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Responding to Increasing Port-related Freight Volumes:

Lessons from Los Angeles / Long Beach and Other US Ports and Hinterlands

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The views expressed in this paper are those of the author and do not necessarily represent positions of the University of Southern California, California State University, the OECD or the International Transport Forum.

ABSTRACT

Rapid growth in international trade over the last two decades has generated both benefits and costs. Costs have become increasingly visible in metropolitan areas -- growing congestion, air pollution – and local communities are demanding solutions. Congestion and air pollution associated with increased international trade have become so severe in the Los Angeles region that port-related trade is facing increased regulation by both state and local agencies. Historically US ports have been remarkably autonomous. Their role as economic development engines is well-recognized by local leaders. Thus recent regulatory efforts represent a significant change in public policy.

This report begins with an overview of trends in port-related trade and its impacts on US metropolitan areas, and discusses changing public perceptions of port-related trade as impacts have increased. Using Southern California as a case study, the report examines responses by the ports, terminal operators, and allied industries to a changed regulatory regime. Two examples are discussed in detail: 1) a state regulation requiring appointments or extended hours at terminal gates, and 2) the OFFPeak extended gate hours program. We use a political economy framework to explain outcomes. I describe the main economic actors and their competitive positions, and we explain the key aspects of the US regulatory system affecting these actors. Those with significant market power within the international trade supply chain were successful in staving off several regulatory attempts to force changes in operating practices. When regulations were imposed, they were able to structure responses to protect their economic interests. Results suggest that "dominant actors" – ports, terminal operators, steamship lines, and their major clients – will continue to be a strong influence in efforts to solve trade-related environmental problems.

1. INTRODUCTION

Economic restructuring and globalization have vastly increased the volume of both domestic and international trade. With the growth in trade, nodes in the global transport network – especially seaports and airports – are experiencing rapid growth of traffic volumes as well as economic activity. Large metropolitan areas, typically the location of the largest seaports and airports, are incurring significant costs as a result of this growth. Increased traffic congestion, noise, and air pollution are generating concern and opposition among local residents and governments. In addition, trade growth generates demand for expanded port facilities, generating competition for scarce coastal resources.

At the same time, the competitive environment in waterborne commerce is changing as scale economies drive development of ever larger ships and reduce transport costs, governance and regulatory structures change, and the global trade industry continues to restructure (e.g. Brooks and Cullinane, 2007; Olivier and Slack, 2006). With more flexibility in trade routes, competition among ports intensifies. Thus at a time when local support of increased trade is in decline, ports may be less able to address externalities while maintaining or growing their market share.

The purpose of this paper is to examine efforts to manage negative local impacts of growing international trade in the US and understand the successes and failures of regulatory efforts aimed at reducing these impacts. In a few metropolitan areas these efforts have resulted in a rapid and significant change in the regulatory environment facing ports, steamship lines, terminal operators, and other actors within the international trade supply chain. This changed environment is being driven primarily by local public concerns. The situation is particularly severe in Los Angeles: state and local agencies have engaged in many efforts to reduce air pollution and manage congestion at the ports and on the main rail and truck routes connected to the port complex. Therefore Los Angeles provides an excellent case study for examining responses to a changed regulatory environment.

This report begins with an overview of trends in port-related trade and its impacts on US metropolitan areas, and discusses changing public perceptions of port-related trade as impacts have increased. Using Southern California as a case study, the report examines responses by the ports, terminal operators, and allied industries to a changed regulatory regime. Two examples are discussed in detail: 1) a state regulation requiring appointments or extended hours at terminal gates, and 2) the OFFPeak extended gate hours program. The report concludes with some observations on how local environmental concerns are affecting international trade interests and what the implications may be for the competitive position of large US ports.

2. TRENDS IN PORT-RELATED TRADE AND IMPACTS ON US METRO AREAS

World merchandise trade growth has outpaced growth of world GDP for now several decades. The US share of world exports is 14.2 percent, and its share of imports is 21 percent (World Trade Organization, 2007). US total foreign trade as a share of GDP continues to increase, from 26% in 2000 to 27.2% in 2005, with goods making up nearly 80% of total trade (USDOT, 2007). Most freight transport in the US is domestic, but the foreign share continues to increase. In terms of value, freight imports and exports increased from 16.2% in 2002 to 19.0% in 2006.

Freight flows by all transport modes have increased. Total US ton-miles of freight increased from 3.2 billion in 1990 to 3.8 billion in 2001 (Bureau of Transportation Statistics, 2006), but truck and air transport have increased faster than other modes. In 2001, for example, of the total bill of $579.6 billion the US spent on freight transportation, trucks carried 80.6%, i.e. $467.2 billion (USDOT 2006, Table 3-7). Total US ton-miles of freight increased from 3,584 billion in 1990 to 4,357 billion in 2003. Over the same period truck ton-miles increased from 854 to 1,264 billion, and air ton-miles increased from 10.4 to 15.1 billion (USDOT 2006, Table 1-46B).

Foreign trade is concentrated; the top eight foreign gateways account for 34% of total 2005 US foreign trade (see Table 1). These gateways include the major port complexes, airports, and land-border crossings with Canada and Mexico. The two largest gateways, Los Angeles and New York, are of course also the two largest metropolitan areas in the US.

Table 1. **Top 8 US Foreign Trade Gateways by Value, 2005**

Gateway	Total Foreign Trade ($ Millions)
Los Angeles (Port of Los Angeles, Port of Long Beach, LA Airport)	331,946
New York (Port of New York and New Jersey, JFK Airport)	265,301
Detroit (bridges)	130,473
Laredo, Texas (land bridges)	93,677
San Francisco (Port of Oakland, SF Airport)	89,818
Houston (Port of Houston)	86,133
Buffalo/Niagara (bridges)	71,496
Seattle (Port of Seattle, Port of Tacoma)	68,780

Source: Calculated from USDOT 2007, Figure 3-17

2.1 Impacts of Trade on US Metro Areas

The growth of international trade has had both positive and negative impacts on metropolitan areas. The positive impact is economic growth which results in more jobs and tax revenues to local governments. It is the economic growth benefits that historically have been the basis of local support for port development (Erie, 2004). Port-related trade relies on an extensive network of warehousing, secondary processing, logistics, shipping, customs, and other services, and hence has a large multiplier effect. For example, it is estimated that port-related trade in the Los Angeles region accounts for about 585,000 jobs, or about 1 in every 12 jobs in the region (Chang, 2005). In the New York/New Jersey greater metropolitan area, port-related trade is estimated to account for about 233,000 jobs and about $5.8 billion in federal, state and local tax contributions in 2004 (Lahr, 2005). Husing (2004) notes that the logistics sector provides well paid and stable blue collar jobs, in contrast to other growing sectors such as retail trade. It therefore plays a critical role in regions with large shares of low-skilled workers such as Los Angeles.

Although local economic benefits are significant, the bulk of benefits of international trade are dispersed throughout the US in the form of lower prices for consumer products. These economic benefits come with large external costs that are concentrated on local populations. The most visible external costs include congestion on the surface transport system, truck involved crashes, air pollution, and noise and other impacts on neighborhoods. Congestion and air pollution problems are briefly described here.

2.1.1 Congestion

Increasing congestion in US metropolitan areas is well documented by the Texas Transportation Institute annual reports that estimate congestion based on traffic volumes and road capacity. Hours of delay per traveler is highest in the largest metropolitan areas (3 million population or more), and has increased dramatically: from 21 in 1982 to 54 in 2005. Total delay cost for 2005 is estimated to be $78 Billion, compared to $15 Billion (constant 2005 dollars) in 1982. As demand continues to increase, peak spreading has occurred, with peak periods extending to several hours each day (Schrank and Lomax, 2007).

