6 THE Impact Project: Trade, Health, and Environment around Southern California's Ports

Case Summary

In our globalized world, most consumer products are shipped from where they are made to their final user through a complex "goods movement system" of container ships, trains, warehouses, and trucks. More than 40 percent of all goods imported into the United States enter through the ports of Los Angeles and Long Beach in Southern California, making that area a major hub of freight transportation (figure 6.1). The emissions, noise, light, and traffic from goods movement activities pose health risks to surrounding communities and workers. In 2001, the University of Southern California's Environmental Health Sciences Center, which has a major focus on air pollution research, and community partners hosted a town hall meeting in which participants highlighted these concerns. Subsequently, academic and community partners formed the "Trade, Health, and Environment Impact Project"—or simply THE Impact Project—to elevate health equity as a central concern in goods management decisions. THE Impact Project supported community-based science, built capacity within communities and among academic researchers to knowledgeably participate in decision-making, and translated emerging health research to inform goods movement planning. This case focuses on the resources, approaches, and strategies local stakeholders used to protect community health from the cumulative impacts of a complex system of decisions made in multiple sectors at the local, regional, state, national, and international level.

Introduction: People, Ports, and Public Health

We use goods produced in other countries every day—cars, clothing, technology, food, and countless other consumer products. These products travel to us through a network of ships, planes, trains, and trucks. Most goods arrive in the United States at a deepwater port in container ships. These containers may then be trucked to railyards, taken by train or truck to warehouses, and eventually transferred to trucks or vans for local delivery. This goods movement system creates negative externalities—unintended health and environmental impacts—including air pollution, traffic accidents, noise, and dangers to workers. Despite extensive federal and state regulations, these externalities may significantly affect the health of communities located near goods movement operations. According to Cummings (2018), "Ports are spaces where the unequal costs and benefits of trade and consumption see their most immediate and palpable distribution." People living near the ports of Los Angeles and Long Beach have long been concerned about the health impacts of goods movement activities on their communities. Since around 2001, environmental organizations, academics, and community groups have increasingly worked together to address these concerns through systems change. This chapter focuses on a community-academic collaborative, THE Impact Project, which aimed to reduce the health impacts associated with goods movement from the ports in Long Beach and Los Angeles, California. It examines the resources, strategies, and processes the partners used to overcome political, economic, and institutional barriers to change at the local level. Although THE Impact Project was just one of many ongoing efforts to promote environmental health and justice in port-adjacent communities, it had a significant impact on local systems-change efforts—even in the context of powerful state, national, and global economic and political forces.

The U.S. economy depends on a global transportation system that continues to grow rapidly. Roughly 40 percent of the goods imported to the United States pass through the ports of Los Angeles and Long Beach, totaling over a billion dollars in cargo each day (Cummings 2018; McDonnell and Kitroeff 2016). Trade through these ports more than doubled between 1995 and 2017 (Port of Long Beach 2018b; Port of Los Angeles 2018a). A total of 16.8 million twenty-foot containers (twenty-foot equivalent units, or TEUs) entered the two ports in 2017, representing a major sector of the

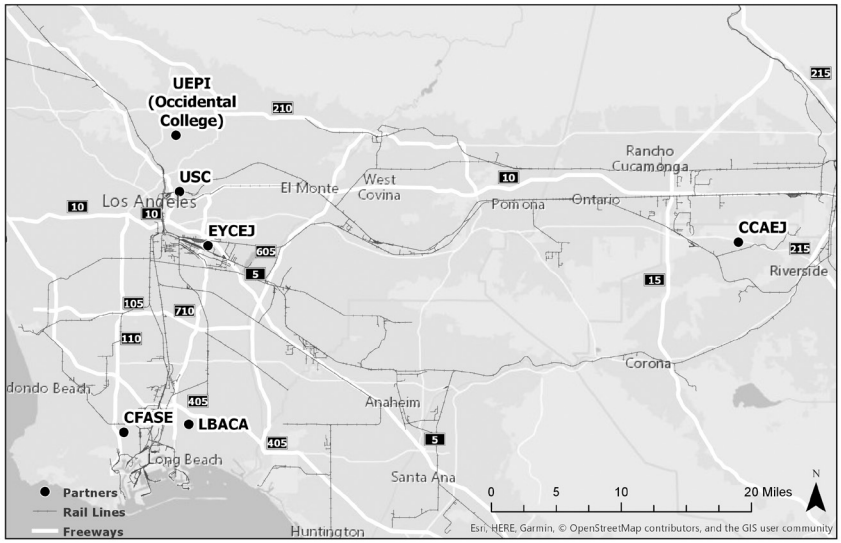

Figure 6.1
Map of Southern California ports region and locations of THE Impact Project partners
Map credit: Karl Korfmacher

Southern California economy. Despite the 2016 expansion of the Panama Canal that allowed larger ships to pass through to East Coast ports, the ports of Southern California are expected to continue growing for the foreseeable future (McDonnell and Kitroeff 2016; SUNY 2016). This projection has spurred expansion of railyards, railways, highways, and warehouses in the region. Many of these infrastructure improvements are subsidized by public funds, including $1.2 billion in transportation projects supported by the American Recovery and Reinvestment Act (ARRA) stimulus starting in 2009 (Matsuoka et al. 2011).

Although individual parts of the goods movement system (e.g., emissions from trucks, locomotives and oceangoing ships) are regulated by state, federal, and in some cases international law, their cumulative environmental impacts can cause significant health problems for those who live nearby. These impacts are concentrated around "intermodal" facilities—including ports, railyards, and warehouses—where goods are moved from one form of transport to another. Air pollution is the primary environmental health concern, but water pollution, noise, traffic, bright all-night lighting, and safety hazards can also affect the health of workers and nearby communities. A

brief overview of how these activities affect health and the systems in place to manage them is provided below.

Environment, Health, and Goods Movement

Goods movement activities at ports involve trains, trucks, heavy equipment, and ships, all of which produce air pollution. Many of these vehicles burn diesel fuel, which produces more harmful gases and particles than gasoline or natural gas engines. This pollution poses particular risks to people living and working near goods transportation facilities and can contribute to regional air quality problems. In addition, people living near goods movement activities may be affected by noise, constant bright lighting, traffic accidents, pedestrian safety risks, traffic congestion, and spills of hazardous chemicals (Matsuoka et al. 2011). People who operate trucks, trains, and machinery, work in warehouses, or unload containers at the ports face health risks from air quality, heat, and other safety hazards.

Air Pollution and Human Health

Historically, air pollution was considered a local problem resulting from combustion for cooking and small-scale commercial activities. With increasing industrialization in the twentieth century, larger factories with tall stacks contributed to regional air pollution concerns. In 1948, more than twenty people died after an industrial air pollution buildup around Donora, Pennsylvania (Davis 2003). This event was followed closely by the infamous London fog of 1952, during which mortality rates tripled, then remained elevated for months, killing an estimated 12,000 people (Bell, Davis, and Fletcher 2003). These lethal air pollution events, along with increased understanding of the health impacts of chronic exposure to air pollution, were primary motivators for federal air quality regulations implemented in the United States in the 1960s and 1970s (Andrews 2006). Although these policies drastically reduced pollution, regional air quality problems persist, particularly in major metropolises. At the same time, research on the health impacts of air pollution has led to greater concern about long-term exposure to even low levels of air pollution. Air pollutants commonly associated with goods movement activities contribute to a wide range of health problems.

Air quality varies constantly, which makes understanding the health impacts of air pollution challenging. Local air quality depends on weather (temperature, sunlight, precipitation, mixing of the atmosphere by wind, etc.), geography, emissions from both stationary (e.g., industrial) and mobile (e.g., vehicle) sources, and the types of chemicals emitted by these sources. The effects of pollutants on people vary based on how long they are exposed and their individual vulnerabilities.

Environmental health concerns related to goods movement focus on diesel exhaust from trucks, trains, ships, and heavy equipment at ports. As a foundation for understanding the health concerns surrounding goods movement, it is important to have an overview of the chemical components of diesel exhaust, the health effects of inhaling these chemicals, the extent to which goods movement activities contribute to overall air quality in urban areas, and who is most susceptible to this pollution. Diesel exhaust consists of gases and particulate matter. The gases include nitrogen oxides (NO_x), sulfur dioxides (SO_2), carbon monoxide (CO), and volatile organic compounds (VOCs). Especially in urban areas, diesel exhaust can be a significant contributor of nitrogen oxides, which in turn are the primary precursor of ground-level ozone (Dallmann and Harley 2010; Kota et al. 2014). Ozone is a constituent of smog and has a variety of health effects (Olivieri and Scoditti 2005; Bernstein et al. 2004).

Diesel combustion is also a major source of particulate matter in urban environments (California Air Resources Board 2018; Rosenbaum, Hartley, and Holder 2011; Hasheminassab et al. 2014; Kim and Hopke 2008; Kim et al. 2010). Particulate matter is categorized by size because smaller particles may penetrate the lung more deeply, enter the blood, and have more severe health effects (Oberdorster et al. 2004; Araujo et al. 2008; Weuve et al. 2012; Li et al. 2003; Li et al. 2016; Bernstein et al. 2004). The smallest particles, called ultrafine particles (UFP), may even enter cells and cause DNA damage (Li et al. 2016). Exposure to fine particulate pollution has been associated with respiratory, neurologic, and cardiovascular effects (Pope et al. 2004; Pope and Dockery 2006; U.S. EPA 2009b; Utell and Frampton 2000).

Research suggests the combined effects of particles and gases comprising diesel exhaust can contribute to cognitive impairment, diabetes, and chronic obstructive pulmonary disease (COPD) (Ranft et al. 2009; Liu et al. 2013; Kramer et al. 2010; Andersen et al. 2011). Pregnant women who

breathe diesel exhaust may have pregnancy complications and low-birth-weight babies (Wilhelm and Ritz 2005; Basu et al. 2014; Wu et al. 2009; Green et al. 2009). Based on studies of workers exposed to diesel exhaust, the U.S. Environmental Protection Agency (EPA) categorized diesel as a "likely human carcinogen" in 1999, and the International Agency for Research on Cancer (IARC) classified it as a "known human carcinogen" (IARC 2012; Benbrahim-Tallaa et al. 2012; Garshick et al. 2012; Attfield et al. 2012).

Air quality can vary significantly across small distances. For example, one study found elevations of ultrafine particles (UFPs), nitrogen dioxide, and elemental carbon within 150 meters of busy roads (Zhu et al. 2002; Boothe and Shendell 2008; Greco et al. 2007). Studies have also detected higher rates of certain cancers among people living near known sources of diesel emissions or who are exposed in the workplace (Silverman et al. 2012; Mack 2004; Crouse et al. 2010). Models suggest that cancer risk from diesel emissions is much higher for people living close to these facilities (Hricko et al. 2014; Hand et al. 2004; NEJAC 2009; Pingkuan Di 2006).

In many urban areas, diesel is the largest source of NO_x and small particulates (U.S. EPA 2002). In 2005, the Los Angeles and Long Beach ports produced around 25 percent of the region's air particulate matter and 25 percent of diesel emissions (Port of Los Angeles 2007; Matsuoka 2014). While there have been significant reductions in emissions from vehicular sources since 2007, goods movement activities still significantly impact air quality in Southern California (Hasheminassab et al. 2014). The ports remain the largest fixed sources of air pollution in the region, emitting more pollution every day than the region's 6 million cars (South Coast Air Quality Management District 2018b).

Certain people are more vulnerable to air pollution than others because of their age, genes, or health status. Research shows that children are particularly affected by air pollution. Children who grow up in areas with air pollution from traffic have reduced lung function (Gauderman et al. 2004; Gauderman et al. 2007). Uncertainty remains about the role of air pollution in the development of asthma (Eder, Ege, and von Mutius 2006; Sarnat and Holguin 2007; McConnell et al. 2010). However, several studies have found that children who live or go to school near high-traffic areas are more likely to develop asthma and to have more frequent asthma attacks (McConnell et al. 2010; Gauderman et al. 2005). In addition, ambient air pollution can

trigger asthma attacks in both adults and children who have asthma (Peel et al. 2005; Jacquemin et al. 2015; Sunyer et al. 1997).

