with approximately 2,780 remaining residents. In Delray, 57% of these residents are persons of color. Among residents, 43% have less than a high school education, and the median household income is approximately $26,000 annually. For those in the civilian workforce, 31% are unemployed. Today, about 1,200 households exist in Delray, and at least one quarter are vacant.

Illustrated by these demographic shifts, Detroit has been dubbed a 'shrinking' city, a term referring to its post-industrial economic decline and related population loss (Dewar & Thomas, 2012; Beauregard, 2009). During the NITC deliberation, a complex planning discourse across Detroit has been underway with implications for Delray residents. In early 2010, a 'right-sizing' debate emerged over how to spread limited resources and services to residents across the city's 139 square miles, where occupied neighborhoods are increasingly interspersed with vacant parcels or blocks (Foley, 2010; Glaeser, 2010). Mayor Bing explained, "There are tough decisions that are going to have to be made. There will be winners and losers, but in the end we've got to do what's right for the city's future (Oosting, 2010)." Later that year, Bing announced the Detroit Works Project, a visioning process that entailed extensive data collection including community input and technical policy audits. In early 2013, the city announced the product of this process, the Detroit Future City's Strategic Framework, with recommendations for 'strategic renewal.' The Framework assigned a variety of typologies to describe regions of

the city and their recommendations, labeling Delray as 'highly vacant' with 'industrial land use strength,' and a 'global trade/industrial' employment district, while declaring its 50-year land use strategy as 'general industry' (DWP, 2012). Thus, the NITC deliberation exists in this context, where community members and leaders in Delray must engage in citywide, statewide, and international planning visions for their ever-changing neighborhood.

Historical Land Use

Delray and the greater Southwest Detroit region, following national trends, became increasingly industrialized in the twentieth century with the building of many facilities and transportation corridors (mapped in Figure 4.1), which remain today. Zug Island is an iconic feature of the community, a manmade island sitting in the Rouge River that borders Delray but is technically within the boundaries of the City of River Rouge. Zug Island was first home to Detroit Iron Works in 1901, and now many companies own facilities there, including United States Steel's mill, EES Coke LLC's coke (a derivative of coal processing) storage facility, and Delray Connecting Railway's railroad. In 1929, the Michigan Central Railroad completed construction of the Ambassador Bridge, an international border crossing located in the Southwest Detroit neighborhood of Hubbard-Richard, of which is often referred to as 'Mexicantown.' In 1930, the Aurora Gasoline Company was built on the Rouge River, now operated by the Marathon Petroleum Company as the only refinery in the state. At the beginning of the following decade, in 1940, the Detroit Wastewater Treatment Plant opened on West Jefferson Avenue, expanding in 1957. It now serves 35% of Michigan's population. A transportation network accompanies this industry. In the 1950's and 1960's, the MDOT built I-75, a major freight thoroughfare from Ontario in Canada to Florida in the United States, which was continuously expanded through downtown to northern suburbs. Today, I-75 passes through Southwest Detroit

at the Ambassador Bridge heading south towards Ohio. With multiple transportation-related and industrial air pollution sources, Wayne County is in non-attainment of EPA's standards for annual and 24-hour PM 2.5 (EPA, 2012) today, and the farthest Southwest pocket of Detroit, 48217, has gained notoriety as Michigan's most polluted zip code (Lam, 2010).

Southwest Detroit and Delray are also home to many historical, social, and cultural resources, as summarized in the NITC's environmental assessment documents and highlighted by residents. Residents repeatedly referred to Fort Wayne, a military site completed in 1851 to fortify America against British invasion, describing how a new bridge would enable renovations and tourism at the historical site— "Fort Wayne will become the jewel it is supposed to be." Although, never used for battle, the U.S. military used the fort until 1948 before it became property of the City of Detroit and deemed a National Historic Place in 1971. As reported by the FEIS, there are three "principal" places of worship in Delray: First Latin American Baptist Church, Jehovah Jireh Temple, and Holy Cross Hungarian Catholic Church. Several other churches have hosted NITC-related meetings, primarily the New Day Church of Deliverance in Delray, which is in the footprint of the proposed bridge, and the Most Holy Redeemer in Southwest Detroit's West Vernor-Junction District. No public schools remain in the boundaries of the Delray community with Southwestern High School the last to close at the end of the 2011-2012 school year. As noted in the NITC's FEIS, Latino Family Services, People's Community Services (PCS), and Community Health and Social Services Center provide health and social services in Delray and the greater Southwest Detroit Region. The Delray Recreation Center, located at the base of the Detroit Wastewater Treatment Plant and operated by PCS, is an enduring fixture in the neighborhood.

Living in Southwest Detroit

During interviews, community members offered detailed accounts of their experiences living in Delray or the greater Southwest Detroit region. Often unprompted, these descriptions were threaded through answers to structured questions about NITC-related public participation and environmental assessment. Interviewees described circumstances of "benign neglect" and "empty promises," which have reduced confidence or engagement in local decision-making processes for some. These discussions were also often coupled with descriptions of active community organizing to counter these negative experiences.

Benign Neglect

Many describe Delray as a neglected community. The district's state representative, Rashida Tlaib, called it, "a sector of the city that has been neglected for years" (Guyette, 2012). Many residents attributed this neglect to the city's disinvestment, explaining how "Delray deliberately was permitted to fall under neglect," and "…basically, they demolish a community by neglecting it." One resident elaborated on how this neglect happened in relation to the NITC deliberation, "…the lack of policing in the community, the safety issues faced…that's the whole disinvestment thing that's been going on that's been accelerated since this project has been going on." Outside of the community, some decision-makers shared similar descriptions, such as one policy analyst who recounted Delray's transformation from a "mostly residential" and "thriving Hungarian community" to a place he struggled to describe, "Delray is a…how do I say this…is uniquely downtrodden. You know, they have been…the community is…I think, some of the community folks said it basically suffered from benign neglect for decades." Interviewees described this neglect as a long-term process, leading some to leave Delray and those remaining to deal with blight and shrinking municipal resources.

Empty Promises

Some residents and community leaders narrated histories of past projects, grants, or developments that were going to "save Delray" and the negative impact these failed projects have had on public participation in current or emergent deliberations, such as the NITC. One resident of over 50 years described several community development proposals in his own words: "Coppertown" in the late 1980's, the "Standard Federal Project" in the early 1990's, and the "Atlas Project" in the late 1990's, among others. He explained:

> …and one of the things that hurt the participation in this community is in 1994 there was a project called the Standard Federal Project, and they were going to build 400 single family homes in the neighborhood. The City bought into it. The City was going to put in a golf course on the Copper Revere property and then—and that was during the Archer administration—and we had a meeting at one of the local churches for that particular thing and there were like 200 people there. And, today, it's tough to get 200 people to come to a meeting…Then in 1998, I believe it was, the Atlas Project came here and, again, it was another project that was going to revitalize the neighborhood that never took place. And then there was the one with Bob Carmack that was being instigated by the West Jefferson Citizens District Council. And that was supposed to be for new housing in Delray, which never materialized. And then there was a project in 1988, I believe it was, called Coppertown, which I was involved in and that was through the ERC, through the Environmental Relations Committee. That was in '88, I believe. They were going to take over Revere Copper property to build a commercial district with housing on the Copper Revere property. They were going to bring one of the old naval ships here, like a carrier or a naval warship, to put a museum on the river in a boat slip, but that never materialized. So this community has been promised a lot but nothing has ever materialized. So it's understandable, you know, that when this project came up, the attitude was, "Ah, here we go again!" You know, it's the same old, same old. And, we hear that today when people—usually when I'm standing at the door with the MDOT meetings or the CBC [Community Benefits Coalition] community meetings people walk by me and say "Same shit, different day." And, you know, that's the attitude they have, you know, because it's just been—that's just the way it has been.

Others echoed versions of this "save Delray" story. A longtime, trusted non-profit leader expressed the potential psychological impacts of failed project proposals, "Because people have been promised so much. They've convened so much. They've been studied so much. And, they're so sick of it. It's really hard for them to just live their daily lives. I really want that to end

for them…the empty promises and delays that are hurting them so much." In Delray, residents are subject to chronic uncertainty about the future of their neighborhood, home, and, as a result, their economic stability and health.

"Which whale are we going to save today?"

Residents of Delray and greater Southwest Detroit also described their collective commitment to celebrating and protecting their community in the face of many concurrent social and economic challenges. Over the course of a year, there are hundreds of meetings to discuss planning for events, including parades, festivals, annual Cinco De Mayo and Day of the Dead celebrations, as well as many meetings to address concerning environmental or social issues. As one lifelong Delray resident explained, "We've got meetings. In this area, we have people that hold more meetings than anywhere. I can take my book out and show you meetings after meetings after meetings." A local business owner explained the need for such meetings, "And, think if there weren't [meetings]. My gosh, people would just run over Southwest Detroit." One resident of Hubbard-Richard, a Southwest Detroit neighborhood at the base of the Ambassador Bridge, explained the various community initiatives she has participated in over the last several decades—from saving the local Clark Park from closure to keeping various schools open, from protesting truck traffic on residential roads to landscaping abandoned, vacant, or vandalized lots. She says that she wakes up each day and asks, "Which whale are we going to save today?" Like this resident, many residents offer substantial amounts of their time, energy, and expertise to address the overwhelming nature of their community's challenges.

The NITC Deliberation: An Overview

Timeline of Institutional Processes

Figure 4.2 depicts the sequence of institutional events that comprise the NITC

deliberation thus far, from 2002 to the present as it continues. There is no exact start date to the deliberation, but 2002 marks the year when MDOT initiated a feasibility study to assess project need. In 2003, many private companies proposed sites for new international crossings. In 2005, MDOT formally began a scoping process, narrowing to Delray and the surrounding Southwest Detroit region. In 2010, Canadian officials announced they would provide $550 million towards building a second bridge border crossing. In 2011, Governor Richard Snyder was elected in Michigan and announced in his first 'State of the State' address that building the NITC would be a priority for his administration. Over this decade, key events included the proposal of various state bills, release of environmental assessment documents in 2008, and announcement of the U.S.-Canada inter-local agreement that approved development in 2012.

Key Players

NITC-related media coverage is extensive, largely tracked on a website called *Build the DRIC Now*. Much of it has focused on key players and their opinions regarding various aspects of the deliberation—*Should a bridge be built? Who should build it? Where and when should it be built? Who should pay for it?* (Gallagher, 2012; Egan & Gallagher, 2012; Spangler & Yung, 2012; Doelen, 2011; Holmes-Greeley, 2011). Many stakeholders have openly supported the development, including a coalition of over 160 individuals and organizations such as the U.S. Chamber of Commerce, the Ontario Trucking Association, the 'Big Three' (Ford Motor Company, General Motors, and Chrysler), and the Southwest Detroit Community Benefits Coalition (CBC), all signing a statement of support coordinated by Governor Snyder's office.

Manuel 'Matty' Moroun, owner of the Ambassador Bridge, has been the most notable opponent of the public NITC project. Moroun owns the Detroit International Bridge Company and is CEO of Centra Inc., a transportation logistics and trucking company based in Southwest

Detroit. Moroun engaged in many litigious exchanges with the state government prior to and concurrent with the NITC deliberation. This included an overnight jail sentence for repeatedly failing to comply with a 2004 MDOT contract to complete the 'Gateway Project,' updates to the I-75 and I-96 interchange. MDOT eventually oversaw the project's construction, which was intended to reduce traffic and redirect freight trucks directly onto highways, rather than via residential streets in Southwest Detroit (Gallagher and Helms, 2012). Moroun also proposed building a twin span to his existing Ambassador Bridge but was denied a permit in 2010 by the U.S. Coast Guard (Brayton, 2010). In 2012, Moroun paid an estimated $34 million to propose and advocate for Proposition 6, which would have required that Michigan lawmakers amend the State Constitution to require a statewide vote for any new border crossing (MI Proposal 12-6, 2012). The media declared Proposition 6 an attempt to stop the NITC (Lessenberry, 2012).

Of those interviewed, community members and leaders overwhelmingly preferred the publicly built NITC to Moroun's proposed second private bridge. Many expressed concerns that Moroun had not historically been a good neighbor. Others felt that such an economically significant international border crossing should not be privately owned, fearing the unforeseen political implications of Moroun's expansion. As one Delray resident explained, "Will I have a chance to speak to Mr. Moroun? No. Will I have a chance to speak to MDOT? My taxes pay their salary, so yes." Another resident similarly expressed this argument, "You know, if it's privately owned, what can you do? If not privately owned, guess what? The people have more say-so. So, if we're going to be shut down like this, let's have a voice in it." Many residents expressed concerns about the ability of the public to participate in decisions regarding the bridge, a major land development with substantial implications for the health of local residents, if it were privately versus publicly owned.

In Delray, the CBC formed in 2008 in response to bridge proposals, as "a community-initiated organization with an elected community board that has been working on behalf of hundreds of residents and other community stakeholders to identify the community's needs for mutually beneficial development in exchange for hosting the NITC project" (Southwest Detroit CBC, n.d.). This group has engaged in the NITC deliberation in many ways, participating in MDOT meetings, holding regular community meetings, conducting outreach to residents about NITC events, submitting comments on the NITC's DEIS, and obtaining grants from the W.K. Kellogg and the Erb Foundation to support their community organizing efforts. Figure 4.3 shows a postcard disseminated by the CBC, highlighting key advocacy messages to potential members: jobs for residents, neighborhood improvements, health protections, and trucks off of residential streets, among others. As the CBC's elected president explained, "Our tactic has really been—we support this bridge, but with benefits. We've stuck with that campaign, not the usual, 'Heck no! It's not coming here!' " Similarly, a community leader defended why this approach was particularly appropriate for Delray, as a residential neighborhood experiencing disinvestment and cumulative industrial sources of pollution, "Saying 'no' is promoting the status quo. The reality is, often times, working with the government instead of ignoring the problem, we can actually begin to address some of the problems." Further, many members of the CBC see that this message fits into a larger dialogue about freight transport in the U.S.:

> We have the busiest North American trade corridor. I mean, people are like, wow, that is great to host that. And, you think jobs must be flowing off of this bridge. It's not. It's bypassing us [host community residents]. It's like bye-bye trade, bye-bye bridge, just leave the crap and the pollution behind and the jacked up streets…that's all they leave behind.

The CBC's strategy is to coexist with the NITC, trying to assure that some of the bridge's benefits (e.g., jobs) are available to Southwest Detroit's residents, while simultaneously they are

working to reduce the adverse effects of the bridge (e.g., increased truck traffic, air pollution, and displacement).

Some residents expressed concern with the approach taken by the CBC, but no other community-led group has organized to express a counter message or strategies. As one community leader explained her view, “Come on now. You know, community benefits agreement says we’re going to build new homes. So what that says to me is that you can put gift wrapping on shit, I guess somebody will like it.” Specifically, while the majority of residents in Delray appear to support the CBC’s ‘bridge with benefits’ message, some throughout the greater Detroit region do not, generally feeling uncomfortable about people living near existing industry and the pending additional transportation infrastructure given the potential health implications.

Proposed Laws Related to the NITC

Over the course of the NITC deliberation, Michigan legislators proposed many related bills that did not pass—many which would have supported public participation and public health through a ‘community benefits’ approach. In 2005, working with Delray residents, then-Representative Steve Tobocman proposed House Bill 4967 to create a Michigan Border Development and Protection Authority to oversee development of a new border crossing. In 2010, Senator Samuel Thomas proposed Senate Bill 1395, Senator Hansen Clark proposed Senate Bill 1417, Representative Coleman Young Jr. proposed House Bill 6155, and Representative Rashida Tlaib proposed House Bill 6128. Each of these required a version of community benefits agreement or compensation to residents to address the NITC’s local impacts. For instance, House Bill 6128 read:

> Transportation to give advice and support to "community representatives" in negotiating "community benefit agreements" with the public-private partnership authorized to build a new DRIC bridge project. The dollar amount would have to be

> comparable to similar payout agreements on other large infrastructure projects around the country.

None of these bills passed into law. According to interviewees, some legislators supported a private bridge and were hesitant to support community benefits as implicit support for the public NITC. Some legislators were wary of setting precedents for community benefits agreements (CBAs) in the state. Others voted 'no,' reacting to public debates about the definition of community benefits. Commissioning a public opinion survey, the Detroit International Bridge Company mischaracterized the CBC's requests for local hiring, reduced truck traffic on residential roads, and pollution mitigation strategies as demands for lavish packages including swimming pools and golf courses (Egan & Gallagher, 2012). Thus, for many political reasons, state-level policy attempts to address Delray's concerns through a CBA were unsuccessful.

In 2011, with Governor Snyder eager to approve the NITC, legislators sponsored additional bills to authorize the governance and building of the international bridge. In January 2011, Senator Hoon-Yung Hopgood introduced Senate Bill 0066 to establish a Multinational Bridge Authority, which stopped in committee. In June 2011, Senator Randy Richardville introduced Senate Bills 410 and 411 in the Economic Development Committee. These bills, which did not pass after eight heavily deliberated public sessions, would have created the 'New International Trade Crossing Act' to authorize the building of the bridge. The CBC sent representatives to nearly all of these public sessions, calling on residents and public health experts to testify on behalf of the Delray community and advocating for community benefits language in the bills. Yet, no formal state legislation passed to authorize the bridge and, thus, community benefits were not legally secured.

Public Participation in the NITC Deliberation

Over more than a decade, the public has participated in the NITC deliberation in countless ways and continues to do so. In the following sections, I describe what public participation looks like in the context of the NITC, including institutionally- and community-driven activities and the barriers, catalysts, and evaluation of these approaches.

Institutionally-Driven Participation

Between 2000 and 2012,[16] government agency staff, elected officials, and consultants solicited public participation in-person in four primary ways in over 140 forums: legislative hearings, general local meetings, topic-specific workshops, and a local advisory council (LAC). Between 2006 and 2010, there were approximately 20 legislative hearings with hundreds of public testimonies in front of various state and house subcommittees to discuss aforementioned bills, appropriations, or specific data (e.g., presentations on traffic projections). Between April 2005 and October 2008, MDOT held approximately 25 meetings, primarily in Southwest Detroit, to update community members and present specific details of the proposals (e.g., the drilling plans or interchange designs). Between December 2005 and December 2007, MDOT coordinated a series of 18 workshops, inviting the public to, "provide their thoughts on the 'look and fit' of the proposed river crossing in the context of its surroundings" (MDOT, 2007). Meeting approximately 70 times between March 2005 and May 2011, the LAC[17] consisted of 59

[16] While Governor Snyder continues to work with legislators, MDOT, and other local and federal agencies to move the NITC forward, MDOT stopped soliciting public participation in 2011 as described in the minutes of the May 25, 2011 LAC meeting:

> ...in order to fulfill the spirit of boilerplate language contained within Section 384 of Public Act 192 of 2010, MDOT has chosen to suspend activities for the NITC Project as of May 31, 2011, until such time as legislation allowing the project to move forward is signed into law. This suspension will include MDOT participation at future LAC meetings until further notice.

[17] According to MDOT (2003), a LAC is, "a representative form of public involvement that relies on delegates who bring the ideas and concerns of their respective groups to the table for discussion, and in turn communicate those discussions back to their groups." Representatives from organizations could request to participate by completing a form that also outlined "roles and responsibilities" of LAC members, including:

organizations and representatives invited to attend monthly meetings. While the deliberation continued beyond 2012, legislators halted related appropriations, preventing MDOT from holding ongoing NITC-related meetings with the public.

In addition to oral comments during these events, agencies and consultants solicited written comments throughout the deliberation. Primarily, they invited the public to comment on DEIS documents under National Environmental Policy Act (NEPA). For the NITC, this occurred between February 15, 2008 and May 29, 2008, including a 30-day extension. Also, between July 11 and August 9, 2012, the U.S. State Department asked the public to comment on the NITC before they granted a Presidential Permit in April 2013 required to begin construction.

Community-Driven Public Participation

When asked how they participate in decision-making related to the NITC, community members and leaders responded more frequently by describing community organizing strategies rather than the aforementioned institutionally-led opportunities. Some community-driven strategies were associated with these institutionally-led opportunities, however, such as collecting public comments on the DEIS. Yet, community leaders independently organized many activities, such as protests or truck counts. The list of activities that community members and leaders initiated was diverse and long: starting organizations to participate in transportation deliberations (e.g., the CBC); contacting and coordinating transportation to support residents' attendance at NITC-related meetings; flyering the neighborhood regarding community meetings;

- Provide an independent perspective to the project.
- Review and evaluate draft documents and reports consistent with the project schedule. This will be accomplished by participating in public meetings, Context Sensitive Design workshops, etc.
- Help provide two-way communications with a variety of interests regarding the project, including affected communities, residents, individual legislators, community leaders and interest groups.
- Provide accurate input to MDOT and the communities on key issues of the project.
- Provide feedback on public meeting format and the content that will shape the community's understanding of the project, as the LAC members have a better understanding of the diversity of ethnic groups in the area

sending “email blasts” with updates and event information; establishing a related Facebook page and blog to distribute messages through social media; meeting with key leaders in Canadian and U.S. local and federal government; coordinating ‘call-in’ days, encouraging residents and allies to call legislators prior to a key decision or vote; collectively preparing talking points for community leaders and representatives; contacting journalists to address misinformation and share community perspectives; writing letters-to-the-editor; holding protests to counter those in opposition to a ‘bridge with benefits’; researching organizing strategies by residents engaged in similar freight transportation deliberations across the U.S.; collaborating to draft comments on environmental assessment documents, permits, and proposed bills; coordinating residents and public health experts to testify at legislative hearings; inviting legislators to participate in windshield tours in Delray promoting a “visit before you vote” message; leading or participating in research (e.g., truck traffic counts, air quality monitoring); educating other residents and decision-makers through multiple forums; and participating in agency-led meetings, workshops, and the LAC.

Catalysts

In discussing the ways that MDOT project leaders and consultants solicited public participation in the NITC deliberation, community members and leaders and decision-makers described three distinct catalysts facilitating their participation: development of long-term relationships across transportation projects, extensive information sharing, and accessibility of agency staff. Described both positively and negatively, long-term relationships between residents and state agencies developed over the course of former projects, such as the Detroit Intermodal Freight Terminal (DIFT),[18] and carried forward into the NITC project. A lifelong resident related

[18] Many interviewees referenced transportation deliberations they were involved with that preceded the NITC, particularly the Detroit Intermodal Rail yard (DIFT). The DIFT is a planned expansion (from 300 to 450 acres) of an

processes across the DIFT and NITC, "MDOT had shut part of the community out [in the DIFT process]…it was like talking behind closed doors about putting this 900 square mile yard in our community. And, so I think they had learned from that and were being more proactive [about the NITC deliberations]…" Lead consultants and local community leaders who worked on both projects similarly noted how experiences in the DIFT informed how the consultants, community, and agency leaders approached the NITC deliberation.

Public participants also found the extensive information sharing in the NITC process useful as they worked to have a role in decision-making. MDOT and consultants coordinated charrettes,[19] general question and answer sessions on specific topics, one-on-one meetings to discuss pending real estate issues, and field trips to see examples of design options, including bus and boat trips for LAC members to see bridges in Toledo, Ohio and Port Huron, Michigan. One resident who was, in general, candidly displeased with the NITC's deliberative processes and outcomes, when asked what went well, stressed, "They [MDOT] *did* educate people." As echoed by many interviewees and seen on the NITC's study website, MDOT provided LAC members, as organizational representatives engaged in regular meetings, extensive data, examples, and materials to answer their questions.

Finally, to facilitate public participation in institutional processes, residents discussed the importance of being able to access and speak with project staff, both in meetings and through other opportunities. Residents described extremely accessible MDOT staff, as a LAC member noted:

---

intermodal rail yard planned for Southwest Detroit between Wyoming and Livernois, south of Interstate 94. Intermodal facilities are intended for transferring goods from one type of transportation to another, such as trucks to trains. Deliberation related to the DIFT began in the mid-1990's lasting until the Record of Decision was released in 2010 (Shreck, 2010).

[19] Charrettes are an interactive planning approach where consultants or planners engage multiple involved parties in a visioning process to design a development or address a complex planning problem (NCI, n.d.). Charrettes can take many forms and are thought to be an approach that generates alternative and creative solutions to planning issues by engaging diverse viewpoints.

> Most projects, the availability of the—I guess you would call it the engineering people that go about planning these projects— it's limited to community meetings. But, I could call Mohammed who is a project manager. I could call him at 11 o'clock at night, and he would answer.

Delray residents repeated this in multiple comments, such as these: "I will say one thing for MDOT over other projects that have come here. They made themselves totally accessible to the community," "So the community sometimes—many times—they are shut down. I didn't find that with MDOT," and, "I think people in the community had developed some really good relationships with MDOT staff. The approach was inclusive, and it was genuine. I can't say that all project directors follow that format." Again, community members and leaders who were engaged with the DIFT process noted increased accessibility and transparency during the NITC process.

In the context of community-driven organizing processes, community members and leaders and decision-makers also described catalysts that assisted residents' efforts to participate in the NITC deliberation. In particular, three such themes appeared: the emergence or identification of key community organizing leaders, ongoing efforts to "be information gatherers," and the CBC's effort to "control their message" to the community, the media, and decision-makers. An active CBC member explained the significance of key leaders and non-profits:

> They knew how to reach out to foundations to get money. We don't know anything about that. Then having the Center [People's Community Services]. That gave us a place that we could go. And, then, with them pulling their knowledge to come in and show us, 'You can do this.' All that really, really was the foundation. But, that, that was key to me, that we had that initial support from them.

Interviewees, including decision-makers, regularly identified a shortlist of key community leaders. This list often included CBC board members, non-profit staff representing environmental and social service organizations, and past and present state representatives,

particularly Steve Tobocman (State Representative 2002-2008) and Rashida Tlaib (State Representative 2008-present). In the context of NITC, these key leaders proved instrumental in providing basic resources (e.g., meeting space, transportation), identifying advocacy strategies, translating environmental documents from technical to common language, and connecting residents to funders and decision-makers.

During the NITC deliberation, information gathering has been crucial for community members and leaders. They described information diverse gathering activities, such as conducting truck counts to learn traffic patterns, speaking with researchers to understand various studies on air pollution and health inequities, going to Southern California to learn about the Clean Trucks Program at the Ports of Long Beach and Los Angeles, contacting experts from Los Angeles Alliance for a New Economy to learn about their efforts supporting workers' rights and occupational health at these ports (LAANE, 2009), and going to Washington D.C. to network with Partnerships for Working Families and hear from "clergy, labor, and community folks," about successful CBAs. The LAC was also an opportunity from 2005 to 2011 for community leaders to collect expert information for the residents and deliver local information to NITC project staff. As a community entity, the CBC served to transfer massive amounts of information to residents, as a former CBC president explained her learning process:

> So, for the first year and a half or so when we had the CBC, I was there at the meetings and I listened, but I learned. I didn't talk a lot. I had questions. But, a lot of time, in my experience, if you just sit back and listen, somebody will probably ask the question that you had or they are going to address it anyways. I don't have to hear myself talk. So, I learned. And, I learned a lot so that by the time I did start to speak up on things and they asked me to. You know, "Can we hear you speak on such a such..." It's because I had sat there for years not speaking. I needed to learn the process I was supporting. I needed to learn information instead of getting up there and sounding like a bumbling idiot.

Enabling them to substantively contribute to the deliberation, these opportunities armed community members and leaders as experts on a diverse range of topics from air pollution control technology to traffic projections, from federal freight policies to eminent domain procedures. As they explained, the process of collecting diverse forms of information allowed them to understand the deliberation process, determine ideal timing for advocacy activities, respond to comments or decision-makers in an informed manner, educate residents or decision-makers, gain credibility, and generate potential alternatives, risk management strategies, or solutions to issues posed during the deliberation.

Finally, "controlling the message," which often requires the assistance of key leaders and preliminary information gathering, facilitated the public's participation in the NITC deliberation in influential ways. As articulated by a resident, "The greater that a community is informed and/or educated, the greater the community is in control of their own voice. As long as someone else is talking for them, it's going to be what that person said." A community leader reiterated that, "When the actual residents speak, it's so much more powerful…I think the power of controlling our destiny and how transportation project happens is really being able to control the message." To illustrate this power, she described a protest that blocked traffic at the Ambassador Bridge (Wilhelm, 2011) (which—in convergence with the Occupy Wall Street movement—may have sparked similar protests in Southern California (Sarr, 2011)). Residents also described resources for "controlling the message" such as media trainings that were conducted to prepare CBC members for their interactions with journalists and legislators.

Barriers

Community members and leaders and decision-makers reported an extensive list of barriers to public participation processes led by government staff or project consultants,

summarized with examples in the exact words of interviewees in Table 4.2. In summary, barriers include: insufficient time or outreach for public processes, uncertainty underlying 5-10 year decision-making processes, difficulty gaining access to influential legislators, confusion on who has decision-making authority, lack of support or investment by local government, few (if any) precedents set for community involvement in infrastructure governance, onus on residents to work across sectors and agencies (e.g., housing, transportation, health, environment) to address concerns, inherent political nature of infrastructure decisions, and difficulty understanding technical information (e.g., EIS documents).

Of these institutional barriers, the inherent political nature of the NITC deliberation was most frequently described over a diverse range of interviewees. Many descriptions about the political challenges and misinformation circled back to both facts and rumors about Moroun and the Detroit International Bridge Company. This entailed descriptions of revolving doors (i.e., former politicians or consultants joining Moroun's staff or vice versa), politicians labeled as "[Ambassador] Bridge people" who may have received payoffs to vote in support of Moroun's private interests, descriptions of misleading advertisements about the proposed public bridge, false eviction notices posted throughout Delray and nearby neighborhoods, and the hiring of people to misrepresent the community in protests, comments, or testimonies against the NITC at different phases. These efforts often countered the CBC's 'bridge with benefits' message, confusing or swaying decision-makers to prioritize Moroun's private interests.

Community members and leaders also commonly explained that, because transportation deliberations are rooted in local social, political, and economic context, they struggled to identify clear models, strategies, or precedents for negotiating community benefits. For example, community leaders turned to those in Southern California for advice given their success

advocating for environmental programs at their ports. Yet, in many ways, the ports were too different to draw lessons from because their community organizers: 1) worked within a very different set of state environmental laws, as ports must comply with the California Environmental Quality Act which adds additional environmental assessment and public engagement requirements to the NEPA process (CA Governor's Office of Planning and Research, n.d.); 2) could access publically available revenue for mitigation from the ports, which collect billions annually in landlord fees from international shipping companies (POLB, 2012); 3) were able to partner with an active local branch of the International Longshore and Warehouse Union, in contrast to Detroit's unions which—once strong—have weakened (Victor, 2012); and 4) could not model how to collaborate with the Canadian government at a land border crossing.

Further, the NITC's ever-changing, never-ending context made it difficult for community members and leaders to stay informed, organize next advocacy steps, communicate a consistent message, and plan for the future of their own family and residence. Initial documents related to project need and feasibility implied that a bridge's construction would be underway by 2008. This date came and went without project approval from the state or federal government. In summer of 2007, MDOT held real estate meetings with property owners in the DRIC study area to discuss options in the event their land would be needed for construction of the NITC. As noted above, in 2011, legislators put forth Senate Bills 410 and 411 but failed to approve the development of the bridge. After this, Governor Snyder explained that "he was looking at all kinds of options," and "the bridge idea is not going to die" (Gongwer, 2011) before announcing its approval under an inter-local agreement in July 2012. As a CBC leader explained, this long-term process required the community to stay politically savvy, reeducating changing leadership:

> We know that it's going to change throughout this process because, you know, we expected a vote last year. And, then it didn't come to a vote. Well, strategy change.

> You gotta know your senators and representatives all over again. When there's a change in guards, we've got to educate them all over again.

One community leader in Southwest Detroit who has spent 10 years working on this issue expressed guilt related to the decision to step away from the CBC when so much remained unfinished, "These things don't happen in a year or two. They happen in five or ten or fifteen years. You know, I always feel bad that I only spent a decade of my life working on this." The continuously growing timeline and changing process complicates community response and generates insecurity for residents who must wait more than a decade for an outcome.

With ever-changing political context, the CBC and other residents refined their message to decision-makers over time accordingly. The CBC welcomed a bridge development but only if it came with community benefits. Without a full commitment that a bridge would be built or if community benefits would be integrated into the final contract, plan, or policy that governed its construction, the CBC waited to describe specific the benefits and costs they requested. One CBC member explained how some decision-makers did not understand the duality in the CBC's coexistence message:

> They say, "We're hearing two different stories. Do you want the bridge or not?" Well, of course we do. We don't want to get pushed over, though. What's so hard to understand that?! Come ON! You're intelligent people. We don't want the people around here suffering the consequences here....We're simple people, you know. Not simple minded. Simple in what we're trying to say. Things change. Nothing stays the same.

The CBC's messages, in turn, led to confusion or frustration among some of the legislators, as one state representative's Chief of Staff wanted to know the price of community benefits, "What are we are talking about, a hundred million?" He indicated that fellow lawmakers did not trust this continually changing approach, feeling that, "when a few of the people are withholding

information or being less than, you know, forthcoming about their intentions, people tend to believe the worst." With few examples of CBAs to share across the nation, the CBC's message was, at times, mistrusted, misunderstood, or simply dismissed by some decision-makers.

In addition to the challenges posed during institutional processes for public participants, many other community or individual barriers emerged for those organizing around the NITC. Table 4.3 summarizes key barriers with examples from the exact words of residents, which included: competing priorities among residents and allies, minimal economic resources to organize, hard-to-reach populations, language barriers, barriers related to immigration status, difficulty building consensus around a key message, and difficulty or failure to include communities along the entire transportation and industrial corridors.

Residents highlighted characteristics of Delray's population that contributed to particular challenges related to public participation, such as little or no access to transportation and inconsistent access to a working telephone. Residents described ways immigration status posed a barrier, stopping many Hispanic families in Delray and the greater Southwest Detroit community from getting involved in public events in fear of interactions with U.S. Immigration and Customs Enforcement agents at schools, churches, or community centers where meetings were held. Language barriers also persisted, although, to address these MDOT published summary reports of the DEIS and FEIS in Spanish and press releases in Spanish and Arabic. CBC events have translators. Competing priorities, such as other 'whale' issues or day-to-day family and work obligations, prevented some community members from staying consistently involved for the course of the deliberation for a bridge which remains unbuilt after over 10 years of discussion.

Evaluating Public Participation

I also asked interviewees how institutional processes for public participation were or could be evaluated, as well as what they thought "successful public participation" looked like. Few were quick to respond, and many simply responded, "That's a good question," or "I don't know." Many community members and leaders noted how goals and measures of success for development deliberations, such as the NITC, are unclear. Further, a local business owner suggested how goals and measures might vary among stakeholders, and he inquired:

> Well, I think they did do their job——but was the job properly defined? You know, their job is to show that they've got everybody aware of what they're doing, that they're completely transparent and not showing favoritism to anything. It's an open process, but is that really the job of MDOT? Or, is it making the most efficient use of resources to make the most effective transportation system possible delivered, protecting communities and the people that are impacted? Did they do what they said they would do? Yes. They had a hell of a lot of meetings. Did it make a difference? Could there have been 50 meetings? I think so.

A long-time Southwest Detroit resident and community organizer expressed that successful participation means identifying measures that sufficiently assess how well community concerns are addressed, "I don't know how they say, 'We're doing enough.' It's pretty clear they're not. So, yeah, if there were standards, benchmarks, something…some guarantee." From the perspective of community members and leaders, it was generally unclear if and how decision-makers thought about the goals and evaluation of institutional opportunities for public participation.

Assessing and Mitigating the NITC's Environmental Health Risks

Organized in compliance with the NEPA process, community members and leaders participated in the NITC through a sequence of institutionally-led opportunities, beginning with determination of project need and site selection and culminating with preparation of the DEIS and FEIS. In the following sections, I explore the role, experiences, and opinions of community

members and leaders in assessing and addressing the NITC's environmental health risks through this stepwise coordination of the deliberation.

Determining Project Need and Scoping

Starting in 2002, MDOT initially determined the need for a new trade crossing before the official scoping of potential locations with little, if any, public participation. However, discussion of project need continued as legislators and elected officials advocated for approval and financial appropriations to build the NITC, well after environmental clearance was granted with the Record of Decision in 2008. Generally speaking, decision-makers and residents referred to traffic projections, redundancy,[20] the aging state of the current bridge crossing, the less than ideal "steep grade", "low-quality, bumpy surface" of current infrastructure as reported by truckers, and economic and health implications as reasons to support the building of a second bridge. A diversity of interviewees referred to multiple bridges as an emergency preparedness measure in, "God forbid, terrorist attacks…" with several references to "events like 9/11." In particular, decision-makers tended to note financial implications of a second bridge more frequently than community members or leaders. They highlighted the NITC's potential to maintain Michigan as a central trade route, and they described the perceived consequences of a collapsed or destroyed Ambassador Bridge as the region's sole, nearly 85 year-old bridge crossing (e.g., "unemployment will jump to 16 or 20% overnight"). Community members and leaders tended to express a need for more efficient traffic flow and reduced idling from an air pollution perspective:

[20] In the context of the NITC and transportation planning, redundancy has been operationalized with two sub-constructs: system connectivity and network resiliency. System connectivity refers to the existence of alternative pathways if the regular flow of traffic is disrupted, and network resiliency refers to the system's overall ability to handle full capacity in the occurrence of these shifts (Build the DRIC, 2010).

> People outside don't see what we see. The trucks lined up all the way to the overpass. They don't see the smoke. They don't see the people with asthma. Then they say, "Why do you want another bridge?" And again, I say, "Do you want a cigarette in your face or do you want the smoker to keep moving?"

From the beginning of the NITC deliberation through today's ongoing discourse, the goals and concerns of community members and leaders are related but often distinctive from those of decision-makers.

Many community members and leaders questioned underlying traffic projections as justification for building the NITC. "If we get 10,000 trucks a day now, you don't think in 20 years from now it's not going to double?" said one resident, while another argued the contrary, "...we objected to some of the studies that projected an increase in truck traffic which we felt was not realistic. And then, voila, we have this recession and the truck traffic has decreased." Adding to this dialogue, a state representative's policy advisor questioned the validity of such projections:

> There was an elusive traffic study last year that never seemed to materialize. MDOT had it. They didn't want to share it with the legislature because they knew it would get released over to the Ambassador Bridge folks, and it was kind of sensitive information. So we had MDOT telling us that the traffic projections were strong. We had the Ambassador Bridge Company telling us our traffic is down— it has been down since 9/11 and so, therefore, you can't justify this just based on the traffic issue. Now, the one thing that I will say is that I do agree with the Ambassador Bridge folks on is that traffic projections are just that—they are projections. So, if advocates for the bridge are paying for the traffic study, they are going to get the results that they want.

Some interviewees also expressed concern that projections may be further unreliable, as delays from the incomplete Gateway Project might have created the appearance of high traffic levels. For those involved, underlying politics may have clouded study of traffic patterns and resultant projections that may be instrumental in justifying a freight development.

Before decision-makers selected the type and location of the NITC crossing, they considered many proposals and sites. A July 2003 article in *Crain's Business Detroit* described five early proposals: 1) the South Crossing by the Bridge Project Association located in Wyandotte, 2) the Central Crossing by the Mich-Can International Bridge Company over Zug Island through Riverview, 3) the Twin Span by the Detroit International Bridge Company and Canadian Transit Company immediately south of the existing Ambassador Bridge, 4) the Truck Tunnel by the Canadian Pacific Railway and Borealis Transportation Infrastructure using the existing rail tunnel and building another, and 5) the East Crossing (not sponsored) proposed to run to or near Belle Isle (Strong, 2003). On August 31, 2005, MDOT held a public scoping meeting to share the proposed alternative sites, describe the environmental assessment process, and take public comments from organizational representatives. On October 4, 2005, Governor Granholm removed Downriver[21] and Belle Isle locations from consideration (Michigan Government, Office of the Governor, 2005), narrowing all potential sites to the area between the Ambassador Bridge and Zug Island. In the DEIS process, MDOT considered 16 site and design alternatives within this span of a few miles, eventually narrowing to the proposed Delray location as presented in the FEIS.

A lead NITC consultant described the institutional scoping process that begins once decision-makers determine need and the Federal Register releases a Federal Notice of Intent that there will be a project:

> And so we looked at the entire border from basically the mouth of the Detroit River north of Belle Isle all the way south to Grosse Ile. And, I forget how many corridors and crossings we had, but it was more than a dozen. You start out with a long, you know, list of potential alternatives and then you just develop some kind of screening criteria because it's not practical to carry them all, you know, through an evaluation

[21] Downriver is a term used to describe a group of 18 suburban towns and cities comprising a region of Wayne County south of Detroit, including Allen Park, Ecourse, Grosse Ile, Lincoln Park, and River Rouge, as mentioned frequently by interviewees.

> process. So we started screening those down into the more practical ones. Sometimes you will expose fatal flaws in an alternative or something that just clearly doesn't meet the need of the project. And, then basically you continue that process of gathering data and evaluating until you get to the very end with one alternative.

During scoping, another NITC consultant explained, agencies minimally seek public involvement, with one major public scoping meeting held, until, "…once we got to a number of practical alternatives, then we started having more the focus of your community. Input shifts, and you are beginning to look for more specifics." To engage the public in narrowing selection among these sites, in 2005, project staff invited the public to prioritize seven evaluation factors. The public (n=826) and MDOT technical staff (n=19) completed the scoring form seen in Figure 4.4, enabling consultants to weight and prioritize criteria for selecting a preferred location, as described in a 'Scoping Information' report (DRIC Partnership Border Study, 2005). Consultants did this by assigning "performance" and "bottom line" scores. The "performance" scores were based on technical data. "Bottom line" scores comprised a composite of weighted evaluation factors. Ranked by MDOT and the public respectively, averaged from one to seven, bottom line factors were: changes to air quality (5,2), protection of community and neighborhood characteristics (2,1), consistency with existing and planned land use (7,4), protection of cultural resources (6,5), protection of the natural environment (3,3), improvement to regional mobility (1,6), and cost and constructionability (4,7) (DRIC Partnership Border Study, n.d.). From the NITC documents, it is unclear who participated in this evaluation as part of site selection and what communities those 826 individuals represented.

Many interviewees highlighted the inevitability of Delray as the selected site based on the community's characteristics. One transportation planner explained, "That property is still contaminated with arsenic so it pretty much can't be used for anything else." Another planner explained, "The river is narrowest and can tie best to 75 and 401 [highways]," a point which a

variety of interviewees repeated. Others speculated that industrial land in Delray is cheaper than other alternative sites. And, a staff member in the Governor's office argued that Delray, given its high proportion of vacant land, is ideal, "It's becoming kind of a desolate area, I think, they said 67 to 70% of places vacated already and just, you know, there's just not much there." Decision-makers speculated a variety of environmental and economic reasons for MDOT's site selection.

In this context of site selection, community members and leaders frequently raised EJ concerns and noted instances where scoping processes generated tense interactions between residents of potential host communities. At a particularly emotionally charged public meeting, one Delray resident explained, "I can just remember vividly this one person from Downriver who was at a meeting and was, you know, yelling or telling the people that lived in Delray that they needed to take personal responsibility to keep this bridge out of his neighborhood." Many residents referenced other communities, such as Grosse Point, Grosse Ile, and Downriver, viewing institutional racism or classism as a factor in selecting Delray. As one woman articulated:

> I call it 'environmental injustice'. Because here you have poor people and people of color who are being harmed. Wyandotte is not going to be harmed, rich white folks. And then you go down to East Village in Detroit. If you can afford a home in Indian Village, you are not poor…So who would be, in terms of population, who could you step on like a cockroach and not get too much of a squeal or squish.

Additionally, in this siting discussion, residents described their ongoing experiences with environmental racism and classism as they "take on 80% of the whole state's pollution" and experience compounding environmental risks such as "…the incinerator, Marathon [refinery], so on and so forth." Many community members and leaders felt these EJ issues were not sufficiently addressed in the scoping process or in the overall NITC deliberation.

<u>The Environmental Impact Statement</u>

The NITC FEIS main document, in its entirety, is over 500 pages across nine main sections (including a 55-page executive summary) and entails hundreds of supplemental pages comprised of 12 appendices, a six-volume engineering report, and a 134-page traffic projection report with its own 4 appendices. This section summarizes how residents and community members use, respond to, describe, and think about the NITC in the context of the DEIS and FEIS texts, their community, and health.

Environmental Health Concerns

MDOT and project consultants analyze and report the NITC's proposed impacts in the 242 pages of the FEIS's *Section 3. What's there now and what are the impacts?* (DRIC Partnership Border Study, 2008), where the word 'health' appears 21 times in various contexts: four times in regards to the NITC's potential role in employee commuting for the health care facilities serving Southwest Detroit, five times when naming local agencies and organizations located in the area (e.g., Community Health and Social Services), four times in defining various terms or policies (e.g., remediation, mitigation), four times to explain policies or lack of science as justification for not addressing health as part of the EIS, and four times to describe each of the health effects generally associated with VOCs, PM 2.5, light pollution, and ground contamination. Specific health outcomes are in this document in one place, when noting generally that ozone affects the respiratory system and carbon monoxide affects cardiovascular and respiratory systems. No projections for population health are required or included.

Community members and leaders frequently discussed the FEIS's key conclusions regarding air pollution, reported in the FEIS Executive Summary:

> As with the No Build Alternative, overall air quality will improve because of EPA rules and regulations. The Preferred Alternative will result in a split of traffic and, therefore, of air quality emissions between the Ambassador Bridge and the new bridge.

The FEIS's projections encouraged many residents given they predict reduced emissions, rerouted commercial vehicles off residential streets, and decreased idling trucks. Yet, some residents questioned the geographic scope and assumptions shaping MDOT's conclusions:

> How they defended their conclusion was based on two things: With two bridges, they'll be a better flow of traffic. Less congestion. Therefore, less pollution. Regionally, that's true. They said, also, the EPA is going to strengthen standards for new truck engines and, therefore, trucks will be less polluting. That standard came into effect this year, and it's only for brand new trucks. We've now partnered with companies for the retrofits and, I mean, they'll keep their trucks on the road for 30-35 years if they can. At the standard of the truck engine when they bought…So, it's so obvious that if you put a plaza in an area where there is no plaza now, you're going to bring in— the reported myths that they are estimating that truck will increase 125% and they estimate that 75% of the current border traffic will move to the NITC. So, it concludes that all of this traffic is suddenly going to be in this neighborhood…when you put a condensed bunch of cars and trucks together in one area where it wasn't before, there is going to be an impact and nobody's acknowledging that there is going to be an impact right there.

While overall air quality will likely improve in Southwest Detroit and Downriver upon building the NITC, Delray residents wanted specific projections for their neighborhood.

Cumulative impacts from multiple air pollution sources, including the proposed NITC, concerned community members. As part of the FEIS, the DRIC Partnership Border Study issued a 148-page *Indirect and Cumulative Impacts Analysis Report* (2008). Specifically in terms of air pollution, the report makes conclusions about CO, PM 2.5 and PM 10, stating that "carbon monoxide concentrations at sensitive locations are not forecast to violate federal standards," and "The conclusion of a qualitative particulate matter PM2.5 and PM10 hot-spot analyses is that the proposed project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS [National Ambient Air Quality Standards]" (pp. 4-22-4-23). One resident and well-known Detroit EJ advocate expressed concerns regarding the interactions of these pollutants, "…what happens when they [chemicals] mix with your body? My concern

is—they've been using us as a laboratory." Another resident inquired about the long term exposures, "What happens when you live there for 30 years and every day you are exposed and you are breathing this?" Many interviewees alluded to the acclimatization that occurs when you grow up in a "sacrifice zone, " as community leader described her recent epiphany:

> …They were going to take us on a tour of Cancer Alley[22] and so I am kind of excited to see what I thought was going to be this horrible example of a community that's impacted by industry. But when I got there I wasn't all that impressed. And, it was not to say that it wasn't everything that they were saying it was, but for me it was different because the oil refineries were all along the Mississippi River but they were at a distance from where we were. So that was something. As a matter of fact, as I was looking at it, kind of sparkly lights and, like, okay. But then we went into one area in particular and there was either a Sunoco—I can't remember—it was either, the yellow emblem, a Sunoco or Shell refinery right across the alley from what we would call a dirt road, from this community, a Black community that sat right on the top of this refinery. I mean, so we were there…so I'm looking and I'm looking at the people and for me, I could look at them and see that something was wrong. I mean, I could look at their skin. I could look at their physical appearance. And, to me, something was just not so healthy, alright? So it didn't really hit me so I came back home and came back here to Detroit and I was going out to Southwest Detroit. I was going over the I-75 bridge, and it hit me. This is why I wasn't impressed. I grew up out here with all of this stuff. I'm like, oh, now this was impressive to me because there was so much industry kind of concentrated in one small area with the community.

She realized how living in Southwest Detroit normalized the site of industrial pollution in her neighborhood. A respected owner of a local business also recognized these compounding risks but cautioned community members and leaders in blaming one sector for air pollution issues:

> I would say it's the fugitive dust. I would say it's the steel plant. I would say it's the coal blowing off the coal fields. I would say it's the pollution coming from the water treatment plants. There's a lot of other causes. So I think once you start demonizing one group [transportation planners], what you get is a lack of cooperation.

Both in interviews and public comments, community members and leaders regularly referenced the unknown chronic, compounding, or interactive effects of environmental health exposures

[22] 'Cancer Alley' is the moniker for an approximately 100-mile stretch of land along the Mississippi River between Baton Rouge and New Orleans in Louisiana that hosts over 150 industrial facilities, including several oil refineries and toxic waste dumps (Nitzken, 1992). Both researchers and private companies have led, funded, and debated whether or not epidemiological studies indicate the presence of above average cancer prevalence clustering among residents along this industrial corridor.

from multiple industrial and transportation sources, to which MDOT referred readers to their aforesaid technical report.

Air quality analyses are complex, and community members and leaders may not understand or agree with their policy-prescribed methods or thresholds in the case of the NITC. For instance, concerns related to PM analyses were threaded through many transcripts. Even for some experts, jargon and complexity of analyses prevented them from commenting on conclusions about PM, as a city planner explained:

> [City of Detroit's] Council was very concerned about air quality, but in-house we didn't seem to have the technical expertise to talk about it. And, I know that [community advocate] and those guys had a much better grasp. I felt a little bit intimidated by them because they had all these . . . what do you call it, particulate 2.5?

A resident expressed similar concerns:

> It always seems like everything is fine no matter what you do. The particulate matter is going to be just fine, you know, and so I think the concerns of the community never really get…you know, a lay person, and I include myself….We can't really talk particulate matter and tell you with any kind of certainty that this will or will not increase that.

However, a consultant leading the NITC EIS analysis explained that, "analysis can be pretty cut and dried." He elaborated that, as a consultant, he simply upholds EPA's methods and thresholds:

> Our job is to analyze the project and say do we exceed these levels of PM2.5 and if we don't then we aren't complying with good public policy. Well, people would come up and would say you're killing asthmatics and the elderly and children, you rat bastard! And I would point them to the EPA website on, you know, PM2.5 and the air quality regulations that says these—it says right in there, these levels of pollutants are set to protect the health and well being of elderly, asthmatics, and children. And I said, so, we as transportation professionals, it's not our job to set public policy.

Juxtaposed, these comments from a resident, local planner, and project consultant show how baseline understanding and expectations for the environmental assessment can vary greatly, where communication among stakeholders may be challenging.

In interviews and comments, community members and leaders indicated many more potential health impacts than those cited in the EIS with most frequent references to school health, cancer, asthma, and safety. In response to the many DEIS public comments related to health and the need for health data or studies, MDOT staff and consultants repeatedly responded (DRIC Partnership Border Study, 2008):

> FHWA has determined that, presently, there is not adequate science to reliably include exposure modeling or risk assessment in the air quality analysis. This is stated in Section 3.6.1 of the DEIS and FEIS. Health studies are used to establish standards. NEPA uses what is available. NEPA studies are not intended to establish standards.

Further, there were many references to general "quality of life" issues among residents and community leaders, who described additional environmental stressors beyond air quality. As one community leader expressed, "From a health perspective, we really aren't concerned about the air quality and the impact, but there are so many other problems in Delray. Now, if we had clean air to begin with…" Similarly, a local state representative phrased the NITC's health risks broadly as a livability issue:

> It gets to a point, how much can we really say this is a livable community when [there is] transportation infrastructure completely surrounding our schools, our parks, our houses. You know, people want to have barbeques in their backyard, and they hear the rumbling. They smell it. They breathe it. They get to the point of - is this humane? Is this morally right?

Beyond air quality, given that Delray is already a heavily industrial site, the NITC might also exacerbate existing safety issues. A CBC board member described how his house was broken into several times, "Because you always have the cover of industry and trucking. When you have that cover, it attracts certain crime, you know. Prostitution. All kinds of pillaging all these

buildings down here. Everybody steals the metal, breaking into your house." A few other residents discussed how the industrial setting attracts illegal dumping and described their fears that more trucks would lead to more waste.

Additional Health Research

Residents and community leaders frequently called for expanding the NITC EIS process to include additional health research. Repeatedly in written comments, in transcripts of meetings (including the 2005 scoping meeting), and in study interviews, residents asked project staff to conduct a health study. Interviewees elaborated, "We need those baselines for comparisons" or a broader needs assessment of the community to, "See what is actually needed. Look at how can we reduce pollution, how we can reduce truck traffic in the area, access to medical care…" Another interviewee suggested that EPA have a satellite office in the disproportionately burdened Southwest Detroit region to better measure and manage EJ-related health issues.

In interviews, meetings, and public comments, many CBC members and active community members also referred to published studies. This entailed references to pollution exposure studies conducted by Batterman and colleagues (Li et al., 2011; Batterman, Zhang, & Konowech, 2009; Batterman & Wu, 2006), EJ analyses conducted by Mohai and colleagues (Mohai, Lanz, Morenoff, House, & Mero, 2009), and the scholarship of a local community-university partnership, Community Action Against Asthma (Lewis et al., 2005; Yip et al., 2004). One community leader said she shared hard copies of such studies with NITC project staff. Another community leader, a former state representative, however, expressed concern that such research was not sufficiently used to inform comments in the NITC deliberation or related policy decisions, "It's like, whatever work was done from that initiative, I don't know where it's gone. I don't know where I can find it." Some community members and leaders used local, related

research to educate or influence policy-makers of environmental risks, while others were uncertain how to access this information for such purposes.