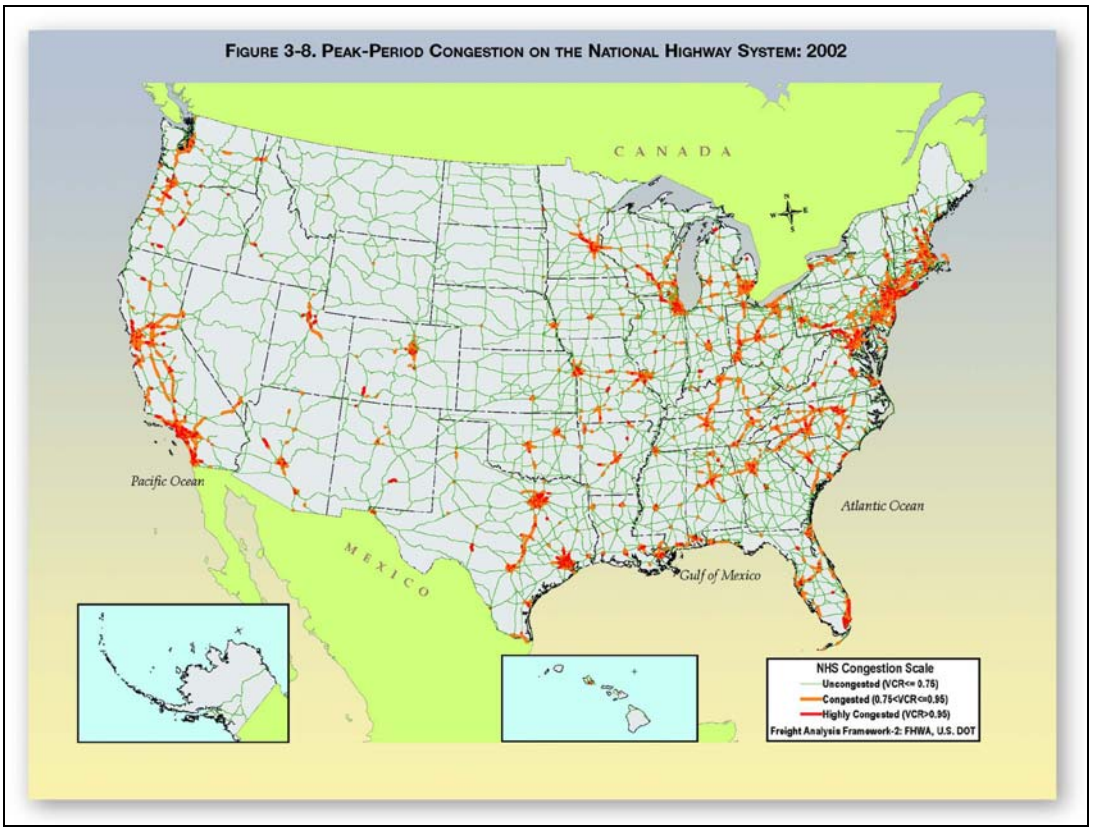
Increased demand is the result of growth in both passenger travel and freight transport. Although truck traffic accounted for just 8% of all highway vehicle miles traveled (VMT) in the US, heavy truck VMT have increased faster than passenger vehicle VMT (USDOT, 2007). Major freight nodes have experienced particularly large increases, contributing to congestion. Figure 1 shows 2002 peak period highway congestion on the US National Highway System. Highly congested roadways are concentrated along the New York/New Jersey coastal corridor, Los Angeles, San Francisco, Houston and Chicago, the major US intermodal hub.

In the Los Angeles region, it is estimated that the ports generate about 35,000 daily truck trips, and the ports are seen as a major contributor to highway congestion. Heavy-duty truck (HDT) miles in the Los Angeles region (i.e. those trucks with five or more axles) have increased faster than total vehicle miles traveled. The major routes serving port-related trade carry very large HDT truck shares: 12 to 14% of total daily traffic, compared to 2 – 3% for other highways in the region.[1] High volumes of trucks add to congestion problems and contribute disproportionately to incident related delays (Haveman and Hummels, 2004; California Highway Patrol, 2003). The drayage trucking industry is a particular problem: low compensation is associated with using older, less maintained trucks and possibly less qualified truck drivers (Monaco, 2004)

The New York/New Jersey (NY/NJ) port complex also generates significant truck traffic. Container traffic of the Port of New York/New Jersey in 2001 generated 13,000 trucks travels per day. Unlike Los Angeles/Long Beach, where more than half of all container traffic has destinations outside of Southern California, most NY/NJ container traffic (75%) is destined for local markets. Thus options for rail traffic are quite limited. Freight movements across the harbor are limited to two bridges, George Washington and Verrazano, handling crossings of more than 30,000 trucks per day. Road congestion is therefore expected to increase by 50% by 2020 (Rodriguez, 2003).

[1] Calculated by the authors from 2002 California State Department of Transportation, District 7 traffic volume data.

Figure 1. **Peak Period Congestion, 2002, US National Highway System**



Source: Provided by Federal Highway Administration; used with permission

2.1.2 Air Pollution

Perhaps the most serious impact of increased trade is air pollution. The transport sector accounts for a large portion of some air pollutants. Freight transport accounts for about 27% of all NOx emissions. While freight transport accounts for about one third of PM10 mobile source emissions, most particulate emissions are from non-mobile sources. See Table 2. Heavy duty trucks are by far the major freight transport source of NOx and PM10, largely because trucks carry about three fourths of all US freight tonnage. Constantly improving emissions control technologies has resulted in greatly reduced emissions rates per mile, but increased VMT has offset some of these gains. Figure 2 shows the share of various pollutants contributed by all vehicles, from 1970 to 2006. While shares of most pollutants have declined, contributions to NOx and PM 2.5 have increased since the early 2000's.

Although emissions have decreased and are expected to continue to decrease despite increased vehicle use, health impacts in "non-attainment" metropolitan areas continue to be significant.[2] Particulates (PM) are especially harmful to human health, and heavy duty truck and train diesel engines are a significant PM source in the major gateway metropolitan areas. In the US, the ability of local air quality management authorities to regulate emissions from trucks and trains is limited due to federal interstate commerce policies. Ocean shipping is

[2] The US Environmental Protection Agency defines non-attainment areas as those that do not meet one or more of the air quality standards for criteria pollutants. These include CO, NOx, SOx, VOC, PM10, PM2.5, and lead.

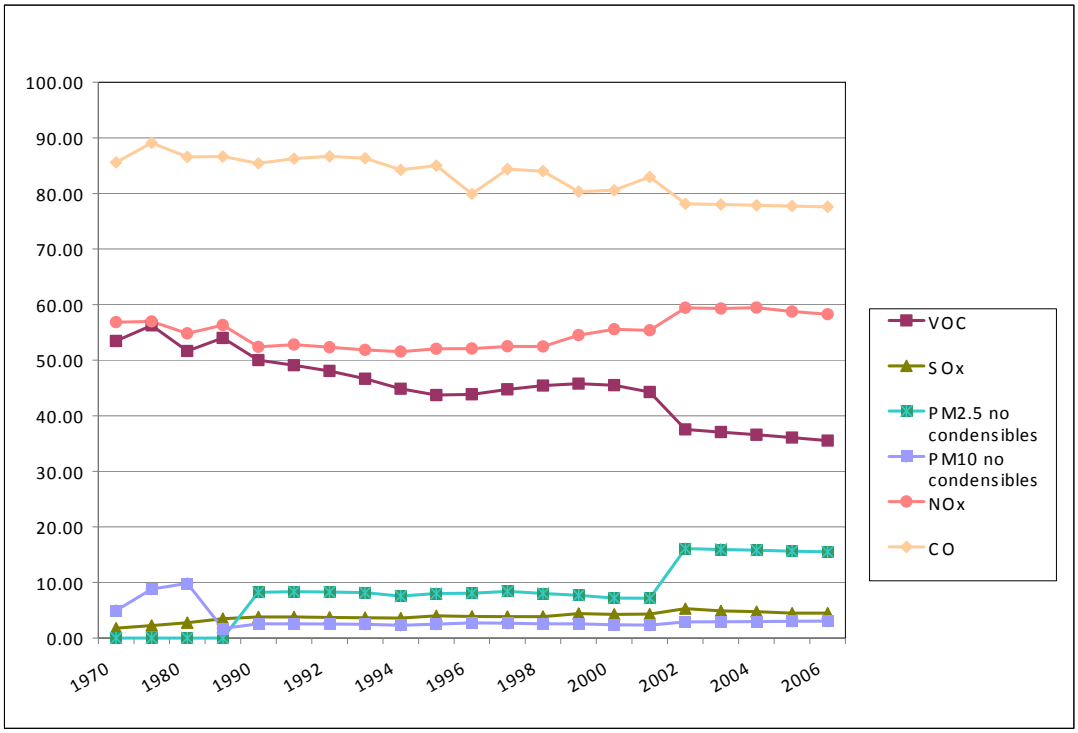
beyond the control of the federal government, as all commercial lines are non-US carriers, and subject only to maritime international treaty requirements.

Table 2. **NOx and PM10 Emissions Shares by Freight Transport Mode, 2002**

	NOx		PM 10	
Mode	All mobile sources	All sources	All mobile sources	All sources
Heavy-duty trucks	33.0	17.9	23.3	0.5
Freight Rail	7.5	4.1	4.1	0.1
Marine vessels	8.8	4.8	8.5	0.2
Air	0.1	0.0	0.1	0.0
Total	49.4	26.8	36.0	0.8

Source: Adapted from Table 5-12, USDOT 2007

Figure 2. **Contribution of Road and Non-Road Vehicles to Emissions, 1970 - 2006**



Source: Calculated from US EPA, 2007

The Los Angeles region is perhaps the most extreme example, as the region is a non-attainment area for several criteria pollutants. Transportation sector emissions have grown at an average rate of about 2% annually (not including international bunker fuels) since 1990 compared to .8% for non-transportation sectors. The ports are the largest single source of emissions, largely because the local air district, SCAQMD (South Coast Air Quality

Management District), does not have jurisdiction over ships or trains. Ships use high sulfur content "bunker fuel", the cheapest form of diesel. Adding to the problem are the unique characteristics of the port drayage segment of the trucking industry which result in an older (and dirtier) heavy duty diesel truck (HDDT) vehicle fleet. NOx emissions are estimated at more than 100 tons per day, and the ports' contribution to pollution, notably PM10, is expected to increase with the growth in port trade (SCAQMD, 2005).