Thus, a wide range of health effects are associated with air pollution from goods movement activities. Communities near transportation activities recognize that the health of their residents may not be adequately protected by the complex system of federal, state, and regional policies, regulations, and programs that have been implemented to control air pollution. The next section provides a brief overview of this system and the gaps that leave certain communities at risk of exposure to harmful levels of pollution.

Air Pollution and Goods Movement: The Policy Context

The extreme air pollution events of the 1950s heightened the public's awareness of air pollution. The United States responded to the growing public concern by passing the Clean Air Act (CAA) of 1963. This law had a weak role for the federal government; most implementation and enforcement was left to the states. Differing state air quality standards encouraged polluting industries to locate in the states with the weakest regulations. Air quality was eventually recognized to be a regional problem, since air pollution crosses state lines and states with weaker controls could "export" their pollution to downwind states. To address such problems, the CAA was strengthened in 1970, setting national standards for air quality. Although it has since been revised several times, the structure of the 1970 Clean Air Act remains the guiding framework for air quality management today (U.S. EPA 2017f).

The goal of the CAA was "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population" (U.S. Congress 1970). Under the CAA, the EPA was directed to set National Ambient Air Quality Standards (NAAQS) for six "criteria pollutants"—sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide, ozone, and lead (U.S. EPA 2016b). Each state must submit a State Implementation Plan (SIP) for review by the EPA specifying how it will meet NAAQS requirements (U.S. EPA 2016d). The EPA was directed to set the NAAQS to "protect public health with an adequate margin of safety" based on the best available science, to be reviewed every five years. For example, in 2015 the EPA lowered the NAAQS for ozone from 75 to 70 parts per billion (ppb) (U.S. EPA 2018j).

Despite the health concerns noted previously, there currently is no separate standard for ultrafine particles (RTI International 2015). Although there is no NAAQS for diesel pollution, California regulates it as a toxic air contaminant (California Air Resources Board 2018).

Because air quality fluctuates constantly, the EPA sets multiple standards for several pollutants based on different time periods. For example, the primary NAAQS standard for $PM_{2.5}$ is set at 12 $\mu g/m^3$ (micrograms per cubic meter of air) averaged over an entire year and 35 $\mu g/m^3$ for any twenty-four-hour period (U.S. EPA 2016b). If air quality monitoring shows that pollution exceeds NAAQS standards, the area is designated a "nonattainment area" for that pollutant and is subject to stricter regulations (U.S. EPA 2017a).

The Clean Air Act addresses mobile sources of pollution by directing the EPA to set national standards for allowable emissions from different kinds of consumer vehicles, heavy-duty vehicles (trailer trucks and buses), and non-road engines (locomotives and aircraft). Because of its persistent air quality problems, California has been allowed to adopt more stringent vehicle emissions (U.S. EPA 2013a). In addition, the 2007 Highway Rule required new bus and truck diesel engines to meet lower emissions standards and burn ultra-low-sulfur diesel (ULSD) fuel, reducing per-vehicle emissions of sulfur by 90 percent (U.S. EPA 2017d). To support implementation of this rule, the federal government established a program of grants to support the retrofitting and replacement of existing diesel engines (U.S. EPA Agency 2017d, 2018h). Air quality was expected to improve significantly as older engines were replaced over time. However, increases in the number of engines operating in an area, weak implementation or rollback of these rules, or new sources of pollution could reverse these trends.

Emissions from ships burning marine diesel pose an additional health hazard. In 2007, researchers estimated 60,000 annual cancer deaths from the global diesel emissions of oceangoing ships (Corbett et al. 2007). Although the CAA sets standards for marine engines, these do not apply to ships from other countries. Container ships burn marine diesel fuel or "bunker fuel," which is less expensive but produces more pollution than other types of diesel. Under rules adopted by the EPA in 2009, all ships operating within 200 miles of the U.S. coast must meet stricter standards (U.S. EPA 2017e). Implementation of this requirement is expected to greatly reduce pollution from oceangoing ships in U.S. ports (U.S. EPA 2018d). New rules by the International Maritime Organization will expand those controls to ports

around the world by 2020 (Gallucci 2018; International Maritime Organization 2018).

Major expansions of goods movement facilities usually must be reviewed under the National Environmental Policy Act (NEPA) and similar state laws (Port of Long Beach 2018a). As described in chapter 2, an environmental impact statement (EIS) under NEPA must predict the environmental impacts of the project, compare them to alternatives including a "no-build" (baseline) scenario, and allow for agency and public review. The process of deciding which goods movement projects require EISs, what impacts are analyzed, and to what extent impacts are mitigated in final plans is frequently controversial (U.S. EPA 2016c).

Thus, multiple policies, programs, and regulations manage the environmental impacts of goods movement activities throughout the United States. Implementation of this system in Southern California is unique in several ways. The region has struggled with poor air quality for decades. In addition to being home to a large number of industrial, freight, and traffic sources of pollution, mountain ranges surrounding Los Angeles trap pollution over the city. These factors, as well as abundant sunshine, contribute to the area's infamous smog. The South Coast Air Quality Management District (SCAQMD) is responsible for managing air quality in Southern California. To address its persistent air pollution problems, Southern California has some of the strictest air emissions controls in the country. Implementation of these restrictions has led to a 75 percent reduction in ozone since the 1950s, despite a tripling of the local population (SCAQMD 2018a). Nonetheless, the region is still a nonattainment area for $PM_{2.5}$ and ozone (SCAQMD 2017).

Transportation continues to be a significant contributor to air pollution in the region, despite Southern California leading the United States in vehicle-based air pollution reduction efforts. Around three-quarters of the pollution contributing to ozone in the Los Angeles region is attributed to mobile sources (SCAQMD 2018a). Many of these vehicles are associated with goods transport: On the I-710 freeway, over 25 percent of the vehicles are heavy-duty diesel freight trucks (Human Impact Partners 2011). Despite California's strong air quality protection programs, there are limits to how much it can regulate emissions. For example, in 2010 a federal judge ruled that California could not restrict trains idling on the basis that the regulation interfered with interstate commerce (Williams 2010).

Even with the multitude of health-based regulations that have significantly improved air quality, air pollution continues to pose a health threat to people in Southern California, particularly those living and working near transportation facilities (Brown et al. 2014; Boothe and Shendell 2008). As well, emerging research on health impacts of fine particulates shows significant acute and chronic health effects of $PM_{2.5}$ exposure at levels below the current U.S. EPA standards (Shi et al. 2016). Thus, increasingly stringent ambient air quality standards, emissions standards for new industrial facilities, programs promoting cleaner engines, and environmental impact reviews of major new activities have significantly improved air quality, but risks remain for communities located near hubs of goods movement activities.

Health Impacts of Noise, Light, and Traffic

Other major concerns of people living near goods movement operations include noise, twenty-four-hour lighting, and traffic. Sometimes called "nuisance" concerns, these issues are typically addressed by local laws or private legal actions but are not generally regulated as "environmental" hazards.

The cranes, machinery, trains, trucks, and traffic associated with goods movement can produce high levels of noise around the clock. Research in both community and occupational settings shows that noise can significantly affect health. In a residential setting, the primary concern is usually sleep disruption and stress (Lercher et al. 2002; Evans 2006). Studies have associated chronic noise exposure with cognitive problems, heart disease, and stroke (Babisch 2006; Stansfeld et al. 2005; Sorensen et al. 2011).

Noise standards for transportation activities are set by the federal government. Non-transportation sources, such as industrial activity, may be regulated by local government through noise ordinances (SCAQMD 2012). Noise regulations apply to planning, constructing, and assessing the impacts of new projects. For example, noise standards from the U.S. Department of Housing and Urban Development (HUD) are used to assess what kind of noise abatement measures need to be built into new public housing constructed near roadways, railyards, or airports (HUD 2018b). Similarly, environmental impact reviews of transportation projects must model noise impacts to show they do not exceed standards. In practice, however, it has been challenging for residents to act on existing sources of noise (e.g., the increased traffic around a port or the frequency of train horns) or address

the cumulative impacts of multiple sources. The U.S. EPA's Office of Noise Abatement and Control, established under the Noise Control Act of 1972, was stripped of its funding in 1981 and has not received congressional budgetary support since that time, limiting noise abatement actions by the federal government (Shapiro 1992).

Many port facilities are lit by stadium lighting to facilitate twenty-four-hour operations and promote safe working conditions. This light often spills over into adjacent neighborhoods. Human and animal research suggests that bright nighttime lighting has negative health effects, including disruption of sleep, hormones, and immune function (Chepesiuk 2009; Pauley 2004; Cho et al. 2015). California has no policies in place to regulate light pollution (National Conference of State Legislatures 2016). However, there are standards for lighting at industrial facilities, and some municipalities, including Los Angeles, have ordinances restricting spillover lighting or "light trespass" (Municipal Research and Services Center 2016; County of Los Angeles 2018). Technical solutions such as light shields, height restrictions, and lighting designed to illuminate only the ground may reduce these problems. Nonetheless, neighbors of port facilities frequently mention spillover lighting as a negative impact on their quality of life (Matsuoka et al. 2011).

Growth in goods movement activities frequently results in increased traffic, which can create the potential for bike, pedestrian, or car collisions in adjacent residential neighborhoods. Accidents involving trucks or train derailment also pose the risk of spilling hazardous materials. Neighbors frequently report that truck traffic negatively affects their quality of life because it brings more traffic jams and excessive noise, makes it less safe to exercise outdoors, and reduces the "walkability" of neighborhoods.

When a new transportation facility is proposed, or an existing facility is being expanded, the impacts of increased traffic are part of the environmental review process. Regional transportation planners model increases in traffic in order to develop routes that do not adversely affect residential streets (U.S. DOT 2018a). However, incremental expansion of operations that do not require environmental review may result in additional traffic on existing roadways. In such cases, municipalities may work with industries to develop voluntary truck-routing agreements; however, local communities' ability to control ongoing increases in traffic associated with existing facilities are limited.

Thus, "nuisance" factors like noise, light, and traffic associated with goods movement developments can negatively affect the health of adjacent communities. Research increasingly shows that cumulative environmental exposures such as air pollution and stress can multiply health effects (Payne-Sturges et al. 2015; Clougherty et al. 2007). Residents may face challenges in addressing these problems including limited resources for advocacy, absence of conclusive local data supporting their concerns, and lack of policy tools to mitigate the impacts of goods movement activities.

Worker Health

The health impacts of goods movement are also significant for workers, including dock, rail, and warehouse workers and truck drivers. Overall, the transportation and warehousing sector is one of the riskiest occupational sectors (Bureau of Labor Statistics 2018). Workers may be exposed to heat stress, poor air quality, and high levels of noise (Landon, Breysse, and Chen 2005). The limited staff of the federal Occupational Health and Safety Administration (OSHA) and related state agencies cannot regularly inspect these workplaces to make sure regulations are being followed. Many workers in the transportation sector do not belong to unions that can advocate for better protections (Cummings 2018). Most port truck drivers are classified as "independent contractors," which limits their ability to access worker protections and to complain about conditions without losing their jobs (Smith, Bensman, and Marvy 2010). Independent contractor status may exacerbate pollution exposures because driver-owners may not be able to afford to maintain emissions controls on their trucks (Cummings 2018). Many people employed in goods movement activities are low-wage, temporary, or contract workers, which means they are likely to have additional health challenges such as poor health care and may themselves live in highly polluted neighborhoods (Matsuoka et al. 2011; Murphy 2017).

Other Health and Environmental Concerns

In addition to these direct health impacts resulting from goods movement decisions in Southern California, there are many additional indirect health and environmental consequences. For example, the diesel fuel emissions and discharge of sewage from container ships may pollute coastal waters. The noise of ship engines can harm marine mammals, and ships sometimes

strike and kill them. Discharged ballast water from ships may transport invasive species that can damage local marine ecosystems. The current system of goods movement also has significant climate change implications. The transportation sector comprises nearly 30 percent of all greenhouse gas emissions in the United States (U.S. EPA 2018i). Global shipping currently contributes around 3 percent of total annual anthropogenic greenhouse gas emissions (Matsuoka et al. 2011; Bouman et al. 2017). Finally, global trade has implications for people living in countries like China, where regulations may be less protective of environmental health. Although these are not "local" community health issues, they may be significant concerns for local, regional, or national stakeholders engaged in goods management decisions.