Additionally, residents described a variety of informal or community-driven studies related to air pollution. These investigations could be as simple as one resident's homemade air pollution catchment, as he explained the surprisingly large amount of particles he collected, "I would take the butter tops of the little plastic butter dishes and would smear it with Vaseline, and I would put it outside on the window ledge overnight." Others described more collectively organized research efforts such as truck counts to assess heavy commercial traffic on residential roads, bucket brigades[23] to monitor air quality, and household surveys to collect cancer prevalence data.

While many community members and leaders felt integration of additional health or community-based research would be valuable to the NITC deliberation, some decision-makers were hesitant to recognize its value. For instance, a lead NITC consultant questioned the legitimacy of HIAs and other local health studies, arguing, "If it [a health study] supports what we want to do, people can have very credible criticism that it wasn't well designed." Yet, he failed to draw similar conclusions about routine, mandatory environmental assessments, which community members and leaders often did. Another consultant who participated in environmental review for the NITC explained:

> We're outsiders as engineers and planners. I've never been to Delray, for instance. I don't know anything about Delray. I can look at the maps and data, and I can do a field survey and acquaint myself with Delray or Grosse Ile. I don't know what the community's values are. I don't know what its culture, its history, those things. So in order to have a fuller picture of a project, you need to engage people that are there. Now there are limits to that because our charge as professionals is to look at things objectively. Community members—they're not—they are very subjective. They have a particular point of view.

[23]Bucket brigades are community groups concerned with un- or under-monitored or regulated air pollution who use specially engineered, affordable buckets to collect air quality data. The concept of bucket brigades emerged in the mid-1990's and has been disseminated throughout the U.S. by Global Community Monitoring (2006).

> That point of view has to be respected but we can't let it, from an objective point of view, you know, let it color our analysis and our decision-making.

This consultant equated environmental assessment with objectivity and local knowledge with subjectivity.

The Role of Public Comments

During the NITC's 90-day DEIS comment process, approximately 10 elected officials, 15 government agency representatives, 15 churches, advocacy groups or non-profits, 7 public schools and universities, 5 business owners, and 40 individuals submitted written comments to project staff. Project staff and consultants coded comments from the general public and reported them with responses in a 60-page table in '*Section 6. How were local, state, and federal agencies and the public involved?'* of the FEIS. Complete letters from elected officials and selected major stakeholders are included in the FEIS appendices with responses. In both documents, responses range from a brief sentence, "Comment acknowledged," to an extensive paragraph, for example, as seen repeatedly in response to various public comments concerning EJ issues, "The disproportionate impacts on minority and low-income populations are discussed in Section 3.1.5 of the FEIS. Mitigation of them is presented in Sections 4.2 and 4.21 of the FEIS and the 'Green Sheet' in that section" (DRIC Partnership Border Study, 2008). Project staff frequently responded to comments by redirecting the public to various components of the FEIS.

Project staff used this comment process as a primary mechanism to solicit public participation during the NITC. In this process, key community leaders or allies, including local representatives, environmental planners and advocates, and a group of law students, each culled through specific sections of the DEIS to lend expertise, identify concerns, draft responses, and solicit feedback on their drafts, often for a larger team of organizations and individuals to sign on to. These community members and leaders discussed their responsibility for "translating the

study" for those seniors, fellow churchgoers, neighbors, and legislators who did not have time, energy, or expertise to read it. Some interviewees also expressed a sense of responsibility for identifying agencies and organizations and educating them on the comment process:

> Our other job was to solicit, to let the community know they should comment, including organizations, including even to get the City of Detroit to respond. Environmental Affairs was the department that was involved in the DEIS planning phase. At the end, here we are at the comment period time and entities like Detroit Public Schools were not even aware it was going on and they had schools that would be affected—Southwestern High. So, getting them to come, meeting with their attorney, giving them examples…you know, here is what you should weigh in on. So this is over like 30 days.

Community members and leaders used team strategies for understanding, preparing, and soliciting comments to collectively respond to the DEIS.

Many community members made comments on the DEIS, but questioned the value of this process as mechanism for impacting development decisions related to the NITC. Some community members were aware of the full comment process, in that agencies are required to review and respond to comments in writing. But, many of those that knew the process, saw it as perfunctory or slight, stating things such as: "But, in general, all of these processes, end with things like, 'Thank you very much for your concern,'" "You know, they have to respond to everyone, but they do it with a blanket statement," and " I don't know what to do. Call them? Make a comment? It just doesn't seem to make a difference, you know?" Several residents were not aware of the required agency responses, as one actively engaged resident discussed:

> These people we are speaking to, how can we trust them? Unless we follow that piece of paper. You made a statement. Once you turn the corner, I can't trust you. What are the results? What is the response to each question? Or, do they just read a bunch of words and put it aside? Wouldn't you love to follow this piece of paper all the way to where it ends? Who controls? Whose signature? Who is the head honcho?

Even with overall discouragement in the comment process, some community members and leaders noted how commenting was a learning opportunity. For instance, CBC members pointed

out how the group process to comment led them to continuously develop a refined list of specific community benefits for which to advocate.

Mitigation Strategies

In the context of NEPA, "Mitigation includes measures to address any damage to the environment caused by the project through avoidance, replacement, restoration, compensation or any other means" (DRIC Partnership Border Study, 2008). For the NITC, the major impacts requiring mitigation include residents' displacement from homes; noise and inconvenience of a new on-ramp; the loss of hundreds of jobs in Delray at eliminated businesses; the demolition of five places of worship; the removal of a recreation center and playground; the disruption of traffic patterns on several streets; and the rerouting of two bus lines. Under NEPA, MDOT is legally required to address these issues if the NITC is built, although some community members and leaders were concerned that there are no mechanisms to ensure accountability.

The Green Sheets and Beyond

Community members and leaders and decision-makers all referenced the Green Sheets as their basis for understanding mitigation measures. The FEIS includes the Green Sheets as a four-page summary of mitigation strategies (DRIC Partnership Border Study, 2008a). Many community members and leaders indicated they felt the Green Sheets "are really not enough," "just what you should do, nothing extra," or that they do not fully reflect residents' suggestions or opinions on mitigation and, at times, they misrepresent residents' definitions of community benefits. For instance, community members and leaders described how legislative staffers placed the Green Sheets into an informative binder of materials for state legislators voting on Senate Bills 410 and 411 and labeled them 'Community Benefits,' a term CBC members believe they co-opted. Over the course of the deliberation, the CBC developed a more extensive list of

potential community benefits than those listed in the FEIS, including prevention and mitigation measures to protect quality of life in Delray such as replacement housing beyond the bridge's footprint, congestion pricing to reduce traffic during peak times, health studies and interventions, and many suggestions for programs, policies, or technologies to reduce air pollution.

To move beyond the Green Sheets, many community members and leaders also offered additional suggestions for mitigation during study interviews. For instance, a local non-profit, Southwest Detroit Environmental Vision (SDEV), recently received a CARE grant from the EPA to retrofit a fleet of trucks with cleaner technology. Community leaders proposed expanding these efforts, but struggled with how to incentivize these retrofits among independent private trucking companies that cross the border. Others discussed the technology the NITC would include to reduce air, water, and noise pollution, such as weigh-in-motion tolling to lessen idling and increase traffic flow, sound-reducing building materials, and containment to retain salt run-off and filtration. Among the most active CBC members, there was a general call for "doing development better," "development done in a way that really respects people," and "being a model for sustainability."

Housing and Displacement

In FEIS texts, MDOT lists housing relocation as one of the NITC's many mitigation measures, where 257 homes will be displaced under the current plan. In general, there is much disagreement as to whether individuals should remain living in Delray, as a heavily industrialized area with severe pollution, and many residents continue to struggle with their own conclusions on this issue. Some see relocation as an inevitable consequence of Delray's long-term shift to an industrial zone, as one life-long senior resident argues, "You know you need to do this. The freeway divided the community. They uprooted people. Older people. They have

documented history. Okay, we know that sometimes you have to move for progress, and there's going to be some causalities." Conversely, some residents defend their interest in staying in Delray, "Then, people will say, 'Well, it's your fault you live here.' Well, that's the worst darn thing a person can say." Others proudly referenced Delray's historic role in the region's economic success, as a resident expounded, "Did you forget where you came from? I still respect Delray. I respect where I came from." Most decision-makers, representing various political parties or sectors, recognized the personal value many place on remaining in their home or community, as one legislator explained, "I'm telling you, there are people. It's in their souls. You can't remove them from here. They don't wanna leave." A staff member representing the Governor's office described such conversations among decision-makers, "They are saying it would be great that we are going to tear down a bunch of houses that have absolutely no value. That's always easy to say. They are not your houses." In the NITC deliberation, housing is a topic that has repeatedly elicited emotional discussions regarding one's sense of community and family history.

Under current regulations, MDOT would most likely only compensate relocation for those in the exact 160-acre footprint of the NITC development, while many others may be affected by the project and its uncertain future. As a community leader explained:

> So, immediately across the street from the plaza at any side the people living there, they are not going to be bought. So, there are obviously are going to be severely impacted by this project. There's going to be a zone of people affected. There's no account for a 500-meter zone of greatest impact from diesel from highway traffic, for example, that's not really being considered.

Residents mentioned how some of their engaged neighbors moved because they were "sick of waiting" for a decision to be made, uncertain how their property would be affected. A few residents even relocated to the same neighborhood Downriver to maintain "a sense of

community." In an effort led by the CBC, PCS, SDEV, MDOT and Michigan State Housing Development Authority (MSHDA) in 2009, a consulting firm, Building Communities, Inc., secured $1.95 million to subsidize construction of 25 homes for residents displaced or affected by the NITC. Although, this plan was not perfect:

> …if you have people who have lived in their homes all these years over at Rademacher and Waterman, could not pay rent and taxes are very, very low and now all of a sudden you are going to put them in $125,000 home that does not have an attached garage…and these are people, minimum wage. What happens to these people? Before the five years are up, I doubt seriously if they will still within the home because they won't be able to maintain it. So, they are setting them up for failure.

Those in homes provided through this grant would have to carry insurance, which many find unattainable for a new house given relatively high premiums in their high-crime, fire-ridden neighborhood. The CBC expected building to occur by 2011, but MSHDA pulled the funding during the long wait for the NITC's approval. All along, community leaders feared that the City was continuing to promote disinvestment in Delray and speculate that the MSDHA money was redirected to other Detroit neighborhoods.

The Deliberation Continues

The NITC deliberation continues to play out both locally and internationally. On April 12, 2013, the U.S. State Department announced approval of the NITC through a Presidential Permit in the U.S. Next, various agencies will partner to identify contractors to design and build the bridge project. Community benefits, if decision-makers uphold them, may be negotiated in these next steps. Many surmise that during the next phases, decision-makers will also continue to contend with Moroun over unforeseen legal deliberations. When built, the NITC may take on a new name as well, as Brian Masse, the member of Canadian Parliament representing Windsor-West, advocated for an international public bridge naming process in early 2013.

Discussion

Based on their experiences over the first ten years of the NITC deliberation, community members and leaders and decision-makers reflected on what it means to be a 'public participant' in the context of freight deliberations and related environmental assessment. Many historical factors in the region impede public participation, where past, unimplemented development proposals have diminished some residents' interest or engagement in the NITC. The NITC is a deliberation fraught with extensive social and economic complications, many aggravated by the city's disinvestment in Delray and Moroun's countering interests in Southwest Detroit. Despite barriers to participation, community members and leaders have continued to remain engaged, forming the CBC, advocating for policies that promote quality of life near the proposed NITC site, seeking funding to support housing for those in or near the NITC footprint, obtaining environmental grants to carry out freight-related demonstration projects, and tirelessly attending or leading countless meetings as the deliberation continue to unfolds.

What is Public Participation?

This case study highlights many catalysts and barriers to public participation that may emerge during freight deliberations. Community members and leaders indicate that successful processes for public participation entail long-term community-agency relationships and extensive information collecting and gathering, reflective of communicative planning models that value communicative interactions as central to planning and problem-solving (Innes & Booher, 2010; Healey, 1992; Habermas, 1991). For instance, community members spoke positively of the ways MDOT project staff and consultants engaged the community earlier, offering more information and opportunities for input on the NITC than during the DIFT deliberation. From the NITC, we also learn ways that project staff may improve public

participation. In their administrative roles (Dyckman, 2013; Howe, 1980), project staff may not be able to easily influence prolonged deliberation timelines or remove major political barriers, but they can continue to support communities in accessing those with decision-making authority, initiating interagency efforts to address complex housing- or health-related issues, and improving translation of technical documents in partnership with community leaders. Some NITC project staff did make these efforts, but greater efforts may be needed in under-resourced, affected communities.

This case study also highlights ways in which freight deliberations may place undue onus on low-income communities as public participants. In addition to countless NITC-related events, there are hundreds of community meetings that one may attend each year in an effort to address multiple, ongoing community issues in Southwest Detroit. While it may not be MDOT's responsibility to address the air pollution from the Marathon Refinery, facilities on Zug Island, and the Detroit Wastewater Treatment Plant in Delray, these compounding environmental health threats factor into how each community member and leader reacts to and participates in the NITC deliberation. Chapter 3 further suggests that these complex, interrelated experiences may not be unique to public participants in Delray and Southwest Detroit where demographic patterns indicate that low-income communities and communities of color may be more likely to host a freight gateway as well as other industrial facilities in the U.S. Others have documented similar circumstances, where multiple, diverse pollution sources are sited together near residential communities, forcing interminable distress and, often, *necessitating* some level of activism to protect health among those living within 'sacrifice zones'[24] (Lerner, 2010). In this case, those

[24] Lerner (2010) explains that "The label *sacrifice zones* comes from the 'National Sacrifice Zones,' an Orwellian term coined by government officials to designate areas dangerously contaminated as a result of mining and processing of uranium into nuclear weapons (pp. 2-3)." He describes how the term applied to locations during the Cold War where – even though the air, soil, and water became "catastrophically contaminated" – housing and

most active in protecting their community are conceivably more likely to experience a sense of community, entailing increased engagement and shared emotional connections (McMillan & Chavis George, 1986). Meanwhile, they are also facing routine uncertainty about keeping their home and community intact, implicating a host of psychosocial stressors and health outcomes (Fullilove, 2004).

This case study also shows how planning that divorces deliberations from their local, historical context (Innes & Booher, 2010; Fischer, 2005) raises many ethical concerns for residents, some related directly to the public participation process. Habermas' (1975) 'decisionism model' names this institutional practice of conceptualizing and treating a local series of complex decisions as seemingly unrelated events. With MDOT staff and consultants, residents and community leaders re-envisioned Delray through various charettes, workshops, and tours of other bridges or freight gateways between 2005 and 2011, beginning years before the project was funded and approved. However, many residents fear their visions for the development will be disregarded as another empty promise for local economic development in Delray as a private developer is selected. Further, from the perspective of some interviewees, the pending bridge development has exacerbated or validated city disinvestment in their neighborhood over the last decade. Engaged in the NITC deliberation, public participants from Delray live among changing land use patterns, from residential to increasingly industrial (DWP, 2013; Dewar & Thomas, 2012; Beauregard, 2009) as documented and deliberated in the Detroit Works Project and its resultant strategic framework. While transportation planners cannot forecast the politically driven timeline and outcomes of major freight and related land use

---

people often remained residing nearby. Lerner argues that the term could also be used to describe places where multiple, compounding pollution sources are sited and 'fenceline' or 'frontline' communities reside today.

development decisions, they must consider ethical implications of soliciting intensive community input for unfunded development plans (Hourdequin, 2012).

Assessing and Mitigating Risks

The case of the NITC shows how institutional discrimination may affect distributive justice (Amerasinghe, Farrell, Jin, Shin, & Stellies, 2008; Cole & Foster, 2001) when siting freight gateways. Community members and leaders and decision-makers provided many reasons for siting the NITC in Delray, where much of the land is vacant and zoned as non-residential, major highways would easily connect, and the Detroit River is relatively narrow. Although well justified economically, the NITC case study qualitatively shows how economic and racial segregation may underlie scoping and siting decisions, as seen elsewhere (Adamkiewicz et al., 2012; UCC, 2007; Stretesky & Lynch, 2002), where low-income communities and communities of color come to expect being stepped on "like a cockroach." Further, while project staff solicited public participation heavily once Delray was selected, the siting phase did not include such opportunities. MDOT presented initial studies at an August 31, 2005 scoping meeting, and Granholm announced that Southwest Detroit was the selected study area just over a month later on October 4, 2005 with little time for public comment. Organized within planning structures and described by many interviewees, the NITC scoping process illustrates patterns of institutional discrimination known to degrade health in multiple ways (Williams, Neighbors, & Jackson, 2003; Gee, 2002; Williams & Collins, 1995; Massey & Denton, 1993).

Through study of the NITC deliberation, we see ways that environmental assessment methods, while intended to reduce environmental risks, may actually perpetuate environmental inequities. For instance, geographic units of analysis selected to conduct environmental assessments may not accurately reflect the distribution of benefits (e.g., employment, economic

development) and burdens (e.g., noise and air pollution) of living near a freight gateway. This case study focuses on the Delray neighborhood that would host the NITC, but also recognizes the relevance of greater Southwest Detroit as it hosts the DIFT, Ambassador Bridge, and truck network among these sites. In the DEIS/FEIS (DRIC Partnership Border Study, 2008; DRIC Partnership Border Study, 2009), project staff relied on a 27-square mile study area to determine that overall air quality will improve, dismissing localized implications for Delray residents neighboring the border crossing. The EPA offers guidance on selecting a geographic scope for NEPA analyses, but there are no requirements since developments' land use needs vary from project to project (EPA, 1998).

The NITC also provides an example to illustrate how the predominant rational planning model used in freight deliberations is limited, disregarding the inherently value-laden nature of risk measures and minimizing many public health concerns. The NEPA process relies on a rational planning model (Flybjerg, 2005; Portugali, 2000) where project staff members bring expertise to decision-making based on various criteria, methods, and thresholds. Planners' communicative overemphasis on those risk topics with well established data sources and methodological approaches, however, may perpetuate omission of more complex social concerns through a process of 'systematically distorted communication' — an obstacle of rational planning processes raised in Habermas' critical communications theory (1975) where "politicians or administrators pretend a political problem to be simply a technical one (p. 276, Forester, 1980)." In the NITC, project consultants focused on traffic projections and air pollution, but may have excluded community concerns in the DEIS/FEIS that were hard to measure or did not fall under policy-prescribed assessment requirements. For instance, the FEIS does not address the implications of a border crossing for neighborhood safety, illegal dumping,

structural damage to households, or related health outcomes, such as respiratory and cardiovascular health. Also, in the discourse of PM 2.5, we see how a project consultant has reported findings within thresholds as mandated, but with confusing, unsettling conclusions for some community members and leaders— many who underscore concerns with the frequently under-discussed, value-laden nature of these and similar standards for 'acceptable' risk (e.g., deaths per million, loss of life expectancy) (Slovic, 1999). The findings for the NITC survey of evaluation factors (Figure 4.4) also illustrate clearly how goals for the NITC deliberation diverge, whereas, as their first priority, MDOT staff ranked 'improvement to regional mobility' and the public ranked 'protection of community and neighborhood characteristics.' These examples illustrate how project staff or consultants conducting environmental assessments are often transportation planners and engineers who do not have the requirements, expertise, models, or funding to move beyond typical procedures or thresholds needed to achieve public health.

Further, the NITC shows how rational planning approaches may devalue community-based input, data, or opinions, thus, impeding discussion of effective mitigation measures. In the case of the NITC, we heard from a lead consultant who sees that, "our [consultants] charge as professionals is to look at things objectively," whereas community members' "point of view has to be respected but we can't let it, from an objective point of view, you know, let it color our analysis and our decision-making." Cognitive psychologists studying how humans interpret risk find that dichotomizing knowledge as objective or subjective prevents both a comprehensive risk assessment and identification of the full suite potential solutions (Slovic et al., 2004). This is because those who participate in community organizing efforts generally become experts, contributing to their community's capacity to address environmental risks through policy interventions (Israel et al., 2010; Freudenberg, 2004). This line of dichotomous thinking may

also disregard the community capacity and potential contributions of residents who have participated in countless NITC-meetings and similar deliberations, some who have come to understand the context, stakeholders, and implications of cumulative health exposures in ways that transportation planners and engineers or newly elected decision-makers may not.

Finally, decision-makers may inevitably place an additional mitigation burden on community members and leaders in freight deliberations, as seen in the NITC deliberation. The CBC and allies have taken responsibility for strategizing to address many potential negative implications of the NITC, such as air pollution, threats to local hiring, and housing displacement, beyond basic government interventions. For instance, to address housing displacement for residents near the NITC footprint, community leaders sought MSHDA resources to fund housing, which was not facilitated by interagency work with MDOT. In regards to health and cumulative exposures, decision-makers dismissed repeated community requests for a health study, while the CBC has struggled to identify funding and expertise to conduct an HIA. Also, many legislators rejected the CBC's proposed CBA without proposing alternate suggestions or related policies to collectively define community benefits or mitigation in a fundable way. Although, for all involved, the lack of CBAs in the U.S. raised concerns about setting a new precedent and may have inhibited productive discussions. Often, it seems it is unclear who would lead or fund these types of interventions, thus, the burden remains on those that the development will impact.

Key Recommendations for Locally Improving Public Participation and Environmental Assessment in Freight Deliberations

As described by community members and leaders, the NITC deliberation occurs in Delray and greater Southwest Detroit region within a context of existing transportation and

industrial infrastructure, increasingly vacant neighborhoods, benign neglect, 'empty promises' planning, and 'whale-saving'—features that both strengthen and hinder the community's capacity to engage as public participants. Community members and leaders also defined key catalysts and barriers to their participation in the NITC deliberation, experienced while engaging in agency-led forums and organizing as a community. More specifically, community members and leaders who engaged in environmental assessment as part of the NITC deliberation described ways that current processes largely overlook cumulative risks and public health concerns and may perpetuate institutional discrimination by devaluing local risk knowledge and relying on systematically distorted risk assessment. While federal policies, guidelines, thresholds, and methods largely dictate this assessment process, there is much flexibility in how it is conducted and communicated locally in host communities. Drawing on the experiences of community members and leaders in this context, this case study concludes with the following key recommendations for planners, project staff, consultants and decision-makers to improve public participation and environmental assessment, including plans for mitigation, with attention to EJ in freight deliberations locally:

- *Assess current and historical planning context throughout freight deliberations*: Transportation planners have the ethical obligation of facilitating early conversations between city planners and residents about local planning efforts that have shaped or continue to shape a proposed host community. In this case, this may look like MDOT or appointed project leaders convening meetings with those implementing Detroit Future City to discuss the convergence of their strategic framework with the NITC plans. This conversation should identify implications and strategies to support residents who remain, relocate, or are displaced, experiences which affect quality of life substantially for host communities. Such

conversations should include community members and leaders and may be particularly crucial for addressing health equity in neighborhoods experiencing municipal disinvestment or continued industrialization.

- *Describe the deliberation's timeline and the role of project staff and decision-makers to residents of a proposed host community early, frequently, and clearly:* Many residents expressed confusion or frustration related to deliberative processes, uncertain where their public comments go or who they are interacting with in a public hearing (e.g., a consultant or elected decision-maker), for instance. To the best of their ability and knowledge, all project staff who facilitate community hearings should provide an early, clear, and repeated overview of: 1) a project's status regarding its funding, approval, design, and development, particularly noting uncertainties; 2) their own role, responsibilities, and authority and how to contact them; and 3) those with decision-making authority (e.g., elected officials) and how to contact them. While key leaders may have this knowledge, residents who engage intermittently may not. This information may assist communities to better understand if, how, and where they can influence decisions.
- *Improve scoping and siting processes with preliminary cumulative impact assessments and increased opportunities for public participation*: Acknowledging patterns of institutional discrimination, a preliminary assessment of cumulative impacts must occur during scoping and siting discussions rather than later during preparation of the DEIS. Additionally, decision-makers should provide sufficient outreach and time to enable community leaders and residents near proposed sites to engage at this phase of decision-making, which was not seen early in the NITC deliberation.

- *Define a meaningful geographic scope for the study area used for environmental assessment with input from community leaders:* Baseline measures and projections for air and noise quality should be assessed both regionally and locally, for instance, within 500 meters of a proposed freight gateway, plaza development, or highway expansion. When a FEIS declares 'no significant impacts' based on a regional assessment, this systematically distorted finding undermines local knowledge of risks and masks information that residents and community leaders may need to identify protective measures for themselves or their community.
- *Acknowledge and present health implications of a proposed freight development*: HIAs or related studies should inform land use decision-making at freight gateways. Even without political or financial support for such studies, sufficient research links freight-related noise and air pollution exposures to various health outcomes. While NEPA does not require inclusion of this information in environmental assessments, project staff should call upon scholars to present these findings to community members and leaders and decision-makers. Even when a freight development is sited, approved, and funded, this information can be particularly useful in developing mitigation measures.
- *Convene interagency workgroups to develop and implement mitigation strategies*: Freight deliberations place undue burden on public participants, as illustrated by the CBC's tireless efforts to identify and advocate for appropriate mitigation strategies. Interagency workgroups may create a network with the capacity to relieve this burden. During a deliberation, project staff should initiate regular conversations among the state's housing, health, environmental quality, and transportation departments with community members to identify or develop the policies, programs, resources, data, or grants needed to protect a freight host community.

- *Partner with community leaders to more effectively translate and share technical materials:* Residents identified trusted key community leaders as catalysts that support their participation in the NITC deliberation. They also valued extensive information sharing through workshops, field trips, presentations, and websites. To translate and disseminate project information in a way that promotes accessibility, project staff should consider working closely with these key leaders to generate materials, schedule or co-sponsor forums, and solicit feedback on their agency's outreach efforts.
- *Determine and communicate actionable steps for follow-up to public questions and comments:* With input from community members and leaders, project staff should establish procedures for responding to questions and comments during deliberative processes. This could entail preparation of outreach materials to simplify a complex topic of interest (e.g., eminent domain, air quality monitoring) or inviting experts to community meetings to address specific questions, for instance. Additionally, public comments and agency responses on the DEIS should not only be presented in an appendix of the FEIS, but summarized in lay terms in handouts or community presentations. Project staff facilitating the NITC deliberation frequently made some of these efforts, which were valued by public participants.
- *Develop codified structures and resources for long-term involvement of representative community members and leaders:* The residents of Southwest Detroit have suffered under the hand of Moroun and multiple, overwhelming threats to environmental health, and new governance of a second bridge could be an opportunity to restore some sense of EJ in the region. As the CBC continues to advocate for "a bridge with benefits," community members and leaders recognize the long-term implications of a border crossing for residents. If not through a CBA, some form of codified community input may assist leaders to identify

additional risks and opportunities for mitigation that will be needed through the lifespan of the border crossing. Just as ports have port authorities that engage residents in long-term community advisory panels or committees, decision-makers should consider a similar model at land border crossings.

These recommendations reflect issues most pertinent to community members and leaders interviewed in this study and engaged in the NITC, but they are not exhaustive. Also, these recommendations primarily call on transportation planners, project staff, and local decision-makers to take responsibility for improving public participation and environmental assessment. Successful implementation of many of these recommendations may rely on broader structural changes at local, statewide, or national levels and require involvement of additional stakeholders, including residents, scholars, public health practitioners, environmental scientists, experts from other sectors, and policymakers. Such structural changes can be sought through the planning, policy, and research efforts discussed in Chapter 6, where these NITC-related findings and implications are synthesized with those from Chapters 3 and 5.

Table 4.1. Estimated Demographic Composition of the Delray Neighborhood and Greater Southwest Detroit, 1950, 1980, & 2010

	1950		1980		2010	
	SW Detroit	**Delray**	**SW Detroit**	**Delray**	**SW Detroit**	**Delray**
Total population	168,988	22,882	104,584	7,096	46,052	2,783
Race & Ethnicity[a]						
Non-White (% of total population)	15,283 (9.04)	3,153 (13.78)	32,355 (30.92)	2,868 (91.11)	26,775 (58.14)	1,577 (56.67)
Hispanic (% of total population)	N/A	N/A	N/A	N/A	25,458 (55.28)	1,304 (46.86)
Age[b]						
< 18/19 years old (% of total population)	53,373 (31.58)	7,294 (31.88)	31,151 (29.79)	2,403 (33.86)	14,372 (31.21)	837 (30.08)
18/19-64 years old (% of total population)	105,307 (62.32)	13,891 (60.71)	61,849 (59.14)	3,848 (54.23)	27,813 (60.39)	1,727 (62.06)
>64 years old (% of total population)	10,308 (6.10)	1,697 (7.41)	11,584 (11.08)	845 (11.91)	3,867 (8.40)	219 (7.87)
Income						
Median household income ($/year)	3,431	3,251	14,825	8,745	26,544	26,317
Education[c]						
Less than high school (% of population over 25 years old)	73,885 (75.50)	11,065 (84.11)	32,789 (55.62)	2,558 (67.80)	12,791 (45.41)	906 (42.62)
Employment[d]						
Unemployed (% of total civilian population in workforce)	4,071 (5.42)	58 (.62)	7,941 (19.22)	484 (22.63)	4,304 (22.94)	431 (30.68)
Households						
Number of households (% vacant)	46,179 (1.69)	6,114 (2.02)	37,390 (7.61)	2.527 (10.61)	15,231 (20.51)	1,209 (23.16)

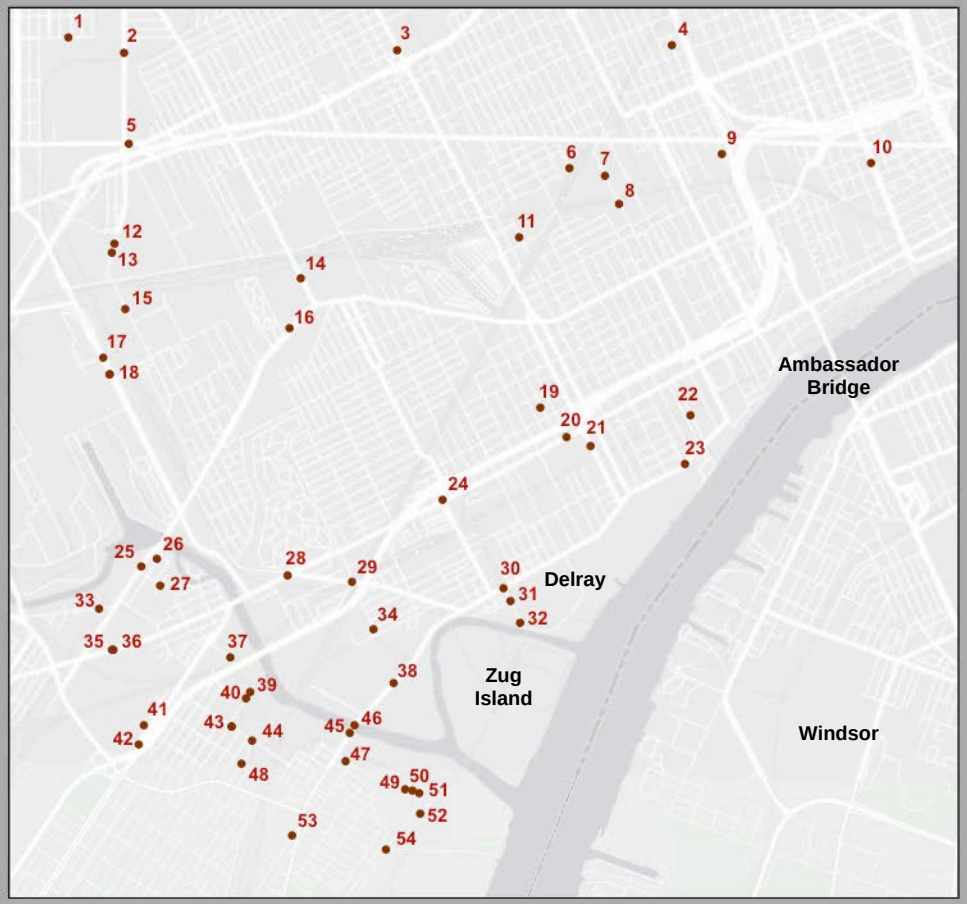
a. In 1950, U.S. Census race categories included Black, White, and Other. In 1980, U.S. Census race categories included White; Black; American Indian, Eskimo, Aleut; Asian and Pacific Islander; and Other. In 2010, U.S. Census race categories included White alone; Black or African American alone; American Indian and Alaska Native alone; Asian alone; Native Hawaiian and Other Pacific Islander alone; Some Other Race alone; and Two or More Races.

b. Over time, categories for youth age varied in the U.S. Census. In 1950, youth included those less than 19 years old, while in 1980 and 2010 youth included those less than 18 years old.

c. U.S. Census data on education was collected using different questions over time with all years calculating rates for those 25 years or older. In 1950 and 1980, respondents could indicate years of high school completed (1 to 3 years or 4 years), but did not indicate successful completion or attainment of degree. In 2010, respondents indicated whether they had completed some high school or obtained a high school degree.

d. Census data for unemployment are based on different reference populations over time. In 1950, civilian population in labor force 14 years and over was considered the reference population. In 1980 and 2010, civilian population in labor force 16 years and over was considered the reference population.

Figure 4.1 Industrial Sites in Southwest Detroit



1 – Michlin Diazo Products Corp.
2 – Automotive Finishes Inc.
3 – Detroit Brake Machining Inc.
4 – Thornapple Valley
5 – DaimlerChrysler Corp.
6 – Secodyne Inc.
7 – General Motors Corp.
8 – Hispanic Manufacturing Corp. Gonzalez Inc.
9 – Detroit Electro-Coatings Co. LLC
10 – Lincoln Brass Works Inc.
11 – Magni Industries Inc.
12 – Towne Robinson Inc.
13 – Xcel Steel Pickling Inc.
14 – Severstal Dearborn LLC.
15 – Ford Motor Co.
16 – Edw C Levy Co.
17 – Double Eagle Steel Coating Co.
18 – Severstal Dearborn LLC
19 – General Motors Corp.
20 – Arvinmeritor
21 – J & L Specialty Steel Inc.
22 – Pillsbury Chemical & Oil Inc.
23 – Diamond Heat Treating Co.
24 – General Motors Corp.
25 – Sunoco Partners Marketing & Terminals
26 – Carmeuse Lime Inc.
27 – Edwards Oil Service Inc.
28 – Rayco Plating Inc.
29 – St Mary's Cement Inc.
30 – Detroit Coke Corp.
31 – Honeywell
32 – EES Coke Battery LLC
33 – Edw C Levy Co.
34 – Wayne Grease Division of Darling & Co.
35 – Polymer Concrete Corporation
36 – Cyclops Corporation Detroit Strip Division
37 – Owens Corning Roofing & Asphalt LLC
38 – Ipmc Inc.
39 – Monarch Petroleum Inc.
40 – Equilon Enterprises LLC
41 – Marathon Petroleum Co.
42 – Marathon Oil Co.
43 – Westwin Ltd.
44 – Wolverine Gasket & Manufacturing Co.
45 – US Gypsum Company
46 – Superior Materials Plant 17
47 – Carmeuse Lime Inc.
48 – Broad Vogt & Conant Inc.
49 – BP Products Inc.
50 – Michigan Marine Terminal
51 – Shell Oil Products
52 – Fritz Products
53 – International Precast Solutions LLC
54 – Detroit Edison

Figure 4.2 Timeline of New International Trade Crossing Key Events, 2002-2012

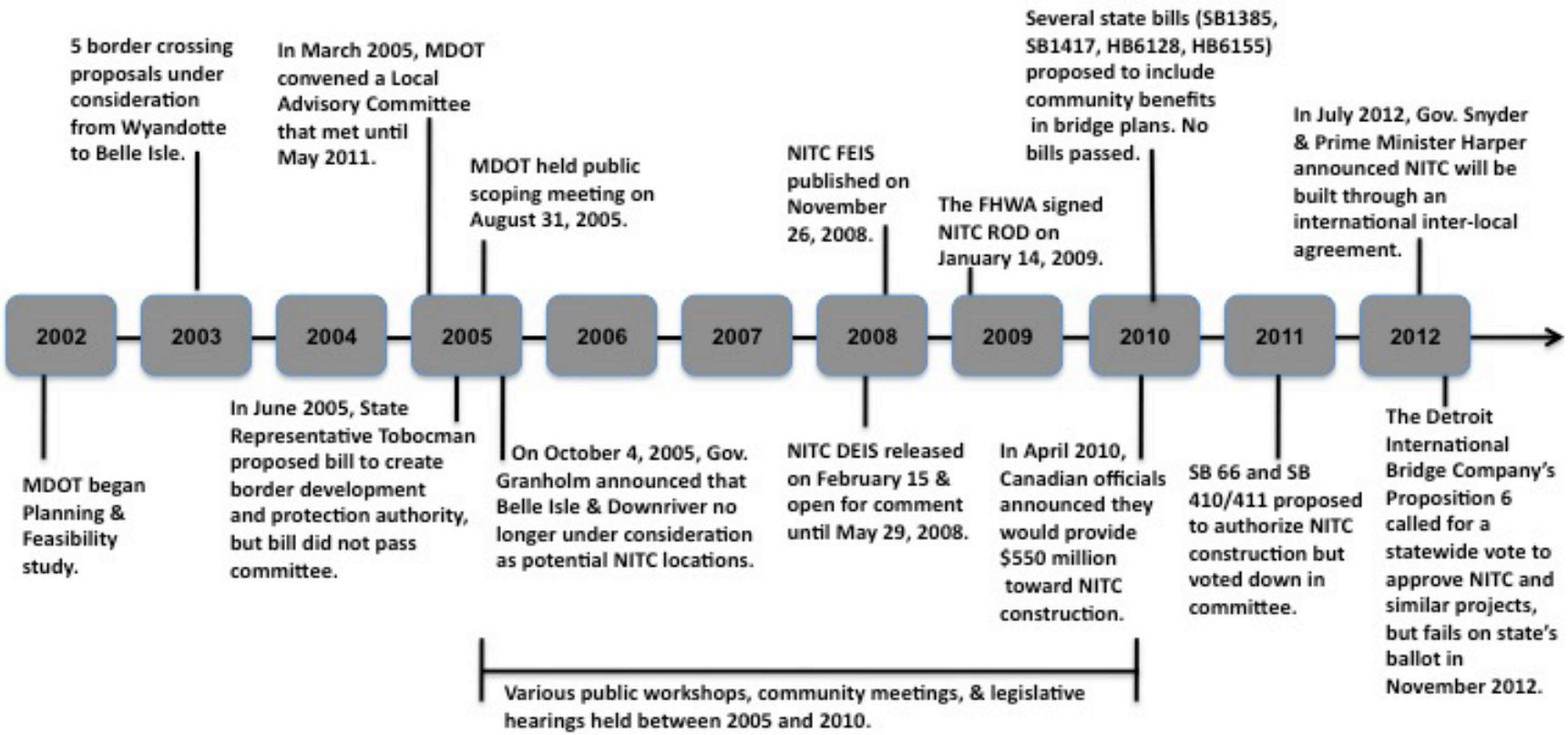


Figure 4.3 Community Benefits Coalition Outreach Postcard

Table 4.2 Institutional Barriers to Public Participation in the New International Trade Crossing Deliberation with Examples from Resident Interviews

Insufficient time or outreach for public processes
And then we went house to house and wrote down every address in Delray and flyered each house as we did it and made up a mailing list and gave it to MDOT so they could send out mailings to all the people. We notified the people of the upcoming meeting, and at the next meeting 180 people showed up. Well, actually, that is their job.

Uncertainty underlying 5-10 year decision-making processes
The longer we wait, the cost will go up further. They want to know how much money do we want from the company to do what we want? How can you ask us that kind of thing? We don't know how many houses you're going to take. They want the CBC to spell out how much it's going to cost. We're not engineers. We're simple people. You know?

Difficulty gaining access to influential legislators
Sometimes when you would call up, they would ask, "Are you a constituent?" Well, no we're not a constituent in the area, but they are going to be voting on our neighborhood. Therefore, we think we should be able to talk with them about their vote. It became very clear that trying to go talk to these legislators one-on-one…they're all over the place. Their level of knowledge is very minimal.

Confusion on who has decision-making authority
A lot of times you didn't know if you were speaking to consultants or MDOT.

Lack of support or investment by local government
…and then it became the City telling the Governor's office to stop talking with us [the CBC]. That's how protective they have been about what's going to happen in this community. And, honestly, the City's position feels like a nail in the coffin in a way that they would turn their backs when we've been fighting the harder fight of trying to get people outside of this area to accept responsibility for impacts and they're not even accepting responsibility. That's pretty deeply disgusting.

Few, if any, precedents set for community involvement in infrastructure governance
We met several times with Lt. Governor Calley. One of the things was he wanted to try…everybody was saying, "Can't we do this?" 'This' being community benefits in another way. We said, "Fine. Find us a legally binding way to do it. Show us." They would never produce it. They kept talking about MOUs and MOAs. Someone said there was a past example of an MOA that was signed between MDOT and former Mayor Coleman Young that they're still abiding by. Well, show it to us.

Onus on residents to work across sectors and agencies (e.g., housing, transportation, health, environment) to address concerns
We actually brought in the MSHDA people. They never did it. We brought this up to past Governor Granholm. And I said, well, "What are we going to do for the seniors?" And then the Governor said, "Oh, yeah, we've got to jump on this…" and said, "you guys get together with MDOT." And so we sent email after email after email to MDOT. One of the things Lt. Governor Calley did was he brought all the groups together. Maybe we can have programs in each department and get this done this way. And, what we realized pretty quickly, I mean, you see what happens with the state budget year after year. It ís impenetrable for the average citizen.

Inherent political nature of major infrastructure decisions, often entailing misinformation
I have worked in Lansing for seven years. I have never been involved in one singular topic that has been so controversial and so bogged down with misinformation and just—it's amazing.

Difficulty understanding technical information (e.g., EIS documents)
There needs to be some technical assistance out here when there's permitting going on and people don't…can't read up on that and actually understand what's coming out of the smokestacks or what they're actually permitting to happen.

Table 4.3 Community and Individual Barriers to Public Participation in the New International Trade Crossing Deliberation with Examples from Resident Interviews

Competing priorities among residents and allies; may lead to intermittent engagement
In an economically disadvantaged community, in Southwest Detroit, for example, in Delray, in particular, we're not all up on it. Everybody is not up on it and educated and communicated with. Everyone is, you know, so busy. And we are, all busy. Middle class. Whatever. Lower class. Middle Income. Low Income. No income. Everyone's trying to survive day-to-day. Get your food on the table. Get your kid cleaned or get your kid to school. So, the majority of people don't have the time to be on top of every single thing that might happen or be happening or even catch the darn news.

Minimal economic resources to organize, counter misinformation, or promote campaign
Now getting people there's a lot of money just in gas money and making sure people have a ride, making sure people are fed and organizing people to get up to Lansing. And, most people could find a better use of their time…whether it's watching their kids or going to their job or watching their, you know, sick mother. So, it's hard to get people to take their day off and go up to Lansing. And, then, do it on very short notice. That's a problem. That's a big problem. And, we're left to scramble and get people there. So, I don't find that helpful. It's something that…we have funders that are helping us to try and make it happen.

Hard-to-reach population (e.g., many homebound seniors, few youth, disconnected phones)
Not your average community. They don't have the same agency because they have so many different challenges and barriers on a daily basis. 40% or more now don't drive. A lot of their telephones, from quarterly meeting to quarterly meeting, you call, easily 25% of the numbers don't work. So, just keeping phones on, keeping heat on…the lack of policing in the community, the safety issues they face.

Language barriers
Not everyone goes to the hearings. Some people can't understand if they don't speak English.

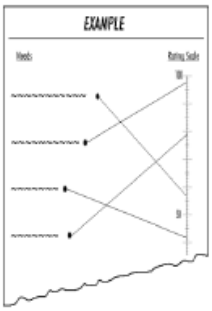
Barriers related to immigration status
I'll tell you about Hispanic people. We're...a lot of us are more timid to express our feelings. They try to keep a low profile. Immigration comes in. You've got a family and kids. You have to be quiet. You have to be quiet and take whatever problems you get. My friend, Ken Cockrel, got this bill passed that they can't ask your status unless you are arrested. But, the State, they can. They look at you, 'Where you from?' There's a lot of stories like that. They just want to get rid of Mexicans. So meetings like this... they can't even go to church or their children's schools.

Difficulty building consensus on key message (e.g., 'Not in my backyard' vs. community benefits)
To not want to move, nobody is trying to change your mind about that. You have the right to not want to move. I think we missed that for a minute because we were excited. Here is opportunity, here is a vision…and later on realized, well, you know, everybody's not on board. And, my thing for people who were not on board to try and poison what we were doing. So, you don't want to move, that's fine, but don't try to poison us and say we're sellouts. No, that's not the intent.

Difficulty, failure, or inability to include communities along the entire transportation or industrial corridor
I've been encouraging the CBC to expand. It's not just going to affect them. It's going to affect River Rouge. It's going to affect Ecourse. Community benefits need to be for the whole region. If you go further south, you have plants. We need to look at it regionally.

Figure 4.4 Detroit River International Crossing Project Scoring Form – Evaluation Factors

DRAFT
Detroit River International Crossing Project
Scoring Form – Evaluation Factors



How Important Are These Items?

We want to know how you value the seven evaluation factors listed below. To provide us your opinion, please rate them on the scale of "1" through "100", with the highest rating indicating the item you believe is most important. Draw a line from the dot (•) following each factor on the left, to the scale on the right, to indicate your opinion. It you choose, you can have all factors at the same point on the scale at the right. When finished, return your form to a project representative, or by email, or by fax at the addresses listed at the bottom of this form.

Your opinions will be used to evaluate the impacts of the Illustrative Alternatives of the Detroit River International Crossing Project. In that process the Detroit River International Crossing Partnership must also consider the project's Purpose and Need Statement (attached). Therefore, a proposed river crossing alternative's international and national importance from economic and travel/transportation (including freight) perspectives may be overriding considerations throughout the evaluation. Thank you.

Factor		Rating Scale
Maintain Air Quality	•	100
Protect Community/Neighborhood Characteristics	•	
Maintain Consistency with Local Planning	•	
Protect Cultural Resources	•	50
Protect the Natural Environment	•	
Improve Regional Mobility	•	
Assess How Project Can Be Built	•	0

Name of Person Completing Form: _____

Please return the completed form by July 31, 2005.

www.partnershipborderstudy.com
Hotline: 800.900.2649
Fax: 248.799.0146

CHAPTER 5

Case Study: Port of Long Beach (POLB), Long Beach, CA

As the eighth largest freight gateway in the U.S. and fourth largest seaport by trade value (BTS, 2009), the Port of Long Beach (POLB) in Long Beach, California and its adjacent transportation corridor are the focus of this case study. In this chapter, I summarize public participation and environmental assessment processes as described by community members and leaders and decision-makers in deliberations related to the POLB. First, I provide an overview of Long Beach, California, as well as nearby communities in Southern California, and a descriptive timeline of recent freight-related deliberations, summarizing central proceedings, policies, and players. Then, I describe the experiences, barriers, and catalysts of public participation in POLB and related deliberations, including those related to government- and community-initiated activities. Next, I describe the public experiences assessing and mitigating environmental health risks at each decision-making step, from determination of project need to scoping to the environmental assessment process. I draw key themes largely from the words of community members and leaders, supplemented with the words of decision-makers and clarifying information from policies, various media sources, environmental assessment documents, and other relevant materials. Finally, I include a discussion and key recommendations, offering interpretations of these findings as they relate to literature and practice and identifying larger implications for transportation planning and health.

About Long Beach, California

Demographic Shifts

Table 5.1 summarizes the demographic composition of Long Beach at three points in time, 1950, 1980, and 2010,[25] The numbers reported in this table suggest that major demographic changes in the population occurred over the last century. The total population continued to grow from approximately 251,000 to 462,000 during this time at a rate slightly lower than the overall U.S. population, which has approximately doubled in the last 60 years (U.S. Census, 2010). One of the most notable demographic shifts in Long Beach has been from a largely white population in 1950 (97%) to a much more diverse population today. Approximately 41% of Long Beach identifies as Hispanic, 14% as Black or African American, and 13% as Asian. Further, Long Beach is now home to the largest Cambodian population outside of Cambodia, where many refugees came during the late 1970's (Bunte & Joseph, 1992). On the east side of the city, there is now a neighborhood known as Cambodia Town or Little Phnom Penh (Tran, 2009). Overall, during the last thirty years, the proportions of the Long Beach's population living in poverty, unemployed, and having less than a high school education have all increased, from 14% to 19%, 13% to 22%, and 6% to 7%, respectively. The number of vacant households has also increased from 5% to 7%.

Living in a Port Community

Punctuating discussions of public participation and environmental assessment, many community members and leaders and local decision-makers described what it means to live and

[25] Three years, 1950, 1980, and 2010, were selected because U.S. Census data was readily available, and they allowed for a comparison over three equidistant points in time. In 1980 and 2010, the U.S. Census designated Long Beach as a 'place' and tracked data collectively for the city. In 1950, data were not collected in this way, but by tract within the county of Los Angeles. Using historical maps provided by the City of Long Beach (1950) and shapefiles provided through the National Historical Geographic Information System (NHGIS) (2012), 50 tracts that comprised Long Beach in 1950 were identified (303A-B, 304-318, 319A-B, 320, 321A-B, 322-326, 327A-G, 328, 329A-329D, 330A-330C, 332Aa, 332Ac, 332B-C, 333B, 333D, 335D, 335G, and 533B). Census data for 1980 and 2010 year was extracted from Social Explorer (2012) and for 1950 from NHGIS (2012). Data were pulled directly from decennial U.S. Census in 1950, 1980, and 2010. However, in 2010, 5-year estimates from the American Community Survey were used to generate data on income, education, and employment, as the 2010 Census did not include these variables. Due to changes in census tract boundaries over time, reported data should not be considered counts, but mere estimates to approximate overall community composition.

work in a 'port community.' Between 1943 and 1997, the U.S. Navy maintained a shipyard at Terminal Island which lies between Long Beach and San Pedro, Los Angeles' port district. Since that era, industry continued to change, with Long Beach transitioning into the port community it is today. A member of the Board of Harbor Commissioners summarized the City's recent history and POLB's current significance in his view:

> …people have awakened to the fact that right now in a very bad economic time, the Port is making jobs—lots of jobs—and they're excellent jobs, and they're union jobs. Wonderful pay. And this is paying off. The attitude over in the City is tremendously changed. People now take pride in the Port. If you drive across the soon-to-be replaced Gerald Desmond Bridge and then you cross over the Commodore Heim Bridge and then suddenly you're in Los Angeles…both sides of the roadway and the bridges, both sides, is this magnificent port system. With all those cranes and all those jobs. It's breathtaking. And I've known people who were here in the Navy in the 40's and 50's and the 60's, when it was a Navy base, a Navy yard, a Navy town, a port, a growing port, but not an important place. And now the shipyards are gone. McDonnell Douglas [later purchased by Boeing Company] over in Long Beach that at one time employed 50,000 workers is gone with one plant left for C-17s, which is modest by comparison. Our Ford plant is gone. Our Procter and Gamble plant is gone. Where we used to be an industrial community, we've become a port community.

The POLB grew tremendously in size and revenue beginning in the mid 1990's through the early 2000's. Today, one of every eight jobs (or about 30,000 jobs) in Long Beach is related to the POLB—a number posted on many POLB print materials and webpages and cited by many interviewees.

The port community includes and extends beyond Long Beach city limits. Unofficially, there are nearly 60 neighborhoods in Long Beach, and those closest to the POLB and related highway infrastructure include Arlington, Bixby Knolls, California Heights, Downtown, Memorial Heights, Los Cerritos, West Long Beach, Wilmore, and Wrigley Heights. However, as a community organizer based in Wilmington, along the I-710 corridor, explained, "So, the 710 freeway is a huge monster in and of itself…and the goods movement doesn't just affect the

communities at the ports. We're about 25 miles away from the ports and it affects us tremendously." The port region entails those cities immediately surrounding the POLB, the Port of Los Angeles (POLA), nearby rail yards, and the northbound I-710 and I-110, including Long Beach, San Pedro, Harbor City, Carson, and Wilmington.

Long Beach and surrounding areas host much industrial and transportation infrastructure in addition to the ports, as displayed in Figure 5.1. Major freeways include I-110 and I-710, which both intersect with I-405 north of Long Beach, as well as the local Seaside (47) and Terminal Island (103) Freeways. Approximately 20 intermodal facilities and 60 industrial facilities, which report to the EPA's Toxic Release Inventory, are within 5 miles of the POLB. The heaviest polluters in the region include the Tesoro Refinery, the ConocoPhillips Refinery, and the Valero Refinery all located in Wilmington; Marchem Technologies, a chemical Manufacturer in Long Beach; BP coke processing facility in Long Beach; and various fabricated metals facilities, including Aviation Repair Solutions, Valmont Coatings, and Maxima Enterprises (EPA, 2008).

POLB and Related Deliberations: An Overview

Key Players

The City of Long Beach's Harbor Department, comprised of 350 employees, manages the POLB whose policies are set by a Board of Harbor Commissioners. Appointed by the mayor for six-year terms, the Board of Harbor Commissioners consists of five members who can each serve two terms. Currently, the Board consists of members who are or were formerly a lawyer, a city planning commissioner, an engineer, a police officer, and a longshoreman. Previously meeting monthly, in May 2012 the Board announced in a press release, *Harbor Commission to Meet Twice Monthly: New Schedule Designed to Boost Public Participation* (POLB, 2012).

Leaders from private companies and labor unions are frequently engaged in POLB deliberations. The POLB is a 'landlord terminal,' leasing port facilities primarily to private tenants from China, South Korea, Hong Kong, and Japan. This structure allows the POLB to generate its own revenues— about $4.9 billion annually in taxes (POLB, 2012)—which supports the Harbor Department rather than tax dollars. Further, to carry goods beyond the port to the rest of the U.S., many trucking and rail companies have a presence or vested financial interest in POLB and related transportation deliberations. Burlington Northern Sante Fe (BNSF) and the Union Pacific are the major rail companies with rail yards in the region. The local trucking industry is diverse and largely represented by the Harbor Trucking Association and the American Trucking Associations. Many unions are also present at the POLB, primarily the International Longshore and Warehouse Local 13 and the International Brotherhood of Electrical Workers Local 11.