The Los Angeles region is not alone, however. Lena et al (2002) document high volumes of truck traffic in low income neighborhoods near the Ports of New York and New Jersey. They calculate estimates of emissions, and conclude that low income residents experience higher exposure levels.

3. THE LOS ANGELES REGION: CHANGING RESPONSES TO PORT-RELATED TRADE

We turn now to the Los Angeles region, where over the past eight years changes in the political and regulatory environment have been extraordinary. In his study of the Los Angeles region, Erie (2004) states that international trade creates a policy dilemma because the benefits are dispersed and the costs are concentrated. The dilemma is particularly strong for local public officials, who are dependent upon trade for economic development and tax revenue, but at the same time must respond to legitimate citizen concerns. The rapid increase in international trade and the associated congestion and environmental effects has raised the visibility of trade and has led to growing public perceptions that the local costs of trade are no longer acceptable. An additional concern is the demand for landside infrastructure – port expansion, highway and rail capacity enhancements – in densely developed urban areas to support trade growth.

The Los Angeles region is the second largest in the US, with estimated 2006 population of 18.6 million and employment of 7.3 million (Southern California Association of Governments, 2007). Figure 3 provides a map of the southwest portion of the region. The ports are located about 20 miles due south of downtown Los Angeles, within the most densely developed part of the region. The main expressways connecting the ports with inter-modal facilities and distribution networks are the I-110 and I-710. The Alameda rail corridor is located between the two expressways, and connects the ports with the main railroad yards just east of downtown Los Angeles.

Public perceptions of the ports and trade they represent have shifted from generally positive to quite negative. After decades of relative independence from state or local control, port-related trade is the target for regulation of truck traffic, truck emissions, ship fuels, and cargo equipment. The ports have been unsuccessful in moving any new expansion project through the environmental review process since 2000, and the two railroads serving the ports have been unable to move forward with expansion of near-dock rail facilities.

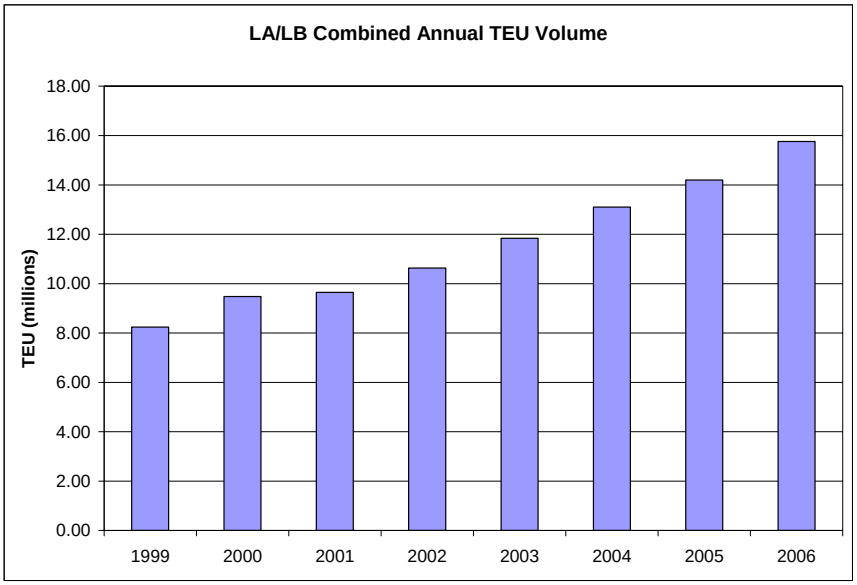
Figure 3. **Map of San Pedro Bay Ports Area**

3.1 Explaining the shift in public perceptions

What explains this dramatic change? The first explanation is the rapid increase in container trade that has taken place (see Figure 4), largely due to rapidly growing East Asian trade. The two ports moved 15.8 million twenty-foot equivalent units in 2006, nearly double the 1999 combined volumes. Combined TEU volumes have increased an average of 1 million TEU per year. To put this growth in perspective, the next largest west coast port, Oakland, had a total 2006 volume of 2.4 million TEU, and the increase over the same period was 700,000 TEUs. The growth rate of the Los Angeles/Long Beach complex has exceeded that of any other West Coast port. Continued growth is explained by scale economies in international shipping, the large local consumer market, good connections to the US national market, and extensive supporting industries.

A near doubling of port traffic volume has resulted in a significant increase in truck traffic, adding to an already congested highway network. For the general public, trucks are the most visible aspect of port-related trade. The Alameda Corridor, a 20 mile, $2.4 Billion rail cargo facility opened in 2002, yet truck traffic on highways continued to increase. Although the Alameda Corridor was not intended to increase the rail modal share or operate near capacity for many years, public perceptions suggested such expectations, and the Corridor came under criticism for not solving the truck traffic problem (Agarwal, Giuliano and Redfearn, 2004). A major study of the I-710 also took place in the early 2000's. The study was based on an expected tripling of port trade by 2020, and the analysis generated alternative plans for greatly increasing capacity of the facility, some of which required the taking of adjacent properties. The study generated significant local opposition that in turn caused state and local transportation planners to temporarily suspend I-710 expansion plans.

Figure 4. **Growth of San Pedro Bay Ports Container Volumes**



Source: Ports of Los Angeles and Long Beach

The port shutdown of 2002 also raised public awareness of port-related traffic. The breakdown in contract negotiations between the ILWU (International Longshore and Warehouse Union) and the PMA (Pacific Maritime Association) resulted in a 9 day shutdown of all west coast ports. While ships queued in the harbor, the I-710 and other main port trucking facilities experienced greatly reduced truck volumes and congestion. For the public, the shutdown illustrated how much truck traffic was generated by the ports (Giuliano et al, 2005).

A second explanation for the shift in public perceptions is air pollution. The SCAQMD Multiple Air Toxics Exposure (MATES) II Study was released in 2000 and provided detailed documentation of local health impacts. It assessed potential disproportionate cancer burdens and found that 71% of all cancer risk from air pollution comes from diesel exhaust (SCAQMD, 2000). A widely circulated map from the report showing diesel emissions concentrations was used to demonstrate that a "diesel death zone" existed around the ports. The MATES Study was followed by several reports from a longitudinal children's health study that documented a significant relationship of school absences, asthma and other lung diseases with exposure to particulate concentrations (Coussens, 2004). The California Air Resources Board (CARB) estimates 750 premature deaths per year from particulate exposure associated with ports and international goods movement activities, and 2,400 premature deaths from all goods movement in California (CARB, 2006). These numbers have been widely circulated.

The Los Angeles region has long been known for its poor air quality, and the health impacts of pollution are widely known. However, research on fine particulates impacts and recent increases in some emissions categories have raised public awareness and concern, in turn placing growing pressure on political leaders to solve the air pollution problem. As noted earlier, state and local air quality regulators do not have jurisdiction over ships or trains. Thus as emissions from on-road vehicles have decreased, the share of emissions from ships and trains has increased. Port-related emissions are consequently viewed as a growing problem.

Air quality has become the key issue for any proposal to expand port capacity. In 2000 the Natural Resources Defense Council (NRDC) filed a lawsuit against the Port of Los Angeles over the construction of the China Shipping Terminal. The settlement included $10 million to clean up diesel trucks. It also required use of yard equipment powered by cleaner burning fuels, and testing of new alternate marine power technology, cold ironing (Giuliano and O'Brien, 2007). Cold ironing uses electric power so that ships can turn off engines while in port. The success of the NRDC China Shipping settlement effort provided a model for dealing with subsequent expansion efforts, which have been consistently opposed on environmental grounds.

3.2 Legislative Response

Local public concerns with port growth and its associated impacts have led to steadily increasing efforts to regulate activities related to trade operations. These efforts have focused primarily on air pollution, because of the precedent of regulation based on human health impacts. In California, the state has air pollution regulation authority, with certain provisions from the federal government that allow it to impose standards more stringent than the federal standards. Therefore local efforts to control trade activity involve persuading state legislators to take action. Table 3 lists state legislative efforts to address port-related impacts between 2000 and 2006. The first successful bill was AB 1775, which called for covering coke both in transport and in open storage.[3] Table 3 illustrates that in just a few years, ports became a legitimate target for state regulatory legislation.

