CARGO ON THE MOVE: OPTIONS FOR INFRASTRUCTURE AND AIR QUALITY IMPROVEMENTS AT THE SAN PEDRO BAY PORTS

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A Thesis

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Abstract

of

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United States residents all benefit from freight transit that puts foreign-made goods into stores in the United States. Ten percent of the world's ship-container traffic either originates or ends in the United States. The Ports of Los Angeles (LA) and Long Beach (LB) combined received a total of 14,000,000 cargo containers in 2010, making it the sixth largest port facility in the world combined and the largest in the United States. An astounding 40% of the entire nation's goods enter through the two ports.

Thus, the Ports of Los Angeles and Long Beach play a crucial role in bringing in products that provide millions of jobs nationwide and contribute billions of dollars to the national economy. These Ports are also major drivers of the local economy, serving as the second largest source of jobs in the greater five-county Los Angeles Region.

Although the Ports have a massive impact on California's economy in terms of jobs and economic activity, these benefits do not come without costs. Such costs include a significant contribution to Southern California's air pollution, which generates some of the worst air quality in the nation. Currently these costs are not being properly borne by those that generate them. The State of California bears the burden of the increased healthcare costs generated by the goods movement industry, primarily through increased

asthma rates and premature deaths due to this poor air quality. Southern California communities are also extremely congested by the increased traffic generated by the movement of goods in and out of these Ports.

The purpose of this thesis is in part to justify the need for a funding stream to help combat these extraordinary costs. I argue it is neither efficient nor fair to place the burden of these costs, generated by the goods movement industry that benefits the entire country, upon California's state and Southern California local governments. A payment stream needs to be found for assistance to help mitigate the air quality damage and the deteriorating infrastructure and the needed structural improvements.

I evaluated three funding options using three criterions: economic efficiency (disrupts the California economy the least), equity (to those who would pay for the costs), political feasibility (would it be acceptable to State Legislators and California voters). These options include approving more general obligation bonds, increasing the gas tax or instituting a per container fee on all cargo processed at the Ports of LA/LB. All three options could raise sufficient revenue for the needed improvements, estimated at $40 billion, but would have different benefits and limitations. I conclude that instituting a container fee would be the most economically efficient, equitable, and possibly the most politically feasible.

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_____
Date

DEDICATION

For my parents and sister who offered me unconditional love and support throughout the course of this thesis. There is no doubt in my mind that without their continued encouragement and counsel I could not have completed this process. Thank you for not only being my family, but friends. I love you all.

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PROBLEMS ASSOCIATED WITH THE GOODS MOVEMENT IN CALIFORNIA

Air pollution and traffic congestion are familiar problems that residents in the Los Angeles area are accustomed to. However, over the last several years, the severe health risks associated with air pollution and congestion cause have become more prominent and at the forefront of the media's attention. A 2005 *LA Weekly* article entitled "Clear and Present Danger: The Air that We Breathe" (Kelly) cites that every year 9,600 people statewide die from cancer and respiratory problems caused by air pollution, most of them in Southern California (Kelly, 2005). Another 2005 article (White) in the *Los Angeles Times*, "Growing Problems Give Ports a Bad Reputation" details that although employment generated by the Ports of Los Angeles and Long Beach are growing, neighbors are complaining about congestion and pollution, and no one knows where to find the money for badly needed transportation improvements. The article also points out that diesel-powered trains and trucks that haul cargo to and from the ports are the biggest source of air pollution in Southern California and the truck congestion on area freeways continues to anger motorists (White, 2005). A September 19, 2007 article (Rabin & Weikel) in the *Los Angeles Times* reiterated that Los Angeles and Orange County have the worst traffic in the nation. A report issued cited that LA area residents spend and extra 100 hours per year stuck in traffic than other large metropolitan areas, and that LA region's major freeways have segments moving at less than 10 mph during the most

heavily traveled part of the long morning and evening peak periods (Rabin & Weikel, 2007).

More recently, the *Los Angeles Times* reported that the Natural Resources Defence Council (NRDC) is suing the Environmental Protection Agency to hold them to their commitments made in the 1990s to expand air-quality monitoring to areas where there is evidence that rising ozone and diesel particulate levels damage public health. The article also cites that emissions from ships, trucks and trains transporting goods in the Los Angeles area have been associated with 2,100 premature deaths each year, according to the Air Resources Board (Williams, 2010).

The purpose of this Master's thesis is an examination of the external costs of goods movement in California. These costs are considered external because they are generated by the use of ports in the Los Angeles Area by business that pay little consideration to the associated health costs as well as the costs of severe congestion they generate upon the residents of Southern California. Its specific purpose is to offer possible solutions to help mitigate these two Californians are confronted with. The remainder of this first chapter discusses the recent history of the goods movement industry including the containerization of cargo; how the Port of Los Angeles and Long Beach play an integral role in the local, state and national economy; and what negative externalities have been exacerbated by the large growth in Port related activities in the last decade.

Recent History of Goods Movement

Freight transport or "goods movement" is a broad term that applies to movement of all types of products (including for-sale items, parts/components, agriculture and more) from the location of their manufacture or harvest to their final retail destination or place of assembly (Hricko, 2008). United States residents all benefit from the availability of freight transit that puts goods made in other countries into stores into the United States. From eating strawberries out of season, to buying cheaper clothes, shoes and electronic items made in Asia. U.S. companies also benefit from being able to ship their goods overseas.

Into the 1950s, most goods transported on water over long distances were shipped by what is called break bulk shipping, in which goods were transported loose or packaged in boxes, bags, barrels, or other relatively small containers that varied depending on the type of good. A major cost in break bulk shipping is the time and labor spent loading and unloading ships at portside in ways that avoid damage to the goods. One analysis in the late 1950s concluded that 60-75% of the cost of transporting cargo by sea was made up of portside costs, while another study of a specific ship voyage found cargo handling made up about 37% of total costs (Tomlinson, 2009). These costs included not only labor, but losses of time and damage (including theft) to cargo waiting to be loaded onto a ship while other material was unloaded. Tomlinson (2009) posits that that a "cargo ship typically would spend as much time in port being loaded and unloaded as it did sailing" (p. 25).

The intermodal shipping container became the preferred way of shipping most ocean freight in the 1960s for two reasons. One was the success of particular companies, such as McLean's (which had been renamed Sea-Land Service, emphasizing the intermodal nature of its business). Sea-Land's growth benefited from being able to demonstrate its cost efficiency servicing the U.S. Military during the Vietnam War, where dockside break bulk unloading bottlenecks were a major problem that the container helped overcome (Tomlinson, 2009).

The standardization of container sizes across the shipping industry, allowed for more aggressive investment in ships and container-handling equipment. In the first few years of use, different companies had used containers suited to their particular industry or circumstances, with factors affecting container size including the ships they owned, the type of goods being transported, legal limits on the length or weight of loads carried on roads in markets they served, and similar limits for rail travel. However, industry-wide and international agreements on principal container sizes were reached rapidly in the early 1960s. Agreements were also reached on container strength, to allow containers to be stacked and also to allow transportation not only by ship and truck, but also by train. (The ends of containers must be strong enough to withstand the forces produced when train cars bump, which are much higher than typical forces on ships and trucks.) Standards for fixtures to allow containers to be lifted and connected were also specified (Tomlinson, 2009). The compromises developed at that time are among the most common sizes today.

Today, cargo coming into the ports on large shipping vessels from ports across the world is most commonly measured in 20-foot equivalent units or TEUs. This measure is used to count containers of various lengths. A standard 40-foot container is two TEUs, and a 48-foot container equals 2.4 TEUs. It is also used to describe the capacities of containerships or ports (Bureau of Transportation Statistics, 2009). A typical 40-foot container includes 2,560 cubic feet of cargo space. This is enough to store over 31,000 bottles of wine, 4,700 computer speakers, 17,500 frozen chickens or 1,200 Christmas trees (Cannon, 2008).

In 2008, three U.S. ports – Los Angeles, Long Beach, and New York/New Jersey – ranked among the world's top 20 container ports when measured by TEUs, placing 16th, 17th, and 20th, respectively. One container in every ten carrying global trade is bound for or originates in the United States, accounting for 10% of worldwide container traffic. The ports of Los Angeles and Long Beach combined received a total of 14,200,110 TEUs in 2008 making it the sixth largest port facility in the *world* combined (American Association of Port Authorities, 2009). This is up from 9,480,216 TEUs in 2000.

To put this figure into context, the next largest port in the United States the New York/New Jersey port, which received 5,265,058 TEUs in 2008 and 3,050,006 in the year 2000 (American Association of Port Authorities, 2008). From 1995 to 2008, the ports of Los Angeles and Long Beach grew the most in terms of absolute level of container traffic, reflecting increased U.S. trade with Pacific Rim countries, particularly China, and

the transportation of higher value per ton Asian manufactured goods into the United States (Bureau of Transportation Statistics, 2009). Despite the worldwide recession and the decline in the nation's economic activity and international merchandise exports, and imports, the United States remains the world's largest trading nation with the world's biggest economy. In 2008, world maritime container traffic (loaded and empty) was estimated at over 387 million TEUs (Bureau of Transportation Statistics, 2008).

The geographic distribution of container activity among U.S. seaports shows a greater concentration of "vessel calls" and cargo traffic in a few leading ports because of increased demand for larger, faster, and more specialized vessels. The Panama Canal was designed and built to accommodate the World War I battleships, Arizona and Pennsylvania. These vessels were 106 feet in beam and had drafts of 34 feet with displacements of 34,000 tons. By comparison, during WWII, larger military vessels, battleships, and aircraft carriers with beams of up to 108 feet, drafts of 38 feet, and displacements of 53,000 tons transited the Canal. These WWII vessels barely fit the 110-foot-wide canal chamber with less than 12 inches between the ship's sides and the walls of the canal (Canal de Panamá, 2011).

The largest ship capable of transiting the canal is called a "Panamax." The size of the ship transiting the canal is limited by the size, width and draft (portion of the vessel submerged below the water line). Ships that are too large to transit the canal are called "post-Panamax." Most vessels now built for the world's container fleet are too large for the Canal. These larger vessels are built to carry more containers and have fewer port

calls. In practical terms, larger ships mean the operating costs of a vessel can be distributed across more containers. These larger ships, however, require ports with deeper drafts and more shore side services and are in port longer to unload and reload containers. This is why theses ships are scheduled to call on fewer ports and use alternative inland modes to transport containers to other destinations, rather than transit through the Panama Canal. Current limitations of the Canal limit ships to about 5,000 TEUs. Today, "maxi-Panamax super-freighter vessels are much longer than two football fields and can carry up to 12,500 TEUs (Canal de Panamá, 2011) and even larger ships are on the drawing board to be released in the next couple of years.

The Panama Canal's severe limitation on vessel size is one reason the ports of L.A. and Long Beach continue to flourish. These two ports are very deep and don't have the size restrictions the Canal does, nor any height limitations on bridges to go under like San Francisco (The Golden Gate Bridge), Oakland (The Bay Bridge) or Panama (The Bridge of Americas). Ships coming in have deep water, virtually no size limitations and no bridges to navigate under when accessing the San Pedro Bay Ports.

Ports of Los Angeles and Long Beach

The Ports of Los Angeles and Long Beach play a crucial role in sustaining and promoting the Los Angeles region's important impact on international trade and the U.S. balance of payment. Moreover, the ports provide millions of jobs nationwide and contribute billions of dollars to the local and national economy. The ports are also major drivers of the local economy, serving as the second largest source of jobs in the greater

five county region, according to the Los Angeles County Economic Development Corporation (LACEDC) (see Figure 1) (O'Brien, 2004).

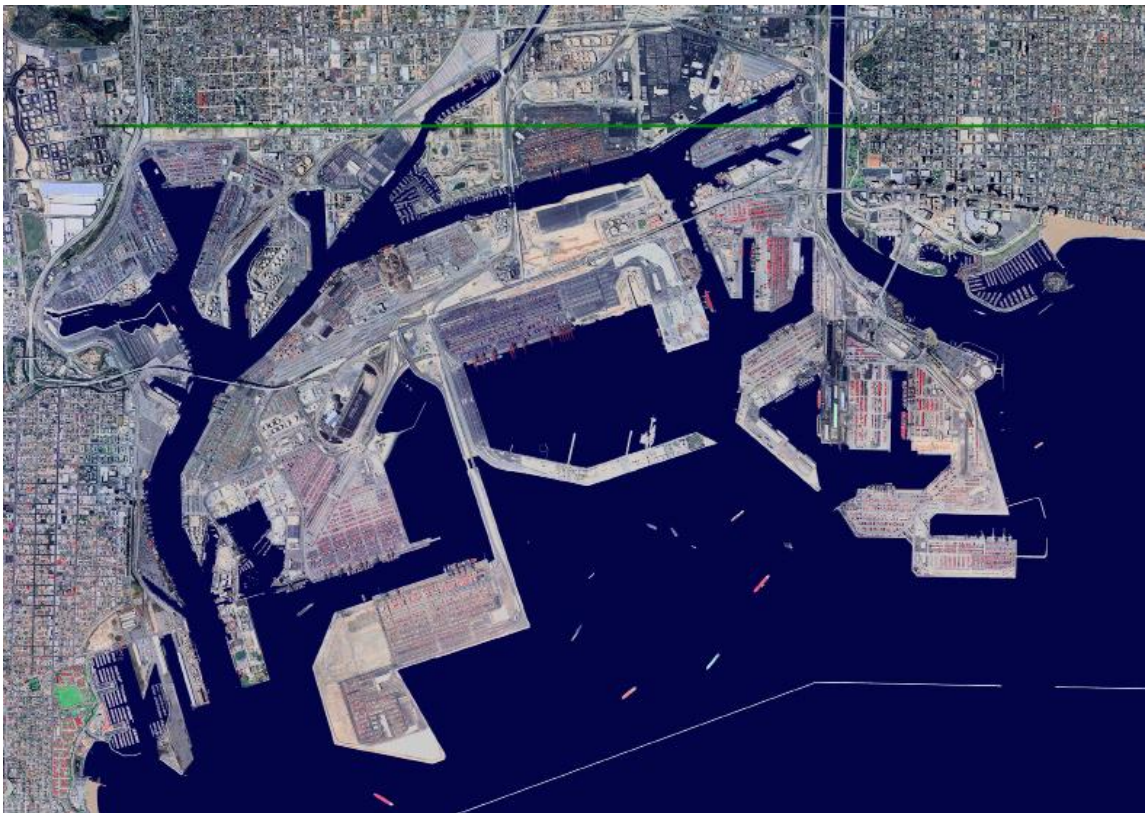

Figure 1. Port Complex (Port of Los Angeles, 2010).