Non-profit organizations abound in Southern California, and many partially or wholly focus their efforts on the ports, the transportation corridor, or air quality, bringing their staff and volunteers into POLB-related deliberations. Interview transcripts and content analysis included references to the Greater Long Beach Interfaith Community Organization, Sierra Club, Natural Resources Defense Council (NRDC), San Pedro Democratic Club, Coalition for Clean Air, various homeowner's associations, Coalition for Clean and Safe Ports, East Yard Communities for Environmental Justice (EYCEJ), Long Beach Alliance for Children with Asthma (LBACA), Los Angeles Alliance for New Economy (LAANE), Coalition for a Safe Environment, and the Center for Community Action and Environmental Justice. Additionally, many university departments, centers, or institutes have grown involved in related research, including the Urban and Environmental Policy Institute at Occidental College and the Southern California

Environmental Health Sciences Center and Children's Environmental Health Center's Community Outreach and Education Core which is affiliated with both the University of Southern California and University of California Los Angeles (UCLA).

Finally, given that Southern California consistently experiences among the highest levels of air pollution in the nation (ALA, 2012) and is typically in non-compliance for National Ambient Air Quality Standards (NAAQS) (EPA, 2012), many state and federal agencies work closely with the POLB and nearby transportation agencies to improve air quality. These efforts include science and policy experts at the California Environmental Protection Agency, South Coast Air Quality Management District (SCAQMD), and the California Air Resources Board (CARB), where SCAQMD primarily regulates stationary pollution sources and the CARB regulates mobile sources.

Timeline of Recent Deliberations

Figure 5.2 depicts the sequence of institutional events that comprise key deliberations at and near the POLB over the last decade from 2002 to the present. While I focused on the POLB as a starting point in this case study, began with interview questions related to the POLB, and interviewed community members and leaders and decision-makers affiliated with the POLB, deliberations related to the POLB, the POLA, and the regional transportation corridor are all of great relevance to the host community at-large. Interviewees often discussed public participation and environmental assessment broadly, drawing on various deliberations as examples.

Built in 1911, the POLB has grown substantially from 800 acres to 3,200 acres over the last century. This has entailed ongoing infrastructure development, most recently including major projects such as the Middle Harbor Redevelopment Project and the proposed Pier S terminal development (POLB, n.d.). Approved by the POLB Board of Harbor Commissioners in

April 2009, the Middle Harbor Redevelopment Project is a nine-year, $1.2 billion project to modernize two existing terminals to reduce pollution. In April 2012, the Orient Overseas Container Line signed a 40-year lease for the Middle Harbor terminals. This is the largest lease ever at a U.S. port, and the development is projected to triple trade at the POLB. Pier S is currently a 160-acre vacant parcel of land where the POLB has proposed a new shipping terminal with a Draft Environmental Impact Statement (DEIS) open for review between September 16, 2011 and December 2, 2011 and a Final Environmental Impact Statement (FEIS) currently unpublished.

When discussing the POLB in the context of environmental health, one must note the physically adjacent POLA, which is the largest freight gateway (by land, air, and sea) in the U.S. and the POLB's economic competitor. During this study, the proposed development of the Southern California International Gateway (SCIG) emerged under POLA's jurisdiction, becoming a central topic during some interviews. At the edge of Wilmington and West Long Beach, the SCIG is BNSF's proposed $500 million rail yard where trucks would bring cargo from ships to place in railcars. The POLA published the DEIS for the SCIG on September 23, 2011 and opened it for comment until February 1, 2012. The POLA released the FEIS/FEIR on March 7, 2013.

Also during this study, a proposal to widen the I-710 was under review and referenced regularly by interviewees. In 2005, Metro, the Los Angeles County Metropolitan Transportation Authority, completed the I-710 Freeway Major Corridor Study to assess traffic congestion and mobility throughout the region. In 2011, Metro, in collaboration with the California Department of Transportation (Caltrans), Gateway Cities Council of Governments, California Department of Transportation, POLA, POLB, the Southern California Association of Governments, and the I-5

Joint Powers Authority conducted the DEIR/DEIS to identify strategies to address increased traffic. The study entailed an elaborate community participation framework with representatives from the 15 cities and unincorporated areas adjacent to 18 miles of the freeway corridor. Requested by community advocates, the Gateway Cities Council of Governments published an HIA for the I-710 Corridor covering six topical areas: mobility, air quality, noise, traffic safety, jobs and economy, and access to neighborhood resources. It was the largest reported transportation project in the U.S. to have an HIA to date, although its findings were not directly integrated into required environmental review documents.

The 'Green Port' Brand: Related Programs, Policies & Lawsuits

Over the course of the last decade, many notable programs, policies, and lawsuits have enabled a 'Green Port' "rebrand" of the POLB, including the Green Port Policy (GPP), the Clean Air Action Plan (CAAP), the Clean Trucks Program (CTP), and the Green Ships Incentive Program. These interventions have redefined the POLB, as well as the POLA, as models of environmental sustainability globally (Hricko, 2012), and some board and staff members describe them as "public relations successes." As a POLB staff member explains:

> And I think when we rebranded, and that's the [Green Port] logo that you see today, it really spoke to our evolution, you know? With community involvement and industry involvement, you know? I think when we did change our image it really allowed us to be more inclusive.

This rebranding was threaded through day-to-day operations at the POLB, reflected in the policies and programs that emerged over the last decade.

The Case of the China Shipping Terminal

As the biggest settlement in the City of Los Angeles' history, *Natural Resources Defense Council (NRDC) v. the City of Los Angeles* (2002) was a momentous court case that motivated establishment of Green Port brand at the POLB. As a landlord port run by the City of Los

Angeles, the POLA had entered into a contract with China Shipping and started to build a new terminal to accommodate 250 of the world's largest container vessels to greatly increase the region's trade volume (NRDC, 2002). After 18 months of litigation, the courts ruled that POLA had violated the California Environmental Quality Act (CEQA), and the China Shipping Project was not covered by the scope of recently completed EIRs as POLA argued. A legal advocate explains the implications of this case:

> And, so they said, "Okay, environmental groups, what can we do to get you to drop this lawsuit?" And we said, "You have to make the greenest port ever. Like, all these innovative technologies that no one's been doing, you have to demonstrate all of them." And it led to this huge settlement that I think totaled $80 million. And it included the port having to do what's called shoreside power, where the ships have to plug in when they get to the berth so instead of running their auxiliary engines and continuing to spew into the air, they'd plug in. That was huge that they had to start doing that. And they had to demonstrate different fuels, not just diesel, but natural gas, more electric stuff. It led to this huge mitigation fund that led to grants to the community to mitigate. And so that kind of started the whole, I guess the focus on the goods movement. I'd say in the whole country, focusing on it as a source of pollution, but also made the ports realize they couldn't get away with just continuing their operations without caring about the impacts because we would force them to not do that. And so the relationship of environmental groups and community groups and the Port of Los Angeles and the Port of Long Beach started out very litigious and very adversarial, and the ports felt very upset and for seven years during a time of exponential growth. The ports did not expand at all because every project—every expansion project would have required an environmental analysis and they realized they were doing all of their analysis insufficiently. So they had to go back and do all their analysis better, and they didn't start growing for another seven years, which is a really big deal. So now fast-forward to 2011, and the relationship between the community and environmental groups and the ports is totally different. There's still issues. It's not perfect. They're nowhere near where we think they should be, but it's way more friendly. It's way more collaborative. So, it's kind of a cool success story of the rule, I think, of litigation.

This case encouraged a shift towards greater community engagement and environmental efforts at both ports and, perhaps, freight gateways across the U.S. who may follow their subsequent policy and program examples.

Green Port Policy

In 2003, POLB staff and board members convened to discuss environmental programming, a conversation that evolved into the GPP. Adopted in January 2005 by the POLB Board of Harbor Commissioners, the GPP established programs, goals, and an implementation schedule to address six areas: air, water, wildlife, soil/sediment, sustainability, and community engagement (POLB, 2005). Strategies related to public participation included: an unveiling of the GPP at an open house, more meaningful mitigation measures (known as the 4M program), a jobs initiative including acting as co-sponsor of a job fair, community-based scoping with additional meetings in neighborhoods, and a "Goods Movement Academy" for high school students. The GPP also outlined 21 strategies for addressing air quality issues, such as the Green Ships Incentives Program that rewards vessel operators with dockage rate discounts when they slow down to 12 knots or less within 40 nautical miles of shore during at least 90% of their visits to the POLB.

Clean Air Action Plan

In 2006, in a collaborative effort, the POLB and POLA created the San Pedro Bay Ports CAAP as a strategy for reducing port-related emissions from all sources, including trucks, ships, cargo handling equipment, and rail. In 2010, the ports worked with state regulatory agencies to publish a revisited version of the CAAP (POLA/POLB, 2010), establishing San Pedro Bay Standards, which entail:

- By 2014, reduce port-related emissions by 22 percent for NO_x, 93% for So_x and 72% for diesel PM.
- By 2023, reduce port-related emissions by 59% for NO_x, 93% for So_x and 77% for diesel PM.
- In addition, the ports have developed a "health-risk reduction standard" that will aim by 2020 to lower the residential cancer risk due to diesel particulate pollution by 85% in the port region and communities adjacent the ports.

Clean Trucks Program

The POLB's CTP is a component of the CAAP that community members and leaders and decision-makers frequently referenced, describing its overwhelming environmental success. The POLB's CTP established a graduated plan for banning older trucks between 2008 and 2012, allotting $55 million for subsidized loans to trucking companies. A member of the POLB's Board of Harbor Commissioners credited private industry for their role in this environmental success:

> The base reason it was successful….it's the private industry that stepped up in a down economy and invested their own money into buying new trucks. And we used to have 1500 LMCs, licensed motor carriers. Some of them were mom-and-pop operations and they drove old beat up trucks. Now we have about 450 or 500 LMCs. But what is done is you've gotten rid of the bottom feeders and now you have a much healthier, stronger trucking industry in Southern California that can survive through the tough times because they've proven it. And they've invested over $700 million of their own private money into buying new trucks. It's amazing.

Remarkably, through this public and private leadership, the CTP reduced truck-related pollution by *90%* in three years.

Yet, the CTP was not implemented without controversy. The policy applied largely to drayage trucks, vehicles used for short trips from the port terminal to nearby rail yards or large distribution facilities. The establishment of "dray-offs" by some drivers or companies, as described by a community leader, was an immediate loophole:

> Where you'd drive a clean truck into the port− a clean truck that meets the program into the port. You would pick up a container cargo. You'd exit the port, and you'd stop somewhere, like on the side of the road and transfer your cargo container to a dirty truck. And the dirty truck would do the rest of the route, right through the community. And then you and your clean truck would go back in.

To address this community health concern, the POLB established a financial penalty for dray-offs in 2011.

Also, conflicting labor issues underlie the CTP, as the wife of a truck driver offered background context:

> ...being a truck driver, doing that drayage used to be a very middle-class sort of job. You would own your own truck, you would be an independent owner-operator, like an independent contractor, and then different trucking companies would hire you to pick up a load. And so everything was fine. Then in the, I guess it was in the 90s, the trucking industry got deregulated. And so the industry totally changed. After the Clean Air Action Plan, when they were looking at this, there was trucking companies that would hire these independent contractors and they would pay them not very much, and there was a lot of these drivers and so there was like, a huge supply I guess you could say, and so they weren't paid very well and so then because they weren't paid very well their old trucks weren't maintained very well.

In 2008, the Consumer Federation of America, the League of United Latin American Citizens, LAANE, and the National Association for the Advancement of Colored People co-authored a report, *Foreclosure on Wheels: Long Beach's Truck Program Puts Drivers at High Risk for Default*. The Coalition for Clean and Safe Ports also formed, as a coalition of environmental, labor, public health and faith-based groups. To address what some deemed "sweatshops on wheels," these coalitions advocated for supporting local truck drivers under the CTP. To address these concerns, the POLA and POLB included provisions in the CTP that trucking companies must employ drayage drivers, rather than relying on them as contract workers who may not be able to sustain the costs of "parking fees, tariffs, gas," and newer trucks. However, the American Trucking Associations challenged this arrangement as a threat to interstate commerce, an issue that remains unsettled in court.

Public Participation in POLB-related Deliberations

The following sections describe what public participation looks like in the context of these POLB and related deliberations, including institutionally and community-driven approaches as well as the barriers, catalysts, and evaluation of these approaches.

<u>Institutionally Driven Participation</u>

Community members and community leaders discussed two kinds of public participation at the POLB, ongoing and project-specific. Led by the Communications and Community Relations Division, ongoing activities at the POLB are extensive, including harbor tours, sponsored events, speakers, Pulse of the Port (monthly video episodes about POLB happenings), Tie Lines (a monthly newsletter), Re:Port (a quarterly newsletter for the greater Long Beach community), and various educational opportunities. In these efforts, the POLB has developed scholarships, high school curricula, internships, and field trips for students. More specifically related to development at the POLB, ongoing opportunities for public participation include biweekly public Board of Harbor Commissioners' Meetings, Let's Talk Port (a series of semi-regular interactive forums started in 2008 designed for the public to ask general questions), and monthly environmental meetings attended by the POLB's Department of Environmental Affairs and Planning staff and local non-profit leaders. Finally, project-specific participation opportunities vary by project but all minimally include those required meetings associated with the CEQA/NEPA process, during Notice of Preparation at the scoping phase and during the public comment period following the publication of a DEIS/DEIR. POLB staff noted that they typically schedule many more meetings than required, however, as one staff member explained:

> We do extra public hearings. We have one this evening. We'll have one next week. We open ourselves up to come and present at community meeting for Q and A. We have an open door policy. There's so many different ways of getting information and listening that I don't believe other agencies do what we do.

The POLB devotes many resources to engaging this port community at large.

Some Long Beach residents are also selected to participate in POLB or related deliberations through formal, structured opportunities. For instance, in 2011 the POLB established guidelines for their Community Grant Mitigation Fund. A mayor-appointed advisory committee selects grantees and is partially comprised of Long Beach residents. The POLA has a

Port Community Advisory Committee (PCAC) comprised of representatives from resident associations, colleges, community organizations, elected officials, business and industry groups, organized labor, and air quality agencies. Started in 2001, the PCAC meets monthly to assess project and non-project-specific POLA impacts, review environmental documents, and provide recommendations. Similar to POLB, POLA has a Community Mitigation Trust Fund that is facilitated by an independent Harbor Community Benefit Foundation led by community leaders. For the I-710 Corridor Project, decision-makers developed a complex Community Participation Framework entailing Local Advisory Committees (LACs) in each of the 14 corridor cities with members "drawn from impacted neighborhoods," as well as three subject working groups, a corridor advisory committee, and a technical advisory committee, each comprised of various stakeholders including LAC members (Gateway Cities COG, 2006).

Community-Driven Public Participation

When asked how they participate in transportation decision-making related to the POLB, community members and leaders often responded by describing various community organizing strategies rather than aforementioned institutionally-led opportunities. While many discussed their participation testifying in CEQA/NEPA related hearings or meetings, community leaders organized many community-driven strategies independent of these institutional opportunities. Residents engaged in many diverse activities, including: contacting journalists to address misinformation or share community perspectives on port-related issues; writing newsletters or brief summaries of proposed developments in basic terms with information about public participation opportunities; investigative student reporting of illegal dray-offs (Scinto & Guenther, 2010); targeting advocacy at elected officials to influence the Board of Harbor Commissioners' decisions; collecting signatures to bring to a project-specific hearing; bringing

petitions against development projects to elected officials; suing city governments for non-compliance with environmental laws; writing thank you letters to POLB staff or elected officials for specific policy decisions; advocating for the creation of a community advisory board; leading community workshops to describe DEIS/DEIR findings; maintaining a hotline for community members to call regarding environmental health concerns; sending letters to private interests involved in a development; collaborating to draft comments on environmental assessment documents; conducting research (e.g., air quality monitoring); starting organizations to participate in transportation deliberations; using social media to promote messages; leading 'toxic tours' with residents, researchers, and elected officials; organizing and training community members to testify at government meetings; coordinating rallies or protests of proposed developments at various events; going door-to-door or calling neighbors to inform them of proposed developments, sometimes in Spanish or Cambodian; engaging youth in leading outreach and education opportunities; and training community members as researchers or community ambassadors on goods movement issues. One resident also described gang involvement in these issues, describing an illegal community organizing strategy used to vandalize trains and stop them from running or idling through a Long Beach neighborhood, "24 hours a day":

> Somebody goes and punched a hole and breaks the sight glass which covers it, tells you how much fuel is in it. Guess what happens when 1000 gallons worth of diesel dumps onto the ground? After about three trains with the sight glasses broke, they had to pay $25-$30,000 to clean it up every time. Railroad quit parking trains down there.

A diverse contingent of the port community is engaged, sometimes tirelessly, to address freight's implications.

<u>Catalysts</u>

As a primary catalyst for increased public participation, community members and leaders and decision-makers recognized "a new era" and "cultural shift" at the POLB in the last decade or so. As one POLB staff member explained, "We hadn't even held public hearings for most projects. Now we are routinely doing EISs and having public hearings. We have hundreds of people there to comment on these proposed port projects." Another POLB staff member explained how this increased public participation now helps to achieve a "license to operate," a term in the field of corporate social responsibility figuratively referring to gaining trust, credibility, or acceptance within a community (Gunningham, Kagan, & Thornton, 2004). He explains:

> And so we realized that you've got to have that if you want to be sustainable. You want to have a license to operate. You may have already heard this term, but we kind of use that term around here a lot. A license to operate from the community and a license to operate from our elected officials. Which basically is kind of a nod that says, "Alright, you're doing the right thing. You're not perfect, but we know you're doing the best you can, and you're moving in the right direction."

According to a diversity of interviewees, this shift has been a result of many converging factors: a "proactive response" to the POLA's China Shipping lawsuit, an increased effort "to measure and be transparent and informative," a "very vocal" community to maintain a sense of accountability, society's shift towards an "electronic" or "information" age to make environmental assessment documents more accessible, a "period of exponential growth" to generate revenue for public participation and mitigation activities, and a "generation of leaders who prioritize environmental stewardship" and "go beyond compliance."

Community members and leaders reported an extensive list of catalysts to public participation processes led by government staff or project consultants. These include making information (e.g., past agendas, minutes, review documents) accessible in multiple languages and locations, coordinating diverse opportunities for project and non-project-specific participation,

directly receiving written responses to their comments, holding ongoing monthly environmental status meetings, inviting a variety non-POLB experts to forums for deliberative discussions, having meetings at public locations (e.g., community centers, schools) rather than the POLB offices, sharing measures and data on environmental efforts that "translate into transparency," crediting residents and community leaders for their role in environmental decision-making, and having broad media coverage announcing upcoming key events.

Among these catalysts, perhaps the most frequently discussed were non-project-specific events or forums as opportunities for interaction with POLB staff or board members. Residents explained that project-specific hearings could be "more intimidating or less known" or heavily attended by industry and business interests, whereas regular non-project-specific meetings or events were an opportunity for, "group learning—when they have port community meetings and people can hear other people's thoughts and concerns." In particular, community leaders discussed the advantages of the monthly environmental status meetings, which are typically led by one or two POLB staff and attended by non-profit leaders but also open to the general public. A POLB staff member explains how he perceives their purpose:

> It's not project-specific. It's just what I call the monthly environmental meeting, and the primary purpose of the meeting is to provide updates and have a forum to discuss a variety of port-related environmental, goods-movement— whether it's our existing programs or even a way of giving updates on future programs. I have a counterpart, and I allow the stakeholders to develop the agenda. It's not my agenda. It's their agenda. And, over the last two years we've been able to provide different presentations that maybe they would not have gotten in a formal setting that allows for a lot more Q and A in an informal setting. It's a formal presentation but an informal setting to be able to ask questions and get straight answers about things and a continual—what I would call— level of accountability. We have these programs, and they wanted a status. Well, what's the status? You told us you were going to do this and, well, this is where we are. And, we're able to explain in a very candid fashion without having to, you know, use code or in a public formula— oh, we'll get back to you, you know? And, it just sparks a different level of communication.

While recognizing that there are frequently conflicts, arguments, and tension among community and government representatives during these meetings, community leaders spoke favorably of "the open dialogue," the opportunity to get a "heads-up of projects in the pipeline," the space to "share information without as much bureaucracy," and being asked "the best way to do outreach."

Described by community members and leaders, catalysts to enable community-driven public participation were similarly extensive. These include unpacking and navigating the ever changing local political structure to strengthen advocacy efforts, conducting ongoing community-led education on POLB-related issues and advocacy strategies, obtaining funding from place-based foundations (e.g., the California Endowment), forging productive relationships with POLB staff, disseminating messages through diverse networks across the region, and identifying credible leaders to lobby decision makers or educate the public. To maintain a consistent, strategic movement, many community leaders explained how they dealt with or prevented burn-out among active residents when concurrent deliberations were calling for their attention, knowing in which instances to rally everyone:

> We had about 500 people. We can rally the troops. What happens with a lot of groups, when you're talking about groups. They tried pounding the people. Attend this meeting. Attend that meeting. Attend this meeting. They burn out. What our theory is on working with the community is why should everybody else have to attend all these out of the way meetings that are really not that important. I attend most of the meetings representing our group. And then when we have a big one and we need everybody, then they're more willing to come out to them.

Also, there were many types of partnerships described as catalysts to community-driven participation processes, which have built capacity, broadened perspectives, increased credibility and access to research findings, and strengthened organizing networks. Interviewees described productive "Blue-Green" partnerships between labor and environmental groups, academic-

community research or organizing partnerships, and partnerships among residents and organizations along the region's transportation corridor.

Barriers

Yet, public participation at the POLB is not without conflict or barriers. Community members and leaders reported a broad list of barriers to public participation processes led by government staff or project consultants, summarized with examples in the words of interviewees in Table 5.2. In brief, barriers include: insufficient time or outreach for public processes; language barriers at public events (e.g., inaccurate translation, translated testimonies needing extra time but not allotted); uncertainty of how, when, or where to participate in institutional opportunities (e.g., "It depends on the project or who's sending it out."); difficulty understanding or communicating technical information (e.g., environmental assessment documents); differing goals among board, staff, and the community; participation that does not reflect the residents of the most affected neighborhoods (e.g., industry representatives on neighborhood councils, residents hired by industry to testify); logistical barriers to participating in events (e.g., scheduling issues); feeling unheard, discriminated against, or disrespected during public forums; feeling like public participation forums are "just a big PR event"; and frequent use of 'overriding considerations'[26] to override large segments of public opinion. Community members and leaders also mentioned political challenges that commonly constrain advocacy efforts, particularly engaging: 1) decision-makers who work but do not live in Long Beach and may be less invested in community issues; 2) decision-makers in nearby jurisdictions who make decisions that may

[26] CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable," (CEQA, 1970).

also affect Long Beach residents but may be harder to access; and 3) politicians who may prioritize re-election issues over long-term community issues.

Further, while many discussed the POLB's transparent and accessible information as a catalyst for public participation, many also noted ways that outreach and information sharing could be improved. As a local consultant expounded:

> It doesn't hurt to engage all kind of age brackets, you know? Go to kids. Go to schools. That is something I don't think planners do a lot of. It's not for lack of wanting to or lack of realizing it's important, it's just for lack of staff time. There's only so much you can do. Which is why the electronic means are so important because they are relatively low cost, but still who are you sending it to when you put it on the website?

Some residents discussed failure to conduct outreach to specific affected populations. For instance, after the POLB banned dray-offs, community leaders were concerned that truck drivers were not informed and continued to run trips as directed by their management, "Is the average truck driver checking the tariff for the Port of Long Beach? Are they checking the agendas for the Port of Long Beach harbor commissioners meetings to see what's been adopted? No." Other residents explained how, as they understood them, current outreach rules have been insufficient, "Basically, if you don't know of the groups that are following these things or if you don't happen to live close enough to a project where you've gotten one of those notices…" you may not learn about public participation opportunities, whereas local polices mandate that "…you only have to notify people within 500 feet of a project." While the POLB creates many opportunities for public participants to engage, community members and leaders were concerned that those in the most affected communities are not always reached.

The goals of board members, staff, and the community vary and this underlying variation may complicate deliberations at the POLB. A community member explained how the POLB's staff is "usually like really open with us…but sometimes they get directives from their harbor

commission or the board, and so they don't always do the work that we would like." Alternately, another resident noted:

> The sometimes over-reliance from commissioners on port staff, I think, complicates things and I'm not sure that staff always represents, or always gives information to the board that is to the benefit of all. It may be to the benefit of the Port of Long Beach, but not necessarily to the benefit of the city or the region or the community. I'm not suggesting that staff is against the community, but they want to run this as a business.

Similarly, a federal agency employee involved in many POLB assessments described how public forums and comment periods associated with CEQA and NEPA are not always intended to reconcile community members' concerns. He explains:

> Well, to be perfectly honest, at a lot of the public hearings we're getting into issues that are so far away from our authority under the Clean Water Act and Section 10, at some of the latest hearings people have talked about the need for filters in homes…if you start to look from a federal agency standpoint, you know, there's operation at the actual terminal and then you start to talk about these indirect or secondary effects in the community there, I mean, I couldn't even begin to address that as part of our permit action, but we go to the public hearing, we listen, and the port is there as well.

Members of the board, staff, and community each carry varied (sometimes incongruent) expectations or goals into a public deliberation, where related environmental, economic, social, and policy considerations may sometimes go unspoken.

In addition to the barriers posed during institutional processes, there were many other community or individual barriers that emerged for those organizing around the POLB and related development deliberations, seen in Table 5.3. These included: competing life priorities among residents and allies; an underlying 'jobs vs. the environment' rhetoric; feeling misled or "tricked" by private interests; having advocacy limited or dictated by private or public funders; turf issues among community-based organizations; and the tiresome nature of ongoing, long term public participation. In particular, family and work obligations were often cited as a reason many did not have time to remain continuously active in the POLB and related deliberations. Related to

this challenge, community members and leaders discussed how tiresome public participation regarding the POLB could be given the long term, concurrent development that happens there. One mother heavily involved in environmental advocacy in Long Beach explained, “So, I'm stretched thin. And then, recently I haven't been involved at all because I'm sick. It probably won't be as much as it was before because that was part of why I got sick.” Another resident explained, “But you know, a lot of this stuff is an exercise in beating your head against a wall. And how much of that can you take? You know, at some point you just get exhausted by it.” A community health worker and Long Beach resident further summed up the long term, unremitting nature of these processes by saying, “You never finish with these kind of things.”

Residents in Long Beach also frequently discussed barriers related to organizing in a port community where many private stakeholders are engaged in deliberations. Running parallel to a national dialogue (Rich & Broder, 2011), residents frequently described being caught in a ‘jobs versus the environment’ discourse. A Board of Harbor Commissioners explains how he sees the local economic impacts of the POLB:

> But there is another benefit that we get out of the local hire component, and it's the person that lives down the 710 corridor that has nothing better to do all day than complain about the port and noise and the pollution, because he doesn’t have a job, but if we put him to work, all of a sudden he starts to believe, “Hey, the port is the reason why I have a job here. Maybe I should be a supporter instead of an opponent.” That is the benefit of believing in social responsibility because when the EIR goes to the City Council because it was appealed someone isn’t speaking against it, they're speaking for it. Because they get a job out of it.

This local decision-maker’s statement suggests that if you are employed at the POLB, you should not express concerns for environmental health. He also signifies how the EIR process may be more about the larger discourse between a project’s supporters and opponents than the merit of the environmental assessment and its findings. A resident explained how this debate creates confusion or tension between residents:

> Sometimes they [developers] mention to the community, "Yeah, we are going to do this. But, don't worry, we will plant trees, and we'll plant more green." They bring pollution. It's like, you know, come on! So then when our group tells the community, "You know what this group wants to do in your neighborhood? Demolition. Your house and the apartments and planning to spread the freeway or railway." And, you know. It's like the people who live close to those areas don't know nothing about it. And they say, "You're going to have jobs." They don't ever explain that these will be temporary.

Others described how this affects public participation:

> Then, the other thing that makes people be quiet in Long Beach is we're being made to feel guilty because most of these projects are supposed to be good for the whole region. It's like, okay, if you don't want that. You're just a NIMBY. And, it's just so good for the whole region...100s of jobs and trade is growing. And, especially those people that live right there are just supposed to move, I guess, if they don't like it. But, I guess that's what it is. And, that's why a lot of people don't speak up either.

Alternately, a consultant who works closely with the POLB also expressed how industry groups face challenges when participating in public forums, "And, it is not just community members who are intimidated. It is business community members that sometimes feel intimidated too and don't feel like they can speak frankly in a multi-stakeholder environment." In public discourse, job security and environmental protection are framed as contradictory goals, perhaps impeding some residents from speaking up and stalling discussion of productive integrated 'win-win' strategies that may serve both economic and environmental interests.

Evaluating Public Participation

While there was no comprehensive evaluation of public participation, the POLB's Communications and Community Relations Division conducts biennial evaluations of their communication efforts. Each year, this Division identifies a consulting firm to conduct a telephone survey of public communications and perceptions. In 2011, 1,000 residents were selected at random, proportionately weighted by population across Long Beach's nine districts (True North Research, 2011). Residents were asked about quality of life in Long Beach, where

they get their information about current events, changes they would like to see made by local government, and perceptions of the POLB. Related to environmental issues, the report states that 58% of respondents agree that the POLB cares about the environment. The report also reads, "Concerns about pollution and environmental impacts appear to be the dominant reason why some voters held an unfavorable opinion about the Port, (p. 5)." When asked what one thing local government could do to improve the City of Long Beach, respondents ranked unsure (16%), improving education (12%), improving police and public safety (8%), improving streets (8%), cleaning of the city (8%), improving job opportunities (8%), and reducing pollution (6%). One communications specialist for the POLB interpreted general polarizing opinions, "Either they're in favor or they're not in favor of our operations and so you have folks that truly love the port and they will support it 110%, yes. Like, this is my seaport!" In 2012, the POLB won many accolades for their communication efforts, including a Telly Award and acknowledgements from the national City-County Communications and Marketing Association (POLB, 2012).

Assessing and Mitigating the POLB's Environmental Health Risks

Two related but distinct policies drive environmental assessment and mitigation at the POLB during transportation deliberations: NEPA and CEQA.[27] NEPA and CEQA assessments are often conducted simultaneously with release of joint documents. At both the POLB and POLA, after projects are approved in a Record of Decision through NEPA and CEQA, the respective Board of Harbor Commissioners must then vote for their approval followed by a final City Council vote.

[27] CEQA and NEPA are similar policies, but do have some distinct requirements (CA Governor's Office of Planning and Research, n.d.). CEQA guides the development of an Environmental Impact Report that aligns closely with NEPA-required Environmental Impact Statement. CEQA includes regulations to ensure outreach is done locally in local newspapers, for instance. Unlike NEPA, CEQA does not require each project alternative have an equal level of analysis. CEQA requires discussion and adoption of project-specific mitigation measures, whereas NEPA must discuss mitigation measures for each project alternative but adoption is not required. Finally, while NEPA must discuss "growth inducing effects" for each project alternative, CEQA requires discussing these when outlining mitigation measures.

More than half of interviewees described how recent litigation at the ports has driven increasingly intensive NEPA/CEQA processes. Interviewees explained that the "new regime" and "wake-up call" in the EIS/EIR process since the mid-2000's has led, for better or for worse, to various implications, including: 1) inclusion of additional cumulative effects and projection methods and analyses, increasing information for public and private stakeholders; 2) additional costs to conduct studies, between $30 and $35 million for large projects; 3) longer and more complex documents with increased risk communication opportunities and challenges; and 4) additional time required to conduct EIS/EIR, entailing long-term public participation and slower economic growth. Noting how EIS/EIR documents have evolved over time, an engineer at a federal agency who leads many assessments at the ports explained:

> I mean, these port documents are getting longer with litigation…and then we throw in the technical appendices…they'll be three big binders easily. But in those [state guidelines], it says that an EIS shouldn't exceed 250 pages or something like that. It's a little less than 25 years ago, but that was kind of the standard. It's hundreds of pages, not thousands of pages. And certainly the port documents are getting up into the thousands of pages….There's a joke that most people don't even read the EIS/EIR. They turn to the finding of what's a significant impact and then they would go and look at those parts of the document and look at the mitigation measures and see if they think the mitigation measures have gone far enough…the environmental process, it's getting fairly out of control.

When asked how long EIS/EIRs usually take, he responded, "I guess two to three years with variability of one to eight years." These shifts have implications for how the public engages in environmental assessment, reflected by the aforementioned catalysts (e.g., sharing measures and data) and barriers (e.g., difficult to communicate or understand technical information) for public participation.

Because the POLB and surrounding transportation-related infrastructure has recently been under continuous development or deliberation, many community members noted the complexity of engaging in multiple projects that may vary in leadership, assessment methods,

and public participation requirements, necessitating many areas of expertise from community leaders. As one resident said, “I mean, every time you blink your eyes there's another EIR. You just cannot stay on top of it.” These next sections provide some additional contextual background, using examples of assessment and mitigation from the Middle Harbor Redevelopment Project. At length, these sections explore the considerations, experiences, and role of community members and leaders and decision-makers in scoping, assessment, and mitigation at and near the POLB.

Determining Project Need and Scoping

Community members and leaders gave little mention of how a specific project’s need is determined at the ports and surrounding transportation infrastructure, although there was frequent discussion of overall trade, traffic trends, and global competition. Many decision-makers talked about the expansion of the Panama Canal as motivation for further development at the ports and surrounding infrastructure, accompanied by the need to get ‘Big Ship Ready.’ As various elected officials and POLB staff members explained, ships that once could not go through the Panama Canal will soon be able to make their way to places along the Gulf or East coasts from Asia. As their website boasts, “already outpacing the yet-to-be-completed Panama Canal expansion (POLB, 2012),” the POLB is preparing for 150,000 ton ‘Big Ships’ by building higher capacity cranes, deepening channels and terminals, and reinforcing berths to hold heavier loads. This plan for trade growth at the POLB may drive some assumptions, projections, and, thus, findings for environmental assessments, as a consultant who conducts EIS/EIR reviews in the region explained:

> But you know, usually when we do our cumulative effects analysis, usually the port is very optimistic, you know, booming economy. They're doing all their expansions and upgrades because everybody is having maximum through-put or optimized through-put, and so I think we try to be conservative, and we don’t assume that there's going

> to be a recession or anything like that. We kind of assume that it's going to be business as usual, continued growth, continued expansion of cargo.

A federal policymaker involved in POLB's EIS/EIR processes expressed how getting 'Big Ship Ready' is changing freight deliberations everywhere:

> …the issues that we're having in our ports that started 10 years ago, we're getting actually other districts calling us up saying, 'We've got some big marine terminals and we're thinking we'd better do an EIS,' and so they're asking for some guidance and input because the next major change is the Panama Canal…

Global macroeconomic forces are initiating local deliberations more than ever before and, ultimately, driving environmental assessments.

Only a handful of interviewees mentioned projects' official Notice of Intent[28] or scoping[29] processes for local transportation deliberations. A few extremely active residents explained that their average neighbor might not always be aware of a project so early in a deliberation or understand the purpose of scoping. Yet, one lifelong resident described the scoping meetings as "extremely critical" as an opportunity to go on record, "you've got to get your points in because to go for that lawsuit you've got to make sure you have standing, and that means you have to bring it up." Another resident makes it her job to educate her community when a project is "down the pipeline," as she writes brief one-pagers or editorials "to help the community understand—What's a scoping meeting? Why is this important? Why should you be there? You know, this is when they decide what's in, what's out." Often, residents learn about a project after a scoping meeting has happened.

Scoping can be an opportunity to promote specific alternatives, which will later be outlined by decision-makers in the DEIS/DEIR. In the case of POLB, POLA, and the

[28] Notice of Intent (NOI) is required by CEQA and Notice of Preparation is required by NEPA. These are the first steps that must precede the preparation of a Draft EIS/EIR.
[29] Scoping is a process of announcing a potential project to collect key considerations from the general public and relevant government agencies. While CEQA does not require scoping meetings, this is common practice at the POLB and POLA.

surrounding transportation infrastructure, alternatives may be locations or they may be new technologies. For instance, in the case of the Middle Harbor Redevelopment Project, alternatives in the FEIS/FEIR included marine terminal automation, expansion of marine terminals outside of POLB, or construction of a new near-dock intermodal terminal. Two suggestions for project alternatives were echoed repeatedly in interviews, hearings, and public comments throughout various deliberations: movement towards zero-emissions projects, such as electrified drayage trucks, and on-dock rail to more directly link ships to trains with reduced need for drayage truck traffic in the port region. In fact, displeased with the alternatives outlined in the DEIS/DEIR for the I-710 Corridor Project, community members are advocating for a 'Community Alternative 7' entailing increased public transit and a zero emissions freight corridor (CEHAJ, 2012; Kato, 2012).

Environmental Impact Statements/Environmental Impact Reports

Environmental Health Concerns

In general, EIS/EIRs related to the POLB, POLA, or surrounding infrastructure assess health impacts in a variety of ways. For instance, in the Final EIS/EIR for the POLB's recent Middle Harbor Redevelopment Project, health is discussed extensively in the 42 page Executive Summary and is the focus of the 248-page appendix, *A-3 Health Risk Assessment,* among other places. The Executive Summary reviews a variety of project impacts including many related to health in the context of air quality, public services and health, noise, hazardous materials, recreation, and EJ, as well as cumulative impacts related to these topics. In terms of air quality, the EIS/EIR declared that: 1)VOCs, CO, NO_x , PM10 , and PM2.5 emissions from project construction would exceed SCAQMD's thresholds; 2) under NEPA guidelines, unmitigated, the project would exceed various SCAQMD annual average daily operation emissions; and 3) the

project's GHG emissions would exceed the CEQA threshold. However, the project would actually "produce lower average daily operational emissions of criteria pollutants compared to the CEQA Baseline levels in 2005." Further, in Executive Summary's section on EJ, the report acknowledges that:

> Construction and operation of related projects in the POLB and POLA region would increase the potential for cancer and chronic non-cancer health risks. Because the populations in closest proximity to the Port are predominantly minority and disproportionately low-income, this elevated cumulative risk would represent a disproportionately high and adverse impact on minority and low-income populations. (p.25)

In this health risk assessment quantifying air emissions, consultants identified nearly 150 sensitive receptors locations (e.g., schools, hospitals, daycares, senior centers), conducted dispersion modeling to estimate exposure at these locations, and estimated health impacts using a cancer risk calculation, chronic hazard index, and acute hazard index.

Across various port-related deliberations, community members and leaders expressed many health concerns, questioning analyses, thresholds, and conclusions, while emphasizing health issues or vulnerable populations they felt were overlooked or insufficiently acknowledged. They discussed a variety of health implications, primarily asthma and cancer, while some referenced other chronic symptoms exacerbated by living near major freight infrastructure:

> And then you could get used to it and that you could sleep through it or it could be an alarm for you, whatever, but your body is never going to get used to it and you're going to start to see the health impacts either in the form of allergies, constant headaches, or you're going to see your neighbors drop like flies because people are dying from cancer.

Several residents referenced cancer prevalence near the ports, as one said, "To me, the number of additional deaths, additional 3000 deaths, it's like a 9-11 every year just from that port pollution, you know, in terms of the scale," and another resident commented, "3,000 deaths a year is a statistic from the government. We have more people than died in 9/11 that die every year…It's

just it didn't happen at once so we could get a photo of it so people don't quite realize." A policy expert with SCAQMD explained that this reoccurring number in interviews and public comments originates from Multiple Air Toxics Exposure Study (also known as MATES I-IV), a series of studies that model air quality and estimate carcinogenic risk near the ports. An interactive online map shows cancer risk by parcel, displaying areas near the POLB where estimated cancer risk reaches its highest for the SCAQMD region at 3,692 cases per million (SCAQMD, n.d.).

Additionally, community members discussed other health risks they felt some decision-makers dismissed during freight deliberations. For example, one resident of San Pedro called for studying the psychological impacts of land use, "We live in a blighted area. It has an impact. It has an emotional, psychological impact that is pervasive in a person's life if they grow up with it." Residents near the proposed SCIG were particularly concerned with potential increase in noise levels of a proposed rail yard, since many of them already live near the Union Pacific rail yard and intermodal facilities. A West Long Beach resident shared how he tried to clarify common comparisons made by some decision-makers and private stakeholders, noting how living by a rail yard carried a much larger noise burden than living near a railroad tracks or truck traffic.

Given the currency of the I-710 Corridor Project and the SCIG, community members and leaders repeatedly expressed concern that these projects run through West Long Beach near sensitive receptor locations, impacting vulnerable populations. Hudson Elementary School, which sits between the I-710 and the Terminal Island Freeway and adjacent to a rail yard and an oil refinery, is a common stop on toxic tours led by community organizers in the region (Cone, 2011). At this school, teachers do a "sniff test" to determine if the air appears too toxic and

students should come in for recess. A Hudson Elementary student's grandfather critiqued current state policy meant to protect students in the context of land use deliberations:

> …somebody said, what are you, a tree hugger? I go, "No, I'm a realist." I'm not an environmentalist. I know you cannot put rail yards next to schools where kids got to breathe the air, and you've got kids, 50% of the kids in school have asthma…when it's affecting kids, it's not logical. The State of California, you cannot build a school next to an industrial area, but you can build an industrial area next to a school. So what's the logic behind that?

In his blog, another community leader drew comparisons to the Tuskegee Syphilis[30] experiment, arguing that decision-makers "must stop the experimentation on what are the bounds you can stretch the respiratory health of these children (Martinez, 2011)?" A few interviewees noted, however, that there were also many health concerns for adults, particularly longshoremen or truck drivers at the ports, populations they were worried got minimal attention or resources. As expressed by one resident, "We have no organization willing to take a stand on adults with asthma. But those children, it's funny how, most of them are going to turn 18 at some point, and they still have asthma."

Community members and leaders questioned assessment methods and their implications for various EIS/EIR processes. Some were concerned with the geographic scope of analysis, as one West Long Beach resident questioned the SCIG's findings:

> "They're judging their cleanness, they're saying we're going to take a million trucks off the freeway. Well, they're basing over a regional area. Well, yeah, if you're living next to it, it's going to have a major impact. How can you have 10,000 more trucks on the I-710 with this project and then have no significant impacts or tell me you're going to have 50% reduction?"

[30] The Tuskegee Syphilis Experiment is an infamous study conducted by the U.S. Public Health Service lasting 40 years from 1932 until 1972 (Jones, 1981). Researchers studied syphilis in approximately 600 African American men, failing to treat them when it became known that penicillin was an effective treatment option. This study, in addition to other notable investigations with similar ethical violations, led to the creation of a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.

A consultant who conducts EIS/EIR reviews explained that this scope is determined, "case by case." Others were concerned with the "simplified view" of traffic models that suggest a negative change in emissions. And, others referenced studies that show how increased capacity leads to increased traffic, which is not always accounted for in EIS/EIR analyses. Also, for many, there were feelings of discomfort when talking in terms of thresholds, measures, or acceptable risks. A resident who has followed many regional deliberations discussed this:

> Now they're saying it could be cancer, and they consider 10 deaths in a million acceptable loss,[31] the Port of Long Beach and the Port of Los Angeles on the EIR studies. Well, we look at it, one death in a million. How about if it was your kid? Or someone in your family that got cancer or asthma?

While a proposed development may improve air quality and meet guidelines for acceptable cancer-related losses regionally, residents wanted specific projections and real conversations about how a development would more locally affect their neighborhoods.

In this vein, many agency staff and consultants discussed their struggles to conduct and communicate the appropriate amount and type of health-related analyses in their EIS/EIRs that are often dictated by state and federal policies. For instance, a POLB staff member explained how the longer the EIS/EIR process, the older baseline data becomes, triggering public critiques. Another federal employee working on many POLB EIS/EIR documents also explained how more sophisticated EIS/EIR processes may project air quality or traffic farther into the future, but "the further into the future you go, less reliable the model is going to be." A local transportation consultant described a methodological "catch-22" of local EIS/EIRs, requiring a "kitchen sink" approach:

[31] In 2006, the SCAQMD adopted thresholds to determine whether a projected health impact for a proposed land use development is 'significant.' POLB later adopted this standard for use in port-related decision-making. According to these thresholds, a 'significant' project impact for incremental cancer risk is 10 or more cases per million (POLB, 2009).

> Because you can sue readily under CEQA. The catch-22 is, if you, what we're starting to do is let these things balloon…you throw in the kitchen sink. Everything's in there. You can't say we didn't talk about 'x.' You can't say we didn't talk about 'y.' We did talk about it. It's right here. But, when you put the words out on papers, somebody says, "Oh, well you didn't do it right. You left this out. You did x, y, z wrong." You're damned if you do and damned if you don't.

Recognizing these many issues, a POLB employee noted the risk communications challenges accompanying this complexity:

> …we're at another turn and that is, we're, you know, five, six years ago, maybe even a little bit further back, we were scrutinized by a lot of the same critics that are saying it's too complicated now, that were saying we weren't doing enough. And what we did was, we went back and we went to ultra-conservative. We got a lot of quantitative modeling in there...our communications folks come to us and they go, "How do I communicate this?" So we're trying to get better about that. We have to continue to work on that. And we do have to try to be a little clearer in the environmental documents because they get jumbled, and that's a constant challenge for us.

In addition to expressing the quantitative modeling well, a federal EIS/EIR reviewer explained the human emotions that also factor into risk communication in his POLB-related experiences, "And some of those hearings were pretty tough. There were lots of children that would be brought that would give comments…they would say things like, 'Why does the Army Corps of Engineers want us to die from cancer?' " POLB staff members and other state and federal government employees are charged with the thorny task of reducing increasingly technical EIR/EIS methods and findings into succinct documents or presentations that inexorably generate critical feedback, questions, and emotional reactions from a wide variety of stakeholders.

Additional Health Research

Related data and research beyond the POLB's environmental assessment process factors into deliberations indirectly in many ways. Given that POLB and POLA are significant sources of air pollution in a non-attainment region, state and federal agencies continue to conduct research on emissions and health impacts more broadly. This includes, for instance, SCAQMD's

MATES I, II, and III. Through collaboration between the EPA and Health Impact Project, an HIA is underway at the POLA and POLB (EPA, 2010). Also, as part of the POLB and POLA's joint Clean Air Action Plan, real time air quality data for nine NAAQS standards is tracked and posted online for six monitoring sites near the ports. Public participants occasionally reference such data or studies in public comments or testimonies.

Academic research, sometimes conducted through community-campus partnerships, also factors into deliberations indirectly by arming community activists with information and contributing to larger policy dialogues. In the past, community members and leaders felt they could only offer anecdotal evidence of their concerns, as a local non-profit leader described, "They just had this feeling that there was pollution coming from the port. They could smell it. They could see it." A longtime San Pedro resident and activist elaborated that residents "had no credibility with the port," when she became involved over a decade ago, and when "we would talk to the commissioners about how dangerous the air, you know, all this particulate matter was and how harmful it was to us, they would roll their eyes." Another resident, a volunteer community health worker (CHW) with LBACA, expressed the significant role of research in their efforts:

> It's something that still needs to be substantiated with the science, and I think we're getting there because you hear more and more people talking about it. Because, see, once it comes out, once we have a science-base and we have experts and we have papers that we can point to, then we can start framing our case much more effectively. If we're just community people stepping up and complaining, you know, it doesn't get us anywhere. It doesn't get us traction. We have to have the science to back up. So we get Andrea Hricko[32] and Ed Avol[33] and NRDC. We get people like that standing behind us, fortifying what we say. We get a lot further. So when we look for empowerment, it's not so much that we're invited in, it's that we pool resources. We have to do research. We have to demonstrate that we're right. Just saying, "Okay, I don't feel good," doesn't cut

[32] Andrea Hricko is a Professor of Clinical Preventive Medicine at University of Southern California and Director of Community Outreach and Engagement for the NIEHS-supported Southern California Environmental Health Sciences Center.
[33] Ed Avol is a Professor of Clinical Preventive Medicine at University of Southern California.

> it….It's been also really helpful working with our academic partners and our government partners because they're the ones that have been creating the statistics that we've been able to use. The maps, the graphs, and knowing that something comes from a university also helps validate the community experiences.

This research takes many forms, including traditional epidemiology and community-based participatory research. For instance, the Assessment Team (known as the A-Team) at LBACA is comprised of CHWs who count truck traffic and collect air pollution data using P-TRAKs, handheld devices that count ultrafine particles.

In interviews, decision-makers also often explained how this growing research base might push larger policy discourse forward, eventually shaping environmental assessment methods or thresholds. Specifically, ultrafine particle pollution, which is unregulated currently, concerns many community members near the ports, and some even explicitly referenced related studies conducted by Dr. John Froines at UCLA. As one federal NEPA expert in Los Angeles explained:

> …we learn as we go along, so one of the key areas for the future is this whole area of ultra-fine particulates. That's probably a key. These are super tiny, less than a tenth of a micron. There's research going on at UCLA and other places about these particles, but there's no standards yet, no regulatory standards of what is acceptable or not, but the indications are that this is bad for you and they are created by combustion processes like trucks and so eventually there will be presumably a sufficient amount of information to decide whether or not to establish standards and what they should be.

Interviewees recognized Southern California's notorious reputation for poor air quality as impetus for innovative environmental research and policies relevant to freight and health, as one resident explained:

> You know, it's interesting because everywhere I go, I hear about how California is ahead of the game, ahead of the game, ahead of the game, ahead of the game. You know what? We're behind the curve from my perspective because we have communities that are more severely impacted than anywhere in the nation. So yeah, in some way, we're ahead of the game as far as trying to find creative ways to approach it, but on the other perspective, we're way behind because we've got more, our communities are so much more exposed.

However, whether “ahead of the game” or “behind the curve,” ongoing research, such as that on ultrafine particles near the ports, may eventually inform state or federal policies that define what a ‘significant impact’ is during environmental assessments.

Many interviewees also mentioned the potential role of HIAs as analyses to supplement the EIS/EIR process, citing the I-710 Corridor Project as an unprecedented example. Largely in response to community advocacy efforts, Caltrans approved the preparation of a HIA alongside the EIS/EIR process. The 442-page HIA was prepared independently by the Human Impact Partners and submitted to Caltrans in November of 2011. In June of 2012, the I-710 Draft EIS/EIR was published but agency leaders chose not to incorporate the HIA findings directly into the materials.

The Role of Public Comments

Providing written or oral comments on a DEIS/DEIR is a major way community members or leaders participate in POLB and related deliberations. Again drawing from the example of the Middle Harbor Redevelopment Project at the POLB, this project included 788 pages of comments from a variety of stakeholders (e.g., city, state, and federal agencies, private interests, and non-profit groups) with responses from the POLB. Many of these were comments prepared collaboratively, where community members, “oftentimes sign on to comments from organizations that have staff, that have the ability to do a much more thorough review of the documents.” For instance, for the Middle Harbor Redevelopment Project, 13 non-profit organizations including the NRDC, EYCEJ, and LAANE and several individuals submitted a 76-page report, receiving 36 pages of responses for the POLB. Across deliberations, comments are often critiques of methods, findings, or proposed mitigation measures drafted with scientific or legal context.

Interviewees explained various reasons for commenting. In their examples, many people are for or against an overall project or development, sometimes for reasons not directly related to the environment, and they use the environmental assessment comment process accordingly. As a local transportation consultant explained, "usually people just kind of set out their boiler plate letters." In another instance, a staff member at the POLB explained how recent discussions of the Panama Canal expansions have led to an increase in comments and testimonies by longshoremen and truck drivers as project proponents interested in job security. Also, a handful of residents who were involved with or knew of port-related lawsuits mentioned commenting as a means to prepare for potential litigation "You can't even really sue agencies unless you bring up the issues during the EIR process…it's really good that you speak these issues and then you put it in written form and then there's grounds for lawsuits if you do that." Finally, as reflected in public comments, every new project is also an opportunity to create a dialogue about further environmental improvements or, "kind of change the public debate or focus the public debate on the issues that are of concern to you," explained a resident. Public comments on recent deliberations include a variety of suggestions for project alternatives or mitigation strategies, such as additional green space, funding for health clinics, or on-dock rail, for instance, and agencies must respond to each comment in writing.

Some community members and leaders expressed concern that "decisions were already made" by the time they were asked to submit comments on a DEIS/DEIR. To highlight this concern, a resident recalled a Board of Harbor Commissioners member discussing how he approaches FEIS/FEIR comments and responses, "The law doesn't say I have to read them. It just says I have to consider it. I considered it. It didn't change my opinion one bit." Many

community members and leaders do not feel they influence decisions. One local advocate and policy expert describe this as a result of "Dad Strategy":

> You decide something, you announce it, and then you defend it. Right? And sort of amid the branding of Green Port is this feeling like they have to convince everybody they're green, right? We're going to do this project. We're letting you know that we've thought through it and we've tried to make it as green as possible, and therefore it is green as possible. Right? We've fought, therefore it is. And instead of, "Hey, we're doing this project. We want it to be green. We're thinking about these things. What do you feel about that? We're going to go make our decision now." Right? Where is the decision point? Because there's a legal structure that defines where their decision point is but most of the time that is pro-forma. Right? Ah, well, since we've put these four volumes and 8000 pages together, which tell you that this is what should be built, you are now a council member entitled to decide on whether we should do that or not.

Decision-makers may consider suggestions (e.g., alternatives, mitigation strategies) in public comments that are raised in a hearing or in response to a DEIR/DEIS, but their decisions on whether and where to build was likely made much earlier.

Mitigation Strategies

CEQA requires discussion and adoption of project-specific mitigation measures in EIS/EIR documents, which means these are proposed and deliberated for each freight-related development at or near the ports. For the POLB's Middle Harbor Redevelopment Project, for example, mitigation of air quality impacts included 35 mitigation measures, many with sub-measures. These ranged from requiring that the new main terminal building be built as LEED certified under the U.S. Green Building Council to providing $5 million to two of POLB's current Community Mitigation Grant Funds to regulations on use of low-sulfur fuels and shore-to-ship power sources. Overall, 16 mitigation measures were added to the FEIS/FEIR in response to comments and feedback on the DEIS/DEIR.