Environmental Justice and Goods Movement

People living or working near goods movement hubs may be impacted by multiple environmental health hazards. Ports and railyards are often located adjacent to other polluting industries. The communities surrounding these industrial and transportation facilities tend to be lower-income and are home to many immigrants, refugees, and people of color. Hricko and colleagues (2014) found that there was a significantly higher percent of families in poverty living adjacent to California railyards compared to those living in the surrounding county. For most of these sites, the proportion of Latino residents was similarly elevated. For example, they analyzed demographic data from communities surrounding the Union Pacific railyard in Los Angeles, which was constructed in 1980. At the time of construction, the adjacent neighborhoods had a higher proportion of racial minorities (68 percent versus 47 percent in the county) and less than half the average income. By 2005, the percent of minority residents in the neighborhood had increased from 68 percent to 89 percent (versus 69 percent in the county). Based on analysis of other recent railyard expansion proposals, the authors suggest that goods movement facilities continue to disproportionately affect lower-income areas and communities of color (Hricko et al. 2014). This pattern is not unique to California. A national study of port communities found that the proportions of lower-income black or Latino residents living near ports were higher than in the overall U.S. population, sometimes by a factor of two to three (Rosenbaum, Hartley, and Holder 2011).

In response to these concerns, in 2007 the U.S. EPA asked the National Environmental Justice Advisory Committee (NEJAC) to "provide advice and recommendations about how the Agency can most effectively promote strategies, in partnership with federal, state, tribal, and local government agencies, and other stakeholders, to identify, mitigate, and/or prevent the disproportionate burden on communities of air pollution resulting from goods movement" (NEJAC 2009, 1). NEJAC appointed a Goods Movement Work Group (GMWG) to research the issue and develop recommendations. The GMWG recommendations emphasized the need for strong community participation and collaborative governance, as well as additional research, regulation, and funding (NEJAC 2009).

Goods Movement in Southern California

Given Southern California's history of air quality problems associated with transportation, it is not surprising that it is a hub for research, community action, and policy to address the health impacts of goods movement. At the same time, global trade's importance to the economy poses a political challenge to those who hope for stronger regulations. Many of the neighborhoods adjacent to the ports of Los Angeles and Long Beach are home to communities with limited political power and economic resources. In contrast, the power of industries involved with goods movement in Southern California is formidable: It includes the world's largest shipping agencies and the nation's largest railroad companies, as well as major trucking and logistics corporations, real estate developers, and retail giants. Nonetheless, community groups in Southern California have succeeded in increasing awareness of the health impacts of goods movement. Not only have these groups advocated for health considerations in related decisions, but they have also reached out to support other port-adjacent communities across the country. Many groups have contributed to these efforts. This case study focuses on THE Impact Project, an initiative that leveraged the resources of community and academic partners to influence the systems governing goods movement. The discussion explores the evolution of these efforts over the past fifteen years, the resources that supported them, their impacts on goods movement decisions, and implications for other communities living near intermodal transportation hubs.

Case Overview: THE Impact Project

In 2001, the Natural Resources Defense Council (NRDC) partnered with homeowner and environmental groups to sue the Port of Los Angeles for failing to conduct an environmental impact report (EIR) on the expansion of container-handling facilities leased to the China Shipping Holding Company as required under the California Environmental Quality Act (CEQA) (Natural Resources Defense Council 2002a, 2002b). The suit ended with a $50 million settlement that funded pollution prevention and mitigation efforts around the port (Cummings 2018). The China Shipping suit was the culmination of years of efforts to force the Port of Los Angeles to address the health and environmental concerns of homeowners from the port-adjacent San Pedro and Peninsula neighborhoods (Natural Resources Defense Council 2002a). The settlement has been hailed as the start of a comprehensive effort to address environmental health impacts of port-related activities in the region.

Other communities abutting goods movement infrastructure in Southern California were also becoming increasingly concerned about port expansion and attendant air pollution, traffic safety, and noise issues. Neighborhood, environmental, and community health groups organized around different aspects of good movement decisions in the region. For example, in the late 1990s the Center for Community Action and Environmental Justice (CCAEJ) began fighting construction of inland warehouses to store freight from the ports. Other groups focused on individual rail, port, and highway projects. The projected rapid growth of the ports added urgency to these efforts.

At the same time that community concern about the health impacts of the ports was growing, local academic researchers were publishing disturbing findings about air pollution's effects on children (Kunzli et al. 2003; Gauderman et al. 2004; Gauderman et al. 2005). Because of the region's infamous air quality problems, Southern California was a hotbed of research on the health effects of air pollution. One hub for this research was the University of Southern California (USC). USC researchers initiated the Children's Health Study in 1993 to investigate the impacts of air quality on children's health with initial funding from the California Air Resources Board and subsequent support from the National Institute for Environmental Health Sciences (NIEHS), the U.S. EPA, and the Health Effects Institute.

The Children's Health Study eventually enrolled 12,000 children (Southern California Environmental Health Sciences Center 2018b).

With NIEHS funding, USC established an Environmental Health Sciences Core Center in 1996 (Southern California Environmental Health Sciences Center 2018a). The Core Center provided support for administrative costs, pilot research projects, outreach, and other programs to foster environmental health research. The environmental health center included researchers from USC and the University of California, Los Angeles (UCLA) and was administered by the USC Keck School of Medicine. Subsequent funding of an NIEHS/EPA Children's Environmental Health Center (CEHC) at USC brought additional resources for environmental health research and outreach.

The NIEHS-funded Core Center at USC had a dedicated budget of $100,000 per year to support community engagement around issues of environmental health. Its Community Outreach and Engagement Core (COEC) "shares research findings with the public and functions as a bridge to inform researchers about community concerns" (Southern California Environmental Health Sciences Center 2018c). From 1997 to 2016, the COEC was led by Andrea Hricko, a public health professional with experience in government and media. Hricko also led the CEHC's outreach program and obtained additional foundation grants that supported community engagement around goods movement issues, particularly air pollution. Staffing levels for outreach varied but usually included at least one full-time program manager and administrative support.

In 2001, the COEC hosted a town hall meeting in Inglewood, California, on environmental health issues ranging from lead poisoning to air pollution. This event brought together a number of the COEC's existing partners, as well as additional community groups, researchers, and government officials. During the open mic portion of the meeting, attendees from the ports region highlighted health concerns related to rapid expansion of port facilities, with some speakers saying their communities were being "smothered" by truck emissions. Coalition for a Safe Environment (CFASE) Executive Director Jesse Marquez told the crowd that the emissions from ships delivering containers from other countries were not regulated by U.S. or California air pollution authorities, which shocked most attendees (Hricko 2016). After the meeting, one participant commented that many in attendance "realized that we'd been working on all these air pollution issues,

and the ports were such a significant part of this, and they had completely escaped our attention" (Minkler et al. 2012, 36).

In light of these community concerns, COEC staff explored how they could leverage their research to support ongoing community efforts related to port expansion. The COEC staff started by systematically reaching out to the groups that had spoken at the town hall meeting to learn more about their concerns, activities, and goals. These included two groups the COEC had worked with previously on air pollution issues: the Center for Community Action and Environmental Justice (CCAEJ), which focused on pollution related to warehouses in Riverside, and the Long Beach Alliance for Children with Asthma (LBACA). The COEC also reached out to two recently formed groups, Coalition for a Safe Environment (CFASE), which was based around the Port of Los Angeles in Wilmington, and East Yard Communities for Environmental Justice (EYCEJ) in the City of Commerce, which focused on the impacts of train and truck traffic on communities located near railyards, warehouses, and the I-710 freeway in the southeastern part of Los Angeles County.

In 2002, Hricko learned that Interstate 710 (I-710) from Long Beach to downtown L.A. was going to be expanded (figure 6.2). As she recalled: "I was taking a group of students on a port tour in 2002 and thought I should find out what the daily truck volume was on the I-710 freeway that we would be traveling down. I was shocked to read that government agencies and the transportation industry had been meeting for more than a year to develop ways to expand the freeway so that three times as many trucks from the ports could travel on it. … None of the environmental justice groups along the I-710 had heard about the expansion or [was] asked to be involved in what seemed to be secret meetings" (Hricko, 2016). Hricko wrote a letter to the Gateway Cities Council of Governments, which represents communities along the I-710, asking that minutes of the meetings be made public. With the release of the minutes, environmental justice groups learned of the potential destruction of 700 homes as part of the proposed project.

Many environmental justice groups in the area were particularly concerned about the impacts of rail transport, but they had not worked together previously. After being introduced through the COEC, several groups including EYCEJ, CCAEJ, and CFASE joined together to form the Modesta Avila Coalition (MAC) to coordinate regional efforts to fight railyard expansion

proposals. The MAC was named after a young woman who was jailed in 1889 for allegedly obstructing a railroad that had been built through her mother's property in San Juan Capistrano (Modesta Avila Coalition 2006). This group served as a structure for amplifying local organizing efforts to reduce air pollution from railyards in Wilmington/Long Beach, Commerce, and San Bernardino. The Modesta Avila Coalition solidified the trust and connections among the key environmental groups that later joined in forming THE Impact Project.

Through these efforts, the COEC staff and partners came to understand that goods movement activities disproportionately impacted the health of low-income urban areas and communities of color. They concluded that federal and state policies did not effectively protect local communities from the cumulative environmental impacts of goods movement activities. Southern California is rich in community and environmental justice groups. Many local community groups across the region were concerned about health effects associated with trade, but they were not connected with each other. However, no one group had the broad technical knowledge, staff capacity, coordination, and skills needed to engage in the multiple projects, plans, and proposals associated with the growing goods movement activities in the region.

After consulting with environmental health center faculty and external advisers, the COEC decided to partner with residents, community environmental justice groups, and an asthma alliance to address the wide-ranging health effects of port activities. The COEC and these community partners soon realized that a more comprehensive collaboration was needed to support their regional engagement in goods movement decisions. They also recognized the need for expertise in environmental policy processes, and so engaged Professor Robert Gottlieb and colleagues from Occidental College's Urban Environmental Policy Institute, who brought expertise in community organizing, social justice, and policy change.

Together, these academic and community partners formed the Trade, Health, and Environment Impact Project—or simply THE Impact Project—in 2005 (table 6.1). The goal was "to ensure that reducing health, environmental and community impacts becomes central to the transportation and goods movement planning and policy process. THE Impact Project also seeks to shift the nature of the debate about ports and freight movement to elevate community voices in the policy arena, while also using

Table 6.1
THE Impact Project partners

Organization Name	Description of Organization
Center for Community Action and Environmental Justice (CCAEJ)	Founded by Penny Newman in 1978, CCAEJ led community efforts to fight the warehouses built throughout Riverside and San Bernardino Counties beginning in the 1990s. At the 2001 town hall meeting, Executive Director Newman spoke about how these warehouses increased truck traffic and pollution in formerly agricultural/rural/suburban communities roughly 70 miles northeast of the ports. CCAEJ's participation highlighted the regional health effects of truck and rail traffic associated with the growth of the ports. CCAEJ left THE Impact Project in 2014 because of the burden of travel from Riverside to Los Angeles.
Coalition for a Safe Environment (CFASE)	CFASE was founded in 2001 by Jesse Marquez to address the environmental problems facing Wilmington, a predominantly Latino community in Los Angeles. Executive Director Marquez participated in the 2001 town hall and became a longtime member of THE Impact Project. CFASE developed particular expertise in commenting on environmental impacts of new infrastructure projects.
Community Outreach and Engagement Core (COEC), University of Southern California (USC)	Part of USC's Environmental Health Sciences Center, which formed in 1996 with a focus on the health effects of air pollution, the COEC's role is to promote bidirectional communication between communities and researchers. COEC director Andrea Hricko had a background in journalism and occupational/environmental health. The COEC staff provided THE Impact Project's fiscal and administrative home, as well as access to USC researchers' expertise.
East Yard Communities for Environmental Justice (EYCEJ)	EYCEJ was cofounded in 2001 by Angelo Logan and Gilbert Estrada to focus on the environmental health threats facing residents in Commerce/East Los Angeles, in particular a massive railyard in Commerce and the region's major truck route to and from the ports—the I-710. EYCEJ later began organizing efforts in Long Beach around another railyard proposal.
Long Beach Alliance for Children with Asthma (LBACA)	LBACA was founded by Dr. Elisa Nicholas in 1999 to provide direct services to children with asthma and promote policy changes to reduce environmental contributors to asthma. LBACA worked closely with USC to educate residents about the latest findings on the relationship between air pollution and lung problems. Its A-Team volunteers counted trucks and documented pollution levels near schools and along highways with port truck traffic.
Urban Environmental Policy Institute (UEPI), Occidental College	UEPI was founded by urban environmental policy scholar and activist Robert Gottlieb in 1997 to support Occidental College programs that promote social and environmental justice in the region. UEPI faculty provided policy expertise to THE Impact Project. UEPI is now the home of the Moving Forward Network.

the science and policy work of the academic partners to strengthen those voices" (NIEHS 2018c).