The Ports of Los Angeles and Long Beach (also known as the San Pedro Bay Ports) handle more than 40% of the entire nation's total import traffic and 24% of its total exports (O'Brien, 2004). The port complex handles 64% of all U.S. Pacific containerized trade, including Hawaii; 54% of the total Pacific containerized trade, including Mexican and Canadian ports (O'Brien, 2009).

According to a 2005 LACEDC study, the national trade impact of the two ports was $256 billion. The number of direct and indirect jobs associated with the trade

activity generated by the San Pedro Bay ports increased by 200%, from 1.1 million jobs nationally in 1994, to 3.3 million jobs in 2005 (O'Brien, 2004). Fifty to seventy percent of the freight coming into these two ports is headed for destinations outside the region. Additionally, *every* state in the union receives or sends some goods through the San Pedro Bay ports. Even Maine, sent and received a total of $86 million worth of goods through the ports in 2000 (Southern California Association of Governments, 2005).

The economic impact (jobs, income, output and state and local taxes) of the containerized trade moving through Southern California was calculated using the combined value of port trade associated with each state with input/output multipliers from the Bureau of Economic Analysis, U.S. Department of Commerce's Export Declarations, The Bureau of Labor and the U.S. Census Bureau. This particular study was the third of its kind commissioned by the Ports and the Alameda Corridor Transportation Authority. The previous two studies were commissioned in the 1990s.

The study found that the total value of international trade via the Ports of Los Angeles and Long Beach to/from U.S. importers and exporters was $256.0 billion in 2005, with $35.4 billion in exports and $220.6 billion in imports. The trade impacts associated with international containerized trade via the Ports of Los Angeles and Long Beach included (Port of Los Angeles, 2007):

- Total output of approximately $364.0 billion in 2005, including export value of $78.7 billion and import value of $285.2 billion.

- Income of $107.5 billion in the U.S. economy, with $18.8 billion from exports and $88.8 billion from imports,
- Approximately 3.3 million total jobs (0.47 million jobs tied to exports and 2.84 million jobs tied to imports), and
- $28.3 billion in state and local taxes ($2.0 billion associated with exports and $26.3 billion associated with imports).

The top imports for the Ports include electronics, plastics, furniture, toys, automobile parts, clothing and crude oil. The primary exports for the Ports include: chemicals, waste paper, foods, pet and animal feed, scrap metal, refined petroleum and petroleum coke. East Asian trade accounts for more than 90% of the shipments through the Ports. The top trading partners by tonnage are: China, Japan, South Korea, Taiwan, Mexico, Iraq, Ecuador, Vietnam and Malaysia (Port of Long Beach, 2010; Port of Los Angeles, 2010).

Southern California has become a leading global trade and transshipment center because of its world-class infrastructure and a massive local market, which results in more favorable costs for delivering cargo through these ports to the rest of the nation. The region has evolved into a distribution center for U.S. trade with Pacific Rim nations partly because of its geographic location, but also because such a large portion of the trade is consumed locally. The population of Southern California is larger than most states and is growing rapidly. In fact, many of the future planning and transportation challenges are inextricably linked to future population growth projections. The Los

Angeles region is anticipated to increase by 5.5 million new people in the next 25 to 30 years (Hricko, 2008).

The ever-increasing population will demand ever more imported goods and the region's manufacturing sector – one of the largest in the nation – will continue to require components, parts and other inputs. With structural trends in the U.S. and world economies driving international trade flows from Asia to the United States, container traffic at the Ports of Los Angeles and Long Beach is estimated to rise dramatically over the next 20 years (Port of Los Angeles, 2007). The value of containerized trade moving through the Ports of Los Angeles and Long Beach jumped from $74 billion in 1994 to $256 billion in 2005, or total growth of 246% (Port of Los Angeles, 2007). The containerized trade that moves through the Ports of Los Angeles and Long Beach impacts every region of the United States. This impact is greatest in the Southwest region, which includes California. However, the impact of these ports is significant in every other region of the country (Port of Los Angeles, 2007).

The San Pedro Bay ports are critical to California's and the United States economy. It is imperative that these ports and the road and rail networks serving them continue to function efficiently. The ports have been successful in adding capacity to meet the demand for marine terminals. However, solving problems with inland transportation systems is more complicated, involving more players and directly affecting the everyday lives of southern California residents.

The two ports are truly national ports, handling exports of products from throughout the country while also processing imports bound for every state. The cargo moving through these two ports generates jobs, income, and taxes in every state in the United States. Assuring that the road and rail system is robust enough to freely move goods to and from the ports must be a regional, state, and national priority.

Southern California is perhaps the nation's most important gateway for international trade. By all accounts, goods movement in the region is expected to grow significantly in the future, straining the system of highways, ports, railroads, intermodal yards, and airports that is, in some locations, already overburdened. Container throughput at the Ports has doubled in just the last eight years, and forecasts suggest it will double again by 2020. Southern California Association of Governments modeling suggests that regional daily truck vehicle miles traveled (VMT) will grow from 28.1 million in 2003 to 51.3 by 2035, an 83% increase. Additionally, train volumes are forecasted to more than double between 2000 and 2025 (Hricko, 2008). In 2005, the Ports combined saw an average of 22,466 truck trips per day (Starcrest Consulting Group, 2006). Major highways like I5, I710, I605, and SR60 frequently carry more than 25,000 trucks per day in the Port region, while more than 150 freight trains per day traverse the Los Angeles region on east-west rail lines carrying goods from the Ports (ICF International, 2005).

The port complex generates several levels of economic impact. At the local level, the port directly affects transportation services and other related businesses, such as

steamship agents, stevedores, customs brokers, truck drivers, warehousemen, and other service providers. The revenues and employment associated with these transportation-related providers could cease to exist if the ports were to close down or become less efficient and lose its cargo base. Hence, this employment base, which is primarily located in the immediate area or region, is directly impacted by port activities. A much larger group of businesses that is less directly related to the port includes the businesses that produce or consume the products that move through the port – the importers and exporters. These businesses use the port facilities because they are the most efficient and thus reduce transportation costs.

Southern California is the logical place to improve infrastructure capacity. Only Southern California can handle the largest new ships; the region's trade capacity – while strained – is orders of magnitude larger than the alternatives. Just the annual increase in container traffic at the San Pedro Bay Ports in 2003 was equivalent to more than 80% of the entire annual container traffic handled by the Port of Oakland. Going forward, Southern California is projected to see an increase in international trade related goods movement even if all of the other ports on the West Coast double their capacity (Port of Los Angeles, 2007). Fortunately, for the state, building capacity improvements in Southern California will hasten job creation, increase the long-term cumulative benefits to the state goods movement provides and reduce air pollution and congestion.

Southern California provides these services to the rest of California and the nation while enduring substantial local burdens, including air pollution, traffic congestion, noise,

public health impacts and visual blight. These burdens are not compensated for, thus forming an effective subsidy for lower-priced goods in other states. This is a significant and growing effect of federal policies encouraging international trade (Southern California Association of Governments, 2005). Freight transport provides benefits to residents, businesses, and producers often living hundreds or thousands of miles away. Nevertheless, the health and quality of life costs of goods movement are concentrated in specific areas, particularly the communities living near seaports, airports, railyards, highways, and distribution centers (Pacific Institute, 2006). The statewide and national purpose served by the Southern California goods movement system points to the need for strong state, private and federal assistance in addressing the problem.

The following chapter includes a detailed description of the negative externalities generated by the two ports in Southern California. The severe air pollution and traffic congestion are immense negative externalities that are not justly being compensated for at this time. In economics an “externality” is an impact (positive or negative) on any party not involved in a given economic transaction. In other words, the participants in an economic transaction do not necessarily bear all of the costs or reap all of the benefits of the transaction. There are a number of potential means of improving overall social utility when externalities are involved. The market-driven approach to correcting externalities is to "*internalize*" third party costs and benefits, for example, by requiring a polluter to repair any damage caused.

The third chapter further expands on what the Ports of Long Beach and Los Angeles have done so far in addressing the numerous problems they face including high levels of diesel particulate matter in the hair and the highway and rail line congestion. I will also describe how the passage of Proposition 1B in 2006 has helped some of the congestion and air pollution problems bud does not supply the needed ongoing funding stream.

Chapter 4 of this thesis describes three alternatives or options to help alleviate the growing problem of negative externalities generated by the two ports. These include raising the gas tax throughout the state, passing General Obligation Bonds or instituting a per container fee levied at the ports on all incoming and outbound containers. I examine these three alternatives using the criteria of efficiency in achieving the desired outcome, equity for the involved stakeholders, and political acceptability. A recommendation regarding the desired policy alternative is made.

In the fifth chapter, I conclude and offer a summery of what needs to happen in the Ports to make them more efficient and more equitable for those living in the area. I also discuss Proposition 26, passed November 2, 2010, which requires a two-thirds vote for all fees passed by the state legislature and how this will complicate imposing a container fee of any kind. I will also examine the opposition arguments to instituting a container fee levied at the Ports and why the arguments can be refuted.

Chapter 2

NEGATIVE EXTERNALITIES HIT HOME

In order for the market to be producing a quantity of a good or service that can be considered socially efficient, buyers and sellers must bear or internalize the full cost and benefit of that product. If there are benefits or costs that are not internalized they are called externalities. Thus, if free markets create pollution, then environmental regulations may be warranted to achieve the best possible situation (Anderson, 2007). The economic approach to undesirable externalities is, in general, do not ban the activities producing the externalities (air pollution and traffic congestion) but rather to adjust the trades between buyers and seller so that the full social effects, not just the private effects, of transactions are felt by parties to the transaction. Taxes and/or fees represent one avenue for causing recognition of these external impacts (Mikesell, 2007).

One way to address negative externalities is by instituting a "Pigouvian tax," a tax levied on a market activity that generates negative externalities. The tax is intended to correct the market outcome. In the presence of negative externalities, the social cost of a market activity is not covered by the private cost of the activity. In such a case, the market outcome is not efficient and may lead to over-consumption of the product. A Pigouvian tax equal to the negative externality is thought to correct the market outcome back to efficiency.

One difficulty with Pigouvian taxes is calculating what level of tax will counterbalance the negative externality. Political factors such as lobbying of government

by polluters may also tend to reduce the level of the tax levied, which will tend to reduce the mitigating effect of the tax. Lobbying of government by special interests who calculate the negative utility of the externality higher than others may also tend to increase the level of the tax levied, which will tend to result in a sub-optimal level of production.

Aside from efficiency, Pigouvian taxes may increase the fairness of how costs of negative externalities are borne. For example, even if a tax on air pollution is not at the perfect level to achieve optimal efficiency, it transfers cost associated with pollution from the public (e.g., via reduction of other taxes or benefit from public spending of the pollution tax proceeds) to the polluter. And by all accounts, the Ports create serious negative externalities that need to be addressed. The most serious include air pollution, highway congestion, locomotive pollution and locomotive congestion on "at grade" intersections.

Air Pollution

Marine ports in the United States are major hubs of economic activity and major sources of pollution. Enormous ships with engines running on often the dirtiest fuel available, thousands of diesel truck trips per day, mile-long trains with diesel locomotives hauling cargo, and other polluting equipment cause an array of environmental impacts that seriously affect local communities and the environment (Bailey et al., 2004).

The Los Angeles and Long Beach Port operate virtually next door to residential neighborhoods, schools, and playgrounds. Due to the close proximity to port pollution,

nearby communities face extraordinarily high health risks from port air pollutants. Many of these areas are low-income communities of color. In the Los Angeles area, oceangoing ships, harbor tugs, and commercial boats such as passenger ferries emit many times more smog-forming pollutants than all the power plants in the Southern California region combined (Pacific Institute, 2006).

The South Coast Air Basin (SCAB) is home to 16.8 million people (about half the population of the state) and has some of the worst air quality in the nation. The basin includes all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties and is approximately 10,743 square miles. Ambient, (outdoor) ozone and particulate levels within the Basin have historically been among the highest in the country and continue to violate established National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA). In fact, in 2006, CARB released a ground breaking study that estimated that at least 5400 premature deaths, 2400 hospitalizations and almost a million lost work days are attributable each year to diesel particulate pollution in the South Coast Air Basin, which includes both the Ports of LA and Long Beach and the surrounding area. Of course, not all of the particulate matter is solely attributable to the Ports and goods movement in general, but a staggering 70% of the diesel particulate pollution is attributable to goods movement in the region (Avol, 2007). CARB estimated in total that the Ports and goods movement industry was costing Californians $19 billion annually in health costs and premature death. In fact, in 2007 local governments in the SCAB region passed a resolution asking that a state and federal

emergency be declared to address the region's air quality crisis and to expedite the needed assistance to bring the region into EPA compliance (Avol, 2007).

Primary Air Pollutants of Concern

The diesel engines at ports, which power ships, trucks, trains, and cargo-handling equipment, create vast amounts of air pollution affecting the health of workers and people living in nearby communities, as well as contributing significantly to regional air pollution. More than 30 human epidemiological studies have found that diesel exhaust increases cancer risks, and a 1999 California Air Resources Board (CARB) study found that diesel exhaust is responsible for 71% of the cancer risk from air pollution (ARB, 2000). More recent studies have linked diesel exhaust to asthma and other respiratory problems. Major air pollutants from diesel engines at ports that can affect human health include particulate matter (PM), volatile organic compounds (VOCs), nitrogen oxides (NOx), ozone, and sulfur oxides (Sox) (Bailey et al., 2004).

Particulate matter pollution ranges from coarse dust kicked up from dirt roads to tiny sooty particles formed when wood, gasoline or diesel is burned. At ports, construction and daily operation create coarse PM, but it is the smallest PM that causes the most health hazards. Much of the fine PM – so small it is invisible to the eye – comes from diesel engine exhaust. Less than 1/20 the diameter of a human hair, fine PM can travel deep into the lungs, landing in the delicate air sacs where oxygen exchange normally occurs. Numerous studies have found these fine particles impair lung function, aggravate such respiratory illnesses as bronchitis and emphysema, and are associated

with premature deaths. Dozens of studies link airborne fine-particle concentrations to increased hospital admissions for asthma attacks, chronic obstructive lung disease, pneumonia, and heart disease, including an increased risk of heart attacks. School absenteeism due to respiratory symptoms has also been linked to PM pollution. Population-based studies in hundreds of cities in the U.S. and around the world have demonstrated a strong linkage between elevated particulate levels and premature deaths, hospital admissions, emergency room visits and asthma attacks (Pacific Institute, 2006).