At the ports, port-related revenue supports mitigation efforts, dollar amounts that vary by a proposed development and its impacts. As aforementioned, both ports have mechanisms for

public participation in determining how mitigation funds are spent—a mayor appointed advisory committee to vet grants for the Community Grant Mitigation Fund at the POLB and the Harbor Community Benefit Foundation at the POLA. At the POLB, $5.4 million has been awarded to about 60 schools for filtration or building repairs, $5 million has been awarded to health care and senior facilities for health education and other initiatives, and another $5.4 million has been awarded to government agencies and non-profits working towards reducing greenhouse gas emissions.

While many community members and leaders spoke positively about these mitigation resources, some raised concerns. First, some representatives from community groups expressed frustration that such funding may stifle advocacy efforts, "If we receive money, for example, from the port. If we receive money, we can't fight." Additionally, residents expressed concern that mitigation funds historically did not always go to the most affected communities or actually counter a project's impacts. A resident actively involved in the Harbor Community Benefit Foundation explained:

> …historically it's been very difficult to spend State Lands[34] money off port lands. However, impacts occur off port land, so we're trying to break that barrier and get this money is supposed to be spend off port lands to mitigate off port impacts.

Another resident expressed concern that, "They received the money to do all of these changes but the people who really need it, they don't give them any benefits. It's one of the things I believe is that we need to push the government." Yet another resident shared an example this at the POLA, "They just spent $55 million on a beautiful park…that didn't really reduce pollution. It didn't put more clean diesel trucks on the road. It was a pet project, if you will." To ensure

[34] Under the Tidelands Act of 1911 implemented by California State Lands Commission, port revenue can only be used for port activities, which may include on-site navigation, development, recreation, trade, or fishing. Mitigation funds set aside through proposed projects or specific mechanisms have enabled funding to be spent in the surrounding host community.

that mitigation funds go to affected communities, however, the POLB's mitigation grants now rely on zone maps to assign preference to projects based on their location in relation to port emissions. Finally, in the case of specific projects, some residents perceive mitigation measures as inadequate in response to a development's impacts. In public hearings, residents have advocated for indoor air filtration equipment across more facilities and individual homes, for instance.

Technology

New technologies provide many opportunities for mitigation of port-related air pollution. Technology is integrated into deliberations as project alternatives or mitigation measures through the EIS/EIR process. Or, findings of ongoing technology demonstrations projects supported by state and federal agencies lead to eventual adoption of new vehicles or infrastructure. For instance, with support from the SCAQMD, the Southern California Association of Governments implemented the *Near-Term Zero-Emission Technology Demonstration and Initial Deployment Project.* The project is testing use of zero-emissions trucks along the Terminal Island Freeway, which connects the ports to nearby rail yards. Respectively, a resident and an air quality policy expert from the SCAQMD called for the POLB's leadership in environmentally progressive technologies:

> You know, that port actually could be, even with existing technology, if they were for example to use electrified infrastructure and develop renewable energy, because they have tons of space for wave and wind and solar and biomass on the property, and they could electrify all of those vehicles and actually, you know, be a reducer of pollution because they'd be producing more energy than they consume and everything else, so right now they're still way above the average, so as much as it's great that they're improving on communicating, being transparent, acknowledging that they're part of the problem and they need to fix it, that's great, they're moving in the right direction. We're going to keep on them every day until they are down to as near zero as possible and definitely below the baseline, and there's a long way to go for that.

> One of the things that we're suggesting is that they make a commitment as part of the project to require zero emission trucks, like electric trucks, to move 100% of the containers between the ports and that rail yard, by 2020. We think that can be done. And there's very few electric trucks that you can go out and buy today, but we think that certainly by 2020, it can be done. The project is proposed to start operation in 2016 and then ramp up to full capacity by 2023, I believe. So, and then it's supposed to be there for decades. Probably many decades. So as we see it, these technologies can be available early in the life of the project, but in order to make that happen it's important that someone, like the ports, require it.

A lead staff member from the Department of Environmental Affairs and Planning at the POLB did not disagree, however:

> We truly are on the cutting edge, and I go and I speak around the world, and I'm so proud because people turn to us and ask for advice because we are the standard. And it also kind of keeps us honest that we can't just stop it, we've got to keep going, you know?

POLB staff and decision-makers unanimously expressed enthusiasm and pride about current and emergent technologies at the port, pointing out their use of hybrid tugs, cold-ironing (i.e., "plugging in ships at dock instead of having them run their dirty engines"), filters on locomotives, solar-based equipment, and LEED-certified buildings, as well as their policies that have led to 90% reduction in emissions. Some also explained, however, that new technologies do not always make it into EIS/EIR documents or other policies when project deliberations begin long before a technology is affordable or widely available.

The Deliberations Continue

In a regional context, SCAQMD approved its Air Quality Management Plan in December of 2012, indicating that air quality is continuing to improve near the POLB and its transportation corridor. Undergoing a thorough CEQA process and open for comments, the Plan announces: 1) basin-wide short-term PM2.5 measures with a contingency plan, 2) regulatory measures, technology assessments, investments and incentives to achieve 8-hour ozone NAAQS set for 2023, 3) measures in the Southern California Association of Governments to reduce vehicle

miles traveled, and 4) a variety of incentives and education to encourage behavior change related to emissions. Still, the report expresses concern that the rate of pollution reduction has slowed, where new epidemiological evidence about PM 2.5 and ozone have led to stricter, more difficult to attain standards. The ports and surrounding transportation infrastructure remain a key pollution source, particularly contributing to NO_x, SO_x, and PM emissions.

Transportation-related deliberations are ongoing at the POLB and for surrounding infrastructure. Currently, residents of the port community await the publication of the FEIS/FEIR for the I-710 Corridor Project and the SCIG. Further, the U.S. Supreme Court will be ruling on provisions of the CTP by mid-2013 in *American Trucking Association. vs. City of Los Angeles,* which could have major economic and environmental implications for the POLA and likely indirectly for the POLB (Savage, 2013). Meanwhile, the POLB continues to maintain current infrastructure and environmental policies, get 'Big Ship Ready,' and deliberate over new projects, such as development on the currently vacant Pier S and of a proposed sand, gravel, and granite facility.

Discussion

Over the last decade, the POLB has experienced a major paradigm shift (Hall, 2007) affecting public participation processes and outcomes. Public participation—sometimes in the form of public relations—has increased substantially through innovative institutionally-driven channels beyond the minimally required means of NEPA and CEQA. Many would argue that community-driven litigation and global economic competition (Hricko, 2013) have dramatically altered the way decision-makers govern and develop the POLB as the 'Green Port.' Despite remaining institutional and community barriers, community members and leaders continue to draw on expert and community-based knowledge and past organizing experiences to expose

overlooked environmental health issues or vulnerable populations, concerns with formal assessment methods or interpretation of findings, and new opportunities for risk communication. Efforts of community leaders continue to evolve, altering or advancing dialogue around issues such as zero-emissions technology, the inclusion of HIAs, more equitable mitigation distribution of mitigation funds, or consideration of additional project alternatives (e.g., I-710's Community Alternative 7).

What is Public Participation?

During interviews, some POLB staff members responded to questions about public participation by describing public relations efforts, an approach that may counter EJ efforts. According to the Public Relations Society of America, public relations are, "a strategic communication process that builds mutually beneficial relationships between organizations and their publics (2011)." We see this public relations frame repeatedly, in the words of interviewees who described POLB's "public relation successes" in the early 2000's and in descriptions of how public participation is evaluated by the POLB's Communications and Community Relations Division's biennial survey. The Federal Highway Administration provides the POLB's Middle Harbor Redevelopment Project as an official 'EJ Case Study', highlighting their effective practices in, "development of a formal *marketing plan* to target audiences in order to successfully educate the community and solicit input from the community on the project and the EIR/EIS (FHWA, 2012) [emphasis added]" rather than a public involvement or citizen engagement plan. Many planners distinguish public relations from public participation, noting its emphasis on selling or promoting an idea, sometimes in an effort to manipulate public opinion (Beder, 1999). This distinction may be particularly important in an EJ context where the majority public opinion may or may not reflect the views of smaller segments of marginalized

populations. These terms are frequently blurred in planning projects, where government agencies hire public relations firms to promote major infrastructure developments (Culbertson, Jeffers, Besser Stone, & Terrell, 2012). Although, there is no guarantee that other approaches to public participation are always separate or more equitable than public relations.

Nonetheless, planners working at the POLB and in some related deliberations have been undeniably extensive in soliciting public participation in ways reflective of Habermas' (1981) model of communicative rationality. Simply stated, this model suggests that rational decisions are likely to emerge from communication between interlocutors that honors the validity of "normative rightness," "theoretical truth," and "expressive or subjective truthfulness" (Habermas, 1985). As interviewees explained, the POLB has increased meaningful opportunities for discourse and exchange of these multiple types of knowledge over the last decade. Community members and leaders noted many communicative facilitators that catalyze their participation, including accessible data and general information, direct responses to their written DEIR/DEIS comments, ongoing (not only project-specific) opportunities for discussing environmental issues, and acknowledgement of their role in environmental management. Further, in 2012, the POLB's Board of Harbor Commissioners began meeting twice per month, rather than once, to increase opportunities for ongoing communication with the general public. The POLB appears to recognize the value of local knowledge in achieving more equitable public health outcomes, as advocated by many scholars (DHHS, 2009; Corburn, 2007; Fischer, 2005; Israel, Schulz, Parker, & Becker, 1998; Levitt & Gross, 1994; Lindbloom & Cohen, 1979).

Still, those involved in POLB deliberations identified many barriers to public participation that may particularly threaten EJ. Community members and leaders introduced barriers not reported in the POLB's biennial evaluations of their communication efforts. Unlike

the citywide survey, my interviews overrepresented community members and leaders representing those neighborhoods that are likely most affected by the POLB and related infrastructure, such as West Long Beach and Wilmington. Thus, my data and findings more directly allow for interrogation of the POLB from the perspective of frontline communities undergoing threats to EJ. While planners are limited in their administrative roles (Dyckman, 2013; Barr, 1972) and likely may be unable to influence prolonged deliberation timelines or remove major political barriers, they can support communities by: extending outreach beyond required regions and along the transportation corridor, reducing logistical barriers (e.g., allowing more time for translation of oral comments in another language, avoiding reorganization of agenda items when possible), discussing varying goals for participation and developments in ongoing environmental meetings, and continuously improving translation of technical documents in partnership with community leaders. Largely related to education, language, or resources (e.g., day care, transportation), these types of barriers may perpetuate institutional discrimination (Phillips, 2011) by discouraging or excluding low-income community members from participating in freight deliberations in ways that are reminiscent of historic discriminatory housing and planning practices (Chaskin, 2013; Fainstein, 2010).

This case study further highlights ways in which, for community members and leaders, public participation entails defending their community, as a 'riskscape' (Morello-Frosch, Pastor, & Sadd, 2001) with compounding pollution sources, in multiple (often concurrent) deliberations. This became clear as interviewees, asked to speak about their participation in events related to the Middle Harbor Redevelopment Project or Pier S, also began interweaving their experiences, reflections, or knowledge related to the SCIG, I-710, industrial facilities, or past developments at the POLB. Collectively, interviewees highlighted how you "never finish these kind of things."

Community members described burnout and strategies for preventing burnout, a longtime familiar experience for community organizers (Staples, 2004; Minkler, 1992). Collectively, community members and leaders identified key organizing strategies that may be particularly useful in the context of inexhaustible freight deliberations, such as identifying key events for rallying residents, partnering with residents in other affected communities along the transportation corridor, and collectively sharing information and drafting comments for DEIR/DEIS documents (Hourdequin et al., 2012).

The POLB's significant economic presence also shapes public participation, where an underlying sense of pride emerges for many living or working in "a port community." While this overall study depicts freight gateways as a threat to environmental health, many see environmental protection as a threat to economic vitality—as seen in the words of one POLB Board of Harbor Commissioner who described "the person that lives down the 710 corridor that has nothing better to do all day than complain about the port and noise and the pollution…" until they begin working at the port. This discourse leaves some community members feeling as though they must choose which they will defend in public comments or hearings: their job or their environment? Nonetheless, many community members and leaders and decision-makers have pride in their 'Green Port' at the POLB and do not see these values at odds, reflecting national blue-green alliances and the green jobs movement (Stillwell & Primrose, 2010; Jones, 2008). Over the last decade, scholars and agencies have started to estimate the number of 'green jobs' in the U.S. at approximately 2.7 million (Muro, Rothwell, & Saha, 2011) to 3.1 million (BLS, 2012), which include jobs that either "produce goods or provide services that benefit the environment" or "in which workers' duties involve making their establishment's production processes more environmentally friendly" (BLS, 2013). To ensure EJ, policymakers and

advocates may need to continuously reframe what it means to be a 'port community' at seaports across the U.S. with strategic attention to or partnership with economic interests.

Assessing and Mitigating Risks

This case study shows the ways a legal framework underlies environmental assessment (McCreight, 2004) and may, ultimately impact public participation in freight deliberations. *Natural Resources Defense Council (NRDC) v. the City of Los Angeles* in the case of the China Shipping Terminal inspired increased rigor in the POLB and POLA's EIR/EIS processes, consequently redefining both opportunities and demands on public participants. Assessment documents are longer and more technical than ever before, influencing timelines for project completion. As interviewees expressed, this both hurts and helps community organizing efforts by allowing more time to learn and engage around an issue, but also leading to a longer window of uncertainty for residents whose home, physically or economically, may be at risk. This uncertainty has its own implications for psychosocial stress and health (Fullilove, 2004). Meanwhile, MAP-21, the current federal transportation bill, has set out to expedite the NEPA review process, setting funding-restricted deadlines and additional categorical exclusions (U.S. DOT, 2012; CEQ, 2011) that may further alter public participation processes in unknown ways.

This case study also reiterates how NEPA and CEQA are mechanisms for disclosure and mitigation (Karkkainen, 2002), whereas regional or global economic factors generally predetermine 'build' or 'no build' outcomes. Some community members and leaders questioned their role in the 'pro forma' environmental assessment process, recognizing that a decision point may come before they are involved or an agency releases a DEIR/DEIS (Hansen & Wolff, 2011; Lochridge, 2011). Community members and leaders were also discouraged by subjective terms in NEPA and CEQA that allow decision-makers to dismiss an alternative proposal or mitigation

measure, including overriding considerations,[35] feasible measures,[36] and practicable means.[37] For instance, during the SCIG deliberation, community members and leaders and some policy-makers in Southern California disagreed with environmental reviewers who omitted emerging zero-emissions technology as an alternative, debating its current and future feasibility. Considering the ethical implications of their work, planners must recognize how the NEPA process may do harm by raising a community's knowledge of their unaddressed risks, and they should adequately and authentically describe the limits of NEPA to community members and leaders (Austin et al., 2004; Bear, 2003; Sullivan, Frances, & Prabhu, 1996; Twelker, 1990). Public participation may not always alter the final outcome of a specific deliberation, but such public environmental assessment processes can be a vital opportunity for community members and leaders to direct a larger discourse in local land use planning (Sandercock, 2003).

Globally, host communities and decision-makers in other deliberations can learn from the POLB and POLA's progressive approaches to mitigating the environmental health impacts at freight gateways, considering their pioneering models for governance, policies, programs, and technology (Hricko, 2013; FHWA, 2012). The POLB's Green Port Policy, the Clean Trucks Program, the Green Ships Incentive Program, and the Clean Air Action Plan are lauded by local and federal transportation and environmental agencies, and the Institute of Sustainable Seaports promotes the POLB as a model for their use of cold-ironing shore power (ISS, 2010). The POLB and POLA may also set a precedent for increasing public participation in mitigation decision-

[35] According to CEQA, a "statement of overriding considerations" indicates that even though a project would result in one or more unavoidable adverse impacts, specific economic, social or other stated benefits are sufficient to warrant project approval.
[36] According to CEQA, " 'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."
[37] Section 101 (b) of the NEPA states "…it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy" to avoid environmental degradation, preserve historic, cultural, and natural resources, and "promote the widest range of beneficial uses of the environment without undesirable and unintentional consequences."

making, as illustrated by the POLB's Community Grant Mitigation Fund advisory committee and the POLA's Port Community Advisory Committee. Although, community members described the limitations of these approaches, where committee members did not necessarily represent those most vulnerable to freight transport's health impacts. To inform mitigation, more research may also help decision-makers in these committees to identify the types of land use interventions, such as green buffers, walls, and roofs (Brauer, Reynolds, & Hystad, 2012; Pugh et al., 2012; Rowe, 2011; Currie & Bass, 2008), that best allay noise and air pollution.

Key Recommendations for Locally Improving Public Participation and Environmental Assessment in Freight Deliberations

As described by community members and leaders, the POLB and its related deliberations occur in the Southern California region within a context of a port-based economy, a 'green' port rebranding, countless community-based organizations, complex political and planning structures, and tremendous traffic congestion and air quality challenges—features that both strengthen and hinder the community's capacity to engage as public participants. Community members and leaders also defined key catalysts and barriers to their participation in POLB and other related deliberation, experienced while engaging in agency-led forums and organizing as a community. Community members and leaders value the POLB's increasingly effective public participation strategies accompanying its shift towards a 'Green Port' over the past decade, but they also identify ways that strategies may not sufficiently address procedural justice in frontline EJ communities. More specifically, community members and leaders who engaged as public participants in environmental assessment as part of POLB-related deliberations also described ways that current processes are extensive and effectively assist overall reductions in air pollution. Yet, they also described how these processes largely feel pro forma and do not adequately assess

or address the most local cumulative impacts for residents facing multiple threats to EJ. While federal and state policies, guidelines, thresholds, and methods largely dictate this assessment process, there is much flexibility in how it is conducted and communicated locally in host communities. Drawing on the experiences of community members and leaders in this context, this case study concludes with the following key recommendations for planners, project staff, consultants, and decision-makers to improve public participation and environmental assessment, including plans for mitigation, with attention to EJ in freight deliberations locally:

- *Continue ongoing, non-project specific interactions with community leaders:* Community members and leaders and decision-makers spoke encouragingly of the POLB's monthly environmental meetings. These meetings enable community leaders, particularly those representing frontline communities such as Wilmington and West Long Beach, to engage early on issues that may impact quality of life, exchange information with environmental planners, advocate for deliberative processes that reflect procedural justice, and seek answers to host communities' questions related to POLB developments.
- *Continue to make information regarding public participation and environmental health available and accessible:* The POLB's website provides a wealth of information including links to real time air quality data, an events calendar, and funded mitigation projects, among many other resources. For those involved in specific deliberations, community members and leaders greatly appreciated this level of transparency. To encourage public participation in public hearings or other such forums, POLB staff should post meeting agendas in advance and minutes soon after, so residents can plan their involvement accordingly alongside their competing scheduled priorities.

- *Define a meaningful geographic scope for the study area used for environmental assessment with input from community leaders:* Even with sufficient outreach and time for community input during scoping, development may still likely occur in a host community facing cumulative risks. Baseline measures and projections for air and noise quality should be assessed both regionally and locally, for instance, within 500 meters of a proposed freight gateway, plaza development, or highway expansion. When a FEIS/FEIR declares 'no significant impacts' based on a regional assessment, this finding undermines local knowledge of risks and masks information that residents and community leaders may need to identify protective measures for themselves or their community.
- *Provide regular, adequate, and free translation services at public forums for residents whose native language is not English:* Freight host communities in Southern California have a large population of residents whose native language is not English. Thus, inadequate translation services may exclude many who are most likely to be affected by freight's environmental health risks. Adequate translation may require additional funding and time allotted per person to speak during public forums.
- *Partner with community leaders to improve public participation opportunities:* Residents identified trusted key community leaders as catalysts that support their participation in the POLB and related deliberation. Project staff should consider working closely with these key leaders to generate materials, co-sponsor forums, and solicit feedback on their agency's outreach efforts. Such partnerships may help POLB staff to establish meeting times and locations that best meet community needs and identify strategies to reduce the burdens that continual public participation may place on residents.

- *Develop outreach materials or messaging that integrates the POLB's environmental and economic goals:* A 'jobs vs. the environment' rhetoric underlies many of the deliberations at the POLB, pitting community members and leaders against one another in their support or opposition for each development. At times, this discourages some residents from expressing their environmental health concerns in public forums. To counter this dichotomous rhetoric, the POLB may wish to develop additional outreach materials that redefine what it means to be a port community and encourage a safe deliberative space to discuss these goals side by side. These materials could highlight their many projects that achieve both economic security and environmental protection.
- *Ensure that residents serving on advisory panels or committees represent host communities:* Community advisory panels or committees may be effective tools for increasing procedural justice in freight deliberations, as they are another mechanism to solicit input from stakeholders. However, residents near the POLB and POLA expressed concern that representatives on such panels or committees have increasingly represented the views of specific organizations or private companies rather than residents. To work towards EJ, residents in frontline communities must be well represented, and community-driven nomination or election procedures may help achieve this goal.
- *Conduct additional evaluation of POLB communication and public relations in frontline communities:* The POLB Communications and Community Relations Division pursues regular widespread feedback from Long Beach residents on the POLB's outreach and communication efforts. To understand and address the POLB's impacts on environmental health and justice, their biannual survey could include additional questions about

environmental health and mitigation strategies and more heavily sample those neighborhoods in zones most exposed to air and noise pollution.

These recommendations reflect issues most pertinent to community members and leaders interviewed in this study and engaged in POLB and other related deliberations, but they are not exhaustive. Also, these recommendations primarily call on transportation and environmental planners, project staff, and local decision-makers to take responsibility for improving public participation and environmental assessment. Successful implementation of many of these recommendations may rely on broader structural changes at local, statewide, or national levels and require involvement of additional stakeholders, including residents, scholars, public health practitioners, environmental scientists, experts from other sectors, and policymakers. Such structural changes can be sought through the planning, policy, and research efforts discussed in Chapter 6, where these POLB-related findings and implications are synthesized with those from Chapters 4 and 5.

Table 5.1. Estimated Demographic Composition of the Long Beach, California, 1950, 1980, & 2010

	1950	1980	2010
Total population	250,767	361,334	462,257
Race & Ethnicity[a]			
Non-White (% of total population)	6,587 (2.60)	91,381 (25.30)	249,191 (53.90)
Hispanic (% of total population)	N/A	50,700 (14.0%)	188,412 (40.80%)
Age[b]			
< 18/19 years old (% of total population)	65,9996 (26.45)	82,638 (22.90)	115,143 (24.90)
18/19-64 years old (% of total population)	155,847 (63.45)	228,022 (63.10)	304,279 (65.80)
>64 years old (% of total population)	27,704 (11.10)	50,674 (14.00)	88,969 (9.20)
Income			
Living in poverty (% of population)	N/A	49,701 (14.20)	86,809 (19.10)
Education[c]			
Less than high school (% of population over 25 years old)	76,385 (29.79)	29,811 (13.20)	61,614 (21.50)
Employment[d]			
Unemployed (% of total civilian population in workforce)	N/A	10,073 (5.80)	24,141 (6.80)
Households			
Number of vacant households (% of total households)	5,692 (5.95)	7,968 (4.99)	12,501 (7.10)

a. In 1950, U.S. Census race categories included Black, White, and Other. In 1980, U.S. Census race categories included White; Black; American Indian, Eskimo, Aleut; Asian and Pacific Islander; and Other. In 2010, U.S. Census race categories included White alone; Black or African American alone; American Indian and Alaska Native alone; Asian alone; Native Hawaiian and Other Pacific Islander alone; Some Other Race alone; and Two or More Races.

b. Over time, categories for youth age varied in the U.S. Census. In 1950, youth included those less than 19 years old, while in 1980 and 2010 youth included those less than 18 years old.

c. U.S. Census data on education was collected using different questions over time with all years calculating rates for those 25 years or older. In 1950 and 1980, respondents could indicate years of high school completed (1 to 3 years or 4 years), but did not indicate successful completion or attainment of degree. In 2010, respondents indicated whether they had completed some high school or obtained a high school degree.

d. Census data for unemployment are based on different reference populations over time. In 1980 and 2010, civilian population in labor force 16 years and over was considered the reference population.

Figure 5.1 Industrial Sites in Long Beach, California and Surrounding Areas

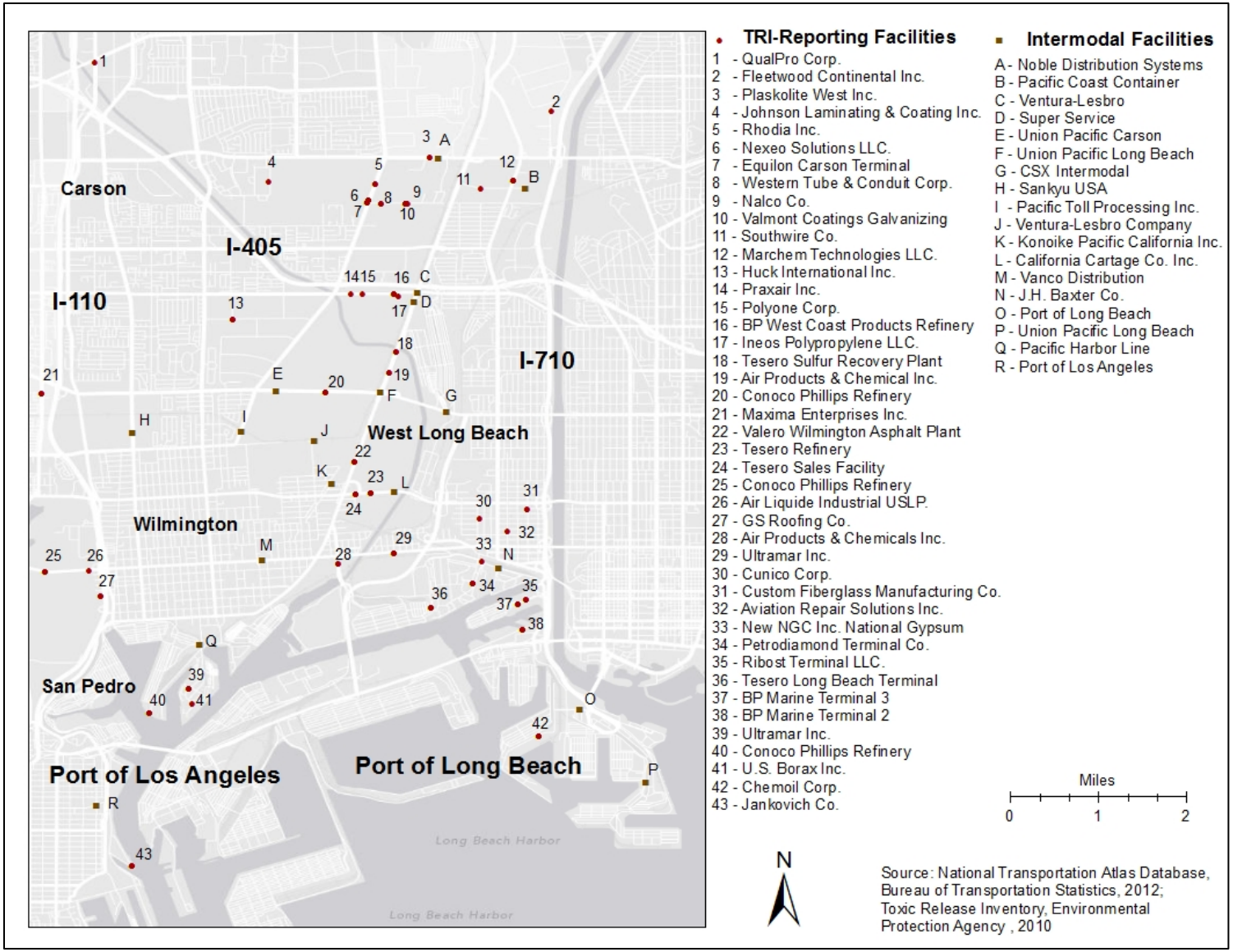


Figure 5.2 Timeline of Major Deliberations at Port of Long Beach and Nearby Transportation Corridor, 2002-2012

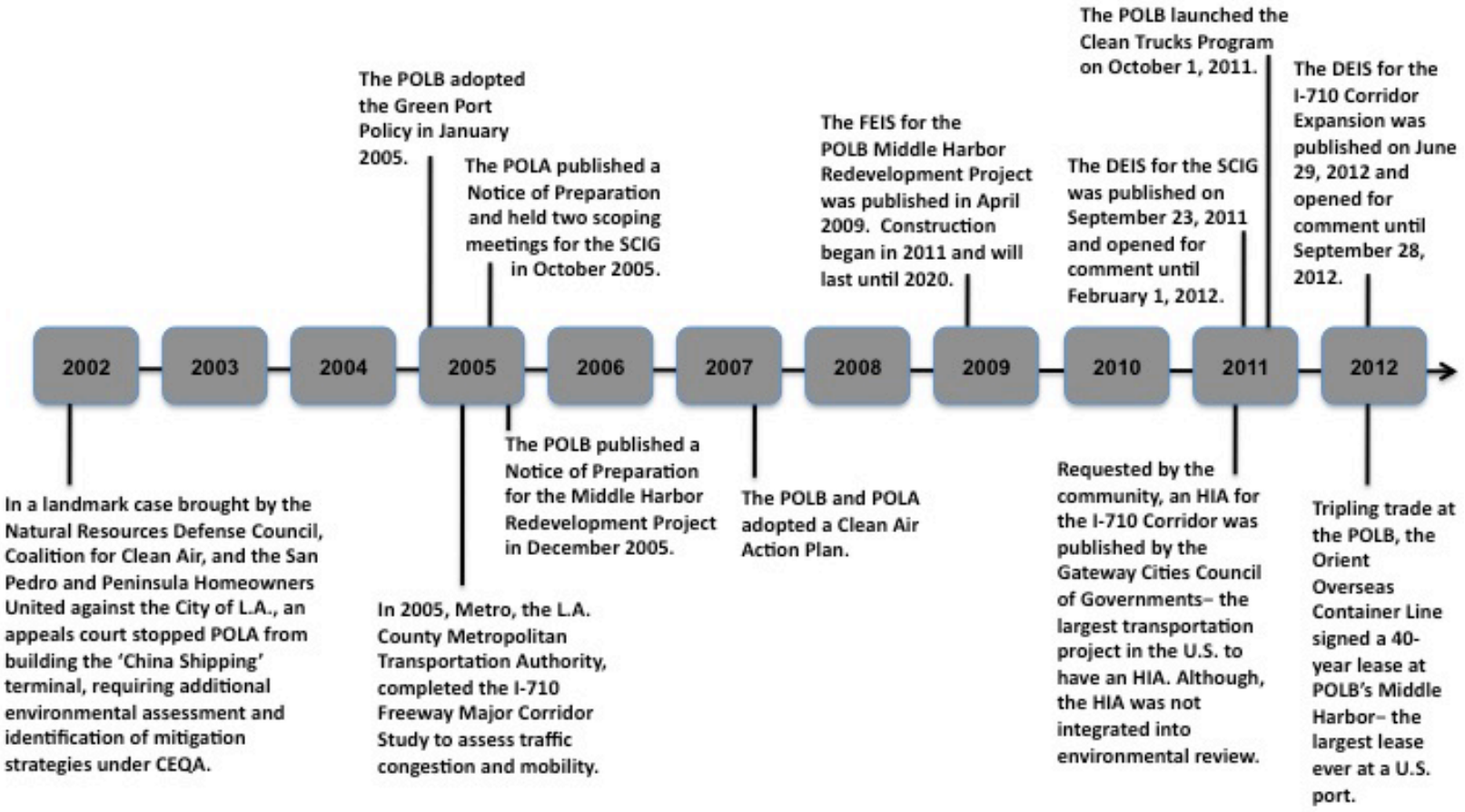


Table 5.2 Institutional Barriers to Public Participation in the Port of Long Beach and Related Deliberations with Examples from Resident Interviews

Insufficient time or outreach for public processes
A big problem though with communication in general from various agencies is that we feel like it's not done adequately…it's not put in places where the community has access to a lot of our members. They don't know how to use a computer. So looking at a website does not help, but if things are posted at the local libraries, or at City Hall, that would help. But they also don't send out notices to the community; they'll send it to community leaders like us, and so if they do that then we'll, we're the ones that post it, which is fine, but when adequate time is not given, then that's also problem.

Language barriers
And another thing that they did, like I told you before, they took the money for interpretation. They have to do interpretation at the public meetings. They have to do it. That is one of the things we are fighting for.

Uncertainty of how, when, or where to participate in institutional opportunities
That's the thing, like if you haven't gone through the process, if you don't happen to have experience. Basically, if you aren't, if you don't know of the groups that are following these things or if you don't happen to live close enough to a project where you've gotten one of those notices so you only have to notify people within 500 feet of a project

Difficulty understanding or communicating technical information
There's no way you can understand these things as a human being. It's not user-friendly at all. If you were to look to the port to make it understandable, you'd be wasting your time. That's how I see it.

Differing goals among board, staff, and community
The port's environmental staff, they're usually like really open with us. They're direct, they try to work with us as well, but sometimes they get directives from their harbor commission, you know, or the board, and so they don't always you know, do the work that we would like. But usually we have a good communication relationship.

Non-representative public participants
They can easily make phone calls and get 200 community people to fill the room saying that they want the project. So it drowns out the true voice of the residents.

Logistical barriers to participating in events
Because when city council was going to vote on, when we turned in 1800 signatures, we had like 200 people come down. But the City Council jockeyed the schedule around and we were supposed to be, at the beginning of the meeting supposed to be, you've got 10 people making comments. Well I was supposed to go up and present them with a petition. Well, they took that section and moved three or four items above it, and by that time, our bus, we had chartered a bus to get some people down there, the bus had to pick people up and take them back. I think it was intentional…

Attending forums, but feeling unheard, discriminated against, or disrespected
…I was thinking that I don't have an education, but I see some representatives, they don't have any education at all. Why? Because when the people come to tell you something they want from the community, they don't listen. You're on the phone. You're doing other things and you don't put attention on what the people are saying. And, I believe education includes full attention to what the people tell you. The people from my community, they believe, well, we didn't go to school, we have no studies, but you went to the school and university, you do a lot of things in your life...but you don't have education, you don't have respect.

"I feel it is just a big PR event."
I am reluctant to go because I feel it is just a big PR event. If you say anything you're just railroaded, in terms like "Oh, it's not true or whatever. Look at all the jobs it creates."

Overriding considerations
That does not mean that ultimately the community has influence. I mean, that, theoretically, I mean, I suppose that's what people would say, but in the end with overriding considerations, they don't, there's no guarantee that allowing the community to come in and speak and get educated means that they're going to influence the process….30 years of doing statement of overriding considerations, usually in the area of air quality, public health, noise, aesthetics; these are the areas where they do overriding considerations….the impacts are always felt most acutely by the communities in the area, so this concept of environmental justice comes into play.

Table 5.3 Community and Individual Barriers to Public Participation in the Port of Long Beach and Related Deliberations with Examples from Resident Interviews

Competing life priorities among residents and allies
And we do the best that we can to do that. because I mean, how is like a mom after work with her kids going to read through one [EIS/EIRs] -it's like, no.

Jobs vs. the environment
Then, the other thing that makes people be quiet in Long Beach is we're being made to feel guilty because most of these projects are supposed to be good for the whole region. It's like, okay, if you don't want that you're just a NIMBY. And, it's just so good for the whole region...100s of jobs and trade is growing

"They try to trick us"
But they try to trick us. Right now they went to tell the people we are going to have a lot of jobs. A lot of our people do not have any jobs. They bring the project like something beautiful. Something wonderful. We are going to have jobs. We are going to have a lot of things...everything green. Sometimes they mention to the community, "Yeah, we are going to do this. But, don't worry, we will plant trees, and we'll plant more green." They bring pollution. It's like, you know, come on! So then when our group tells the community, "You know what this group wants to do in your neighborhood? Demolition. Your house and the apartments and planning to spread the freeway or railway." And, you know. It's like the people who live close to those areas don't know nothing about it. And they say, "You're going to have jobs." They don't ever explain that these will be temporary.

Private or public funders dictate or limit advocacy
If we receive money, for example, from the port…if we receive money, we can't fight. If we receive money from the refineries, we can't fight… It's a trick. They offer the money to the organization that has been working with the community and some of these organizations go into this trick. Later, these organizations cannot say nothing against these things happening, you know, because they are receiving money from them.

Turf Issues
...there is rivalry. Well, rivalry might not be the best word. People are protective of their own little turf, not in terms of power but in terms of them being suspicious of each other. I don't know if the port does this on purpose but kind of plays into it.

Public participation is tiresome
I used to go to every single board meetings. I don't go as much anymore. I hardly ever go. But you know, a lot of this stuff is an exercise in beating your head against a wall. And how much of that can you take? You know, at some point you just get exhausted by it. It's like, I've had enough of that. So, but that is an awesome theoretically, another way to be a part of the process is you can go there and make a comment. It doesn't mean that they're going to listen.

CHAPTER 6

Addressing Global Freight Transport's Local Impacts: Crosscutting Findings, Recommendations, and Conclusions

This dissertation defines global freight transport as an EJ issue that undeniably affects quality of life in U.S. host communities. In Chapter 3, I quantitatively estimated inequitable patterns of exposure to well-documented freight-related health risks, calling for improved planning to address distributive justice nationally and locally. Then—while I began by technically describing mandated public participation and environmental assessment practices related to freight developments in Chapter 1— I was guided by institutional ethnography to extend these descriptions to reflect the lived experiences of residents in two distinct freight host communities in Chapters 4 and 5. These qualitative findings enabled deconstruction of public participation and environmental assessment in theory and practice, identifying recommendations to improve EJ locally. Here, in this final chapter, I offer a comprehensive synthesis of national demographic summaries with crosscutting comparisons from these case studies. From this synthesis, key recommendations emerge to inform future research and cross-sector interventions to address global freight transport's local threats to public health.

Demography of Freight Host Communities

Quantitative investigations showed ways that populations near major freight gateways are demographically different than the general U.S. population. Based on areally weighted estimations, by race, ethnicity, poverty status, and education status, residents of host communities living with 500 meters of freight gateways are different than non-host communities.

Logistic regression models consistently showed that race and ethnicity were associated with host community status. Finally, in larger 1-mile host communities, poverty status also became a positive predictor of host community status. These findings echo patterns seen historically in studies of hazardous waste facilities (UCC, 2007; Bullard, 2000) and add to those in preliminarily studies of the goods movement by the EPA (Rosenbaum, Hartley, & Holder, 2011; EPA, 2009). Further, these findings suggest that Hispanic populations may be particularly at risk from freight-related environmental health exposures in the U.S.

This spatial inquiry also began quantifying the experiences of residents in qualitative interviews who often discussed their exposure to or concerns about a variety of pollution sources. Hot spot analyses and descriptive data illustrated potential patterns of cumulative pollution sources in host communities, including both stationary and mobile sources. For instance, TRI air release sites are 1.64 times more likely to appear in 500-meter freight host communities and 1.33 times more likely to appear in 1-mile freight host communities.

These findings raise issues of distributive justice, whereby marginalized populations are at greater risk for health burdens associated with freight transport in the U.S. Ongoing exposure to freight's health risks likely builds on a range of chronic risk factors, stressors, and discrimination already felt by low-income communities and communities of color (Adler & Rehpkopf, 2008; Lantz, House, Mero, & Williams, 2005; Schulz et al., 2000; Williams, Yu, Jackson, & Anderson, 1997). A faction of researchers (Garcia et al, 2013) and the EPA (2009) have recognized freight's health implications. Yet, this assessment and others like it may help federal and state agencies and public health and transportation professionals to fully recognize the goods movement as an EJ issue, enabling data-driven decision-making processes regarding current or new infrastructure.

Comparing the New International Trade Crossing (NITC) and the Port of Long Beach POLB)

Key Differences

Amid these national patterns, it is also clear that each freight deliberation is contextually unique, and the NITC and the POLB illustrate this when described side by side. These case studies highlight ways that freight gateways may differ, particularly by: governance and funding structures, the role of private interests, local policy context, local history and planning, and a community's capacities and responses. To successfully engage in freight deliberations, community members and leaders and decision-makers must draw on local knowledge related to these site-specific characteristics.

Governance and Funding

In this study, the term freight gateway has been used to include rail yards, border crossing, airports, and seaports. These sites can be financed privately, publicly, or in combination (Abdel Aziz, 2007; Perez & March, 2006), and local, state, federal, and international bodies or policies can govern them. For instance, decisions about the NITC fall under the purview of state policymakers, and the MDOT has largely managed the project. Canadian taxpayer dollars are primarily funding the NITC with some matching U.S. federal dollars—although with no immediate revenue allotted to support community benefits or to extend mitigation of adverse effects on air and noise quality for the host community. In contrast, the POLB and POLA are governed and managed by their respective boards and staff. Revenue from landlord fees is substantially higher than that at most other freight gateways, and there are mechanisms in place for directing portions of these revenues to mitigation.

The Role of Private Interests

These cases also deviate from each other given their distinct casts of private sector players. In Long Beach, global shipping companies have a vested interest in the POLB's economic success, where major shipping companies, such as China Shipping Container Lines, China Ocean Shipping Company, and Hanjin, idle, dock, plug-in, and unload at POLB terminals, falling under the jurisdiction of POLB environmental policies. At both sites, national truck, rail, and transportation logistics companies are all stakeholders in freight infrastructure decisions, as demonstrated, for instance, by the range of transportation-related corporations or associations weighing in both for and against the NITC. These players can hold a leadership role in addressing environmental health, such as those shipping companies voluntarily complying with the POLB's Green Ships Program. Conversely, they can counter publicly supported, environmental planning processes, as demonstrated by Moroun's corrupt tactics in Southwest Detroit and Michigan.

Local Policy Context

Local policy context also distinguishes the two case studies in this dissertation. California follows state policies that are not relevant to the NITC or related deliberations in Detroit, most notably CEQA. While Michigan also has a statewide 'mini-NEPA,' the Michigan Environmental Protection Act (1994), it is less far reaching than CEQA and has seen a smaller case history since its enactment in 1970. As a result, at the POLB and POLA, CEQA has given community members and leaders additional legal grounds in their advocacy efforts, as illustrated by the case of the China Shipping Terminal that has significantly shifted environmental planning at the ports (Natural Resources Defense Council, 2002). Some interviewees in Southern California noted that the ports', region's, and state's leadership in environmental policies has occurred out of necessity given the notoriously poor air quality in the Los Angeles South Coast Air Basin attributed to

surrounding its geographic and climate features, population density, and transportation and industrial sources.

Local History and Planning

Underlying each case is, of course, also local history and planning that varies substantially for the regions containing the proposed NITC and the POLB. For instance, to understand the NITC deliberation, one must first acknowledge Delray as a highly vacant area with high unemployment (31%) within Detroit— a shrinking city currently undergoing profound economic distress and contentious conversations about strategic renewal (Detroit Works Project, 2012; Dewar & Thomas, 2012; Foley, 2010; Glaeser, 2010; Beauregard, 2009). Further, the statewide NITC deliberation has occurred in a place where regional policymaking is aggravated by a deep history of racial and economic segregation (Schulz et al., 2002). These social and economic factors shape decision-maker's outside perceptions of Delray as a host community in transition and the community's ability to respond to interrelated land use planning processes occurring as artificially separate conversations.

Meanwhile, at the POLB, community leaders and members and decision-makers must stay apprised of concurrent planning efforts at the POLA, in Long Beach, and in Los Angeles County for the sprawling metropolitan region comprised of 88 municipalities (Gish, 2012) and a population of over 18 million people (U.S. Census, 2010). POLB deliberations are inherently related to two critical environmental issues notoriously associated with Southern California for decades: congestion on their dense highway network and poor air quality (Sorenson et al., 2009; Cameron, 1991). Related to these issues, Chapter 5 identifies some instances where POLB deliberations occur contemporaneous to regional planning efforts, such as the proposed I-710 corridor expansion and SCIG and the SCAQMD's Regional Management Plan.

Community Capacity and Response

Local community organizing efforts may also guide decision-making in different ways across freight host communities. Chapter 4 describes the hundreds of meetings that Southwest Detroiters attend each year to address compounding EJ issues or plan for community events. Several community-based organizations engage around environmental issues in Southwest Detroit, although the CBC has primarily taken the lead on organizing around NITC-related issues with nominal resources to support their work. In contrast, the number and diversity of community-based organizations working on POLB-related issues is unmatched for most other issues and regions in the U.S. This may be a result of both the 'ahead of the game' and 'behind the curve' phenomena that one Long Beach resident used to describe successful air quality efforts as a result of both proactive, progressive policies and critical, urgent responses to severe non-attainment. Also, communities nearby the POLB are highly populated with overall higher levels of employment and education relative to Detroit. Thus, while still confronting multiple threats to EJ, these factors may contribute to the community's capacity to respond with more legal, economic, and human resources than other freight host communities.

These two case studies also illustrated a diverse range of potential community responses to proposed freight developments that reflect these aforementioned contextual factors. Often seen simply as not-in-my-backyard (NIMBY) responses, deliberations are generally much more complex than 'build' or 'no build.' In fact, they span from protesting the development of new infrastructure (e.g., SCIG) to proposing new alternatives (e.g., Community Alternative 7 for the I-710 Corridor) to negotiating CBAs (e.g., the NITC as "a bridge with benefits"). In both cases examined in this chapter, these strategies are not mutually exclusive with various community residents or groups advocating for different outcomes. Also, key messages may change over time

as alternatives, assessment, and mitigation options unfold over the course of a deliberation.

Key Similarities

Despite these differences, the deliberations introduced in this study imply some comparable, potentially generalizable features. They suggest that freight deliberations are similar in that: 1) they are long-term and time-intensive; 2) they rely on multi-disciplinary, multi-sector conversations; 3) they exist at the nexus of science and democracy; and 4) they generate both economic opportunities and conflicts.

Long-term, Time-Intensive Deliberations

Time was a frequent theme during interviews across both sites — time to organize, time to comment, time to assess, time to advocate, time to undergo a lawsuit, time to approve,[38] and time to build (Todorovich & Schned, 2012). In general, transportation planning is a long-term process, where development decisions may span decades. And, once decisions are made, they have a physical presence for a century or more. Across sites, interviewees described the indefinite, unfinished nature of such deliberations. Community members and leaders wavered on the pros and cons of this additional time. While there may be more opportunities to educate, build trust, and organize the community, momentum and engagement are challenging to maintain as the time period expands. In addition, as the length of time is extended, the cast of key players continues to change. In both case studies, community members also expressed how turnover in appointed or elected officials meant having to re-educate decision-makers regularly.

Multi-disciplinary, Multi-sector Conversations

Community residents and leaders underscored that, as a public participant in these long-

[38] No interviewees discussed the process of re-visiting environmental assessments when a deliberation exceeds a set timeline. However, it may be worth knowing that, typically, if no construction has occurred within three years of a ROD, lead agencies are required to re-evaluate the FEIS to determine if conditions have changed (Deverman, 2012). This may entail simple documentation or another environmental review. For some projects with extensive implications for natural, cultural, or historic resources, re-evaluation may be required after two years.

term deliberations, one becomes exposed to complex systems, sharing information while learning many new concepts. During interviews, community members gave examples of how they had become experts on a variety of topics related to the environment (e.g., EIS, modeling, NAAQS), housing (e.g., eminent domain, housing programs, nuisance abatement, structural damage), labor (e.g., green jobs, union policies, unemployment trends), public health (e.g., HIAs, disease prevalence, exposure studies), policy and law (e.g., Title VI, Executive Order 12898, proposed bills), and transportation planning (e.g., diesel retrofits, zoning, regional plans, mobility measures). Often, residents were as or more knowledgeable in these diverse areas as decision-makers, providing countless examples of how they educated a policy-maker or neighbor. For instance, in Detroit, some residents described their newfound expertise in state housing programs necessary to understand what recourse they may have for living near the new bridge. Many residents in Long Beach, in another instance, may have been unaffiliated with the POLB previously but now have intimate knowledge of the drayage trucking industry.

Nexus of Science and Democracy

Both the NITC and the POLB-related deliberations show how freight decisions live at the challenged intersection of science and democracy. During an era when evidence-based policymaking is touted in public health (Jacobs, Jones, Gabella, Spring, & Brownson, 2012; Brownson, Chriqui, & Stamatakis, 2009; Brownson, Fielding, & Maylahn, 2009), many argue as to what types of data and knowledge constitute evidence (DHHS, 2009; Corburn, 2007; Fischer, 2005; Levitt & Gross, 1994; Lindbloom & Cohen, 1979). Decision-makers described many testimonies or reports where the data was molded to fit an argument and evidence was unhelpful in decision-making—not unlike most publicly debated, highly political topics. This was apparent in the debate over projected traffic volumes, for instance, where different stakeholders used

different numbers to argue for and against the NITC. Interviewees alluded to an evidence hierarchy (DHHS, 2009) in environmental assessment, where EIS/EIR models, data, and findings were held in the highest regard and community-based research, HIAs, and resident anecdotes had less authority. These secondary types of evidence can shift or even become part of EIS methods and deliberations over time, however, as seen in the calling for an official HIA in the I-710 Corridor Project.

Economic Opportunity and Conflict

Freight deliberations appear to create both economic opportunities and conflicts within host communities. In Chapter 3, we see that unemployment did not appear to differ between host and non-host freight communities and lower unemployment actually correlated with host community status in 1-mile buffers. In the case of the POLB, one of every eight residents is employed at the port. In Southwest Detroit, reported in the Final Environmental Impact Statement (FEIS), MDOT and FHWA estimated that the NITC will create approximately 4,000 jobs per year over three years of construction, in addition to eventual toll and administrative positions (2008). However, many Detroit residents expressed concern that the newly created jobs would go to an outside pool of applicants rather than residents. Meanwhile, a real or imagined dichotomous tradeoff (Matthews, 2010; Mayer, 2009; Jones, 2008) between job protection and environmental protection complicates these deliberations. To address some of these interrelated issues, interventions have been proposed across the U.S., including apprentice programs, local hiring agreements, project hiring agreements, and local disadvantaged business enterprises (Beer et al., 2010), as well as 'blue-green' coalitions (Mayer, 2009) between labor and environmental groups who collectively advocate for and negotiate these interventions. The Alameda Corridor in Los Angeles serves as a notable case study for local hiring, where an agreement negotiated by

the Alameda Corridor Transportation Authority (ACTA) and the Alameda Corridor Jobs Coalition in 1998 included provisions requiring job training and placement services to 1,000 residents surrounding the infrastructure project, a region where unemployment was as high as 34% (PolicyLink, n.d.). The CBC in Delray aims to similarly negotiate with concessionaires for local hiring.

What is Public Participation in a Freight Host Community?

There is not a single definition of 'public participant' in the context of freight and health. This dissertation focused on community members and leaders representing freight host communities as one stakeholder group, but this study also shows how there are many 'publics' in a freight deliberation. This is evident in the NEPA public comment process, where residents, business owners, staff members from external agencies, advocates, and scholars all contribute in response to the NITC's and Middle Harbor Redevelopment Project's DEISs, for instance. Thus, amidst these multiple voices, decision-makers may not always discern the concerns of host community residents. However, given that quality of life is likely most at stake for these residents, this dissertation argues that public participation—both theoretically and in practice—must be reconsidered in this freight-related context.

As a measurable or evaluable construct, public participation remains imprecise, as its successful processes and outcomes look different to different stakeholders in freight deliberations. In this study, interviewees could more easily describe successful or flawed processes than outcomes, providing a range of catalysts and barriers of institutionally- and community-led participation strategies. Perception of successful or failed participation outcomes, however, may depend largely on one's preferred outcome for a given development or mitigation decision. The EPA and FHWA celebrate the POLA and POLB as EJ success stories (FHWA,

2012), but community members and leaders do not always characterize them in this same manner. Most agree that successful participation should lead to reduced negative impacts for host communities, but what remains variable is *by how much*?

Among those residents most actively engaged, it seems that public participation in these deliberations is rarely a short-term or straight-forward process—heavily burdening or, at times, completely exhausting the resources of individuals and communities who may already be under compounding social, economic, or environmental stress. In the case of the NITC, thus far, community members and leaders in Delray interested in influencing the deliberation from beginning to end would need to be involved for over a decade, learn about and organize around several major decisions and various politicized questions: Would the bridge be approved by local, state, and federal decision-makers? Where will the bridge be built? Are environmental requirements fully met in draft documents? What will be done to address social, environmental, and economic implications of the bridge? Who will build the bridge? How will the bridge be financed? And, how will the bridge be governed and maintained to ensure mitigation measures are maintained? Near the POLB, these public participation opportunities are generally running concurrently for multiple projects under multiple jurisdictions. This may be the case nationally, as seen in Chapter 3, where freight host communities are more likely than other communities to also host industrial sources of air pollution. In these freight host communities facing multiple EJ threats, interviewees highlighted the psychosocial stress and, sometimes, physical health outcomes that resulted from being constant public participants.

Institutionally-Led Public Participation in Freight Deliberations

To promote procedural justice, government-led public participation processes must begin to address the excessive burdens that deliberations place on community members and leaders in

freight host communities. From some of these community members and leaders in the NITC and POLB host communities, we learn that meaningful participation looks like: early solicitation of public participants, acknowledgement of the ethical implications of public participation processes, recognition and reduction of residents' economic barriers, transparency of deliberative processes, accessible information, and opportunities for non-project specific communication between agencies and community members and leaders.

Solicitation of public participation in freight deliberations often occurs too late to achieve environmental justice. In the case of the NITC, residents were given one month between a scoping meeting identifying several proposed sites and Governor Granholm's announcement that the NITC would be built in Southwest Detroit—insufficient time to rally a community response. In the case of the POLB, many residents explained how, "a lot of this stuff is an exercise in beating your head against a wall," expressing concern that public hearings are merely a required step or public relations effort that often occur too late to lead to community-driven decision outcomes. EJ is relevant from the scoping phase of a freight development but not typically assessed by agencies until the DEIS process.

