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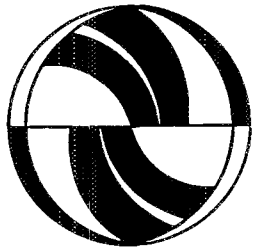

Seaport-Surface Transportation Access and Urban Transportation Congestion

Peter L. Shaw

Working Paper
UCTC No. 116

The University of California
Transportation Center

University of California
Berkeley, CA 94720

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Seaport-Surface Transportation Access and Urban Transportation Congestion

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University of California at Berkeley

Disclaimer

The ideas, data and opinions expressed in this report are those of the author. They are designed to inform, clarify and suggest possible courses of action on this important subject.

The contents of the report do not represent the views of the research sponsors: U.S. Department of Transportation, California Department of Transportation, University of California, and California State University Long Beach (Graduate Center for Public Policy and Administration; Office of Research; Foundation).

EXECUTIVE SUMMARY

This research examines the impact of urban surface transportation congestion upon the flow of international cargo. Within the specific frame-of-reference of Southern California, the following key elements will be reviewed: 1. the larger context of urban congestion; 2. congestion in Southern California; 3. a framework of policy options to improve the flow of cargo via land access; 4. attractive policies, action and implementation.

Congestion in urban areas is clearly growing. Surface freight transportation, primarily by motor carrier, is a subset of the larger urban transportation system. Inevitably, trucking in high use corridors is perceived by citizens to be a large causal agent of congestion rather than an injured or harmed party. Furthermore, railroads may also be seen as a causal agent in some corridors where long unit trains block urban arterial street crossings.

In California, state and local programs are taking the initiative to respond to the particularly acute problems in the San Francisco Bay Area and the Southern California region. They address for the first time freight and passenger (automotive) congestion.

The national, state and local focus upon urban congestion received reinforcement from the U.S. Surface Transportation Assistance Act of 1987. That legislation emphasized the problem of mobility and congestion. In 1990 the voters of the State of California further highlighted the issue by approving state bonds to ameliorate congestion. Furthermore, special regional and local congestion plans were required.

In this environment, the ports of San Pedro Bay (Long Beach and Los Angeles) were developing their massive plans for the Year 2020, but without any significant public support for access congestion problems. Creation of the Alameda Corridor Transportation Authority was an effective way to focus public and private attention on the matter and to develop a program with a financial plan. The City of Los Angeles, concerned by trucks, is attempting to regulate their impact during weekday travel.

Each of these activities started independent of the other. It was not planned as a coherent, coordinated program. Now, there is opportunity to tie them together in a mutually supportive way. Despite the fact that public resources are scarce and the private sector rarely fronts capital funds, close coordination should be encouraged. Competition for limited funds should not cancel out such efforts. Careful fiscal programming and scheduling can prioritize congestion plans to improve seaport-surface freight access difficulties.

Four scenarios (status quo; work trip; freight shipment; work/freight combination) suggest that even with large scale public and private investments, transportation systems will be taxed to capacity. Status quo offers an unacceptable future. A scenario emphasizing only freight is unlikely as well. When comparing the political power of cargo versus commuters, there is no contest. Most likely is the combination of commuting and freight needs.

Shippers, carriers and seaports must present their collective case more effectively to help direct scarce public resources to freight needs. There must be an extremely strong and credible linkage of efficient surface freight access to seaports to the regional job base and economic viability.

Shippers, carriers, seaports and government can accomplish much on their own by taking advantage of forces already evident in the transportation sector. Concerned interests might consider several promising strategies:

Short-term: squeeze productivity gains from system by effectively using

1. technology: electronic data linkages
   time slots
   equipment changes
2. operations: dedicated rights-of-way
3. labor: night and weekend flexibility

Medium-term: shift cargo to electrified rail system

1. move truck containers to rail
2. sell time slots for ocean carriers and and freeway access
3. encourage ondock/near-dock rail transfer facilities

Long-term: develop total plan balancing people and freight transportation needs

1. accept ceiling to system capability
2. lift ceiling only if large landside transportation investments are made and technology improves
3. prevent cargo diversion
4. develop plan to relieve major hub landside stress (Long Beach and Los Angeles) by encouraging partnerships ports to take overload and niche services

ACKNOWLEDGEMENTS

The subject of congested surface transportation facilities in urban areas and landside access to seaports is gaining recognition as an issue to address. Shippers, carriers, seaports and local public officials seem to be in accord. However consensus ends there. Divergence quickly occurs with three basic question:

* what priority should public policy give to the issue?

* what should be the role of the private sector?

* who pays?

Extensive meetings with public and private officials has made possible the exploration at a broad policy level of a fascinating subject. Many expressed optimism and pessimism. The optimism is that public policy is focusing on the issue (U.S. Intermodal Surface Transportation Efficiency Act of 1991; California Congestion Management Program, 1990). The pessimism is that the private sector may not wait for public policy to take effect. Congested transportation facilities in urban areas may force them to seek, quickly, other routing alternatives.

These officials believe that with sustained policy discussion fundamental improvements will be made in the next decade. The author greatly appreciates their insight and assistance: U.S. Department of Transportation (Office of the Secretary, Federal Highway Administration, Maritime Administration); U.S. Army Corps of Engineers; Transportation Research Board; American Association of Port Authorities; American Association of Railroads; American Trucking Association; California Transportation Commission; California Department of Transportation; Southern California Association of Governments; South Coast Air Quality Management District; Los Angeles County Transportation Commission; City of Long Beach; Port of Long Beach; City of Los Angeles; Port of Los Angeles; Propeller Club of the United States --Ports of Long Beach/Los Angeles Chapter.

Valuable administrative and technical assistance were provided by the U.C. University Transportation Center, Berkeley and the U.C. Institute for Transportation Studies, Irvine. Dr. Melvin M. Webber and Dr. Wilfred Recker provided important guidance and support. At California State University Long Beach, timely assistance was also appreciated from the Foundation, Office of Research and Graduate Center for Public Policy and Administration.

Two Transportation Fellows, David Sutton and Anna Day, were excellent researchers and colleagues on the project team.

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Surface Transportation Congestion and the Path of Least Resistance

Introduction

Hydraulic engineering, cardio-vascular systems, and water flowing downhill may be useful models for understanding the flow of international cargo through the U.S. surface transportation system.

Any blockage to the flow of the fluids will result in other less restrictive routes. Ultimately, the flow will seek out the "path of least resistance."

And so it may be with the cargo flow of international trade through Southern California. The surface transportation system is perilously close to arterial blockage. Though a hemorrhage will not result in the strictest sense of the medical analogy, cargo will move to easier, less congested routes of flow.

What does this mean to the seaports affected by surface transportation congestion?

If the analogy runs to its logical conclusion, cargo will move through other seaports depending upon the severity and duration of the impedance. If the obstacle is temporary or within the same urban area, alternative routes soon would be available. If the diversion is longer-term, other more lasting impacts are foreseen. International cargo is time and money sensitive. If the shipper, carrier and customer perceive a likelihood of sustained blockage, more permanent arrangements will be made.

Thus, the seaport-surface transportation community is keenly interested in how affected urban areas of seaports resolve such challenges.

Their very long-term success may depend upon how amenable their host region will be towards their activities. Seaports often have been overlooked and undervalued, except for their job creation and tax revenue potential. Some areas now turn to seaports for their cash generation potential to help relieve state and local governmental budget deficits.[1] Still other areas are tempted to

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[1]"State Seeks to Tap Port Profits," Los Angeles Times (July 8, 1992), p. A-13. In the case of California, as much as "50% of ports' net reserves" may be diverted.

consider them as necessary evils for the economy and public good. The question posed more and more is one of federalism -- how much benefit for the locality versus the nation.

Against this backdrop is the impact of urban surface transportation congestion upon seaports.

This study is the third in a four-part series reviewing the relationship of urban seaports to their supporting surface transportation systems. The first report examined surface transportation issues and seaports.[2] The second work was a case study of an innovative model -- the Southern California Alameda Corridor program.[3] The fourth part will consider the impact of air quality controls upon surface freight access to seaports.[4]

Purpose

This research examines the impact of urban surface transportation congestion upon the flow of international cargo. Within the specific frame-of-reference of Southern California, the following key elements will be reviewed:

1. the larger context of urban congestion

2. local congestion in Southern California

3. a framework of policy strategies to improve the flow of cargo via land access

4. attractive strategy opportunities

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[2]Peter L. Shaw, Surface Transportation Policy and Seaports (Berkeley, CA: University of California University Transportation Center, 1992 -- in publication).

[3]John K. Parker, Alameda Corridor Consolidated Transportation Authority (Berkeley, CA: University of California University Transportation Center, 1992 -- in publication).

[4]Peter L. Shaw, Seaport-Surface Transportation Access and Air Quality Controls (Berkeley, CA: University of California University Transportation Center, research stage).

Significance

At the risk of stretching a folksaying too far, "congestion is in the eyes of the beholder." The continuum of congestion may range from extreme to extreme. For example, a world metropolis (Hong Kong, Mexico City or Calcutta) may suffer from the worst congestion, while a small rural town (Chetek, Wisconsin) may experience the least. Somewhere in between are quite diverse realities.

The official customary definition of congestion will be explored more fully in Chapter III. Our purpose here is to raise the point that congestion is comparative or relative in nature. So much depends upon the "eyes of the beholder."

A wide range of interpretation is possible given the following diverse vantage points:

* user (driver, passenger, motor carrier)
* facility operator
* funder
* regulator
* implementor
* enforcer
* customer
* consumer
* citizen
* elected officials
* civil servant
* technician

There is definitely a genuine problem of perception for surface transportation access to U.S. urban seaports. It is visible primarily to the technical community. Despite the fact that many significant negative impacts on the productivity of American export/import transportation systems are occurring, the technical community is still a small voice in the wilderness of urban surface transportation congestion problems.

Research Approach

The topic is evolving quickly and in many regards has the appearance of a moving target.

In early 1990, the economy was growing and seaport growth projections indicated a steady, upward curve for several decades. By August 1990, the Persian Gulf crisis started and seemed to put trade, the economy and port plans "on hold." In March 1991 with the successful ending of United Nations Coalition Forces' operations in the Middle East, the economy rebounded sharply. During the fall 1991 and spring 1992, the nation was in the second phase of a severe "double-dip" recession. Some doubted the first phase ever ended or feared we would soon enter a "third dip."

Ports, as other major public and private institutions, were forced to slow short-term developmental plans. The primary reason seemed to be less business activity (demand for cargo -- consumer purchases). Tax revenues were dropping. Yet, in the early 1992 period exports were growing and ocean carrier space was selling at a premium.

Furthermore, transportation congestion, as a proxy measure of economic activity, was lessening in some quarters.

The research implication of congestion fluctuations is that the subject is very sensitive to rapid changes of national (and international) economic and trade conditions. In some cases, seaport states and urban areas are even more volatile.

The congestion is real. Cargo is still delayed. Urban areas are impacted.

Thus this study takes the **long-term perspective**: trade and economies will continue to grow while congestion will worsen. But if one would focus only on the immediate or shorter-term periods, the urgency is beginning to diminish.

An extensive literature search of federal, state and local government sources was conducted. Increasingly, a related body of literature is available as the nation focuses upon urban congestion. California has developed a statutory requirement, now being implemented, for "Congestion Management Plans."

The Transportation Research Board Committee structure has begun to focus on the subject. In the last year, three major initiatives were undertaken:

1. **Conference Roundtable:** at the annual national 1991 meeting, a special Roundtable on Ports-Public Policy Issues (Panel Session No. 93, January 15, 1991) addressed the subject.[5] A proceedings of the roundtable has been published as a TRB Circular.[6] The author organized the roundtable and edited the proceedings.

2. **Research Advisory Committee:** TRB is studying Ports-Land Access Issues under contract to the U.S. Department of Transportation, Maritime Administration. Advisory committee meetings have addressed issues intermodal container cargo and bulk cargo issues. An interim report to Congress was published, summer 1991,[7] and a first phase final report, February 1992.[8] The author serves on the Advisory Committee.

3. **Conference on Strategic Planning and Management Issues for U.S. Seaports:** TRB conducted a special meeting to focus on long-term issues and published a proceedings.[9] The author served on the Conference Steering Committee.

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[5]Transportation Research Board, Roundtable on Ports-Public Policy Issues (Washington, D.C.: TRB Annual Conference, Panel No. 93, January 15, 1991). Panelists represented key elements of government and industry: Arlene L. Dietz, U.S. Army Corps of Engineers, Robert Remen, California Transportation Commission, Lawrence D. Dahms, Metropolitan Transportation Commission, Gill V. Hicks, Alameda Corridor Transportation Authority, David J. Hensing, American Association of State Highway and Transportation Officials, D. Henry Watts, Norfolk Southern Corporation, Robert E. Farris, American Trucking Associations, Erik Stromberg, American Association of Port Authorities, Carl W. Stenberg, American Society for Public Administration.

[6]Peter L. Shaw, Editor, Transportation Research Board Proceedings of the Roundtable on Ports-Land Access:Public Policy Issues (Washington, D.C.: TRB Circular 391, March 1992).

[7]Transportation Research Board Committee on Landside Access to General Cargo Seaports, Interim Report (Washington, D.C.: TRB Committee, August 1991).

[8]Transportation Research Board Committee on Landside Access to Seaports, Landside Access to U.S. Ports; Phase 1: General Cargo Ports (Washington, D.C.: TRB Committee, February 1992).

[9]Transportation Research Board, Proceedings for TRB Conference on Maritime Transportation Strategic Planning (Washington, D.C.: TRB, June 5-7, 1991, Transportation Research Circular 392, March 1992).

First hand information was obtained by participating in these TRB programs and in access to primary documents. For example, the American Association of Port Authorities and the U.S. Maritime Administration conducted a special survey of ports on the access question. U.S. Department of Transportation officials (Federal Highway Administration, Maritime Administration and Urban Mass Transportation Administration) sent field teams to ten major urban port locations to examine local access problems and conduct hearings. In addition, meetings with many leading public and private senior executives provided a rich background of informal and formal perspectives. These contacts included representatives of federal, state and local government, and rail, truck and ocean carriers, and shipper and broker interests.

Research Questions

Previous research identified primary and secondary sets of issues regarding the surface transportation access systems to seaports. In that work, urban transportation system congestion was found to be a significant factor for current operational and future planning/investment decisions.

Thus research investigated the following critical elements:

1. what is the general context of urban congestion issues?
   - in the nation
   - in California
   - in Southern California
2. what congestion issues relate to Southern California seaport surface transportation?
3. what policy strategy frameworks and options are available to relieve congestion?
   - in general
   - for seaport access
4. what policy strategies appear more promising to improve seaport access problems?

Limitations and Constraints

This modest scale research project is designed to be a **policy overview** of the subject, not a detailed economic, engineering or environmental study. Even if resources were available for such large-scale comprehensive analysis, there is question that the data would not be available. Many of the concepts and options are at the broad stage of idea generation and feasibility.

In general, specific data -- both useful and up-to-date -- are hard to come by. Since 1980 the federal government has downsized its data collection function, especially in the international trade and surface transportation statistical areas. The limited data available are often found to be proprietary or carrier specific. State and local statistical generation is spotty at best and relies on grosser levels of tabulation, in which seaport-access issues might well be submerged. Many times, basic data categories are made more complex by different observational/reporting periods or measurements. True impacts upon seaports and private carriers are not freely divulged, due to the realities of information competitive advantage in the marketplace. Nevertheless, it is possible to identify and draw useful observations employing data proximates, shadow pricing or rules-of-thumb.

Lastly, some issues reviewed are highly volatile and closely covered by the media. Public and private officials may not feel free to discuss themy. These kinds of issues include air quality, trucking bans, hazardous cargo, accidents and safety and project financing. Still, informal background interviews with experts were quite productive. Anonymity and "no attribution" were promised.

Organization of Study

The study is organized in the following sections:

II -- Transportation Congestion in Urban Areas

III -- Southern California Seaport - Surface Freight Congestion

IV -- Strategy Framework

V -- Strategy Opportunities and Congestion

VI -- Appendix

VII -- Bibliography

Chapter II

Transportation Congestion in Urban Areas

Introduction

Land access to seaports may be discussed at two levels: general access as with any other major surface cargo travel demand generator, and isolated as special situation demand generators. It is tempting to consider seaport land access problems as little different than other urban cargo flows; nonetheless, they are distinct enough to warrant special investigation.