THE Impact Project was facilitated by COEC and USC staff members who also administered project funding. Of the community partners listed in table 6.1, one—the Center for Community Action and Environmental Justice (CCAEJ)—withdrew in 2014 because of the logistical challenges of traveling from Riverside to Los Angeles for meetings. THE Impact Project received multiyear grants from private foundations (primarily The California Endowment and The Kresge Foundation) totaling over $2.2 million between 2006 and 2012 that supported the six partners' activities (Hricko 2016). Grants were split evenly between the academic and community partners, after accounting for costs of joint workshops and conferences. Work plans for the grant proposals were developed jointly, then were submitted and administered by USC staff. Ongoing funding from a variety of foundation and government sources also supported the USC outreach core's work on goods movement.

THE Impact Project faced many challenges in trying to protect community health from activities associated with goods movement. Most significant were the strong political and economic forces involved in goods movement decisions. As EYCEJ's Angelo Logan said, "We're up against huge forces. The railroads, the shippers, the Wal-Marts, companies with money and lobbyists and PR firms" (Roosevelt 2009). Because of the scope of goods movement activities, THE Impact Project aspired to inform a multitude of decision-making contexts such as local land use decisions, state planning committees, EIR processes, and even national air pollution policy. Finally, the neighborhoods most directly affected by these forces were generally lower-income communities of color with little political power. Although effective community organizations existed, they often had limited staff and multiple competing priorities. Making a difference despite these challenges necessitated diverse strategies, resources, and actions over a long time horizon.

THE Impact Project has been variously characterized as a way of "leveraging" resources to engage researchers in local problems, as a vehicle for supporting community engagement in a public participation process, and as community-based participatory research (Garcia et al. 2013; National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011; NIEHS 2013). Regardless of how its activities

are described, the project's goal was to support the efforts of community groups to reduce health disparities by influencing regional goods movement decisions. It provided a collaborative structure for bridging the experience of powerful local environmental justice groups with the scientific expertise of environmental health researchers.

One of the challenges of analyzing THE Impact Project's accomplishments is the complexity, scope, and scale of decisions in which its partners engaged. Each member organization had a rich portfolio of work in environmental health research, community organizing, or policy engagement. Their collaboration through THE Impact Project produced new materials, forged relationships, and supported engagement in multiple decision arenas that complemented these ongoing efforts. As well, many groups that were not part of THE Impact Project worked on these issues simultaneously. By one count in 2011, there were more than fifteen organizations with full-time staff working on these issues, as well as numerous volunteers (Matsuoka et al. 2011).

The rest of this chapter highlights how THE Impact Project advanced, complemented, and enhanced efforts to protect community health from the externalities of goods movement activities. It focuses on the products, activities, and events directly supported by THE Impact Project's funding and collaborative structure. However, it also strives to illuminate "ripple effects" through which this collaboration enhanced efforts outside the scope of THE Impact Project.

THE Impact Project's range of activities was extensive. In the period from 2005 to 2016, key efforts were focused in three areas: public communication, capacity building, and engagement in policy processes. The examples given here highlight how partners' activities grew from their experiences with THE Impact Project. These examples provide a basis for discussion of how this partnership shaped goods movement decisions in Southern California.

THE Impact Project's Collaborative Efforts

THE Impact Project's diverse strategies fell within three broad categories: public communication, capacity building, and engagement in policy processes. These three functions closely supported each other. Public communication activities raised the awareness of residents, community leaders, and elected officials that individual goods movement proposals like

port developments, new railyards and warehouses, and highway expansions were not just economic development decisions, but also had regional health implications for communities living near goods movement hubs. In order to focus growing public awareness on influencing specific decisions, THE Impact Project's community partners required dedicated staff time, technical resources, and communication tools.

Public Communication

Increasing public awareness of the health consequences of goods movements was a key strategy. Throughout its messaging, THE Impact Project emphasized the economic, demographic, and geographic disparities of the negative externalities of goods movement. The project developed multimedia communication tools and organized public events appropriate to diverse local communities. Members also wrote articles, blogs, and short editorials for the mainstream news media and for the local groups' newsletters and websites to keep issues of goods movement and health in the public eye (THE Impact Project 2010a).

Media

Before 2002, Los Angeles news outlets had not devoted significant coverage to the health effects of pollution resulting from ports. THE Impact Project partners supported a significant increase in media attention as part of its efforts to build public awareness of these issues (Garcia et al. 2013). After emceeing the 2001 USC town hall meeting, National Public Radio reporter Warren Olney produced a series of radio stories on ports and air quality. In 2002, Gary Polakovic wrote the first significant story in the *Los Angeles Times*, calling the ports "LA's worst polluter" (Polakovic 2002). Between 2003 and 2007, *Los Angeles Times* reporter Deborah Schoch wrote nearly 200 articles on goods movement, most of which addressed health, safety, and pollution-related issues. COEC staff and community partners worked closely with journalists, helping them access scientific information, hear local community members' perspectives, and understand events unfolding around new proposals. Sometimes THE Impact Project members were quoted; other times they assisted reporters "on background" or took journalists on "toxic tours" of the ports (Ostrov 2012).

THE Impact Project partners also informed journalists of upcoming decisions, hearings, and issues of concern to community groups. This

contributed to frequent coverage of organizing efforts and public hearings on development projects. Other times, partners worked closely with journalists investigating community concerns. For example, in 2003 USC COEC director Andrea Hricko spent hours talking with *Los Angeles Times* reporter Deborah Schoch about the lack of community input into the Major Corridor Study for the I-710. Schoch's related articles contributed to growing concern about the proposal and contributed to a reset of the public participation process (Schoch 2003a; 2003b; Hricko 2016).

Communications Tools

THE Impact Project produced communications tools appropriate for diverse audiences. These included short video clips, interactive maps, policy briefs, and infographics. These products were used by staff members in their various outreach and training activities but were also available to the public on THE Impact Project's website, which served as a hub for research-based environmental health information related to goods movement. Some of these tools translated emerging scientific findings from academic journal articles into readable summaries. Others synthesized the state of knowledge on issues such as air pollution and asthma. Photographs captured the impacts of ports on neighborhood residents—such trains passing behind school playgrounds and truckyards visible from a child's bedroom. Short videos documented the stories of residents affected by truck traffic associated with the ports (THE Impact Project 2018).

Partners used these communication products to enhance understanding of the health equity impacts associated with goods movement activities. As THE Impact Project community partner Angelo Logan said, "Providing research, collating fact sheets, infographics, a whole bunch of information related to the environmental health impacts of a proposed project, really debunking the arguments the port was making … [and] having the resource of USC being able to dig into the data to come up with answers was really important" (Logan 2016).

Organizational Capacity Building

In addition to its communication efforts, THE Impact Project initiated a number of projects that built capacity in organizations serving affected neighborhoods. For example, grant subcontracts to the community partners supported staff, funded events, and provided small stipends to community

members engaged in community-based science (THE Impact Project 2012a). Ongoing outreach by the project's partners to new community groups, government officials, and professionals engaged additional stakeholders. These activities helped diverse groups translate public awareness into policy action and developed a core of expertise within partner organizations that could sustain this work in the future.

A-Teams

THE Impact Project supported neighborhood-based teams of community members called A-Teams (short for "Neighborhood Assessment Teams") through education, capacity building, and technology for community-based data collection (Truax et al. 2013). Starting in 2012, THE Impact Project partners recruited A-Team members from four neighborhoods and trained them to use P-Trak particle counters to measure trends in air pollution and compare the ultrafine particle concentrations in different communities (Truax et al. 2013; THE Impact Project 2010a, 2011). Later, A-Team members counted trucks to document the extent of traffic affecting residential neighborhoods near schools.

A-Team members also received training on the health effects of air pollution, video production, and public speaking techniques, which increased their ability to present scientific findings and personal stories in public settings. Each A-Team used its monitoring capacity to raise awareness in its community in different ways. At one point, CCAEJ A-Team members "measured pollution at a highly impacted neighborhood and compared that to a neighborhood where key elected officials live. This highlighted the disparity in exposures between the decision-makers and the people who live in the community" (Truax et al. 2013, 14).

Technical Reports, Summaries, and Research Presentations

THE Impact Project leveraged the technical expertise of USC researchers and the COEC staff's ability to analyze, synthesize, and communicate environmental health information. Perhaps the most direct way in which technical expertise was leveraged was by identifying opportunities for USC researchers to share research findings that linked port-related air pollution with health effects on local populations. Researchers' testimony on the health effects of air pollution helped make emerging science accessible and meaningful to decision makers. In addition, THE Impact Project translated

these new findings into a range of communication products. For example, the project produced a number of infographics designed to communicate the negative effects of traffic on health and well-being.

In 2011, the project issued a report funded under a separate grant from the Kresge Foundation to Occidental College. The report, called "Global Trade Impacts: Addressing the Health, Social, and Environmental Consequences of Moving International Freight through Our Communities," provided an overview of port-related health impacts, trends, and predictions for increased goods movement activities and case studies of seventeen goods movement hubs throughout the country (Matsuoka et al. 2011). This report served as a resource to groups around the country and framed an agenda for future action.[1] Its recommendations highlighted the need for community groups in different regions to share information, organize strategies, and promote national-level policy changes.

In 2012, THE Impact Project partners produced four policy briefs about the health impacts of goods movement activities, respectively called "Driving Harm" (trucks), "Tracking Harm" (railways), "Storing Harm" (warehouses), and "Importing Harm" (ports) (THE Impact Project 2012a, 2012c, 2012d, 2012e). All members of THE Impact Project worked on these briefs, which were edited by the partners from Occidental College. The policy briefs helped community partners educate their members and staff, as well as local officials and other stakeholders, about the needs for policy change (Southern California Environmental Health Sciences Center 2012).

"Moving Forward" Conferences

Starting in 2005, THE Impact Project organized a series of meetings that came to be called the "Moving Forward" conferences. These meetings focused on supporting community engagement in addressing health impacts from goods movement activities. Each of these meetings was successively larger (350 attendees in 2005, 400 in 2007, and 550 in 2010) and attracted participants from other port communities in the United States and around the world (THE Impact Project 2010b). A fourth conference was held by the Moving Forward Network in 2017 with 500 attendees (Moving Forward Network 2018).

Through these initiatives, THE Impact Project interacted with groups organizing around transportation hubs in other regions nationally and internationally. Participants expressed a desire to share lessons learned,

technical resources, and strategies and to explore the state and national-level policy implications of their work. To address this need, THE Impact Project partners helped create the Moving Forward Network (MFN), a national network of groups working to address health impacts of international trade on disadvantaged communities (Moving Forward Network 2018).

In 2014, the Moving Forward Network received a two-year, $900,000 grant from the Kresge Foundation through the Urban Environmental Policy Institute (UEPI) at Occidental College. Its website, meetings, and campaigns facilitated information sharing and it provided direct support (through small subgrants) for community groups from seventeen port communities, including THE Impact Project. USC continued to lend technical support, for example, by providing updates on new research related to air quality and health for the MFN website. Two former members of THE Impact Project were hired by UEPI as MFN staff members—Angelo Logan as campaign director (formerly with EYCEJ) and Jessica Tovar as policy director (formerly with the LBACA) (Moving Forward Network 2018). THE Impact Project remained involved in the Moving Forward Network as a regional member, with several of its partners serving on the MFN Advisory Board.

THE Impact Project's Engagement in Goods Movement Policy Decisions

THE Impact Project's goal was to help affected communities influence decisions about the operation, development, and expansion of goods movement activities to better protect public health. Its activities were designed to support effective engagement in local decisions, which was achieved by increasing awareness of health information, participation by community members, and the transparency of decisions being made in multiple arenas.