The first effort to change operational practices was Assembly Bill (AB) 2650, passed in 2002. US ports typically service truck pick-ups and deliveries only during regular weekday hours. Outside pressure to extend truck gate operating hours had been growing for several years; it seemed an obvious solution for spreading truck trips over more hours of the day. AB 2650 prohibited truck queuing of more than 30 minutes at terminal gates. In order to avoid penalties, terminal operators could either operate full gate service 70 hours or more per week, or implement a truck appointment system. Justification for the bill was based on air quality: reduced truck queues at terminal gates would reduce diesel emissions. AB 2650 did not result in the adoption of extended gate hours, as will be explained later in this paper.

AB 2650 was followed by several legislative efforts to impose emissions regulations on port or port related operations, and to establish container fees to fund congestion or emissions mitigation. AB 2042 would have established an air quality baseline for the two ports. No project would be allowed that increased pollution levels beyond the baseline. AB 2041 would have established a regional governing body, the Port Congestion Management District, and authorized a charge for cargo moved at the San Pedro Bay Ports between the peak hours of 8 AM and 5 PM. Fee revenue would be spent on freight-related congestion mitigation projects. The bill was adamantly opposed by marine terminal operators (MTOs) and other port trade interests. Ultimately terminal operators set up their own extended gate program, OFFPeak, in return for the sponsor withdrawing AB 2041. By 2004 port-related trade had become a highly visible and contentious political issue.

There are three additional observations to be drawn from Table 3. First, cargo fees to fund mitigation efforts outside the ports had almost no support in 2001, but by 2006 were

[3] Coke is a solid byproduct of petroleum refining.

avoided only by veto of the Governor, reflecting a growing political consensus that the costs of mitigation should be borne by trade interests. Second, more aspects of port operations are the subject of regulatory proposals, for example mandating priority berthing for vessels using low sulfur fuels, or requiring ports to negotiate emissions technology changes via terminal lease agreements, suggesting changing perceptions of the role of government in addressing trade-related externalities. Finally, efforts to improve conditions for drayage truckers (reduced truck turn times, collective bargaining) were unsuccessful throughout the period, reflecting a lack of political support for this constituency.

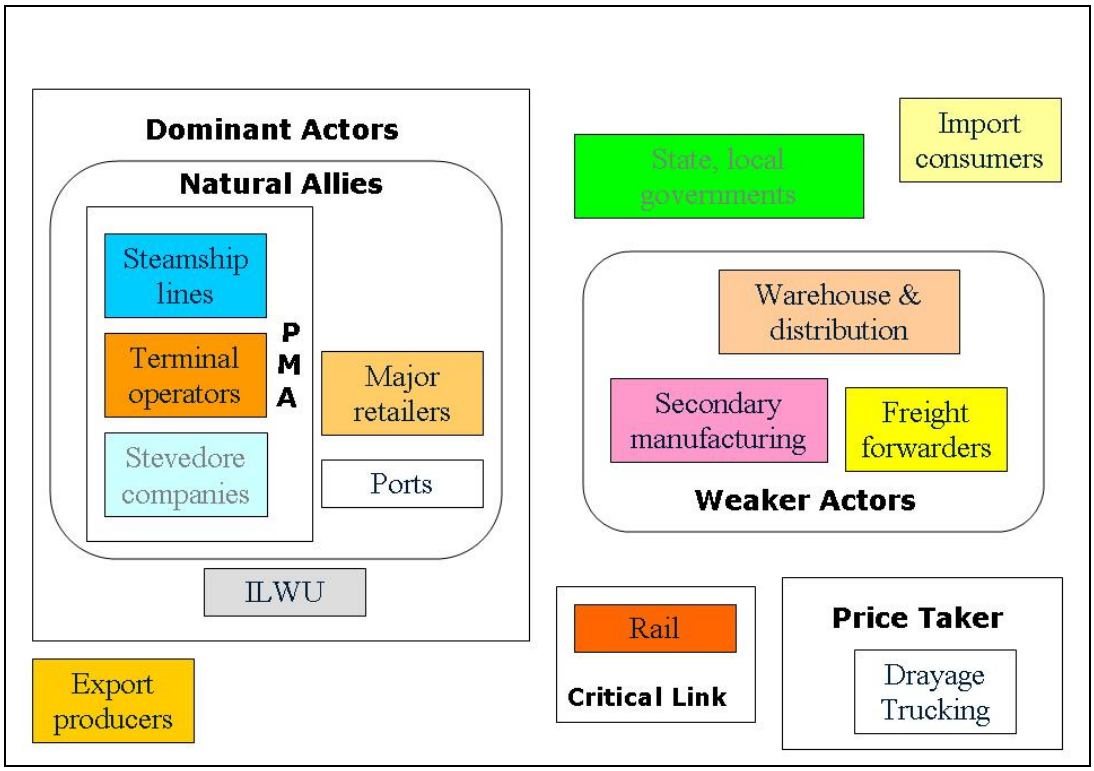
Table 3. **California State Legislative Activity Associated with Mitigating Port-related Trade Impacts, 2000 - 2006**

Year	Bill	Status	Description
2000	AB 1775	Passed	Required covers on coke piles and on coke in transport
2001	Karnette	Died in committee	First proposal for cargo fee
2002	AB 2650	In committee	Reduced queue time at terminal gates; reduced turn times
2002	AB 2650 revised	Passed	Reduced queue times at terminal gates
2004	AB 2042	Passed by Legislature; vetoed by Governor	Established baseline for "no net increase" in emissions
2004	Senate Bill (SB) 1397	Passed in Senate; died in Assembly	SCAQMD authority to regulate locomotive emissions
2004	AB 2041	Passed by Legislature; withdrawn by sponsor (Lowenthal)	Port management congestion district + container fee for environmental mitigation, infrastructure, security
2005	SB 760	Not passed	$30/TEU mitigation fee in LA/LB
2005	SB 761	Passed in Senate; died in Assembly	Truck turn time maximum 60 minutes
2005	SB 762	Passed in Senate; died in Assembly	Joint Powers Authority to license, limit, and regulate trucks at the port
2005	SB 763	Passed	Priority berthing for vessels using low sulfur fuels
2005	SB 764	Passed in Senate, died in Assembly	Caps on port emissions to 2001 levels
2005	SB 848	Died in committee	Collective bargaining for truckers
2005	AB 1101	Died in Assembly	Regulate ports, distribution centers as stationary sources
2006	SB 927	Passed by Legislature; vetoed by Governor	$30/TEU mitigation fee in LA/LB
2006	SB 1829	Passed in Senate; died in Assembly	Limits trucks wait time to 30 minutes in line and 30 minutes inside the terminal
2006	SB 1601	Died in Senate	Require best available technology to reduce NOx emissions through lease agreements

3.3 Institutional Relationships in Goods Movement

Understanding responses to the changed regulatory environment requires an understanding of the institutional relationships within the port-related trade supply chain. We have developed a conceptual model of institutional relationships as shown in Figure 5 . We adopt a political economy approach, explaining relationships and outcomes in the context of market power and political influence.

Figure 5. **Conceptual Model of Port-related Supply Chain**



3.3.1 Dominant Actors

We identify steamship lines, ports, terminal operators, their major customers, and the Longshore labor union as the "dominant actors" in the supply chain. They are dominant in the sense that they have both significant market power within port-related trade and substantial political influence within the US. All but the ILWU are "natural allies," in that they have sufficiently aligned objectives to promote cooperation in many circumstances. Public ports in California are granted operating authority by the state under the 1911 California Tidelands Trust Act. Operating authority comes with certain protections on funds and limits on local regulatory oversight. The ports are managed by governing boards whose members are appointed by their respective mayors, and who have significant authority over port management. This lack of direct accountability has historically insulated the ports from political pressure (Erie, 2004). The ports operate as landlords (tenant terminals have long-term lease agreements), and their primary focus is a stable and adequate source of lease revenues.

Tenant marine terminal operating companies (MTOs) are either owned by or have long-term contractual agreements with the steamship lines. The steamship lines are foreign flag carriers, and are subject only to international maritime agreements with respect to operating practices. MTOs serve specific customers or product lines. They manage the movement of cargo between ships and the landside shippers who serve steamship line customers -- foreign manufacturers, wholesalers and retailers. These entities are interdependent and share common economic interests. Major customers in Asia-Pacific trade include the large discount retailers, e.g. Wal-Mart and Target. Major customers can influence ship schedules, rates, and cargo handling. For example, MTOs may offer special pickup times, or allow longer dwell time of cargo on the docks for preferred customers.

Federal oversight for US ports and port operations is provided by the Federal Maritime Commission (FMC). The FMC is an independent regulatory agency which administers the Shipping Act of 1984 and the Ocean Reform Shipping Act of 1998. The Shipping Act allows terminal operators anti-trust immunity under certain conditions: to enter into agreement with each other to discuss rates, conditions of service or cooperative working arrangements. Thus the US regulatory structure facilitates collaborative actions among steamship lines, MTOs, and ports.