This chapter will review the surface transportation system urban congestion problems in general terms for the nation and California.

Chapter III will explore the special case of Southern California seaports and issues of congestion.

System Congestion in Urban Areas

In the major metropolitan areas of the nation, whether coastal or inland, surface transportation facilities are under stress. The facilities are overloaded for several reasons:

1. rapid population growth
2. easier access to automobiles
3. more trucks carrying cargo
4. aging highway/transit infrastructure
5. travel demand in areas not fully transportation developed
6. low cost gasoline

This set of possible explanations for congestion appears to be constant in almost all large urban areas. Locations more affected are the newer urban areas, experiencing the most growth in the last two decades. They also indicate an intricate interrelationship of population, service demand, and aging and/or overused infrastructure. Many of these factors affect seaport access via surface

transportation systems.[1]

In general terms, six trends shape the traffic congestion problem:[2]

1. suburban development trends
   - -population migration
   - -employment migration

2. economic trends
   - -shift in employment base
   - -economic growth and distribution
   - -methods of production and communication
   - -discretionary travel

3. labor force trends
   - -labor force participation
   - -women entering the labor force

4. automobile use trends
   - -vehicle availability
   - -use of private vehicles

5. truck traffic trends
   - -level of truck traffic
   - -size and weight of trucks
   - -heavy-truck accident rate

6. highway infrastructure trends

Important criteria for determining congestion are customarily the following:

1. measures of congestion

2. traffic congestion thresholds
   - -traffic density
   - -average travel speed
   - -maximum service flow
   - -volume-to-capacity ratio
   - -average daily traffic volume
   - -daily vehicle miles of travel

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[1]U.S. Congress, Office of Technology Assessment, Delivering the Goods, Summary-Public Works Technologies, Management, and Financing (Washington, D.C.: OTA-SET-478, April 1991), pp. 1-4.

[2] U.S. General Accounting Office, Traffic Congestion: Trends, Measures, and Effects (Washington, D.C.: GAO/PEMD-90-1, November 1989), pp. 15-47.

The overall national picture is one of declining mobility in urban areas. The principal cause is the "work-trip", that is, commuting. Motor carrier trips are growing at a much slower rate. Automobiles represent the majority of vehicles at any given time in general on commuting routes. Still, there is a citizen perception of "too many trucks on the road at rush hour" and "too many big truck accidents." That leaves the unanswerable question of: what is too many?

In effect, urban areas with congestion problems have experienced a worsening from 1982 to 1988.[3]

By key measures, major seaport urban area are in the top forty. For example, Table II,1 shows a congestion index for 1988, based upon freeway vehicle miles of travel, lane miles and principal arterial street systems. Los Angeles is ranked first. Others in the top forty are: San Francisco, Miami, Seattle, Houston, San Diego, Boston, New York, Philadelphia, Portland, Tampa, Sacramento, Baltimore and Corpus Christie.

Los Angeles and many of the same seaport urban areas rank highly for costs: recurring delay, incident delay, recurring fuel, incident fuel, delay and fuel cost, and insurance. The total valuation for Los Angeles is over $6.8 billion (Table II,2).

Such costs when factored per vehicle place Los Angeles and San Francisco near the top for western cities and the nation. New York and Washington, D.C. lead the northeastern cities for total congestion costs per registered vehicle (Table II,3).

Lastly, when congestion and cost are presented per capita, Los Angeles is still among the top three (Table II,4).

The preceding statistics are most assuredly a dubious honor. The data indicate the widespread nature of congestion and its economic impacts. What is not clear is how much may be attributed to motor carrier cargo serving seaports. Later, other indicators will be used as a proxy for the proportion of seaport truck travel. It is very much an area deserving further origin-destination data generation and analysis.

Such high levels of general congestion spill over to seaport areas. Table II,5 identifies infrastructure impediments, including congestion. Fifty percent of the respondents to an American Association of Port Authorities survey considered congestion to be "usually or always" a concern.

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[3]Texas Transportation Institute, Roadway Congestion in Major Urbanized Areas 1982 to 1988 (Austin, Texas: TTI, July 1990), pp. i-xv.

Table II,1 **1988 Roadway Congestion Index Value**

Urbanized Area	Freeway/Expressway		Principal Arterial Street		Roadway[3] Congestion Index	Rank
	DVMT[1] (1000)	DVMT/[2] Ln-Mile	DVMT[1] (1000)	DVMT/[2] Ln-Mile		
Los Angeles CA	102,140	20,590	78,240	6,520	1.52	1
San Fran-Oak CA	40,370	17,360	13,540	6,620	1.33	2
Washington DC	23,600	15,850	18,800	8,250	1.32	3
Chicago IL	31,970	14,500	26,070	6,940	1.18	4
Miami FL	7,890	13,710	13,740	6,800	1.18	4
Seattle-Everett WA	17,190	15,080	8,820	5,980	1.17	6
Houston TX	27,100	15,140	10,190	5,150	1.15	7
San Diego CA	25,040	14,770	8,850	5,460	1.13	8
Boston MA	22,720	15,040	12,860	4,780	1.12	9
New York NY	78,010	13,430	49,710	6,990	1.10	10
Atlanta GA	22,970	13,920	9,790	6,570	1.10	10
Detroit MI	22,020	13,430	21,670	6,160	1.09	12
Philadelphia PA	16,680	11,910	22,120	6,850	1.07	13
Portland OR	7,100	13,150	3,280	6,250	1.05	14
Tampa FL	3,440	11,860	4,070	6,500	1.03	15
Sacramento CA	8,420	12,470	6,660	6,340	1.03	15
Dallas TX	22,380	13,360	8,150	4,810	1.02	17
Phoenix AZ	5,550	10,670	16,680	5,790	1.00	18
Nashville TN	5,250	11,930	5,390	5,890	0.99	19
Denver CO	10,490	12,200	10,450	5,690	0.99	19
St. Louis MO	17,390	11,710	11,470	6,570	0.98	21
Cleveland OH	12,670	12,800	5,010	4,510	0.97	22
Austin TX	5,220	12,430	2,070	4,920	0.96	23
Milwaukee WI	7,140	12,200	4,730	4,770	0.94	24
Baltimore MD	13,920	11,500	9,160	5,260	0.92	25
Albuquerque NM	2,230	11,130	3,390	4,840	0.90	26
Cincinnati OH	9,750	11,540	3,440	4,320	0.88	27
Minn-St. Paul MN	16,420	11,440	5,300	4,530	0.88	27
Louisville KY	6,040	10,690	2,860	5,610	0.87	29
Fort Worth TX	11,150	11,150	4,200	4,860	0.87	29
Memphis TN	3,950	10,390	4,050	5,030	0.86	31
San Antonio TX	9,050	11,040	4,990	4,660	0.86	31
Indianapolis IN	7,750	10,760	3,940	4,640	0.84	33
Pittsburgh PA	7,380	7,770	10,630	6,020	0.81	34
Oklahoma City OK	6,620	9,390	3,450	5,260	0.78	35
El Paso TX	3,320	9,490	3,110	3,860	0.74	36
Kansas City MO	12,220	9,090	4,490	4,300	0.72	37
Salt Lake City UT	4,080	8,490	1,910	5,460	0.72	37
Corpus Christi TX	1,510	8,160	1,440	4,500	0.70	39
Northeastern Avg.	27,050	12,580	20,550	6,360	1.06	
Midwestern Avg.	13,630	11,590	8,400	5,240	0.92	
Southern Avg.	8,700	12,360	7,410	6,160	1.03	
Southwestern Avg.	9,280	11,200	6,050	4,960	0.90	
Western Avg.	33,380	15,570	19,900	6,190	1.21	
Total Avg.	16,870	12,350	11,250	5,600	0.99	
Maximum Value	102,140	20,590	78,240	8,250	1.52	
Minimum Value	1,510	7,770	1,440	3,860	0.70	

Notes: [1]Daily vehicle-miles of travel
[2]Daily vehicle-miles of travel per lane-mile
[3]See Equation 1

Source: Texas Transportation Institute, Roadway Congestion in Major Urbanized Areas 1982 to 1988. Austin, Texas: TTI, July 1990, p. xi.

Table II,2 Component and Total Congestion Costs By Urbanized Area for 1988

Urbanized Area	Annual Cost Due to Congestion ($Millions)						Total Delay, Fuel &Insurance	Rank
	Recurring Delay	Incident Delay	Recurring Fuel	Incident Fuel	Delay&Fuel Cost	Insurance		
Los Angeles CA	2,060	2,420	350	410	5,240	1,640	6,880	1
New York NY	1,270	2,440	200	380	4,290	1,760	6,040	2
San Fran-Oak CA	760	960	130	160	2,010	340	2,340	3
Chicago IL	530	620	90	100	1,340	540	1,880	4
Washington DC	480	820	80	130	1,510	220	1,730	5
Philadelphia PA	290	380	40	60	770	780	1,550	6
Detroit MI	340	550	50	90	1,030	470	1,510	7
Houston TX	420	570	70	90	1,150	310	1,470	8
Boston MA	260	750	40	120	1,170	120	1,280	9
Miami FL	230	290	40	50	610	430	1,040	10
Dallas TX	250	430	40	70	790	170	960	11
Seattle-Everett WA	270	360	50	60	740	60	800	12
Atlanta GA	260	290	40	50	640	100	730	13
San Diego CA	240	160	40	30	470	110	570	14
Pittsburgh PA	110	160	20	20	310	250	570	14
Baltimore MD	100	180	20	30	330	190	520	16
Phoenix AZ	220	200	40	30	490	40	520	16
Denver CO	140	140	20	20	320	70	400	18
Fort Worth TX	90	160	20	30	300	80	380	19
Minn-St. Paul MN	130	120	20	20	290	70	360	20
St. Louis MO	110	120	20	20	270	80	350	21
Sacramento CA	100	80	20	10	210	100	300	22
Cleveland OH	70	50	10	10	140	140	290	23
Portland OR	70	120	10	20	220	50	270	24
San Antonio TX	80	80	10	10	180	70	250	25
Nashville TN	50	60	10	10	130	40	170	26
Milwaukee WI	60	60	10	10	140	30	160	27
Tampa FL	50	60	10	10	130	30	160	27
Austin TX	60	60	10	10	140	10	160	27
Cincinnati OH	60	50	10	10	130	20	150	30
Memphis TN	20	20	0	0	40	70	120	31
Kansas City MO	30	50	0	10	90	20	110	32
Oklahoma City OK	30	30	0	0	60	30	90	33
Indianapolis IN	20	30	0	0	50	20	80	34
Louisville KY	20	20	0	0	40	30	70	35
Albuquerque NM	20	20	0	0	40	10	60	36
Salt Lake City UT	20	10	0	0	30	20	60	36
El Paso TX	10	10	0	0	20	20	50	38
Corpus Christi TX	0	0	0	0	0	10	20	39
Northeastern Avg.	420	790	70	120	1,390	550	1,950	
Midwestern Avg.	130	160	20	30	330	130	460	
Southern Avg.	120	140	20	20	310	130	440	
Southwestern Avg.	120	160	20	30	320	70	390	
Western Avg.	580	680	100	120	1,480	380	1,860	
Total Avg.	240	330	40	50	660	220	880	
Maximum Value	2,060	2,440	350	410	5,230	1,760	6,870	
Minimum Value	0	0	0	0	10	10	20	

Source: Texas Transportation Institute, Roadway Congestion in Major Urbanized Areas 1982 to 1988 (Austin, Texas: TTI, July 1990), p. xiii.

Table II,3 Estimated Economic Impact of Congestion in 1988

Urbanized Area	Cost Per Registered Vehicle		Cost Per Capita	
	Total Congestion (Dollars)	Delay & Fuel (Dollars)	Total Congestion (Dollars)	Delay & Fuel (Dollars)
Northeastern Cities				
Baltimore MD	520	330	270	170
Boston MA	830	760	440	400
New York NY	1,030	730	370	260
Philadelphia PA	570	280	380	190
Pittsburgh PA	470	260	310	170
Washington DC	1,050	920	570	500
Midwestern Cities				
Chicago IL	470	330	260	180
Cincinnati OH	160	140	150	130
Cleveland OH	200	100	160	80
Detroit MI	520	360	390	270
Indianapolis IN	140	100	80	60
Kansas City MO	170	130	100	80
Louisville KY	160	110	90	60
Milwaukee WI	310	250	130	110
Minn-St. Paul MN	220	180	180	150
Oklahoma City OK	200	130	130	90
St. Louis MO	370	280	180	140
Southern Cities				
Atlanta GA	480	420	410	360
Memphis TN	200	90	140	60
Miami FL	770	450	570	330
Nashville TN	340	260	310	240
Tampa FL	270	210	240	190
Southwestern Cities				
Albuquerque NM	160	130	120	100
Austin TX	320	300	320	290
Corpus Christi TX	60	40	50	30
Dallas TX	600	500	490	410
Denver CO	290	250	260	220
El Paso TX	150	90	100	60
Fort Worth TX	370	290	330	260
Houston TX	660	520	520	410
Phoenix AZ	450	410	290	260
Salt Lake City UT	90	60	80	50
San Antonio TX	280	210	220	160
Western Cities				
Los Angeles CA	880	670	620	470
Portland OR	440	350	280	230
Sacramento CA	240	170	290	200
San Diego CA	410	330	260	210
San Fran-Oak CA	780	670	650	560
Seattle-Everett WA	680	630	490	460
Northeastern Avg.	750	550	390	280
Midwestern Avg.	260	190	170	120
Southern Avg.	410	280	340	240
Southwestern Avg.	310	250	250	200
Western Avg.	570	470	430	350
Total Avg.	420	320	290	220
Maximum Value	1,050	920	650	560
Minimum Value	70	40	50	30

Source: Texas Transportation Institute, Roadway Congestion in Major Urbanized Areas 1982 to 1988. Austin, Texas: TTI, July 1990, p. xiv.

Table II,4 1988 Urbanized Area Rankings By Roadway Congestion Index and Cost Per Capita

Urbanized Area	Roadway Congestion Index	Rank	Congestion Cost Per Capita (Dollars)	Rank	Congestion Cost Per Vehicle (Dollars)	Rank
Los Angeles CA	1.52	1	620	2	880	3
San Fran-Oak CA	1.33	2	650	1	780	5
Washington DC	1.32	3	570	3	1,050	1
Chicago IL	1.18	4	260	21	470	14
Miami FL	1.18	4	570	3	770	6
Seattle-Everett WA	1.17	6	490	6	680	7
Houston TX	1.15	7	520	5	660	8
San Diego CA	1.13	8	260	21	410	18
Boston MA	1.12	9	440	8	830	4
New York NY	1.10	10	370	12	1,030	2
Atlanta GA	1.10	10	410	9	680	13
Detroit MI	1.09	12	390	10	520	11
Philadelphia PA	1.07	13	380	11	570	10
Portland OR	1.05	14	290	19	440	17
Tampa FL	1.03	15	260	24	270	26
Sacramento CA	1.03	15	290	17	240	27
Dallas TX	1.02	17	490	6	600	9
Phoenix AZ	1.00	18	290	17	450	16
Nashville TN	0.99	19	310	15	340	21
Denver CO	0.99	19	260	21	290	24
St. Louis MO	0.98	21	180	26	370	19
Cleveland OH	0.97	22	160	28	200	29
Austin TX	0.96	23	320	14	320	22
Milwaukee WI	0.94	24	130	31	310	23
Baltimore MD	0.92	25	280	20	520	11
Albuquerque NM	0.90	26	120	33	160	33
Cincinnati OH	0.88	27	160	29	160	33
Minn-St. Paul MN	0.88	27	180	26	220	28
Louisville KY	0.87	29	90	36	160	33
Fort Worth TX	0.87	29	330	13	370	19
Memphis TN	0.86	31	140	30	200	29
San Antonio TX	0.86	31	220	25	280	25
Indianapolis IN	0.84	33	90	37	140	37
Pittsburgh PA	0.81	34	310	15	470	14
Oklahoma City OK	0.78	35	130	31	200	29
El Paso TX	0.74	36	100	34	150	36
Kansas City MO	0.72	37	100	34	170	29
Salt Lake City UT	0.72	37	80	37	90	38
Corpus Christi TX	0.70	39	50	39	60	39

Source: Texas Transportation Institute, Roadway Congestion in Major Urbanized Areas 1982 to 1988. Austin, Texas: TTI, July 1990, p. xv.