The most recent studies conducted by CARB using EPA approved methodology found that approximately 9,000 people in California are estimated to die prematurely each year as a result of exposure to fine particle pollution statewide. These premature deaths shorten lives by an average of 14 years. ARB's report estimated that 9,200 premature deaths in California are associated with fine particulate pollution on an annual basis, with a statistical range from 7,300 to as high as 11,000 premature deaths each year. California has the most extensive particulate monitoring network in the nation (Stanich & Young, 2010). To put that number in perspective, in 2008, according to the California Highway Patrol, 3,401 people were killed in California due to vehicular accidents (California Highway Patrol [CHP], 2008).

Volatile organic compounds (VOCs) are often toxic, and when they are evaporated into the air they can react with other pollutants to form ground-level ozone, commonly referred to as smog. Common VOCs produced by diesel engines include

benzene and formaldehyde, both of which have been shown to possess significant health risks, including cancer and birth defects (Bailey et al., 2004).

Nitrogen oxides (NOx) are a family of chemical, including nitrogen dioxide, nitric acid, nitrous oxide, nitrates and other related compounds. They have been shown to cause a variety of health problems, including respiratory distress, and react with VOCs in the atmosphere to create ozone. A number of studies have found that NOx can have a toxic effect on the airways, leading to inflammation and asthmatic reactions. In fact, people with allergies or asthma have far stronger reactions to common allergens, such as pollen, when they are exposed to NOx (Pacific Institute, 2006).

According to a 2004 journal article in the New England Journal of Medicine (Gauderman et al., 2004), children and infants are among the most susceptible to many air pollutants. In addition to associations between air pollution and respiratory symptoms, asthma exacerbations, and asthma hospitalizations, recent studies have found links between air pollution and preterm birth, infant mortality, deficits in lung growth and development of asthma (Gauderman et al., 2004). Children are more vulnerable to the adverse affects of air pollution than are adults, this is in part because changes and the development of the lungs continue through adolescence. Children also have increased exposure to many air pollutants compared with adults because of higher levels of physical activity and more time spent outdoors. Additionally, studies have found that in children particulate pollution affects lung function and growth. They also found that children living in communities with increased levels of particulate matter were more

likely to have bronchitis symptoms (Committee on Environmental Health, 2004). An in-depth 2004 study in the New England Journal of Medicine found that high levels of air pollution have chronic, adverse effects on lung development in children from the age of 10 to 18 years, leading to clinically significant deficits in attained lunch function as children reach adulthood (Gauderman et al., 2004).

Another serious danger associated with goods movement is an increased level of ground level ozone. Ozone pollution occurs when abnormally high concentrations of the gas accumulate near the ground, the result of the reaction of sunlight with man-made precursor chemicals, including nitrogen oxides and volatile organic compounds. Ozone, an important component of smog, is a highly reactive and unstable gas capable of damaging living cells, such as those present in the linings of the human lungs. This pollutant forms in the atmosphere through complex reactions between chemicals directly emitted from vehicles, industry (including heavy machinery) and many other sources. Ozone is a powerful oxidant – its actions can be compared to household bleach, which can kill living cells (such as human skin cells) upon contact. If forms in greater quantities on hot, sunny, calm days. In metropolitan areas (especially in Southern California), ozone concentrations frequently exceed existing state and federal health standards (ARB, 2008). The California Air Resources Board regulates ozone emission because of its health and environmental effects.

Ozone can damage the tissues of the respiratory tract, causing inflammation and irritation, and result in symptoms such as coughing, chest tightness and worsening of

asthma symptoms. A 2004 American Medical Association journal article also found similar results that even short-term exposure to ozone was linked to adverse health effects, including increased rates of hospital admissions, and emergency room visits, the exacerbation of chronic respiratory conditions and decreased lung function. They were able to conclude that there was a statistically significant association between short-term changes in ozone and mortality on average for 95 large US communities, which include about 40% of the US population (Bell, McDermott, Zeger, Samet, & Dominici, 2004).

In addition, ozone has also been found to cause substantial damage to crops, forests and native plants. A 2008 ARB study showed that ozone exposure reduces the overall productivity of plants, damaging cells and causing destruction of leaf tissue. As a result ozone exposure reduces the plants' ability to photosynthesize and produce their own food. Plants respond by growing more leaves thereby reducing the amounts of stored carbohydrates in roots and stems. This weakens plants, making them susceptible to disease, pests, cold and drought (ARB, 2008).

The two San Pedro Bay ports are the largest single point source of air pollution in the region, accounting for about 10% of the nitrogen oxides emissions and about 25% of the diesel particulate matter in the region. The region and the ports are regulated by the world's largest local pollution control agency, the South Coast Air Quality Management District (SCAQMD). A key driving force behind the move to reduce pollution from the San Pedro ports is concern that diesel emissions from port operations are contributing to high cancer and asthma rates among residents in the area. Several years ago, the

SCAQMD released the Multiple Air Toxics Exposure Study, which concluded that diesel particulate emissions from heavy duty vehicles contributes 71% of the cancer risk facing residents in the Los Angeles metropolitan area (SCAQMD, 2008). Additionally, they found that port pollution/goods movement alone is responsible for roughly 640 premature deaths every year in the Southern California region and $1.0 billion in health related costs just in the Los Angeles metropolitan area (SCAQMD, 2008).

CARB in 2006, using U.S. EPA methodology and approved health valuation found that the annual effects associated with the ports and goods movement in California primarily due to diesel particulate matter and high concentrations of ozone was approximately $19 billion per year. This includes, 2400 premature deaths, 2000 hospital admissions due to respiratory causes, 360,000 lost work days, 3,900,000 minor restricted days and 1,100,000 school absence days. The U.S. EPA has established $4.8 million in 1990 dollars at the 1990 income level as the mean value of avoiding one premature death. This value is the mean estimate from five contingent valuation studies and 21 wage-risk studies.

Contingent valuation studies provide stated preference data about willingness-to-pay (Or accept) for a minor decrease (or increase) in mortality risk. This is also known as the "value of a statistical life." As real income increases, people are willing to pay more to prevent premature death. U.S. EPA adjusts the 1990 value of avoiding a premature death by a factor of 1.201 to account for real income growth from 1990 through 2020. CARB updated these values to the value of 2005 dollars. After the adjustments, the value

of avoiding one premature death is $7.9 million in 2005, $8.1 million in 2010 and $8.6 million in 2020, all expressed in 2005 dollars (ARB Emission Reduction Plan, 2006).

Highway Use and Congestion

Southern California Association of Governments (SCAG) is the nation's largest metropolitan planning organization, representing six counties, (Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial) 190 cities, and more than 19 million residents. SCAG undertakes a variety of planning and policy initiatives related to goods movement and have conducted some of the most in depth economic analysis on goods movement and the Ports. The SCAG region is undoubtedly the most affected area of the state from the goods movement industry. They have been at the forefront calling for more state and federal intervention regarding the impacts the goods movement industry is having on their region.

For the past several decades, Southern California has been consistently experiencing very high levels of congestion. Contributing factors include large population and physical extent of the region, rapid population growth, high automobile dependence and a maturing regional highway system with limited options for expansion. As a major gateway for international trade, the region's highways carry some of the highest truck volumes and share some of the most congested bottlenecks for freight trucks in the nation. For example, the I-710, which feeds trucks directly from the Ports and the I-605 and the SR 91, carry as many as 40,000 trucks on an average weekday (SCAG, 2007).

Highway congestion causes delays affecting personal mobility and goods movement and results in increased economic and social costs. In addition, congestion impacts the region's air quality. The number of vehicle miles traveled (VMT) indicates the overall level of highway and automobile/truck usage. I n 2006, truck traffic accounted for 7% of the total VMT in the SCAG region.

However, truck VMT share varied among counties. Specifically the three inland counties had significantly higher truck VMT than the coastal counties, ranging from 10% in Riverside County to 13% in Imperial County. Trucks are much larger, heavier and accelerate more slowly than passenger vehicles, and thus have a much greater impact on traffic flows than passenger vehicles. On a flat terrain, a heavy-duty truck could be equivalent to 2.5 passenger vehicles in its impact on road capacity. As trucks travel up a grade, their speeds decrease and impacts on congestion can become more severe. Consequently, the truck VMT share statistics can underestimate their actual impacts on traffic congestion in the region (SCAG, 2006).

Due to the significant increase in international trade, truck VMT has also been growing at a much faster rate than passenger VMT. Between 2000 and 2006, truck VMT grew 14%, doubling the rate of passenger VMT growth at 7%. By 2035, total truck VMT in the Southern California Association of Governments region is estimated to almost double the current level (SCAG, 2006). Some freeways in the SCAG region currently handle up to 40,000 trucks per day, and it is projected that these freeways may have to handle up to 80,000 trucks per day by 2025 (SCAG, 2007).

Though two-thirds of the truck VMT take place during the off-peak period of the day, there are various freeway segments in the region that carry heavy truck volumes during the peak periods (i.e., from 6-9 a.m. and 4-7 p.m.). Due to the location of the San Pedro port complex, those segments are located in the central part of the regional transportation system, and tend to generate disproportionate impacts than otherwise. For example, the I-710, SR-60 and I-15 is one of the most heavily used freeways by trucks engaged in inter and intra-regional goods movement, serving both ports and domestic traffic. The I-15 is the primary freight corridor between Los Angeles and the states to the north and east (SCAG, 2006).

Locomotives

Trains have long been considered an efficient way to move goods for long distances. The locomotives that pull trains have powerful, long-lasting engines that typically run on diesel fuel. Trains are an integral part of California's goods movement system, as each container train can replace up to an estimated 250 truck trips (ARB, 2006).

At this time, moving goods with locomotives generates less pollution than with trucks, but this will not be true in the future unless locomotive engines become significantly cleaner to keep pace with the improvements to truck engines. The average locomotive in 2000 generated less than half of the NOx and PM emissions that the average truck would have generated to move the same ton of cargo the same distance. However, emissions from trucks are being reduced at a faster rate than emissions from

locomotives as a result of more stringent truck regulations. The California Air Resources Board estimated that diesel PM emissions per-ton mile of goods moved by rail will equal or exceed comparable truck emissions by 2015, as new trucks meeting 2007 emission standards start to reduce truck fleet emissions (ARB, 2006).

Roughly, 20% of the containers leave ports by rail, usually in unit trains containing 100 cars, with two containers onboard each car. The unit trains, more than 50 of which leave ports daily, are assembled at rail yards with the help of switching engines that operate solely within the yard. Switching engines are frequently highly polluting, converted long-haul engines that are no longer economic to operate in long distance service (Southern California Regional Strategy for Goods Movement, 2005).

Federal law limits the abilities of states and local jurisdictions to control locomotive emissions, or to enforce rules that affect national railroad transportation. Due to these statutory restrictions, states and local agencies have limited authority to require the reduction or mitigation of emissions from locomotives. Rules have to be narrowly and carefully crafted to survive federal preemption, which limit the emission reductions that can be obtained through requiring cleaner technology. Attempts to adopt broader regulatory requirements would likely be subject to court challenges that could delay or eliminate the emission benefits. Currently, voluntary agreements with the railroads are a part of the State's strategy in emission reductions because they avoid these delays (ARB Emission Reduction Plan, 2006).

At-grade Rail

At grade rail refers to a train track that is at the same level or "grade" as a street and thus intersects with automobile traffic. Trains always have the right-of-way. Thus, when an at grade train passes an intersection during peak traffic hours, it often causes congestion that delays traffic and may back queues into adjacent intersections or onto freeways, causing operational and safety concerns. In some cases, it can take several cycles for queued vehicles to clear the intersection, causing considerable delay to drivers. The congestion problem is exacerbated if a second train passes before the congestion from the first train clears. Additionally, increasing traffic on the railroad lines and the increasing number of these types of crossings further exacerbate congestion in already heavily congested areas (Southern California Regional Strategy for Goods Movement, 2005).

Grade separation is a process used to improve traffic flow at intersections and junctions. With grade separation design, each road or rail surface is placed at a different grade, or elevation. This difference in elevation is accomplished using tunnels, ramps, bridges and interchanges at every point where the two roads or rails cross one another. For example, an elevated train running above a roadway is considered an example of rail grade separation. An urban light rail system, where the train cars move with traffic at street level, is not grade separated.

Roads with grade separation generally allow traffic to move freely, with fewer interruptions, and at higher overall speeds; this is why speed limits are typically higher

for grade-separated roads. In addition, less conflict between traffic movements reduces the capacity for accidents. Motorways, though having higher average speeds, usually have much lower accident rates per distance travelled than roads, which are not grade separated (Colton Crossing, 2010)

Riverside County and City bears many of the burdens of the goods movement in and out of the San Pedro Bay Ports. There are 61 mainline at-grade rail crossings in Riverside County alone. The average crossing is blocked 1 hour and 50 minutes per day and is projected to grow to 3 hours and 40 minutes by 2030. Ten of the 61 at-grade crossings are blocked three hours per day including all of the crossings in downtown Riverside (the City). Additionally, if grade separations are not constructed, these crossings are projected to grow to 6 hours and 15 minutes per day by 2030 (SCAG, 2007). In fact, Riverside Mayor Ron Loveridge has called grade separations the "most important public policy issue before Southern California" (Gang, 2008, p. 2). In the City of Riverside, trains delayed firefighters and police nearly 500 times at the 26 crossings in the City limits between 2002 and 2007 (Gang, 2008).

John Standiford, deputy of the Riverside County Transportation Commission emphasized how expensive these projects are. In the past Standiford said the rule of thumb was $25 million for each grade separation. Now, most top $30 million and one, an overpass of Union Pacific in Riverside County would exceed $108 million. The higher cost is due to the size and scope of the project, including its need to buy nearby property. Largely, costs have risen because of the need to buy rights-of-way from property owners

and an escalation in construction materials (Gang, 2008). In 2003, 68 million tons of rail freight passed through Riverside County with less than 5% originating or ending locally (SCAG, 2007).

The "Colton Crossing" is often the most cited need for grade separation in the state. The volume of trains passing through the Colton crossing, an at-grade intersection of the Union Pacific and Burlington Northern Santa Fe rail lines in San Bernardino County, is expected to increase 88% by the year 2025, averaging more than 10 trains per hour. Established in 1882, Colton Crossing is located in the City of Colton just south of Interstate 10 about a quarter mile east of Rancho Avenue. Used by BNSF Railway (BNSF), north/south tracks, and Union Pacific Railroad (UPRR),east/west tracks, for goods movement, in addition to Metrolink and Amtrak for passenger service, more than 110 trains passed through Colton Crossing daily in 2008 – making it one of the busiest at-grade rail-to-rail crossings in the nation (Colton Crossing, 2010).