The partners' roles in these decision processes included commenting on environmental impact reports, testifying at hearings, serving on committees and task forces, organizing community members to participate in these processes, educating decision makers, and developing alternative proposals. Different partners played different roles—for example, academic partners could not advocate for policy but could provide information that enhanced the effectiveness of community partners' advocacy efforts. When scientific credibility was needed, the academic partners could tap faculty to testify about the findings of relevant research. The partners used multiple approaches in different decision sectors, and their strategies evolved over

time. The focus here is on THE Impact Project's engagement in conducting environmental impact reviews of proposed projects, developing new policy initiatives, influencing state and federal policy change, and promoting more inclusive planning for the I-710 freeway expansion. These policy processes spanned more than ten years (table 6.2), and many were ongoing simultaneously. The sections that follow (1) describe THE Impact Project's evolving engagement in infrastructure development proposals; (2) trace how the partners were involved with local planning and policy processes; (3) give several examples of how the partners engaged at the state and federal level in efforts to better protect community environmental health; and (4) highlight their decade-long involvement in the planning process around expanding an eighteen-mile section of the I-710 freeway through southeast Los Angeles. Taken together, these examples showcase how the partners' efforts evolved from reacting to development proposals, to changing how the planning process integrated public input, to creating more health-protective development alternatives.

Involvement in Environmental Review of Goods Movement Expansion Proposals

As described in Chapter 2, the National Environmental Policy Act (NEPA) requires major federal actions with significant environmental impacts to produce an environmental impact statement (EIS). Many states have a parallel process of review for state and local government actions. California's Environmental Quality Act (CEQA) requires lead agencies to produce an environmental impact report (EIR). For federal actions within California, the NEPA and CEQA processes are combined under the authority of the California Natural Resources Agency and referred to as an EIR/EIS (Council on Environmental Quality 2014). This process provides for public comment on the draft EIR and outside parties may sue in court if they believe the process was conducted improperly.

Before 2004, homeowner, community, and environmental groups had accumulated years of experience fighting specific proposals for port expansion, new railyards, and warehouses. As early as 1997, the Center for Community Action and Environmental Justice (which became an Impact Project partner), fought a proliferation of warehouses and truck traffic from the ports. In 2001, the Natural Resource Defense Council (NRDC), the Coalition for Clean Air, and homeowner groups near the Port of Los

Table 6.2
Timeline of THE Impact Project engagement in goods movement decisions

2001	Natural Resources Defense Council and the Port of Los Angeles settle China Shipping lawsuit.
	USC and partners sponsor town hall meeting on environmental health in Inglewood, CA.
	I-710 Major Corridor Study (MCS) initiated.
2004	Modesta Avila Coalition forms to coordinate regional efforts on community impacts of railyards.
	Academic and community partners begin meeting to discuss formation of a broader coalition.
2005	Environmental impact review initiated for the Southern California International Gateway (SCIG) railyard project of the Burlington Northern Santa Fe Railway (BNSF) and Port of Los Angeles.
	Formation of THE Impact Project.
	THE Impact Project hosts first Moving Forward Conference (350 attendees).
2006	Clean Air Action Plan issued by the ports of Los Angeles and Long Beach; four members of THE Impact Project appointed to Implementation Task Force by the mayor of Los Angeles.
	THE Impact Project receives $600,000 grant from The California Endowment.
2007	THE Impact Project members from USC and EYCEJ appointed to 6-member USEPA Environmental Justice Advisory Council's Goods Movement Work Group (GMWG).
	Environmental review process initiated for expansion of the I-710 freeway.
	THE Impact Project hosts second Moving Forward Conference (400 attendees).
	Coalition for Environmental Health and Justice (CEHAJ) forms to focus on community impacts of I-710 freeway, develops "Community Alternative" (CA7).
2008	Los Angeles Harbor Department adopts Clean Truck Program (CTP).
2010	Health Impact Assessment of I-710 expansion project conducted. THE Impact Project hosts third "Moving Forward" conference (550 attendees).
	THE Impact Project releases four policy briefs on goods movement.
2013	Metro decides to conduct a Recirculated Draft Environmental Impact Report (RDEIR/SDEIS) for I-710 expansion that included new Alternative 7.
2014	Moving Forward Network forms with a $900,000 grant from Kresge Foundation.
2015	City of Commerce Green Zones ordinance passes.
2016	Clean Up, Green Up (CUGU) ordinance passed by the City of Los Angeles.
	California Superior Court upholds challenges to the BNSF SCIG EIR from the National Resources Defense Council and the City of Long Beach, requiring reanalysis of air quality impacts.
2017	Moving Forward Network sponsors fourth Moving Forward Conference (500 attendees).
	Metro releases I-710 RDEIR/SDEIS for public comment.
2018	Metro selects Alternative 5c as preferred alternative for I-710 project.
	Port of Los Angeles announces plans for REIR of BNSF SCIG project.

Angeles successfully argued that the port had failed to conduct an EIR for the China Shipping Terminal, blocking the project until environmental concerns were addressed and winning $50 million in mitigation benefits for the community (Matsuoka et al. 2011). According to NRDC, this was a "precedent-setting settlement that dragged the Port into the 21st century in terms of environmental compliance" (Pettit 2008). The Coalition for Clean Air's policy director summarized the decision's significance saying that "for the first time, the Port of Los Angeles, not the workers or the communities, will be required to shoulder substantial costs to correct its illegal development practices of favoring shipping tenants over public health. … The Court's decision today tells the Port Authority that its operational health will depend on its ability to protect people who live, work and breathe in and around the harbor area" (Natural Resources Defense Council 2002a).

This lawsuit was hailed as a turning point for how port development projects were reviewed. It helped launch the Port of Los Angeles' Clean Air Action Plan (CAAP) (Pettit 2008; Port of Long Beach and Port of Los Angeles 2017). Despite these efforts, the need to engage in EIRs of new development proposals continued. Soon after it formed, THE Impact Project partners engaged in the EIR process for a proposed railyard expansion. This experience set the stage for its future policy work.

In 2005, an EIR was initiated for the Southern California International Gateway (SCIG), a 153-acre, $175 million railyard proposed by the Burlington Northern Santa Fe Railway (BNSF) (Schoch 2005; Los Angeles Harbor Department 2018; Port of Los Angeles 2013). The site for the proposed railyard was located immediately south of the existing Union Pacific Intermodal Container Transfer Facility (ICTF) in Wilmington, which is four miles north of the ports of Los Angeles and Long Beach (Port of Los Angeles 2013). At the time, 750,000 containers per year were trucked from the ports to be transferred onto trains at the ICTF, which was also slated to double in size. The proposed SCIG would accommodate an additional 1.5 million containers per year, with an estimated 2 million annual truck trips impacting lower-income communities of color in Wilmington (part of the City of Los Angeles) and Long Beach (Port of Long Beach and Port of Los Angeles 2006b; Parkin 2016).

Proponents of the project argued that it would significantly improve regional air quality by removing 1.5 million truck trips per year from the I-710 freeway (Port of Los Angeles 2013; Parkin 2016). With the new railyard, trucks that currently carry containers from the ports twenty miles

north to BNSF's Hobart railyard in the City of Commerce would instead have to travel only four miles to the SCIG (Weikel 2012).

This reasoning suggested that construction of the SCIG would reduce regional air pollution. However, there were concerns about local community health impacts. Residents of the diverse neighborhoods of West Long Beach, located across the Terminal Island Freeway from the proposed SCIG, were concerned that the prevailing winds would carry the pollution from the additional 2 million trucks arriving at the SCIG into their communities. This area also contains numerous "sensitive receptors," including five schools, day care centers, and a homeless veterans' center (Schoch 2005).

Local residents soon organized to oppose the SCIG proposal based on community health and environmental concerns. At the first hearing about the SCIG in 2005, community groups mobilized more than 200 attendees (Hricko 2016). THE Impact Project partners, including the Wilmington-based Coalition for a Safe Environment (CFASE), East Yard Communities for Environmental Justice (EYCEJ) (which later set up a satellite office to help organize the West Long Beach communities), Long Beach Alliance for Children with Asthma (LBACA), and the USC COEC, along with local residents and the NRDC, were active in the SCIG review process. Several of these groups later joined the "Stop the SCIG" campaign to focus on the effects of this particular proposal (Green L.A. Port Working Group 2018). As with the China Shipping project, the public's primary opportunity to engage in the decision was through the EIR process under the CEQA.

THE Impact Project enabled all of its members to be more effective participants in the SCIG deliberations. For example, the community partners documented the proximity of schools, playgrounds, football fields, homeless veterans' centers, and other "sensitive receptors" that would be impacted. USC analyzed the BSNF SCIG Draft EIR by "looking at the traffic baseline, the claims that the new railyard would reduce traffic congestion and air pollution, and the claims that by building a new massive railyard near West Long Beach the region's air would be made cleaner" (THE Impact Project 2018). USC research helped LBACA make the case that, despite the claims that the SCIG would improve overall air quality, it could worsen conditions for local children with asthma by increasing emissions near residential neighborhoods. In 2010, EYCEJ and LBACA gave a presentation to the Long Beach city council about the potential local health impacts of SCIG and that same year the USC COEC director made a presentation about the project to

the Long Beach Unified School Board (THE Impact Project 2010b). CFASE and LBACA and EYCEJ organized local protests against the project. Based on these and other interactions with local policy makers, the City of Long Beach moved from initial support of the proposal to joining the lawsuit against it (Hricko 2016). In addition to extensive policy engagement by the communities around the SCIG site, THE Impact Project's connections provided a regional perspective to this proposal. In 2009, the San Bernardino–based CCAEJ group gave a press conference naming BNSF "Polluter of the Year," which generated media coverage of the cumulative regional health impacts of railyard growth (BNSF declined the award) (Snibbe 2010).

The SCIG EIR was released for public comment in September 2011. It was revised and released for additional comment as a Recirculated EIR in 2012 (Los Angeles Harbor Department 2013). Despite community concerns about the project (including a candlelight vigil in front of the mayor's mansion and a twenty-four-hour hunger strike by community organizers including CFASE and EYCEJ), the Port and City of Los Angeles voted to certify the final EIR of the SCIG in 2013 (Parkin 2016; Green L.A. Port Working Group 2018). The EIR found that the facility would have a net positive impact on air quality by incorporating green technology and reducing truck traffic on the I-710 freeway. Multiple lawsuits were filed challenging the EIR. Plaintiffs included the City of Long Beach, the Long Beach School District, the South Coast Air Quality Management District, local community and environmental justice groups (including THE Impact Project partners CFASE and EYCEJ), and the Natural Resources Defense Council, with support from the California Attorney General's Office. In 2016, the California Superior Court ruled that that the EIR was insufficient. Among the concerns were that the EIR underestimated air pollution and noise impacts on local neighborhoods, failed to account for impacts on existing railyards, and assumed full implementation of unenforceable mitigation measures (Parkin 2016). Contrary to the EIR findings, the court suggested that the project could actually worsen air quality in the region. This ruling blocked the project until a revised EIR could be completed (Mongelluzzo 2016). In the fall of 2018, the Port of Los Angeles and BNSF announced their intention to reanalyze the air quality impacts sections, circulate a revised EIR for public comment, and reconsider the project (Chirls 2018).

THE Impact Project enhanced community groups' ability to bring their concerns into the EIR process. Nonetheless, this case highlighted the

inadequacies of the EIR process as a framework for protecting community health. In addition to the time and expense required to participate effectively in the EIR process, community groups can only react to existing proposals, alternatives set forth by the lead agency, and narrowly defined health analyses, with limited consideration of cumulative effects. Litigation is costly and time-consuming. In addition, even when legal action leads to a settlement, there is no effective way for communities to ensure compliance. As well, community groups' faith in settlements had been undermined when the ports allowed delayed implementation of several provisions of the China Shipping settlement without informing the public (Barboza 2016b). Through experience in the SCIG and other EIR processes, THE Impact Project partners recognized the limited efficacy of participating in the EIR process. They therefore sought other opportunities to shape the way goods movement systems were planned, reviewed, and implemented to more proactively and effectively promote health considerations.