Table II,5 Infrastructure Impediments Identified in AAPA Survey

Impediment	All Ports (Total= 54) (No.)	(%)	Container Ports (Total= 25) (No.)	(%)	All other (Total=29 (No.)	(%)
Truck routes congested						
Usually or always	27	50	16	64	11	38
Sometimes	22	24	6	24	6	21
Additional rights-of-way for new routes available	12	41	9	36	13	45
Drawbridges contribute to congestion						
Usually or always	7	13	5	20	2	7
Sometimes	11	20	7	28	4	14
Roadway turning radii adequate						
Usually or always	43	80	19	76	24	83
Sometimes	8	15	4	16	4	14
Port terminal served by weight-restricted bridges	7	13	4	16	3	10
Truck routes clearly marked						
Usually or always	34	63	19	76	15	52
Sometimes	11	20	3	12	8	26
Rarely or never	7	13	3	12	4	14
Rail tracks in highway rights-of-way	34	63	18	72	16	52
Numerous at-grade rail-highway crossings	25	46	14	56	11	38
Inadequate clearances for high-cube double stacks	12	22	9	36	3	10

Source: Transportation Research Board Committee on Landside Access to Seaports, Landside Access to U.S. Ports; Phase 1: General Cargo Ports (Washington, D.C.: TRB Committee, February 1992), p. 3.2a.

California Congestion

The California situation is principally in the San Francisco Bay Area and the Southern California area. Although urban congestion is widely experienced by almost all of the state's large and middle sized cities, it is potentially very acute for the seaport in the Bay Area and the Ports of San Pedro Bay (Southern California).

The previous data places California high in the national frame of reference for the severity of congestion. Yet, greater insight is offered by viewing the state more closely.

Population growth is mushrooming, despite a severe recession. U.S. Census Bureau projections foresee a 28.32 % increase in state population between 1990 and 2010, 29.126 to 37.347 million. [4] The Southern California region will be the dominant part of the state's growth. Los Angeles and Orange counties and the desert will be 16.245 million, about 45% of the state total. Another forecast predicts the state will reach 50 million residents by 2016.[5]

An additional indicator of the rapid growth is the employment in major urban centers. Between 1960 and 1990, the Los Angeles-Long Beach Standard Metropolitan Statistical Areas (SMSA) doubled, the Anaheim-Santa Ana-Garden Grove SMSA grew by a factor of ten (Table II,6). The high growth rate will diminish greatly, compared to the past, but still be respectable between 1990 to 2010. Again, such numbers (in the range of twenty-five percent) are indicative of the levels of travel volumes thus requiring freight services by rail and truck (Table II,7).

Such population growth requires extensive logistic support by rail and highway. For example, the rail system carried dry and liquid bulk commodities. The largest increase was in farm products, over 18% between 1980 and 1990. The largest decrease was in metallic ores, over 68% (Table II,8).

Predicted change from 1990 to 2010 is about 31 percent for farm products and 23 percent decrease for metallic ores (Table II,9).

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[4]California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), pp. 113-126.

[5]"Where will state put 50 million?" San Francisco Chronicle (October 12, 1991), p. 17; reviews new book by Leon Bouvier, "Fifty Million Californians: Inevitable?"

Table II,6 Employment Trends By Region, 1960-1990

REGION	1960	1970	1980	1990	COUNTIES
LOS ANGELES	1,846,260	2,373,964	3,545,400	4,076,025	LOS ANGELES
ORANGE COUNTY	136,134	351,909	1,067,000	1,364,125	ORANGE
DESERT	136,089	244,338	574,300	1,006,113	IMPERIAL, RIVERSIDE, SAN BERNARDINO
SAN DIEGO	196,251	287,675	722,500	1,157,375	SAN DIEGO
SAN FRANCISCO	337,049	375,931	325,875	398,406	SAN FRANCISCO
EAST BAY	303,994	420,827	929,275	1,199,932	ALAMEDA, SOLANO, CONTRA COSTA
NORTH BAY	48,625	85,106	267,850	380,413	MARIN, NAPA, SONOMA
SOUTH BAY	246,160	464,712	999,975	1,180,756	SANTA CLARA, SAN MATEO
CENTRAL COAST	123,109	244,777	626,050	935,456	MONTEREY, SAN BENITO, SAN LUIS OBISPO, SANTA BARBARA, SANTA CRUZ, VENTURA
SACRAMENTO	108,701	140,196	387,800	569,925	SACRAMENTO, YOLO
SAN JOAQUIN VALLEY	227,116	422,675	903,475	1,070,663	FRESNO, KERN, KINGS, MADERA, MERCED, SAN JOAQUIN, STANISLAUS, TULARE
SIERRA	26,349	39,683	148,800	231,020	ALPINE, AMADOR, CALAVERAS, EL DORADO, INYO, MARIPOSA, MONO, NEVADA, PLACER, SIERRA, TUOLUMNE
NORTHEAST CALIFORNIA	55,523	81,794	205,950	242,576	BUTTE, COLUSA, GLENN, LASSEN, MODOC, PLUMAS, SHASTA, SISKIYOU, SUTTER TEHAMA, TRINITY, YUBA
NORTH COAST	38,622	40,573	89,400	104,057	DEL NORTE, HUMBOLDT, LAKE, MENDOCINO
STATE TOTAL	3,829,982	5,574,160	10,793,650	13,916,842	

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 69.

Table II,7 **California Employment, Major Urban Centers, 1990-2010** (In thousands)

SMSA	COUNTY	1990	2000	2010
ANAHEIM-SANTA ANA-GARDEN GROVE	ORANGE	1,330.7	1,649.1	1,844.8
BAKERSFIELD	KERN	223.7	259.7	288.7
FRESNO	FRESNO	288.9	339.5	385.0
LOS ANGELES-LONG BEACH	LOS ANGELES	4,481.4	5,004.3	5,582.4
OXNARD-SIMI VALLEY-VENTURA	VENTURA	269.2	332.5	369.0
RIVERSIDE-SAN BERNARDINO-ONTARIO	SAN BERNARDINO, RIVERSIDE	681.0	800.6	898.3
SACRAMENTO	SACRAMENTO, YOLO, PLACER	646.4	773.6	866.2
SAN DIEGO	SAN DIEGO	1,166.3	1,398.4	1,556.0
SAN FRANCISCO-OAKLAND	SAN FRANCISCO, SAN MATEO, ALAMEDA, CONTRA COSTA, MARIN	2,073.2	2,355.6	2,630.8
SAN JOSE	SANTA CLARA	1,043.9	1,266.5	1,411.6
VALLEJO-FAIRFIELD-NAPA	NAPA, SOLANO	162.3	192.6	208.5

NOTE: Estimates derived from prior trends and projected proportion of labor force.

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 130.

Table II,8 **Major Commodities Carried by Rail in California, 1980-90**(in thousands of tons)

COMMODITY	1980	1985	1990	PERCENT CHANGE 1980-1990
Farm Products	8,586	6,985	10,137	18.06
Chemicals & Allied Products	5,957	5,852	6,566	10.22
Non-metallic Minerals	13,728	11,847	11,037	-19.60
Food & Kindred Products	10,109	8,085	8,383	-17.07
Lumber & Wood Products	9,405	6,952	6,276	-33.27
Metallic Ores	11,594	5,159	3,675	-68.30
Stone, Clay & Glass Products	5,907	4,785	4,373	-25.97
Pulp & Paper	4,631	3,982	3,652	-21.14
Petroleum Products	4,191	3,619	3,466	-17.30
Primary Metal Products	5,797	3,696	2,955	-49.03
Transportation Equipment	2,629	2,992	2,856	8.63
Waste & Scrap Material	3,773	2,827	2,856	-24.30

NOTE: California statistics obtained by applying estimates of California's share, for each commodity, to the national totals of freight carried by Class I railroads, excluding those commodities not generally handled in California. 1990 estimates based on national trend data for the past decade.

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 69.

Table II,9 **Major Commodities Carried by Rail in California, 1990-2010** (in thousands of tons)

COMMODITY	1990	2000	2010	PERCENT CHANGE
Farm Products	10,137	11,658	13,290	31.10
Chemicals & Allied Products	6,566	7,223	7,945	21.00
Non-metallic Minerals	11,037	10,154	9,545	-13.52
Food & Kindred Products	8,383	8,718	9,154	9.20
Lumber & Wood Products	6,276	5,648	5,084	-18.99
Metallic Ores	3,675	3,124	2,811	-23.51
Stone, Clay & Glass Products	4,373	4,023	3,742	-14.43
Pulp & Paper	3,652	3,506	3,366	-7.83
Petroleum Products	3,466	3,535	3,641	5.05
Primary Metal Products	2,955	2,896	2,838	-3.96
Transportation Equipment	2,856	2,999	3,179	11.31
Waste & Scrap Material	2,856	2,970	3,089	8.16

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 153.

Highway travel is represented by the volume carried by the top ten California freeways in 1989. All are in Southern California and are major truck routes (Table II,10).

Lastly, the above statistical measures and forecasts are to a large part driven by another forecast, the cargo passing through California ports 1990-2010 (Table II,11). The grand total for the state may increase by seventy percent. The ports of San Pedro Bay might see an increase of eighty-one percent.

A considerable part of the conception of urban travel congestion is the role that central routes such as freeways play. Serving mixed traffic needs, in terms of passenger and freight, commuting rush hour and non-commuting, non-rush hour trips,freeways are a useful source of the public perception. Opinion polls will be addressed in later section.

However actual official observation and measurement, performed in 1988 and earlier by the State of California Department of Transportation is a useful guide.[6] The study sampled 2,950 truck trips made in fifteen large urban areas, including Los Angeles, San Francisco and San Diego, found that:

*Large trucks (three or more axles, gross vehicle weight 26,000 pounds or more) account for 79 percent of all truck travel (excluding travel by light trucks, such as pick-ups and panel trucks) in the fifteen large urban areas.

*Among these large trucks, tractor trucks (typically 5-axle, 18-wheel tractor-semitrailer trucks) predominate; they account for 58 percent of all truck travel in the fifteen large urban areas.

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[6]California Department of Transportation, Urban Freeway Gridlock Study: Technical Report (Sacramento: Caltrans, 1988), pp. 1-3.

Table II,10 Top Ten California Freeways by Annual Average Daily Traffic, 1989

ROUTE	NAME	LOCATION	ANNUAL ADT	RANK
101	Ventura Freeway	West of Route 405	277,000	1
405	San Diego Freeway	East of Route 605	271,000	2
405	San Diego Freeway	North of Olympic Blvd in west Los Angeles	266,000	3
10	Santa Monica Freeway	Between Normandie & Vermont Ave	265,000	4
110	Harbor Freeway	Between 4th & 5th Streets	264,000	5
5	Golden State Freeway	South of Route 405	259,000	6
57	Orange Freeway	South of Chapman in Fullerton	224,000	7
91	Artesia Freeway	West of Bellflower Blvd	221,000	8
5	Santa Ana Freeway	South of east Los Angeles interchange	221,000	9
60	Pomona Freeway	At Grand Avenue	205,000	10

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 156.

Table II,11 Cargo Forecast for California Ports By Community Type, 1990-2010 (in thousands of metric tonnes)

COMMODITY	SAN PEDRO BAY			SAN FRANCISCO BAY AREA			TOTAL		
	1990	2000	2010	1990	2000	2010	1990	2000	2010
INTERNATIONAL									
Containerizable	16,427.4	25,285.8	40,011.6	6,657.0	12,843.8	20,231.6	23,084.4	38,129.6	60,243.2
Food	2,609.4	3,724.3	5,347.2	--	--	--	2,609.4	3,724.3	5,347.2
Beverages	439.1	668.8	942.7	--	--	--	439.1	668.8	942.7
Cotton	578.0	723.0	1,027.9	--	--	--	578.0	723.0	1,027.9
Chemicals	1,866.3	2,784.6	4,401.4	--	--	--	1,866.3	2,784.6	4,401.4
Tires	268.1	381.9	705.3	--	--	--	268.1	381.9	705.3
Paper/Products/Waste	1,866.5	2,803.0	4,139.2	--	--	--	1,866.5	2,803.0	4,139.2
Metal Manufactures	1,146.3	1,745.2	2,869.3	--	--	--	1,146.3	1,745.2	2,869.3
Mech/Elec Equipment	2,529.3	3,760.5	6,004.4	--	--	--	2,529.3	3,760.5	6,004.4
Auto Parts	383.3	515.6	717.2	--	--	--	383.3	515.6	717.2
Furniture	679.9	1,208.2	2,373.4	--	--	--	679.9	1,208.2	2,373.4
Apparel/Footwear	988.6	1,513.3	2,168.0	--	--	--	988.6	1,513.3	2,168.0
Rubber/Products	656.7	1,220.5	2,425.8	--	--	--	656.7	1,220.5	2,425.8
Hide/Skins	289.5	554.1	882.7	--	--	--	289.5	554.1	882.7
Other General	2,126.4	3,682.8	6,007.1	--	--	--	2,126.4	3,682.8	6,007.1
Breakbulk/Neobulk	5,828.6	8,186.7	11,717.8	1,031.3	1,336.3	1,915.9	6,859.9	9,523.0	13,633.7
General	--	--	--	280.7	479.8	735.5	280.7	479.8	735.5
Logs/Wood	882.6	1,891.2	3,251.5	--	--	--	882.6	1,891.2	3,251.5
Iron/Steel Products	4,946.0	6,295.5	8,466.3	471.9	464.8	574.2	5,417.9	6,760.3	9,040.5
Newsprint	--	--	--	278.7	391.7	606.2	278.7	391.7	606.2
Autos/Trucks	1,363.7	1,735.5	2,494.0	327.1	347.2	407.0	1,690.8	2,082.7	2,901.0
Dry Bulk	12,280.9	18,453.1	27,962.1	2,807.0	4,212.4	5,275.1	15,087.9	22,665.5	33,237.2
Grains	1,592.6	3,313.0	6,205.9	255.7	390.5	491.4	1,848.3	3,703.5	6,697.3
Sugar	--	--	--	33.2	52.6	72.4	33.2	52.6	72.4
Iron/Steel Scrap	1,005.7	1,082.1	1,345.2	621.6	794.8	862.4	1,627.3	1,876.9	2,207.6
Nonmetallic Minerals	542.5	727.8	1,170.9	1,115.5	1,973.6	2,875.4	1,658.0	2,701.4	4,046.3
Coal/Petrol Coke	5,543.2	6,710.7	7,306.4	604.6	695.9	598.4	6,147.8	7,406.6	7,904.8
Other	3,596.9	6,619.5	11,933.7	176.4	305.0	375.1	3,773.3	6,924.5	12,308.8
Liquid Bulk	11,231.3	18,774.9	25,146.5	11,659.2	18,773.5	20,856.6	22,890.5	37,548.4	46,003.1
Petroleum/Products	11,231.3	18,774.9	25,146.5	11,137.7	18,119.6	20,056.8	22,369.0	36,894.5	45,203.3
Other	--	--	--	521.5	653.9	799.8	521.5	653.9	799.8
Total	47,131.9	72,436.0	107,332.0	22,481.6	37,513.2	48,686.2	69,613.5	109,949.2	156,018.2
DOMESTIC									
Containerizable	1,271.8	2,323.9	4,100.8	1,116.0	1,490.0	1,995.0	2,387.8	3,813.9	6,095.8
Breakbulk	--	--	--	10.0	18.0	34.0	10.0	18.0	34.0
Neo Bulk	653.9	1,022.2	1,623.4	--	--	--	653.9	1,022.2	1,623.4
Sugar	--	--	--	608.0	533.0	468.0	608.0	533.0	468.0
Autos	39.9	46.6	51.6	59.0	87.0	130.0	98.9	133.6	181.6
Dry Bulk	134.0	240.0	430.2	261.0	311.0	387.0	395.0	551.0	817.2
Liquid Bulk	28,173.4	26,885.1	25,976.5	25,862.0	25,733.0	25,698.0	54,035.4	52,618.1	51,674.5
Total	30,273.0	30,517.8	32,182.5	27,916.0	28,172.0	28,712.0	58,189.0	58,689.8	60,894.5
GRAND TOTAL	77,404.9	102,953.8	139,514.5	50,397.6	65,685.2	77,398.2	127,802.5	168,639.0	216,912.7

NOTE: Tonnage represents all imports and exports as well as domestic trade. Commodity types not directly comparable in all cases.