The Colton Crossing is unique primarily because it is not only at grade with street traffic but also with other rail traffic. Trains have to wait for each other as they navigate this extremely dangerous crossing. The needed rail-to-rail grade separation will significantly minimize delays caused by idling trains waiting to get through Colton Crossing, thus reducing delays to vehicle traffic waiting to get through crossings caused by those idling trains. The extensive funding and planning needed for this project are still being evaluated. Even though, the Crossing is a priority of the State, the land owners surrounding the crossing and some community members have held the project up due to

conflicting ideas of how the grade separation should be constructed (Colton Crossing, 2010).

The Southern California Association of Governments (SCAG) in 2008 estimated that there is approximately $6 billion worth of needed grade separations for rail for the 131 desperately needed projects in the six counties it encompasses including Los Angeles, Orange, Ventura, San Bernardino, Riverside and Imperial. These projects have all been identified by the California Goods Movement Action Plan because they create substantial traffic delays and excess emissions due to extended idling. Construction of grade separations to enable simultaneous vehicle and rail traffic is critical element of any strategy to increase the volume of containers moving efficiently throughout the state (SCAG, 2007). Unfortunately, because of the enormous costs, local governments cannot carry out these needed projects alone. Additionally, because the trains always have the right-of-way with street traffic and are not impacted (except the noteworthy Colton Crossing), the rail lines are unwilling to contribute either, leaving an enormous need with little funding available.

Conclusion

Although the Ports have a massive impact on California's economy in terms of jobs and economic activity, it does not come without costs. Currently these costs are not being properly internalized. The State bears the burden of the increased healthcare costs generated by the goods movement industry, those living in the Southern California region have some of the worst air quality in the nation and communities are being disrupted at

unacceptable levels due to the increased truck and locomotive traffic in their areas. A funding stream is necessary to help combat these extraordinary costs. In partnership with the goods movement industry the state needs serious assistance to help mitigate the air quality damage and the deteriorating infrastructure and the needed structural improvements. Local governments will simply not be able to fund these projects alone, nor should they since the goods movement industry benefits the entire state and nation.

Summary of Costs Californians are Currently Bearing Due to the Ports and Goods Movement

- $19 billion in annual health related costs due to diesel particulate matter and ozone from the Ports and the goods movement industry
- The South Coast Air Basin is one of the dirtiest in the country and continues to be in nonattainment of federal EPA standards. The SCAG region could potentially lose millions of dollars in federal transportation funding if they do not meet compliance deadlines.
- Many hours per day with rail crossings down due to port containers being transported: including, public safety delays (500 delays for public safety officials in five years in the city of Riverside alone), personal time lost, and idling traffic/increased air pollution
- Increased traffic and freeway congestion – 40,000 trucks per day in the SCAG region on freeways not designed to handle the volume and increasing weight of the traffic. Freeways are literally crumbling under the strain.

Costs to Mitigate Ports and Goods Movement Negative Externalities and Improve Efficiency

SCAG's Multi-County Goods Movement Action Plan details approximately $40 billion in (2007 costs) related projects that would not only improve air quality, reduce congestion but also increase efficiency. These projects include retrofitting/replacing old and dirty trucks, rail grade separations, double and triple tracking the main rail lines going to and from the Ports, highway improvements including construction of truck lanes and widening some of the most congested freeways in the region and country.

Chapter 3

WHAT HAS BEEN DONE SO FAR TO ADDRESS AIR POLLUTION?

Despite the many challenges facing the State of California and the Ports of Los Angeles and Long Beach, there have been improvements in the region's air quality. The Ports have recently become much more proactive in trying to reduce air pollution due primarily to the communities surrounding the Ports demanding they be "part of the solution instead of the problem" (Johnson, Rogan, & Pope, 2005). This chapter is dedicated to describing what the state of California and the Ports of LA and Long Beach have done to help address the negative externalities, (primarily air pollution) created by the goods movement industry in the last several years.

The remainder of this chapter discusses programs initiated by the Ports and State to help address goods movement produced negative externalities. These programs include PierPASS, a program created by the Ports to incentivize off-peak truck shipping from the Ports, Proposition 1B passed in 2006, and the Clean Truck Program initiated by the Ports in 2006 (San Pedro Bay Ports, 2010).

PierPASS – Incentivizing Off-peak Truck Shipments

In order for the Ports to remain the largest in the nation it is imperative they stay competitive. Much of the oppositions' concerns around implementing environmental or infrastructure improvements at the expense of cargo owner's centers around maintaining this "competiveness" and not driving shipping traffic to other competing ports. There are a couple of things that needs to be kept in mind when it comes to competiveness. We can

talk about planning at the local level, at the state level, even at the national level, but trade in today's world is a function of global market dynamics. For example, most of the ocean shipping companies that navigate the international waters and bring the goods to major ports are no longer U.S. flag carriers. They are international carriers that are principally subject to international treaty, often outside the jurisdictional arm of local planning and policy organizations, particularly when it comes to questions of air quality. The federal government by most accounts has been "hands off." Unlike our counterparts in places like Canada and Europe, the U.S. has no formal national freight policy (Kyser, Sidhu, Guerra, & Ritter, 2010). In fact, the 2009 Cato Institute *Handbook for Policymakers* clearly reaffirms the importance of this position. They argue that the current Administration needs to recognize that the relative openness of American markets is an important source of our economic vitality and that any trade barriers are a drag on growth and prosperity. They also posit that widening the circle of people with whom the US does business, brings benefits to consumers in the form of lower prices and greater variety and any impediment on that flow would be detrimental to the economy and unnecessary in their eyes (Cato, 2009). They too firmly stand behind a "hands off" policy to foreign trade.

The state and local role then has been to fill the gap where the federal government has not acted. In California, it is particularly important to note that the state is involved because it owns the coastal waters and the ports. The ports operate under a 1911 law called the California Tidelands Trust Act. The state cedes authority to local cities to

operate the ports on behalf of the state. There are a couple of important implications of this for planners and policy advisors. First, the revenues that are generated from port activities have to go back into port operations. Local city councils cannot take the revenues generated by the port and put them into schools or healthcare for example. There has to be a direct nexus between port revenues and expenditures, which raises complex issues for local jurisdictional authorities. Also, the stakeholders involved in trade-related issues may be exempt from local planning regulations because of their involvement in interstate commerce superseded by the federal government. The railroads are the principal example of this. The latest trend is that the ports themselves have become regulating agencies, sometimes in response to the threat of state legislation and sometimes in a more voluntary "self-regulatory" fashion (Tomlinson, 2009). Typically when a bill is before the California Legislature dealing with putting more restrictions on the Ports or capping pollution levels, the Ports will often ask the Legislator to drop the bill and allow them to come up with a more tailored and local solution that involves the goods movement industry. In fact, that is how PierPASS was created.

In 2004, the Ports began to experience extremely long backlogs and severe labor shortages, due in part to the unprecedented growth in international trade. Shipping terminals planned on a five to six percent growth in container volume, but saw growth almost double that. The Ports had simply not upgraded their facilities in terms of manpower and infrastructure to cope with the steep increases in freight. Additionally, at that time, the Ports were only open during the day or (daylight hours). The longshoremen

(the freight handlers at the Ports) simply were not able to keep up with the volume. Large container ships had to wait idle for weeks to be unloaded. Some shippers even began to bypass the Ports altogether and offload cargo in Oakland. The containers were then moved by rail back to Los Angles for intermodal transport into cities beyond Los Angeles (Raine, 2004).

Outcries from industry, city officials and the public spawned the creation of the successful program known as PierPASS. PierPASS is a not-for-profit organization created by 13 terminal operators to reduce congestion and improve air quality in and around the Ports of Los Angeles and Long Beach. The program provides an incentive for cargo owners to move cargo at night and on weekends in order to reduce truck traffic and pollution during peak daytime traffic hours, and to alleviate port congestion. The program charges a per container mitigation fee on all outbound containers of $50 per 20-foot container and $100 for all other sizes for containers moved Monday – Friday 3 a.m. - 6 p.m. If the containers are moved outside these hours or on "OffPeak" time then the fee is waived (PierPass, 2010).

The goods movement industry came together and proposed an industry-driven solution that provided a financial incentive to move cargo outside of peak hours and a funding mechanism for five new shifts per week. This solution became known as the "OffPeak" program and was launched on July 23, 2005. PierPASS has achieved more than 15 million off-peak truck trips since its inception in 2005. In a typical week, the off-peak program shifts 63,000 truck trips to off-peak evening and weekend hours. In

addition to reduced truck traffic on local highways, the OffPeak program provides a variety of benefits: spreading traffic across more hours, reducing the uncertainty of delivery time, and improving turn-around times for companies and truck drivers (PierPASS, 2010).

In fact, area commuters have reported a noticeable decrease in traffic congestion on roads near the Ports. Northbound truck traffic on Interstate 710 during peak hours has dropped an estimated 24% since the introduction of OffPeak, according to a study by the Alameda Corridor Transportation Authority (ACTA). On a typical day, more than 10,000 trucks use the OffPeak shifts – enough to stretch from Long Beach to San Diego if they lined up end-to-end. Studies conducted by SCAG estimate that the PierPASS program has offset about two years of port growth by shifting a large percentage of the goods to the off-peak. The PierPASS program has also demonstrated that the goods movement industry could support container fees, with the understanding of the fee revenues would be used to improve the goods movement system as a whole (PierPASS, 2010).

Proposition 1B – Investing in Air Pollution Cleanup and Infrastructure

California spends about $20 billion a year from a combination of state, federal, and local funds to maintain, operate, and improve its highways, streets and roads, passenger rail, and transit systems. California has over 380 million lane miles of roads and highways that must be maintained by the State or local government. These expenditures are primarily funded on a pay-as-you-go basis from taxes and user fees

(State of California Department of Transportation [Caltrans], Division of Transportation System Information [TSI], 2006).

There are two primary state tax sources that fund state transportation programs. First, the state's 18 cents per gallon excise tax on gasoline and diesel fuel (generally referred to as the gas tax) generates about $3.4 billion annually. Second, revenues from the state sales tax on gasoline and diesel fuel currently provide about $2 billion a year.

Additionally, the state imposes weight fees on commercial vehicles (trucks), which generate roughly $900 million a year. Generally, these revenues must be used for specific transportation purposes, including improvements to highways, streets and roads, passenger rail, and transit systems. These funds may also be used to mitigate the environmental impacts of various transportation projects (Legislative Analysts Office [LAO], 2010a).

Since 1990, voters have approved roughly $5 billion in state general obligation bonds to fund transportation. These bond proceeds have been dedicated primarily to passenger rail and transit improvements, as well as to retrofit highways and bridges for earthquake safety. As of June 2006, all but about $355 million of the authorized bonds have been spent on projects.

Unfortunately this seemingly large funding stream fails to meet the ever-increasing demand of California's infrastructure needs and more specifically its goods movement related needs. In November 2006, California voters approved Proposition 1B,

which among other things, authorized $1 billion to reduce emissions from goods movement in California's trade corridors.

Getting enough money to build a transportation project typically requires a time-consuming process of collecting money from a variety of sources: bond measures, transportation taxes, grants and development fees. Proposition 1B provided a major infusion of cash and allowed many big, partly funded projects to be constructed. Proposition 1B jump-started traffic relief, mass transit and safety improvements throughout the state without raising taxes. It will build more lanes on congested highways, expand carpool lanes, fix local streets, roads, and intersections, make bridges seismically safe, and replace old school buses.

It also included annual accountability measures, such as audits and reports, to ensure funds are spent as intended. It was part of the Rebuild California Plan, which used taxes Californian were already paying to build roads, housing and schools needed to sustain our economy and get more Californians back to work that had been laid off in the bad economy (LAO, 2010b). The component of the Proposition that is especially important to this thesis is the portion dedicated to helping the goods movement industry and the Ports in southern California.

> One billion dollars ($1,000,000,000) shall be made available, upon appropriation by the Legislature and subject to such conditions and criteria contained in a statute enacted by the Legislature, to the State Air Resources Board for emission reductions, not otherwise required by law or regulation, from activities related to

> the movement of freight along California's trade corridors. Funds made available by this paragraph are intended to supplement existing funds used to finance strategies and public benefit projects that reduce emissions and improve air quality in trade corridors commencing at the state's airports, seaports, and land ports of entry. (Government Code, Title 2, Division 1, Section 1, Chapter 12.49, Article 2, Section 8879.23(c)(2)) (LAO, 2007b, p. 13)

Proposition 1B authorized the state to sell about $20 billion of general obligation bonds to fund transportation projects to relieve congestion, improve the movement of goods, improve air quality, and enhance the safety and security of the transportation system. The bond package included:

- Congestion Reduction, Highway and Local Road Improvements— $11.3 billion—for capital improvements to reduce congestion and increase capacity on state highways, local roads, and public transit for grants available to locally funded transportation projects, as well as for projects to rehabilitate state highways and local roads.
- Public Transportation—$4 billion—to make capital improvements to local transit service and the state's intercity rail service. These improvements would include purchasing buses and rail cars, as well as making safety enhancements to existing transit facilities.
- Goods Movement and Air Quality—$3.2 billion—for projects to improve the movement of goods—through the ports, on the state highway and rail systems,

and between California and Mexico—and for projects to improve air quality by reducing emissions related to goods movement and replacing or retrofitting school buses.

- Safety and Security—$1.5 billion—for projects to increase protection against a security threat or improve disaster response capabilities on transit systems; as well as for grants to improve the safety of rail crossings to seismically retrofit local bridges, ramps, and overpasses; and to improve security and disaster planning in publicly owned ports, harbors, and ferry terminals (LAO, 2007b).

The proposition implementing statutes directed ARB to maximize the emission reduction benefits and achieve the earliest possible health risk reduction in communities heavily impacted by goods movement. This bond program (i.e. "Program") supplements regulatory actions and other incentives to cut diesel emissions. By statute, the Program can only fund emission reductions "not otherwise required by law or regulation" (Air Resources Board [ARB], 2010, p. 39). Key pollutants targeted by the Program include diesel particulate matter (diesel PM), an air toxic, and nitrogen oxides (NOx) that contribute to the formation of both PM2.5 and ozone. The projects funded under the Program also provide co-benefits by reducing greenhouse gases and black carbon emissions that contribute to climate change (ARB, 2010b). Proposition 1B has been critically important in helping the Ports meet its' goals of cleaning its truck fleet and restricting Port access to dirty trucks. The infusion of cash to the Ports has allowed them

to fund more projects and at a more rapid pace to clean the truck fleet that services the Ports.