However, there are ethical implications of soliciting early, intensive community input for unfunded development plans (Hourdequin, 2012). Transportation projects in the U.S. are often approved, first, and funded, second, inviting residents to engage in development deliberations that may never be realized. Project staff must engage residents, but have little authority over major freight development decisions that are determined primarily by elected officials in political processes. The ramifications of planning for unfunded projects was demonstrated in the examples of 'empty promises' planning in Delray, where residents have engaged extensively in various community development plans in hopes of economic opportunities that were never seen.

Freight-related planning processes may also overlook economic barriers to public participation, where those most vulnerable to freight's health impacts have fewest resources to engage in decision-making. For instance, to testify in some hearings related to the NITC, residents had to drive 90 miles from Detroit to Lansing during working hours. Members of local advisory committees often contribute time—sometimes hundreds of hours— voluntarily, including many individuals living with limited financial resources. Grants or honorariums may be necessary to support these efforts to enable participation of the most vulnerable populations who may have the fewest resources to contribute.

Freight-related planning processes may uphold procedural justice better when planners facilitate transparent deliberative processes, providing accessible information. Community members and leaders expressed concern that sometimes decision-making steps are not transparent. For some, it was unclear: 1) who actually has decision-making authority; 2) how comments get to decision-makers when communicated to consultants or planners; 3) which comments are considered 'official' (when written, spoken, or both); 4) when to submit comments; 5) where responses to comments live; and 6) where one can go to seek technical assistance in reading documents. While many of these concerns are addressed on project websites or announced through various means during a deliberation, participants who are new, have low literacy skills, do not speak English, or have no internet access may be at a disadvantage. Interviewees reiterated the technical nature of DEIS documents in nearly every interview as a barrier to public participation. Pictorial maps of the EIS/EIR process (as seen in Figures 1.1 and 1.2) may summarize each step, but this process may be daunting in practice.

In addition to clarified, earlier processes, ethical discussions, financial support, and transparent, accessible procedures, project staff's efforts to build long-term community-agency

relationships using a communicative planning model could further catalyze public participation in freight host communities. Communicative planning models contend that planners are negotiators, mediators, or facilitators of social interaction, where policymakers draw upon diverse types of knowledge (Fainstein, 2000; Healey, 1997). In both the case of the NITC and the POLB, opportunities for non-project-specific communication were valued as opportunities to get updates, raise concerns, ask questions, and problem solve in ways that a meeting or event scheduled in the context of a specific, potentially contentious, deliberation may not. In each case, there was a community leader who described these ongoing dialogues as opportunities for "democratizing knowledge" (Corburn, 2004; Schensul, 2002), elaborating on how accessible and transparent exchanges of information facilitate participatory democracy. While the implementation of monthly meetings or structured advisory committees do not necessarily result in decision-making that solves all threats to environmental health or justice, it seems such long-term relationships may lead to productive, informed conflict and more agreeable processes or outcomes related to freight and health.

Community Organizing in Freight Deliberations

By reviewing catalysts and barriers of public participation outlined in Chapters 4 and 5, many opportunities for understanding and facilitating community-led processes in freight host communities are also apparent in the study of the NITC and POLB. To highlight key goals, tactics, stakeholders, and considerations for organizing in a host community, Figure 6.1 adapts the Midwest Academy Strategy Chart, a template for strategizing general community organizing efforts, in the context of freight and health issues. Host communities who live among several pollution sources have a shortlist of options: to coexist, to shut down or stop development of transportation and industrial infrastructure, or to seek funding to relocate (Breech, 2010). As

noted in Chapters 4 and 5, and summarized in Figure 6.1, the list of potential allies to address health in freight host communities is long, including residents along the greater transportation corridor, local public health, environmental, or social service leaders, community-based researchers, community health workers, teachers, school nurses, local health care providers, leaders at neighborhood associations, church leaders, industry or union leaders, youth leaders, and some taxpayers. Summarized in Figure 6.1, however, organizing efforts are complicated by the fact that relevant targets (i.e., individuals with decision-making power) continuously change over the course of a deliberation. In the case of the POLB, city council members and commissioners make final decisions on projects, but managing staff and constituents have influence over the long-term vision of the POLB. In the context of the SCIG, Long Beach residents had to appeal to Los Angeles City Council members and advocate to the POLB's Board of Harbor Commissioners to make a statement against the project. At the NITC, elected officials voting on policies to codify community benefits were notable targets, while taxpayers statewide weighed in on Proposal 6.

Community members and leaders also provided innovative education and outreach strategies that may be essential for engaging residents in freight deliberations. In Long Beach, for instance, a resident described workshops that she leads through her neighborhood association to share her knowledge of environmental review, summarize findings of an EIS/EIR, or share draft comments. Similarly, East Yard Communities for Environmental Justice leads a series of Good Movement 101 workshops. Through a community-campus partnership, UCLA is also leading an initiative called Assessment of Local Environmental Risk Training (ALERT), educating residents on the science of air pollution and health. Funded by the National Institutes of Environmental Health Sciences, this program has enrolled 54 residents, of which 75% say they

now use environmental health data "much more" or "more frequently" than before their participation to educate neighbors or advocate on behalf of their community (Marquez, 2012; UCLA Center for Health Policy Research, n.d.).

Emerging Considerations for Freight-Related Public Participation

Over the course of this study, there were also many indications that the responsibilities of transportation planners may be evolving with new considerations for public participation. First, federal policies have been moving the NEPA review process in a more efficient direction. In March 2011, the Council on Environmental Quality began soliciting for NEPA Pilot Projects, which would test ways to simplify NEPA processes, reduce time and cost of reviews, improve use of information technology, and improve effectiveness of public engagement (CEQ, n.d.). Under Executive Order 13563 (2011), the Obama Administration put forth a Memorandum, '*Speeding Infrastructure Development through More Efficient and Effective Permitting and Environmental Review'* to all federal agencies, including the U.S. Department of Transportation (U.S. DOT, 2012; CEQ, 2011). This call was echoed in the latest federal transportation bill, MAP-21, of which Section 1319 is titled *Accelerated Decision-making in Environmental Reviews* (U.S. DOT & FHWA, 2013). As this dissertation highlights, drawn-out deliberations have many negative consequences, but sufficient time is also needed for communities to learn the complex issues underlying a project and respond accordingly without excluding hard-to-reach populations.

Another emerging consideration for transportation planners with implications for public participation may be the move towards more private freight infrastructure projects across the U.S. In both case studies, community members and leaders gave countless examples of how current private interests stymied their voice or tricked them. This was most apparent in the

example of Moroun and the uncommon instance of his privately owned border crossing. Residents near the ports continue to rally against BNSF's proposed SCIG, which falls under POLA's jurisdiction. Residents in Detroit await the next steps in the NITC deliberation to negotiate community benefits with the private concessionaire that is selected. With aging infrastructure and decreasing budgets, public-private partnerships (P3's) are become increasingly common (Transportation for America, 2011; NCSL, 2010). Public participation may be cut or reduced in these processes, if legislators do not consider its role when drafting guidelines or policies that define a specific private or P3 arrangement (NCSL, 2010).

Assessing and Mitigating Environmental Health Risks

Assessing Risks

In both Detroit and Long Beach, residents described public health more broadly than decision-makers. As summarized in Figure 1.1, much health research on transportation-related pollution focuses on respiratory outcomes, some on cardiovascular and cancer outcomes, and a lesser but growing literature on neurological and nervous system effects. While community members and leaders raised related concerns, primarily asthma in Detroit and asthma and cancer in Long Beach, there were many more references to the broader concept of quality of life. Residents were concerned with the psychological impacts of blight or industry, safety in a residential area aside an industrial zone, noise, and structural damages to their homes and residential streets. Research shows that residents of neighborhoods characterized by 'disorder,' (i.e., crime, drug traffic, graffiti, litter, noise and abandoned buildings) experience greater stress and, consequently, experience higher rates of negative physical and mental health outcomes (Brenner, 2012; Kruger, Reischl, & Gee, 2007; Browning & Cagney, 2003; Ellen, Mijanovich, & Dillman, 2001). To address some of these missing aspects, residents near the proposed NITC

began asking for an HIA as early as 2005. In Southern California, residents fought for an HIA for the I-710 Corridor Project, and, although conducted, EIS/EIR documents may not incorporate its findings. While many of these health concerns are covered in literature and some during environmental assessment, they appear undermined as real concerns by some decision-makers in the NITC and POLB-related deliberations.

As depicted in Chapter 3, compounding exposures create challenges for host communities that environmental assessment is not designed to address. Some residents in host communities even become acclimatized to multiple exposures as described in Chapters 4 and 5. While environmental assessments acknowledge cumulative exposures through various methods and reports, they leave much onus on community members and leaders to assess and respond. Outside of specific deliberations, EPA has many tools for host communities to assess their cumulative environmental health risks, including the Community-Focused Exposure and Risk Screening Tool (C-FERST), Enviromapper, the Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT), EJView, and the Environmental Benefits Mapping and Analysis Program (BenMAP). Several residents suggested that another study or tool, however, may cause just as much damage as good, reinforcing what they may already know or laying out what feels like insurmountable health risks without comprehensive interventions for mitigating multiple exposures.

The policy-prescribed methods and thresholds used by experts to conduct environmental assessment may reproduce inequities that do not fully reflect residents' experiences or perceptions. In both the NITC and near the POLB, community members and leaders questioned the geographic scope used to determine 'no significant impacts' or even improved impacts. In particular, residents argued that, while air quality would likely improve regionally, assessments

should also report findings from more localized analyses that ask: What types of environmental changes should residents within 500 meters or 1 mile of a development expect? Some residents were also uncomfortable with 'acceptable' risks, as seen in the context of projected cancer cases in California, as value-laden terms (Slovic, 1999).And, in another example, policy-makers began calling the 'Green Sheet' summary of FEIS mitigation measures 'community benefits,' but these measures did not reflect the community benefits as defined by the CBC. These are examples of what Habermas (1975) calls 'systematically distorted communication,' where scientific assessments are not entirely value-free but perpetuated as though they are. This institutionalized lexicon normalizes expectations for assessment and may inherently preclude discussions of alternative methods, measures, or thresholds that better reflect the concerns of freight host communities.

Further, community members and leaders expressed concern that this emphasis on objectivity—whether real or artificial—may minimize complex political realities and devalue other types of risk knowledge necessary for rational decision-making. The NEPA processes is promoted as objective in many ways, but residents were concerned with the implications of subjective terms used to dismiss an alternative proposal or mitigation measure, such as 'overriding considerations,' 'feasible measures,' and 'practicable means.' For instance, community members and leaders and some policy-makers in Southern California disagreed with environmental reviewers who omitted emerging zero-emissions technology as an alternative in the SCIG, debating its current and future feasibility. Additionally, some decision-makers equated environmental assessment with objectivity and local knowledge with subjectivity, not recognizing how bias or values may underlie all kinds of knowledge (Slovic, 1999). This was seen in the case of the NITC consultant who had never been to Delray and explained "our charge

as professionals is to look at things objectively." This consultant went on to question the legitimacy of HIAs and other local health studies, arguing there is too much potential for bias. Yet, he failed to draw similar conclusions about environmental assessments, which community members and leaders often did. Many scholars (Wilson, 2001; Throgmorten, 1993;Wachs, 1985; Rein & White, 1977) argue rational planning approaches, reflected by this consultant, are entrenched institutionally through the professional education and language of planners, where positivist analyses may often become "part of their identity (Innes and Booher, 2010, p.19)." While most interviewees implied that expert-led, standard indicators, methodologies, and decision-making steps are productive, many suggested that reconciling such findings with the experiences of the community was also a rational approach as advocated by decision scientists (2004).

As noted with solicitation of public participation overall, community members and leaders raised concerns that environmental assessment processes are also "pro forma" or "perfunctory" and could do more to alleviate environmental health risks. From the time a NOI/NOP is filed, life in a potential freight host community changes. Yet, environmental health or justice concerns often remain unmeasured until well after scoping when assessed for a DEIS. This may shift NIMBY to WIMBY— *why* in my backyard (Goldstein, Fischhoff, Marcus, & Coussens, 2003)? Alternatives analyses, a central step in the DEIS preparation, may also be an unrealized opportunity to compare and contrast EJ impacts. Somewhat misleading by its name, however, site alternatives are frequently in the same community within a relatively close geographic span of one another. More so in the case of the NITC than the POLB, residents also expressed concern that the FEIS was a mere "green or red light" among legislators rather than an opportunity to talk through specific findings or determine the best mitigation measures, a critique

of NEPA that is consistent with the literature (Hansen & Wolff, 2011; Lochridge, 2011). Public participants must instigate these discussions with legislators who may be far removed from or elected many years after environmental assessment occurs.

Mitigating Risks

While EJ patterns seen in Chapter 3 may appear too entrenched to untangle and address, mitigation measures built into the environmental assessment process offer one avenue for intervening on potential disproportionate burdens. In both the NITC and POLB cases, interviewees highlighted strategies for mitigation, including those that were policy-, program- and technologically-oriented. In Detroit, residents have proposed more extensive mitigation measures than those in the FEIS as part of a CBA. In Southern California, the POLB's advisory board and the POLA's Harbor Community Foundation represent residents to distribute mitigation funds to local projects, such as air filtration in schools. These strategies have the potential to ensure accountability, while drawing more directly on local knowledge of assets and needs. Outside of the environmental assessment process, programs highlighted at the POLB's Green Port, as well as others modeled across the U.S. and globally (Green Port, 2009; Port of Charleston, n.d.), may also be necessary to prevent health impacts and consequent disparities. The International Institute for Sustainable Seaports works towards this end as a clearinghouse of strategies and research (IISS, 2011). As shown in Figure 1.1, these prevention and mitigation strategies may determine noise and air quality and the presence of environmental stressors in host communities.

Freight deliberations are currently not regulated in a way that addresses mitigation of cumulative pollution exposures. While NEPA requires agencies to assess cumulative exposures, there are no requirements for mitigation. The EPA offers agencies leading transportation

developments guidance on mitigating cumulative impacts:

> At a minimum, the mitigation should address the proposed project's contribution to the cumulative impacts. In addition, it is appropriate to suggest mitigation to address cumulative impacts that are caused by activities other than the proposed project. For example, mitigation could include forming partnerships among the different governmental agencies and private organizations to work on environmental restoration when those entities have contributed to cumulative impacts over a long period of time. It is important to note that EPA suggestions for mitigation are not necessarily constrained by whether the action agency has jurisdiction to implement the measures but the measures should be realistic and technically feasible. (EPA, 1999, p.4)

Yet, such mitigation cannot be implemented without appropriation of additional funds. As seen in the case of the NITC, mitigation of direct impacts is minimal and of cumulative impacts is unlikely. At the POLB, however, funding mechanisms, such as the Community Grant Mitigation Fund, may begin to serve this purpose when directed at the most cumulatively affected zones.

This dissertation's findings implicate housing as a major, often emotionally charged, issue for host communities addressed by government agencies when discussing mitigation. In both cases, residents described instances of decision-makers or private interests asking why they "don't just move," a question with few simple answers. Over the lingering course of a deliberation, residents struggle with deciding to stay or leave. For some, sense of community or social capital may be a strong force, given the commitment they have already made to 'saving whales,' as one Detroiter described the tireless community organizing that happens every day. Some move fearing their housing value will continue to decline. Some cannot afford to relocate. Some wait to hear if state agencies will reimburse them for declining home values or the taking of their home. Some wait in hopes that new development will revive their local economy and generate new community assets despite potential environmental burdens. Additionally, in Delray, the NITC is complicated by the disinvestment and vacant and abandoned lots associated

with the larger issues of Detroit as a shrinking city (Dewar & Thomas, 2012; Beauregard, 2009). As residents illustrated through their personal narratives, freight gateways that lead to displacement can alter sense of community (Chavis & Pretty, 1999), social capital (Hawe & Shiell, 2000; Putnam, 2000; Coleman, 1988), community capacity (Freudenberg, 2004; Goodman et al., 1998) and, thus, quality of life (CDC, 2000; CDC, 1993). Living in prolonged suspense of freight decisions, the economic and psychological health impacts are typically unmeasured but prominent.

Key Recommendations: Improving Public Participation and Environmental Assessment Through Planning, Policy, and Research

Drawing from the preceding synthesis of demographic patterns, cross-case comparisons, and analyses of public participation and environmental assessment enabled by the findings presented in Chapters 3, 4, and 5, this next section lays out overarching key recommendations for addressing EJ in freight host communities. In Chapters 4 and 5, I specifically outlined local recommendations based on the context and experiences of respective host communities. Here, I call on planners, public health practitioners, scholars, community leaders, decision-makers, and elected officials to take a part in addressing freight's implications for health equity nationally. In this section, I outline strategies for public participation that reflect the social and economic realities of freight's host communities; challenge transportation and public health professionals to better integrate their planning and evaluation efforts; name specific policy interventions that could begin to address the inaccessible, inequitable nature of freight deliberations; and, finally, encourage specific research topics and approaches that may inform each of these recommendations and future freight planning efforts.

Public Participation in Freight Host Communities

To address EJ in freight host communities, planners responsible for public participation must address the ethical implications of freight deliberations whose processes and outcomes place undue burden the psychosocial and physical health of residents. Likely experiencing compounding threats to EJ, freight host communities may deserve additional agency efforts, stepping past generic public participation processes to increase both procedural and, in some cases, restorative justice to repair the long-term effects of hosting freight and industry. To do this, planners can largely borrow from the EPA's National EJ Advisory Council's updated model guidelines for public participation (NEJAC, 2012). These guidelines address many of the barriers interviewees raised in Long Beach and Detroit, and align well with those recommendations presented at the end of Chapters 4 and 5. This document moves from rhetoric of communicative planning models towards actionable strategies for government agencies, such as (pp. 17-18):

- Develop co-sponsoring/co-planning relationships with community organizations and provide resources for their needs.
- Schedule meetings and/or public hearings to make them accessible and user-friendly for EJ stakeholders. Consider timeframes that do not conflict with work schedules, rush hours, dinner hours and other community commitments that may decrease attendance.
- Hire trainers with a good understanding of the subject matter, both technical and administrative. The trainers should be ambassadors of the community engagement process.
- Provide information to communities about the government's role as it pertains to short-term and long-term economic and environmental needs and health effects.
- After holding a public forum in a community, establish a procedure to follow up with concrete action to address the community's concerns.

- Establish interagency working groups (at all levels) to address and coordinate issues of EJ.

With recent federal transportation policies pushing for more efficient environmental assessment procedures and the increasing privatization of developments, planners should continue to assess if sufficient time is provided for early, informed, and meaningful participation, particularly in freight host communities where residents are tracking multiple threats to environmental health.

These improvements could also be institutionalized in many ways through training, policy, or funding mechanisms. The NEJAC's recommendations are not misaligned with the American Planner Association's current Code of Conduct, of which the first principle is to, "Recognize the rights of citizens to participate in planning decisions (1992)." Thus, discussion of EJ and public participation is a natural fit into planning curricula, and freight-related case studies in coursework may assist in unpacking the rational planning model's limitations, highlighting the valuable role of residents in risk assessment and problem-solving, and describing the ethical implications of long-term deliberations or 'empty promises' planning. The U.S. may also look to Canadian models for addressing the inadequacies of current public participation in meeting the needs of under-resourced populations. For example, lessons may also be culled from models such as the Canadian Environmental Assessment Agency's Participant Funding Program (2012). Through this program, individuals, non-profit organizations, and Aboriginal groups are eligible for funding if they have a "direct, local interest" (e.g., property ownership), have "community knowledge or Aboriginal traditional knowledge relevant to the environmental assessment," or have "expert information relevant to the anticipated environmental effects of the project." A similar funding mechanism would address some of the barriers described by residents in both

Long Beach and Detroit and likely experienced elsewhere in the U.S. where resources for travel, meeting space, and daycare, for instance, are minimal.

Meanwhile, community organizers can continue to learn from one another, borrowing from the lessons of other public participants in freight deliberations. For those frontline communities engaging in a freight development for the first time, the goals, allies, targets, and tactics compiled in Figure 6.1 may be a good way to guide early discussions. Yet, given the nature of compounding nature of EJ issues, these communities likely have the experience of organizing around other deliberations to build upon. Those organizing at the California ports have established strong local and regional networks for tackling freight-related EJ issues. Continued growth of the University of Southern California's Impact Project's network supported by regular *Moving Forward Together* conferences, for instance, may assist others nationally and internationally. This network has generated many resources to aid other host communities to understand the complex, multi-disciplinary, and multi-sector nature of these issues and their potential solutions, including the Pacific Institute (2010)'s *Gearing Up for Action: A Curriculum Guide for Freight Transport Justice* and the Impact Project's comprehensive website with a Speaker's Kit, past presentations, and related research.

Transportation Planning and Public Health

This study also uncovered defining and unifying features of the fields of public health and transportation planning, revealing opportunities to address health in freight host communities. Collaboration among public health professionals and transportation planners is becoming increasingly common, as reflected by funding mechanisms such as the Partnership for Sustainable Communities, a joint grant program through the Departments of Housing and Urban Development, Department of Transportation, and Environmental Protection Agency, and the

Health Impact Project, a collaboration by the Robert Wood Johnson Foundation and the Pew Charitable Trusts funding HIAs. Professional associations including the American Public Health Association and the Transportation Research Board are growing task forces and committees that emphasize this integration. In August 2012, the U.S. Department of Transportation held the first ever White House Roundtable on Health and Transportation (U.S. DOT, 2012) and in December, 2012, the Federal Highway Administration launched a *Health in Transportation* website.

Yet, in both Detroit and Long Beach, interviewees illustrated how tension exists between transportation planners and community members in the context of health. The findings for the NITC survey of evaluation factors (Figure 4.4) illustrates where goals diverge, whereas, as their first priority, MDOT staff ranked 'improvement to regional mobility' and the public ranked 'protection of community and neighborhood characteristics.' Many interviewees described the affective nature of these deliberations, where government staff or consultants felt personally attacked. In both Detroit and Long Beach, consultants and agency staff told the stories of meetings when residents accused them of "killing asthmatics and the elderly and children," or "children would say things like, 'Why does the Army Corps of Engineers want us to die from cancer?'" Transportation planners are charged with reducing traffic and boosting the economy, and while many are amenable to doing public health work to reduce asthma or cancer risks, this is a deviation from their areas of expertise.

Thus, we may achieve public health by working to first understand existing transportation planning challenges and opportunities in reducing or intervening on health risks and disparities (Litman, 2012; Litman, 2011). Public health advocates may benefit from identifying ways to integrate health considerations into current tools and metrics in planning, such as Context

Sensitive Solutions (D'Ignazio et al., 2011).[39] It also becomes necessary to investigate public health implications of innovative transportation planning interventions, such as congestion pricing, High Occupancy Vehicle lanes, or freight fleet management models (Taylor, 2011).[40] Some HIAs or health-related evaluations of these approaches have been done (UCBHIG, 2010; SFHD, n.d.). Tasked with meeting various economic- and travel-related performance metrics (EPA, 2011), development of additional measures that account for quality of life or health outcomes may assist transportation planners in developing local plans. Finally, in this study, some transportation and environmental planners stated or implied that they do their job to comply with NEPA or CEQA processes, and that to really address health, federal and state policies that govern the content and methods of these assessments would need to change. Policy advocacy may be needed to shift their role.

Policy Advocacy

Insights for policy advocacy can be extracted from qualitative data to address the EJ issues characterized in Chapter 3. This study will not be the first to critique NEPA and offer suggestions for its improvement to better address public health[41] (Walker, 2010; Bhatia &

[39] Emerging under NEPA's framework, the FHWA defined Context Sensitive Solutions in 1998 as:

- A collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility
- An approach that considers the total context within which a transportation improvement project will exist

[40] Congestion pricing, sometimes referred to as road or value pricing, is a system of charging drivers for using infrastructure services. This is done by implementing variably priced lanes, tolls, zone-based charges, or area-wide per-mile charges (U.S. DOT, 2009). It has been advocated as a way to address economic and environmental issues.

[41] NEPA does not require government agencies to measure or forecast health outcomes (Bhatia & Wernham, 2008), but the policy addresses health directly in various clauses when stating its purpose (CDC, 2012):

> *. . . promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.* NEPA § 102 [42 USC §4321]
>
> *. . . assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.* [42 USC §4331]

Wernham, 2008; Klopf, Wolff Culver, & Morton, 2007; Laron et al., 2004; Steinemann, 2001; Canter & Clark, 1997). Such suggestions must consider the many ways increasingly elaborate review processes may stall opportunities for environmental or economic advancements. Still, there is potential to improve environmental assessment in U.S. freight infrastructure deliberations. While consultants are seen as objective, third-party preparers of environmental assessments, they are often funded by state agencies which have politically-driven, legislated agendas. Currently, peer review is not part of the NEPA process (Doremus, 2011; EPA, 2006), where experts removed from a deliberation may offer critical assessments of methods, findings, and interpretation of findings. Additionally, to ensure fuller disclosure, decision-makers may benefit from also routinely hearing community-based research or HIA findings, but these are currently not part of NEPA processes. Likely given the unique context of each freight deliberation, there is currently no standard monetary value for mitigation or community benefits built into NEPA. Vigorous policy debates drawing on real examples would be helpful to establish such standards or to assist host communities in establishing reasonable requests of legislators appropriating funds—particularly considering that some legislators may have little knowledge of the costs associated with transportation's health impacts. There is little case law related to human health aspects of NEPA (Bhatia & Wernham, 2008). To many interviewees, it is unclear if new assessment policies are necessary, or current federal, state, and local regulations and procedures related to NEPA, permitting, Title VI, or trucks on residential roads, for instance, simply need reinforcement.

Other avenues for policy advocacy related to freight and health issues emerged during this study. Regulatory actions on freight vehicle emissions are associated with population-level

---

. . . attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences. [42 USC §4331]

improvements in life expectancy in the U.S., but both freight and industrial pollution continues to have a ubiquitous cumulative presence affecting health in host communities (Correia et al., 2013; Lepeule, 2012; Pope, 2007). Ongoing advocacy to reduce mobile and stationary emissions is key to reducing health risks in freight host communities. This study also highlights the inadequacies of state eminent domain policies, where advocacy is needed to extend compensation beyond infrastructure footprints to cover the area where air pollution disperses locally. Community members and leaders may also wish to act during policy windows with the introduction of each major federal transportation bill. As MAP-21, the current primary federal transportation law and funding mechanism, sets out to initiate quicker environmental reviews and develop the Freight Policy Council, where may health and EJ fit into these initiatives? As the National Environmental Justice Advisory Council continues to inform implementation of Executive Orders 12989 (1994), how is freight and health addressed?

Also, interviewees made few, if any, references to climate change, which results largely due to freight transport's emissions. This topic simply may not have arisen in the context of interview questions or in discussions of ongoing local impacts, whereas climate change's implications can be uncertain and long term (Kinney et al., 2008; Kovats & Hajat, 2008). As local governments set out to prepare for climate change, drafting plans for adapting to changing climates and mitigating emission sources (e.g., industry, transport) (ICLEI, n.d.), freight infrastructure technology and siting decisions may be wholly relevant. Transportation planners could expand environmental assessment to consider a freight project's contributions to local climate change or design mitigation measures that account for climate projections. For instance, planners might identify if and how a freight development may contribute to urban heat islands. Contributing to heat-related morbidity and mortality among sensitive populations, urban heat

islands are small pockets of urban areas where temperature is notably higher than surrounding areas often due to difference in type and density infrastructure and surface materials (e.g., asphalt) (Rosenthal, 2010). Further, recent speculation surmises that federal agencies will actually be *required* to consider climate impacts of major projects, such as freight developments, in a NEPA-like fashion, but no such policy exists (Snyder, 2013).

Research Needs

To inform these policy and practice efforts, the need for additional transdisciplinary research (Holmes, 2008; Stokols, 2006) related to freight and health is apparent. Such studies are growing increasingly sophisticated with air pollution dispersion models and improved tools for measurement. Further epidemiological studies of near road, port, border plaza, or airport that account for cumulative exposure sources (e.g., nearby industry, entire transportation corridors) must be done to continue pushing regulatory frameworks— as seen in the translation of epidemiological evidence into updated national PM2.5 standards and in current regulatory discussions related to ultrafine particles. Also, studies of occupational health for longshoremen, airport workers, and truck drivers are needed to understand work-related risks and ensure these are accounted for in freight deliberations and mitigation strategies. Participatory or collaborative research that integrates these findings with local knowledge may be increasingly capable of generating policy changes (Garcia et al, 2013; Israel et al., 2010; Themba, Minkler, & Freudenberg, 2008; Corburn, 2007). Given recent science, for instance, we see inclusion of new standards for PM2.5 (EPA, 2012) and look towards further regulations on ultrafine particles in response to ongoing research.

To ensure that policies effectively address environmental health and justice, research and evaluation of policy implementation is needed. For instance, a systematic review of freight

deliberation decisions and outcomes could offer insight as to whether mitigation strategies achieve their intended outcomes. Such a study could be guided by these research questions: Are mitigation measures implemented? Who is accountable? How are they funded? For instance, the NITC's FEIS states that they will "secure enhancement funds" to coordinate local job training but does not assign responsibility or offer details. Further, policy advocates aiming to increase attention to health in the environmental assessment process may wish to closely study NEPA outcomes in freight deliberations, assessing geographic scope and factors in cases of 'significant' versus 'no significant' impacts.

New research questions related to planning and health have also emerged during this study. To better align the efforts of transportation and public health professionals, a review of MPO, state, or local transportation plans may be useful, culling out how transportation currently measures or addresses public health goals (Hartell & McAndrews, 2012; Young & Kresge, 2012). While various policies mandate that local Departments of Transportation in the U.S. have public involvement plans in place (DOT, n.d.), policy-makers need research to assess if these plans explicitly or sufficiently acknowledge how public involvement may look different in freight host communities that may have less education and multiple threats to EJ. Also, ongoing natural experiments or case studies of landscape design, such as interventions referenced by interviewees (e.g., green space buffers, tree berms) could offer a pool of suggestions to draw upon when selecting mitigation measures (Brauer, Reynolds, & Hystad, 2012; Pugh et al., 2012; Rowe, 2011; Currie & Bass, 2008).

Finally, there are many opportunities to advance EJ research. This study attempted to show distinct patterns of environmental injustice near freight gateways. While insightful, research should not stop with descriptive demographic comparisons. An exploration of land use

with attention to vacancies and land ownership may be necessary to address institutionalized barriers to EJ. In the core of Southwest Detroit, for instance, all land between Fort Street and the Detroit River, between West Grand Boulevard and Livernois is zoned with an M4[42] designation called 'Intensive Industrial District' (City of Detroit, 2013). There are hundreds of homes in this region, and in nearby adjacent areas zoned as R2, '2-Family Residential' and B4, 'General Business District.' Further, vacancies are growing increasingly common in industrial and coastal cities (Dewar and Thomas, 2012; Beauregard, 2009), of which many are freight host communities experiencing post-industrialization. While data are often hard to locate or generate, EJ studies should investigate relationships between race and ethnicity, socioeconomic position, land use, zoning, housing markets, and health. Identifying notable patterns could inform the conceptualization of larger, federal EJ strategies related to freight and other hazards.

Limitations

Chapter 3 summarizes the limitations of spatial inquiry at length, as well as steps to remedy study bias. These include issues with areal weighting, accurate spatial data, missing data, and the use of proxy variables to specify models. This study compares multiple approaches to areal weighting and validates spatial data through many sources. Further, given the large sample size and historically validated data from the U.S. Census Bureau, missing data and proxy variables do not appear to compromise the conclusion that freight host communities are different than non-freight-host communities. This spatial inquiry advances EJ research by applying and

[42] Detroit's City Planning Commission, describes M4 classification as such:

> This district will permit uses which are usually objectionable and, therefore, the district is rarely, if ever, located adjacent to residential districts. A broad range of uses is permitted in this district. New residences are prohibited with the exception of loft conversions of existing buildings and of residential uses combined in structures with permitted commercial uses. These requirements are to protect residences from an undesirable environment and to ensure reservation of adequate areas for industrial development.

expanding methods to include digitized polygon shapefiles of freight-related pollutions sources. Given the inherent methodological challenges of spatial national studies, EJ research may simply require a variety of approaches and illustrations to assess and communicate patterns of environmental burden (Maantay, 2002).

There were many opportunities for bias in this dissertation's qualitative inquiry also, although efforts were made to reduce each. Researchers are imperfect instruments in data collection and analysis (Onwuegbuzie & Leech, 2007). Researcher bias is particularly inevitable in a study with political layers related to labor, environmental health, and social equity. Also, the goal of institutional ethnography is generally to uncover the interworkings of institutional practices from the perspective of lay residents, workers, or citizens they affect (Smith, 2006). I attempt to synthesize these perspectives, but I am not a Delray or Long Beach resident. However, in qualitative research such biases are not fatal flaws but, instead, opportunities for reflection when biases are laid out transparently (Watt, 2007; Paterson, 1994). Appendix G contains a brief statement that presents such reflections in the context of this study. There are also mechanisms for ensuring study methods and findings better reflect multiple perspectives and the experiences of interviewees in qualitative research, however. By having multiple coders develop a codelist and open code the first ten transcripts, this study was broader in its perspectives. Further, member checking ensures that the experiences of interviewees are conveyed in context and accurately when synthesizing (Cohen & Crabtree, 2006). To this end, I continue to share preliminary summaries and presentations of findings with interviewees.[43] Finally, readers of this study should note that even with extensive content analysis, participant

[43] Member checking is ongoing and will continue beyond the publication of this dissertation. Interviewees and additional interested community members and leaders will receive brief 1-2 page summaries of this study's findings. Key informants identified during interviews will review these first. In both cities, meetings will be held to share these documents and seek feedback. Future presentations and publications will reflect this feedback.

observation, and interviews, this study is not exhaustive, and some components of the public participation and environmental assessment processes under study were inevitably left out. As a central characteristic of freight land use development decisions, these deliberations will continue for many years beyond the timeline of this study.

Interviewees may have biased the study also, offering socially desirable or politically correct answers or choosing not to participate in the study at all, a longtime common threat in social science research (Crowne & Marlow, 1960). In Detroit, for instance, some decision-makers chose not to participate, citing their role in ongoing litigation regarding the Ambassador Bridge as a reason they did not feel comfortable speaking about the related freight issues. Also, legislators cut MDOT's NITC-related spending during the spring of 2011, stopping meetings with the Local Advisory Council. Some staff explained that, as they had been asked to pause any planning-related discussions, participating in this study was not possible. Interviews with these individuals would have provided additional valuable perspectives.

Additionally, this study may benefit from additional international perspectives. The NITC host community in Windsor, Ontario, Canada, for instance, may have experienced the deliberation in different ways. While a few Windsor residents participated in Detroit events and a few were interviewed as pilot study participants, there was not sufficient data to gather and share overarching themes about that host community's experiences. Further, a macro study of decision-making at freight gateways may also include another layer of interviewees from private companies or union leaders, where Asian shipping companies or Canadian trucking unions, for instance, may have a vested interest in how health risks are addressed for economic, labor, and social reasons. Additional practical research questions may be: How do these stakeholders influence decision-making? How do they interact with or affect host communities? How do they

assess or address occupational health risks for truck drivers and longshoremen?

Findings of this study are not intended to be wholly generalizable to all U.S. regions. In fact, the clear differences in local governance, funding, history, planning, culture, and community capacity at the two case sites described earlier in this chapter highlight ways in which each community's decision-making processes are unique. Thus, site-specific recommendations may not be applicable everywhere. However, despite the major differences between the NITC and POLB deliberations, which were selected for their maximum variation, there are transferable lessons for other sites given their many shared features—their long timelines; the need for integrated multi-sector, multidisciplinary approaches; the existence of economic opportunities and challenges; and the complex convergence of science and democracy that underlie decision-making. The federal funding pipeline and mandated use of public participation activities are constant variables that will likely render findings useful for others, including community members and leaders and decision-makers living or working near other major freight gateways.

Significance

The local implications of global trade are not unique to those living in the shadows of the Ambassador Bridge, in the footprint of the proposed NITC, or along the transportation corridor that comprises Southern California's port community. Nor are these the only communities where residents are public participants in freight deliberations. Thus, this dissertation's findings have global relevance, as the experiences of interviewees may resonate with those living near the Panama Canal, which so many interviewees referenced, or other freight gateways in the midst of deliberations (Hricko, 2013). As just some examples:

- In Cherry, Washington, a recent deliberation has ensued over whether to build the Gateway

Pacific Terminal, a multi-commodity export facility that will increase rail traffic of coal-carrying trains. The Northwest Washington Central Labor Council wrote an open letter to the Whatcom County community explaining how they thought local physicians advocating against the development misrepresented the project's health risks (Stark, 2011). A group of 170 local physicians responded by signing on to an open request for a HIA. Further, members of the Lummi Nation, native to this region, have raised concerns that this terminal will affect salmon populations, a traditional cultural and natural resource for this community. Currently, the project's EIS is underway. According to the project website, more than 9,000 people participated in scoping meetings over the course of November and December 2012 (Whatcom County, 2012).

- In South Durban, South Africa, Transnet is leading a major expansion of the ports and surrounding infrastructure at Durban Bay to accommodate 17 million more shipping containers each year (Gedye, 2012)—a project that has been written into the National Planning Commission's (2012) national development plan. The South Durban Community Environmental Alliance, in collaboration with many other groups, has expressed concerns over unemployment, housing, and environmental health in the economically vulnerable region. Community groups are advocating for use of rail rather than additional trucks in this development. Compounding air quality concerns, the port region sees as many as 7,000 truck-related crashes each year accompanied by several hundred deaths and injuries (Ethekwini Transport Authority, 2011).
- In the Alaskan Arctic, such deliberations may be a long way off but oil and shipping companies are scouting sites for infrastructure. Experts from the U.S. Department of Defense suggest there will eventually be a new 'North' U.S. coast ripe for development. Forecasting

> when and how to build this infrastructure is dependent on many long-term factors, however, including climate change. During a panel presentation at the 2012 Association of the United States Army Annual Meeting and Exposition in Washington, D.C., Major General Francis G. Mahon of the U.S. Northern Command described global economic interests in developing this emerging coast, which could allow major companies to ship Chinese products to Europe more directly than the Panama Canal (U.S. Army, 2012).

And, still there are other examples (Hricko, 2013; Matsuoka, 2011). In conducting and sharing this ongoing research, it has become increasingly apparent that many communities have their own version of the POLB and NITC stories.

Conclusion

Freight transport is an EJ issue with implications for population health. At the 50 largest U.S. freight gateways, areally weighted analyses show that populations within 500 meters of a freight gateway have statistically significant higher proportions of persons of color, Hispanic ethnicity, without a high school diploma, and below the federal poverty level. Logistic regression models also compare 500-meter and 1-mile host communities to non-host communities, and collective results suggest that communities of color are disproportionately compromised by both transportation and industrial air pollution sources. The spatial patterns reported in this study deserve attention nationally and locally, particularly given continuous development at or near freight gateways globally.

Through the words of those most directly involved, this study clarifies what it means to be a 'public participant' in the context of these freight-related deliberations. Frequently, low-income, persons of color— who have historically been excluded from land use decision-making—must protect their communities from freight-related health risks, sometimes over the

course of concurrent, decade-long deliberations through participation in hundreds of meetings. As highlighted in the case of the NITC and the POLB, even after considerable investments in participation on the part of these community residents, macroeconomic forces often trump community concerns through 'overriding considerations' or other means, whereby development decisions are often made well in advance or outside of public participation opportunities. Still, host communities may shift deliberations by: 1) exposing risks in institutional forums; 2) educating decision-makers and neighbors of deliberative processes and opportunities; 3) advocating and preparing for job opportunities; 4) legally challenging assessment procedures; 5) proposing site or project alternatives; 6) pushing adoption of sustainable technologies; 7) proposing equalizing mitigation opportunities; 8) initiating cross-sector conversations; or 9) codifying innovative governance structures.

Environmental assessment is a primary mechanism for identifying and mitigating risks for freight host communities. This study suggests that laws like NEPA and CEQA may frequently address issues of procedural justice, but they do not always lead to distributive or restorative justice regarding environmental health. Community members and leaders described how these technocratic processes may, in fact, uphold discriminatory practices where siting follows normative inequitable patterns, analyses overlook the most local of impacts relying on "systematically distorted" knowledge, and mitigation goes underfunded. Often, assessment processes are more about the larger discourse between a project's supporters and opponents than the merit of the environmental assessment and its findings. Environmental assessment raises a range of community concerns it is not expected to reconcile, some which may be dismissed as lesser knowledge relative to expert-generated data in EIS documents.

Beginning in prehistoric times, trade has been a lasting feature of our human civilization. In the U.S. today, President Obama recently set a goal to double the nation's exports by 2015. In 2012, the Department of Transportation awarded 47 grants to freight-related infrastructure projects, including more than $276 million to 17 ports across the U.S. through TIGER grants (U.S. DOT, 2012). Living in these freight host communities can affect one's health in many ways, creating or dismantling social and economic opportunities. These consequences are more complex than any single sector, discipline, or agency, however. Thus, continued conversations between transportation, environmental, housing, employment, and health agencies with communities can better address freight's impacts locally without demonizing or burdening a single stakeholder group. In today's increasingly populous, globalized world, trade through ships, trucks, planes, and rail has severe implications for climate change and health equity. As we now have the advanced technology to expand trade to unprecedented levels and get 'Big Ship Ready,' we also have the abilities to assess and address its unprecedented social and environmental consequences that disproportionately burden consistently marginalized populations in the U.S.

Table 6.1 Community Organizing for Health in Freight Host Communities– A Strategy Chart
Adapted from the Midwest Academy Strategy Chart - http://www.partnersinpolicymaking.com/curriculumchangechart.html

GOALS	KEY CONSIDERATIONS	ALLIES & OPPONENTS	TARGETS	POTENTIAL TACTICS

1. COEXIST
This may entail adoption of community benefits agreements, effective mitigation measures, or community-driven development alternatives.
 	
2. SHUT DOWN/STOP DEVELOPMENT
This may entail litigation to counter private interests.
 	
3. SEEK FUNDS TO RELOCATE
Residents may ultimately choose or be forced to move out of their community. This may entail eminent domain or require advocacy and grants to fund relocation.
	RESOURCES
	- Meeting space
	- Refreshments
	- Copies
	- Grant-writing support
	- Media access
	- NEPA technical expertise
	- Honorariums or resources for gas, day care, etc.
	
	CAPACITY-BUILDING
	- Skill development as leaders or members of boards or coalitions
	  - Leadership
	  - Policy advocacy
	  - Community-based research
	- Increased knowledge of transportation planning, public health, etc.
	
	OTHER CONSIDERATIONS
	- Past 'empty promise' developments impact morale
	- Multiple pollution sources requiring ongoing advocacy
	- Impacts of long-term deliberations on quantity and quality of participation
	- Competing priorities for residents' time and energy
	- Complex messages may be easily confused (e.g., Yes, if x, y, and z are adopted. Otherwise, no development.)
		ALLIES
		- Residents along regional transportation corridor
		- Public health, environmental, or social service leaders
		- Community-based researchers
		- Community health workers
		- Teachers and school nurses
		- Medical community
		- Neighborhood associations and churches
		- Industry or union leaders in support of sustainable development or community benefits (e.g., jobs)
		- Youth leaders
		- Taxpayers
		
		OPPONENTS
		- Residents in other potential host communities
		- Industry or union leaders opposing regulations or governance strategies
		- Taxpayers
			- Transportation planners and consultants who conduct environmental review, and identify and implement alternatives and mitigation strategies
			
			- Appointed or elected officials who determine appropriations, project approval, project governance, and associated legislation
			
			- Federal agency staff who approve final permits
			
			- Private concessionaires or developers who may negotiate community benefits
			
			- Constituents and taxpayers who can influence decision-makers
			
			- Media outlets who frame issues in multiple ways (e.g., jobs vs. the environment; environmental justice)
				To achieve one of the three goals, host communities may use a combination of strategies that entail education, litigation, and advocacy for regulatory or governance policies. These are just some examples:
				
				1. Draft comments on environmental assessment documents to identify overlooked health concerns, propose mitigation measures, etc.
				
				2. Advocate for codified mechanisms for resident involvement in long-term port/border governance (e.g., community foundation or advisory committee)
				
				3. Educate targets on health concerns by sharing findings of community-driven studies (e.g., 'bucket brigade' air quality monitoring) and peer-reviewed literature
				
				4. Partner with legal aid organizations to litigate on regulatory grounds
				
				5. Invite targets for windshield tour of affected community to share history, context, and concerns
				
				6. Educate households in affected community on freight development, eminent domain, and legal rights

APPENDICES

Appendix A: Glossary of Freight & Health Terminology

Adapted from Long Beach Alliance for Children's Asthma *Speaker's Kit* (http://hydra.usc.edu/scehsc/web/Resources/Speaker's_Kit/Glossary.pdf)

Air Pollution: Particles or gases in the air that are not part of the normal composition of air. "Smog" is *visible* air pollution, though many pollutants, including some of the most dangerous, cannot be seen by the naked eye.

Asthma: A chronic disease of the lungs in which the airways become inflamed and constricted, leading to wheezing and difficulty breathing. Asthma attacks can range in severity from mild to life threatening; symptoms include shortness of breath, coughing wheezing, and chest pain or tightness.

Carbon Monoxide (CO): A gas that is generated by car and industrial emissions; CO has been found to have harmful effects on health.

Criteria Air Pollutant: Air pollutants for which legal standards for acceptable levels of exposure have been set by government agencies, because they pose a danger to public health and the environment, are widespread throughout the U.S., and come from a variety of sources.

Diesel Exhaust: Emissions created when diesel fuel is burned by trucks, ships, rail, and other machinery that have diesel engines; contains many types of particles and gases.

Drayage: Refers to a truck hauling a container, usually a short distance (such as from a port to a railyard).

Environmental Impact Report/Environmental Impact Statement EIR/EIS: documents that are required to be prepared, respectively, by the federal or California government, to describe the environmental impacts of new projects.

Environmental Justice: "The fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies" (U.S. EPA)

Export: Any good or product transported from one country to another country, typically for use in trade.

Gateway Cities Council of Governments (COG): an organization representing cities along the important trade corridor in California, the I-710 (Long Beach) Freeway.

Goods Movement: The transportation of products (goods) from where they are made to the places where they are sold.

Health Risk Assessment (HRA): a scientific method used to find out what health impacts may come from being exposed to certain chemical or toxic air contaminants that are released from a specific location or found in the air. A HRA is used to determine whether current or future exposure to these chemicals will cause harm to the health a broad population, such as a city or a community.

I-710 Air Quality Improvement Plan (AQIP): A short term air quality improvement plan developed by a group of agencies including: The Los Angeles County MTA, CalTrans, the Southern California Association of Governments and the Gateway Cities COG, to be implemented before any I-710 expansion project takes place.

Import: Any good or product, brought *into* one country from another country, typically for use in trade.

Intermodal facility: This type of facility is designed for more than one type of transportation, such as the loading and unloading of containers from trucks to trains, and from trains to trucks.

International Cargo Container: Metal containers designed to transport goods; today's average international cargo container is 40 feet long. Containers used to be 20 feet long, called a "TEU" (see below). Thus, the 40-foot containers are equivalent to 2 TEUs.

Micron (µm): a micro meter; one micron is about 60-100 times smaller than the width of a human hair. Typically the measurement used to describe the size of particulate matter (PM); for example, PM 2.5 is 2.5 microns.

Noise Pollution: the introduction of noise into the environment in such a way that quality of life, community and environmental health is negatively impacted (for example, constant noise from a railyard facility that disturbs nearby communities).

Nitrogen Dioxide (**NOx):** a gas typically created when fuel is burned; NOx is a major contributor to the formation of smog, and has been found to have many negative impacts on environmental and human health.

Ozone (O3): Comes from NOx and reactive organics (ROG) combining in the presence of sunlight. Ground-level ozone is an air pollutant that is a major component of smog, and has harmful effects on the respiratory system.

Particulate Matter (PM): Particles floating in air that are created by burning fuel, such as diesel or gasoline. The smallest types of PM in the air are too small to be seen, and can get into the lungs, causing harmful health effects.

Port: A facility to load goods onto ships, planes or other forms of transportation equipment so that they can be moved from one place to another.

Rail Yard: A complex series of railroad tracks used for storing, sorting, loading/unloading, and repairing railroad cars and/or locomotives. Rail yards also serve as a site where containers of goods are transferred onto trucks or trains.

Sensitive Receptor: A term frequently used by government agencies to describe facilities that serve or house generally vulnerable populations (e.g., schools, hospitals)

Southern California International Gateway: A near-dock rail facility (about 4 miles from the Port of LA) proposed by BNSF railroad that would handle only international containers coming directly from the port. The SCIG would be located between the Terminal Island Freeway, Sepulveda Boulevard and Pacific Coast Highway on land owned primarily by the Port of Los Angeles, but partly by the City of Long Beach and City of Carson.

Smog: Visible air pollution which react in certain weather conditions and have negative impacts on human and environmental health.

Sulfur Dioxide SOx: formed by burning coal and fuel; has been found to be harmful to human and environmental health.

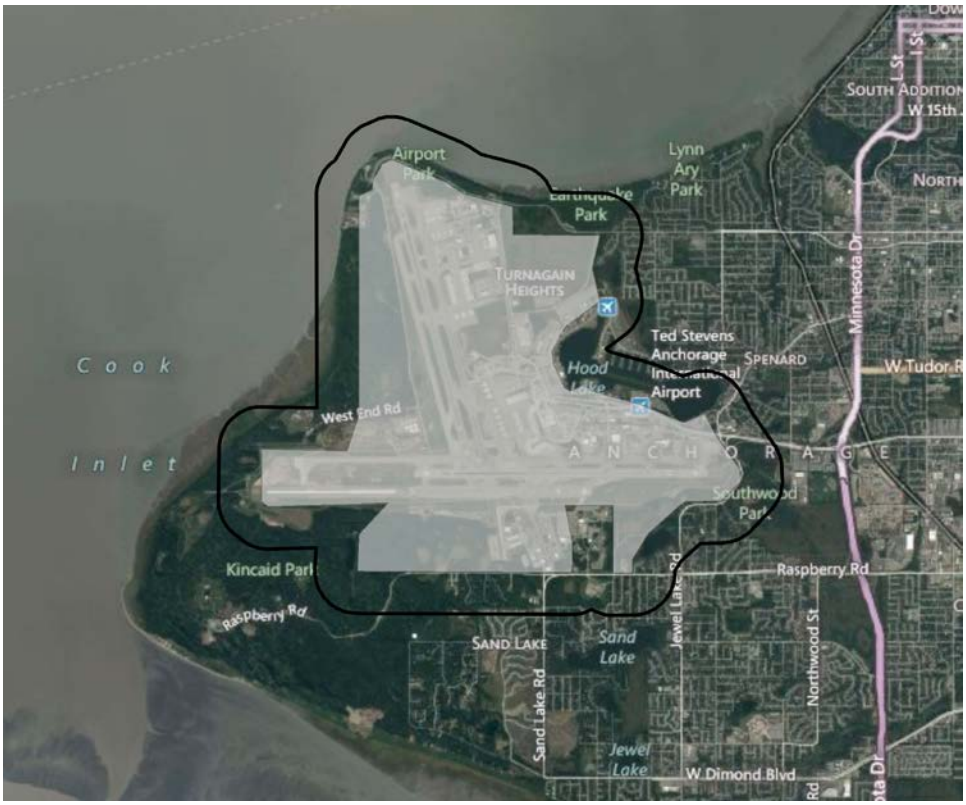
"Twenty-foot equivalent unit" (TEU): unit of measure for containers in which goods are transported; a typical shipping container is 40 feet long or considered to be 2 TEUs.

Toxic Air Contaminant: A label used by the State of California for certain chemicals that are declared to be toxic to human health, requiring regulation. Diesel particulate matter was named a Toxic Air Contaminant in 1998.

Transportation Corridor: A major corridor of route for moving containers from one destination to another; the I-710 Freeway is an important transportation corridor for movement of containers from the San Pedro Bay Ports to the local rail yards and out to distribution centers in Riverside and San Bernardino Counties.

Ultrafine Particles: Particles that are less than 1 micron in size (one-millionth of a meter, 60-100 times smaller than the width of a human hair). Ultrafine particles are harmful because they travel deep into the lungs.