Source: California Transportation Commission, California's Transportation Future (Sacramento: CTC, April 1990), p. 156.

In the Los Angeles area, 450 truck trips were examined and considered in accord with the experience in other large urban areas:

*Large trucks account for 84 percent of all truck travel in the Los Angeles area.

*Tractor trucks account for 69 percent of all truck travel.

*The freeways carry 66 percent of all truck travel in the Los Angeles area.

*Large trucks account for 88 percent of the truck travel on the freeways.

*California trucks account for 88 percent of all truck travel on the freeways.

*Large trucks registered in California account for 56 percent of all truck travel on the freeways; only 12 percent of truck travel on the freeways is made by large trucks registered outside California.

In the AM peak period, large trucks (one direction) were the following percentages of the total vehicles on the road in Los Angeles, 3.8 in AM Peak, 5.5% Midday Offpeak, and 2.6 PM Peak.[7]

Such low percentages suggest that where trucks do use the freeway, they may well be heavily concentrated. In other areas, they are definitely visible and may cause a psychological impact larger than the numbers suggest. For example, see Table II,12 comparing Los Angeles, San Francisco and San Diego. The observed range for large trucks was as high as 17.2 percent in some locations. In the case of Midday Offpeak, the 5.5 percent average equated to "300 trucks per hour (one direction)."

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[7] Ibid., "Large Truck Peak Hour Population," p. 1.

Table II, 12 Large Trucks as a Percentage of Total Vehicles (One Direction)

	Los Angeles	San Francisco	San Diego
AM Peak (7-9AM)			
Weighted Average*	3.8	4.2	1.8
Observed Range	0.5-17.2	0.8-13.2	0.7-5.7
Midday Offpeak (11AM-1PM)			
Weighted Average*	5.5	5.4	2.5
Observed Range	0.7-16.2	0.6-12.1	0.6-4.8
PM Peak (4-6PM)			
Weighted Average*	2.6	2.4	0.8
Observed Range	0.2-13.2	0.3-6.8	0.1-1.9

* Weighted by volume, all sites.

- Average traffic volumes during the evening peak period were slightly higher than the average traffic volumes during the morning peak period. Midday traffic volumes were 10 to 15 percent lower than the peak period volumes.

Source: California Department of Transportation, Urban Freeway Gridlock Study: Technical Report (Sacramento: Caltrans, 1988), Technical Memorandum 1-2, p. 1.

Conclusion

Congestion in urban areas is clearly growing. Surface freight transportation, primarily by motor carrier, is a subset of the larger urban transportation system. Inevitably, trucking in high use corridors is perceived by citizens to be a large causal agent of congestion rather than an injured or harmed party. Furthermore, railroads may also be seen as a causal agent in some corridors where long unit trains block urban arterial street crossings.

In California, state and local programs are taking the initiative to respond to the particularly acute problems in the San Francisco Bay Area and the Southern California region. They address for the first time freight and passenger (automotive) congestion.

The next chapter discusses surface transportation access issues for the Southern California San Pedro Bay seaports -- the Port of Long Beach and the Port of Los Angeles.

Chapter III

Southern California Seaport - Surface Freight Congestion

Introduction

This chapter explores how the Southern California area is responding to the growing challenge of urban transportation congestion and declining mobility of people and freight.

The responsible agencies are keenly aware of the fact that congestion is a national and state phenomenon. As described in previous chapters, the area is not alone. Most other major urban seaport areas are experiencing similar challenges. However, the severity of problems relating to congestion and declining mobility is much higher than the others, even in California. Southern California must wrestle with **both** general congestion **and** seaport access congestion. The combination may become a powerful disincentive to routing freight through Southern California.

Programs and activities designed to improve congestion are generally directed towards general congestion for the commuting time periods. Very little is designed for freight movements. Against the context of passenger congestion, seaport surface freight access congestion issues must "fit in." Such issues and needs must **compete**, usually unsuccessfully, with the "people" side of the problem for **scarce public official leadership and public funds**. Private sector executives sum up the relationship best as: "freight does not vote."

The following sections focus upon the relationship between congestion and freight, public programs and plans to improve congestion in general and for seaport access.

Southern California -- Congestion and Freight

To address congestion in the freight context, larger forces must be considered.

For example, the nation is undergoing structural changes in its economic and employment base. More and more production is shifting from agriculture and industry to the service sector. Employees are earning less thus can afford to purchase fewer goods

and services. Rapid population growth is in the cohort that is young, uneducated and unskilled, often unemployed. Consequently, there are fundamental changes occurring in the population's capability to generate consumption of traditional goods and services. The need for surface transportation services through seaports cannot help but to be affected in terms of type of cargo carried, quantity and value.

For transportation companies and seaports, unprecedented flexibility and timely service are standard expectations for survival. Yet, the urban areas of many seaports are clogged by their own congestion. Not only does the congestion impede the local economy, but it has strong impacts on the national trade context. Ultimately, congestion adds unnecessary or undesirable costs to business and higher prices to the consumer. At some point in this complex web of impacts, government too sees lower tax receipts and increases in other directly and indirectly related problems requiring government services (environment, jobs, safety, etc.).

An indication of the scale of the overall problem for Southern California is provided by an annual report on the economic power of the area, generally known as the "Sixty-Mile Circle." Significant data are startling:[1]

> * The area of the 60-Mile Circle (radius from downtown Los Angeles) is home to 13.8 million people, nearly **46 percent of the state's total population**, more than all U.S. states except California, New York, and Texas.
>
> * The region's total **nonfarm employment** makes up over **47 percent of the state total**, while **manufacturing stands at 54 percent**, and **services employment 48 percent** of state totals.
>
> * The **gross product** (total value of all goods and services produced annually) of the 60-Mile Circle ranks **twelfth in the world**, higher than all countries of the world except the United States, Japan, the USSR, Germany, France, Italy, the United Kingdom, Canada, China, Brazil, and Spain.

In essence, the area of the 60-Mile Circle represents on the average about one-half of the state in most standard measures.

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[1]County of Los Angeles and Security Pacific Corporation, Portrait for Progress: the Economy of Los Angeles County and the Sixty-Mile Circle Region (Los Angeles: Security Pacific Corporation, November 1991), pp. i, 1.

Another indicator of scale and density is the number of cities over one hundred thousand population. The City of Los Angeles population is 3,536,800, however there are **twenty-four cities between 100,000 and 439,300 (Long Beach)**, with none between Long Beach and Los Angeles. Several new towns on the urban fringe will soon pass the one-hundred thousand mark.[2]

Operational Impacts

Translation of the preceding numbers to Southern California realities is best accomplished by reviewing congestion data.

For freeways, significant connections were found. In Caltrans data for the state (Table III,1), traffic volumes were in the same ranges for the three major urban areas (Bay Area, San Diego), however in Los Angeles the "Midday Offpeak" was as high or higher than peak hours. There was "significant congestion during the peak periods at 35 to 40 percent of the sites...in Los Angeles."[3]

The principal high volume truck routes in Los Angeles were (Figure III,1):

I-5 (Santa Ana Freeway)

I-710 (Long Beach Freeway) from the harbors

I-605 (San Gabriel Freeway)

SR-60 (Pomona Freeway)

Trucks have an impact that may be both real and perceived. On many urban freeways in California the mixture of both can be exacerbated by truck performance: slow, difficult to maneuver, and individual truck characteristics. To illustrate:[4]

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[2]Ibid., p. 3.

[3]California Department of Transportation, Urban Freeway Gridlock Study: Technical Report (Sacramento: Caltrans, 1988), "Large Truck Peak Hour Population," pp. 4-7.

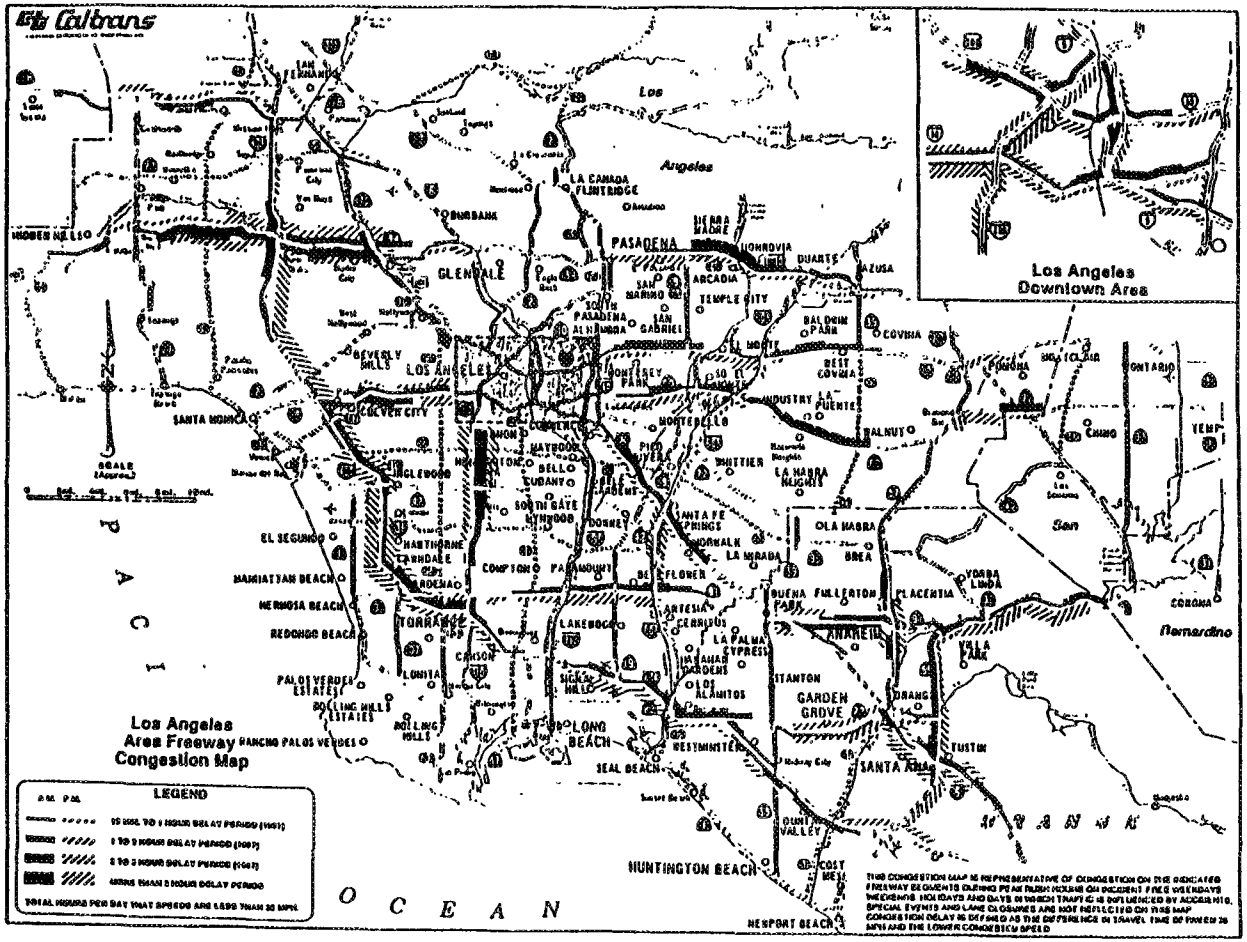
[4]Ibid., "Large Truck Impacts on Freeway Traffic Flow," p. 1.

Table III,1 Freeway Traffic Volumes (One Direction)

	Average All Sites		Maximum Observed	
	Vehicles Per Hour	Vehicles Per Lane	Vehicles Per Hour	Vehicles Per Lane
Los Angeles				
PM Peak Period	6,450	1,550	11,600	2,330
AM Peak Period	6,400	1,520	12,910	2,580
Midday Offpeak	5,500	1,310	11,870	2,370
San Francisco				
PM Peak Period	5,050	1,360	8,290	2,070
AM Peak Period	4,850	1,320	8,340	2,090
Midday Offpeak	4,530	1,240	8,150	2,040
San Diego				
PM Peak Period	5,330	1,430	9,470	1,970
AM Peak Period	4,340	1,150	7,790	1,950
Midday Offpeak	3,930	1,040	6,620	1,660

Source: California Department of Transportation, Urban Freeway Gridlock Study: Technical Report (Sacramento: Caltrans, 1988), "Large Truck Peak Hour Population," p. 4.

Figure III,1 **Los Angeles Area Freeway Congestion Map**



Source: California Department of Transportation, Urban Freeway Gridlock Study: Technical Report (Sacramento: Caltrans, 1988), "Freeway Congestion: Traffic Volumes, Truck Volumes, Congestion,

* On an urban freeway with 10 percent trucks in the traffic stream and grades below 2 percent... trucks have an impact equivalent to 1.5 to 2.0 passenger cars.

* An additional 0.1 equivalent cars may be added to the 1.5 to 2.0 base to account for the 'frictional' impact of trucks on passengers cars in an adjacent lane.

* Trucks are restricted by regulation to the rightmost lane or lanes of California freeways. this increases the density of trucks in the rightmost lanes and creates a perceived, if not an actual, barrier to merging traffic.

When considering accident data, it is clear that most events occur at freeway interchange areas, on weekdays, "late at night or early in the morning, and generally do not coincide with peak commuter periods." "Speed differential has a significant effect on truck accidents."[5]

The impacts associated with truck accidents are significant for large trucks on freeways:[6]

* In Los Angeles, all truck-involved incidents and accidents cause 9 million vehicle hours of delay per year at an estimated cost of about $ 100 million. This is about 20 percent of the $ 500 million delay cost of all truck and automobile incidents, and about 10 percent of the $ 1 billion delay cost of all congestion caused by peak period traffic congestion, incidents, and accidents in the area.

* Major incidents, which comprise 5 to 10 percent of all truck incidents, are thought to be responsible for about half of the total delay caused by all truck incidents.

* A major incident blocks two or more lanes of the freeway for two hours or longer. About two-thirds of major incidents are the result of overturns, spills, and shifted loads. these tend to occur on ramps, and the

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[5]Ibid., "Large Truck Accident Experience," p. 1.

[6]Ibid., "Large Truck Incidents: Impact on Peak-Hour Urban Freeway Congestion," pp. 1-2.

primary cause is excessive speed on the curve. Most occur outside the peak periods: before dawn or during the midday when trucks and other vehicles are operating at full freeway speeds. The average duration of major incidents is 3 hours and 39 minutes.

* Common incidents, which comprises 90 to 95 percent of all incidents, re thought to be responsible for the other half of the total delay caused by all truck incidents.

* Common incidents disrupt traffic for shorter periods of time -- less than two hours. *** The average duration of a common incident is one hour.

Furthermore, in the Los Angeles areas freeways experiencing severe congestion were 30 percent of the network, and commensurately had high traffic volumes, injuries and accident rates. "In Los Angeles the highly congested freeways that also had relatively high percentage of large trucks in the traffic stream were I-5, I-10, SR-55, SR-60, SR-91, SR-101, I-405, I-710." Those serving the Los Central Business District and harbor area had the highest percentages of large trucks. Perhaps oddly, (t)he most congested freeways (those with high traffic volumes, injury rates, and congestion) had relatively low percentages of large trucks compared to the less congested freeways."[7]

Speed does not seem to be a major factor.[8] Despite the passenger car driver perception, the majority of trucks do not speed:

> ...In Los Angeles the speeds of large trucks tended to be approximately equal t the speeds of passenger cars during peak traffic periods. during offpeak periods, large trucks speeds were observed to be lower than passenger car speeds by approximately 5 mph. It appears that during heavy traffic flow, large trucks keep pace with the overall traffic stream. However, during the offpeak period, when passenger car speeds increase, large truck speeds tend to remain below 60 mph, possibly due to the effect of speed enforcement.

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[7]Ibid., "Freeway Congestion: Traffic Volumes, Truck Volumes, Congestion, Accidents," p. 1.

[8]Ibid., "Los Angeles Truck Speed Case Study, Technical Memorandum 1-7," pp. 1-3.