The presence of large scale economies in international trade has led to the concentration of trade in a few very large ports. Ever larger ships require deeper ports and larger dockside operations, which imply infrastructure investments that need high volumes and long-term contracts to cover costs. On the landside, more trade volume generates supporting activities – third party providers, secondary manufacturing, freight distributors, and high quality rail transport – that further reinforce the advantages of large ports. These dominant actors therefore have significant market power within the international supply chain.

3.3.2 The Longshore Union

Represented on the west coast by the International Longshore and Warehouse Union (ILWU)[4], longshore labor is arguably the most powerful (and highest paid) unionized labor force in the US. The ILWU contract covers wages and benefits, working conditions, and allocation of labor. It also controls the size of the labor force. As trade volumes have grown, longshore labor has enjoyed favorable bargaining conditions, and hence has been able to retain significant control over dock operations.

Unlike many other industries, the terminal operators have been given authority by the FMC (see above) to act cooperatively in dealing with longshore labor. They do so through the Pacific Maritime Association (PMA), whose members include terminal operators, stevedore companies, and steamship lines. Labor contracts are the outcome of bilateral negations between the PMA and the ILWU, hence the same labor provisions apply at all west coast ports. Once an ILWU contract is in place, terminal operators (MTOs) have few options for economizing on longshore labor. The ILWU's market power derives from its potential to disrupt west coast trade. As long as high labor costs can be passed on, PMA members have little incentive oppose union demands.

[4] On the east coast, labor is represented by the International Longshoremen's Association (ILA).

3.3.3 Drayage Trucking

In contrast, the drayage trucking industry has little influence within the international supply chain. The truck drayage industry is composed mainly of owner-operator drivers who contract with small trucking companies. These are low-skill, low-pay jobs. Drivers receive a lump sum based on the cargo hauled and the distance traveled which must cover all costs including fuel, insurance, registration and maintenance. With easy entry and an apparently still plentiful supply of labor, drayage is a price taking industry segment.

Truckers have no formal means of influencing the behavior of MTOs (or of the trucking companies who contract with them). Because they are considered private contractors and not employees, drivers are subject to federal anti-trust laws prohibiting cooperative action that could impede interstate commerce. In Los Angeles drayage truckers are mainly Spanish speaking immigrants, most of whom are reticent to political action or other forms of influence.

3.3.4 Other Actors

There are many other participants in international trade: railroads, third party providers, customs brokers, etc. Two Class I railroad companies serve the San Pedro Bay ports, Union Pacific and BNSF. By virtue of the importance of the rail network in distributing goods throughout the US, the railroads also have significant market power. Other industry segments are more fragmented, and to date have had little apparent influence in port-related activities.

4. TWO EXAMPLES: AB2650 AND OFFPEAK

The combination of favorable competitive conditions and supportive national regulatory environment allow ports, MTOs and steamship lines considerable control and flexibility in responding to local efforts to mitigate congestion and air pollution impacts. We illustrate with two examples, AB 2650 and the OFFPeak fee program. The summaries presented here are based on comprehensive evaluations of each program.[5]

4.1 AB 2650

As noted in Section 3, AB 2650 was the first attempt to change dock operational practices. It went into effect in July 2003. It imposed a penalty of $250 on marine terminal operators for each truck idling more than 30 minutes while waiting to enter the terminal gate. Because the bill targeted ports of a certain size, only three were subject to the regulation: Los Angeles, Long Beach and Oakland. Terminals could avoid fines by extending full service gate hours to 70 per week (65 hours at the Port of Oakland), or by offering a gate appointment system to trucks to drop off or pick-up cargo containers. The bill had some important caveats: the penalty applied only to 1) trucks idling (not waiting with engine off), 2) trucks with an appointment, 3) wait time to the entry of the terminal property (not the pedestal within the entry where trucks receive permission to enter the docks). AB 2650 had no jurisdiction over queuing within the terminal.

[5] On AB 2650, see Giuliano, O'Brien and Maggadino, 2005; Giuliano and O'Brien, 2007. On OFFPeak, see Giuliano and O'Brien, 2008; Giuliano et al 2008.

No terminal chose to comply with AB 2650 by instituting extended gate hours, or even modifying existing extended hours; most implemented an appointment system. Although the legislation included some guidelines, terminal operators had great flexibility in structuring appointment systems. Appointments were implemented with different appointment providers, policies for making appointments, and gate procedures. Appointments are made via a proprietary web-based information system. The terminal operator determines which service is to be used, and the trucking companies and others pay to access the service based on volume of transactions. Trucking companies typically service all terminals, so using the appointment systems required subscribing to each of the information systems used by the terminals they service. No terminal made special arrangements for trucks with appointments once they were inside the terminal.

4.2 Results from AB 2650

The stated purpose of AB 2650 was to reduce emissions from truck idling at terminal gates. In order for an appointment system to be effective in reducing truck idling, appointments must be used, and appointments must be associated with a reduction in truck wait times.

4.2.1 Use of Appointment System

Terminal operators were not required to report on use of the appointment system. Ex-post surveys of MTOs on use of appointments yielded estimates from almost none to 30% or more, with most responses at the low end of the range. Monthly data from three terminals showed different patterns, as shown in Figure 6. Only one terminal had a large share of appointments; this was due to a strategy of using appointments as a way of managing truck moves on the dock. We also obtained limited data from a fourth terminal; appointments were 1 – 3% of total moves. While an appointment system can potentially reduce transaction times, the generally low rates of appointment utilization imply limited impact.

Appointment systems can only be effective if truckers use them. If appointments reduce trip times by reducing wait time or making sure cargo is released and ready for pickup, truckers have every incentive to make them, since they are paid by the load, not by hour. We examined the impact of appointments by comparing transaction time data from one MTO for transactions conducted with and without appointment times. Since the greatest share of appointments at any terminal is for picking up an import container, our comparison is limited to import pickup transactions. Figure 7 gives the cumulative distribution of transaction times for all import pickup transactions, and for import pickup with appointment transactions. It can be seen that transactions with appointments are longer than transactions without appointments. The group means are 52.6 minutes for all transactions and 84.6 minutes for transactions with appointments; the difference is statistically significant. In a survey of 27 trucking companies, the average estimate of transaction time with appointment is longer than without appointment, consistent with the Figure 7 data. Our conservative conclusion is that we have no evidence that appointments are associated with time savings. However, longer transaction times could simply mean that appointments are more likely to be used for the most complex transactions.

Figure 6. **Appointments as Share of Total Gate Moves**

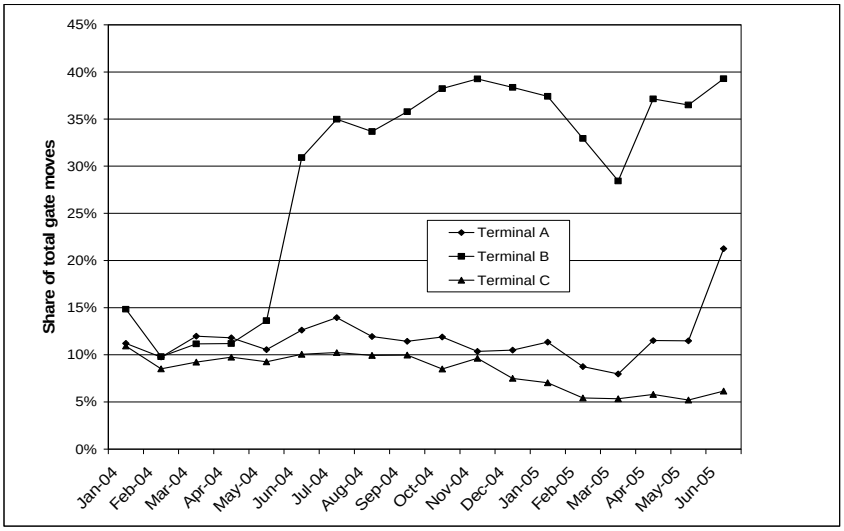
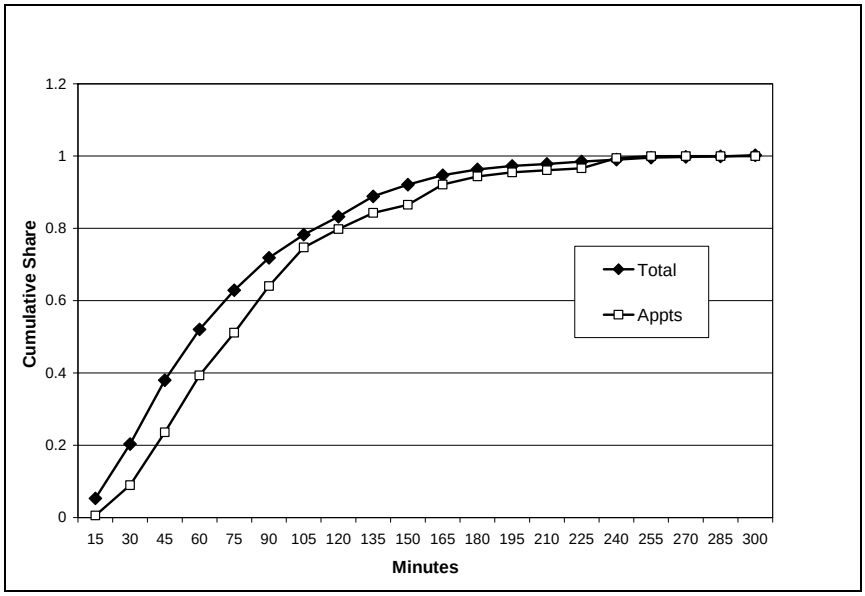


Figure 7. **Cumulative Distribution, Import Transactions**



We conducted simulations to evaluate conditions under which an appointment system would generate time savings sufficient to measurably reduce queuing and truck idling, based on plausible rates of appointment use. We found that reducing wait time on the docks would have the greatest impact, holding appointment share constant. For the average transaction, time spent at the terminal is a larger portion of total transaction time than time spent waiting to enter the terminal, so has the greatest potential for reducing total transaction time. We also found that a much larger proportion of appointment use would be required to generate significant time savings. For example a transaction time savings of 10 minutes for 30% of all import moves would generate a total transaction time reduction of about 6%.