Local Planning and Policy Processes

The China Shipping lawsuit and subsequent experiences like the BNSF SCIG EIR process underscored the failure of existing policy processes to adequately address the cumulative health impacts of good movement decisions. THE Impact Project had several early opportunities to address the health impacts of goods movement issues more comprehensively. One effort was through the Los Angeles Clean Air Action Plan (CAAP), which was adopted in 2006 (Port of Long Beach and Port of Los Angeles 2006b). The CAAP included a Clean Trucks Program that aimed to phase in cleaner diesel engines ahead of federal timetables (Cummings 2018). THE Impact Partners were active participants in these local planning efforts. In addition, they explored tools that local governments could use to shape the development, expansion, and operation of goods movement activities. A common theme of the project's local policy engagement was increasing transparency in decision-making processes. Increased transparency was expected to allow nongovernmental partners to participate earlier and more effectively.

Clean Air Action Plan

After the China Shipping settlement, the ports of Long Beach and Los Angeles began developing a plan to address air pollution from the ports (Port of Long Beach and Port of Los Angeles 2017). The plan was finalized in 2006

following the election of Los Angeles Mayor Antonio Villaraigosa, who supported efforts to address the ports' environmental health impacts (Garcia et al. 2013). In 2006, the Ports of Los Angeles and Long Beach adopted the San Pedro Bays Clean Air Action Plan, committing to reduce the ports' emissions by 45 percent over a five-year period (Port of Long Beach and Port of Los Angeles 2006b; Hricko 2008; Minkler et al. 2012). The plan "ushered in a slew of anti-air pollution strategies including the ports' Clean Trucks Programs, vessel pollution reduction programs, and advanced new technology, such as the world's first hybrid tugboat"(Port of Long Beach and Port of Los Angeles 2006a).

Although the CAAP adoption coincided with the establishment of THE Impact Project, the partners had already begun to collaborate during development of the plan. Following the passage of the CAAP, five of six Impact Project partner groups were invited to serve on the CAAP implementation task force (Garcia et al. 2013). While time-consuming, holding such appointments allowed project members to act as watchdogs over implementation of the plan and mobilize against efforts to dilute the plan (Garcia et al. 2013; Hricko 2008). Although the committee did not continue to meet regularly, THE Impact Project partners remained involved in implementation of the CAAP.

The Clean Trucks Program (CTP), adopted by the L.A. Harbor Department in 2008, was a cornerstone of the CAAP (Matsuoka et al. 2011; Cummings 2018). It aimed to replace or retrofit older trucks to reduce diesel emissions. THE Impact Project's materials on the Clean Trucks Program emphasized health benefits both to communities living near the ports and workers at the ports. They also recognized the economic burden of these measures, advocating for a Clean Trucks Mitigation Fund and for trucking companies to hire truckers as employees (rather than as independent contractors) so these lower-income workers would not bear the brunt of emissions control costs (THE Impact Project, 2012a; Cummings 2018).

According to the ports, diesel emissions from trucks at the port were reduced 90 percent over three years, ahead of the CTP schedule (Port of Long Beach and Port of Los Angeles 2018). Other parts of the CTP did not go as smoothly: In 2010, THE Impact Project partners worked with port officials to ensure that penalties were assessed on shippers who engaged in "container switching" (moving containers from new trucks to older, noncompliant vehicles after leaving port property) (THE Impact Project 2010a).

In 2012, the final step of the CTP banned all trucks that did not meet the 2007 federal Clean Truck Emission Standards (Port of Long Beach and Port of Los Angeles 2018, 2006a). The CAAP was updated in 2010, and the ports continue to hold periodic public meetings to give updates on progress (Port of Long Beach and Port of Los Angeles 2006a; U.S. Supreme Court 2013; Matsuoka et al. 2011). Nearly ten years after adoption of the plan, concerns came to light about failures to comply with emissions reduction timelines (Port of Los Angeles 2018b; Times Editorial Board 2016). This highlighted the importance of remaining involved in implementation.

Local Land Use Planning, Practices, and Policies

THE Impact Project partners' focus on the risks to people living nearest to these pollution sources led them to explore tools to buffer and mitigate environmental harm from goods movement. Partners worked in their own communities on diverse efforts that encompassed regulation, planning, incentives, enforcement, land and transportation policy, and design standards.

For example, California passed a state law in 2003, Senate Bill No. 352 (SB 352), that prohibited building new schools within 500 feet of a busy road or freeway (NIEHS 2012b). However, SB 352 did not prohibit expanding highways or railyards near an existing school. In 2005, the Center for Community Action and Environmental Justice worked with the Riverside County planning agency to incorporate a 1,000-foot buffer zone in "good neighbor" guidelines, which planning commissioners used to deny new warehouse proposals near homes, schools, and hospitals (Matsuoka et al. 2011). Riverside County also passed truck routing and no-parking/idling regulations to reduce the impacts of trucks on residential neighborhoods (Matsuoka et al. 2011).

The City of Commerce's 2015 Green Zones ordinance was a comprehensive local effort to promote environment and health. Although the ordinance did not explicitly target goods movement industries, it provided for incentives, support, and promotion of greening all businesses in the area to mitigate the impacts of the four railyards and other transportation infrastructure in Commerce. East Yard Communities for Environmental Justice (EYCEJ) was a leading advocate for the ordinance. The Green Zones ordinance is an example of how THE Impact Project partners' work evolved from fighting specific proposed developments to a more comprehensive,

proactive approach. An EYCEJ brief on the effort noted that "rather than considering specific uses or developments one-on-one as they emerge or are proposed, the policy recommends defining a buffer zone around the City's established sensitive uses, coupled with limitations on the future siting of sensitive uses that could create conflicts with existing or future businesses" (EYCEJ 2018b). As Angelo Logan of EYCEJ said, "We have to fight things—all kinds of things—but we also have to have a vision for something better" (Bogado 2015).

A similar ordinance called "Clean Up, Green Up" (CUGU) was passed by the City of Los Angeles in 2016 targeting three "toxic hot spot" neighborhoods (Clean Up Green Up 2018; Barboza 2016a; Sylvia 2016). The Coalition for a Safe Environment (CFASE), an Impact Project member, was among the community groups that championed this policy. In addition to supporting green businesses, the ordinance set standards to minimize spillover lighting, require landscaping vegetation to conserve water and filter air particulates, evaluate noise impacts of additions and improvements, and install signage to inform residents of health risks of near-roadway air pollution (City of Los Angeles 2015).[2] At the same time, the city council passed a rule requiring that all new housing built within 1,000 feet of a freeway include a high-efficiency air filtration system (Barboza 2016a). THE Impact Project members from USC provided testimony noting the potential health benefits of this provision. The community partners emphasized broad community benefits, including creation of green jobs that would create economic opportunities for residents. These local laws reflect implementation of a vision for local efforts to protect public health in areas cumulatively impacted by goods movement and other industries (EYCEJ 2018b, 2010).

Increasing Transparency and Participation in Local Policy Processes

The initiatives described thus far are just a few examples of the ways partners in THE Impact Project directly engaged in local decision processes. Through this work, they recognized the need to increase transparency and expand public participation opportunities in ongoing policy and planning efforts. For example, partners successfully encouraged the Ports' Harbor Commission to begin publishing agendas, videotaping hearings, and posting searchable transcripts of meetings online (Matsuoka et al. 2011). The proceedings of port authorities in many other regions remain much less accessible to the public (NEJAC 2009). THE Impact Project partners pushed

for expanded opportunities for public input and community representation on policy advisory committees. THE Impact Project reported in 2010 that "one unexpected success is that SCAG (Southern California Association of Governments) opened their Goods Movement Steering Committee to Impact Project members as a response to our advocacy about environmental justice and environmental health" (THE Impact Project 2010a, 7). The growing number of meetings to attend and issues to follow challenged the capacity of the partners, who needed to make strategic choices about which opportunities represented the most effective use of their limited resources.

State and National Policy Engagement

Although the primary focus of THE Impact Project was on the local impacts of goods movement, participants recognized that many of the decisions driving goods movement in this region were shaped by state, federal, and in some cases international laws and agencies. For example, in 2003, California passed a bill limiting to 30 minutes the time trucks could be left idling off port property. However, this law did not limit idling on port property, despite the fact that on-site truck emissions can significantly affect air quality in fenceline communities. Community groups advocated for the South Coast Air Quality Management District to adopt anti-idling rules applying to both trucks and trains on port property, which it did in 2006. In 2010, however, a federal judge ruled that the South Coast Air Quality Management District's rail idling restrictions interfered with interstate commerce (Matsuoka et al. 2011). In this case, federal action was needed to address concern about trains idling at railyards. Martha Matsuoka (2008, 27) called these efforts using a "social movement regionalism" approach, and as THE Impact Project partners uncovered legal constraints to local action, they took steps to address the gaps in state and federal policy.

National Environmental Justice Advisory Council Because of their national leadership on the community health impacts of goods movement, in 2007 two of THE Impact Project members were appointed to serve on the EPA's six-member National Environmental Justice Advisory Council's newly formed Goods Movement Work Group (GMWG) (Matsuoka et al. 2011; U.S. EPA 2011). The GMWG final report included many examples from Southern California and references to work of THE Impact Project partners.

Although the GMWG report did not directly change any policies, it set forth recommendations for consideration by federal agencies to address environmental justice issues in their planning, funding, and policies. Local groups could also point to this document in their own work. For example, the report advocated for the use of health impact assessment (HIA) in goods movement decisions. This recommendation supported THE Impact Project's promotion of an HIA of the I-710 expansion. The U.S. EPA later published an "environmental justice primer" for communities around ports that incorporated the GMWG's work (U.S. EPA 2018a).

Moving Forward Network and National Policy THE Impact Project's Moving Forward conferences gave rise to the Moving Forward Network (MFN). MFN became a vehicle through which THE Impact Project and other local partners could collaborate to change federal policy that would benefit all communities. In 2015 the MFN initiated a "zero campaign" asking the EPA to hold ports to Clean Air Act standards for industrial emission sources. As the MFN campaign director, Angelo Logan, said, "Part of the mission and goal is to build an infrastructure for groups across the country to help them have resources to influence national policy—but at the same time we support local" (Logan 2016).

THE Impact Project members' participation in these efforts contributed their experiences in Southern California to national policy campaigns. In addition, participating in these national forums provided the local partners with new knowledge, visibility and credibility, which enhanced their ability to obtain support for their local initiatives.

Broadening Consideration of Health in I-710 Expansion Planning

Interstate 710 (the I-710, also known as the Long Beach Freeway) is an eighteen-mile stretch of freeway that connects the ports of Long Beach and downtown Los Angeles with rail, truck routes, and warehouses on the east side of the city (figure 6.2) (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011; Matsuoka 2014). The I-710's eight general traffic lanes have been notoriously overcrowded for decades, and growth of the ports has significantly increased the number of trucks carrying goods to warehouses and railyards (Matsuoka 2014). The I-710 is under the jurisdiction of Caltrans, the state transportation agency, which partnered with local agencies including the Gateway

Figure 6.2
Map of I-710 corridor
Map credit: Karl Korfmacher

Cities Council of Governments (GCCOG), Southern California Association of Governments (SCAG), and the Los Angeles County Metropolitan Transit Authority (Metro, formerly known as MTA) to plan for the future of the freeway (Gateway Cities Council of Governments 2018; Southern California Association of Governments 2018; National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011; LA Metro 2018d). THE Impact Project and other community groups advocated for greater consideration of health in planning for this $6 billion project over a period of nearly fifteen years.

Government agencies began planning for expansion of an eighteen-mile section of the I-710 around 1999. The first step was a $3.9 million Major Corridor Study, which was launched by Metro in 2001 and completed in 2005 (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011; Schoch 2003a). Although the effort claimed to include a significant commitment to public outreach, few residents in the corridor were aware of the study until 2003, when the *Los Angeles Times* reported that plans for expansion of the I-710 could result in destruction of up to 700 nearby homes (Schoch 2003b). Community groups criticized the outreach efforts for not posting minutes of planning committee meetings, holding meetings primarily during the work day, misleading public materials, and minimal attendance at public meetings (Schoch 2003b). In addition to the loss of homes, concerns included air quality, noise, traffic safety, and disproportionate impacts on low-income communities and communities of color (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011).