Earlier predictions were equally grim. The Southern California Association of Governments (SCAG) forecast, based upon 1984 and 1986 data, a year 2010 regional population of 18,256,000 people.[9] After reviewing a range of mobility alternatives, including "No Project," it was determined that even with a mixture of strategies, there would still be significant congestion. the strategies included: developing new transportation facilities; demand management; system management; and job/housing balance. Table III-2 shows the comparison of the preferred strategy to no project and the 1984 baseline.

In terms of seaport surface transportation activity, no data are available indicating the mode and vehicles serving the harbors in relation to the overall regional transportation flows.

For example, the number of trucks trips generated by port traffic is not accessible in consistent and uniform measures as regional truck movement data. Thus the impacts on urban mobility and congestion are not well documented. As indicated above by the general studies of truck traffic on the freeways, the totals for the region appear sizeable. The perceived impact is even larger when concentrated on certain freeway and arterial routes and by time of day.

Despite these difficulties, it is possible to obtain a sense of the relative level of activity and impact for both rail and trucks by approximate sources. The San Pedro Bay ports were number one (Los Angeles) and number two (Long Beach) for the nation in the handling of container freight (Table III,3).[10]

Public Perception

The travelling public perceives transportation congestion to rank among the top issues in the state and southern California. Polls have confirmed in the last decade the growing sense of public concern and frustration with the difficulties of urban mobility.

Recent surveys document the direction and intensity of opinion. Table III,4 shows the primary mode of travel. Between 1989 and 1991 the percentage of drivers commuting alone decreased the percentage ridesharing increased. Perceptions of travel effort worsened in the same three year period, whether by freeway

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[9]Southern California Association of Governments, Regional Mobility Plan (Los Angeles: SCAG, 1989, pp. III-1-2.

[10]"Los Angeles still tops port ratings; Long Beach leapfrogs into No. 2 slot," Traffic World (April 1, 1991), pp. 25-26.

Table III,2 **Mobility Plan Performance Indicators**

INDICATOR	1984	NO PROJECT	PREFERRED STRATEGY
Vehicle Miles Traveled (000)	221,292	376,187	284,382
Vehicle Hours Traveled (000)	6,343	19,575	7,850
Hours of Delay (000)	629	10,132	899
Percent Delay	10% (6 min/hr)	32% (32 min/hr)	11% (7 min/hr)
Average Daily Speeds (MPH)			
All Facilities	35	19	36
Freeways	47	24	45
Miles of Congestion			
AM Peak	452	2,564	280
PM Peak	856	4,567	612
Transit Mode Split Home-to-Work	6.6%	5.1%	19.3%
Average Auto Occupancy Home-to-Work Trips	1.129	1.150	1.186

Source: Southern California Association of Governments Regional Mobility Plan (Los Angeles: SCAG, 1989), p. V-49.

Table III,3 1990 Port Comparisons -- International Containerized Cargo Only

Ranking 1990	Ranking 1989	Port	TEUs 1990	TEUs 1989	Percent change
1	1	Los Angeles	1,454,621	1,447,547	0
2	3	Long Beach	1,213,931	1,167,106	1
3	2	New York/NJ	1,210,173	1,197,853	4
4	4	Seattle	767,303	723,025	6
5	5	Oakland	578,892	562,316	3
6	6	Charleston	558,853	550,492	2
7	7	Tacoma	483,319	515,747	-6
8	8	Houston	370,069	348,141	6
9	11	Norfolk	358,894	279,682	28
10	10	Savannah	313,208	292,229	7
11	12	Miami	296,188	258,282	15
12	9	Baltimore	271,134	317,432	-15
13	13	Pt. Everglades	174,759	160,403	9
14	15	New Orleans	157,195	140,677	12
15	14	Portsmouth	138,825	158,571	-12
16	16	Portland	111,576	107,119	4
17	17	Jacksonville	107,286	96,798	11
18	19	San Fancisco	106,306	83,567	27
19	18	San Juan	100,287	90,878	10
20	21	West Palm Beach	72,076	64,943	11

Source: "1990 Port Comparisons," Traffic World (April 1, 1991), p. 26.

Table III,4 **Primary Travel Mode, 1989-1991**

Travel Mode	1989 Freq.	1989 %	1990 Freq.	1990 %	1991 Freq.	1991 %	1991 (excl. Orange) Freq.	1991 (excl. Orange) %
Drive Alone	418	83%	944	79%	2,014	79%	1,590	78%
Carpool	55	11	174	14	334	13	281	14
Vanpool	1	0	5	.5	13	1	10	1
Bicycle	10	2	10	1	14	1	11	1
Motorcycle	3	1	2	0	8	0	6	0
Public Bus	9	2	52	4	120	5	109	5
Commuter Rail	NA*		NA*		5	0	4	0
Private Bus	1	0	5	.5	6	0	5	0
Walk or jog	3	1	16	1	34	1	27	1
	500	100%	1,208	100%	2,548	100%	2,043	100%

Source: Commuter Transportation Services, State of the Commute (Los Angeles: CTS, 1991), p. 4.

or surface street (Table III,5). The evening trip home is slightly worse than the morning trip to work.

Yet, other studies indicated that congestion was improving somewhat. Caltrans observed on selected key routes was "...15% below a typical Monday in December...." Speculative ideas that might account for the surprising decline were: increased ridesharing, start-up of a Freeway Service Patrol, greater use of alternative work schedules, more "layoffs and fewer orders of goods because of the sluggish economy..."[11]

State and Local Governmental Programs to Improve Congestion

In June 1990 the voters of California approved a transportation capital project program underwritten by state bonds. A key component was the requirement that the state, regions, counties and cities develop Congestion Management Programs (CMP).[12] The CMP is to:

> develop a new integrated approach to making transportation programming decisions. This new process is intended to work toward the identification of an urban mobility system involving all modes and transportation providers. Through the participation of these providers and other interested parties, a single CMP capital improvement program is developed that determines what actions will be taken to protect and improve the multifaceted system.

There are five sections to a CMP:

1. CMP transportation system and level of service standards for the highway and roadway portions of the system;

2. transit standards;

3. transportation demand management and trip reduction (TDM);

4. program for analyzing the impacts of land use decisions;

5. seven year capital improvement program.

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[11]Mark A. Stein, "Freeways' Crush Is Down Slightly, Caltrans Reports, Los Angeles Times (July 23, 1991), pp. A-3, A-23.

[12]Caltrans, Congestion Management Program: Resource Handbook (Sacramento: Caltrans, November 1990), pp. 1-12.

Table III,5 **Perceptions of Traffic by Freeway Users and Surface Street Users**

PERCEPTIONS OF TRAFFIC BY FREEWAY USERS

Traffic Rating	To Work 1989	1990	1991	To Home 1989	1990	1991
Always Bad	30%	33%	24%	35%	34%	28%
More Often Bad	14	14	23	16	16	24
Mixed	6	6	10	7	7	10
More Often Good	23	19	23	23	16	20
Always Good	27	28	20	19	27	18

PERCEPTIONS OF TRAFFIC BY SURFACE STREET USERS

Traffic Rating	To Work 1989	1990	1991	To Home 1989	1990	1991
Always Bad	17%	19%	13%	25%	21%	15%
More Often Bad	15	14	18	15	17	20
Mixed	5	9	11	6	8	11
More Often Good	27	24	35	25	24	33
Always Good	36	34	24	29	30	21

Source: Commuter Transportation Services, State of the Commute (Los Angeles: CTS, 1991), p. 34.

Other requirements include a traffic data base and close coordination with land use, transportation and air quality agencies. The implementing agency is responsible for developing the CMP, i.e., thirty-one urbanized counties in California. The management coordination process is described in Figure III,2, which shows the stages of agency designation, program development, review and adoption and implementation.

The roles of the transportation providers and related agencies are detailed in Table III,6. Seven levels of governmental organization and the public have important responsibilities.

The relationship of other planning processes to the CMP is displayed in Figure III,3. Note the strong role of air quality agencies.

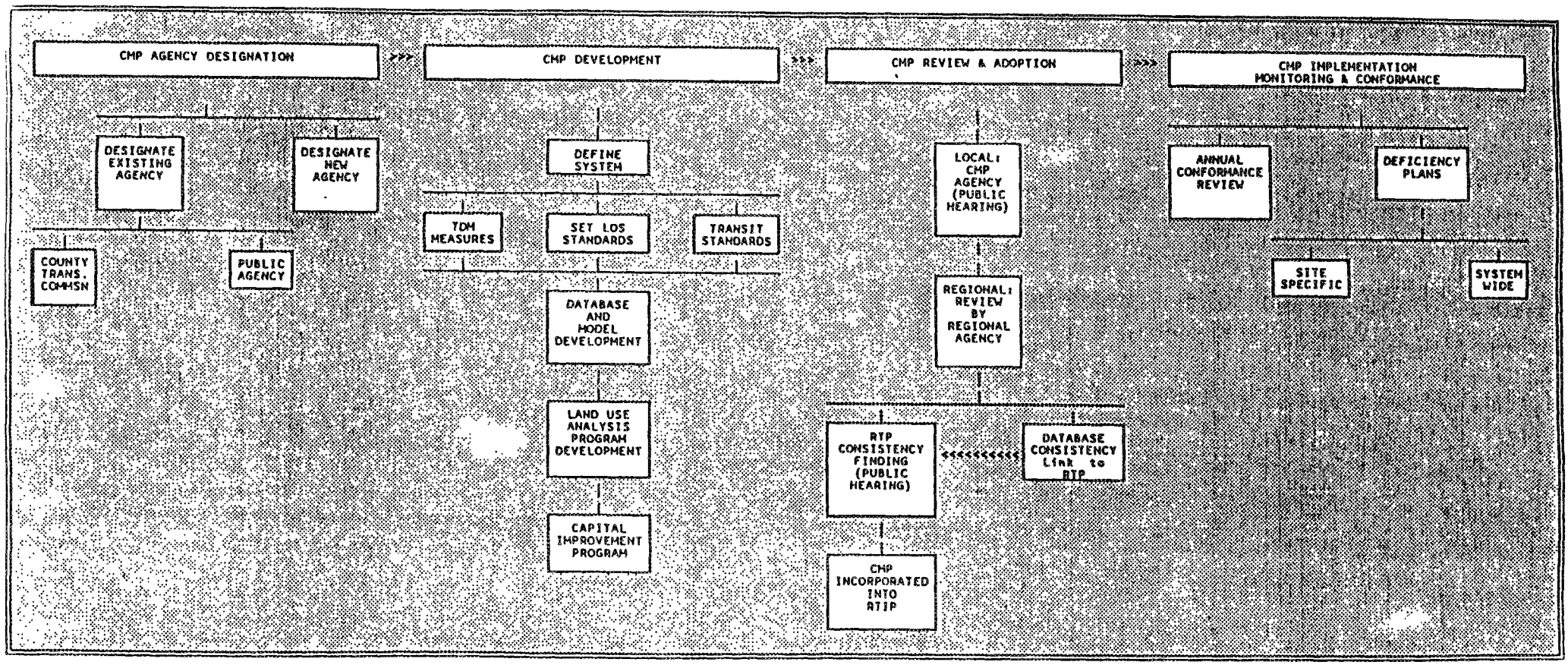
The CMP programs are to be funded from three sources of state transportation support:

* Local Subvention Funds

* Flexible Congestion Relief and Urban and Commuter Rail Funds

* Traffic System Management (TSM) Funds

Figure III,2 Congestion Management Program Processes



Source: Caltrans, Congestion Management Program: Resource Handbook (Sacramento: Caltrans, November 1990), p. 5.

Table III,6 CMP Processes and Participants

PARTICIPANT	CMA DESIGNATION	CMP DEVELOPMENT	CMP REVIEW & ADOPTION	CMP IMPLEMENT-ATION, MONITORING & CONFORMANCE
CITIES & COUNTIES	X	X	-	X
CMA	-	X	X	X
CALTRANS	-	X	-	-
TRANSIT PROVIDERS	-	X	-	X
REGIONAL AGENCY	-	X	X[2]	-
AIR QUALITY AGENCY	-	X	-	X[3]
PUBLIC	-	X	X	X

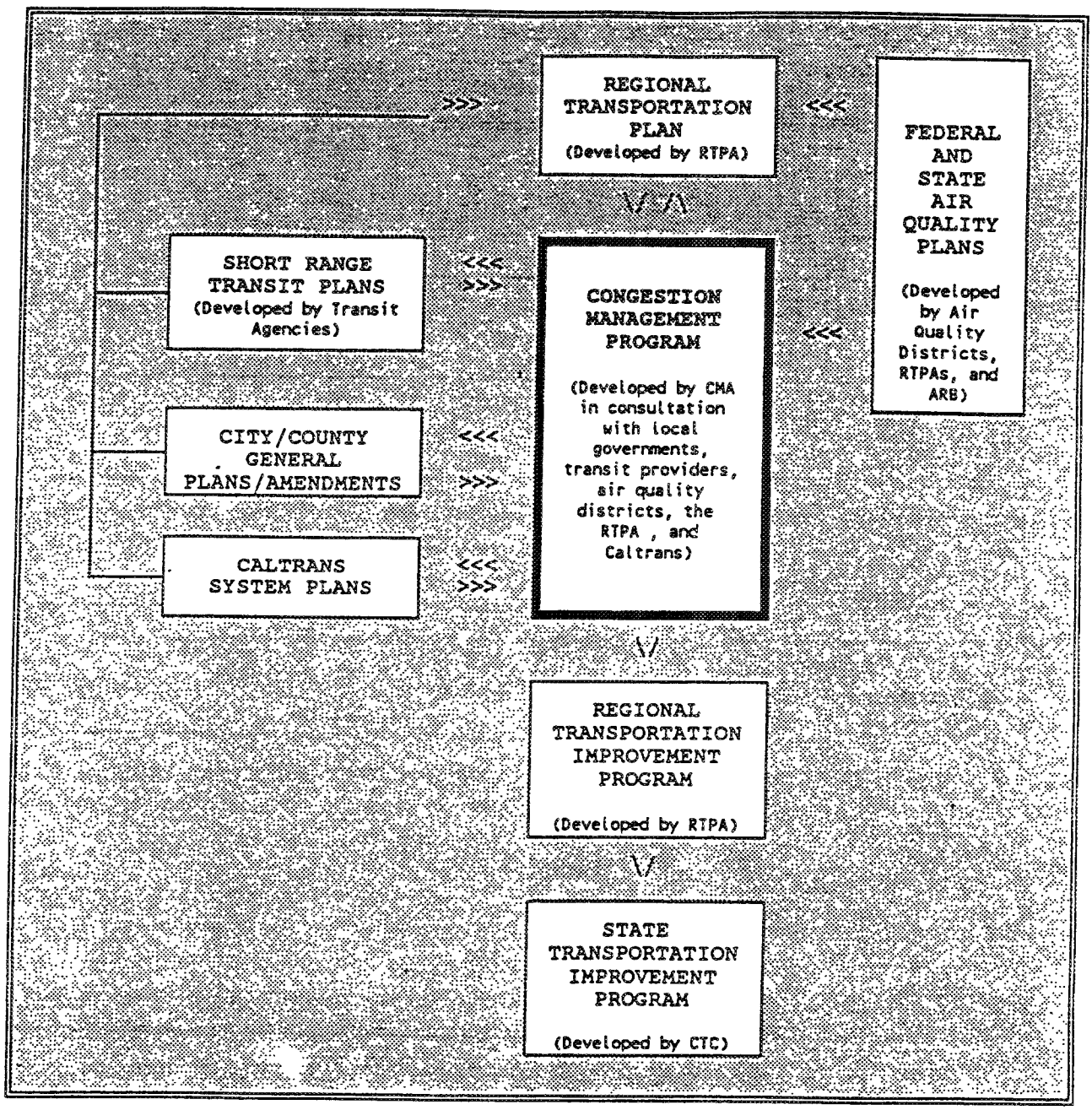
[1] Table identifies statutory responsibilities of various participants.

[2] Regional transportation planning agency review for consistency with RTP.

[3] Air Quality Agency participation in deficiency plan process.

Source: Caltrans, California Management Program: Resource Handbook (Sacramento: Caltrans, November 1990), p. 7.

Figure III,3 CMP Relationship to Other Planning Processes



>>> Flow of influence, communication, and information.

Source: Caltrans, Congestion Management Program: Resource Handbook (Sacramento: Caltrans, November 1990), p.8.