The State budgets for fiscal years 2007-08, 2008-09, and 2009-10 each appropriated installments of $250 million for the Program. ARB awards grants to fund projects proposed by local agencies that are involved in freight movement or air quality improvements associated with goods movement activities. Examples of local agencies include air pollution control and air quality management districts (air districts), ports, and regional transportation agencies in the trade corridors. The local agencies are responsible for providing financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies, consistent with the guidelines adopted by the California Air Resources Board (ARB). Bond funds flow via grant agreements from ARB to local agencies, then to equipment owners via contracts or other binding agreements with those local agencies. At both steps, there is competition based on the projected emission reductions and reductions per State dollar invested to ensure the most beneficial projects are funded (California Air Resources Board [ARB], 2010b).

While the implementation language for Proposition 1B does not explicitly require an allocation by trade corridor, it does direct ARB to identify a means to consider an air basin's attainment status for State and Federal air quality standards and its health risk from goods movement. ARB staff believes this is most efficiently and effectively done by targeting funding to each trade corridor based on population, goods movement emissions, and federal attainment needs. These targets also ensure that California

residents in each defined trade corridor see benefits from the Program. Finally, such targets facilitate a transparent and open discussion of the optimum funding levels to reduce the contribution of goods movement sources to each region's toughest air pollution challenges. The funding targets for each trade corridor, including all State and local Program administration funds, are:

- $550 million: Los Angeles/Inland Empire trade corridor
- $250 million: Central Valley trade corridor
- $140 million: Bay Area trade corridor
- $60 million: San Diego/Border trade corridor

The South Coast Air Quality Management District (SCAQMD) – one of the most heavily polluted districts in the country – and the ARB are working together to identify projects that achieve maximum benefits for each dollar invested. The vast majority of the funds are being used to replace and upgrade dirty, old, diesel trucks that service the Ports of Los Angeles and Long Beach. By the end of 2010, 5,300 existing diesel trucks operating in the four statewide trade corridors have entered into contract to be upgraded or scraped completely. By the end of 2010, 3,140 of the upgraded trucks were in service with the remainder expected to be operational in 2011. Since retrofits had a top priority, all eligible truck retrofits projects have received funding. The truck upgrades involve scrapping an old diesel truck and replacing it with a new diesel or natural gas model meeting 2007 or later emission standards, or retrofitting the existing newer trucks with a diesel soot filter to help further mitigate the toxic pollutants emitted (ARB, 2010a).

The ARB estimates that these projects will have a dramatic improvement on air quality and emissions in the heavily polluted South Coast Air Basin. They estimated that the $245 million spent thus far on truck improvements and replacements will reduce over 3 million pounds or 1,500 tons of particulate matter (PM), plus 60 million pounds or 30,400 tons of nitrogen oxides (NOx) in California over the life of their grant contract (typically two to five years). Because of the immense benefits of these truck replacements, this program is leveraging substantial match funding from private, local, and federal sources – more than one match dollar for every program dollar invested (ARB, 2010b).

Clean Truck Program

On November 20, 2006 (after the passage of Proposition 1B), the Los Angeles and Long Beach Boards of Harbor Commissioners approved the Clean Air Action Plan (CAAP). The CAAP was the subject of significant public outreach, including public workshops, meeting with stakeholders, and a day-long public hearing before a joint meeting of the Harbor Commissioners (ZumMallen, 2010).

A key component of the CAAP is the implementation of a Clean Trucks Program (CTP) that will replace the approximately 16,800 dirty diesel trucks that service the Ports on a regular basis with a cleaner fleet that will significantly reduce air pollution in the area. In order to help with the financing of this large endeavor, the Ports approved a tariff on incoming container cargo that passes through the Ports by truck and is paid by the beneficial cargo owner. The fee is expected to generate approximately $1.6 billion

over a five-year period. When combined with other funds from Prop 1B and the South Coast Air Quality Management District, an estimated $2.2 billion will be available to support the CTP. The CTP recognizes the fact that the majority of the current independent owner operator trucks and licensed motor carriers that service the Ports will need a significant subsidy in order to afford cleaner trucks, as noted by a number of economic studies commissioned by the Ports. The subsidies provided through the CTP equates to almost 80% of the cost of a new, clean, more fuel-efficient truck. To take advantage of the program truck operators will have to scrap their older dirty trucks. Priority of subsidies and grants has been given to the oldest, most polluting trucks to achieve the highest emission reductions, with pre-1989 trucks given highest priority (ZumMallen, 2010).

On New Year's Day 2010, the Ports of LA and Long Beach banned trucks with 1993 and older engines, and also barred nearly all trucks with 1994-2003 engines. The Clean Trucks Program will ban all trucks that don't meet 2007 emission standards by 2012. With the industry replacing vehicles much sooner than expected, the result is a major reduction in air pollution - two years ahead of schedule. The Port of Long Beach and Los Angeles's ambitious Clean Trucks Program has reduced air pollution from harbor trucks by nearly 80% as of January 1, 2010 instead of 2012 as anticipated (San Pedro Bay Ports, 2010). Ironically, the recession has helped the Ports meet their targets faster because less cargo coming into the Ports means fewer trucks are needed to haul it.

Truck owners that applied for financial assistance to obtain a cleaner truck have gotten it and the Ports have met their expected goals before the target date.

Summary and Analysis

All three of these programs PierPASS, Proposition 1B and the Clean Truck Program have significantly reduced and will continue to reduce air pollution in and around the Ports. However, Proposition 1B and CTP funds will run out of funds and do not provide a continuous funding stream for improvements needed in the future. Granted, these new trucks are clean by today's standards around the Ports due to these programs but in a few short years even cleaner trucks will be available and there will not be any funding to assist truck operators to upgrade their equipment to the cleanest possible.

It is vital that the State find some kind of dedicated revenue stream that can continually provide funding for goods movement related infrastructure and equipment upgrades. Because as previously noted, the goods movement industry and the Ports specifically, are a vital component to California and the nation's economy. It will be imperative to keep it healthy and manageable and mitigate the negative externalities to the best of our ability. Additionally, neither of the programs initiated by the Ports or the State provides funding for the desperately needed grade separations that are literally bifurcating cities in Southern California as well.

Chapter 4 discusses three different possible funding streams to provide the needed rail grade separations as previously discussed and even more funding for air pollution

mitigation upgrades and projects including air filter systems for schools around the Ports that have some of the dirtiest air in the nation.

Chapter 4

OPTIONS FOR FINANCING AIR POLLUTION MITIGATION AND INFRASTRUCTURE IMPROVEMENTS

In order for the Ports of Los Angeles and Long Beach to remain competitive and number one in the nation, and for the cities surrounding the Ports to be less affected by the port's activities, billions of dollars of investment are needed. As previously discussed in Chapters 2 and 3, the two primary needs are air pollution mitigation and transportation infrastructure, including railroad grade separations.

In this section, I estimate the total investment needed is $40 billion. As previously discussed in Chapter 2, the Southern California Association of Governments, "Multi-County Goods Movement Action Plan" details approximately $40 billion (2007 costs) in related projects that would not only improve air quality and, reduce congestion but also increase efficiency. To put this large dollar amount into perspective, over the last five fiscal years, it represents between approximately 41.98% and 50.38% of the State's annual General Fund (LAO, n.d.). These projects include retrofitting/replacing old and dirty trucks, rail grade separations, double and triple tracking the main rail lines going to and from the Ports, highway improvements including construction of truck lanes and widening some of the most congested freeways in the region and country. Some of these projects could be constructed / implemented quickly – others would take years to complete. The Action Plan includes projects that span out to the year 2025.

Such extensive investment will likely require the support of the California Legislature, the Governor and possibly even voter approval. The remainder of this

chapter is dedicated to discussing three possible funding mechanisms for this investment. These funding mechanisms include the issue of general obligation (GO) bonds, raising the state gas tax, or imposing a per container fee on all cargo coming in and out of the Ports of Los Angeles and Long Beach. All three of these options will be examined using the criteria of (1) efficiency in terms of the least distortion it will impart upon California's market economy, (2) equity for those who would pay for the funding and (3) political feasibility of getting the option approved by the California Legislature and voters. After assessing how well each of the revenue options satisfies each of these criterions, I will recommend one policy alternative.

Evaluation Criteria: Efficiency, Equity, and Political Feasibility

Efficiency

Typically the efficiency criterion is one of the most important evaluative considerations when looking at imposing a new tax or fee. I use *efficiency* more or less as the term is used in economics, for maximizing the aggregate of individuals' welfare, or in other words, does it maximize the public interest? It is important that the funding mechanism chosen not disrupt or cause too many ripple effects in the California economy, and that the unintended consequences be minimal.

Equity

When a government seeks to raise a specific amount of money, who should pay the increase? Striving for equity is a vital component of what government is charged with. It will be imperative that whatever funding mechanism is chosen, it be as fair and

equitable as possible. I will examine equity under the lens of who will ultimately pay for the chosen funding mechanism and how well distributed the costs are.

Political Feasibility

A feasible policy must be politically acceptable, or at least not unacceptable. Political unacceptability is a combination of two things: too much opposition (which may be wide or intense or both) and/or too little support (which may be insufficiently broad or insufficiently intense or both). I will examine this criterion through the lens of likely Legislative approval and voter approval if needed.

General Obligation Bonds

Background on Bonds

The workhorse of the state's infrastructure budget is the general obligation (GO) bond. Since the late 1970s, bonds have significantly increased as a share of the state's capital spending, routinely accounting for more than half of the total since the mid-1990s. (Other sources include the state general fund, special funds, and the federal highway trust fund). Bond financing is a type of long-term borrowing that the State uses to raise money for various purposes. The State obtains this money by selling bonds to investors. In exchange, it agrees to pay this money back with interest, according to a specified schedule. The State has traditionally used bonds to finance major capital outlay projects such as roads, educational facilities, prisons, parks, water projects, and office buildings, that are infrastructure projects. This is mainly done because these facilities provide

services over many years, their large dollar costs can be difficult to pay for all at once, and different taxpayers' benefit from the facilities (LAO, 2006).

The State's cost for using bonds depends primarily on the amount sold, their interest rates, the period over which they are repaid, and their maturity structure. Most GO Bonds will be paid off over a 30-year period with level annual payments. Assuming that a bond issue carries a tax-exempt interest rate of 5%, the cost of paying off the bonds with level payments over 30 years is close to $2 for each dollar borrowed - $1 for the amount borrowed and close to $1 for interest. This cost, however, is spread over the entire 30-year period, so the cost after adjusting for inflation is considerably less – about $1.30 for each $1 borrowed (LAO, 2007b)

General Obligation Bonds are paid off from the state's General Fund, which is largely supported by tax revenues. They must be approved by the State Legislature with a two-thirds vote, signed by the Governor and placed on the ballot for voter approval because their repayment is guaranteed by the state's general taxing power. They must be approved by a simple majority of voters (LAO, 2007b).

In theory, we could fund all of our infrastructure needs upfront through the direct appropriations of taxes and fees under a pay-as-you-go approach without any borrowing. However, this is not realistic, given the large volume of our infrastructure needs, the importance of having the infrastructure available within the near future, and the substantial magnitude of tax and fee increases that direct appropriations would necessitate. Thus, although direct appropriations and renting/leasing may be able to play

an important role in addressing our infrastructure needs, borrowing through the use of bond financing has and will continue to play a significant role (LAO, 2006).

It makes sense to pay the extra cost of using bonds when this expense is outweighed by the benefits of having projects in place sooner than otherwise would be possible. This criterion is often met in the case of capital outlays, given the large costs of infrastructure projects, the many years over which they provide services and the substantial increases in taxes or charges that would be needed to pay for them up front. The need to use more bonds however does raise a number of other key questions (Public Policy Institute of California [PPIC], 2009).

As mentioned above, the state has increasingly relied on general obligation bonds to fund infrastructure projects and improvements. This funding approach does not provide a stable funding source for state infrastructure projects. Instead of being funded on a relatively steady basis, infrastructure programs must wait to see if a bond authorization is placed on the ballot and voters approve the measure. This has led to a "boom-bust experience" (LAO, 2011b).

Despite investments over the last decade, the state faces a growing backlog of deferred maintenance and aging infrastructure due to several factors. Much of the infrastructure in California was built decades ago and is approaching the end of its useful life. The need for renovation has been exacerbated because of insufficient spending for routine maintenance and repair of facilities. Lastly, policy and spending decisions have

tended to favor investments in new infrastructure rather than rehabilitation of existing systems (LAO, 2011b).

Increased Spending Provided Through Bonds

In recent years, a growing proportion of transportation infrastructure funding has come from GO bonds passed by the voters. Funding from bonds has increased from an average of 3% of total transportation spending at the beginning of the decade to an average of 21% in the last three years. This increase is due mainly to Proposition 1B (the $20 billion transportation bond passed in 2006). In addition, in 2008, voters approved Proposition 1A to provide $10 billion in bonds for high-speed rail and local transit systems. The state's increased reliance on bond funds to finance transportation projects will put additional pressure on the state's General Fund as these bonds are sold. The LAO estimates that the annual debt service on transportation bonds will increase from roughly $700 million in 2010-11 to $2.3 billion in 2020-21 if the state moves forward with selling already authorized bonds at the projected rate (LAO, 2011b).

How Much More Debt Can We Afford?

There is no accepted "rule" for how much debt is too much or how many bonds the state can "afford." Rather, this depends on policy choices about how much of our revenues to devote to the funding of infrastructure versus other state priorities, and also what level of taxes and user charges is appropriate for the funding of infrastructure. In addition, it depends on the state's ability to sell its bonds at reasonable interest rates in the financial market place (LAO, 2007b).

California's credit ratings currently are scored as A-, A1, and A-, respectively, by the nation's three major rating agencies – Standard & Poor's, Moody's Investors Service, and Fitch Ratings. Although these are all investment-grade ratings, they remain one of the lowest in the country. The state's current low ratings are principally related to factors other than the amount of debt outstanding – most notably its' continued projected imbalance between revenues and expenditures and the ongoing structural deficit this implies. It appears that the main adverse implication of the low ratings thus far have been the additional interest premium the state has had to pay on its new bond issues compared to what AAA-rated states pay (California State Treasurer, 2011).

Moody's Investor service calculates the ratios of debt to personal income and debt per capita for each state and publishes an annual report containing the median ratios. It is useful to compare California's debt levels with those of its "peer group" of the 10 most populous states. The debt to personal income and debt per capita ratios of these 10 states are, on average higher than the Moody's median for all states combined. California's ratios of debt to personal income, debt per capita, and debt as a percentage of GDP rank well above the medians for the 10 most populous states (State of California, 2010).