Appendix B: Screenshots of 50 Largest (By Trade Value) Freight Gateways as Digitized with 500-meter Buffers

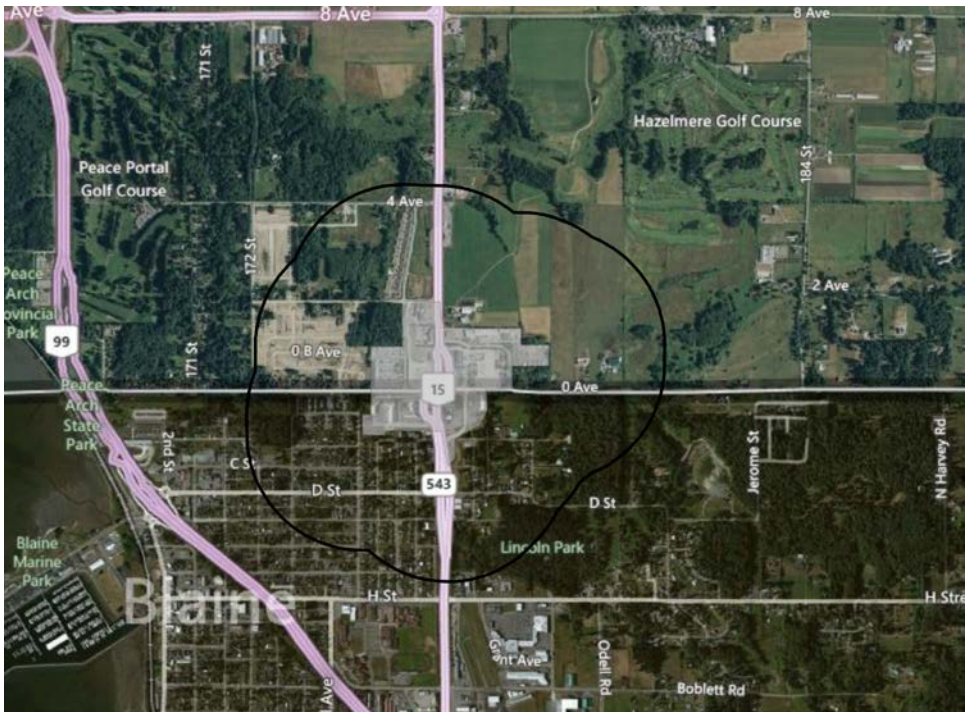


Anchorage, Alaska

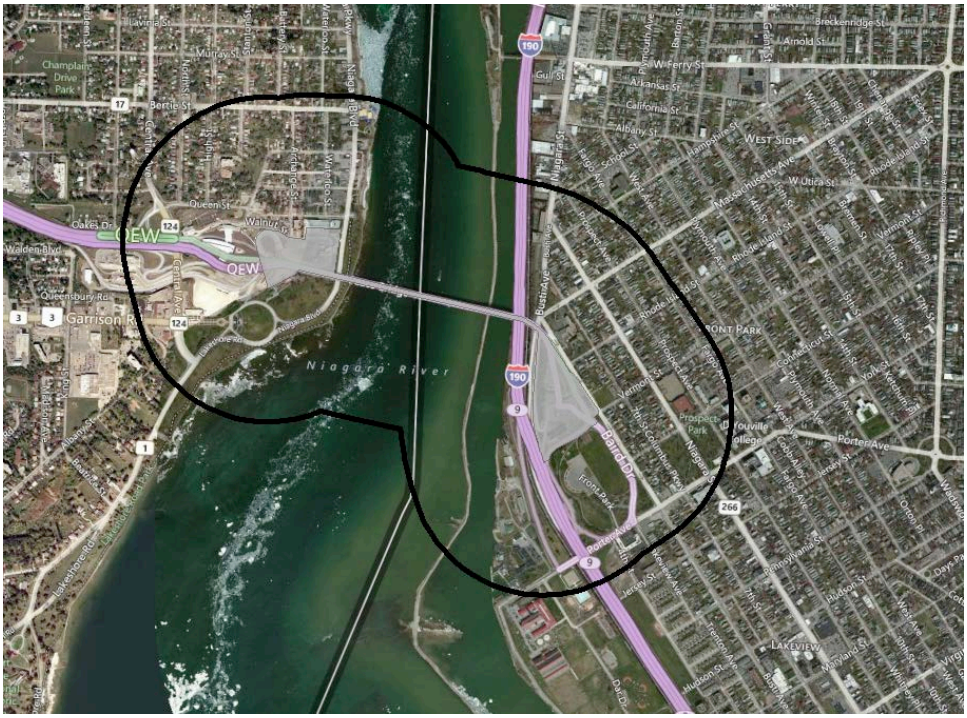
Atlanta, Georgia

Baltimore, Maryland

Beaumont, Texas

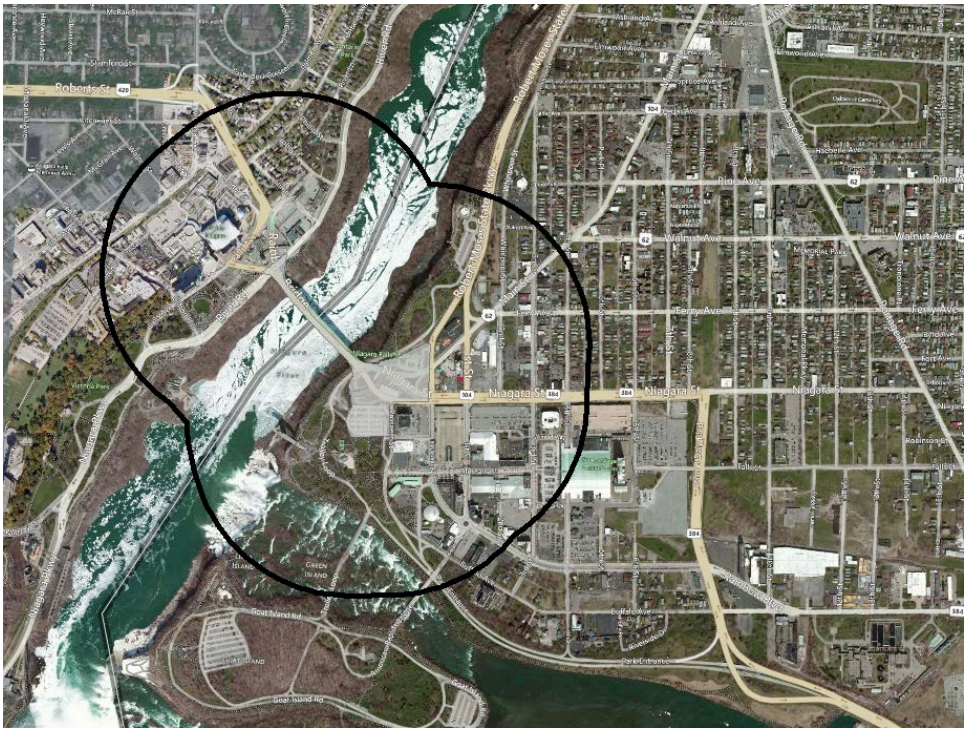


Blaine, Washington

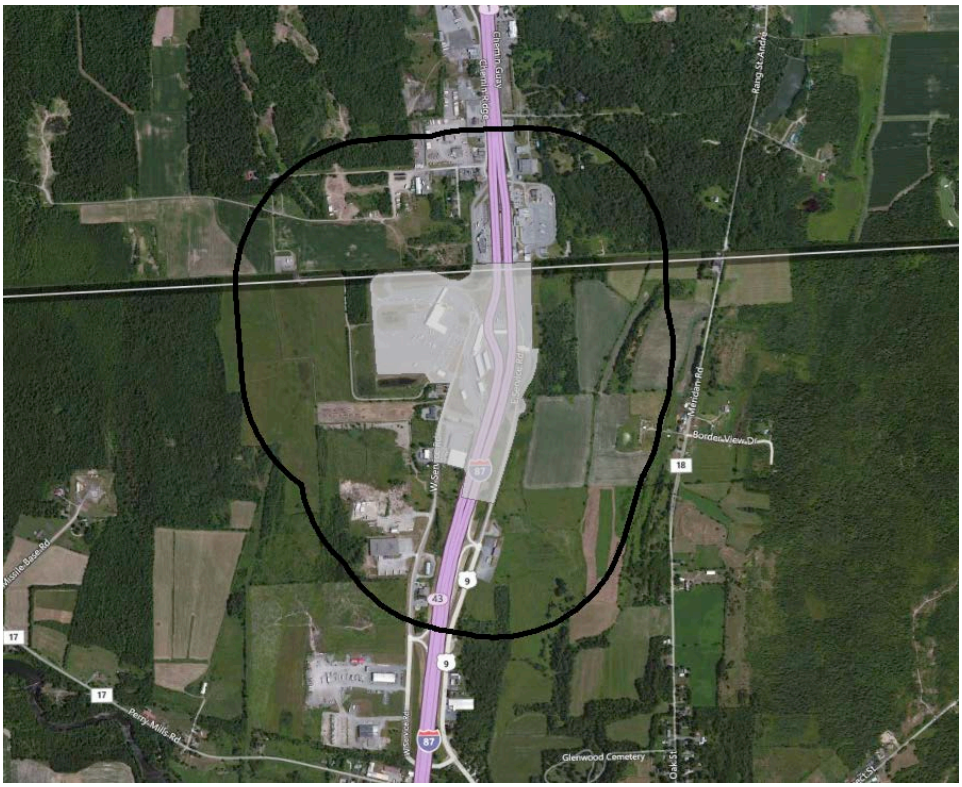


Buffalo-Niagara, New York (Peace Bridge)

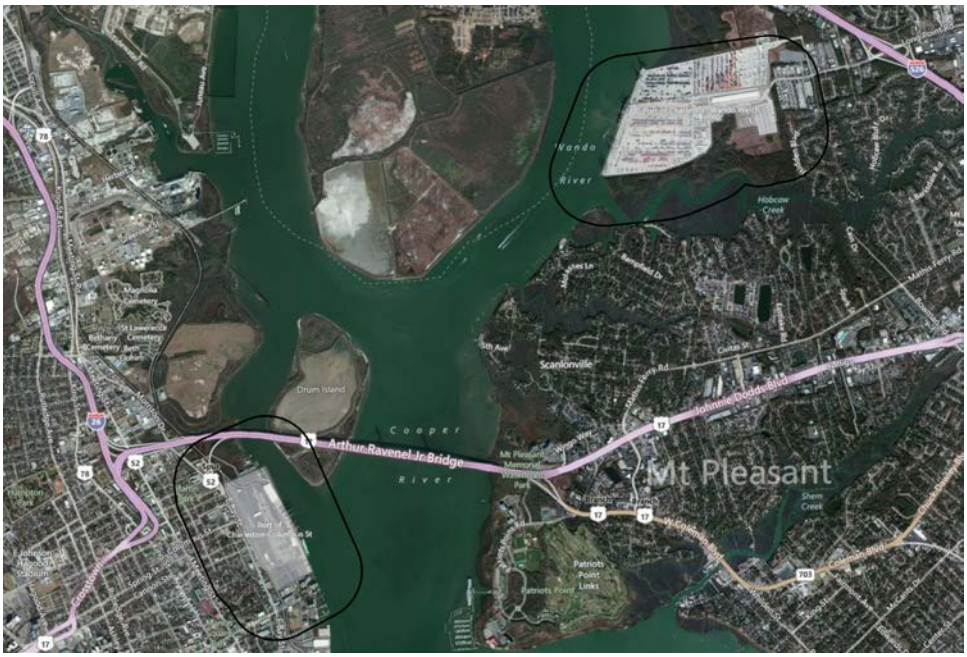
Buffalo-Niagara, New York (Queenston - Lewiston Bridge)



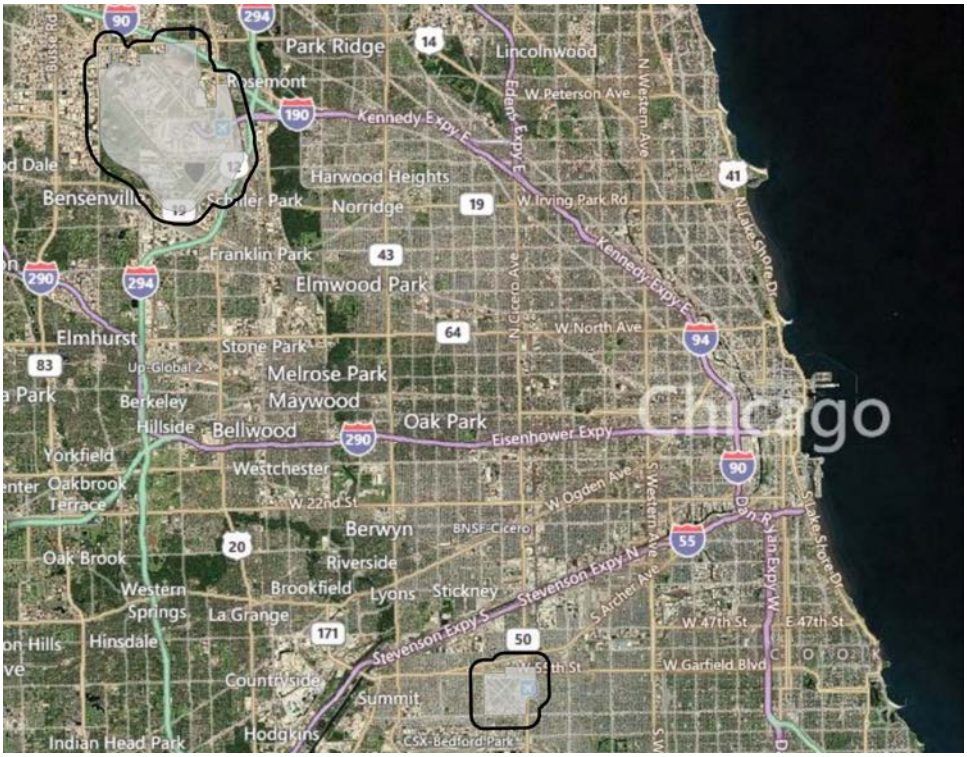
Buffalo-Niagara, New York (Rainbow Bridge)



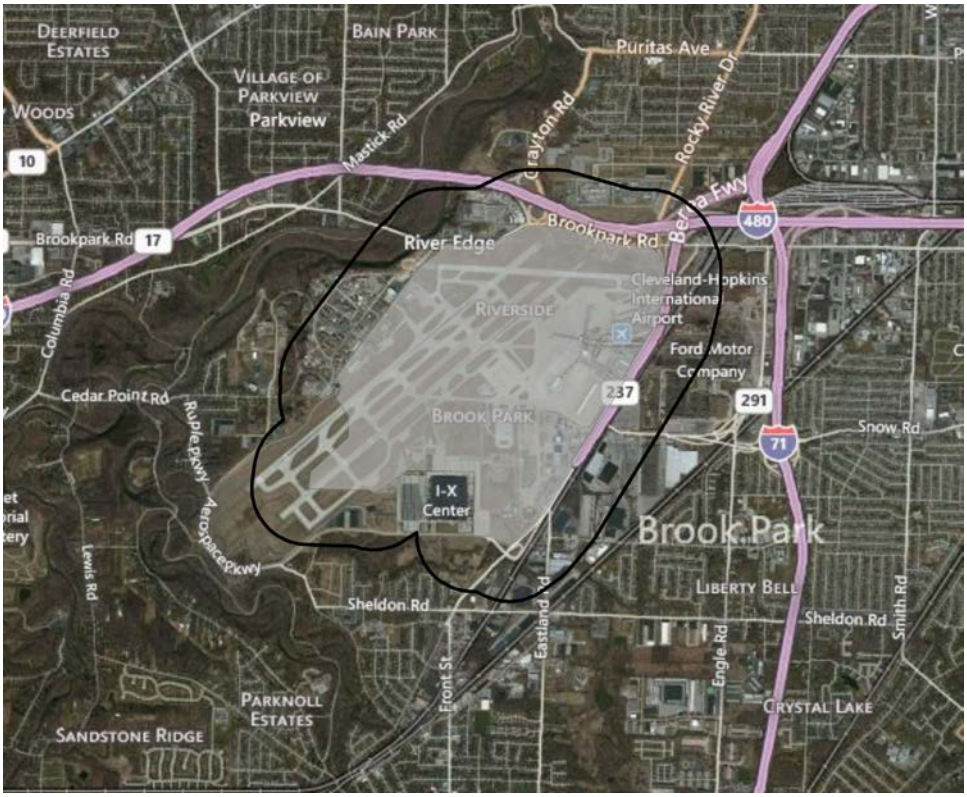
Champlain-Rouses Point, New York



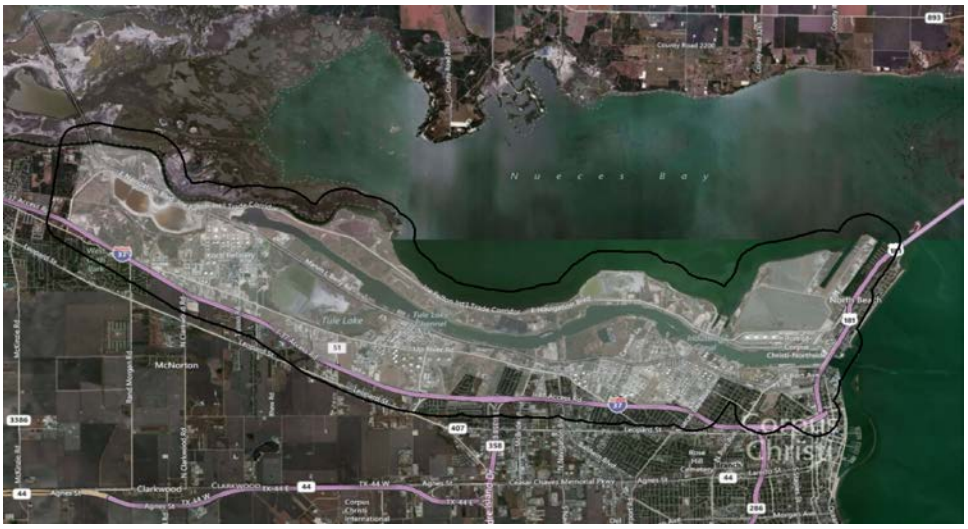
Charleston, South Carolina



Chicago, Illinois



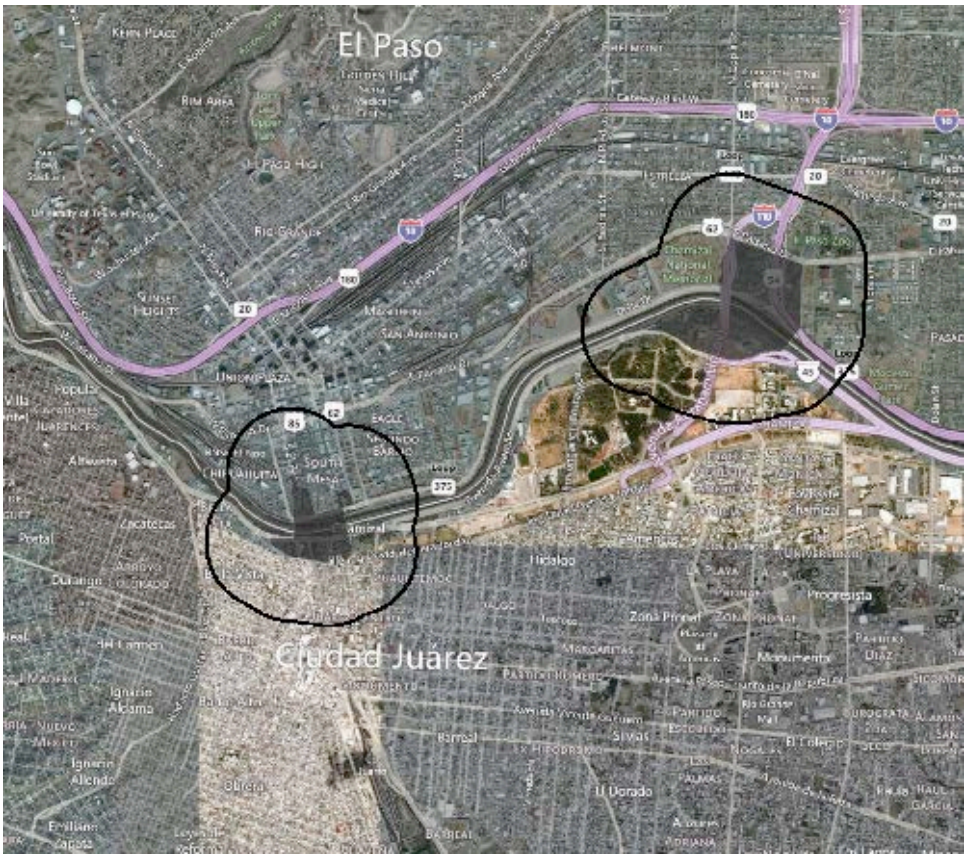
Cleveland, Ohio



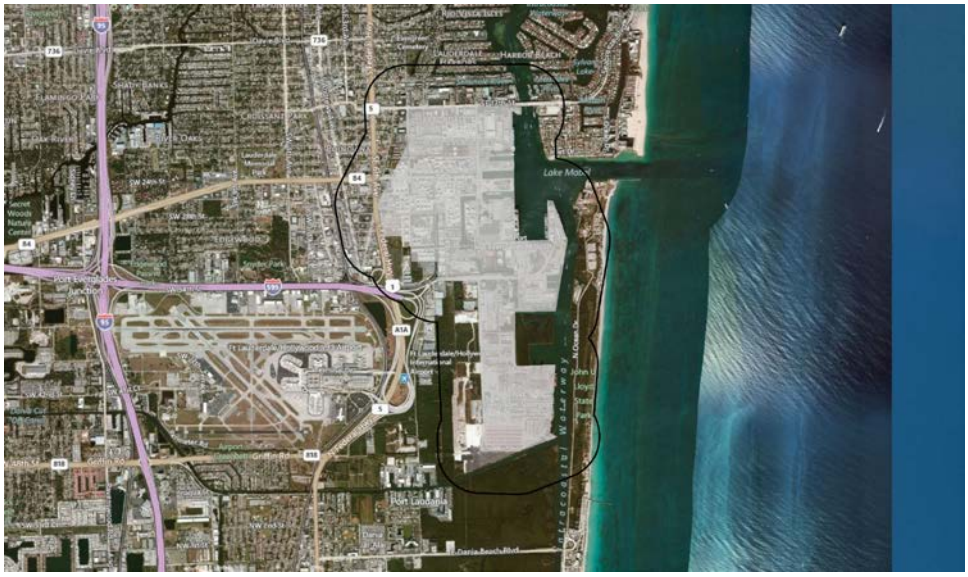
Corpus Christi, Texas

Dallas, Texas

Detroit, Michigan



El Paso, Texas

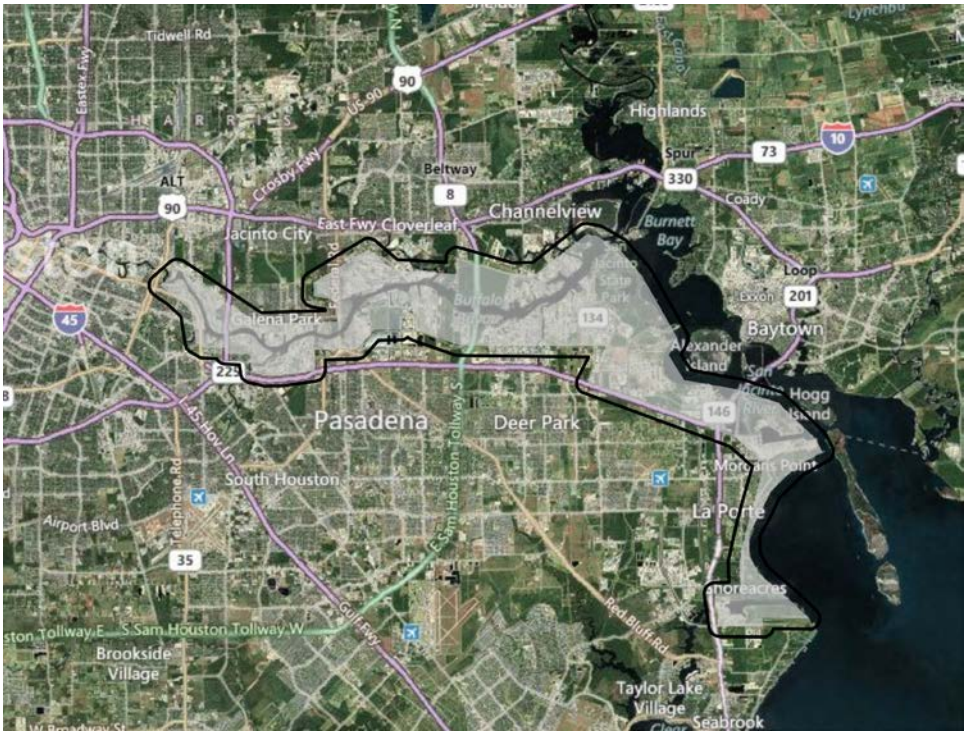


Everglades, Florida

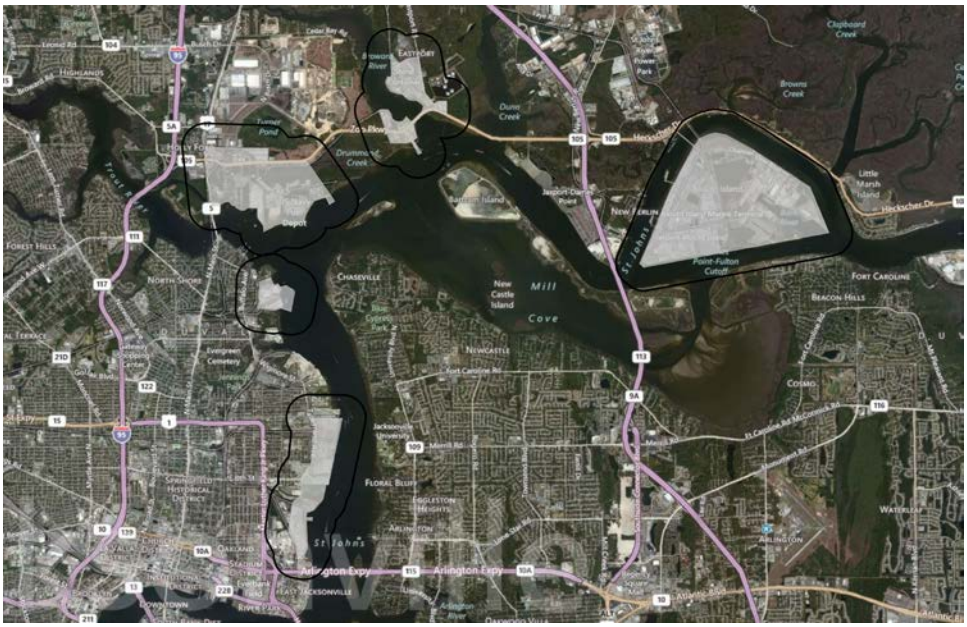
Freeport, Texas

Gramercy, Louisiana

Hidalgo, Texas



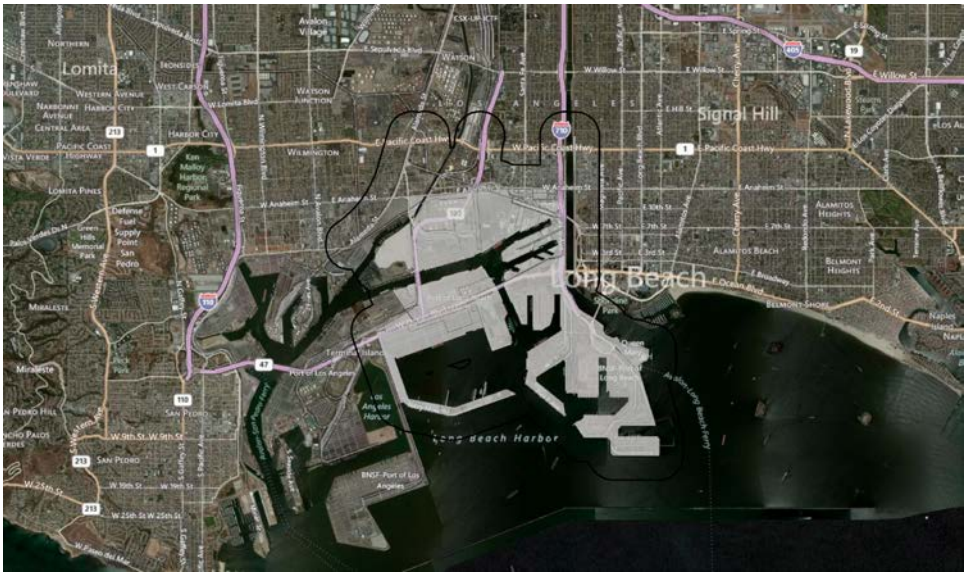
Houston, Texas



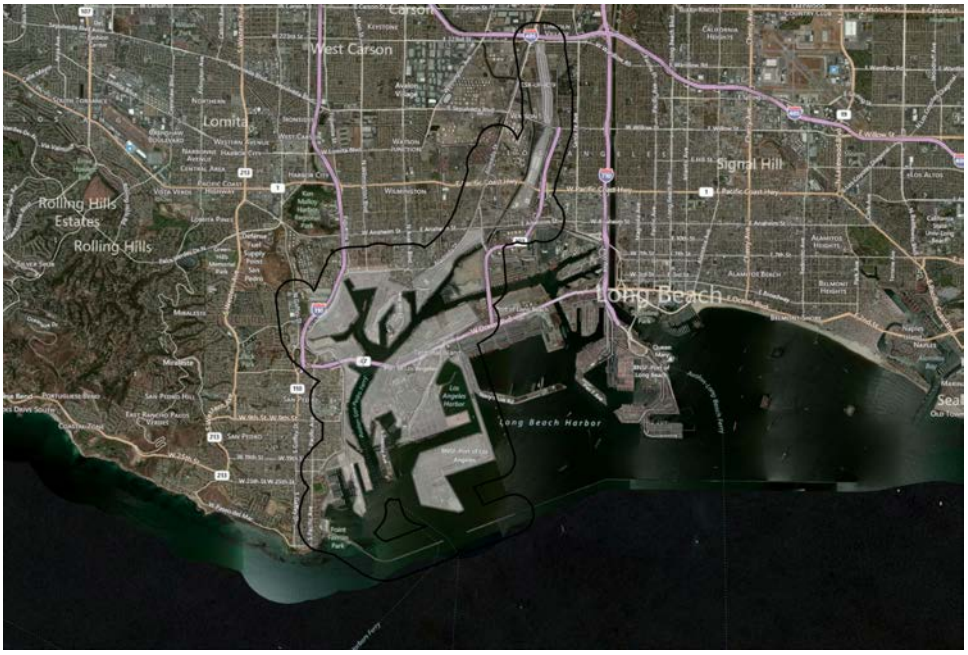
Jacksonville, Florida

Lake Charles, Louisiana

Laredo, Texas

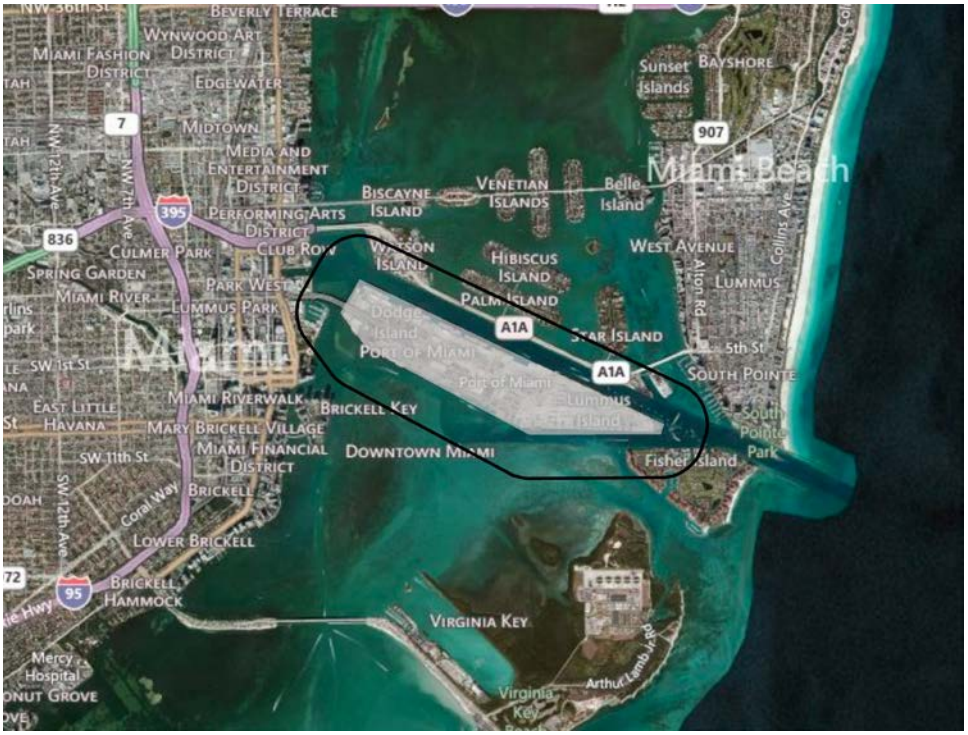


Long Beach, California

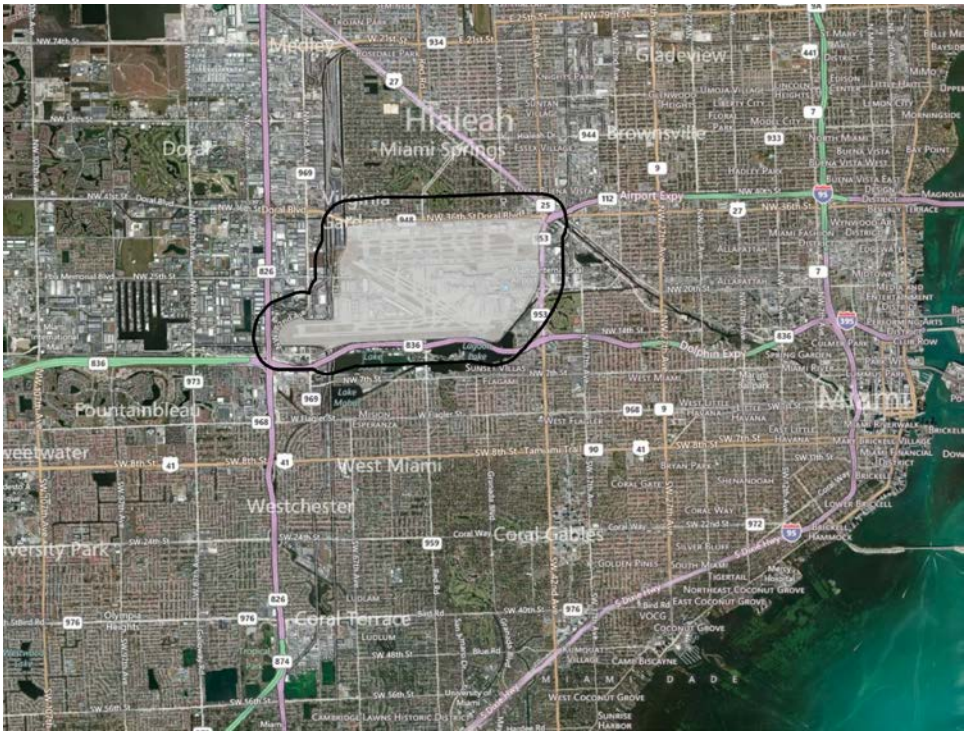


Los Angeles, California (seaport)

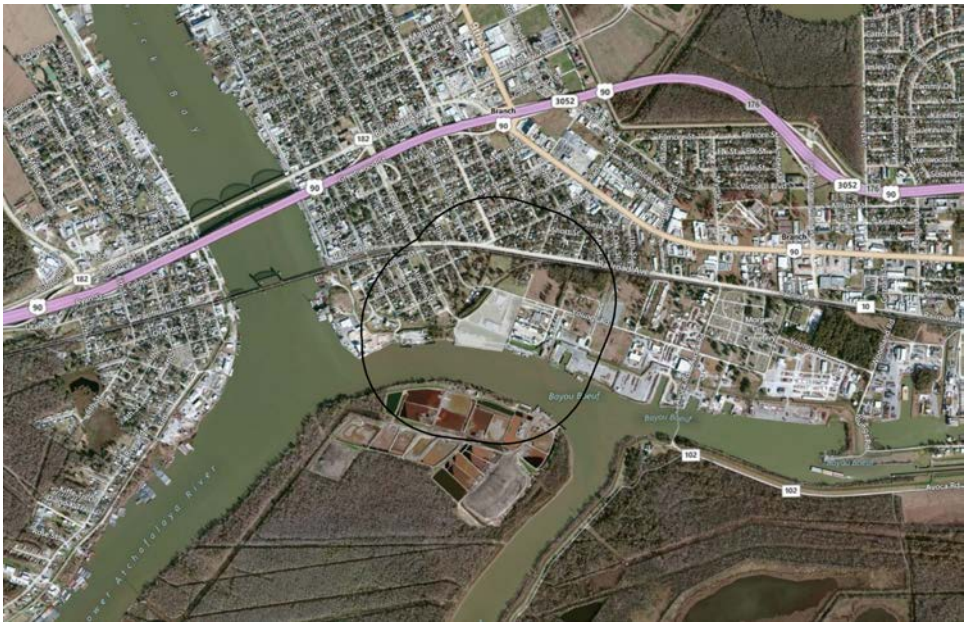
Los Angeles, California (airport)



Miami, Florida (seaport)



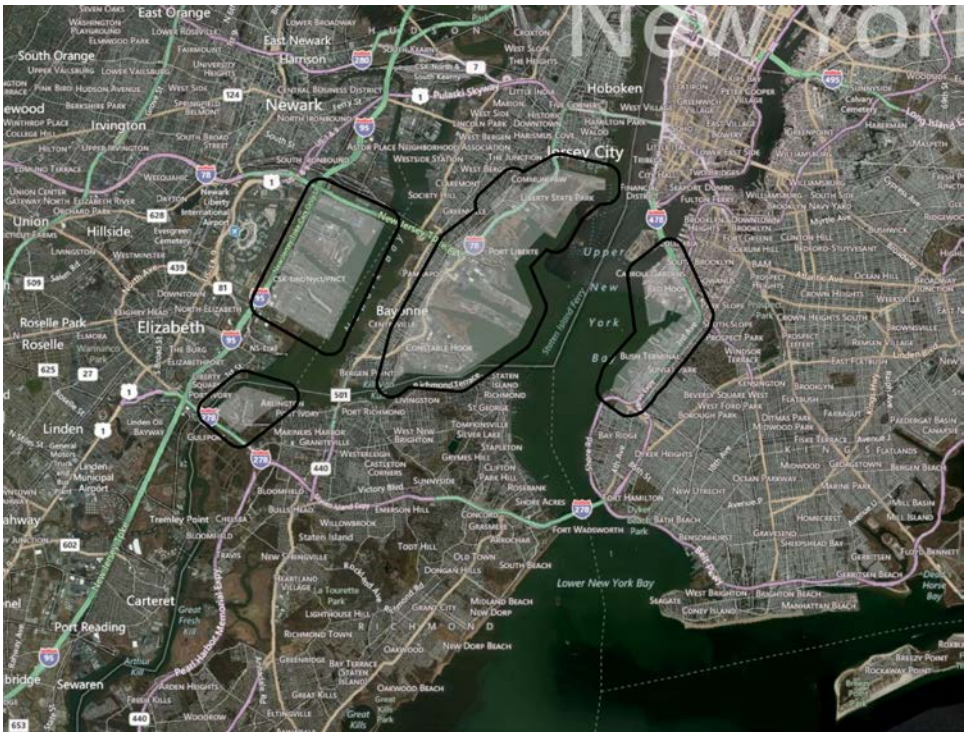
Miami, Florida (airport)



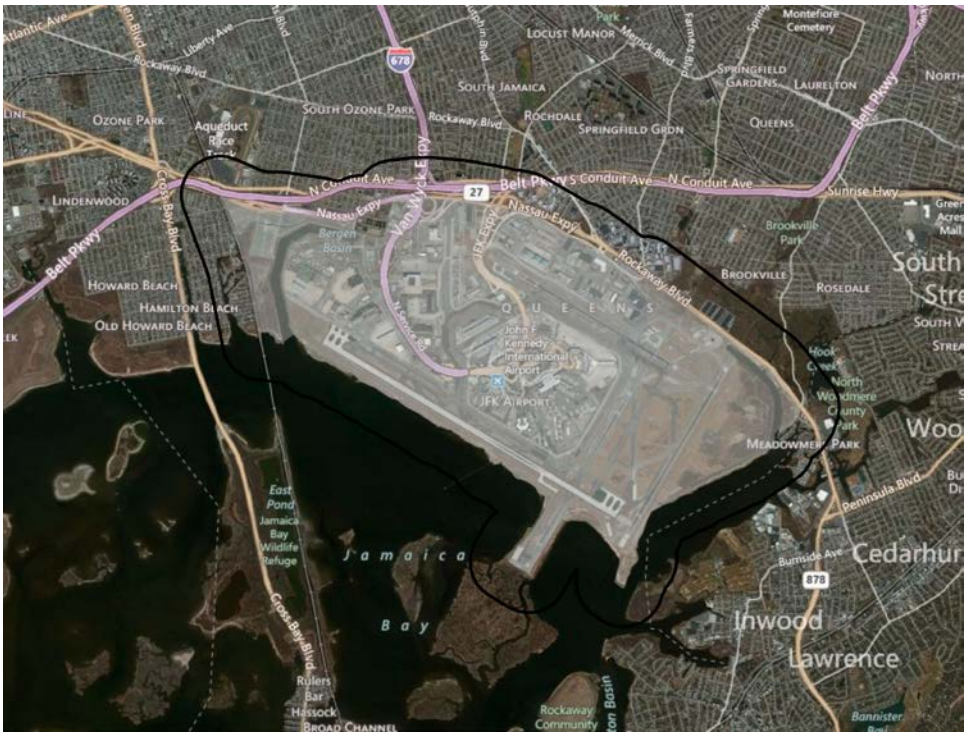
Morgan City, Louisiana

New Orleans, Louisiana (seaport)

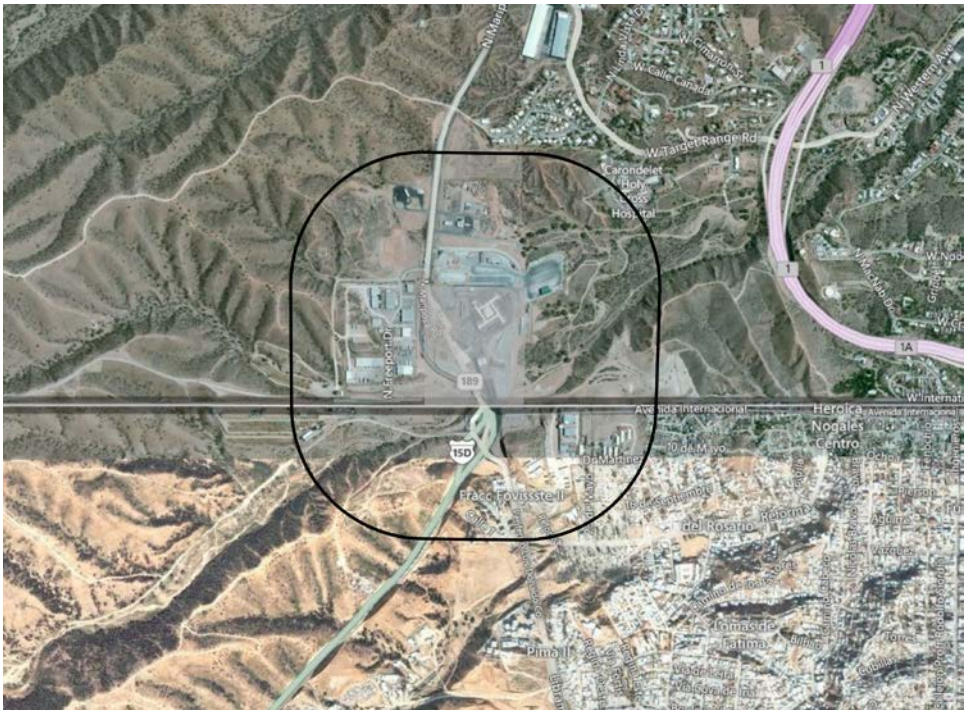
New Orleans, Louisiana (airport)



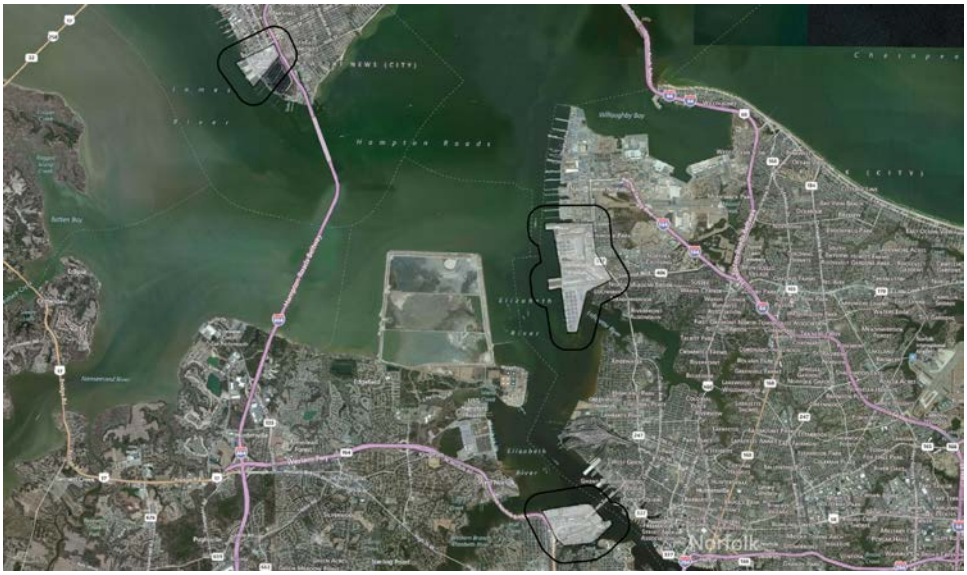
New York, New York (seaport)



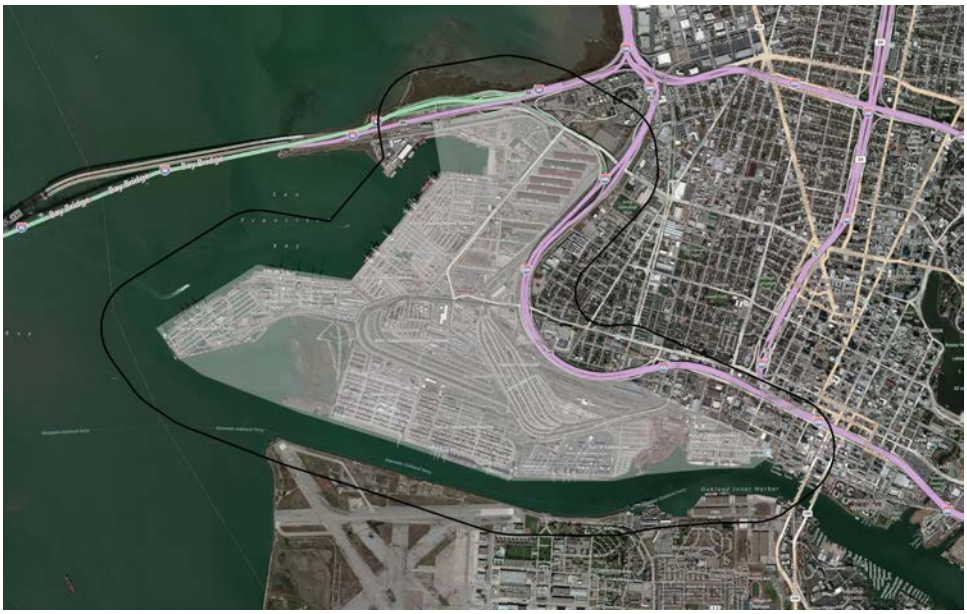
New York, New York (airport)



Nogales, Arizona



Norfolk, Virginia

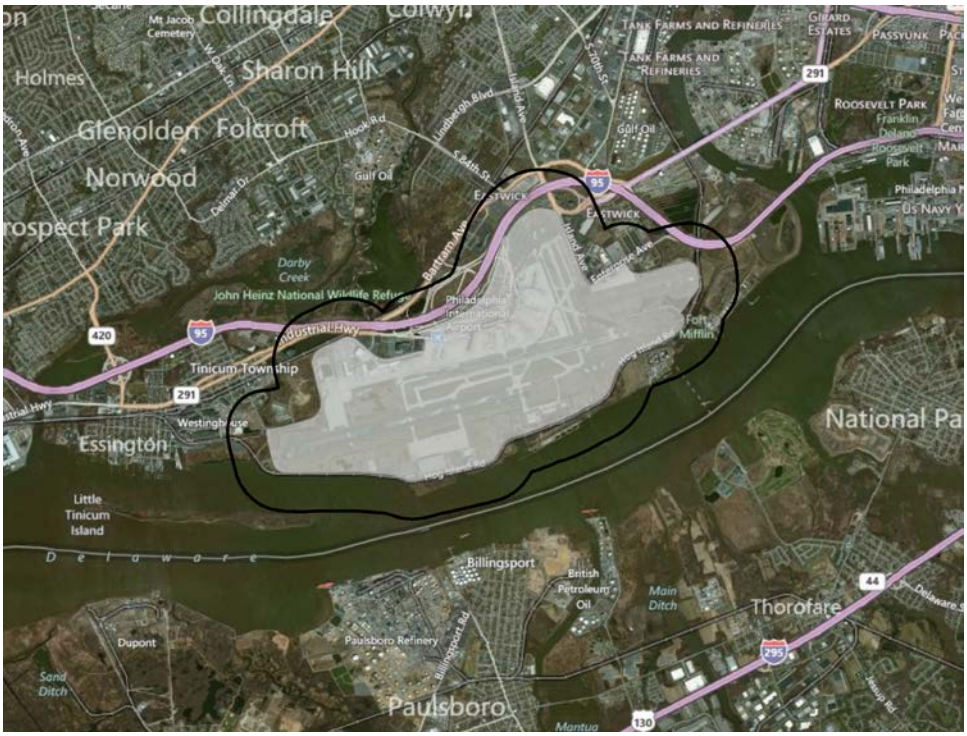


Oakland, California

Otay Mesa, Arizona

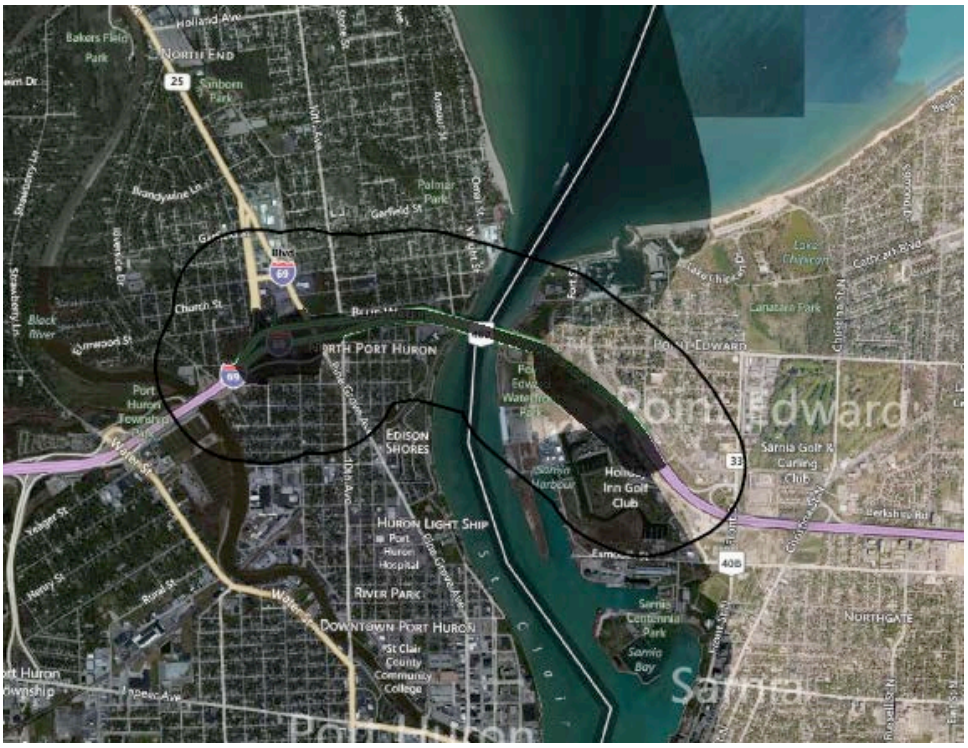
Pembina, North Dakota

Philadelphia, Pennsylvania (seaport)



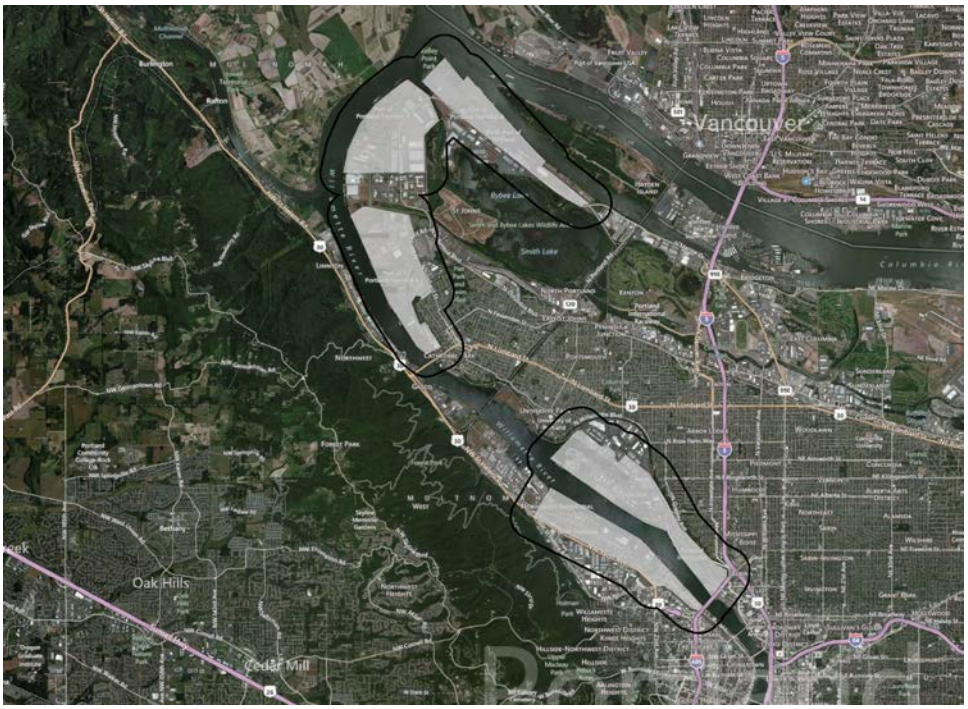
Philadelphia, Pennsylvania (airport)