County of Los Angeles

In accordance with the state requirements to develop a Congestion Management Program (CMP), the Los Angeles County Transportation Commission has developed criteria for local congestion:[13]

* freeways which are experiencing operations of thirty miles per hour or less for a minimum of five hours a day;

* arterial intersections are experiencing at least one hour of congestion during daily peak periods at Level of Service E or F;

* transit routes have boardings of 20,000 or more passengers a day.

The congested corridors are:

1A	Santa Monica Freeway (I-10)
1B	San Bernadino/Pomona Freeway Corridor (I-10, SR-60)
2	San Fernando Valley - Cross Valley to Downtown Los Angeles (I-5)
3	Downtown Los Angeles - San Pedro (I-110)
4	San Fernando Valley/Orange County Corridor
5A	134/210 Corridor
5B	West San Gabriel Valley Corridor
6	Downtown Los Angeles - Orange County Line (including I-5)
7	I-605 Freeway Corridor
8	Manhattan Beach/Artesia Corridor
9	North County Access (Routes 126, 14, and 138)

For readers familiar with the Southern California area, there is a temptation to believe, after reviewing the above list, that the whole county (and region) is congested. The temptation is based on reality.

Recommendations for action are classified by time:

-Immediate (ability to implement during 1991)
-Short-term (ability to implement within 1992-1995)
-Long-term (beyond 1995)

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[13]Los Angeles County Transportation Commission, Congested Corridors Action Plan (Los Angeles: LACTC, Preliminary Draft, January 1991), pp. i-vi.

In general terms, a phased approach is planned with the time horizons developed appropriately. For the county overall, the following ideas are planned. Phase I may be implemented in the near-term. Should they not work as desired, Phase II can be implemented. The following are more relevant ideas for seaport-surface transportation access congestion problems:

Phase I

1. Implement Caltrans Urban Freeway Congestion Relief Program.

2. Implement HOV (High Occupancy Vehicle) Master Plan as expeditiously as possible.

3. Require HOV lanes on all new highways.

4. Implement the TRIP program on all congested corridors.

5. Expedite the implementation of Freeway Tow Service.

6. Prepare and Park-and-Ride Master Plan focused on the congested corridors and rail lines.

7. Complete the conversion of freeway call boxes to cellular technology.

8. Encourage parking restrictions during peak hours on major surface streets.

9. Create a county-wide coordinated signalization program.

10. Identify new funding partners, such as the ports, the airport and the private sector.

11. Encourage the effective programming of trip reduction and development fees by local jurisdictions.

12. Implement the Congestion Management Program to assure land use decisions are balanced with the transportation system.

Phase II

1. Provide preferential bus lanes and carpool lanes on surface streets where feasible.

2. Tie receipt of new funding for coordinated signal systems to a commitment to implement peak-hour parking restrictions at congested locations. Funding for off-street parking areas may need to be identified.

3. Provide a county-wide coordinated signalization program.

4. Establish neighborhood work cents for telecommuting.

5. Assist cities in developing off-street truck delivery zones.

6. Implement market-pricing mechanisms to discourage peak hour travel by single occupant vehicles.

7. Establish staggered work hours for heavy industrial areas.

8. Regulate truck traffic to minimize truck accidents on freeways during peak periods.

The freeway routes serving seaports are severely congested for almost their entire distance, including alternate arterials. the corridors are:

* San Pedro -- Los Angeles (I-110)

* Long Beach -- Los Angeles (I-710)

* Long Beach -- San Gabriel (I-605/I-10)

* San Fernando Valley -- LAX -- Long Beach -- Orange County (I-405)

* San Fernando Valley -- LA CBD -- Orange County

* Santa Monica -- Los Angeles -- San Bernadino (I-10)

* Los Angeles -- Pomona (SR 60)

* South Bay -- Riverside (SR 91)

Further development of the CMP process in 1991 presented greater definition of key elements, as required by the state legislation.[14] Figure III,4 defines the Level of Service. The LOS has six levels ranging from "A" (the best) to "F" (the worst). Most of the freeways identified in Los Angeles area are at "E" and "F".

An important part of the legislation is the requirement that a process of coordination with local government be established. The definition of government is inclusive of general government, special districts, operating districts and authorities. Coordination is thereby achieved with air quality programs, transit operators, zoning and permits, and **ports and harbors.** Normally, seaports would be concerned about the congestion caused by developments approved by other governments. Here it is clear that seaports themselves may cause congestion by approving new development within their jurisdictions. Figure III,5 describes the process.

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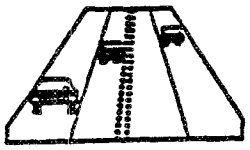
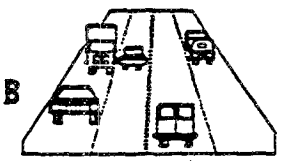
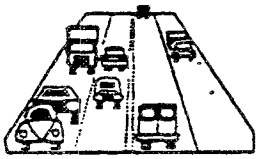
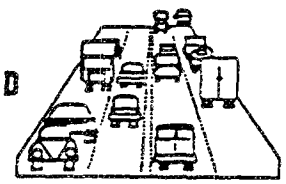
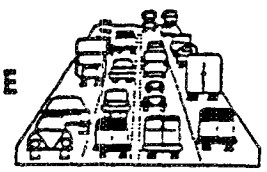
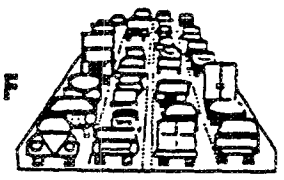
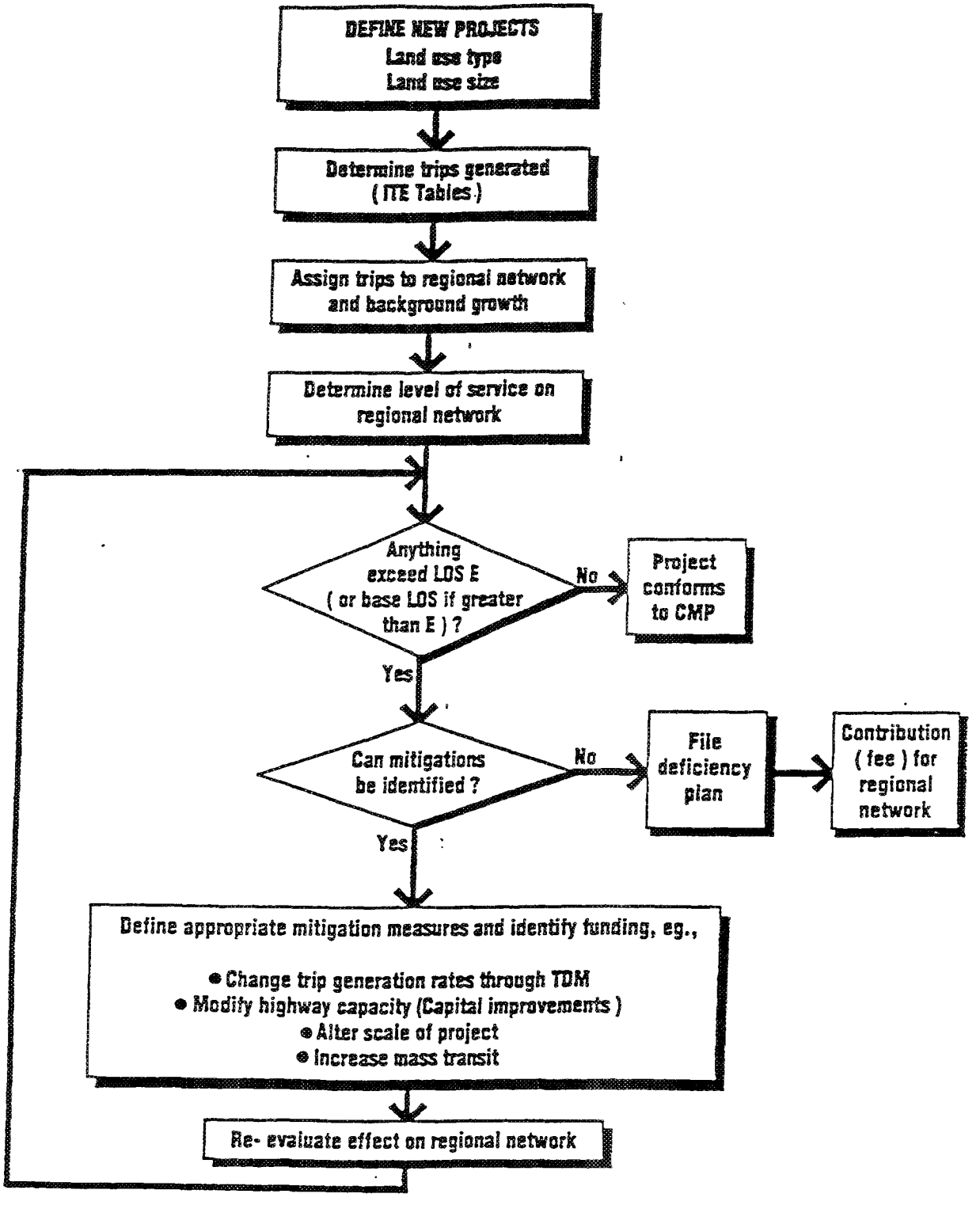
[14]Los Angeles County Transportation Commission, Congestion Management Program for Los Angeles County (Los Angeles: LACTC, Draft, May 15, 1991), pp. 1-7.

Figure III,4 Levels of Service

LEVEL OF SERVICE		TECHNICAL DESCRIPTORS			
		FLOW CONDITIONS	OPERATING SPEED	DELAY	SERVICE RATING
A		Highest quality of service. Free traffic flow, low volumes and densities. Little or no restriction on maneuverability or speed.	55+	None	Good
B		Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability.	50	None	Good
C		Stable traffic flow, but less freedom to select speed, change lanes, or pass. Density increasing.	45	Minimal	Adequate
D		Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less maneuverability and driver comfort.	40	Minimal	Adequate
E		Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability and low driver comfort.	35	Significant	Poor
F		Forced traffic flow. Speed and flow may drop to zero with high densities.	<25	Considerable	Poor

Source: Los Angeles County Transportation Commission, Congestion Management Program for Los Angeles County (Los Angeles: LACTC, draft, May 15, 1991), p. 9.

Figure III,5 CMP Review Process for Local Jurisdictions



Source: Los Angeles County Transportation Commission, Congestion Management Program for Los Angeles County (Los Angeles: LACTC, Draft, May 15, 1991), p. 9.

City of Los Angeles Truck Ban Proposal

First proposed in 1988, the truck ban ordinance has been intensely debated by all parties. Under the leadership of a mayoral advisory panel, three public meetings were held (1990 and 1991), where over five hundred parties expressed interest.[15]

In part, its development was stimulated by the success in TDM measures for the 1984 Olympics in Los Angeles. The concept was transferred to downtown, Central Business District (CBD) congestion problems, which were worsened by rapid new high-rise commercial developments and METRO Rail (subway) construction disruption. Quickly, the popularity of the idea spilled over to possible application to the freeway system as well, which was experiencing severe congestion and increasing number of large truck accidents. In the public's mind, it did not matter that Caltrans had jurisdiction over the freeways, not the City of Los Angeles.

In its current version, the proposed municipal ordinance would require:[16]

* Truck operators mush show proof of a current safety inspection.

* Truck operators must identify those trucks that will be authorized to operate during non-peak hours.

* Truck operators must choose operating periods (non-peak, or nighttime deliveries).

* Shippers and receivers of goods must accept night deliveries, if their daytime operation exceeds eight truck shipments per week.

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[15]City of Los Angeles Department of Transportation, Memorandum to Mayor Bradley--Approval of Peak-Hour Heavy Duty Truck Management Program (Los Angeles: Department of Transportation, October 22, 1991), pp. 1-6.

[16]City of Los Angeles, Department of Transportation, Peak-Hour Heavy-Duty Truck Management Program (Los Angeles: City Council Ordinance, Draft, October 1991)., pp.1-32; see also: City of Los Angeles, Truck Management Program California Environmental Quality Act (CEQA) Negative Declaration (Los Angeles: Department of Transportation, June 1991); City of Los Angeles, Truck Management Program CEQA Mitigated Negative Declaration (Los Angeles: Department of Transportation, September 17, 1991).

Exemptions would include:

* All Federal, State, county,and municipal government emergency vehicles utilized in fire, police or rescue operations.

* All trucks which carry mail exclusively for the U.S. Postal Service and all U.S military vehicles.

* All trucks actively engaged in the transportation of hazardous waste.

In addition, general exemptions relate to emergencies, trucks powered by clean alternative fuels, truck operational contractual agreements in existence prior to adoption of the ordinance, transport of perishable products, driver/cargo safety reasons, or extreme hardship forcing closure of business.

The draft ordinance was intensely debated, mainly in the press. The California Trucking Association resisted strongly and many articles in the local and national press played up the theme of "Big Government" hurting struggling businesses, at a time when business was threatening to leave the state.[17] As a result, the it has been tabled for further discussion and revision.

Alameda Corridor

A major activity underway to reduce congestion in the main rail and trucking corridors to the Ports of Long Beach and Los Angeles has been developed by the Alameda Corridor Joint Powers Authority (ACTA).[18] The goal of the twenty-two mile route (Figure III,6) from central Los Angeles to the ocean is:

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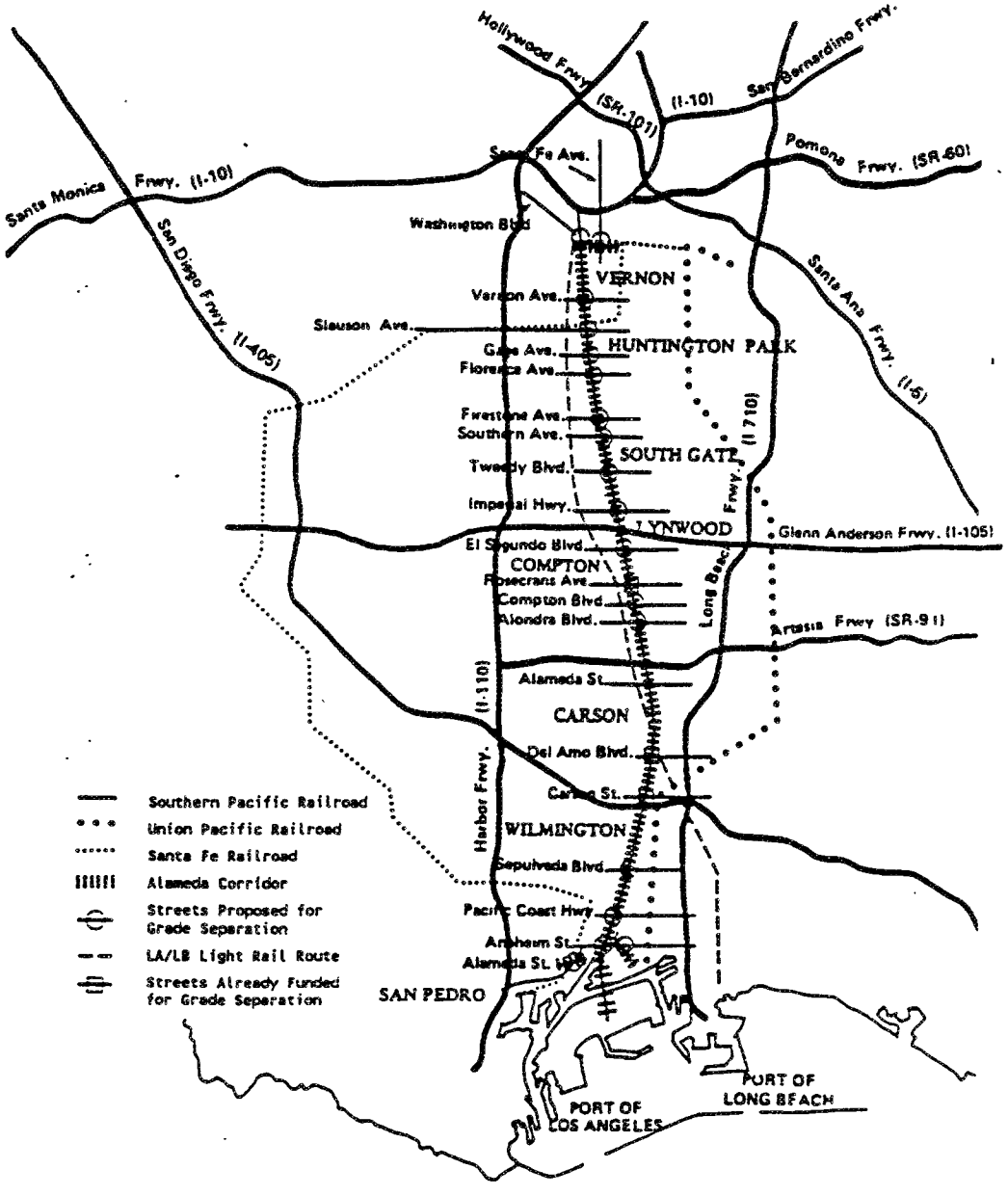
[17]Representative coverage of the debate was: Frederick M. Muir, "Business Groups Assail Plan to Ban Trucks During Rush Hours," Traffic: Mayor Bradley's proposal would cost billions in higher transportation costs, lost jobs and inefficiency, leaders assert. Los Angeles Times (October 17, 1991), p. A1; Robert W. Poole Jr., "Why a Cudgel When a Scalpel Would Do?" Instead of banning trucks from the city, charge them for rush-hour road use. Los Angeles Times (November 14, 1991), p. B7; David M. Cawthorne, "Truckers call for massive rate hike should L.A. impose truck ban," Traffic World (November 11, 1991), p. 13.