According to the State's 2010 Debt Affordability Report, from July 1, 2009 through August 31, 2010, yields on the State's tax-exempt GO bonds fluctuated considerably. Yields on these bonds ranged from a low of 4.82% to a high of 6.10%. Compared to benchmark "AAA" – rated tax-exempt GO bond interest rates, California had to pay 0.87% to 1.72% higher yields to investors. These higher rates are a direct

result of the state's low credit rating. Bond rating agencies cite several factors for California's continual ranking at the bottom. Including, the state's fiscal imbalance, cash flow weakness, California's inability to and willingness to raise revenues or reduce expenditures, Constitutional amendments that limit discretion over major portions of the General Fund spending, limited financial and budgetary flexibility and a political environment that makes timely and productive budget decisions difficult (State of California, 2010).

Affordability

Even if the state is able to market additional debt at reasonable interest rates, it still needs to be able make room in its budget to pay the added debt service. This is because for any given level of state revenues, each new dollar of debt service comes at the expense of a dollar that could be allocated to another program area, whether this is education, health, social services etc. Thus, the "affordability" of more bonds has to be considered not just in terms of their initial marketability, but also whether their debt service can be accommodated both on a near-term and long-term cumulative basis within the state's budget, given other spending priorities (LAO, 2007b).

Efficiency

Approving a $40 billion GO bond package could have a very serious impact on California's market economy. California's General Fund would be extremely taxed if we added an additional $40 billion in GO bond debt. On January 10, 2011, the Governor released the 2011-12 Governors' Budget shortly after assuming office. At that time, the

administration put the size of the budget problem facing the Legislature at $25.4 billion—consisting of an expected General Fund deficit of $8.2 billion at the end of 2010-11 (assuming no corrective actions by the state) and a $17.2 billion operating deficit in 2011-12. Adding sizeable debt service for new bonds would be virtually impossible at this time (LAO, 2011a).

As noted earlier, California continues to grapple with continual budget deficits and an economic recession. The Legislative Analyst's Office estimates annual budget problems of about $20 billion each year through 2015−16. Unfunded liabilities in pension and retiree health funds for state employees, teachers, and university employees now total $136 billion (LAO, 2010b). Moreover, as discussed previously, a major bond package would also be difficult to sell to investors. Many investors would be very leery of purchasing bonds of such magnitude when California's budget remains unbalanced and its economy is still in a major economic recession.

Equity

Approving only general obligation bonds to modernize the Southern California goods movement system and mitigate the detrimental air quality effects the ports cause would be virtually impossible and impractical. From an equity standpoint, the only payers of the bonds are California taxpayers. Because the debt service on general obligation bonds must come from the General Fund, it would severely impact the State's ability to pay its current obligations including education, corrections and health and human services programs. In addition, as previously noted, the Ports of Los Angeles and

Long Beach play a vital role in supplying the *entire* nation with the goods it desires. The 10,000-acre San Pedro complex moves a combined 160 million tons and $200 billion worth of cargo each year, more than 80% via containers. Between 40% and 50% of all imports that move through the San Pedro Port Complex are destined for delivery outside of California (O'Brien, 2004). This huge segment of exports that greatly impacts California with congestion and pollution would be able to use the improved infrastructure and facilities without helping to pay for its enormous cost. In essence, people in Nevada would continue to be able to purchase their cheap socks at Wal-Mart without paying for the infrastructure improvements and air quality mitigations needed in California where the merchandise arrived.

The budget crisis, compounded by the broader economic crisis, will limit the potential for increased reliance on state GO bonds as a strategy for rebuilding California's infrastructure. Additionally, it is not clear the voters recognize these tradeoffs. The "yes" campaigns for state GO bonds often tout them as not requiring tax increases. But a May 2007 Public Policy Institute of California (PPIC) statewide survey found that nearly two-thirds of residents knew very little (43%) or nothing (21%) about how the state bonds are paid for (PPIC, 2009)

Political Feasibility

It would be very challenging to get the political muster to put forward more GO bonds in these tough economic times, especially ones solely dedicated to Southern California. Education, social services, state parks etc. all took major cuts this year in the

state budget. It is difficult to go back to your constituency as an elected official and ask them to support more bonds which debt service would come directly out of the programs they support and care about. Furthermore, not all of the bonds that were approved by Prop 1B and 1A have been sold yet either, and the state's low bond rating would further damper support for approving more bonds. Unfortunately, this option does not hold much promise. Between the state's poor bond rating, only California residents paying for improvements and the payments would come at the expense of other vital programs, I do not believe the Legislature could garner enough support for this option. Many Northern Californians would not want their tax dollars going to improving goods movement in Southern California, no matter how well the arguments in favor were argued and ultimately seeing vital programs diminished all over the state to accommodate this new spending if taxes were not raised.

Gas Tax

The primary source of transportation infrastructure funding since the 1920s had been a per-gallon gas tax – a simple user fee that charges vehicles roughly in proportion to their road use. However, fuel taxes have declined in importance since the 1960s as a result of inflation and gains in fuel efficiency. Transportation agencies have made up the gap with other measures – notably, local sales taxes and state GO bonds – which do not create incentives to use transportation infrastructure more efficiently (PPIC, 2009).

According to the Department of Transportation's five-year maintenance plan, the state will need to spend an additional $3 billion annually over the next several years to

address all highway maintenance and rehabilitation needs. However, annual gas tax revenues will be insufficient to cover even these costs let alone any other major projects. The current gas tax of $0.18 per gallon went into effect in 1994. Since then, inflation has eroded the value of per gallon tax revenues by 29%. While travel on California's roads increased by 28% between 1991 and 2007, gas tax revenues (adjusted for inflation) have not increased. As a result, the revenue generated per mile traveled declined by more than 20%. In addition; the consumption of gasoline has declined every year since 2005. This results in lower gas tax revenue to the state as well (LAO, 2007b).

On state highways in the coming decades, vehicle miles traveled (VMT) are expected to continue to outstrip population growth under "business as usual" scenarios. In addition, goods movement on California's roads, spurred by the growth in port traffic, will continue to contribute significantly to the growth of VMT. Meanwhile, the number of state highway lane miles grew by only 6% between 1980 and 2006, contributing to increased congestion in the state's metropolitan areas. Congestion not only costs the economy in lost time, but by raising fuel consumption it also contributes to higher emissions (PPIC, 2009).

To address the shortfall between current gas tax revenues and the state's highway maintenance and rehabilitation costs, the LAO has recommend on several occasions the Legislature raise the gas tax. They have further recommend that the gas tax be indexed to inflation to prevent further erosion of the revenue over time. They estimate that the

current rate would need to be increased by $0.10 per gallon to fund current maintenance and rehabilitation needs alone (LAO, 2007a).

By increasing the gas tax to pay for the $40 billion in improvements in Southern California, this option would be more or less a pay as you go funding mechanism. The tax could be raised and the increased amount could be dedicated to the defined goods movement projects. The projects would be prioritized and the funding would be allotted each year based on the amount of revenue available and the list of prioritized projects, if they were ready to be funded/built or implemented. It would be up to the Legislature and Governor to decide how to structure the increase. It could be designed as a gradual increase, so not to shock California drivers.

Efficiency

The gas tax of $0.18 per gallon generated about $3.2 billion in 2009-10. Two-thirds of the revenues ($2.2 billion) were deposited into the State Highway Account (SHA) and one-third was apportioned for local roads – to be spent at the local level on city street maintenance, etc. Priority usage of the SHA is given to the Department of Transportation (Caltrans) for the administration and maintenance and repair of the state's highways (LAO, 2009). In order to start generating revenue on a large scale for new projects, when our current infrastructure is vastly underfunded, a rather significant increase in the gas tax would have to be approved, which of course would dramatically affect people's driving habits, disrupt businesses, and have a negative effect on California's struggling economy. Many would not be able to afford a large sudden

increase and the use of public transit would undoubtedly increase. Doubling the gas tax to 36 cents per gallon and using the additional $0.18 for goods movement improvements could generate as much as $3 billion per year, if the increase doesn't dramatically alter California's economy and personal driving habits. It is unclear how much an increase would alter the economy, but undoubtedly any increase would have ripple effects throughout the economy.

Equity

Unfortunately, increasing the gas tax would not spread the true costs of the needed goods movement improvements to all of the users, just those in California. Only Californians and those here on vacation that purchases fuel would pay the increase. Additionally, how much one drives does not equate with how much one purchases of products from overseas. The increase in fuel tax is a valid form of revenue for transportation related infrastructure but not a good proxy in this case. It would be far more equitable to find a funding mechanism that captured all the users of the ports – not just those here in California.

Political Feasibility

Gas taxes can no longer fund all transportation needs. California's gas tax has been $0.18 per gallon since 1994, yet raising it is politically unpalatable. User fees such as the gas tax provide multiple benefits – in addition to raising revenues, they encourage more efficient use of infrastructure, thereby lowering overall investment needs and reducing harmful emissions.

Both the Legislative Analyst's Office and PPIC have called to increase the gas tax on several occasions; however, it seems to have fallen on deaf ears in the California Legislature (LAO, 2011b; PPIC, 2009). Any increase in the gas tax would require a two-thirds vote of the Legislature and the Governor's signature.

To complicate matters further, almost all of the Republicans in California's Legislature have signed a "no tax pledge" sponsored by the Americans for Tax Reform which asks its signatories to "oppose and vote against any and all efforts to increase taxes" (Daily Caller, 2011). To obtain the needed two-thirds vote for a gas tax increase, every Democrat in the Assembly and the Senate would have to vote in favor of it, along with two Republicans in the Assembly and two in the Senate. Because the tax has not been increased since 1994, the chance of getting this approved seems to be virtually nonexistent.

Port Container Fee

A user fee levied on each incoming and outgoing container at the Ports of Los Angeles and Long Beach is a viable alternative for creating significant investment in the area related to goods movement. If a fee was established of just a nominal amount of $30 per TEU, it would generate approximately $420,000,000 in its first year for goods movement improvements (approximately 14,000,000 total T.E.U.s processed in 2010 by the Ports of Los Angeles and Long Beach multiplied by $30) (The Port of Long Beach, 2011; The Port of Los Angeles, 2011).

By charging a fee on containerized cargo, you could also stipulate that the funds go into a "special fund" which could not be transferred to the state's General Fund. Additionally, existing law sets forth the duties of the Infrastructure and Economic Development Bank, which already handle large financing transactions for the State, including the issuance of bonds. A container fee could be structured in a manner that authorizes the California Infrastructure Bank to issue revenue bonds for the infrastructure and air quality projects to be paid by the revenue from the container fee, in order to expedite projects and eliminate time for waiting for enough money to come in from the fee to begin construction on multi-million dollar projects.

SB 974 authored by Senator Alan Lowenthal was introduced February 23, 2007, which would have levied a $30 per container user fee on each shipping container processed through the Ports of Los Angeles and Long Beach. Half the fee would have gone to container related goods movement infrastructure projects that improved the overall efficiency of container cargo movement to and from the ports by improve the rail system, including rail grade separations and on-dock rail facilities at the ports. Additionally, half of the fee would have gone to projects that reduce air pollution caused by the movement of container cargo to and from the ports (Assembly Committee on Transportation, 2008a).

Efficiency

A container fee would be the most efficient out of the funding options examined. The fee is directly targeted at the problem and will likely create the fewest distortions

into the economy. Because the fee will be spread among all users nationwide, California's taxpayers will only pay their share and not the entire country's share unlike the gas tax increase or general obligation bond methods. Additionally, because this could be designed as an ongoing fee, revenues would be constant and consistent and allow projects that may take a decade or more to complete to be authorized as well.

An ongoing dedicated stream of revenue would be most preferable because despite investments over the last decade, the state faces a growing backlog of deferred maintenance and aging goods movement infrastructure. A container fee would be able to fund the needed new goods movement related projects as well as help fund the backlog of maintenance needed around the ports – including freeways, and bridge maintenance that has been highly degraded to the large increase of traffic over the last 10 years and lack of funding for maintenance.

Equity

The container fee approach is also by far the most equitable in terms of those that would pay the fee. The users of the ports – including multi-national billion dollar companies like, Wal-Mart, Target, Home Depot, etc. would pay the most by a per container fee since they use the ports the most by volume. Additionally the costs associated with the improvements would be spread amongst all users of the facilities – including those that leave California. As previously mentioned, up to 50% of the goods arriving at the Ports ultimately leave California. This type of fee would ensure all that use and benefit from the country's largest port complex pay for the damage done both to

the infrastructure, congestion and poor air quality in the region. The taxpayers of Californians would not be the only ones paying for the improvements, unlike the GO bond option and in most cases (tourists and visitors would have to pay the increase if they purchased fuel in California) an increase in the gas tax.

Political Feasibility

SB 974 was passed by the California Legislature on August 5, 2008 with minimal bipartisan support. One Republican Assemblymember Bob Huff, and one Republican Senator Bob Margett supported the measure (Assembly Committee on Transportation, 2008b). Despite its enormous support including numerous cities (Burbank, Long Beach, South Gate, for example) and dozens of environmental organizations, school districts, labor organizations and even the Orange County Tax Payers Association, it was ultimately defeated with a veto. The opposition was even bigger including the California Chamber of Commerce (Cal Chamber), and virtually every big importer in the state, including Nike, Wal-Mart, Target, Home Depot, etc. (Assembly Committee on Transportation, 2008a).

The two republicans that voted for the measure were from the same area of the state – Los Angeles and Orange County. They witnessed personally how heavily impacted their districts were from the Ports and how desperately needed these projects were. Fortunately, at the time, the vote threshold for this measure was only a simple majority because California's Constitution at the time required only a simple majority for fees charged with a direct nexus to what the fee is prescribed to be used for. For a

revenue to qualify as a fee rather than a tax (which requires a two-thirds vote of the Legislature) there has to be a clearly established nexus between the revenue enacted, and the service or product delivered. This may be perhaps the fairest method of gathering revenue, as it is only collected when a specific benefit is accessed. For example, when you enter a state park, you pay a fee for services: ranger patrol, drinking water, toilet facilities, etc. If you don't go to the park, you don't pay the fee (Secretary of State, 2010).