According to COEC director Andrea Hricko (2016), the resulting public outcry from the *Los Angeles Times* story "stopped completion of the I-710 Major Corridor Study in its tracks. Environmental justice groups demanded a completely new structure to gain true public input and transparency in the freeway expansion process and to more carefully consider the air pollution impacts." Six new local Tier 1 Community Advisory Committees (CACs) and an overarching Tier 2 Community Advisory Committee were formed. Several future Impact Project members (USC's Professor Ed Avol, LBACA's Dr. Elisa Nicholas, and EYCEJ Executive Director Angelo Logan) were appointed to the Tier 2 Citizens Advisory Committee, which met over thirty times in nine months to develop recommendations to the Oversight Planning Committee (OPC) (National Academies of Sciences Transportation

Research Board and Strategic Highway Research Program 2011; LA Metro 2018b; Gateway Cities Council of Governments 2018; Gateway Cities Council of Governments 2006). Whereas the initial public outreach structure ran parallel to, but separate from, the planning and decision-making committees, the new structure integrated community participation into analyses, recommendations, and decisions. In its final report, the Tier 2 CAC stated that "health is the overriding consideration" and that "major infrastructure improvements must be conditioned on achieving air quality goals to protect public health" (Human Impact Partners 2011; I-710 Major Corridor Study Tier 2 Community Advisory Committee 2004). The "locally preferred solution" (LPS) that was endorsed by the Major Corridor Study report in 2005 included ten general traffic lanes separated from four lanes for trucks and minimized the number of homes that would be removed. One analysis of the Community Participation Framework for the Major Corridor Study described it as "collaborative, bottom-up decision making"—a far cry from the criticisms of the study's initial participation structure (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011).

After the Major Corridor Study's locally preferred solution was identified, an environmental review process for the expansion was initiated in 2007. An environmental impact report (EIR) was required by California's Environmental Quality Act process (CEQA), as well as an environmental impact statement (EIS) under the National Environmental Policy Act (NEPA). Caltrans had overall responsibility for the joint EIR/EIS process, which was paid for by Metro and managed by the Gateway Cities Council of Governments (GCCOG). The EIR/EIS process examined five alternatives, including a "no build" scenario (LA Metro 2011; Gateway Cities Council of Governments 2018).

The participation process for the EIR/EIS was based on the MCS Community Planning Framework (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011). It provided for up to eighteen Local Advisory Committees to ensure strong community representation (Matsuoka 2014). Although these committees were set up for the EIR/EIS process, they provided input on related planning discussions as well.

This structure provided multiple opportunities for input, but the sheer number of meetings and complexity of the process challenged THE Impact Project partners' resources to engage in all of them (Matsuoka 2014).

Nonetheless, their membership on standing committees gave them timely access to information about the process and opportunities to provide input to formative decisions. In addition to participating directly in the committee structure, the project members lobbied successfully for local health department staff to be appointed to committees (Hricko 2016). Partners also met regularly with elected officials and others who sat on the Local Advisory Committees to increase their understanding of health concerns (THE Impact Project 2009). They also attended public meetings, organized residents to attend hearings, submitted documentation of potential health impacts, and commented on draft documents. Matsuoka (2014, 21) described participation by THE Impact Project - simultaneously sitting on working committees while also organizing public advocacy and engagement- as an "inside-outside" strategy.

The partners also pushed for the EIR/EIS to include both a health risk assessment (HRA) and a health impact assessment (HIA). Based on their past experiences, they were not convinced that the standard EIR/EIS process would sufficiently protect health of people living near the I-710. They pointed out that people living in the fifteen communities within the I-710 corridor already had poorer health status than others in the region, and that there were ten schools and six day care centers within a quarter mile of the I-710 (Coalition for Environmental Health and Justice 2009). The partners hoped that conducting both a HRA and a HIA would enhance consideration of cumulative impacts on these vulnerable populations.

In 2008, the partners in THE Impact Project successfully advocated for a health risk assessment to be conducted as part of the EIR/EIS. The HRA process already existed under CEQA, but this was the first time it was used for a transportation project (SCAQMD 2018c; Sausser et al. 2009). The HRA process focuses on air quality, particularly the cancer risk from toxic air contaminants (Lester 2008). The HRA report predicted that by 2035, all alternatives under consideration would improve air quality and reduce cancer risk, with exceptions in some areas within 300 meters of the freeway (ENVIRON International Corporation 2012). Despite expectations of increased traffic over this time period, decreases in pollution were predicted because of the phase-in of cleaner engines under new state and federal regulations (Yeung 2012).

Although the HRA provided additional health analysis of the project alternatives, it assessed only a narrow range of health impacts from air

pollution (Human Impact Partners 2011; NEJAC 2009). After one member of THE Impact Project attended a local training on HIA in 2008, the group began to explore the idea of doing an HIA of the I-710 as part of the EIR/EIS process (NEJAC 2009). The partners realized that an HIA of the I-710 project proposal had the potential to bring new health information into the process. Soon after, THE Impact Project partners met with local officials who were on I-710 Local Advisory Committees to advocate for an HIA. They also organized groups of residents, local health departments, and experts to speak at public meetings in support of HIA (Heller 2016). In October 2009, the I-710 Project Committee voted in support of doing a HIA (EYCEJ 2009, 2017). Partners continued to push for the HIA to be included as an official part of the EIR/EIS process. In 2010, the GCCG contracted with Human Impact Partners, a nonprofit consultant from Oakland, to conduct an HIA and specified that their findings should be part of the final EIR/EIS. As Matsuoka noted (2014, 21), "Caltrans and Metro agreed to adoption of an HIA as part of the formal EIR/EIS process, but community organizations and advocates had to continually push for integration of the HIA findings in the [Draft] EIR/EIS analysis."

The HIA assessed a broader range of health effects than did the HRA, including the effects on air quality, jobs, noise, access to neighborhood resources, and mobility issues such as safety, travel time, physical activity, and stress involved in commuting for work (Human Impact Partners 2013). The HIA integrated community members' concerns, observations, and perceptions with quantitative data. It found that all alternatives under consideration would likely improve human health through better air quality and employment opportunities, but that negative impacts from noise might be expected. The I-710 HIA used the air quality models developed for the EIR/EIS, which ensured consistency with the rest of the analyses, but did not test the implications of alternate assumptions, such as higher future traffic projections. Safety impacts were found to be mixed, with the potential to improve safety in some areas and decrease it in others (Gateway Cities Council of Governments 2018). The HIA also noted that the expansion plans missed an opportunity to promote health through improved public transportation, walkability, and bikeability (Human Impact Partners 2011). The HIA recommended options to improve each health determinant and promote health equity.

The final HIA was submitted to the GCCOG in November 2011 (Human Impact Partners 2011). The HIA was forwarded along with the EIR materials to Caltrans, which declined to consider it as part of the final EIR (Human Impact Partners 2011). Although the HIA was not part of the final EIR, these efforts helped to raise awareness of health issues in the I-710 planning process in several ways. For example, stakeholders believed that the HIA contributed to Caltrans' decision to consider a new alternative for the I-710 expansion (Human Impact Partners 2011). In addition, according to EYCEJ's Angelo Logan (2016), "The HIA made people who were making recommendations to Caltrans realize that public health is much broader. … Building a freeway is not just about what happens on that freeway, it is about what happens in the community."

Meanwhile, several of THE Impact Project partners joined other community and public interest groups including Physicians for Social Responsibility and the Natural Resources Defense Council to form the Coalition for Environmental Health and Justice (CEHAJ), which aimed to develop an alternative for expansion of the I-710 that better promoted community health and equity (EYCEJ 2017, 2018a). Because this was an advocacy coalition, USC was not an official member but provided technical support as needed. CEHAJ proposed "Community Alternative 7" (CA7), which it described as "an alternative vision of how goods movement projects, like the I-710 Corridor Project, can protect community health, improve quality of life, improve air quality, and effectively and safely plan for the region's goods movement growth" (EYCEJ 2017). CA7 included elements such as mandating zero-emissions vehicles, promoting public transportation, improvements in bike and pedestrian infrastructure, protecting the nearby Los Angeles River, and community benefits in the form of training and hiring local residents. As Angelo Logan (2016) said, "Within the environmental justice community, this was a shift in approach—becoming more proactive and less reactive, less 'let's stop the project' [and] more like 'let's promote a different project.'"

The Draft EIR/EIS was released for public comment in 2012. The California Endowment provided $25,000 to CEHAJ to hire a technical consultant to help the group comment on the DEIS/DEIR. Although Matsuoka (2014, 19) referred to this as a "David and Goliath battle" (referencing the over $30 million paid to the DEIS/EIR consultants), these resources contributed significantly to the effectiveness of the community responses. In September

2012, CEHAJ submitted 832 pages of comments on the existing alternatives and detailed its CA7 proposal. CEHAJ then encouraged local officials and other members of EIS/EIR committees to advocate for consideration of CA7. In addition, CEHAJ worked with California State Senator Ricardo Lara to propose legislation that would require Caltrans to evaluate broader considerations of community health, such as those embodied in CA7. Although the bill (S.811) passed both houses, the governor did not sign it (Matsuoka 2014). After reviewing comments and new information, in March 2013 the project committee produced a Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Study (RDEIR/SDEIS) (LA Metro 2018c). This process included a review of new alternatives, including Alternative 7, which was based on CA7 (LA Metro 2015; EYCEJ 2017). Alternative 7 fell short of CA7, however, because the I-710 Project Committee noted that mitigation provisions could not be considered under the CEQA process (LA Metro 2014). Nonetheless, according to Matsuoka (2014, 6), "Not only does CA7 reflect a major organizing win, it represents an alternative vision of how goods movement projects, like the I-710 Corridor Project, can protect community health, create jobs, improve quality of life, improve air quality, and effectively and safely plan for the region's goods movement growth."

Technical studies in support of this RDEIR/SDEIS were released for public comment in the spring of 2017. In spring 2018, Alternative 5c (expansion of general purpose lanes, safety improvements, and community health program funding but no designated freight corridor) was identified as the "preferred alternative" (LA Metro 2018a). Although the I-710 expansion project is not yet underway, it is clear that THE Impact Project partners, along with NRDC, CEHAJ, and others, shifted the decision process toward greater consideration of community health (LA Metro 2018c). THE Impact Project engaged through partners sitting on I-710 committees, briefing local officials and other committee members, and organizing community members to effectively participate in public meetings. The partners' knowledge of both the policy process and environmental health research led them to effectively advocate for additional analysis—the HRA and HIA—to inform the decisions. On the other hand, their influence in policy outcomes was still constrained by the structures, alternatives, and baseline assumptions determined by the government agencies. Nonetheless, this environmental review process included more robust opportunities for participation and set

a new standard for engagement in goods movement planning (National Academies of Sciences Transportation Research Board and Strategic Highway Research Program 2011). As Matsuoka (2014, 23) wrote, "Winning change has not been easy but with smart and relentless advocacy and funding support for leadership development, technical assistance, and community organizing to expand and deepen regional community leadership, the campaign to transform the I-710 corridor is changing the way transportation planning and major infrastructure projects can help not harm communities."

Overview: The Impact Project's Engagement in Decision-Making Processes

THE Impact Project aimed to inform an entire local policy system, which necessitated interacting in a wide range of sectors, from land use to transportation to air quality at the local, regional, state, and even national levels. Although there were no government agency representatives in THE Impact Project, the partners interacted with policy actors and institutions regularly. These interactions included commenting on proposed actions as part of established processes (e.g., EIR/EIS), proposing local laws, enhancing participation in existing decision-making processes, and building networks to change the state and federal policy environment. THE Impact Project's most significant outcome was indirect: building its partners' capacity to engage in issues on an ongoing basis. As a result, it is difficult to evaluate the full effect of the initiative. Nonetheless, partners and observers agreed that the collaboration fostered by THE Impact Project promoted consideration of community environmental health concerns in goods movement policy (NIEHS 2013). According to Cacari-Stone and colleagues (2014, 1621), "The formalization of THE Impact regional partnership was described as a key change in the policy landscape, enabling ongoing regional dialogue and increased procedural justice." How the partnership leveraged resources to create this change is examined next.

Applying the Local Environmental Health Initiative Framework to THE Impact Project

THE Impact Project's dedicated funding ended in 2012, but it continued to receive some support as a regional member of the nationwide Moving Forward Network. As of 2018, partners continued to meet every other

month to share information and coordinate activities. In addition, the experience, capacity, and connections forged through THE Impact Project laid the groundwork for the partners to continue promoting consideration of health in ongoing goods movement decisions.