Port Arthur, Texas



Port Huron, Michigan

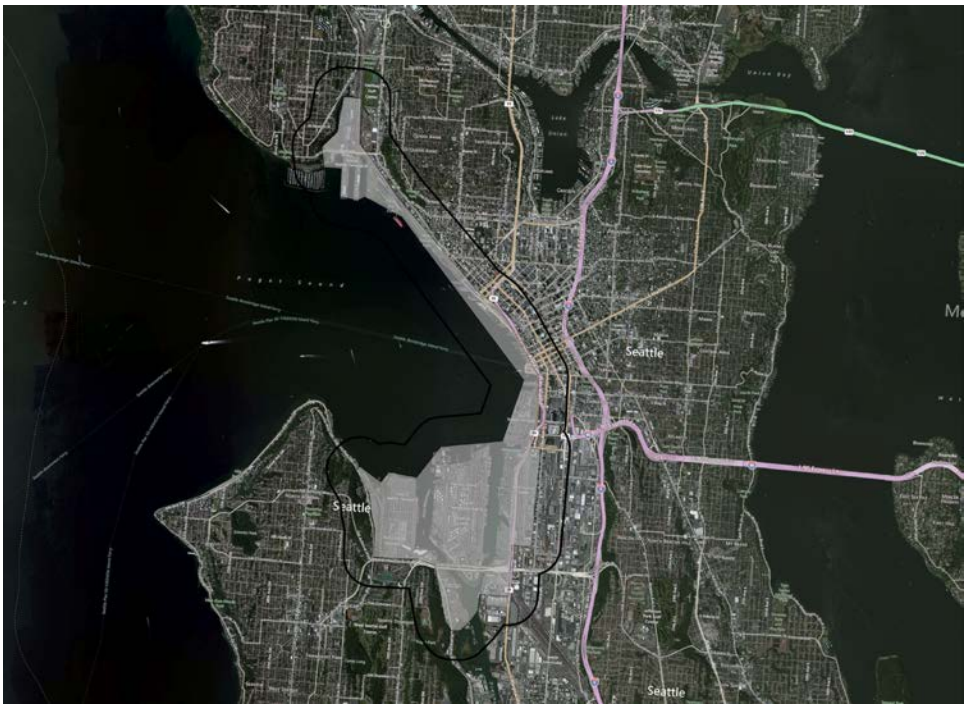
Portal, North Dakota



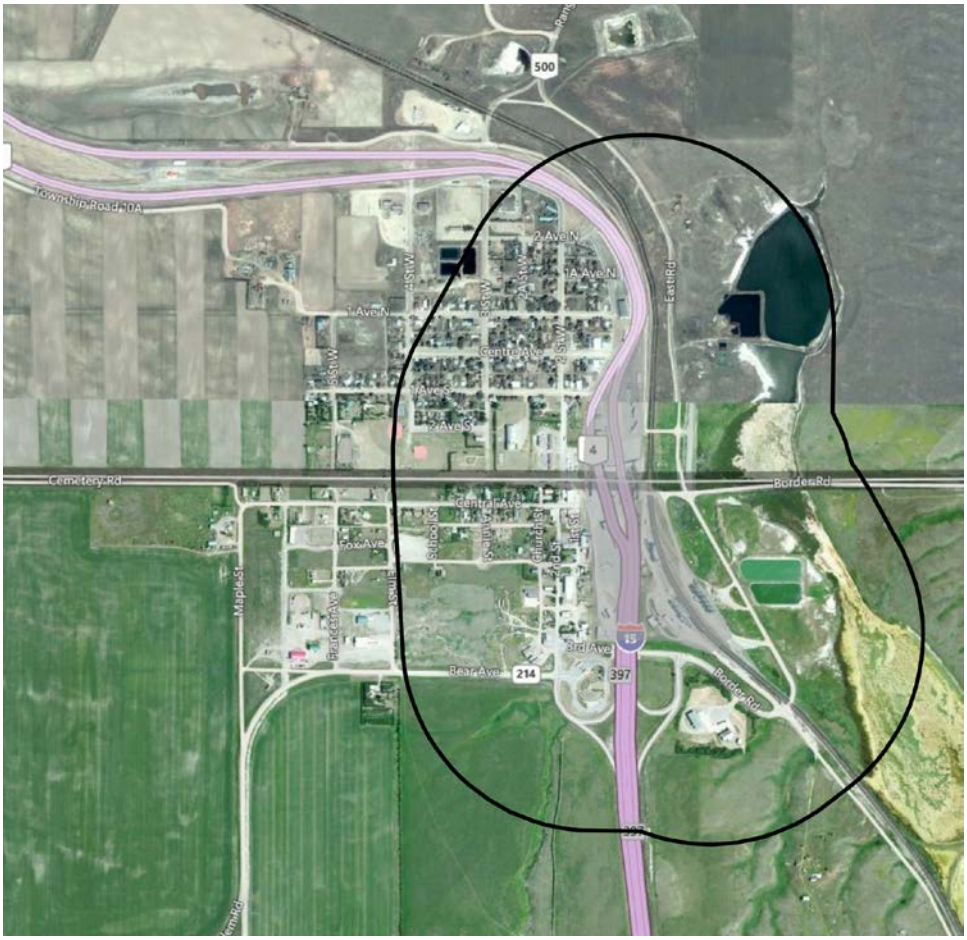
Portland, Oregon

San Francisco, California

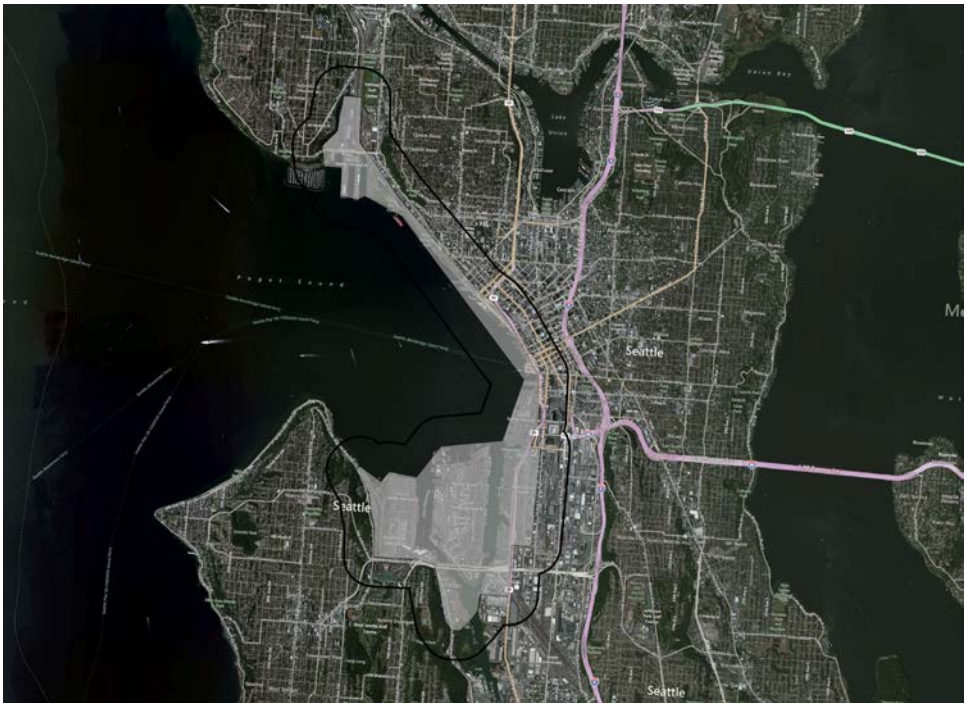
Savannah, Georgia



Seattle, Washington

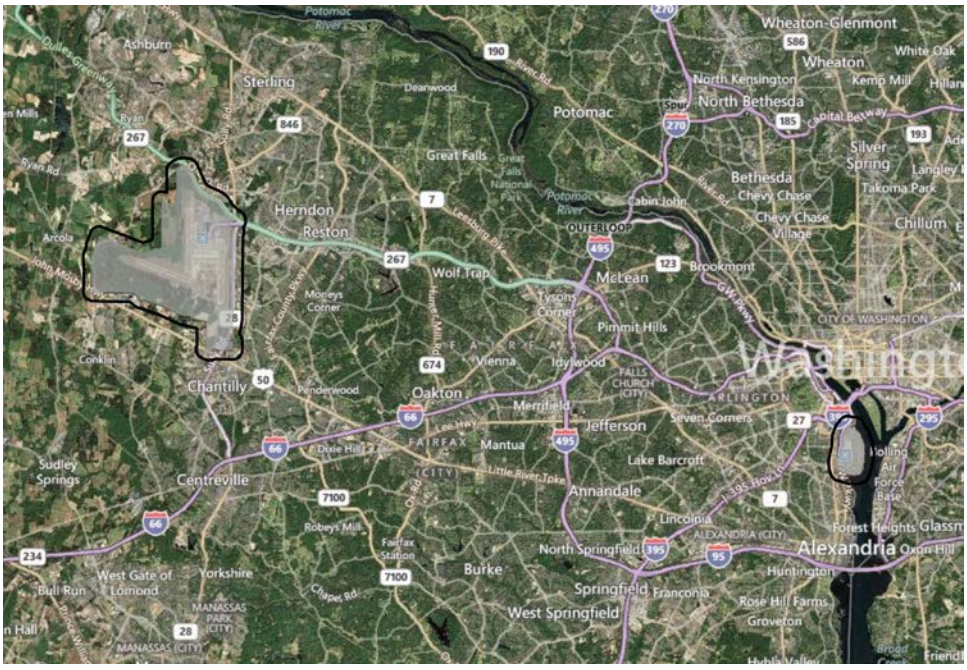


Sweetgrass, Texas



Tacoma, Washington

Texas City, Texas



Washington D.C.

Appendix C: Interview Protocol for Host Community Members & Leaders

As mentioned in the informed consent, one of the main objectives of this study is to understand public participation in decision-making related to the ports in Long Beach. We will be conducting interviews of about 20-25 people in your community who are working on this issue. Your knowledge and experience will be very useful for understanding how to improve opportunities and information to assist public participation in decision-making.

Any questions about the informed consent? *(Acquire signed consent before starting interview).* I'll be taping this interview so we can better remember what you said, is this ok? Remember, you can ask me to turn off the recording anytime during the interview. *(turn recorder on)*

Participant's Experience

1. What has been your role in relation to _____?
   Prompts: Affiliations?

2. How have you shared your opinions or knowledge on _____?
   Prompt: Letter, email, testify at meetings, press release, group membership, other?

Participant's Perception of Public Participation

3. In general, how does the public participate in the government's decision-making related to _____? What does this look like?
   Prompts: Government-driven? Community-driven?

4. In general, what do you think is the purpose of government initiated public participation in decision-making related to _____? Is this purpose achieved?

5. Describe how opinions and local knowledge are solicited from the public.
   Prompts: Likes/dislikes, tools, location, language, forums, EIS

6. Describe how individuals from agencies and organizations who make decisions about _____ include or leave out the public?
   Prompts: Likes/dislikes, tools, location, language, forum

7. What have been some of the facilitators to the public's involvement with _____?
   Can you give any examples?

8. What have been some of the barriers to the public's involvement with _____?
   Can you give any examples?

9. How do you think government agencies should evaluate public participation? How should they determine if they have done a good job engaging the public?

10. Outside of government-initiated events or materials, what other strategies to community

members use to become part of the decision-making processes related to transportation and health?

Institutional Process – Skills, Tools & Information

11. How do you or the average residents get information about the projects at the Port, like the Middle Redevelopment Project or Pier S expansion?

12. Describe the types of information that is shared with the public about _____.
Prompts: Likes/dislikes, format, methods of sharing information, EIS

13. How do you or others use reports prepared by government agencies or consultants, such as environmental assessments?

14. What other tools or resources do you find helpful when participating in decision-making related to _____? Prompts: maps, policy briefs, websites, EIS

15. What other additional tools or resources would be helpful? Prompts: maps, policy briefs, websites

Participation & Environmental Health Pathways

16. Much evidence exists to suggest that pollution is linked to many different illnesses, including respiratory illnesses like asthma and cardiovascular illnesses like heart disease. How do you think such research findings affect decisions related to _____ ?

17. How do you think knowledge of environmental health concerns affects public participation related to _____?

18. How do community members learn about or study these environmental health issues, formally or informally?

19. Do you see _____ as an Environmental Justice issue? Please explain.

Conclusion of Open-Ended Questions

20. What advice, if any, would you give to government officials to improve the decision-making process related to _____ for public participants?
Prompts: Information, resources, process, etc.
21. What questions – related to this process or environmental health --- would you like to ask planners, commissioners, or government employees who make decisions related the ports?

22. Is there anything else you would like to tell us about this topic?

23. Is there anyone else you think we should talk to?

24. Are there any upcoming events related to _____ that I should be aware of?

25. How might the results of this study be useful to you or your community?

Appendix D: Interview Protocol for Decision-makers

As mentioned in the informed consent, one of the main objectives of this study is to understand public participation in decision-making related to the transportation infrastructure in your community. In total, we will be conducting interviews of about 20-25 people in your community who are working on this issue, including community members, policymakers, and planners. Your knowledge and experience will be very useful for understanding how to improve opportunities and information to assist public participation in decision-making.

Any questions about the informed consent? *(Acquire signed consent before starting interview).* I'll be taping this interview so we can better remember what you said, is this ok? Remember, you can ask me to turn off the recording anytime during the interview. *(turn recorder on)*

Participant's Experience

26. How did you get involved in _____?

27. What has been your role in relation to _____?

Public Participation in Transportation Decision-making

28. In the context of decision-making related to transportation infrastructure, what is public participation?

29. What does institutionally guided public participation look like in this context?

30. In general, what do you think is the purpose of government initiated public participation in decision-making related to _____? Is this purpose achieved?

31. Describe how opinions and local knowledge are solicited from the public.
Prompts: Likes/dislikes, tools, location, language, forums, EIS

32. Describe how individuals from agencies and organizations who make decisions about _____ include or leave out the public? Prompts: Tools, location, language, forum

33. What is the role of consultants in this decision-making process?

34. What have been some of the facilitators to the public's involvement with _____?
Can you give any examples?

35. What have been some of the barriers to the public's involvement with _____?
Can you give any examples?

36. How do you think government agencies should evaluate public participation? (In other words: How do they determine if they have done a good or poor job engaging the public?)

37. Outside of government-initiated events or materials, what other strategies to community members use to become part of the decision-making processes related to transportation infrastructure?

Exchange of Information

38. Describe the types of information that is shared with the public about _____.
    Prompts: Likes/dislikes, format, methods of sharing information, EIS

39. How do you or community members get information about the projects?
    (Prompts: about happenings, scoping, reports, comment periods)

40. How do you or others use reports prepared by government agencies or consultants, such as environmental assessments?

41. How do you or engaged community members share additional information?
    (Prompts: academic studies, community-driven studies)

Public Participation & Environmental Health Pathways

42. What is the relationship between public health and transportation planning?

43. Much evidence exists to suggest that pollution is linked to many different illnesses, including respiratory illnesses like asthma and cardiovascular illnesses like heart disease. How do you think such research findings affect decisions related to _____ ?

44. How do you think knowledge of environmental health concerns affects public participation related to _____?

45. How do community members learn about or study these environmental health issues?

46. The EPA has identified the goods movement as an environmental justice (EJ) issue. Do you see _____ as an EJ issue? Please explain. (Define goods movement and EJ if necessary.)

47. What advice do you have for public health in addressing transportation-related health issues?

Conclusion of Open-Ended Questions

48. What advice, if any, would you give to community members concerned with a specific transportation deliberation? What strategies should they use to ensure they have their concerns and questions heard?

49. Is there anything else you would like to tell us about this topic?

50. Is there anyone else you think we should talk to?

51. Are there any upcoming events related to _____ that I should be aware of?

Appendix E: Codelist for Qualitative Data Analysis

Demographic Characteristics of Communities

1. Race/ethnicity
2. Immigration status
3. Income level
4. Language

Housing & Development

5. Why don't you move?/Why do you live here?/I wouldn't live there
6. Displacement/relocation/property attainment processes and experiences (e.g. opinions about, eminent domain, schools/homes/business within footprint of project)
7. Land use (e.g., residential/industrial/commercial)
8. Housing programs or grants (Michigan State Housing Development Authority, Empowerment (US) or Renaissance (MI) Zones, etc.)
9. Preservation (historic, community) (e.g., Fort Wayne, churches)
10. Contaminated land or property (e.g., Brownfield Redevelopment Zone)
11. Green space
12. Project impact or potential impact (negative/positive) on housing, revitalization, development, community
13. Examples of past failures & successes of housing/redevelopment/revitalization

Affected/Non-Affected Communities

14. Community history
15. Historically marginalized, neglected, disproportionately burdened community
16. Related communities that were not selected/affected
17. Specific affected sites or neighborhoods (e.g., West Long Beach, Springwells, Mexicantown)

Transportation

18. Existing related major infrastructure (e.g., Ambassador Bridge, railyards)
19. Transportation planning & policy in general (e.g., SAFTEA-LU)
20. Transportation funding (e.g., P3, public good, taxpayer dollars)
21. Traffic trends (current & forecasted) (e.g., patterns, capacity, flow, congestion, right of way, mobility, local/international)
22. Suggestions or concerns regarding commercial traffic routes and accessibility (e.g., trucks on non-truck roads, interchanges, service roads, ramps)
23. Public safety (e.g., terrorism, homeland security, 9/11, redundancy, border patrol)
24. Transport of hazardous cargo
25. Project need or necessity (e.g., opinions on whether it needs to happen)
26. Project scoping (e.g., description, approval)
27. Project physical design (e.g., description, approval, plaza, noise walls, buffers, toll area, ramps, etc.)
28. Mitigation (e.g., funding for programs to counter environmental impacts)
29. Technology to reduce emissions from heavy-duty vehicles (e.g., weight motion tolling, license plate readers)

30. Programs and plans (real or potential) to reduce emissions from heavy-duty vehicles (e.g., Cool Cities)
    a. Successes
    b. Challenges, failures
31. Policies (real or potential) to reduce emissions from heavy-duty vehicles (e.g., Green Port Policy, anti-idling)
    a. Successes
    b. Challenges, failures
32. Inclusion or discussion of alternative transportation infrastructure (e.g., pedestrian infrastructure, high-speed rail)
33. Consideration of alternative sites (e.g., preferred, no-build, etc.)
34. Examples of other transportation project failures or successes locally or across the country
35. Project timeline

Economic Implications

36. Jobs (e.g., attracted, lost, general)
37. Local business
38. Trade (local or global)
39. Role of private companies
40. Labor issues
41. Hired project opposers
42. Other economic implications

Institutional Public Engagement Process

43. General description of processes (e.g., meetings, hearings, comments)
44. Value, role, importance, purpose
45. Amount (e.g., number of meetings)
46. Timing of process (e.g., when public brought in, too short/long)
47. Solicitation processes
48. General barriers to public participation
49. General facilitators to public participation
50. Reach – inclusivity/exclusivity (e.g., level, parts of the community left out)
51. Evaluation (formal or informal) (e.g., measures for success or failure in engaging public)
52. Addressing (or not addressing) public's questions or concerns
53. Sharing information about the project (e.g., format, amount, description, accessibility)
54. Institutional structures for guiding process (e.g., local advisory committees, community boards)
55. Suggestions for improved public planning processes
56. Role of consultants

Advocacy & Engaged Stakeholders

57. Key leaders or champions on issues (per the interviewee's or commenter's notice)
58. Advocacy groups (generated to address specific project or projects) (e.g., Community Benefits Coalition)
59. Collaboration or reach of partnerships (descriptions, (in) sufficiency)
60. Motivation for participation in issues

61. Commitment of time or resources to issues (e.g., non-stop, drop off, episodic, ebb & flow)
62. Citizen science (e.g., assessment, data collection, public air quality monitoring)
63. Citizen planning (design, land use, zoning)
64. Sharing information with institutions (risks, science, plans, opinions)
65. Community organizing strategies (other than information sharing) (e.g., elected official tours, testifying)
66. Community benefits (e.g., campaign, meetings)
67. Community organizing related to project
    a. Challenges, barriers, needs, what's not working, models
    b. Catalysts, facilitators, what's working, models
68. Lessons learned through engagement

Public Health & Environment

69. General public health reference
70. Suggestions for public health interventions
71. Respiratory (e.g., asthma)
72. Cardiovascular
73. Quality of life
74. Emergency preparedness
75. Physical activity/pedestrian safety
76. School health
77. Air quality
78. Natural resources (issues other than air quality (e.g., water quality, flora/fauna)
79. Climate change/global environmental concerns
80. Noise pollution
81. Cumulative exposures (e.g., discussion of other facilities (e.g., oil refineries), multiple exposures)
82. Finger pointing (e.g., pollution is from X facility, not traffic; often related to 89)
83. Environmental racism/justice

Science & Assessment

84. Scientific integrity (e.g., political influence, bias, objectivity/subjectivity)
85. Additional cited studies (i.e., not citizen science or required for project)
86. Environmental Impact Study[44] – role or value
87. Environmental Impact Study – opinions on content (e.g., accurate/wrong, failed to evaluate X/evaluated well, needs to be redone or revised)
88. Environmental Impact Study – public's experience with (e.g., technical nature, reading, breaking down, or discussing with others)
89. Institutional assessments beyond EIS/EIR (e.g., HIA, additional measures (addressed or recommended))
90. Role of researchers

Policy & Law

91. Lawsuits
92. Legal requirements or violations (e.g., accountability, transparency)

[44] Any reference to DEIS, FEIS, EIS, EIR, NEPA, or CEQA

93. Reference to other local, state, or federal policies
94. Political processes for decision-making (e.g., senate hearings, executive orders)
95. Developing or passing policies or resolutions to codify
96. Role of government- city (agencies, politicians)
97. Role of government – state (agencies, politicians)
98. Role of government – federal (agencies, politicians)
99. Role of government – governor's office

Other (O)

100. Critical junctures/turning points/shifting norms
101. Media
102. New research questions
103. Additional questions for planners or policymakers
104. Relationship between transportation and health
105. Detroit timeline
106. Long Beach timeline

Appendix F. Researcher Reflections

Exactly one decade ago, in 2003, I started working in Southwest Detroit as an undergraduate research assistant through University of Michigan's Undergraduate Research Opportunity Program. My job was to prepare a report outlining the environmental and social impacts of the Ambassador Bridge to support the efforts of the watchdog organization, Bridgewatch Detroit. To my dismay, I was told during the first week of my position this would be done in a cubicle in Ann Arbor. While office space and computers in Southwest Detroit were coveted (wi-fi and laptops were not yet ubiquitous), I begged my supervisors to squeeze me in. Surrendering to the curiosity of a 20-year intern, they agreed. Two or three days a week, I drove down I-96 to Bagley St. to an office space buzzing with community organizers and graduate interns. Entering this space, I was able to engage more deeply. That summer, I helped coordinate a Photovoice project and attended more meetings than I could have ever hoped for. Research was new territory, and I loved it. (Eventually, I learned that most research was not, in fact, this participatory in nature.) Unknowingly, this is when this dissertation began.

This research position sent me down a winding track of opportunities where environmental justice remained the central thread. While pursuing my MPH and PhD, I collected skill sets along the way: program planning, evaluation, community organizing, grant writing, teaching, mapmaking, and data collection and analysis. I coordinated household interventions to improve asthma management in immigrant and refugee communities in Portland, Oregon; evaluated food and transportation policies affecting chronic illness outcomes across the U.S.; designed and evaluated school sustainability initiatives in rural Oregon; and analyzed policies for co-management of natural and cultural resources among Aboriginal Australians and the Australian federal government. In this work, I repeatedly saw how vulnerable communities

responded to environmental risks and opportunities wholeheartedly but typically without many resources.

Meanwhile, into all of these experiences, I've carried my identity as a white woman who has also spent much of her life in suburbia and classrooms. I'm trained to think, talk, and write in politically correct ways. I was a child of Detroit's 'White Flight' legacy. While my family is proudly working class, we reaped the benefits of mortgages, employment, decent schools, and enough overtime during the booming late 1990's to get my sister and me undergraduate educations. If I moved to Detroit today, as I have considered, I'd be a 'gentry' as it's called in meetings. These aren't bad things to be, but they make me noticeably different than many residents of Southwest Detroit and West Long Beach. Mostly, I feel fully welcomed, as I jump in for clean-ups, truck counts, get-out-the-vote callings, and tutoring. In meetings, though, I try to sit back and listen. I'm forever sorting out in my head when, if at all, it is appropriate to contribute. My outsider identity still makes me uneasy sometimes, but I'd be concerned if it didn't.

Uncontrollably, these professional and personal experiences steer this study and the goals for all work I do. As anyone who read this dissertation would quickly note, I do not claim to be free of bias: I ask questions with attention to public health and place great value on the perceptions, knowledge, and experiences of those living among environmental burden. I've seen how their knowledge works to write policies and address inequities. I've seen what happens when their knowledge is left out. Institutional ethnographic approaches encourage these values, too. While I strived for objectivity and clearly defined assumptions accompanying the statistical findings presented in Chapter 3, I strived for conveying the subjective words, contexts and meanings presented by interviewees in Chapter 4 and 5. I hope that mixed methods are this

dissertation's strength not weakness and that my juxtaposition of methods and findings unveil a more comprehensive depiction of the many truths at play to inform systemic changes.

Looking back at the products I prepared during my UROP appointment, I smirk. At the end of a binder of materials titled, *The Bridgewatch Detroit Guide: A Reference on the Effects of the Ambassador Bridge on Southwest Detroit and the Need for Community Involvement*, I included a one-page list of action strategies. The last suggestion reads:

> Beg the Bi-National Border Study not to burden our community with another bridge, since the environmental and social repercussions of the Ambassador Bridge already weigh heavy on our businesses, streets, and health!

While my outsider's call to action deserves a smirk, that's not what strikes me most. As an undergraduate research assistant, my *a priori* assumptions and resultant model were pretty well reduced: bridge → pollution → bad for environmental health. More recently, it took a month in Long Beach, endless trips from Ann Arbor to Detroit, full immersion into the heaps of transcripts and spatial data, and, eventually, over 350 pages to convey my understanding of these issues, including the science, politics, and potential interventions that go with them.

REFERENCES

(2010). Bridge cash for Michigan called a 'bribe'. *CBC News*.

Abdel Aziz, A.M. (2007). Successful delivery of public-private partnerships for infrastructure development. *Journal of Construction Engineering and Management, 133*(12), 918-931.

Abelson, J., Forest, P.-G., Eyles, J., Smith, P., Martin, E., & Gauvin, F.-P. (2003). Deliberations about deliberative methods: issues in the design and evaluation of public participation processes. *Social science & medicine, 57*(2), 239-51.

Adamkiewicz, G., Zota, A., Fabian, M., Chahine, T., Julien, R., Spengler, J., & Levy, J. (2011). Moving environmental justice indoors: understanding structural influences on residential exposure patterns in low-income communities. *American Journal of Public Health, 101*(1), S238-S245.

Adamson, I.Y, Vincent, R., & Bjarnason, S.G. (1999). Cell injury and interstitial inflammation in rat lung after inhalation of ozone and urban particulates. *American Journal of Respiratory Cellular Molecular Biology, 20,* 1067–1072.

Adler, N., & Rehkopf, D. (2008). U.S. disparities in health: Descriptions, causes, and mechanisms. *Annual Review of Public Health, 29*, 235-252.

Aitken, M. (2010). A three-dimensional view of public participation in land-use planning: Empowerment of social control. *Planning Theory, 9*(1), 248-264.

Akinbami, L., Moorman, J., and Liu, X. (2011). Asthma prevalence, health care use, and mortality, United States, 2005-2009. *National Health Statistics Reports, 32*, 1-15.

Allison, P. D. (2001). *Sage university papers series on quantitative applications in the social sciences, 07-136: Missing data.* Thousand Oaks, CA: Sage.

Amerasinghe, M., Farrell, L., Jin, S., Shin, N., & Stellies, K. (2008). *Enabling environmental justice: Assessment of participatory tools.* Cambridge, MA: Massachusetts Institute of Technology.

American Lung Association (ALA). (2012). *State of the air.* Washington D.C.: ALA.

American Public Health Association (APHA). (2010). *The hidden costs of transportation*. Washington D.C.: APHA.

American Public Health Association (APHA). (2009). *At the intersection of public health and transportation: Promoting healthy transportation policy.* Washington D.C.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35* (4), 216-224.

Asch P, & Seneca J. (1978). Some evidence on the distribution of air quality. *Land Economics, 54*(3), 278-279.

ATLAS.ti. (2010). ATLAS.ti. (Version 6.2) [Computer software] Berlin, Germany: ATLAS.ti Scientific Software Development GmbH.

Austin, J.E., Carter, J.M., Klein, B.D., & Schang, S.E. (2004). *Judging NEPA: A "hard look" at judicial decision-making under the National Environmental Policy Act.* Washington D.C.: Environmental Law Institute.

Babbie, E. (2010). *The practice of social research.* Belmont, CA: Cengage Learning.

Babisch, W., Beule, B., Schust, M., Kersten, N., & Ising, H. (2005). Traffic noise and risk of myocardial infarction. *Epidemiology, 16*(1), 33-40.

Baden, B.M., Noonan, D.S., Rama Mohana, R.T. Scales of justice: Is there a geographic bias in environmental equity analysis? *Journal of Environmental Planning and Management, 50* (2), 163-174.

Baldauf, R.W., Khlystov, A., Isakov, V., Thoma, E., Bowker, G.E., Long, T., & Snow, R. (2008). Impacts of noise barriers on near-road air quality. *Atmospheric Environment, 42*(32), 7502-7507.

Barr, D. (1972). The professional urban planner. *Journal of the American Planning Association, 38*(3), 155-159.

Bass, R.E., Herson, A.I. & Bogdan, K. (2001). *The NEPA Book: A Step-by-Step Guide on how to Comply with the National Environmental Policy Act.* Point Arena, CA: Solano Press.

Batterman, S., Peng, C.Y., & Braun, J. (2002). Levels and composition of volatile organic compounds on commuting routes in Detroit, Michigan. *Atmospheric Environment, 36* (39-40) 6015-30.

Batterman, S., Zhang, K., & Kononowech, R., (2010). Prediction and analysis of near-road concentrations using a reduced-form emission/dispersion model. *Environmental Health Perspectives, 25*(9), 29-35.

Batterman, S. & Wu, Y-C. (2006). Proximity of schools in Detroit, Michigan to automobile truck traffic. *Journal of Exposure Science and Environmental Epidemiology,16,* 457-470.

Bear, D. (2003). Some modest suggestions for improving implementation of the National Environmental Policy Act. *Natural Resources Journal, 43* (4), 931 - 960.

Beauregard, R. A. (2009). Urban population loss in historical perspective: United States, 1820 - 2000. *Environment and Planning A, 41*(3), 514-528.

Becker, H. & Geer, B. (1957). Participant observation and interviewing: A comparison. *Human Organization, 16*(3), 28-32.

Beder, S. (1999). Public participation or public relations? In Martin, B. (Eds.) *Technology and public participation*. Wollongong, New South Wales: University of Wollongong Press.

Been, V. & Gupta, F. (1997). Coming to the nuisance or going to the barrios? A longitudinal analysis of environmental justice claims. *Ecology Law Quarterly, 24*(1), 1-56.

Beer, S., Burket, C., Cilluffo, N., Gao, S., Johnson, S., Micheal, R., Shen, F., Yang, J., & Zhou, H. (2010). *Paving the way: Linking Southwest Detroit to infrastructure jobs.* Ann Arbor, MI: University of Michigan Urban & Regional Planning Program.

Bell, J. & Cohen, L. (2009). *Healthy, equitable transportation policy: Recommendations and research.* Oakland, CA: PolicyLink & the Prevention Institute.

Bell, J. & Cohen, L. (2009). *Transportation prescription: Bold new ideas for healthy, equitable transportation reform in America*. Oakland, CA: PolicyLink & the Prevention Institute.

Berglund, B., Lindvall, T., & Schwela, H.D. (Eds.) (1999). *Guidelines for community noise.* Geneva: World Health Organization.

Bernard, S. M., Samet, J. M., Grambsch, A., Ebi, K. L., & Romieu, I. (2001). The potential impacts of climate variability and change on air pollution-related health effects in the United States. *Environmental Health Perspective, 109* (S2), 199–209.

Bhatia, R. & Wernham, A. (2008). Integrating human health into Environmental Impact Assessment: An unrealized opportunity for environmental health and justice. *Environmental Health Perspectives, 116*(8), 991-1000.

Blumer, H. (1954). What is wrong with social theory? *American Sociological Review, 19*(1) 3-10.

Bonfiglioli, A. (2003). *Empowering the poor: Local governance for poverty reduction.* New York, NY: United Nations Capital Development Fund.

Bowen, G. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods, 5*(3), 1-9.

Bowen, W. M., Atlas, M., & Lee, S. (2008). Industrial agglomeration and the regional scientific explanation of perceived environmental injustice. *The Annals of Regional Science, 43*(4), 1013-1031.

Brauer, M., Reynolds, C., & Hysatd, P. (2012). *Traffic-related pollution and health: A Canadian perspective on scientific evidence and potential exposure-mitigation strategies.* The University of British Columbia, School of Population and Public Health. Retrieved from: https://circle.ubc.ca/bitstream/handle/2429/41542/2012-03-01%20Traffic%20and%20Health%20FINAL.pdf?sequence=1

Brayton, E. (2010, March 3). Coast guard rejects permit for second Ambassador Bridge. *Detroit Free Press.*

Breech, R. (2010). Detroit 48217: Dead zone? [Blog Post]. Retrieved from: http://airhugger.wordpress.com/2010/07/20/detroit-48217-dead-zone/

Brenner, A. (2012). *Does where we live matter? Neighborhood context and implications for stress and health* [Dissertation]. Ann Arbor, MI: University of Michigan.

Brieschke, G., Chang, A., Forrest, L., Herron, C., Johnson, K., Mark, R.,…Winston, L. (2007). *A local response to the Detroit River International Crossing: Recommendations to guide a Community Benefits Agreement*. Ann Arbor, MI: University of Michigan Urban & Regional Planning Program. Retrieved from: http://www.taubmancollege.umich.edu/planning/students/student_work/project_galleries/international_crossing/

Brook R, Franklin B, Cascio WE, Hong Y, Howard, G., Lipsett, M,…Tager, I. (2004). Air pollution and cardiovascular disease: a statement for healthcare professionals from the expert panel on Population and Prevention Science of the American Heart Association. *Circulation, 109*(21), 2655-2671.

Browning, C., & Cagney, K. (2003). Moving beyond poverty: neighborhood structure, social processes, and health. *Journal of Health and Social Behavior, 44*(4), 552-571.

Brownson, R., Chriqui, J., & Stamatakis, K. (2009). Understanding evidence-based public health policy. *American Journal of Public Health, 99*(9), 1576–1583.

Brownson, R., Fielding, J., & Maylahn, C. (2009). Evidence-based public health: A fundamental concept for public health practice. *Annual Review of Public Health, 30,* 175–201.

Brunekreef, B., & Holgate, S., (2002). Air pollution and health. *Lancet, 360*(9341), 1233-1242.

Build the DRIC. (2010). DRIC: The solution for traffic redundancy. Retrieved from: http://buildthedricnow.com/2010/07/20/dric-the-solution-for-traffic-redundancy/

Buchanan D, Miller FG, Wallerstein N. (2007). Ethical issues in community based participatory research: Balancing rigorous research with community participation. *Progress in Community Health Partnerships, 2*(1), 153-60.

Bullard, R. D., & Johnson, G. S. (2000). Environmental justice: Grassroots activism and its impact on public policy decision-making. *Environmental Health, 56*(3), 555-578.

Bunte, P. & Joseph, R. (1992). *Ethnographic evaluation of the 1990 Decennial Census report series: Report #9: The Cambodian community of Long Beach: An ethnographic analysis of factors leading to census undercount.* Washington D.C.: Center for Survey Methods Research, Bureau of the Census.

Bureau of Transportation Statistics (BTS). (2012). *Freight management and operations, 2012.* Retrieved from: http://www.ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/12factsfigures/index.htm

Bureau of Transportation Statistics (BTS). (2009). *America's freight transportation gateways: Connecting our nation to places and markets abroad.* Retrieved from: http://www.bts.gov/publications/americas_freight_transportation_gateways/2009/

Butterfoss, F. (2006). Process evaluation for community participation. *Annual review of public health, 27*, 323-40.

California Air Resources Board (CARB). (2005). Draft emission reduction plan for ports and international goods movement. Sacramento, CA: California Air Resources Board. Retrieved from: http://ceres.ca.gov/ceqa/more/tas/ceqa_nepa/section2.html

California Environmental Quality Act of 1970. California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387.

California Governor's Office of Planning and Research. (n.d.) *NEPA and CEQA: Comparisons and contrasts*. Sacramento CA: State of California. Retrieved from: http://ceres.ca.gov/ceqa/more/tas/ceqa_nepa/section2.html

Callahan, K. (2007.) Citizen participation: questions of diversity, equity and fairness. *Journal of Public Management and Social Policy, 13*(1), 53–68.

Cameron, M. (1991). *Transportation efficiency: Tackling Southern California's air pollution and congestion.* New York, NY: Environmental Defense Fund.

Campbell, M. & Gregor, F. (2008) *Mapping social relations: A primer in doing institutional ethnography.* Lanham, MD: AltaMira Press.

Canadian Environmental Assessment Agency. (2012). *Participant funding program.* Retrieved from: http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=E33AE9FB

Canter, L. & Clark R. (1997). NEPA effectiveness: A survey of academics. *Environmental Impact Assessment Review, 17*(5), 313-327.

Canter, L.W., & Kamath, J. (1995). Questionnaire checklist for cumulative impacts. *Environmental Impact Assessment Review, 15*, 311-339.

Cesaroni, H., Boogaard, H., Jonkers, S., Porta, D., Badaloni, C., Cattani, G.,…Hoek, G. (2012). Health benefits of traffic-related air pollution reduction in different socioeconomic groups: The effect of low-emission zoning in Rome. *Journal of Occupational Environmental Medicine, 69*(2), *133*-139.

Chaskin, R. (2013). Integration and exclusion: Urban poverty, public housing reform, and the dynamics of neighborhood restructuring. *The Annals of the American Academy of Political and Social Science, 647* (1), 237-267.

Chavis, D.M., & Pretty, G. (1999). Sense of community: Advances in measurement and application. *Journal of Community Psychology, 27*(6), 635-642.

Chen, B., Hong, C., & Kan, H. (2004). Exposures and health outcomes from outdoor air pollutants in China. *Toxicology, 198*(1-3), 291-300.

Cho, S.-H., Tong, H., McGee, J.K., Baldauf, R.W., Krantz, Q.T. & Gilmour, M.I. (2009). Comparative toxicity of size-fractionated airborne particulate matter collected at different distances from an urban highway. *Environmental Health Perspectives, 117*(11), 1682–1689.

Christens, B. (2010). Public relationship building in grassroots community organizing: Relational intervention for individual and systems change. *Journal of Community Psychology, 38*(7), 886-900.

City of Detroit.(2013). Zoning map index. Retrieved from: http://www.detroitmi.gov/Default.aspx?tabid=3093

City of Detroit. (n.d.). Zoning classifications. Retrieved from: http://www.detroitmi.gov/CityCouncil/CouncilDivisions/CityPlanningCommission/ZoningandLandUse/ZoningClassifications.aspx

City of Long Beach. (2012). List of neighborhood groups: 2012. Long Beach, CA: Neighborhood Services. Retrieved from: http://www.longbeach.gov/civica/filebank/blobdload.asp?BlobID=35622

City of Long Beach. (1950). Los Angeles California and adjacent areas by census tract. Part 3 – tracts in Long Beach city. Retrieved from: http://bl-libg-doghill.ads.iu.edu/gm-web/census1950/losangelespart350.gif

Clean Air Act of 1963, 42 U.S.C. § 202(a) (2009).

Clinical Translational Science Awards (CTSA) Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement. (2011). *Principles of community engagement,* 2nd edition. (NIH 11-7782). Washington D.C.: Government Printing Office.

Coastal Conservation League. (n.d.). *I-526 Expansion: What is the issue?* Retrieved from: http://coastalconservationleague.org/projects/i-526-extension/

Cohen, D. & Crabtree, B. (2006). *Qualitative research guidelines project: Member checks.* Princeton, NJ: Robert Wood Johnson Foundation. Retrieved from: http://www.qualres.org/HomeMemb-3696.html

Cole, L. & Foster, S. (2001). *From the ground up: Environmental racism and he rise of the environmental justice movement.* New York, NY: New York University Press.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94,* S95-S120.

Consumer Federation of America, the League of United Latin American Citizens, Los Angeles Alliance for a New Economy, & the National Association for the Advancement of Colored People. (2008). *Foreclosure on wheels: Long Beach's truck program puts drivers at high risk for default.* Retrieved from: http://www.consumercal.org/downloads/Foreclosure%20on%20Wheels.pdf

Cooper, T.A. & Canter, L.W. (1997). Documentation of cumulative impacts in environmental impact statements. *Environmental Impact Assessment Review 17,* 385-411.

Cope, M. & Elwood, S. (2009). *Qualitative GIS: A mixed methods approach.* Thousand Oaks: California, Sage.

Corbett, A., Winebrake, J., Green, E., Kasibhatla, P., Eyring, V., & Lauer, A. (2007). Mortality from ship emissions: A global assessment. *Environmental Science and Technology, 41(*24), 8512-8518.

Corburn, J. (2007). Community knowledge in environmental health science: Co-producing policy expertise. *Environmental Science & Policy, 10,* 150-161.

Corburn, J. (2004). Confronting the challenges in reconnecting urban planning and public health. *American Journal of Public Health, 94,* 541-546.

Correia, A. W. Pope III, C.A., Dockery, D.W., Wang, Y. Ezzati, M. Dominici, F. (2013). Effect of air pollution control on life expectancy in the united states: An analysis of 545 U.S. counties for the period from 2000 to 2007. *Epidemiology,* 24(1), 23-31.

Council on Environmental Quality. (2011). *Presidential memorandum--speeding infrastructure development through more efficient and effective permitting and environmental review* [Press

Release]. Washington D.C. Executive Office of the President.

Council on Environmental Quality. (2007). *A citizen's guide to the NEPA: Having your voice heard.* Washington D.C. Executive Office of the President.

Council on Environmental Quality. (n.d.). *CEQ NEPA Pilot Program.* Washington D.C. Executive Office of the President. Retrieved from: http://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/nepa-pilot-project

Corburn, J. (2009). *Toward a healthy city: People, places, and the politics of urban planning.* Cambridge, MA: MIT Press.

Craddock, A., Troped, P., Fields, B., Melly S., Simms, S., Gimmler, F., & Fowler, M. (2009). Factors associated with federal transportation funding for local pedestrian and bicycle programming and facilities. *Journal of Public Health Policy, 30*(S1), S38-72.

Cressie, N. (1996). Change of support and the modifiable areal unit problem. *Geographical Systems, 3*,159-180.

Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.

Crouse, D., Goldberg, M., Ross, N., Chen, H., & Labreche, F. (2010). Postmenopausal breast cancer is associated with exposure to traffic-related air pollution in Montreal, Canada: A case–control study. *Environmental Health Perspectives, 118*(11), 1578-1583.

Crowne, D., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24* (4), 349-354.

Culbertson, H., Jeffers, D., Besser Stone, D., & Terrell, M. (2012). Social, political, and economic contexts in public relations: Theory and cases. Hillsdale, NJ: Routeledge.

Currie, B. & Bass, B. (2008). Estimates of air pollution mitigation with green plants and green roofs using the UFORE model. *Urban ecosystems, 11*(4), 409-422.

Daniels, S. & Walker, G. (2001). *Working through environmental conflict: The collaborative learning approach.* Santa Barbara, CA: Praeger Publishers.

Dannenberg, A., Bhatia, R. Cole, B., Heaton, S., Feldman, J. & Rutt, C. (2008). Use of health impact assessment in the U.S.: 27 case studies, 1999-2007. *American Journal of Preventative Medicine, 34*(3), 241-256.

Davidoff, P. (1965). Advocacy and pluralism in planning. *American Journal of the American Institute of Planners, 31*(4), 331-338.

Detroit Data Collaborative. (2012). Detroit neighborhood boundaries - Zillow. [data files]

Prepared by Detroit Data Collaborative (http://www.detroitdatacollaborative.org/archives/category/neighborhoods).

Detroit River International Crossing Partnership Border Study. (2011, May 25). New International Trade Crossing Local Advisory Council/Local Agency Group meeting notes. Retrieved from: http://www.partnershipborderstudy.com/pdf/2011-05-25LACNotes.pdf

Detroit River International Crossing Partnership Border Study. (2008). Executive summary. Retrieved from: http://www.partnershipborderstudy.com/pdf/FEIS/Summary.pdf

Detroit River International Crossing Partnership Border Study. (2008). Green sheet: Project mitigation summary. Retrieved from: http://www.partnershipborderstudy.com/pdf/FEIS/Green%20Sheet.pdf

Detroit River International Crossing Partnership Border Study. (2008). Indirect and Cumulative Impacts Analysis Report. Retrieved from: http://www.partnershipborderstudy.com/pdf/us-tech-reports/Indirect%20&%20Cumulative%20Impact%20Analysis%20Technical%20Report.pdf

Detroit River International Crossing Partnership Border Study. (2008). Section 3: What's there now and what are the impacts? Retrieved from: http://www.partnershipborderstudy.com/pdf/FEIS/Section%203.pdf

Detroit River International Crossing Partnership Border Study. (2008). Section 4: What are mitigation and the proposed measures to reduce harm? Retrieved from: http://www.partnershipborderstudy.com/pdf/FEIS/Section%204.pdf

Detroit River International Crossing Partnership Border Study. (2008). Section 6: How were local, state and federal agencies and the public involved? Retrieved from: http://www.partnershipborderstudy.com/pdf/FEIS/Section%206.pdf

Detroit River International Crossing Partnership Border Study. (2005). Scoping information. Retrieved from: http://www.partnershipborderstudy.com/pdf/ScopingInfo-Draft.pdf

Detroit River International Crossing Partnership Border Study. (n.d.). U.S. evaluation factor weighting. Retrieved from: http://www.partnershipborderstudy.com/pdf/Evaluation%20Factor%20Weighting-US.pdf

Detroit Works Project. (2012). *Detroit Future City: Strategic framework.* Retrieved from: http://detroitworksproject.com/the-framework/

DeVault, M. & McCoy, L. (2002). Institutional ethnography: Using interviews to investigate ruling relations. In J. Gubrium & J. Holstein (Eds.), *Handbook of interview research* (pp.751-776). Thousand Oaks, CA: Sage Publications.

Deverman, R. (2012, December 4). [Personal Communication].

Dewar, M. & Manning-Thomas, J. (2012). *The City After Abandonment.* Philadelphia, PA: University of Pennsylvania Press.

Dietz, T. & Stern, P. (Eds.). (2008). *Public participation in environmental assessment and decision-making.* Washington D.C.: National Academies Press.

Diez Roux, A.V., Auchincloss, A., Green, T.L., Raghunathan, T., Barr, R.G., Kaufman, J., Astor, B., Keeler, J. (2008). Long-term exposure to ambient particulate matter and prevalence of subclinical atherosclerosis in the Multiethnic Study of Atherosclerosis (MESA). *American Journal Epidemiology, 167*(6), 667-75.

D'Ignazio, J., Day, M., Maguire, M., Lane, L., Toth, G., & Venner, M. (2011). *Going the distance together: A citizen's guide to Context Sensitive Solutions for better transportation.* Washington D.C.: National Cooperatve Highway Research Program, Transportation Research Board of the National Academies.

Doremus, H. (2011). Through another's eyes: Getting the benefit of outside perspectives in environmental review. *Boston College Environmental Law Review, 38* (2), 247-280.

Drechsler-Parks, D.M. (1995). Cardiac output effects of O3 and NO2 exposure in healthy older adults. *Toxicol and Industrial Health, 11*, 99–109.

Dvonch, J., Kannan, S., Schulz, A., Keeler, G., Mentz, G., House J,… Brook, R. (2009). Acute effects of ambient particulate matter on blood pressure: Differential effects across urban communities. *Hypertension, 53*(5), 853-859.

Dyckman, J. (2013). Three crises of American planning. In Burchell, R. & Sternlieb, G. *Planning theory: A search for future directions* (pp. 279-296). New Brunswick, NJ: Transaction Publishers.

Egan, P. & Gallagher, J. (2012, November 3). Moroun's latest Proposal 6 flyer stokes anti-Detroit sentiment. *The Detroit Free Press.*

Egan, P. & Gallagher, J. (2012, June 15). New bridge is big reward without the risk, lieutenant governor says. *The Detroit Free Press.*

Ehrlich, P., Ehrlich, A., & Holdren, J. (1977). *Ecoscience: Population, Resources, Environment*. San Francisco: W. H. Freeman

Ellen, I., Mijanovich, T., & Dillman, K.N. (2001). Neighborhood effects on health: Exploring the links and assessing the evidence. *Journal of Urban Affairs, 23* (3&4), 391-408.

Emerson, R., Fretz, R., & Shaw, L. (Eds.). (1995). *Writing ethnographic fieldnotes.* Chicago, IL: University of Chicago Press.

Esri. (2011). ArcGIS (Version 10) [Computer software] Redlands, CA: Environmental Systems Research Institute.

Esri. (2011). *High/Low Clustering (Getis-Ord General)*. Retrieved from: http://edndoc.esri.com/arcobjects/9.2/net/shared/geoprocessing/spatial_statistics_tools/high_low_clustering_getis_ord_general_g_spatial_statistics_.htm

Esri. (n.d.). GIS dictionary. Retrieved from: http://support.esri.com/en/knowledgebase/Gisdictionary/browse

Esri. (2010). North American airports. [data files] Prepared by Tele Atlas North America, Inc.

Ethekwini Transport Authority. (2011). Road safety initiatives in Ethekwini. Retrieved from: http://www.sarf.org.za/ETA.pdf

Exec. Order No. 13563 (2011). Improving Regulation and Regulatory Review.

Exec. Order No. 12898 (2006). National Environmental Policy Act of 1994.

Fainstein, S. (2010). *The just city*. Ithaca, NY: Cornell University Press.

Fainstein, S. (2000). New directions in planning theory. *Urban Affairs Review, 35*(4), 451-478.

Fals-Borda, O., & Rahman, M. A. (Eds.). (1991). *Action and knowledge: Breaking the monopoly with participatory action research*, 1st edition. New York, NY: Apex Press.

Fann, N., Roman, H., Fulcher, C., Gentile, M., Hubbell, B., Wesson, K., and Levy, J. (2011). Maximizing health benefits and minimizing inequality: Incorporating local-scale data in the design and evaluation of air quality policies. *Risk Analysis, 31* (6), 908-922.

Fearon, J. D. (1998). Deliberation as discussion. In J. Elster (Ed.), *Deliberative democracy* (pp. 44–68). Cambridge, MA: Cambridge University Press.

Federal Geographic Data Committee. (2000). Content Standards for Digital Geospatial Metadata Workbook, Version 2. Reston, VA: U.S. Geologic Survey.

Fidell, S., Pearsons, K., Tabachnick, B., & Howe, R. (2000). Effects on sleep disturbance of changes in aircraft noise near three airports. *Journal of Acoustical Society of America, 107*(5), 2535–2547.

Fischer, F. (2005). *Citizens, experts, and the environment.* Durham, NC: Duke University Press.

Flannery, P. (2012, May 3). It's time for Michigan to act. *The Windsor Star*.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry,*

12(2), 219-245.

Flyvbjerg, B. (2005). *Rationality and power: Democracy in practice.* Chicago: IL: University of Chicago Press.

Foley, A. (2010, February 27). Detroit Mayor Bing's relocation plan reeks of Trail of Tears [Blog Post]. *MLive.*

Forester, J. (1980). Critical theory and planning practice. *Journal of the American Planning Association, 48*(3), 275-286.

Forsyth, A., Slotterback, C. S., & Krizek, K. J. (2010). Health impact assessment in planning: Development of the design for health HIA tools. *Environmental Impact Assessment Review, 30*(1), 42-51.

Foster, S. (1998). Justice from the ground up: Distributive inequities, grassroots resistance, and the transformative politics of the environmental justice movement. *California Law Review, 86*(4), 775-841.

Frankland, J. & Bloor, M. (1999). Some issues arising in the systematic analysis of focus group material. In R. Barbour & J. Kitzinger (Eds.), *Developing Focus Group Research: Politics, Theory & Practice*. London, England: Sage Publications.

Freudenberg, Nicholas. (2004). Community capacity for environmental health promotion: Determinants and implications for practice. *Health Education & Behavior,* 31(4), 472-490.

Friedman MS, Powell KE, Hutwagner L, et al. (2001). Impact of changes in transportation and commuting behaviors during the 1996 Summer Olympic Games in Atlanta on air quality and childhood asthma. *Journal of the American Medical Association, 285*(7), 897-905.

Fritz, G. J., & Herbarth, O. (2001). Pulmonary function and urban air pollution in preschool children. *Exposure, 203*(3), 235-244.

Fullilove, M.T. (2004). *Root shock: How tearing up city neighborhoods hurts America and what we can do about it.* New York, NY: Random House.

Gallagher, J. (2012, March 30). Ohio House unanimously backs proposal for NITC bridge to Canada. *The Detroit Free Press.*

Gallagher, J. (2011, January 28). Gov. Rick Snyder's support for NITC project raises questions; here are some answers. *The Detroit Free Press.*

Gallagher, J. & Helms, M. (2012, January 12). Bridge owner Moroun to spend night in jail after appeals court denies bid for release. *The Detroit Free Press.*

Garcia, A.P., Wallerstein, N., Hricko, A., Marquez, J., Logan, A., Green Nasser, E., & Minkler, M. (2013). THE (Trade, Health, Environment) Impact Project: A community-based participatory research environmental justice case study. *Environmental Justice, 6* (1), 17-26.

Gateway Cities Council of Governments (COG). (2006). *I-710 EIR/EIS community participation framework.* Retrieved from: http://www.gatewaycog.org/resources/Comm_Par_Framework_adopted14sep06.pdf

Gaventa, J. & Barrett, G. (2010*). So what difference does it make? Mapping the outcomes of citizen engagement.* Brighton, United Kingdom: Institute of Development Studies.

Gedye, L. (2012, September 28). Durban port expansion: Drastic makeover for shipping. *Mail and Guardian.*

Gee, G. (2002). A multilevel analysis of the relationship between institutional and individual racial discrimination and health status. *American Journal of Public Health, 92* (4): 615–623.

Geertz, C. (1983). *Local knowledge: Further essays in interpretive anthropology.* New York, NY: Basic Books.

Gibbs, C., & Melvin, J. L. (2008). Structural disadvantage and the concentration of environmental hazards in school areas: A research note. *Crime, Law and Social Change, 49*(4), 315-328.