4.2.2 Trucking Response

Why were appointments so little used? Our survey revealed an overall perception that the appointment system did not improve conditions for truckers. The majority stated that it did not improve their ability to meet customer demands, nor did it reduce turn times (the time required to complete a transaction at the docks, including waiting to enter the terminal and completing the transaction within the terminal). No firm gave an unequivocally positive response. Respondents were also asked to rate the effectiveness of the appointment system at each terminal in reducing turn times on a scale of one to five, with 1 = not effective and 5 = exceptionally effective. Terminals are not given high marks: mean scores range from 1.4 to 2.3.

Written comments, as well as the open-ended discussion conducted with respondents after completion of the survey, provide some explanations for their negative assessment. First, truckers expected that appointments would reduce transaction time by assuring that containers and/or chassis were ready and available for pick-up. However, this was not the case; practices "inside the gate" did not change as a result of the appointment system. Second, some respondents noted that the real constraints are limited gate hours and limited dock labor. If container volumes are increasing and the container processing rate remains constant, transaction time will increase, with or without appointments. Others noted the difficulty of using several different appointment systems. Finally, respondents cited the difficulties of making and keeping sequential appointments, because any delay with an earlier transaction cascades to all other later transactions.

4.2.3 Conclusions on AB 2650

We have no evidence to suggest that the appointment system reduced queuing at terminal gates and hence HDT emissions. Data from terminals and information from interviews supports a finding of no impact for two reasons: 1) the majority of terminals did not view appointments as an effective operational strategy, and few efforts were made to offer any priority to those with appointments; 2) trips with appointments made up a very small share of all trips at most terminals, and hence could not have had a significant impact on queuing even if such trips were granted priority. Our estimates of potential turn time savings from appointments suggests that a large proportion of trips would have to use appointments, and appointment trips would have to be given some priority in order to realize significant time savings. It is only under these conditions that an appointment system would reduce truck queuing enough to result in lower truck emissions.

4.3 OFFPeak

As noted in section 3 above, the OFFPeak program was established in order to avoid implementation of AB 2041. The stated intent of OFFPeak is to spread port truck traffic across more hours of the day in order to reduce peak period truck traffic and related congestion. In June 2004, MTOs filed an amendment to the existing West Coast Marine Terminal Operator Agreement with the FMC to give the MTOs the authority to develop and implement an off-peak services program. The amendment was approved in early August 2004.

The MTOs established a special purpose non-profit entity called PierPASS, Inc. to act on behalf of the MTOs and coordinate the program. An independent financial consulting firm

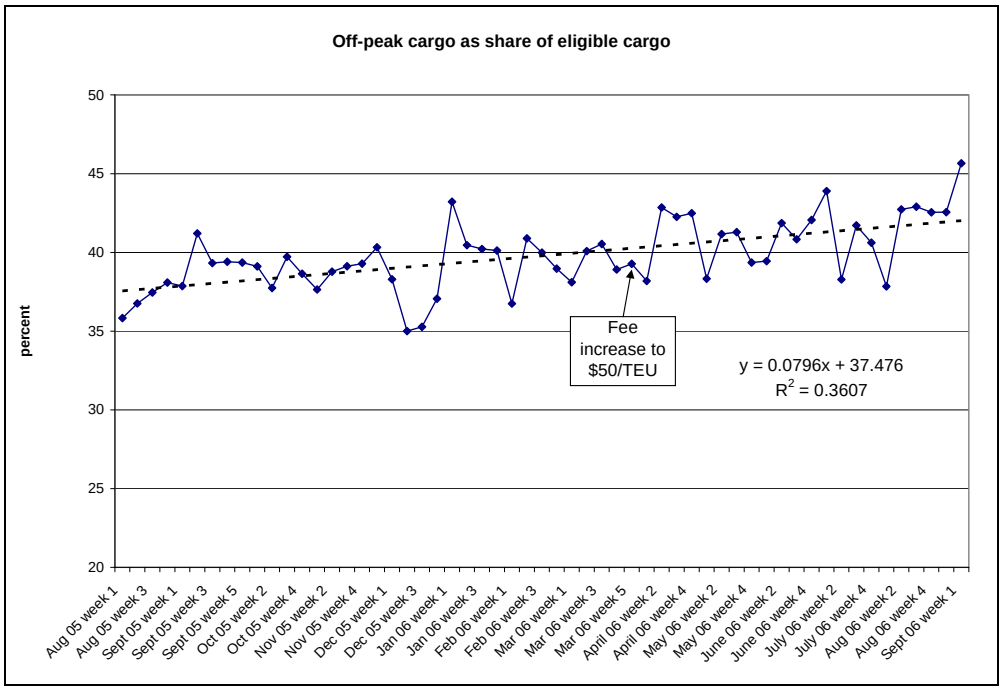
was hired to estimate expected costs and revenues of the program, and the peak fee was based on the financial analysis. The Traffic Mitigation Fee (TMF) was set at $40/TEU, and later increased to $50/TEU. The fee is imposed on eligible cargo from 8 AM to 5 PM, Monday through Thursday. Exempt cargo includes empty containers, cargo transshipped to other ports, domestic cargo, and cargo subject to Alameda Transportation Corridor fee. No off-peak operations are available on Friday. Fee revenue, discounted by PierPASS operating expenses, is returned to the MTO of origin. The program includes a sunset clause after 3 years.

4.3.1 Use of OFFPeak

The OFFPeak program was launched in July 2005. The stated program targets for off-peak container moves was 20% by the end of the first year, 35% by the end of the second year, and more than 40% by the time the program was scheduled to sunset 3 years later. Results of the program were immediate; some off-peak shifts were moving 30% of the day's eligible containers, surpassing the first year goal. By December 2005, PierPASS claimed to have diverted 1 million truck trips to the off-peak, and by June 2006 the figure was 2 million truck trips.

Figure 8 gives weekly shares of off-peak cargo based on data provided by PierPASS, Inc., from July 2005 to September 2006. Figure 8 includes only cargo *eligible* to pay the fee, about 55 – 60% of all truck moves, excluding Friday cargo moves. From 7/05 to 9/06 (57 weeks of data), the average share of off-peak cargo is 39.8%. The share is increasing over the period. We estimated a simple regression on the series; the estimated average rate of increase is about 8%/week. The immediate response to the program is evident, with the early weeks in the range of 35%. Given the many exemptions to the fee, we estimate diversion to be in the range of 22 – 30% of all truck moves.

Figure 8. **Weekly Share of Off-Peak Cargo**



4.3.2 Impacts on the Highway System

Given the increased use of off-peak hours, we would expect some temporal redistribution of truck traffic. We compared the temporal distribution of truck traffic for weekdays in May, August and December, 2004 (before OFFPeak) and 2006 (after OFFPeak). Figure 9 shows hourly distribution of heavy truck volumes, before and after OFFPeak, for I-710, one of the main truck corridors. It can be readily seen that mid-day volumes decreased and late afternoon/evening increased. Figures 9 also suggests that there were small shifts of truck traffic out of AM and PM peaks, but large shifts out of the mid-day period and into the evening period.

OFFPeak was also intended to shift truck traffic to weekends. Again using the I-710 data, we compared truck volumes on weekends before/after OFFPeak. Total weekend truck volume increased after OFFPeak, with most of the increase taking place in the early morning hours. Daily average truck volumes before/after OFFPeak were about 5000 and 5300 respectively. Before and after volumes were 6400 and 8000 on Saturdays and 3700 and 3500 on Sunday.