The project contributed a multisectoral, regional, scientifically informed, community health and environmental justice perspective to goods movement decisions in Southern California. In retrospect, the partners believed that their collaboration contributed to change beyond what they might have accomplished individually. As USC's Hricko noted, "Without THE Impact Project and the close connections we at USC built with community and environmental justice groups around port and goods movement issues, our outreach program could never have fully understood the cumulative impacts of air pollution and traffic in these disproportionately impacted communities." EYCEJ's Logan (2016) added: "Working with USC and Occidental College allowed our community members to better grasp exactly how air pollution was impacting their health and to come up with policy solutions to address the issue."

Table 6.3 uses the conceptual framework for local environmental health initiatives to clarify the unique resources leveraged by THE Impact Project and how its collaborative structure contributed to changes in goods movement decisions.

Issue Framing and Problem Definition

Before THE Impact Project was formed, numerous groups had opposed port, railyard, and highway expansion projects based on community concerns including health. Most of these efforts, such as the China Shipping lawsuit, focused on specific proposals and their local impacts. THE Impact Project reframed the entire range of plans, projects, and decisions relating to goods movement as a regional environmental health and justice issue. THE project's explicit goal was "to change how the global trade and freight transportation issues are being framed" (Matsuoka et al. 2011, 60). The media attention, new decision processes, and initiatives described throughout this chapter speak to their success in doing so.

In addition to increasing attention to the health externalities of goods movement, the project specifically focused on the cumulative impacts of good movements on communities already burdened by excessive environmental pollution. By emphasizing the multiple sources and health

Table 6.3
THE Impact Project and the Local Environmental Health Initiative Framework

Collaborative Function	Analysis of THE Impact Project
Issue framing and problem definition	Reframed issue of goods movement as a regional phenomenon with environmental health and equity consequences. Broad regional scale required involvement of multiple communities. Targeted diverse scope of decisions by multiple decision makers.
Resources for collaboration	Human resources included 6 partner groups and their staff. Leveraged time, skills, and credibility of researchers. Supported by foundation grants and partner groups' core funding.
Structure and decision-making process	Brought existing community groups into new issues, areas, and roles; consensus decision-making, shared convening responsibilities, and equitable funding distribution. Fiscal management/administration of project funding by USC. Met frequently during period of robust project funding (2006–2012); monthly meetings continued 2013–2016; semi-monthly post-2016. Stable partnership of 6 groups (one partner withdrew in 2014 due to logistical challenges).
Impacts of collaboration:	
Outputs	Diverse communication tools and strategies to build general public awareness and support partners' advocacy efforts (policy briefs, videos, website). A-Teams (community based science) Hosted workshops and large conferences.
Social outcomes	Increased partners' capacity (scientific knowledge, partnerships, credibility) to engage in goods movement decisions.
Impacts on policies, systems, and environments (PSE)	Close working relationships between partners supported ongoing collaboration outside of THE Impact Project. Served on planning and advisory committees. Greater transparency, public involvement, and consideration of health in a wide range of goods management decisions. Informed local "green" ordinances. Gave rise to national Moving Forward Network.

determinants associated with goods movement, the project provided a basis for collective action by geographically disparate groups. Highlighting the common concerns of multiple groups and the regional scope of the problem assisted communities' efforts by capturing media attention, attracting financial resources, and disseminating technical information. Communicating the cumulative impacts of multiple ports-related activities and types of hazards also increased the public's understanding that although each individual new activity might comply with existing regulations, the additive effects of these activities had significant negative health implications.

THE Impact Project emphasized disparities in impacts on neighborhoods that already suffered from multiple environmental exposures and poorer health status. The partners also promoted awareness of vulnerable populations within communities, particularly children. This reframing highlighted the ethical implications, health costs, and community impacts on already overburdened communities. This focus also helped legitimize and give moral standing to port-adjacent community members as participants in decision processes.

Resources for Collaboration

Compared to many areas of the country, the greater Los Angeles area is rich in community groups, local foundations, and scientific expertise. However, when THE Impact Project first started, these groups were focused on their local communities' concerns rather than the wide-ranging health impacts of regional goods movement decisions as a whole. By providing a scientific basis for these arguments and coordinating among established groups in new ways, THE Impact Project was able to access significant human, technical, and financial resources over time. The partners were all involved in seeking, prioritizing, and applying these resources, with fiscal administration provided by USC.

Human Resources The collaborative's primary human resources were its paid staff, both at USC and in the partner groups that received subcontracts. Each of these partners leveraged additional human resources. THE Impact Project's relevance to USC's environmental health center's research justified devoting the majority of staff time at the Community Outreach and Engagement Core (COEC) to goods movement issues for most of the period between 2001 and 2014 (Hricko 2016). In addition, the COEC leveraged the efforts of researchers themselves to speak at hearings, talk with journalists,

review reports, and contribute to technical summaries. Engagement in these activities increased environmental health researchers' skills and interests in future policy engagement. For example, USC Professor Ed Avol participated in the I-710 Major Corridor Study, served as consultant to the Port of Los Angeles Community Advisory Committee, and was appointed to the Harbor Community Benefit Foundation, among other public advisory roles. Avol (2018) noted, "It has been critically important to get public health and air pollution impacts a seat at these discussions, and we pushed to do just that."

Although the project's core team included neither government agency staff nor elected officials, the partners worked with policy makers in a variety of capacities. For example, partners frequently reached out to local elected officials and health department staff to educate them about health impacts and community concerns. These individuals within government were then able to bring THE Impact Project's information to bear in decision-making settings in which partners were not directly involved.

Knowledge Resources THE Impact Project accessed both community and scientific knowledge to support its partners' engagement. One of the most significant resources available was the technical expertise of USC researchers and its staff's ability to analyze, synthesize, and integrate scientific information to make it accessible to communities. The National Institute of Environmental Health Sciences (NIEHS) core center program encourages researchers to study environmental health problems identified by the COEC. The geography, poor air quality, and population density of Southern California made this an ideal community in which to study the impacts of air pollution on health.

THE Impact Project also leveraged local knowledge from residents about their needs, experiences, and observations living and working near goods movement hubs. It documented and disseminated this knowledge through its communication materials and video storytelling and by helping residents participate in hearings. As well, THE Impact Project generated new knowledge through community-based science. For example, A-Teams collected particulate concentration readings and truck counts that they reported in public hearings. Thus, the project facilitated a two-way exchange of information in which the community partners shared their knowledge of residents' concerns and researchers provided relevant technical expertise.

Financial Resources THE Impact Project received several grants from private foundations to support its work. Grant proposals were generally written by COEC staff in partnership with the community group members and were submitted by, awarded to, and administered by USC. Financial resources were then divided equally among the partners to support staff and direct costs of their work. While USC officially controlled the majority of financial resources, the collaborative process gave all partners a role. Although this system took the burden of grant administration off the community partners, it did somewhat restrict the work plans. For example, some USC researchers were initially concerned about being the hub for the A-Teams, whose monitoring was not considered "fully scientific" because the P-Trak particle monitors they used were not up to research standards (Hricko 2016). Additionally, as a research institution USC could not be directly involved in advocacy, so grant proposals had to clearly distinguish partners' roles in THE Impact Project related to education, capacity building, and translating knowledge from their advocacy work. USC administrators required that at least one proposal involving THE Impact Project be reworked because it was too advocacy-oriented (Hricko 2016). Thus, being hosted by an academic institution both facilitated the group's access to and somewhat constrained its use of financial resources.

Group Structure and Decision-Making Processes

Although the fiscal administration of THE Impact Project was based at USC, it was a partnership in which all members shared decision-making power. The group met monthly to discuss plans, projects, and proposals. Project membership was stable over time, although CCAEJ withdrew in 2014 because of the challenges of traveling seventy miles from Riverside to meetings. All major decisions about how to prioritize issues, what activities to undertake, and what projects to seek grant support for were made by consensus.

Collaborative Outputs and Outcomes

Outputs included communication products, trainings, and policy engagement. Many of the communications outputs of THE Impact Project are easily identified: The project's website included a comprehensive collection of videos, research summaries, and policy briefs. The project also hosted a wide range of events, including workshops and the Moving Forward conferences.

The various forms of policy engagement (attending hearings, participating on committees, promoting local policies, shaping decision processes, etc.) may also be considered collaborative outputs.

The initiative's "social outcomes"—the impacts on capacity, relationships, and roles of members—continue to shape the partners' involvement in goods movement decision-making. Even after the project's major funding ended, partners met regularly to share information about ongoing issues.

As with any collaborative systems-change effort, it is difficult to conclusively identify THE Impact Project's outcomes in the policy arena (Cacari-Stone et al. 2014; Korfmacher et al. 2016). Because of the breadth of decisions relating to goods movement, the diverse approaches to influencing these decisions (e.g., legal action, negotiation, organizing, testifying, etc.), and the multiplicity of organizations involved in goods movement in Southern California, it is clear that THE Impact Project's contributions were just one factor. However, the trends in decision-making prior to and outside the scope of THE Impact Project strongly suggest that the initiative had significant policy outcomes. In addition, several studies in which decision makers were interviewed about THE Impact project attested to the widespread perception that it had a long-term impact on policy change (Cacari-Stone et al. 2014; Garcia et al. 2013).

In addition to impacts on policy outcomes, THE Impact Project helped change policy processes by creating new ways of participating in goods movement decisions. Prior to the project's formation, various community groups involved in areas heavily impacted by goods movement lacked a structure through which they could advance their collective interests. THE Impact Project successfully pushed for greater transparency and opportunities for participation, built community capacity to testify in public hearings, and gained positions on relevant committees. The diverse technical, human, and financial resources of THE Impact Project contributed to these lasting changes.

At the same time, it is important to note that while some goods movement decisions have been influenced by health concerns in recent years, changes in large-scale plans and policies have been limited. As Matsuoka and colleagues (2011, 50, 57) noted, "Despite the ever-growing evidence about the nature of these widespread health, environmental and workplace issues, these findings have not been widely incorporated into policy

decisions about expanding the size of ports and the freight transportation system in the United States.... Because the goods movement policy debates are framed primarily as economic development and job creation approaches, negative impacts on health, labor, community and environment continue to be seen only as externalities." In the context of such enormous national and international forces, the procedural, educational, and mitigation accomplishments of THE Impact Project are significant, and are likely to lead to long-term improvements.

THE Impact Project was a leader in redefining goods movement as a driver of environmental health inequities. Through the Moving Forward conferences and outreach to other communities nationally, partners were able to share their experiences and build greater public awareness of the issue. These efforts continue to support related activities in port-adjacent communities across the country.

Conclusions

THE Impact Project facilitated collaborative efforts to promote more health-protective goods movement decisions in Southern California. Unique contributions from academic, community, and funding partners made this possible. The community organizing and problem-solving experience of the partners formed a strong foundation for policy engagement. The resources of the USC COEC were essential for coordinating, developing, and expanding efforts to bring new perspectives from both communities and researchers into local decisions about goods movement. Private foundation funding enabled the project's outreach, translational, and participatory efforts. Government agencies responded by enhancing opportunities for public participation and consideration of health in new projects. This tapestry of human, technical, and institutional resources provided a unique context for reframing how concerned communities responded to the encroachment of goods movement infrastructure throughout the region.

Some of the changes influenced by the project, such as the Clean Air Action Plan, local laws, and a new model for participation in Environmental Impact Review processes, were durably institutionalized. The USC COEC had ongoing NIEHS funding that supports continued commitment to these efforts. In addition, community groups continue to engage in goods movement decisions with the knowledge, tools, and connections gained through

THE Impact Project. Nonetheless, the capacity to sustain these efforts depends largely on the ongoing priorities of the community groups.

Can this local initiative to address goods movement be disseminated elsewhere? As already noted, THE Impact Project helped launch the nationwide Moving Forward Network to promote health protection for communities around other parts of the country. What worked in Southern California may not be appropriate in other areas facing similar challenges. Matsuoka and colleagues (2011, 49) acknowledge that "in regions with fewer organizations and/or less developed attention to health, ports, and freight transportation, strategies are geared towards education and identifying opportunities for establishing coalitions and networks." On the other hand, MFN provides an opportunity for other communities to learn from each other's experiences.

THE Impact Project's capacity to sustain collaborative relationships, access credible health information, and work across diverse issue areas reframed the conversation around goods movement in ways that are likely to have a lasting impact on decision-making in Southern California. Thus, although there are great challenges in confronting the growth of such a powerful and important economic force in the region, according to Minkler and colleagues (2012, 37), "The community-driven movement built by THE Impact project has dramatically influenced and changed how policy decisions about goods movement are made."