Gillespie-Bennett, J., Pierse, N., Wickens, K., Crane, J., & Howden-Chapman, P. (2011). The respiratory health effects of nitrogen dioxide in children with asthma. *The European Respiratory Journal, 38*(2), 303-9.

Gish, T. (2012). Myth busting: Challenging the notion of an unplanned Los Angeles (pp.19-34). In Sloane, D. (ed.). *Planning Los Angeles.* Chicago, IL: American Planning Association's Planners Press.

Glaeser, E. (2010, March 16). Shrinking Detroit back to greatness. *New York Times.*

Global Community Monitoring. (2006). History of the bucket brigade. Retrieved from: http://gcmonitor.org/section.php?id=136

Godschalk, D., Brody, S., & Burby, R. (2003). Public participation in natural hazard mitigation policy formation: challenges for comprehensive planning. *Journal of Environmental Planning and Management, 46*(5), 733–754.

Goffman, E.(1974). *Frame analysis: An easy on the organization of experience.* Cambridge, MA: Harvard University Press.

Goldstein, B., Fischhoff, B., Marcus, S. & Coussens, C. (ed.s). (2003). *Ensuring environmental*

health in postindustrial cities. Washington D.C.: National Academies Press.

Golooba-Mutebi, F. (2004). Reassessing popular participation in Uganda. *Public Administration and Development, 24* (4), 289–304.

Goodman, R., Speers, M., McLeroy, K., Fawcett, S., Kegler, M., Parker, E., Rathgeb Smith, S., Sterling, T., & Wallerstein, N. (1998). Identifying and defining the dimensions of community capacity to provide basis for measurement. *Health Education and Behavior, 25*(3), 258-278.

Google. (2012). Google Earth (Version 6.2.2.6613) [Computer software] Mountain View, CA: Google.

Green Port. (2009). Nordic ports: Taking the environmental lead. Retrieved from: http://www.greenport.com/news101/community-beyond-the-gate/nordic-ports-taking-the-environmental-lead

Griefahn B. & Spreng M. (2004). Disturbed sleep patterns and limitation of noise. *Noise and Health, 6*(22), 27–33.

Grubesic, T.H., & Matisziw, T.C. (2006). On the use of ZIP codes and ZIP code tabulation for the spatial analysis of epidemiological data. *International Journal of Health Geographics, 5*(1), 58-73.

Gunningham, N. Kagan, R.A., & Thornton, D. (2004). Social license and environmental protection: Why businesses go beyond compliance. *Law & Social Inquiry, 7*, 307-341.

Guyette, C. (2012, June 20). Bridge fight hardly over. *The Metro Times.*

Habermas, J. (1985). *The theory of communicative action: Vol. 1. Reason and the rationalization of society.* Boston, MA: Beacon Press

Habermas, J. (1981). *The theory of communicative action: Reason and the rationalization of society.* Boston, MA: Beacon Press.

Habermas, J. (1975). *Legitimation crisis.* Boston, MA: Beacon Press.

Hall, P. (2007). Seaports, urban sustainability, and paradigm shift. *Journal of Urban Technology, 14*(2), 87-101.

Handwerker, P. (2001). *Quick ethnography.* Lanham, Maryland: AltaMira Press.

Hansen, R. & Wolff, T. (2011). Environmental review & case study: Reviewing NEPA's past: improving NEPA's future. *Environmental Practice, 13*(3), 235-249.

Harwood, S. (2005). Struggling to embrace difference in land-use decision-making in

multicultural communities. *Planning, Practice, and Research, 20*(4), 355-371.

Hartell, A. & McAndrews, C. (2012). *Research needs statement: Implementation strategies for health components of transportation plans.* Washington D.C.: Transportation Research Board.

Hastings, M.G., Jarvis, J.C. & Steig, E.J. (2009). Anthropogenic impacts on nitrogen isotopes of ice-core nitrate. *Science, 324*(5932),1288-1292.

Hawe, P. & Shiell, A. (2004). Complex interventions: How "out of control" can a randomised controlled trial be? *British Medical Journal, 328,* 1561-1563.

H.B. 4967, 93rd Leg, Reg. Sess. (MI. 2005).

H.B. 6128, 95th Leg, Reg. Sess. (MI. 2010).

H.B. 6155, 95th Leg, Reg. Sess. (MI. 2010).

Healey, P. (1997). *Collaborative planning*. Hampshire, UK: Macmillan.

Healey, P. (1992). Planning through debate. *The Town Planning Review, 63*(2), 143-151.

Health Effects Institute. (2010). *Traffic-related air pollution: A critical review of the literature on emissions, exposure, and health effects.* Boston, MA.

Heller, J. (2012). The I-710 corridor project health impact assessment: Case study and lessons learned. Oakland, CA: The Human Impact Project.

Herson, A.I. & Bogdan, K.M. (1991). Cumulative impact analysis under NEPA: Recent legal developments. *The Environmental Professional, 13,* 100-106.

Hibbard, M. & Lurie, S. (2000). Saving land but losing ground: Challenges to community planning in an era of participation. *Journal of Planning Education and Research, 20*(2), 187–195.

Holifield, R., Porter, M., & Walker, G. (Eds.). (2010). *Spaces of environmental justice.* Malden, MA: Wiley-Blackwell.

Hollander, J. (2010). Moving toward a shrinking cities metric: Analyzing land use changes associated with depopulation in Flint, Michigan. *Cityscape, 12*(1), 133-151.

Holmes, J., Lehman, A., Hade, E., Ferketich, A., Gehlert, S., Rauscher, G.,.. Bird, C. (2008). Challenges for multilevel health disparities research in a transdisciplinary environment. *American Journal of Preventative Medicine, 35*(2S), S182–S192.

Holmes-Greeley, P. (2011, October 25). Editorial: Dollars and politics: Senate bridge vote

raises concerns. *The Muskegon Chronicle.*

Horvath, S.M., Bedi, J.F., & Drechsler-Parks, D.M. (1986). Effects of peroxyacetyl nitrate alone and in combination with ozone in healthy young women. *Journal of Air Pollution Control Association, 36,* 265–270.

Hourdequin, M., Landres, P., Hanson, M., & Craig, D. (2012). Ethical implications of democratic theory for U.S. public participation in environmental impact assessment. *Environmental Assessment Review, 35,* 37-44.

Howe, E. (1980). Role choices of urban planners. *Journal of the American Planning Association, 46*(4), 398-409.

Hricko, A. (2012). Progress and pollution: Port cities prepare for the Panama Expansion. *Environmental Health Perspectives, 120*(12), A470-A473.

Hricko, A. (2008). Global trade comes home: Community impacts of goods movement. *Environmental Health Perspectives, 116* (2), 79-81.

Hricko, A. (2006). Ships, Trucks and Trains: Effects of goods movement on environmental health. *Environmental Health Perspectives, 114* (4), A204-A205.

Hsieh, H.F. & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.

Hu, S., Fruin, S., Kozawa, K., Mara, S., Winer, A.M., & Paulson, S.E. (2009). Aircraft Emission Impacts in a Neighborhood Adjacent to a General Aviation Airport in Southern California. *Environmental Science &* Technology, 43 (21), 8039-8045.

IBM Corp. (2011). IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corporation.

ICLEI – Local Governements for Sustainability (n.d.). *U.S. local sustainability plans and climate action plans.* Retrieved from: http://www.icleiusa.org/action-center/planning/List%20of%20U.S.%20Sustainability%20and%20Climate%20Plans.pdf

Integrated Approaches to Participatory Development (IAPAD). (2009). *Participatory mapping toolbox.* Retrieved from: http://www.iapad.org/toolbox.htm

Innes, J. & Booher, D. (2010). *Planning with complexity: An introduction to collaborative rationality for public policy.* New York, NY: Routledge.

Innes, J. & Booher, D. (2004). Reframing public participation: Strategies for the 21st century. *Planning Theory and Practice, 5(*4), 419-436.

Innes, J. (1998). Information in communicative planning. *Journal of the American Planning Association,* 64(1), 52-63.

Intergovernmental Panel on Climate Change (IPCC). (2007). *Climate change 2007: The physical science basis for policymakers.* New York, NY: Cambridge University Press.

International Association for Public Participation (IAP2). (2007). IAP2 spectrum of public participation. Retrieved from: http://www.iap2.org/associations/4748/files/IAP2%20Spectrum_vertical.pdf

International Institute for Sustainable Seaports. (2011). *Office of Research and Development: Inventory of innovative technologies for the U.S. seaports.* Arlington, VA: International Institute for Sustainable Seaports.

International Institute for Sustainable Seaports. (2010). *Environmental initiatives at seaports worldwide: A snapshot of best practices.* Arlington, VA: International Institute for Sustainable Seaports.

International Transport Forum. (2011, October). Highlights of the International Transport Forum 2011: Transport for society. Paris, France: Organisation for Economic Co-operation and Development.

Israel, B., Coombe, C. M., Cheezum, R. R., Schulz, A. J., McGranaghan, R. J., Lichtenstein, R.,…Burris, A. (2010). Community-based participatory research: A capacity-building approach for policy advocacy aimed at eliminating health disparities. *American Journal of Public Health, 100*(11), 2094-102.

Israel, B., Eng. E., Schulz, A., & Parker, E. (Eds.) (2005). *Methods in community-based participatory research for health.* San Francisco: California: John Wiley and Sons.

Israel, B., Schulz, A., Parker, A., & Becker, A. (1998). Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health, 19,* 173-202.

Jacobs, J.A., Jones, E., Gabella, B.A., Spring, B., & Brownson, R.C. (2012). Tools for implementing an evidence-based approach in public health practice. *Preventing Chronic Disease: Public Health Research, Practice, and Policy, 9,* 110324

Jerrett, M. (2009). Global geographies of injustice in traffic-related air pollution exposure. Epidemiology, 20(2), 231-233.

Jones, V. (2008). *The green collar economy: How one solution can fix our two biggest problems.* New York: NY: Harper Collins Publishers.

Jones J (1981). *Bad blood: The Tuskegee Syphilis Experiment*. New York: Free Press.

Kamaras, G. (1993). Cumulative impact assessment: A comparison of federal and state environmental review provisions. *Albany Law Review, 57*(1),113-143.

Kampa, M. & Castanas, E. (2008). Human health effects of air pollution. *Environmental Pollution, 151*(2), 362-367.

Karkkainen, B. (2002). Toward a smarter NEPA: Monitoring and managing government's environmental performance. *Columbia Law Review, 102*(4), 903-972.

Kato, R. (2012, September 5). *Freeway expansion is a pill for poor health. L.A. streets* [Blog Post]. Retrieved from: http://la.streetsblog.org/2012/09/05/oped-freeway-expansion-is-a-pill-for-poor-health/#more-76036

Kawachi, I., & Berkman, L. (2003). *Neighborhoods and Health*. New York: Oxford University Press.

Kelly, F., Fuller, G., Walton, H., & Fussell, J. (2012). Monitoring air pollution: Use of early warning systems for public health. *Respirology, 17*(1), 7-19.

Kinney, P.L., O'Neill, M.S., Bell, M.L., Schwartz, J., (2008). Approaches for estimating effects of climate change on heat-related deaths: challenges and opportunities. *Environmental Science and Policy 11,* 87–96.

Kleinman, M.T., Bufalino, C., Rasmussen, R., Hyde, D., Bhalla, D.K., & Mautz, W.J. (2000). Toxicity of chemical components of ambient fine particulate matter (PM2.5) inhaled by aged rats. *Journal of Applied Toxicology, 20,* 357–364.

Klinfelter, Q. (2012, April 30). Detroit-Windsor crossing needs second bridge. *National Public Radio News.*

Klopf, S., Wolff Culver, N. and Morton, P. (2007). A road map to a better NEPA: Why environmental risk assessments should be used to analyze the environmental consequences of complex federal actions. *Sustainable Development and Law Policy, 8*(1), 38-43.

Kovats, R.S., & Hajat, S. (2008). Heat stress and public health: a critical review. *Annual Review of Public Health 29,* 41–55.

Krieger, N., Chen, J., Waterman, P., Rehkopf, D., & Subramanian, S.V. (2003). Race/ethnicity, gender, and monitoring socioeconomic gradients in health: A comparison of area-based socioeconomic measures—the public health disparities geocoding project. *American Journal of Public Health, 93*(10), 1655-1671.

Kruger, D., Reischl, T., & Gee, G. (2007). Neighborhood social conditions mediate the association between physical deterioration and mental health. *American Journal of Community Psychology, 40,* 261-271.

Kuehn, R. (2000). A taxonomy of environmental justice. *Environmental Law Reporter, 30,* 10681-10689.

Kunzli, N., Jerrett, M., Garcia-Esteban, R., Basagana, X., Beckermann, B., Gilliland, M., Peters, J.,…Mack, W. (2010). Ambient air pollution and the progression of atherosclerosis in adults. *Environmental Health Perspectives, 113*(2), 201-206.

Kuo, C.Y., Wong, R.H., Lin, J.Y., Lai, J.C., & Lee, H. (2006). Accumulation of chromium and nickel metals in lung tumors from lung cancer patients in Taiwan. *Journal of Toxicology and Environmental Health, 69*(14), 1337.

Laden, F., Neas, L., Dockery, D., & Schwartz, J. (2000). Association of fine particulate matter from different sources with daily mortality in six U.S. cities. *Environmental Health Perspectives, 108*(10), 941-947.

Lam, T. (2010, June 20). 48217: Life in Michigan's most polluted zip code. *Detroit Free Press.*

Lane, M. B. (2005). Public Participation in Planning: An Intellectual History. *Australian Geographer*, 36 (3), 283-299.

Lang, K. (2012, June 28). Highway bill conference report released. *The Hill*.

Langford, M., Maguire, D.J., & Unwin, D. (1991). The areal interpolation problem: Estimating population using remote sensing in a GIS framework. In I. Masser and M. Blakemore (Eds.), *Handing Geographic Information: Methodology and Potential Applications* (pp. 55-77). London, UK: Longman.

Lantz P, House J, Mero R, Williams DR. Stress, life events, and socioeconomic disparities in health: results from the Americans' Changing Lives Study. (2005). *Journal of Health and Social Behavior, 46*(3), 274-288.

Larson K, Hess K, Hutchinson R, et al. (2004). *Evaluating the performance of environmental streamlining: Development of a NEPA baseline for measuring continuous performance*. Washington D.C.:Federal Highway Administration.

Latza, U., Gerdes, S., & Baur, X. (2009). Effects of nitrogen dioxide on human health : Systematic review of experimental and epidemiological studies conducted between 2002 and 2006. *International Journal of Hygiene and Environmental Health, 212*(3), 271-287.

Lazarus, R. (1993). Pursuing environmental justice: The distributional effects of environmental protection. *Northwestern University Law Review, 87,* 787–857.

LeCompte, M. & Schensul, J. (2010). *Designing and conducting ethnographic research: An introduction.* Lanham, Maryland: AltaMira Press.

Lepeule, J., Laden, F., Dockery, D., Schwartz, J., (2012). Chronic exposure to fine particles and mortality: an extended follow-up of the Harvard Six Cities Study from 1974 to 2009. *Environmental Health Perspectives,* 120(7), 965–970.

Lerner, S. (2010). *Sacrifice zones: The front lines of toxic chemical exposure in the United States*. Cambridge, MA: MIT Press.

Lessenberry, J. (2012, November 16). Michigan voters spoke, but Morouns don't seem to listen. *The Toledo Blade*.

Levitt, N., Gross, P. (1994). The perils of democratizing science.*The Chronicle of Higher Education, 5,* B1–B2.

Lewis, T. Robins, T., Dvonch, J.T., Keeler, G., Yip, F.Y., Mentz, G.B.,...Hill, Y. (2005). Air pollution-associated changes in lung function among asthmatic children in Detroit. *Environmental Health Perspectives, 113*(8), 1068-1075.

Li, S., Batterman, S., Wasilevich, E., Elasaad, H., Wahl, R., and Mukherjee, B. (2011). Asthma exacerbation and proximity of residence to major roads: a population-based matched case-control study among the pediatric Medicaid population in Detroit, Michigan. *Environmental Health*, 10, 34.

Lind, E.A. & Tyler, T.R. (1988). *The social psychology of procedural justice.* New York, NY: Plenum Press.

Lindblom, C.E., & Cohen, D.K. (1979). *Usable knowledge: Social science and social problem solving.* New Haven, CT: Yale University Press.

Litman, T. (2012). *If health matters: Integrating public health objectives in transportation planning.* Victoria, BC: Victoria Transport Policy Institute.

Litman, T. (2011). *Win-win transportation solutions: Mobility management strategies that provide economic, social, and environmental benefits.* Victoria, BC: Victoria Transport Policy Institute.

Lochridge, W. Allowing for greater admission of evidence in NEPA predetermination suits. *University of Chicago Legal Forum*, 375–396.

Long Beach Alliance for Children with Asthma (n.d.). *Speaker's kit: Glossary of goods movement terminology*. Los Angeles, CA: The Impact Project.

Los Angeles Alliance for a New Economy (LAANE). (2009). *Building opportunity: Investing in our future through a port construction careers policy.* Los Angeles, CA: LAANE.

Mack, T. (2004). *Cancers in the urban environment.* San Diego, CA: Elsevier Press.

Maantay, J., Maroko, A., & Porter-Morgan, H. (2008). Research note: A new method for mapping population and understanding the spatial dynamics of disease in urban areas: Asthma in the Bronx, New York. *Urban Geography, 29*(7), 724-738.

Maantay, J. (2002). Mapping environmental injustices: Pitfalls and potential of geographic information systems in assessing environmental health and equity. *Environmental Health Perspectives, 110* (2), 161-171.

Mallach, A. (2006). *Bringing buildings back: From abandoned properties to community assets.* Montclair, NJ: National Housing Institute.

Marquez, L. (2012, May 1). Project gives residents breathing L.A.'s dirty air data on air pollution. *UCLA Today.*

Martinez, A. (2011, October 28). What can the LA and Long Beach freight industry learn from the infamous Tuskegee experiment? *Natural Resources Defense Council Switchboard.*

Massey, D. & Denton, N. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, Massachusetts: Harvard University Press.

Matsui, E., Hansel, N., McCormack, M., Rusher, R., Breysse, P., & Diette, G. (2008). Asthma in the inner city and the indoor environment. *Immunology and Allergy Clinics of North America, 28*(3), 665-686.

Matsuoka, M., Hricko, A., Gottlieb, R., & De Lara, J. (2011). *Global trade impacts: Addressing the health, social and environmental consequences of moving international freight through our communities.* Los Angeles, CA: Occidental College and University of Southern California.

Matthews, T. (2010): The enduring conflict of "jobs versus the environment": Local pollution havens as an integrative empirical measure of economy versus environment, *Sociological Spectrum, 31*(1), 59-85.

Matthews, S., Detweiler, J., & Burton, L. (2005). Geo-ethnography: Coupling geographic information analysis techniques with ethnographic methods in urban research. *Cartographica, 40*(4), 75-90.

Mauderly, J.L. & Samet, J. (2009). Is there evidence for synergy among air pollutants in causing health effects? *Environmental Health Perspectives,117*(1), 1–6.

Mayer, B. (2009). *Blue-Green coalitions: Fighting for safe workplaces and healthy communities.* Ithaca, NY: Cornell University Press.

Maxwell, J. (2005). *Qualitative research design: An interactive approach*, 2nd edition. Thousand Oaks, CA: Sage.

McCreight, M. (2004). Using the law for leverage. In Staples, L. (Eds), *Roots to power: A manual for grassroots organizing* (pp. 254–263). Westport, CT: Praeger Publishing.

McMillan, D. & Chavis George, D. (1986). Sense of community: A definition and theory.

Journal of Community Psychology, 14, 6-23.

Michigan Department of Transportation. (2007). Detroit River International Crossing Study: Open house notice. Retrieved from: http://www.partnershipborderstudy.com/pdf/12-12-07MtgMailerComplete.pdf

Michigan Department of Transportation. (2003). Detroit River International Crossing Study Local Advisory Council roles and responsibilities. Retrieved from: http://www.partnershipborderstudy.com/pdf/DRICLACRolesResponsibilitiesApplication.pdf

Michigan Environmental Protection Act. (1994). Michigan Code of Regulations, Natural Resources and Environmental Protection Act 451 of 1994, Part 17, Section 324.1701-6.

Michigan Government. (2012). Proposal 12-6: A Proposal to Amend the State Constitution Regarding Construction of International Bridges and Tunnels.

Michigan Government, Office of the Governor. (2005). *Governor Granholm announces Downriver, Belle Isle eliminated as options for new border crossing* [Press Release]. Retrieved from: http://www.michigan.gov/granholm/0,4587,7-168-23442_21974-127615--,00.html

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook*, 2nd edition. Thousand Oaks, CA: Sage Publications.

Miller, S. (2011). Social institutions. In E. Zalta (ed.), *The Stanford encyclopedia of philosophy.* Retrieved from: http://plato.stanford.edu/archives/spr2011/entries/social-institutions/

Minkler M, Breckwich Vasquez V, Chang C, Miller, J., Rubin, V.,…Bell, J. (2008). *Promoting healthy public policy through community-based participatory research: Ten case studies*. Berkeley, CA: University of California Berkeley and PolicyLink.

Minkler, M. & Wallerstein, N. (2005). Improving health through community organization and community building. In M. Minkler (Ed.), *Community Organizing and Community Building for Health*, 2nd edition (pp. 26–50). New Brunswick, NJ: Rutgers University Press.

Minkler, M. (1992). Community organizing among the elderly poor in the united states: A case study. *International Journal of Health Services, 22*(2), 303-316.

Minnesota Pollution Control Agency (MPCA). (2002). *Citizens' guide to air pollution modeling.* Retrieved from: http://www.pca.state.mn.us/index.php/component/option,com_docman/task,doc_view/gid,390

Minton, J., Pickett, K., & Dorling, D. (2012). Health, employment, and economic change, 1973-2009: Repeated cross sectional study. *British Medical Journal, 340*, e2316

Mohai, P., Lanz, P., Morenoff, J., House, J., & Mero, R.P. (2009). Racial and socioeconomic disparities in residential proximity to polluting industrial facilities: Evidence from the Americans' Changing Lives Study. *American Journal of Public Health, 99* (S3): S649-S656.

Mohai, P. & Saha, R. (2006). Reassessing racial and socioeconomic disparities in environmental justice research. *Demography, 43* (2), 383-399.

Morello-Frosch, R., Pastor, M., & Sadd, J. (2001). Environmental justice and Southern California's "riskscape": The distribution of air toxics exposures and health risks among diverse communities. *Urban Affairs Review, 36* (4), 551-578.

Morse, J.M., Barrett, M., Mayan, M., Olson, K., and Spiers, J. (2002).Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods 1*,(2), 1-22.

Moving Ahead for Progress in the 21st Century Act (MAP-21), Pub. L. No. 112-141, Section 1813 (2012).

Muro, M., Rothwell, J., & Saha, D. (2011). *Sizing the clean economy: A national and regional green jobs assessment.* Washington D.C.: Brooking Institution.

Muzet, A. (2007). Environmental noise, sleep and health. *Sleep Medicine Reviews*, *11*(2), 135–42.

National Charrette Institute (NCI). (n.d.) The NCI charrette system. Retrieved from: http://www.charretteinstitute.org/charrette.html

National Conference of State Legislators. (2010). *Public-private partnerships for transportation: A toolkit for legislators.* Denver, CO: NCSL.

National Environmental Justice Advisory Council (NEJAC). (2012). *Draft report: Model guidelines for public participation: An update to the 1996 NEJAC model plan public participation.*

National Historic Geographic Information System (NHGIS). (2012). U.S. Census, 1950, 1980, 2010. [data files]. Prepared by NHGIS (www.nhgis.org).

National Planning Commission. (2012). *National development plan: Vision for 2030.* Republic of South Africa.

Natural Resources Defense Council. (2002). *Appeals court stops china shipping terminal construction* [Press Release]. Retrieved from http://www.nrdc.org/media/pressreleases/021030b.asp

Natural Resources Defense Council v. City of Los Angeles, 103 Cal.App.4th 268 (126 Cal.Rptr.2d 615 2002).

Nawrot, T., Plusquin, M., Hogervorst, J., et al.. (2006). Environmental exposure to cadmium and risk of cancer: a prospective population-based study. *Lancet Oncology, 7*(2), 119-126.

Nitzkin, J.L. (1992). Cancer in Louisiana: a public health perspective. *Journal of Louisiana State Medical Society, 144* (4),162-168.

Oakes, J.M., Anderton, D., Anderson, A.B., (1996). A longitudinal analysis of environmental equity in communities with hazardous waste facilities. *Social Science Research 25*(2), 125-148.

Onwuegbuzie, A. & Leech, N. (2007). Validity and qualitative research: An oxymoron? Quality *& Quantity, 41* (2), 233-249.

Oosting, J. (2012, June 15). Snyder: By building bridge, Michigan is building 'future of economic strength and security'. *MLive.*

Oosting, J. (2010, February 25). Detroit Mayor Dave Bing: Relocation 'absolutely' part of plan to downsize city. *MLive.*

Oregon Department of Transportation (ODOT) & Washington State Department of Transportation (WSDT). (n.d.) *Columbia River crossing.* Retrieved from: http://www.columbiarivercrossing.org/

Pacific Institute. (2010). *Gearing up for action: A curriculum guide for freight transport justice.* Oakland, CA: Pacific Institute.

Pastor, M.J., Sadd, J.L., & Hipp, J. (2001). Which came first? Toxic facilities, minority move-in, and environmental justice. *Journal of Urban Affairs 23*(1), 1-21.

Pastor, M.J., Sadd, J.L., & Morello-Frosch, R. (2004). Waiting to inhale: The demographics of toxic air release facilities in 21st-century California. *Social Science Quarterly,* 85 (2), 420-440.

Paterson, B. (1994). A framework to identify reactivity in qualitative research. *Western Journal of Nursing Research, 16*(1), 301-316.

Patton, M. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, California: Sage.

Pelto, G.H. & Gove, S. (1991). Developing a focused ethnographic study for the WHO Acute Respiratory Infection (ARI) Control Programme (pp. 215-226). In *Rapid assessment procedures: Qualitative methodologies for planning and evaluation of health-related programmes.* Boston, MA: International Nutrition Foundation for Developing Countries.

Perez, B. & March, J. (2006). Public-private partnerships and the development of transport infrastructure: Trends on both sides of the Atlantic. *First International Conference on Funding Transportation Infrastructure.* Alberta, Canada.

Phillips, C. (2011). Institutional racism and ethnic inequalities: an expanded multilevel framework. *Journal of Social Policy, 40* (1), 173-192.

PolicyLink. (2009). *Community mapping: How to use it.* Retrieved from: http://www.policylink.org/site/c.lkIXLbMNJrE/b.5137443/apps/s/content.asp?ct=665715

PolicyLink. (n.d.). Local hiring strategies: Local hiring in $2.4 billion Almeda Corridor project. Retrieved from: http://www.policylink.org/site/c.lkIXLbMNJrE/b.5137641/k.7ADF/Case_Studies.htm

Port of Charleston. (n.d.). *Pledge for growth*. Retrieved from: http://www.pledgeforgrowth.com/PFG_home.asp

Port of Long Beach. (2012). *Being big ship ready.* [Press Release]. Retrieved from: http://www.polb.com/news/displaynews.asp?NewsID=1088&TargetID=44

Port of Long Beach. (2012). *Harbor Commission to meet twice monthly: New schedule designed to boost public participation* [Press Release]. Retrieved from: http://www.polb.com/news/displaynews.asp?NewsID=1012

Port of Long Beach. (2012). *Port wins communication awards: Recognition by top experts in the field* [Press Release]. Retrieved from: http://www.polb.com/news/displaynews.asp?NewsID=1063&TargetID=34

Port of Long Beach. (2005). *Long Beach Harbor Department Green Port Policy: White paper.* Retrieved from: http://www.polb.com/civica/filebank/blobdload.asp?BlobID=2268

Port of Long Beach. (n.d.). Environmental documents. Retrieved from: http://www.polb.com/environment/docs.asp

Port of Los Angeles & Port of Long Beach (POLA/POLB). (2010). *San Pedro Bay Ports Clean Air Action Plan: 2010 update.* Retrieved from: http://www.cleanairactionplan.org/civica/filebank/blobdload.asp?BlobID=2474

Portugali, J. (2000). *Self-organization and the city*. Berlin: Springer.

Pope, C.A. (2007). Mortality effects of longer term exposures to fine particulate air pollution: A review of recent epidemiological evidence. *Inhalation Toxicology*, 19(S1), 33-38.

Price, M. (2009). *Mastering ArcGIS*, 4th edition. New York, NY: McGraw-Hill

Protection of Human Subjects, 45 CFR 46.101.(b) (1991).

Public Relations Society of America. (2011). What is public relations: PRSA's widely accepted definition. Retrieved from: http://www.prsa.org/AboutPRSA/PublicRelationsDefined/

Pugh, T., MacKenzie, A.R., Whyatt, J.D., & Hewitt, C.N. (2012). Effectiveness of green infrastructure for improvement of air quality in urban street canyons. *Environmental Science and Technology*, *46,* 7692-7699.

Putnam, Robert. (2000). *Bowling alone: The collapse and revival of american community*. New York, NY: Simon and Schuster.

Quinn, C. & Wania, F. (2012). Understanding differences in the body burden–age relationships of bioaccumulating contaminants based on population cross sections versus individuals. *Environmental Health Perspectives, 120* (4), 299-312.

Reed, M. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*, *141*(10), 2417-2431.

Rein, M. & White, S. (1977). Policy research: Belief and doubt. *Policy Analysis, 3*, 239-371.

Rich, M. & Broder, J. (2011, September 4). A debate arises on job creation and the environment. *New York Times*.

Riley, T. & Hawe, P. (2010). A typology of practice narratives during the implementation of a preventive, community intervention trial. *Implementation Science, 4,* 80, 1-13.

Ringquist, E.J. (2005). Assessing evidence of environmental inequities: A meta-analysis. *Journal of Policy Analysis and Management,24* (2), 223-247.

Ritz, B., Wilhelm, M., & Zhao, Y. (2006). Air pollution and infant death in Southern California, 1989-2000. *Pediatrics, 118*(2), 493-502.

Ritzer, G. (2011). *The new Blackwell companion to major social theorists.* Malden, MA: Blackwell Publishing.

Rocha Menocal, A. & Sharma, B. (2008) *Joint Evaluation of Citizens' Voice and Accountability: Synthesis Report.* London, UK: Department for International Development.

Rodriguez, C.E. (2000). *Changing race: Latinos, the Census, and the history of ethnicity in the United States*. New York, NY: New York University Press.

Rosenbaum, A., Hartley, S., & Holder, C. (2011). Analysis of diesel particulate matter health risk disparities in selected U.S. harbor areas. *American Journal of Public Health, 101*(S1), S217-S223.

Rosenbaum, A., Hartley, S., Vutukuru, S. (2008). Estimation of diesel particulate matter concentration isopleths near selected harbor areas with revised emissions. San Francisco CA: ICF International.

Rosenthal, J.K. (2010). Evaluating the impact of the urban heat island on public health: Spatial and social determinants of heat-related mortality in New York City [Dissertation]. Columbia University, New York City.

Ross, C. & Mirowsky, J. (1995). Does employment affect health? *Journal of Health and Social Behavior, 36* (September), 230-243.

Roth, P.L. (1994). Missing data: A conceptual review for applied psychologists. *Personnel Psychology, 47*, 537–559.

Rowe, B. (2011). Green roofs as a means of pollution abatement. *Environmental pollution, 159*(8-9), 2100-2110.

Salvi, S. (2007). Health effects of ambient air pollution in children. *Paediatric Respiratory Reviews, 8*(4), 275-80.

Sandercock, L. (2003). *Cosmopolis II: Mongrel cities in the 21st century.* New York, NY: Continuum.

San Francisco Health Department. (n.d.). *Potential health effects of road pricing in San Francisco, California.* Retrieved from: http://www.sfphes.org/component/jdownloads/finish/37-congestion-pricing/120-potential-health-effects-of-road-pricing-in-san-francisco-california/0?Itemid=0

Sarr, D. (2011, December 12). Occupy port protestors ousted, one man arrested. *KABC News*.

S.B. 0066, 96th Leg, Reg. Sess. (MI. 2011).

S.B. 410, 96th Leg, Reg. Sess. (MI. 2011).

S.B. 411, 96th Leg, Reg. Sess. (MI. 2011).

S.B. 1395, 95th Leg, Reg. Sess. (MI. 2010).

S.B. 1417, 95th Leg, Reg. Sess. (MI. 2010).

Schensul, J. (2002). Democratizing science through social science research partnerships. *Bulletin*

of Science Technology Society, 22(3),190-202.

Schlessinger, R. & Gearhart, J. (1987). Intermittent exposures to mixed atmospheres of nitrogen dioxide and sulfuric acid: Effect of particle clearance from the respiratory region of rabbit lungs. *Toxicology, 44*(3), 309-319.

Schneider, M. (2011). *Introduction to public health*, 3rd edition. Sudbury, MA: Jones and Bartlett Publishers.

Shreck, B. (2010). *Record of Decision announced for the Detroit Intermodal Freight Terminal in Wayne County* [Press Release]. Retrieved from http://www.michigan.gov/mdot/0,1607,7-151-9620-236968--,00.html

Schulz, A.J., Israel B.A., Williams, D.R., Parker, E., Becker, A., & James, S. (2000). Social inequalities, stressors and self-reported health status among African American and White women in the Detroit metropolitan area. *Social Science and Medicine, 51*(11),1639-1653.

Schulz, A., Williams, D., Israel, B, & Lempert, L. (2002). Racial and spatial relations as fundamental determinants of health in Detroit. *Milbank Quarterly, 80*(4), 677-707.

Schultz, C. (2012). History of the cumulative effects analysis requirement under NEPA and its interpretation in U.S. Forest Service case law. *Journal of Environmental Law and Litigation, 27, 125*- 190.

Schwandt, T. (2007). *Dictionary of qualitative inquiry,* 3rd edition. Thousand Oaks, California: Sage.

Scinto, M & Guenther, J. (2010). *Crackdown on dirty trucks skirting rules at the Port of L.A.* Neon Tommy – USC. Retrieved from: http://www.neontommy.com/2010/05/crackdown-on-dirty-trucks-skir

Shankardass, K., McConnell, R., Jerrett, M., Milam, J., Richardson, J., & Berhane, K. (2009). Parent stress increases the effect of traffic-related air pollution on childhood asthma incidence. *Proceedings of the National Academy of Sciences of the United States of America, 106*(30), 12406-12411.

Silverman, R.M., Yin, L., & Patterson, K. (2012). Dawn of the dead city: An exploratory analysis of vacant addresses in Buffalo, NY 2008–2010. *Journal of Urban Affairs, 34* (3).

Slovic,P., Finucane, M.L., Peters, E., & MacGregor, D.G. (2004). Risk analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis, 24*(2), 311-322.

Slovic, P. (1999). Trust, emotion, sex, politics, and science: Surveying the risk-assessment battlefield. *Risk Analysis,* 19(4), 689-701.

Smith, D. (Ed.). (2006). *Institutional ethnography as pratice.* Lanham, MD: Rowman and Littlefield Publishers.

Smith, M. (2005, April 16). Recent trends in cumulative impact case law [Presentation]. Alexandria, VA: National Association of Environmental Professionals Annual Conference.

Snyder, T. (2013, March 21). Will Big Highway Projects Have to Consider Climate Change? D.C. Streets Blog [Blog Post]. Retrieved from: http://dc.streetsblog.org/2013/03/21/will-big-highway-projects-have-to-consider-climate-change/?goback=%2Egde_4133917_member_225090145

Sørensen, M., Andersen, Z.J., Nordsborg, R.B., Becker, T., Tjønneland, A., Overvad, K., & Raaschou-Nielsen, O. (2013). Long-term exposure to road traffic noise and incident diabetes: A cohort study. *Environmental Health Perspectives, 121*(2), 217-222.

Sorensen, M., Andersen, Z.A., Nordsborg, R.B., Jensen, S.S., Lillelund, K.G., Beelen, R.,…Raaschou-Nielson, O. (2012). Road traffic noise and incident myocardial infarction: A prospective cohort study. *Public Library of Science, 7*(6), e39283.

Sorensen, M., Wachs, M., Min, E., Kofner, A., Ecola, L., Hanson, M.,…Griffin, J. (2009). Moving Los Angeles: Short-term policy options for improving transportation. Santa Monica, CA: Rand Corporation.

South Coast Air Quality Management District. (2012). Final 2012: Air quality management plan. Retrieved from: http://www.aqmd.gov/aqmp/2012aqmp/Final/Chapters.pdf

South Coast Air Quality Management District. (2005). MATES III: Fact sheet. Retrieved from: http://www.aqmd.gov/news1/2005/matesiiifactsheet.html

Southwest Detroit Community Benefits Coalition. (n.d.) Southwest Detroit Community Benefits Coalition: About us. Retrieved from: http://www.delraycbc.org/about-us.php

Spangler, T. & Yung, K. (2012, June 17). New international bridge to bring huge boost to both sides of border. *The Detroit Free Press*.

Srivastava, P. & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. *International Journal of Qualitative Methods, 8*(1),76-84.

Stansfeld, S., Haines M., & Brown B. (2000). Noise and health in the urban environment. *Review of Environmental Health, 15* (1-2), 43–82.

Staples, L. (2004). *Roots to power: A manual for grassroots organizing.* Westport, CT: Praeger Publishing.

Stark, J. (2011, October 24). Whatcom Docs call for analysis of coal terminal health impacts.

The Bellingham Herald.

Steinemann, A. (2001). Improving alternatives for environmental impact assessment. *Environmental Impact Assessment Review, 21*(1), 3-21.

Stevens, M. R., Berke, P. R., & Song, Y. (2010). Public participation in local government review of development proposals in hazardous locations: Does it matter, and what do local government planners have to do with it? *Environmental Management, 45*(2), 320-35.

Stillwell, F. & Primrose, D. (2010) Economic stimulus and restructuring: Infrastructure, green jobs and spatial impacts. *Urban Policy and Research, 28* (1), 5-25.

Stokols, D. (2006). Towards a science of transdisciplinary action research. *American Journal of Community Psychology, 38,* 63-77.

Stretesky, P. B., & Lynch, M. J. (2002). Environmental hazards and school segregation in Hillsborough County, Florida, 1987-1999. *The Sociological Quarterly, 43*(4), 553-573.

Strong, M. (2003, July 7). The five proposals. *Crain's Business Detroit.*

Sullivan, W.C., Frances, E.K., & Prabhu, M. (1996). Assessing the impact of environmental impact statements on citizens. *Environmental Impact Assessment Review, 16 (*3), 171-182.

Taquino, M., Parisi, D., & Gill, D.A. (2002). Units of analysis and the environmental justice hypothesis: The case of industrial hog farms. *Social Science Quarterly, 83*(1), 298-316.

Taylor, B. (2011). *Addressing equity in transportation pricing and finance: Overcoming the challenges of congestion pricing* [Powerpoint Presentation]. Los Angeles, CA: Institute of Transportation Studies, University of California.

Themba-Nixon M, Minkler M, & Freudenberg N. (2008). The role of CBPR in policy advocacy. In M. Minkler, & N. Wallerstein, (Eds.), *Community based participatory research for health: From process to outcomes*, 2nd edition (pp. 307–322) San Francisco, CA: Jossey-Bass.

Throgmorton, J.A. (1993). Survey research as rhetorical trope: Electric power planning arguments in Chicago. In Fisher, F. & J. Forester (Eds.) *The argumentative turn in policy analysis and planning* (pp 78–96). Durham, NC: Duke University Press.

Todorovich, P. & Schned, D. (2012). *Getting infrastructure going: Expediting the environmental review process.* New York, NY: The Regional Plan Association.

Tong S. & Colditz P.(2004). Air pollution and sudden infant death syndrome: A literature review. *Paediatroc Perinatal Epidemiology, 18*(5), 327-35.

Townsend A.R., Howarth, R.W., Bazzaz, F.A., Booth, M.S., Cleveland, C.C., Collinges, S.K.,…Wolfe, A.H. 2003. Human health effects of a changing global nitrogen cycle. *Frontiers in Ecology and the Environment, 1*(5), 240-246.

Tran, M. (2009, November 1). Trying to get Cambodia Town off the ground. *Los Angeles Times.*

Transportation for America. (2011). *The fix we're in for: The state of our nation's bridges.* Washington, D.C

Transportation Research Board. (2006.) The fuel tax and alternatives for transportation funding. Washington D.C.: National Academy of Sciences.

True North Research. (2011). *Public communications and perceptions survey report.* Encinitas, CA: True North Research.

Tsekeris, C. (2010). Reflections on reflexivity: Sociological issues and perspectives. *Contemporary Issues, 3* (1), 28–37.

Turner, S. (2006). Mapping institutions as work and texts. In D. Smith (Ed.), Institutional ethnography as practice (pp. 139-162) Lanham, MD: Rowman and Littlefield Publishers.

Twelker, E. (1990). Twenty years of NEPA: From the decisionmaker's aid to decisionmaker's dread. *Land and Water Law Review, 25*(1), 119-132.

UC Berkeley Health Impact Group (UCBHIG). (2010). *Health impact assessment of the Port of Oakland*. Berkeley, CA:University of California.

United Church of Christ Justice & Witness Ministries (UCC). (2007). *Toxic wastes and race at twenty 1987-2007*. Cleveland, OH: United Church of Christ.

U.S. Army. (2012, October 25). Melting ice will present new challenges. *Army News Service.*

U.S. Bureau of Labor Statistics (BLS). (2013). *The BLS green jobs definition*. Retrieved from: http://www.bls.gov/green/green_definition.htm

U.S. Bureau of Labor Statistics (BLS). (2012). Employment green goods and services – 2011. Retrieved from: http://www.bls.gov/news.release/pdf/ggqcew.pdf

U.S. Census Bureau. (2011). *The 2006-20010 American Community Survey 5-Year Summary File technical documentation (version 2*).

U.S. Census Bureau. (2012). American Community Survey, 2006-2010. [data files] Prepared by Social Explorer (www.socialexplorer.com).

U.S. Census Bureau. (2012). U.S. Census Files, 1950, 1980, 2010. [data files] Prepared by Social Explorer (www.socialexplorer.com).

U.S. Census Bureau. (2010). 2010 TIGER/Line Shapefiles. [data files] Prepared by U.S. Census Bureau (http://www.census.gov/geo/www/tiger/tgrshp2011/tgrshp2011.ht ml).

U.S. Centers for Disease Control and Prevention. (2012). *NEPA: Frequently asked questions.* Retrieved from: http://www.cdc.gov/healthyplaces/nepafaq.htm

U.S. Centers for Disease Control and Prevention. (2000). Community indicators of health-related quality of life—United States, 1993–1997. *Morbidity and Mortality Weekly Report, 49*(13),281–285.

U.S. Centers for Disease Control and Prevention. (1993). Quality of life as a new public health measure—Behavioral Risk Factor Surveillance System, 1993. *Morbidity and Mortality Weekly Report, 43,* 375–380.

U.S. Congressional Budget Office (CBO). (2012). *Using public-private partnerships to carry out highway projects.* Washington D.C.: U.S.

U.S. Congressional Budget Office (CBO). (2010). *Public spending on transportation and water infrastructure.* Washington D.C.: U.S.

U.S. Department of Energy (DOE). (2012). *Environmental justice five-year implementation plan.* Washington D.C.: U.S.

U.S. Department of Health and Human Services (DHHS). (2012). *HHS environmental justice strategy.* Washington D.C.

U.S. Department of Health and Human Services (DHHS). (2010). *The national plan for action: Chapter 1: Introduction*. Baltimore, MD: National Partnership for Action to End Health Disparities, Office of Minority Health.

U.S. Department of Health and Human Services (DHHS). (2009). Evaluating sources of knowledge for evidence-based actions in public health. Baltimore, MD: Office of Disease Prevention and Health Promotion. Retrieved from: http://www.healthedpartners.org/hc2020/090710call/3_1_Evidenced%20Based%20PH_FINAL-1%2007%2009.pdf

U.S. Department of Transportation (DOT). (2013). Health in transportation. Retrieved from: http://www.fhwa.dot.gov/planning/health_in_transportation/

U.S. Department of Transportation (DOT). (2012, August 30). Health and transportation, a critical intersection [Blog Post]. Retrieved from: http://fastlane.dot.gov/2012/08/health-and-transportation-a-critical-intersection.html#.UQBncKVki4R

U.S. Department of Transportation (DOT). (2012, July 26). Expedited review of port projects to speed jobs, economic growth [Blog Post]. Retrieved from:

http://fastlane.dot.gov/2012/07/obama-administration-expedites-major-port-projects.html#.UP2hraVki4R

U.S. Department of Transportation (DOT). (2012, June 20). DOT's commitment to nation's ports remains strong [Blog Post]. Retrieved from: http://fastlane.dot.gov/2012/06/dots-commitment-to-our-nations-ports-remains-strong.html#.UP2CTaVki4Q

U.S. Department of Transportation (DOT). (2012). *Department of Transportation environmental justice strategy.* Washington D.C.: Federal Highway Administration.

U.S. Department of Transportation (DOT). (2009).*Congestion pricing – A primer: Overview.* Washington D.C.: Federal Highway Administration. Retrieved from: http://ops.fhwa.dot.gov/publications/fhwahop08039/cp_prim1_03.htm

U.S. Department of Transportation (DOT). (n.d.). *Project profiles.* Retrieved from: http://www.fhwa.dot.gov/ipd/p3/project_profiles/

U.S. Department of Transportation. (n.d.) *A guide to transportation decision-making.* Washington D.C.

U.S. Department of Transportation. (n.d.) *Public involvement: Key legislation, regulations, and guidance.* Retrieved from: http://www.fhwa.dot.gov/planning/public_involvement/legislation/

U.S. Department of Transportation & Federal Highway Administration. (2013). *Interim guidance on MAP-21 Section 1319 accelerated decision-making in environmental reviews.* Retrieved from: http://www.fhwa.dot.gov/map21/guidance/guideaccdecer.cfm

U.S. Department of Transportation & Michigan Department of Transportation. (2008). *Final environmental impact statement.* Retrieved from: http://www.partnershipborderstudy.com/reports_us.asp#feis

U.S. Environmental Protection Agency (EPA). (2013). *2011:Toxics Release Inventory: National analysis overview.* Retrieved from: http://www.epa.gov/tri/tridata/tri11/nationalanalysis/index.htm

U.S. Environmental Protection Agency (EPA). (2012). *Currently designated nonattainment areas for all criteria pollutants.* Retrieved from: http://www.epa.gov/oaqps001/greenbk/ancl.html#Notes

U.S. Environmental Protection Agency (EPA). (2011). *Guide to sustainable performance measures.* EPA-231-K-10-004. Washington D.C.: U.S. EPA.

U.S. Environmental Protection Agency. (EPA). (2011). *Envirofacts.* Retrieved from: http://www.epa.gov/enviro/

U.S. Environmental Protection Agency. (EPA). (2010*). Designation of North American Emission Control Area to reduce emissions*. Washington D.C.: Office of Transportaion and Air Quality, U.S. EPA.

U.S. Environmental Protection Agency (EPA). (2010). *Technical guidance on the use of MOVES2010 for emission inventory preparation in State Implementation Plans and Transportation Conformity,* 420-B-10-023. Retrieved from: *http://www.epa.gov/otaq/models/moves/420b10023.pdf*

U.S. Environmental Protection Agency (EPA). (2009). *EPA needs to improve its efforts to reduce air emissions at U.S. ports,* 09-P-0125. Retrieved from: http://www.epa.gov/oig/reports/2009/20090323-09-P-0125.pdf

U.S. Environmental Protection Agency (EPA). (2008). Toxic Release Inventory Program. TRI.NET. [software] Washington D.C.

U.S. Environmental Protection Agency (EPA). (2006). *Peer review handbook*, 3rd edition. EPA-100-B-06/002. Washington D.C.: U.S. EPA.

U.S. Environmental Protection Agency (EPA). (1999). *Consideration of cumulative impacts in EPA review of NEPA documents*. EPA 315-R-99-002. Washington D.C.: U.S. EPA.

U.S. Environmental Protection Agency (EPA). (1998). *Final guidance for incorporating environmental justice concerns in EPA's NEPA compliance analyses*. Washington D.C.: U.S. EPA.

U.S. Environmental Protection Agency (EPA). (n.d.). *Developing the Risk-Screening Environmental Indicators.* Retrieved from: http://www.epa.gov/oppt/rsei/pubs/rsei_development.pdf

U.S. Environmental Protection Agency (EPA). (n.d.). *Environmental justice key terms.* Retrieved from: http://www.epa.gov/region7/ej/definitions.htm

U.S. Federal Highway Administration (FHWA). (2012). *Environmental justice: Balancing the environment and economic development.* Retrieved from: http://www.fhwa.dot.gov/environment/environmental_justice/ej_and_nepa/case_studies/case01.cfm

University of California- Los Angeles (UCLA) Center for Health Policy Research. (n.d.) *ALERT Project.* Retrieved from: http://healthpolicy.ucla.edu/programs/health-data/alert-project/Pages/default.aspx

van Kempen, E., Van Kamp, I., Fischer, P., Davies, D., Houthuijs, R., Stellato, C.,…Standfeld, S. (2006). Noise exposure and children's blood pressure and heart rate: the RANCH project. *Journal of Occupational Environmental Medicine, 63*(9), 632-639.

Vander Doelen, C. (2011, November 7). Bridge battle a heavyweight bout. *The Windsor Star.*

Venkatram, A., Isakov, V., Seila, R., & Baldauf. (2009). Modeling the impacts of traffic emissions on air toxics concentrations near roadways. *Atmospheric Environment, 43*(2), 3191-3199.

Victor, G.D. (2012). Struggling against U. S. labor's decline under late capitalism: Lessons for the early 21st century. *Science & Society*, 76 (3), 393-405.

Vincent, R., Bjarnason, S.G., Adamson, I.Y., Hedgecock, C., Kumarathasan, P., Guenette, J.…Bouthillier (1997). Acute pulmonary toxicity of urban particulate matter and ozone. *American Journal of Pathology, 151,* 1563–1570.

Virtanen, M., Joensuu, M., Virtanen, P., Elovainio, M., & Vahtera, J. (2005). Temporary employment and health: A review. *International Journal of Epidemiology, 34* (3), 610-622.

Volk, H., Hertz-Picciotto I., Delwiche, L., Lurmann, F., & McConnell, R. (2011). Residential proximity to freeways and autism in the CHARGE study. *Environmental Health Perspectives,119*(6),873–877.

Wachs M (1985) When planners lie with numbers. *Journal of the American Planning Association, 55,* 476–479.

Walker, G. (2010). Environmental justice, impact assessment and the politics of knowledge: The implications of assessing the social distribution of environmental outcomes. *Environmental Impact Assessment Review, 30*(5), 312-318.

Wang, C., & Burris, M. A. (1994). Empowerment through photo novella: Portraits of participation. *Health Education and Behavior, 21(*2), 171-186.

Watson, A., Bates, R., & Kennedy, D. (Eds.) (1988). *Air pollution, the automobile, and public health.* Cambridge, MA: Health Effects Institute.

Watt, D. (2007). On becoming a qualitative researcher: The value of reflexivity. *The Qualitative Report*, *12*(1), 82-101.

Webler, T., & Tuler, S. (2002). Unlocking the puzzle of public participation. *Bulletin of Science, Technology and Society*, *22*(3), 179-189.

Whatcom County, Washington. (2012). *Environmental impact statement: Proposed Gateway Pacific Terminal/Custer Spur*. Retrieved from: http://www.eisgatewaypacificwa.gov

Wilhelm, T. (2011, October 27). Detroit protestors block trucks on Ambassador Bridge Thursday. *The Windsor Star.*

Williams, R.W. (1999). The contested terrain of environmental justice research: Community as unit of analysis. *Social Science Journal, 36*(2),313-328.

Williams, D.R., Neighbors, H.W., & Jackson J. (2003). Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*, 93(2), 200–208.

Williams, D.R., Yu Y., Jackson J, & Anderson NB. (1997). Racial differences in physical and mental health: Socioeconomic status, stress and discrimination. *Journal of Health Psychology, 2*(3),335-351.

Williams, D.R. & Collins, C. (1995). US socioeconomic and racial differences in health: Patterns and explanations. *Annual Review of Sociology*. 21, 349–386.

Wilson, R. (2001). Assessing communicative rationality as a transportation planning paradigm. *Transportation, 28*, 1-31.

Wright, R. & Subramanian, S.V. (2007). Advancing a multilevel framework for epidemiologic research on asthma disparities. *Chest, 132*(5), 757S-769S.

Wu, Y.C., & Batterman, S. (2006). Proximity of schools in Detroit, Michigan to automobile and truck traffic. *Journal of Exposure Science and Environmental Epidemiology, 16* (5), 457-470.

Yin, R. (2006). Mixed methods research: Are the methods genuinely integrated or merely parallel? *Research in Schools, Sp,* 41-47.

Yip, F.Y., Keeler, G.J., Dvonch, J.T., Robins, T.G., Parker, E.A., Israel, B.A. & Brakefield-Caldwell, W. (2004). Personal exposures to particulate matter among children with asthma in Detroit, Michigan. *Atmospheric Environment, 38*, 5227-5236.

Young, E. & Kresge, J. *Integrating public health and transportation planning: Perspectives for MPOs and COGs.* National Association of Regional Councils (NARC), New York, NY; 2012.

Zanobetti, A, & Schwartz, J. (2000) Race, gender, and social status as modifiers of the effects of PM10 on mortality. *Journal of Occupational and Environmental Medicine, 42* (5) 469-474.

Zhu, Z., Hinds, W., Kim, S., Shen, S., & Sioutas, C. (2002). Study of ultrafine particles near a major highway with heavy-duty diesel traffic. *Atmospheric Environment, 36*, 4323–4335.

Zimmerman, M., Israel, B., Freudenberg, N., Becker, M. & Janz, N. (1995). Methodology. In N. Freudenberg & M. Zimmerman (Eds.), *AIDS prevention in the community: Lessons learned from the first decade* (pp.199-211). Washington D.C.: American Public Health Association.