[18]Alameda Corridor Transportation Authority, Alameda Corridor Update (Carson, CA: ACTA, March 1992), pp. 1-5.

Figure III,6 Alameda Corridor Rail and Highway Facilities



Source: Alameda Corridor Transportation Authority, The Alameda Corridor: A National Priority (Huntington Park, CA: ACTA, October 1991), p. 12.

...to facilitate truck and railroad access to the ports of Los Angeles and Long Beach -- the busiest harbor complex in the United States.

A combination of projects will make the improvement possible. Anticipated benefits include:

* reduced freeway congestion/improved freeway safety

  (development of near-dock and on-dock rail systems)

  (diversion of freeway truck traffic to Alameda Street)

* reduced noise and traffic delays

  (50% reduction in train-related noise and vibration in residential areas)

  (90% reduction in train-related traffic delays, eliminating some 14,000 hours of delay by the year 2020, due to the rerouting of trains and elimination of grade crossings)

* improved railroad operations

  (30% reduction in train operating hours, and a 75% reduction in the number of times trains have to stop for other trains to pass. Stopped trains cause severe traffic tie-ups on streets.

  (Train speeds will increase from 10-20 miles per hour to 30-40 miles per hour.

* improved air quality

* increased economic activity

The entire program may cost $1.5 billion and be completed in 2000. Much of the plan (See Table III,7) was premised upon a greater level of federal and state funding. For example, federal funds were anticipated at $332 million, while $67.6 million was actually included in the new surface transportation legislation. State funds were planned at $145 million and now are at zero.

In 1991, "...about 19,000 truck trips and 25 train movements per day..." were generated. "By the year 2020, truck traffic is projected to increase to 49,000 daily trips and 90 daily train

Table III,7 Estimated Costs for the Alameda Corridor ($ Millions)

Track and Signal	$101
Structures	$391
Roadway	$81
Utility Relocation	$58
Right-of-Way *	$260
Subtotal	*$891*
Engineering, Construction Management, and Administration	$126
Financing and Legal	$61
Project Reserve	$108
PROJECT COST (1991 $)	**$1,186**
Project Cost (escalated)	*$1,589*

* *Excludes railroad right-of-way*

Source: Alameda Corridor Transportation Authority, The Alameda Corridor: A National Priority (Huntington Park, CA: ACTA, October 1991), p. 15.

movements."[19]

Although a very attractive idea which initially received strong public and private support, technical studies now indicate that not as many trucks as first thought would be diverted from adjacent freeways and arterials. In addition, key railroad right-of-way (Southern Pacific) has too high an asking price -- $500 million.[20]

Conclusion

The national, state and local focus upon urban congestion received reinforcement from the U.S. Surface Transportation Assistance Act of 1987. That legislation emphasized the problem of mobility and congestion. In 1990 the voters of the State of California further highlighted the issue by actually putting large sums of newly approved state bonds into the arena for ameliorating congestion. Furthermore, special plans were required of regional and local jurisdiction to deal with congestion.

In this environment, the ports of San Pedro Bay were developing their massive plans for the Year 2020, but without any significant public support for access congestion problems. Creation of the Alameda Corridor Transportation Authority was their way to focus public and private attention on the matter and to develop a program with a financial plan.

Lastly, the City of Los Angeles, still concerned by trucks, is attempting to regulate their impact during day-time, weekday travel.

Each of these activities started independent of the other. It was not planned as a coherent, coordinated program. Now, there is opportunity to tie them together in a mutually supportive way. Despite the fact that public resources are scarce and the private sector prefers not to front capital funds in public-private projects, **close coordination** should be encouraged. At all costs, competition for limited funds should not cancel out such efforts. Careful fiscal programming and scheduling can prioritize congestion plans to ameliorate seaport-surface freight access difficulties.

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[19]Alameda Corridor Transportation Authority, The Alameda Corridor: A National Priority (Huntington Park, CA: ACTA, October 1991), p. 9.

[20]Robert P. James, "Touted Alameda Corridor imperiled as governments pull out fiscal rug," Traffic World (November 4, 1991), pp. 12-13.

Chapter IV

Strategy Framework

Introduction

To discuss options and their underlying frameworks, it is necessary to consider the perspective of the observer. Put simply:

for whom is congested surface freight access to seaports a problem?

This chapter will review several perspectives, discuss congestion relief strategies and suggest scenarios in which strategies may be developed.

Perspectives

If public complaints and perception were the primary perspective, then the driver/carrier using the system (mostly freeways and local highways/roads) would be the starting point. This might require emphasis upon mobility and safety of travel.

If seaport economic viability as a job and tax generator were considered critical, then transportation access questions would be justified immediately by community economic health concerns.

If transportation financing were the primary perspective, then we might anticipate financial reality coming into play. How will the changes and improvements required for better access be funded?

Lastly, if service to the shipper were the primary consideration, then the "perfect order" concept would take precedence. It is the shipper's dream and often the transportation provider's nightmare. Basically, the shipment may be characterized by four desirable attributes, which may serve as criteria. Is the shipment:[1]

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[1]Brian Rutemiller, Regional Logistics Manager, Proctor and Gamble, Inc., Statement at Caltrans Intermodal Goods Movement Conference (Sacramento: June 9, 1992).

1. on-time?

2. intact with no damage?

3. the right product and quantity?

4. invoiced correctly?

The four criteria are not very sophisticated or complicated. But it is the essence of a fundamental thought process. The first three items, shipment punctuality, condition and correctness, depend very much upon reliable performance of the transportation system. The fourth, invoicing, may depend more upon freight brokers and office procedures than physical transport of goods. Lastly, implied is the element of **cost**. The lowest cost supplier of transportation may not be able to offer reliably the four main criteria. Paying extra is no guarantee of better service though it often goes hand-in-hand.

If the issue were to be discussed only from the private sector, that is the "shipper" point-of-view, the matter might be resolved rather quickly. Still, several interests must be balanced including:

1. driver/carrier perception of congestion and safety

2. community jobs and tax revenues

3. transportation financing

4. shipper needs

Transportation Strategies

The subject of urban transportation congestion has been intensively explored in the last decade. Unfortunately, most of the attention was given to the movement of people for the work trip. Practically nothing has been developed for the movement of freight and its relationship to work-trip oriented congestion. When there has been discussion, the focus is the mixing in general traffic of passenger vehicles and trucks -- thus interest in safety and accidents. Nothing has explored the general subject for surface freight access to seaports by truck or rail. As noted in earlier chapters, recent legislation and project proposals in

California have broken new ground (Congestion Management Program, Alameda Corridor Program).

Nevertheless, it would be valuable to review the possibilities cited by a leading study prepared by the Institute for Traffic Engineers.[2] Addressing the movement of people in urban areas, its broad categories provide a solid starting point. Table IV,1 displays an emphasis upon highways, new capacity, transit, managing demand, funding and institutional measures. See Appendix A for a full review of tools to alleviate congestion.

A related study updated the list and considered twelve more promising approaches as tools:[3]

Basic Tools

1. traffic signal improvements
2. expanding the road system
3. suburban-scale transit

Immediate-Action Tools

4. jam busters: clearing incidents fast
5. TMAs and TROs (Transportation Management Associations or Trip Reduction Ordinances)
6. high-occupancy vehicle (HOV) lanes, buses and carpools

Advanced Tools

7. light rail transit
8. toll roads: direct user financing
9. land use strategies to reduce driving

New Tools

10. super streets: a strategic approach to managing arterial highways
11. telecommuting: the stay-at-home alternative
12. smart cars on smart highways: intelligent vehicle-highway systems (IVHS)

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[2]Institute of Traffic Engineers, A Toolbox for Alleviating Traffic Congestion (Washington, D.C.: ITE, 1989), pp. 145-150.

[3]Urban Land Institute, 12 Tools for Improving Mobility and Managing Congestion (Washington, D.C.: ULI, 1991), pp. 3-11.

Table IV,1

Tools for Improving Mobility and Managing Congestion

A. Highways

1. Urban Freeways
2. Arterial
3. Local Streets
4. Enforcement

B. Building New Capacity

1. New Highways
2. Access Control and Management
3. Geometric Design
4. Reconstruction
5. Traffic Management During Reconstruction
6. Street Widening
7. Grade Separation
8. Railroad Grade Separation

C. Providing Transit Service (to reduce overall burden)

1. Construction of Rail/Fixed Guideway Transit Fac.
2. Implement Fixed Route and Express Bus Services
3. Implement Paratransit Services
4. Implementation of Providing Transit Services
5. Land Use Policies for Improved Transit Access
6. Site Design Criteria that Increases Transit Usage
7. Transit-Oriented Parking Management Strategies
8. Employer Initiatives that Encourage Transit Use

D. Managing Transportation Demand

1. Strategic Approaches to Avoiding Congestion
   a. Growth Management
   b. Road Pricing
   c. Auto Restricted Zones
   d. Parking Management
   e. Site Design to Minimize Traffic
   f. Negotiated Demand Management Agreements

2. Mitigating Existing Congestion
   a. Ridesharing
   b. Alternative Work Hours
   c. Trip Reduction Ordinances

E. Funding and Institutional Measures

1. Funding
   a. Fuel Taxes
   b. General Revenues
   c. Toll Roads
   d. Bonding
      (1) Developer Fees
      (2) Exactments
   e. Public-Private Partnerships

2. Institutional Measures
   a. Transportation Management Associations
   b. Traffic Management teams
   c. Regional Traffic Management
   d. Human Resource Development

Source: Institute of Traffic Engineers, A Toolbox for Alleviating Traffic Congestion (Washington, D.C.: ITE, 1989), pp. 145-150.

****

Reviewing the preceding two lists, there appear to be seven ideas of value to the freight side of congestion:

1. traffic signal improvements
2. expanding the road system
3. jam busters
4. toll roads
5. land use strategies
6. super streets
7. IVHS

This summary essentially draws from the fuller ITE list stressing:

* new capacity

* managing demand and existing facilities

* funding and institutional measures

Implied in the first two is a potentially positive influence of new technology such IVHS.

Scenarios

In a complex urban arena such as Southern California, it is quite difficult to develop with accuracy the exact, detailed scenarios for the future of surface transportation in the region. So many possibilities exist within the basic transport framework already extant.

Notwithstanding the above reality, it is necessary to posit some kind of broad brush alternatives for the future and describe their ingredients. Four scenarios appear likely:

1. status quo
2. work trip
3. freight shipment
4. work/freight combination

These scenarios are clearly artificial and are meant to suggest how two "purist" approaches and one "combination" approach might work.

Status Quo:

...assumes that the current environment of transportation in all regards is "frozen" -- nothing significantly changes. It serves as a base-line in order to compare "other futures" with an artificial portrait of that moment. The time period represented by status quo is the 1991-1992 transportation situation in Southern California. Carriers will be forced to find dramatically different ways to operate. It is very possible that shippers will divert cargo around Southern California. Local cargo might use San Diego or Oxnard instead of Long Beach or Los Angeles. Through shipments might well bypass the United States Pacific Coast altogether and route via Vancouver, Canada or Ensenada, Mexico. Obviously, such thinking is highly speculative, but....

Work Trip:

...incorporates all the facilities already developed or in process that support the work trip. To the extent passenger vehicles move more quickly and safely, surface freight will also benefit from less congestion. Even railroads will potentially

receive less pressure from drivers blocked by track grade-level crossings. There is also the real possibility that freight delivery will be restricted or banned outright in some areas. Perhaps, congestion will grow so much that trucks will be prohibited from entering the urban area. Air quality considerations already indicate railroad electrification. Part of this option is that trucks would shift containers at an outlying regional transfer facility to be railed into the urban area. Realistically though, the general consensus is that all of the proposed mobility plans will have to be implemented to hold at the same congestion levels of today. This is a daunting proposition -- running as fast as possible to stay in the same place.

Freight Shipment:

...is also artificial and rests upon the notion that all freight improvement proposals will be constructed. For example, the San Pedro Bay ports project a four to five percent annual cargo growth rate through the year 2020. If the tonnage occurs, enormous facility development to handle the cargo increase will have to occur (in 1987 $ 5 billion). Tonnage of that level will definitely tax the systems capacity, whether motor or rail carrier. Large private sector investments are projected for harbor, rail and trucking facilities. The Alameda Corridor consolidation program is illustrative of the landside scale. New technology may well come into play and allow for a cargo shift from truck to rail.

Work/Freight Combination:

...is the more realistic in so far as a compromise position. The more important financially feasible elements of the other two scenarios would be included. However politically freight has little influence. In fact, it may well be excluded in some areas at certain times of weekdays. Congestion from passenger vehicle traffic might become so severe that the only freight permitted in the area will be to "within region" destinations, not to the "hinterland." The Southern California market is so huge that it requires about sixty percent of the cargo arriving at the ports.[4]

Table IV,2 summarizes some speculation about the likely components of each scenario.

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[4]Port of Long Beach, Economic Impact (Long Beach: Port Brochure, May 1991), unpaged.

Table IV, 2

Southern California Transportation Facilities Scenarios

Scenario:	Status Quo	Work Trip	Freight Shipment	Work/Freight Combination
Facilities:				
freeway:	basic network complete	tollways	freight	mixed traffic
	some extra lanes and HOV under construction	more HOV	tollway (Alameda Cor.)	tollways smaller A.C.
highways/ roads:	superstreets in development	more	more	more
	signalization	more	more	more
transit:	subway/light rail expansions	"	use for freight	limited
	commuter rail expansion	"	" " "	"
	stable bus system	"	" " "	"
railroads:	same service	same	more	same
	sale of some trackage for commuter rail	elect. power	none	some
	continued growth of Intermodal Container Transfer Facility	none	large	some
motor carriers:	no major change in service or facility	less service	more service	some service improvement
seaports:	some dredging	some	large	some
	some land-fill	same	intensive	"
	some on-dock, near-dock transfer facilities	"	"	"
	larger vessels and dock transfer equipment	some	large	"

Perspectives and Strategies: A Range of Impacts

The juxtaposition of diverse perspectives and scenarios leads to a better understanding of their collective impacts. Table IV,3 reviews how the perspectives of the driver/carrier, jobs/taxes, finance and shippers interact with scenarios of status quo, work trip, freight shipment and work/freight combination.

For the **driver/carrier**, the status quo would be intolerable, according to conventional political and technical wisdom. The Southern California Association of Governments predicted that the already slow speeds (47 m.p.h. freeway, 1984) and poor mobility would degenerate greatly (24 m.p.h., 2010) to full weekday gridlock in major activity centers and freeway corridors.[5] The capability of local and regional government to manage the area will be even more strongly doubted.

Emphasis upon the work trip would provide some relief, though projected population growth may well offset gains. In selected corridors and areas, the freight shipment scenario would offer genuine relief for the carrier.