Because Republican Caucus Chairman (at the time – he is now Senate Republican Caucus Chairman) Assemblymember Bob Huff was heavily criticized by fellow Republicans for voting SB 974 – which the opposition had labeled as a "job killer" he responded with an editorial, printed in the "Flash Report" –a conservative daily column. He stated in is response,

> To say traffic congestion grips our state would be an underestimate. It is choking the lifeblood out of California…Traffic congestion knows no social, political or ideological boundary…SB 974 will generate over $400 million per year in new revenue for the container traffic that is choking our freeways, and creating longer and more frequent trains that divide our communities. Almost half of this train and truck traffic travels east of the Rocky Mountains, and another 15% travels north of the Los Angeles basin. That means it is the consumers of those products that will eventually be paying their fair share of this congestion relief container fee. I know of no other source of potential funding for our local transportation

> projects in which such a low percentage of the funds come from our own local taxpayers. There is a clear justification to put a fee on those containers to help unite, not divide our impacted communities. This new transportation revenue source will help ease congestion on our freeways, will improve safety and wait time at rail crossings, and yes, will reduce the particulate air pollution that is probably causing the high asthma and other health problems clustered around our ports, railways and freeways…Being a fiscal conservative has to include more than just saying no. We must bring solutions to the table as well. By voting for SB 974, I am saying yes to commerce, yes to jobs, yes to better health, and yes to traffic congestion relief. (Huff, 2008, paras. 1, 11, 16)

All of the above three options for financing goods movement infrastructure and air quality mitigation would now require a two-thirds vote by the Legislature. Although SB 974 was passed in 2008 with only a majority vote requirement, today it too would be a two-thirds vote. Proposition 26 which was passed by California voters on November 2, 2010 restricted the Legislature's ability to pass fees as a majority vote. The initiative broadened the definition of a state or local tax to include many payments that had been considered to be fees or charges. As a result the measure increased the number of revenue proposals subject to the higher approval requirements. Generally, the type of fees and charges that became taxes under the measure is ones that government imposes to address health, environmental, or other societal or economic concerns. These types of fees pay for many services that benefit the public broadly, rather than providing services

directly to the fee payer. The state was using these types of regulatory fees to pay for most of its environmental programs. Now a two-thirds vote would be needed to enact, or increase any of those fees (Secretary of State, 2010). Of course any controversial measure, which requires a two-thirds vote, is very difficult to achieve. A container fee would be no different.

Conclusion

It is clear that an ongoing, dedicated stream of revenue is needed to improve California's goods movement infrastructure and to ensure the vitality of the Ports that are a major economic engine for the State and Nation. All of the options discussed as a means for generating revenue for these needed improvements have their benefits and limitations. However, in my opinion, a container fee is the most equitable, efficient and possibly politically feasible since two Republicans have gone on record in supporting it, and we now have a Democratic Governor who may be more inclined to support something like this, especially since he was the Mayor of Oakland which also has a port. Additionally, because it is new revenue – it would not limit the Legislature's spending ability unlike GO bonds. Most importantly it is the most equitable. Currently millions of TEUs are shipped out of state and the end users pay nothing towards the infrastructure and air quality mitigation needed. A container fee would be paid by all users of the Ports, not just those in California. Californian's would only pay their share and not be strapped with the entire bill.

According to the Los Angeles Economic Development Corporation, there needs to be a minimum of $10.5 billion in investment in Southern California to improve railroads, rail yards and highways to keep up with surging international trade or risk looking more than 500,000 new jobs and more than $1 billion in tax revenue a year. Inefficiencies in the freight transport system are clearly costing our state in lost economic productivity and health costs. A container fee has the potential to raise the needed revenue, will allow California's largest ports to remain number one in the country and help mitigate the damaging air quality problems associated with goods movement (Assembly Committee on Transportation, 2008a). Although it would be a two-thirds vote bill, all tax increases, bonds and virtually all fees now are as well. It may have the most political feasibility because the equity of who would pay the fee is far greater than a gas tax increase or new GO bonds. It would require a great amount of work, coalition building and public awareness and support to garner the needed two-thirds vote, but may be possible.

Multi-national billion dollar corporations continue to be able to use our facilities, roads, and infrastructure, pollute our air, increase public health costs due to increased cases of asthma and missed school days at no expense. It is time they too paid their fair share. Because the Ports of Los Angeles and Long Beach are economic engines for the entire country, it is logical and fair that **all** that use the facilities pay their fair share – a container fee does just that.

The final chapter of this thesis includes thoughts from Senator Alan Lowenthal (D- Long Beach), the Senator who introduced the bill that would create a container fee on incoming and outgoing cargo in the Ports of Los Angeles and Long Beach and his views as to why this measure is so desperately needed and how he came to the idea etc. Additionally, the thoughts of Jesse N. Marquez, the Executive Director of Coalition for a Safe Environment (CFASE) will be included. Marquez, a lifetime Wilmington resident, founded CFASE in April 2001 as a committee to investigate Port of Los Angeles expansion projects, environmental and public health impacts on Wilmington residents, and the local Harbor community. CFASE works to mitigate, reduce, and eliminate public exposure and public health impacts caused by air, land and water pollution generated by the Ports of Los Angeles and Long Beach, international cargo, cruise ships, the petroleum industry, energy sources and the goods movement transportation industry in general (Impact Project, 2011). His input on the container fee is unique in the sense that he has lived near the Ports his entire life and has seen firsthand the devastating health effects they have had on the communities surrounding them. He is by many accounts a well-respected environmental justice advocate and grass-roots organizer that has had a tremendous impact on his community.

I also examine more thoroughly the opposition's arguments primarily centered on a container fee increasing diversion from the Ports of LA and Long Beach, which will cost California jobs. In addition, the conclusion will offer some advice on strategy on how to garner enough support for a container fee, and which Republicans would be likely

supporters of the measure and may offer assistance to get to the needed two-thirds vote threshold.

Chapter 5

CONCLUSION

In this concluding portion of my thesis, I include a transcript of two interviews I conducted regarding SB 974, and its benefits and limitations. I also discuss some of the main opposition's arguments to the container fee introduced by Senator Lowenthal, two elasticity studies which refute some of those arguments, how much public support there was for the container fee and offer some political strategy for how a container fee may be politically viable, and who would need to be engaged throughout the process to ensure success.

Interviews with Prominent People Regarding SB 974

I thought it would be very insightful and helpful to include portions of interviews I conducted with Senator Alan S. Lowenthal (D-Long Beach) and Jesse Marquez with the Coalition for a Safe Environment. Both of these individuals help to provide insight to the need for a container fee, the environmental problems associated with the Ports of LA/Long Beach, and what the benefits and limitations of a container fee would be. They each have a unique perspective on the issue; one from a political background and the other an environmental justice background which is often at odds with government and industry in general.

Senator Alan Lowenthal (D- Long Beach)

1. How long have you lived in Long Beach?

A: 42 years

2. When did you start noticing how much air pollution the Ports of LA/LB were creating?

A: It was when I first ran for public office. It was 1992, and I was running for Long Beach City Council. I was going door to door and speaking with potential voters, after I gave my introduction, one of them said "That's nice Alan, but come here" (and we went over to his windowsill and he rubbed his finger on it and showed me this black gunk) and asked me "What is this"? He said he has to clean his patio furniture weekly because it gets covered with this black powdery substance. I said I didn't know, but that I would find out. I soon discovered it was petroleum coke (a byproduct of the oil refining process). I learned that petroleum coke was shipped to the Ports and stored in massive piles (hundreds of feet high) and then eventually loaded on a ship and taken to Asia. However, while it sat at the Ports, it was uncovered and the daily winds blew this fine particulate all throughout the west side of Long Beach. It was then that I first learned about the Ports' activities and the fact that the Ports of Long Beach and Los Angeles was the largest port complex in the nation (at that time moving about 3 million containers combined, now it is roughly 14 million).

3. How did you come up with the idea to introduce a container fee?

A: It was the confluence of a few issues. First, I had been in the Legislature a few years and had introduced some bills to reduce pollution at the ports. AB 2650, which was signed by the Governor, reduced the idling of trucks waiting to enter the ports and AB

2042, which was vetoed, would have basically capped the emission rates at the Ports. Over the years, I had learned just how unhealthy the levels of pollution coming from the ports were. It was not only the ports, but also pollution centers including the rail and truck corridors that linked the ports to various distribution centers. In addition, the state was hitting a tough economic time, after the "dot.com bust" and California was in dire need for infrastructure funding. Additionally, in the post-9/11 era, the word "security" meant a lot more and with the ports of LA/Long Beach being responsible for about 40% of the nation's cargo, it was even more important to provide them security funding. Security funding for the ports was especially important after Congress gave more port security funds to South Dakota and Martha's Vineyard than the Port of Los Angeles. If something was to be done, I realized it had to be done in California. So, after the Governor vetoed AB 2042 in 2004, I had some conversations with my staff and an attorney for the NRDC about levying a fee on containers moving to and from the ports for infrastructure, air quality improvements and security.

4. *What do you see as the main benefit(s) for a container fee as opposed to trying to increase the gas tax or pass additional GO bonds to pay for the needed infrastructure improvements needed around the Ports and for Goods movement in general in California?*

A: To me it's very simple. If you use a system and later you find out that that system needs to be upgraded (from an infrastructure and air quality perspective), then the

user should pay for the upgrades. The Ports of Los Angeles and Long Beach are responsible for approximately 40% of all seaborne cargo coming to the United States. The cargo arrives at the ports, goes to one of 10,000 distribution centers in Southern California and then gets re-shipped to the rest of the country. With the approximate value of that cargo in 2007 at about $300 billion, a $30/TEU fee would generate a little under $500 million a year, it makes sense that the users' of this international cargo moving system – ultimately the consumers of these goods should pay a few cents more per item for their goods in order to improve that very system and to reduce the pollution coming from it. The current system is responsible for about 4,000 premature deaths each year.

Increasing the gas tax would also be a two-thirds vote in the Legislature and given the partisan divide and the Republican pledge to never vote for any tax increases ever, I don't give the gas tax option a lot of consideration. Besides, motorists throughout the state would be paying for it and while many would benefit from the improved air quality, far fewer would benefit from the improved infrastructure.

As far as bonds go, we did pass a G.O. bond in 2006 and as Chair of the Senate Transportation Committee I was instrumental in securing $2 billion for goods movement infrastructure and $1 billion for air quality improvements. However, the need for funding is much, much greater, about $30 billion for infrastructure and $10 billion for air quality improvements.

I believe in and often speak to stakeholders about what I refer to as the "three legged

stool" when it comes to goods movement: the federal government, the state government and the private sector. The G.O. bond in 2006 was a generous gesture on behalf of the taxpayers of California for the State's part. It would be wonderful if the Federal government got involved, however they're still out of the picture, and lastly I view the container fee as the private sector's share. I never envisioned the container fee covering all of the goods movement needs in California. By my rough calculations I envisioned a scenario where the container fee could be bonded against (this type of revenue bond would not need a vote of the people) with about a maximum of $7 billion in principal (projects), with half going to infrastructure and half going to air quality.

5. *Now that a container fee would be a two-thirds vote because of Prop 26, do you think the idea is dead, or is do you think there is any way to achieve the needed two-thirds vote?*

A: It's alive but barely. As a result of Proposition 26, any container fee would need a two-thirds vote of the Legislature and I was lucky to get 22 in the Senate and 46 in the Assembly, let alone the 27 and 54, which we would now need. The Republicans in the State Legislature have signed "No Tax" pledges vowing never to vote for a tax increase -ever. Before Proposition 26, the container fee was a fee, however, now it would be labeled a tax, thus need a two-thirds vote.

The sad part is, with the 2010 election we finally got a Governor that would be more receptive to the concept at the same time the voters altered the state's constitution

with Prop. 26, – severely limiting the Legislature's ability to levy fees of any kind. At this time, I just don't think it would be possible unless it had bipartisan support and was revenue neutral. That is, it would be part of a deal that other port expenses would be reduced equal to the container fee.

Jesse Marquez, Executive Director of Coalition for a Safe Environment

1. How far from the Ports of LA/LB do you live?

A: I live four blocks (0.5 mile) from the Port of Los Angeles and approximately 25 blocks (three miles) from the Port of Long Beach.

2. How have you seen the Ports affect the area you live in?

A: The Ports are not an economic engine for everyone. If you are not employed by the ports, importers, retailers, longshoremen or construction you do not receive any benefit except cheap imported items which have other significant negative impacts on you.

The Ports have deprived me, my family, and my community of our rights to:

- Good quality of life
- Clean air
- Good health
- Clean environment
- Noise free neighborhood
- Freedom from light pollution
- Truck traffic free streets, freeways and highways
- Safe community
- Hazard free community
- Community land for public parks, recreation, housing, local commercial development, public schools
- Good quality government

1. *What are the benefits/limitations of implementing a container fee to do infrastructure improvements and air quality improvements like SB 974 would have done?*

A: The benefits include:

a. All goods movement industry transportation infrastructure costs should be paid by the goods movement industry, not the public.
b. All goods movement industry negative public health & health care cost impacts should be paid by the goods movement industry.
c. All goods movement industry air quality and environmental negative impacts should be paid by the goods movement industry.
d. All goods movement industry public safety negative impacts should be paid by the goods movement industry.

The limitations include:

a. The proposed container fee in SB 974 is an arbitrary number and not based on an economic assessment.
b. The SCAG study you cite failed to include a comprehensive assessment of all public costs, so the cost or fee would probably be closer to $300-$500 per TEU.
c. There has been no unbiased state commissioned comprehensive container fee assessment study.
d. A low fee stops and/or delays the complete mitigation of the Ports and goods movement industry.

e. The Ports and goods movement industry find innovative ways to still screw the public. An example is the Port of Long Beach paid 100% for the construction of the Gerald Desmond Bridge from Terminal Island to Long Beach and the Long Beach Freeway and owned it. The Port of LB has now transferred the ownership of the bridge to Caltrans in order to replace it. Guess who now is going to pay the $1.1 billion to replace it? You, me, and every Californian, so that the private goods movement industry gets a new expanded truck route to and from the Ports of LA/LB. Not one elected official opposed it.

Opposition to SB 974

The primary opposition to SB 974 – Senator Lowenthal's (D - Long Beach) container fee bill was centered around the presumed diversion and associated job loss from the Ports of Los Angeles and Long Beach. The California Chamber of Commerce was one of the main opponents, calling the bill a "job killer." They claimed that SB 974 would put California's largest ports at a "disadvantage in the goods movement arena because no other port facilities in the state or nation would be subject to this tax. The economic impacts of this type of unique tax, while unknown, are potentially disastrous for the state of California" (Schmelzer, 2007). Additionally, a large coalition of importers including Wal-Mart, Nike, Rite-Aid, Linens-N-Things and dozens of others, further elaborated their opposition with similar if not identical comments. They claimed that the measure was an inappropriate means of financing the infrastructure improvements and environmental mitigation projects needed for California's growing

population and economy. They insisted in their opposition letter to the proposed container fee, that because international trade follows the path of least resistance, that any additional discretionary costs will cost diversion from the Ports of LA/LB and ultimately California jobs (Coalition Opposed to SB 974, 2007).