We employed simulation modeling to estimate impacts of OFFPeak on the region's transport system. The "before" year is 2004; the "after" year is 2006. Over this period, container volume increased by about 2.7 million TEU, and we adjusted our simulation data accordingly. No adjustments were made for overall regional growth. We simulate four scenarios, each with four different time period simulations: AM peak, mid-day, PM peak, and night. Scenario 1 is the before OFFPeak baseline. Scenario 2 estimates what would have happened had port volume increased while the hourly distribution of port truck traffic remained unchanged. Scenario 3 estimates the impact only of the OFFPeak time distribution shift, holding port traffic constant. Scenario 4 estimates the combined effects of port growth and truck traffic distribution shift.

Table 4 provides comparisons across the scenarios for vehicle hours traveled. For example, in the AM peak, port growth leads to a 1.04% increase in VHT relative to the baseline, and the OFFPeak shift leads to a 1.08% decrease in VHT. When we combine growth and the OFFPeak shift, we get a 0.45% increase. That is, the OFFPeak shift offsets some of the increase in AM peak VHT. The separate effects of growth and OFFPeak are given in the last two rows; about half of the growth effect is offset by the OFFPeak effect

The mid-day changes are much larger, consistent with the greater OFFPeak mid-day shift (about 8% reduction), and the greater share of truck traffic in the mid-day. Results suggest that the OFFPeak shift has almost entirely offset the port growth effect. The PM peak results are similar to AM peak: changes are small, but the OFFPeak shift tends to offset the growth effect. Night is the only period when OFFPeak contributes to VHT. Despite the large average shift (about 10%), the effect is small, because truck traffic accounts for a smaller share of total traffic at night. Results suggest that the OFFPeak shift has about four times the effect of the port growth effect. This does not affect average speeds, because there is little congestion on the network during night hours.

Figure 9. **I-710 Average Hourly Distribution of Heavy Truck Traffic, Before and After OFFPeak.**

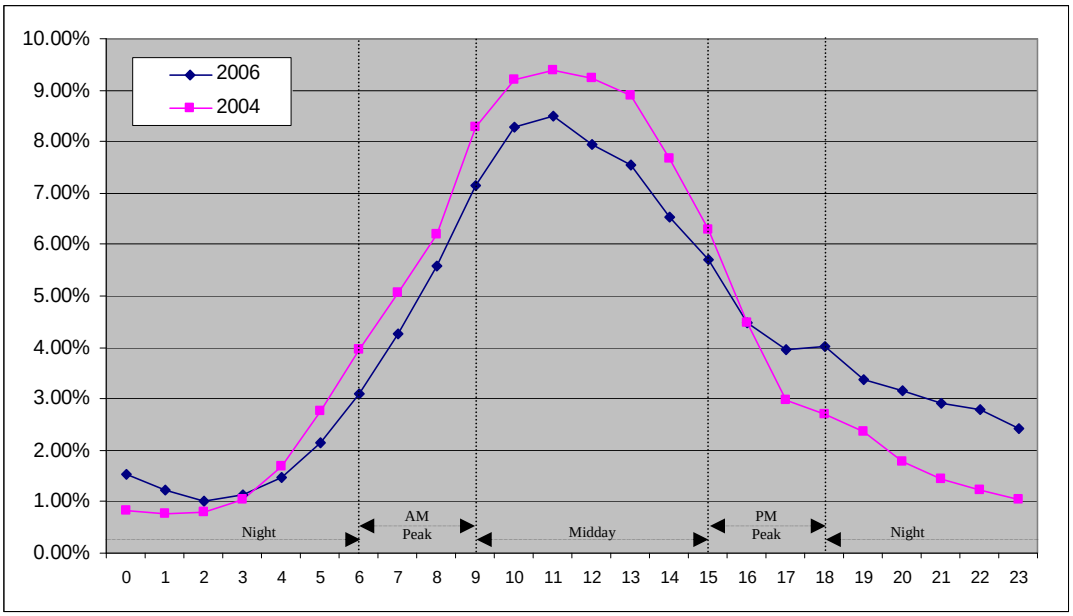


Table 4. **Scenario Result Comparisons (Percent change), Port sub-area only**

Scenario	Time Period			
	AM peak (6 – 8 AM)	Mid-day (9 AM – 14 PM)	PM peak (15 – 18 PM)	Night (19 PM – 05 AM)
VHT				
1 vs 2 growth effect only	1.04	21.64	3.17	0.22
1 vs 3 PP effect only	-1.08	-10.95	0.71	1.21
1 vs 4 growth + PP effect	0.45	0.97	1.95	1.15
2 vs 4 PP effect, given growth	-0.58	-17.00	-1.181	0.925
3 vs 4 growth effect, given PP	1.54	13.38	1.23	-0.06

4.3.3 Terminal Operator Response

Terminal operators were generally positive in their assessment of OFFPeak. They agreed that the program was brought about by political pressure, not by congestion and increased cargo volumes at the terminals. Only 2 respondents said the fee revenue was not adequate to cover costs. Given the extra pay associated with second or third shift work, it might be expected that lack of labor would not be a problem. However, the ILWU controls the number of longshore workers, both "regular" and casual. Additional longshore workers would be drawn from the casual pool in the short run. Nine respondents reported some type of labor difficulty.

Terminal operators saw the OFFPeak structure as the best possible solution under the circumstances: it allowed MTOs to control implementation of extended gates with limited oversight, it eliminated competition between MTOs on peak service parameter, it assured that the fees would be returned to MTOs to offset off-peak costs, and it restricted access to financial and operating data. Terminal operators also recognized that they were able to accommodate significant growth in container volumes by shifting more activity to the night shift.

4.3.4 Drayage Trucking

Apart from the terminal operators themselves, the greatest impact of OFFPeak has been felt by the port drayage industry. Spreading out gate moves over a longer period should translate to shorter transaction times for truckers, as less time would be spent waiting for a container to be available. It is also possible that the additional gate hours would allow truckers to make additional turns, thereby increasing the truck driver's income. However, the trucker's work day is regulated by federal hours of service mandates. It is therefore possible that OFFPeak would require significant modifications to the driver's schedule to accommodate a second shift. Trucker response should also depend on whether extra pay is provided for off-peak hauls.

Four trucker surveys have been conducted since the inception of OFFPeak, two by the California Trucking Association and two by PierPASS, Inc. The surveys are of limited comparability, and, as might be expected given the different agendas of the two organizations, show conflicting results regarding overall satisfaction with OFFPeak, effects on turn times and pay, and willingness to work night shifts or weekends. Our comparisons of the surveys yield the following observations:

- Two-thirds of work start times are between 5 and 10 AM, suggesting that most drivers have not replaced a first shift with a second shift, but have modified start time to work additional hours.
- The average number of trips per week has not changed, suggesting that turn times have not been shortened.
- No more than one-third of those working at night receive extra pay for doing so.

4.3.5 Other Stakeholders

Other key stakeholders make it clear how limited a role they have played in the development of OFFPeak. The Ports have been interested observers but have not been involved in establishing the fee structure. Distribution centers, warehouses, and exporters have modified their own operations in response to OFFPeak, adding second shift staff, or

allocating more space to off-peak storage. Unlike the terminal operators, these stakeholders do not enjoy the benefit of the traffic mitigation fee as a means of covering off-peak operating costs. Their options are to pass along the costs where feasible and move as much port-related activity to the evening as possible.

We conclude that the OFFPeak program achieved its objective of shifting truck traffic out of peak periods. In doing so, it offset about two years of port growth. Shifting truck trips to less congested time periods benefited drayage truckers, as trips were being made at faster speeds. However, travel time benefits were likely not as large as the costs of working less convenient hours (generally without extra pay). The traveling public received benefits from less daytime truck volume. The ports and MTOs likely benefited from increased trade volume, and certainly benefited from having the fee contribute to the added costs of off-peak operation. We surmise that extended operations contributed to the ports' ability to process more cargo. The direct costs of OFFPeak are paid by cargo owners, but we do not know the ultimate incidence of these costs.

4.4 Conclusions from AB 2650 and OFFPeak

Outcomes of AB 2650 and the OFFPeak program were quite different. Although the intent of AB 2650 was to increase use of extended gate hours, terminal operators chose to implement appointment systems as the means of compliance. With few exceptions, appointment systems were structured to meet requirements, not to promote efficiencies either at the gates or on the docks. Consequently, appointments were infrequently used and had no measurable impact on truck transaction times. In contrast, OFFPeak was successful in shifting truck moves to night hours and hence reducing congestion on the highway system. We explain these different outcomes in the context of our conceptual model.

First, AB 2650 was imposed from the outside, without the endorsement of the dominant actors. These actors were able to influence the bill to make it as benign as possible. The earlier version of the bill that included a limit on turn times was opposed by the PMA and the Long Beach Board of Harbor Commissioners. The turn time limit was removed as a condition of withdrawing their opposition. The exemptions in AB 2650 made it difficult to enforce, and limited surveillance made documenting an excessive wait time unlikely. Even if a violation occurred, a fine of $250 was small relative to the costs of extended gate hours. The option of an appointment system provided a low cost means of compliance that would have no serious effect on dock operations. AB 2650 also served as a powerful signal to the dominant actors that they were no longer exempt from regulatory legislation.