Unfortunately, the opposition was never able to fully argue where this diversion would go. The Ports of Oakland and Seattle are too small to handle the amount of cargo LA and LB do. Additionally, as previously discussed in Chapter 1, the Panama Canal has severe limitations on what kind of shipping vessels will fit through it. The Panama Canal's severe limitation on vessel size is one reason the ports of L.A. and Long Beach continue to flourish. These two ports are very deep and don't have the size restrictions the Canal does, nor any height limitations on bridges to go under like San Francisco (The Golden Gate Bridge), Oakland (The Bay Bridge) or Panama (The Bridge of Americas). Ships coming in have deep water, virtually no size limitations and no bridges to navigate under when accessing the San Pedro Bay Ports. This is why in part as discussed further in the chapter; two elasticity studies found that the demand for the Ports of LA/LB is fairly inelastic even with a container fee imposed.

The California Taxpayers' Association also led a portion of the opposition, their arguments were undeniably true. They posited that the fee payers under SB 974 are those that pay shippers (multi-billion dollar companies like Wal-Mart, Target and Home Depot are some examples) to transport their goods; "they receive no benefits from helping the state to meet air pollution standards already required by law" (Casazza, 2007, p. 1).

While this statement is factually true, it fails to address the fact that as previously discussed in depth in Chapter 2, the Ports of Los Angeles and Long Beach represent the single largest source of air pollution in Southern California. More than 90% of emissions of harmful particulate matter at the ports come from ships, container handling equipment, and trains and trucks handling containerized cargo (O'Brien, 2004). While the shippers would not receive a direct benefit from the fees imposed, they are the direct problem the container fee is aimed at addressing. The purpose of regulatory action is to make sure that the negative impacts of port operations, if not controlled through the market, are addressed through legislation. The goal for this particular government intervention is to ensure that the benefits of the ports are not outweighed by their environmental impacts.

Elasticity Studies Refute Opposition Claims

Two elasticity studies were conducted between 2005 and 2006 examining instituting a port container fee at Los Angeles and Long Beach, specifically looking at diversion rates and what different levels of fees would likely do to incoming cargo rates at the ports. One was commissioned by the Southern California Association of Governments (SCAG) and funded in part through grants from the United States Department of Transportation and the Federal Highway Administration. The second was commissioned and funded by the Natural Resources Defense Council (NRDC) and the Coalition for Clean Air.

The elasticity study commissioned by SCAG was conducted in 2005 and examined in depth questions relating to port diversion if a Port User Fee (PUF) was

enacted at the San Pedro Bay Ports (L.A and Long Beach). The study determined the economic viability and impact on demand for the San Pedro Bay Port services if additional PUFs to fund the transportation infrastructure improvements (primarily rail grade separations) needed along with environmental mitigation were imposed. It also studied the anticipated diversion rates with investment in congestion relief, including many of the same projects listed in the SCAG Multi-County Goods Movement Action Plan that I used as my basis for needed investment.

Their study concluded that imports at the Ports of LA/LB are fairly inelastic until fees in the range of $90 per TEU are introduced. At that point, they projected total inbound cargo volume to decline by about 13%. At the $240/TEU point their model predicted that virtually all container traffic had been rerouted to other ports.

The Southern California Association of Governments study is also helpful because their study indicated that funding congestion relief (not just air quality mitigation and grade separations) with the PUF makes the LA/LB ports *more* attractive to importers. Even a fee of $150/TEU, total inbound freight is higher than for a $0 fee in the "As-Is Scenario" (no improvements, business-as-usual). A congestion relief scenario was also studied where proceeds from the assessment of container fees are used to retire the bonds on major port access infrastructure improvements, including dedicated truck lanes from the ports to the warehouse district, and rail mainline and terminal improvements permitting more reliable service. These improvements in infrastructure would substantially reduce the duration to complete store deliveries from incoming cargo ships.

The analysis indicated that estimates of the mean would drop by one day and the standard deviation would drop by 0.4 days. Moreover, a major program of capacity improvements to main rail lines in Southern California, plus the addition of substantial new rail terminal capacity would improve the reliability of the entire goods movement system in Southern California thus making the system work better and more efficiently for all importers. They concluded that the values of the reductions in transit time and transit time variability are more valuable to large, nationwide importers than a $100/TEU fee.

The study also concluded that it would be important that any PUF be assessed against *all* containers entering the San Pedro Bay Ports regardless of landside mode or destination. The most effective fee collection point is at the dock as an additional port charge. This approach would ensure that all inbound loaded containers are equally accessed a fee and that no transportation mode is exempted. In this way, the competitive place of all transportation providers will remain unaffected by the fee. Moreover, the revenue collected for a given fee value will be maximized. Attempts to collect fees further down the supply chain entail all the risks of missed revenue plus the potential to unintentionally divert shipments from one transportation mode to another (Leachman, 2005).

The second elasticity study conducted in tandem by the Natural Resources Defense Council and the Coalition for Clean Air in 2006 found similar results. Their analysis showed that a $30/TEU PUF (as in SB 974) implemented at the Ports of LA/LB will have very little effect on ship diversion rates from those ports. The voyages to the

Ports of LA/LB demonstrate exceptionally strong demand to use these particular California ports for containerized cargo logistics, primarily due to the ancillary benefits of these ports (i.e., landside logistics, access to markets, cargo handling capabilities etc.). The study further noted that a $30/TEU PUF would increase voyage costs to LA/LB by only 1.5-2.5% on average. These minimal increases (particularly for voyages coming from Asian ports) would induce diversions of less than 1.5%. Placing these diversion estimates in the context of growth forecasts at the Ports of LA/LB make any diversion impacts from a $30 PUF negligible. The study also stressed they thought their conclusions to be conservative. That is, diversion will likely be less than estimated in their analysis (Corbett, Winebrake, & Green, 2006).

These two elasticity studies offer strong evidence that the opposition's arguments are weak. The diversion created by a container fee would likely be negligible because the Ports of LA/LB offer so many benefits to shippers and all of the investment in the area in the form of warehouses and distribution centers. It is clear that as long as a container fee was not priced higher than the recommendations made in the studies, that shippers would not only pay the fee as opposed to diverting cargo but actually *benefit* from better and more efficient infrastructure to move goods quickly.

Public Support

California residents strongly favored a container fee in 2008 when the Public Policy Institute of California asked a question about container fees in their 2008 Statewide Survey. They asked respondents "To help relieve traffic congestion at

California's major seaports, and to help clean up air pollution caused by port traffic, would you favor or oppose charging a container fee on owners of cargo moving through these ports?" Six in 10 Californians (61%) and likely voters (57%) favored this proposal. Democrats (69%) and Independents (59%) were much more likely than Republicans (48%) to express support (PPIC, 2008). Garnering public support and using the dozens of organizations that would likely support a container fee again (for example, Sierra Club, Natural Resources Defense Council, Community Action to Fight Asthma, California Nurses Association, Breast Cancer Fund) to activate their supporters/members in a statewide outreach would be critical. Virtually all these organizations could enlist their members to send letters and make phone calls to their Legislators. Public support would have to come in strong to outweigh all of the business opposition. It would be crucial for Legislators to hear from their constituents that this was an important issue and necessary for them to support the bill.

Republican Support

As previously discussed, the passage of a container fee now would have a two-thirds vote requirement due to the passage of Proposition 26. Senator Lowenthal's office received confirmation of this through a Legislative Council Opinion that opined, in fact, it would be a two-thirds vote and would no longer be considered a fee but a tax under current law, thus requiring the increased vote threshold. This more than likely would require some Republican support. If the current makeup of the Legislature stays the same after the 2012 redistricting and subsequent elections, then at minimum it would require

two Republicans in the Senate and two in the Assembly to vote for the measure *if* all the Democrats supported it. The primary Republican that would need to be a part of any container fee strategy would be Senator Bob Huff. As previously mentioned in Chapter 4, then Assemblymember Bob Huff (R- Diamond Bar) voted for SB 974. Unfortunately, the other Republican that supported the measure (Senator Bob Margett) has since been termed out. It would be imperative that Senator Huff be involved with any container PUF legislation. As the Senate Republican Caucus Chair, he would be in an ideal position to try and persuade other Republican members to support the measure.

In addition, other possible Republican supporters may include Senator Tom Harman (R-Huntington Beach), and Senator Sam Blakeslee (R-San Luis Obispo). Senator Harman will be termed out at the end of 2012, but for the remainder of his term, he could be a potential ally. His district is heavily impacted by goods movement; he has supported controversial, pro-environmental bills in the past, and is seen as a "moderate" in his caucus. He also sits on the Senate Transportation and Housing Committee, so he is intimately familiar with the State's infrastructure needs and the immense investment needed in the goods movement sector.

Senator Blakeslee from San Luis Obispo would be another target for support that should be a part of this strategy. His district includes parts of Monterey, Santa Cruz and Carmel – all very liberal cities by any standard. He consistently votes for pro-environment bills. His district is by far the most liberal of any Republican seat in the Senate. Although he is not from Southern California, because of the massive

environmental support that would likely follow a container fee bill, he may support it because his district would. Additionally, his district may become even more liberal through the redistricting process, so he will be even more likely to support such a measure in 2012 after the redistricting process has been completed in order to be re-elected.

It will likely be up to the Senate Republicans to court or help persuade Assembly Republicans into supporting a port container fee. Almost everyone who works in or around the Capitol could attest to the fact that Senate Republicans are far more moderate and independent from party politics than Assembly Republicans. If Senator Huff could reach out to Assemblymember Curt Hagman (R-Chino Hills) who represents the same district Senator Huff did in the Assembly (he would likely be the candidate to replace Senator Huff when he terms out in 2016) it would go a long way. Senator Huff could explain to Assemblymember Hagman why he supports the bill and show that there was no political fallout for supporting the bill in 2008. Senator Huff ran for the State Senate in 2008 after voting for SB 974, and won easily.

The other Republican Assemblymember that I would consider being a possible supporter of a PUF would be Kevin Jeffries (R-Riverside). Jeffries has resided in Riverside County since 1971. As previously noted in Chapter 2, Riverside County and City bear many of the burdens associated with the goods movement industry from the Ports of LA/LB. There are 61 mainline at-grade rail crossings in Riverside County alone. The average crossing is blocked one hour and fifty minutes per day and is projected to

grow to three hours and forty minutes by 2030. Ten of the 61 at-grade crossings are blocked three hours per day including all of the crossings in down town Riverside (the City). Additionally, if grade separations are not constructed, these crossings are projected to grow to six hours and fifteen minutes per day by 2030.

In fact, Riverside Mayor Ron Loveridge has called grade separations the most important public policy issue before Southern California (Gang, 2008). In the City of Riverside, trains delayed firefighters and police nearly 500 times at the 26 crossings in the City limits between 2002 and 2007 (Gang, 2008). Support from Jeffries's cities and the fact that he was a volunteer firefighter for many years may lend him to support the bill as well. He also is the Vice Chair of the Assembly Transportation Committee and sits on the Select Committee on Inland Empire Transportation Issues. He is very familiar with the devastating affects the Ports of LA/LB are having on his communities and how desperately the grade separations and other mitigations are needed (Assembly Republican Caucus, n.d.).

Final Thoughts

The State's economy and quality of life depend upon the efficient, safe delivery of goods to and from our ports and borders. At the same time, the environmental impacts from goods movement activities must be reduced to ensure protection of public health.

The goods movement and logistics industry is an increasingly important sector of good jobs for Californians. It is vital to grow the industry by improving the essential infrastructure needed to move goods from California's ports throughout California and to

the rest of the country. Improving the goods movement infrastructure also is pivotal to relieving congestion on freeways and increasing mobility for everyone in California.

Additionally, improving goods movement infrastructure will also help California meet its Greenhouse Gas reductions. On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: (1) 2000 levels by 2010, (2) 1990 levels by 2020, and (3) 80 percent below 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of AB 32, the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that the ARB create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost effective reductions of greenhouse gases" (ARB, 2009, para. 1). Executive Order S-17-06 further directs State agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98% of California's GHG emissions are from the burning of fossil fuels and 40% of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.

One of the main strategies in the Caltrans Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest

levels of carbon dioxide (a known GHG) from mobile sources, such as automobiles, occur at stop-and go speeds (0-25 miles per hour [mph]) and speeds over 55 mph; the most severe emissions occur from 0-25 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions (City of Colton, 2011). This includes areas that are heavily impacted by at grade rail, where trains disrupt the flow of traffic continually.

As discussed previously, the purpose of the grade separation projects is to alleviate existing and future rail congestion. By increasing the average train speed in the project areas the grade separation projects would reduce the grade-crossing signal system gate down time and on-road delays at nearby at-grade rail crossings.

The construction of rail grade separations has multiple benefits including reducing air pollution and greenhouse gas emissions since vehicles will no longer be forced to idle for trains at the at-grade road/rail crossing. For example, just one at grade rail crossing in the City of Riverside (previously, noted as being heavily impacted by the goods movement industry); the intersection of Magnolia Avenue currently carries a total of about 25,000 vehicles per day. This segment of the Union Pacific rail line is used by 47 freight trains and 12 passenger trains daily. The rail traffic causes approximately 137 minutes of traffic delay per day on Magnolia Avenue. Between January 1, 2003, and May 2007, Riverside Fire Department emergency response vehicles and American Medical Response ambulances were delayed 44 times with an average delay of 3.25 minutes by trains blocking traffic at this crossing alone. Completing just this one grade

separation will also eliminate over 16.8 tons per year (based on 2030 projections) of greenhouse gases generated by idling vehicles delayed by trains (City of Riverside, 2011).

A container fee in my opinion would be an extremely valuable tool to help California's ailing goods movement infrastructure, improve congestion, public safety and provide for the needed air quality mitigation. It would be the most economically efficient and equitable way to pay for the needed improvements. By spreading the costs evenly by all users and consumers of imported goods, it would provide the needed funding quickly and provide a dedicated and consistent revenue stream for projects that could take more than a decade to complete. Additionally, with the right strategy in place and a large coalition of supporters engaging their membership to engage the public it could be possible to pass a container fee even with tremendous business opposition and a two-thirds vote requirement. It is the right thing to do for California's environment and economy. Although most would consider passing this type of legislation to be a "long-shot," including Senator Lowenthal, I think it's worth the risk.

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