In contrast, OFFPeak was developed and implemented by MTOs, with the tacit approval of ports and steamship lines. The experience of AB 2650 motivated MTOs to become proactive. AB 2041 was introduced in February 2004, and by July 2004 the FMC discussion agreement had been amended to allow establishment of common gate hours and fees. The discussion agreement allowed MTOs to implement a significant operational change that resulted in a best possible outcome. The success of the program allowed the dominant actors to take credit for reducing congestion and vehicle emissions.

Second, winners and losers reflect market power positions. Dominant actors were winners in AB 2650 in the sense that they were able to avoid any costly changes in operations. Drayage truckers were losers, as, contrary to their expectations, turn times did not improve. Terminal operators have no incentive to employ practices that would reduce delays

for truck drivers. Rather, their incentive is to serve their customers and manage dock operations within the constraints of longshore work rules and contract provisions.

The MTOs, ports and steamship lines were clear winners in OFFPeak for the reasons given above. The program protects terminal operators in several ways: 1) establishment of a common fee and operating practices eliminates competition on these dimensions of service; 2) control of both fee rate and revenue minimizes the chance of financial losses; 3) the separate, non-profit entity limits information available to the public, making it difficult if not impossible to determine whether MTOs are generating excess profits from cooperative price setting. The major retailers were not harmed; most terminals were already operating special gate hours for major customers, and distribution systems of these retailers were already structured for 24 hour operation. Longshore labor was also a winner. OFFPeak hours were determined by the ILWU shift schedule, and second shift work comes with significant shift premiums and guarantees.

Actors without market power have not benefited from OFFPeak. Drayage trucking was not consulted in the development of OFFPeak, despite the obvious impacts it would have on this industry segment. Fewer longshore crews at night and gaps in service during shift changes have resulted in delays for truckers which are typically not compensated by additional pay. During the formation of OFFPeak, truckers attempted to claim some of the program revenue, arguing that they should be compensated for night work and longer hours, just as longshore workers are. They were summarily ignored; dominant actors knew they would not be able to exert enough political pressure to achieve such an outcome. Similarly, distribution centers and warehouses had limited input in the development of OFFPeak. Like the drayage truckers, they were left to absorb the additional costs of the program.

5. CONCLUSIONS

The outcomes of AB2650 and OFFPeak provide many insights on the response of port-related trade interests to a rapidly changing political and regulatory environment. AB 2650 demonstrated that political support was sufficient to impose regulations on port operations in order to reduce environmental impacts. While an established regulatory framework for reducing stationary and mobile source emissions has been in existence for many years, these are aimed directly at emissions. AB 2650 indirectly targeted emissions by regulating specific operating practices, greatly increasing government involvement and authority. AB 2650 also represented a significant change in perceptions regarding the responsibilities of port-related trade. Highway congestion and local air pollution problems became in part the responsibility of trade interests to solve. Again, there is some historical precedent -- ports have been responsible for reducing pollution impacts on local waters for decades in the US – but the important dimension is the scope and scale of perceived responsibility.

OFFPeak illustrates the capacity of the dominant actors to respond to increased pressures for solving congestion and environmental problems. It represents a significant shift in strategy. The growing evidence of particulates on health effects, together with port activity being a major source of particulate emissions has made it virtually impossible for political leaders not to embrace an aggressive mitigation strategy. International trade proponents have no choice but to actively participate. Without operational changes that are viewed by those outside the industry as minor, no credible case could be made for supporting growth in port

activity, or for the public infrastructure investments to accommodate that growth. Thus the question is one of how externalities can be addressed with the least cost to the dominant port interests. Some basic principles seem to emerge: direct all operational changes, maintain control of revenue streams, and cooperate to achieve outcomes that are mutually beneficial.

Both case studies suggest that the incidence of costs associated with these programs reflects the institutional relationships within the port-related supply chain. Costs were borne by those with weaker positions, notably drayage trucking and the smaller wholesalers and distributors, who had no part in the design of appointment systems or extended gate hours, but were faced with adapting their own business operations.

The case studies also demonstrate the key role US regulatory policy. The FMC agreement process, which allows MTOs substantial authority to collaborate, made it possible to establish the OFFPeak program. Agreement amendments are subject to permissive review requirements: proposed agreements must only be listed in the Federal Register for 45 days, and unless objections are placed with the FMC, the amendment goes into effect. Parties who may be affected by an amendment may be unaware of the filing until after the fact, as the only source of information is the Federal Register. The US regulatory framework, in which MTOs, steamship lines, and stevedore companies may cooperate for many different purposes, both supports and reinforces the market power of the dominant actors, giving them a relatively free hand in controlling port activities. The US regulatory framework also supports and reinforces the weakness of drayage trucking by subjecting this sector to anti-trust prohibitions on cooperative service practices or rate setting.

5.1 Is Los Angeles Unique?

To what extent does the Los Angeles experience help us understand the larger issue of a changed regulatory environment? Is Los Angeles the harbinger of the future, or is the situation so unique that there are few conclusions to be drawn? Los Angeles is in some ways indeed unique: international trade constitutes a large share of the regional economy; the ports' container volume is more than double that of the next largest complex (New York/New Jersey); it has the worst air quality and traffic congestion among US metropolitan areas. It is also capable of handling the world's largest ships and has the nation's largest network of supportive industries.

On the other hand, environmental concerns continue to grow throughout the US and the world, and Los Angeles has long been recognized as a source for precedent setting. Cargo handling equipment provides just one example. Reducing emissions from cargo handling equipment began in the 1990s in Los Angeles. Since then, these practices have been adopted at the ports in Seattle, Houston, and New York/New Jersey.

Air pollution and traffic congestion associated with truck traffic are growing concerns in other metropolitan areas. Feasibility studies for short-sea shipping have been conducted for Oakland, the upper west Pacific coast ports, as well as Los Angeles (Le-Griffin and Moore, 2006). The New York/New Jersey ports considered an inland distribution network that would shift truck traffic to rail and barge, and funded a demonstration of the barge service (Port Authority of New York and New Jersey, 2006). Efforts to shift truck traffic to rail have been examined for Oakland and for New York/New Jersey, and New York/New Jersey is engaged in a major expansion of on-dock and near-dock rail.

We have not yet seen the passage and implementation of regulations such as AB 2650 in other US metropolitan areas, but efforts to do so are increasing. Appointment systems have been proposed in both Seattle and New York/New Jersey. Truck idling bills have been introduced in Illinois, Rhode Island, Connecticut and New Jersey. New Jersey Assembly Bill A2646, introduced in October 2006, would prohibit the idling or queuing of heavy duty diesel trucks at marine terminals for more than 30 minutes, would fine terminal operators $250 per infraction, and would exempt terminals if extended gate hours are offered. The bill has to date remained stalled in committee.[6] The Port of New York and New Jersey 2006 Strategic Plan calls for extended gate hours and an OFFPeak type fee program, though no actions have yet been taken to implement these plans.

Finally, the utility of FMC agreements for controlling mitigation strategies is becoming evident outside Los Angeles. As of this writing, port interests at PANYNJ have submitted a draft amendment for the purpose of coordinating policies and programs associated with measures to reduce congestion at the ports, and Seattle is using the existing west coast agreement to develop methods for managing local truck traffic.

5.2 Implications

Results from Los Angeles lead to some broader considerations on the role of ports in an era of global industry restructuring and rising environmental concerns. Olivier and Slack (2006) note the emergence of the transnational corporation in the global supply chain, and argue that global trade flows will increasingly follow the logic of logistics chains based on terminals and their forward and backward linkages. This new logic weakens the ability of ports to influence global trade flows. Hall (2007) argues that changing patterns of globalization have changed the relationship between port and hinterland: the benefits of increased trade impose substantial local costs that the port has a responsibility to address, since localities themselves have little control over trade-related externalities. Hall's perspective is borne out in Los Angeles, where there is a growing expectation that ports take an active role in addressing externalities. Indeed, the San Pedro Bay ports have moved from a position of passive lease agents to active self-regulators. We see similar efforts by ports to lead air pollution and congestion mitigation efforts in New York and New Jersey and in Seattle.

Mitigation costs to port-related trade, however, can be substantial. In Los Angeles the OFFPeak fee is $50 per TEU. In their continuing effort to address congestion and pollution, port interests have agreed on additional fees of $15 per TEU for upgrading the drayage truck fleet and $30 per TEU for surface transport infrastructure (the latter again in response to pending state legislation). Whether anticipated trade growth can be sustained with fees approaching $100 per TEU remains to be seen. Los Angeles demonstrates the fundamental dilemma facing large US trade nodes: growing local demand for relief from port trade externalities vs an increasingly competitive international trade industry.

[6] http://www.njleg.state.nj.us/bills/BillsByNumber.asp

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