Lastly, the combination of work and freight scenarios offers some hope. Improvements should be visible and measurable. Such compromise is more typical of the transportation fiscal programming and project planning process. The net result, though, is deterioration against status quo <u>if</u> projected population growth continues. For the same reason, all scenarios look grim. The economic viability of the region is at stake

The perspective of **jobs/taxes** suggests that congestion is one of several serious problems faced by Southern California and the state. If business finds that it cannot meet its profit expectations due to mobility and congestion problems, then it may well move out of the region and the state. Reports from business media definitely state that the trend is growing. More jobs are being exported. The governor created a task force to address the issue.[6]

To the extent that mobility and congestion are leading causes of job loss and tax receipt decline, then the status quo scenario is most unpromising. Furthermore, the very viability of the seaports except for local, i.e., within region, origin and destinations is at risk.

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[5]Southern California Association of Governments, <u>Regional Mobility Plan</u> (Los Angeles: SCAG, 1989), p. V-49.

[6]Governor Pete Wilson, <u>Task Force on State Competitiveness</u> (Sacramento: May 1992).

The work trip scenario, if modestly successful, should convince business to stay and create jobs. Once again, the stress of commuting is perceived more immediately than moving cargo.

On the other hand, if the freight shipment scenario is emphasized, it is very possible that industry may choose to stay and expand.

In the remaining scenario, work/freight combination, the rate of job loss and tax receipt decline may well slow. The accomplishment here would be to buy time to reposture the region for a turnaround. Nevertheless, there are several other issues beyond logistics that influence decisions -- air quality, cost of housing, educational systems, social peace and public safety.

Oddly, it is tempting to believe that **transportation finance** would be widely perceived as a necessity. Whether public or private funds, an urban area's survival and growth rests upon an extensive and well maintained system to move people and goods. Yet, as so well documented for the nation, infrastructure (including transportation) has been allowed to deteriorate.

In the status quo scenario, public expenditures have risen in the last two years and appear to be at a higher long-term level than previously. The State of California now has a large bond program. The federal government has renewed surface transportation funding for six years. Both sources infuse significant amounts to Southern California. In general, the private sector is not a player financially. It waits for the public sector to fund mutually beneficial projects.

The public sector will increase funding in the work trip scenario, while almost none will be dedicated by the private sector. Although there are plans for tollways, high speed trains to other cities and IVHS, little private money has been fronted.

The private sector may find that in order to continue business, it must contribute capital for the freight shipment scenario. It may find itself improving its own operations as well. Both capital and operating investments may be rationalized if the public sector provides credible leadership as part of coherent transport plan.

The combined approach of work and freight yields a more probable though scattergun approach. Projects from both categories will compete intensely for scarce financial resources. To make this scenario workable, a well balanced decisionmaking process fairly weighing people and freight needs must be employed.

The **shipper/carrier** perspective will be the most telling. So long as a sizeable customer base exists in Southern California, a large percentage of cargo will have regional origin or destinations

(about sixty percent).

To the extent that the shipper and carrier have choices, the San Pedro Bay ports are at risk if the status quo scenario prevails. The degree of mobility degradation predicted by SCAG is of real concern. Why would shippers send their cargo through either port? Why would carriers attempt to move cargo through the area unless there was no choice. In effect, the freedom of the private sector to determine routing and mode of transport is a function of other opportunities. See Appendix B for camparison of truck management strategies.

With the belief that shippers and carriers will continue to use both seaports, it is likely that every attempt will be made to employ the most favorable set of characteristics from scheduling, technology, labor and operating restrictions. Operations will more difficult, yet there will be opportunities for large shippers/carriers and niche services.

Particularly promising is the productivity improvement possible from rapidly evolving sectors:

* new technology:	electronic data interface container tagging multiple uses of containers rail electrification (containers shift from truck to rail at regional edge
* scheduling:	closer coordination of ships/trains/trucks shift to off-hours: weekend, nights
* labor:	more flexible work agreements: hours and tasks
* operating restrictions:	linkage of mobility, congestion and air quality plans may actually enhance operations and lower costs after difficult transition period

All in all, the shipper and carrier may well have more choices than at first apparent. Many of these choices will be very positive in the work trip or freight shipment scenarios. The work/freight scenario would benefit as well. Probably, the most important distinction from the shipper/carrier perspective is: how do the changes occur -- voluntarily or forcibly? This report would argue that events are already encouraging them to seek out and apply all workable remedies. Nevertheless, the option to vacate seaport service is ever present.

Table IV,3

Impact of Strategies to Offset Congestion in Southern California

Scenarios:	Status Quo	Work Trip	Freight Shipment	Work/Freight Combination
Perspective:				
1. Driver/Carrier				
congestion	severe	tolerable	better on freight corridors only	moderately better
accidents	major	fewer auto-auto; auto-truck same	likely big improve- on freight corridors	" "
time/money	high	visible improvement	better on freight corridors	" "
stress	severe	less severe	" " " "	" "
govt. leadership	little confidence	some regained	some regained	large improvement
2. Jobs/ Taxes				
job creation	down	moderate	some	moderate
job retention	"	"	"	"
tax revenue	"	"	"	"
seaport viability	"	"	strong	"

Table IV,3 (con't.)

Impact of Strategies to Offset Congestion in Southern California

Scenarios: / Perspective:	Status Quo	Work Trip	Freight Shipment	Work/Freight Combination
3. Transp. Finance				
operations				
-public $	moderate	high	low	moderate/low
-private $	low (ICTF/rail)	none	low	none
capital				
-public	moderate	high	low	moderate/low
-private	low (ICTF/rail)	none	moderate	none
4. Shipper/Carrier				
routing				
-within region some	via other regional ports	low	moderate	moderate
-to hinterland	via Canadian/ Mexican ports	low	moderate	moderate

Table IV,3 (con't.)

Impact of Strategies to Offset Congestion in Southern California

Scenarios:	Status Quo	Work Trip	Freight Shipment	Work/Freight Combination
Perspectives:				
scheduling				
-time	daytime	night	night	night
-day	weekday	weekend	weekend	weekend
-coordination with yard space	low	moderate	high	moderate
-coordination carrier arrival/ departure (slots)	"	"	"	"
technology				
-Just-In-Time	moderate	"	"	"
-data transfer	low	"	"	"
-container tags	"	"	"	"
-innovative container uses	moderate	"	"	"

Table IV,3 (con't.)

Impact of Strategies to Offset Congestion in Southern California

Scenarios:	Status Quo	Work Trip	Freight Shipment	Work/Freight Combination
Perspectives:				
labor costs				
-work hours	std. weekday	some overtime	high overtime	some overtime
-job classif. flexibility	little	some	high	some
operating restrictions				
-time	none	very strict	some	some
-location	none	truck bans	"	"
-facility	some	very strict	"	"
-service	none	" "	"	"

LEGEND

Scenarios:

Status Quo -- existing laws, policies, programs, plans, projects as of 1992.

Work Trip -- emphasis upon improving the work trip only; no support for freight

Freight Shipment -- emphasis upon improving freight shipments only; no support for work trip

Work/Freight Combination-- balance upon work and freight trips; flexible weighting

Perspectives:

Driver/ Carrier -- primary user of highway system; concerns of mobility and safety

Jobs/Taxes -- general citizenry and governments; impact on job creation/maintenance and tax revenue generation

Transportation Financing -- funding provided from public or private funds; issues of private sector rights of ownership, access and use, fair return on investments

Shipper/ Carrier -- shipment on-time, intact, correct, invoiced properly, acceptable cost; carrier able to provide competitive service and cost

Conclusion

Reviewed in this chapter has been the impact of several forces upon the transportation decisionmaking process. Key elements addressed were the importance of perspective and future transportation system supply in Southern California.

To many observers, the mobility prognosis for the region looks bleak. Rapid population growth is the major underlying cause of system overload and breakdown. Declining mobility and worsening congestion are just two of many critical urban policy indicators. In fact, other nontransportation elements are far worse, i.e., health, education, social stability.

Close review of four scenarios suggests that even with large scale public and private investments, the transportation systems will be taxed to capacity. Some scenarios, e.g., status quo, offer an unacceptable future. A scenarios emphasizing only freight is unlikely as well. When comparing the political power of cargo versus commuters, there is no contest.

Where do such conclusions leave shippers, carriers and seaports? Obviously, they must present their collective case more effectively to help direct scarce public resources to freight needs. **There must be an extremely strong and credible linkage of efficient surface freight access to seaports to the regional job base and economic viability.** Perhaps that linkage has been taken for granted. It is not clear at all in today's economic and political environment.

The next chapter will suggest that shippers, carriers, seaports and government can accomplish much on their own by taking advantage of forces already evident in the transportation sector. Promising strategies to enhance effective seaport surface freight access will be highlighted.

Chapter V

Strategy Opportunities and Congestion

Introduction

The diverse challenges of transportation congestion in urban areas lead shippers and thus carriers to an interesting decision tree. The challenge or opportunity presented at each decision branch is primarily influenced by external forces. This chapter discusses the forces in terms of resulting strategy opportunities.

At each stage, a new operational context is created for shippers and carriers. Their decisions, made in response to changing external stimuli, do not have significant impact upon public policy except in large-scale situations. At some point the cumulative number of such decisions yields a critical mass. Here is the point public policy is forced to respond. Often, that response is **poorly crafted and too late.** It is the hope of this chapter that public policy can be more proactive and anticipate the directions set in motion.

The likely decision opportunities are reviewed in terms of institutional changes, market forces, technology and labor.

Institutional Changes

Traditionally the image of private sector transportation functions is one of a regulated environment permitting limited, but intense, market competition. U.S. deregulation greatly changed business relationships.[1] The domestic, and in part, the transportation global playing field was changed by three major pieces of legislation:

1. Motor Carrier Act of 1980 (Public Law 96-296)

2. Staggers Rail Act of 1980 (Public Law 96-448)

3. Shipping Act of 1984 (Public Law 98-237)

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[1]Peter L. Shaw, Linda Brandt, Gerald Leonard, John Matzer, Elbert Segelhorst, Export Transportation and Intergovernmental Public Policy (Washington, D.C.: U.S. Department of Transportation, Technology Sharing Program, DOT-I-86-13, February 1985), Chapter V- "Transportation Regulation."

Competition in general is now more widespread and free-wheeling. Structural changes in the transportation carrier industry have been fundamental. There are fewer carriers in each sector (truck, rail and shipping). Rates and service are far more competitive. Almost everything is negotiable and agreements remain confidential.

In some circumstances, carriers are allowed to form partnerships. The motivation in part is to obtain an edge in the competitive marketplace, but more often it may well mean mutual survival. At first rail carriers acquired trucking companies, and then inland barge operators. Then, some formed alliances with ocean carriers (Table V,1).

Since the late 1980's, large shippers have almost demanded such cooperation to maximize service and to lower cost. Sea-Land believes that "the changing needs of shippers have forced carriers to rethink strategies, with emphasis on the following factors:"[2]

* stronger customer orientation
* high-quality service
* emphasis on value-added services and differentiated products
* sophisticated information systems
* marketing focus versus operations and sales focus
* greater focus on integrated logistics services
* door-to-door services
* global coverage
* inland intermodal capability in North America and Europe
* formation of strategic partnerships and alliances

Four lines already have established relationships. Sea-Land Service and Maersk Line share shipping space, as well as American

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[2]Transportation Research Board, Maritime Transportation Strategic Planning (Washington, D.C.: TRB Workshop Proceedings, June 5-7, 1991, Transportation Research Circular Number 392, March 1992), pp. 46-59.

Table V,1 Sea-Land Strategic Partners

PARTNER	TYPE OF AGREEMENT	TRADE LANE	RATIONALE/BENEFITS
P&O NEDLLOYD CGM	VESSEL SHARING AGREEMENT (USA); SHARING OF TERMINALS AND ROLLING STOCK.	NORTH AMERICA–EUROPE	ASSET RATIONALIZATION; COST REDUCTIONS; BETTER UTILIZATION OF CAPACITY/EQUIPMENT
MAERSK	SLOT CHARTER	U.S. WEST COAST–EUROPE	NEW SERVICE FOR SEA–LAND
MAERSK	SLOT/SWAP AGREEMENT	U.S. EAST COAST/GULF–EUROPE	ENHANCE SERVICE CAPABILITIES
MAERSK	VESSEL SHARING AGREEMENT	NORTH AMERICA–ASIA INTRA–ASIA	ENHANCE SERVICE CAPABILITIES; REDUCE CAPACITY; ENHANCE INTRA–ASIA SERVICES
PARTNER	TYPE OF AGREEMENT	TRADE LANE	RATIONALE/BENEFITS
CTE	SLOT CHARTERING	NORTH AMERICA–EUROPE	PREVENT ADDITIONAL CAPACITY FROM ENTERING TRADE; GROW REVENUES
NORASIA	VESSEL SHARING AGREEMENT	EUROPE–MIDDLE EAST–ASIA	ENHANCE AND AUGMENT SERVICE CAPACITY; LOW–COST ENTRY TO EXPANDING TRADES
SOVIETS	PARTNERSHIP; CONNECTING–CARRIER AGREEMENT	TRANS SIBERIAN LAND BRIDGE (ASIA–EUROPE); BLACK SEA–MEDITERRANEAN	NEW BUSINESS/SERVICE OPPORTUNITIES
FRANS MAAS	PARTNERSHIP	INTRA–EUROPE	NEW BUSINESS/SERVICE OPPORTUNITIES

Source: Steven McGowan, Vice President, Corporate Planning and Development, Sea-Land Services, Inc., "Forecasting Transportation market Demands and Forging Strategic Alliance to Meet Them" in Transportation Research Board, Maritime Transportation Strategic Planning (Washington, D.C.: TRB Workshop Proceedings, June 5-7, 1991, Transportation Research Circular 392, March 1992), p. 53.

President Lines and Orient Overseas Container Line.[3]

Double container stacks on unit trains (stack trains) initially were designed for Pacific Coast ocean and rail carrier alliances. The service grew quickly in popularity and help to account for high seaport growth. Now, the concept has been introduced on the East Coast and appears very successfully. New York and Norfolk offer discounted rail service on west bound traffic. Though already served by container trains, the new double-stack service adds considerable cargo capability and theoretically lower unit costs to shippers.[4] The belief is:[5]

> Real possibilities now exist for a "reverse mini-landbridge" service with cargo from Europe bound for U.S. West Coast or the Far East moving crosscountry by rail.
>
> Such a service would be appealing to the Far East Ocean carriers operating double-Suez routes between Southeast Asia and U.S. East Coast.
>
> As more and more industry expands to Malaysia, Singapore and Indonesia, the outlook for East Coast ports to recapture lost market share and attract world-class carriers back to their ports has never looked better.

Intermodal is maturing. Many large shippers are switching from truck to intermodal. "Proctor and Gamble increased intermodal use by 109 percent between 1989 and 1990."[6]

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[3]"American President Lines, OOCL to Begin Joint Service in December," Traffic World (November 11, 1991), p. 24.

[4]"Stack-Train Service Begins At Two North Atlantic Ports," Container News (September 1991), p. 10.

[5]Herb Schild, "Stack Trains Bring New Opportunities," Container News (Editor's Notes, September 1991), p. 2.

[6]M. McNeil Porter, "Intermodal Here At Last," Container News (September 1991), p. 40.

Market Forces

As the difficulty of shipping cargo through Southern California grows, many of the options considered are no longer beyond the pale.

Customer service is a relatively new feature caused by a more competitive marketplace. Heretofore, sea and land carriers often had the attitude that the customer must fit into their operations rather than the carrier truly serving the customer ("Shippers can be a demanding lot!).

Illustrative of that change is the concept of "Just-in-Time" (JIT). The new practice has helped to balance the customarily uneven relationship by lowering shipper inventory and warehousing costs. Assuming the JIT shipment is reliably on time, smaller reserves of key resources or parts are necessary.

The popularity of JIT suggests two fascinating public policy questions. Should the following two trends be permitted:

* shift of private sector shipper warehousing costs to publicly funded transportation systems?

* put another way, should seaports, freeways and other publicly funded resources become "moving warehouses?"

A fascinating study would explore the volumes of cargo pre- and post-JIT adoption, versus private warehouse utilization. Could JIT cargo volume be so high that in some areas it might be forbidden in order to remove excess trucks from the freeways and local traffic? The final tradeoff in this direction of thinking is jobs created or kept and lower consumer prices versus congestion costs.

JIT is in no small degree a function of **the value of time.**

The placement of rail intermodal facilities only five miles from the San Pedro Bay Ports represents one response to the imperatives of time. The Intermodal Container Transfer Facility (ICTF) represents large private sector investment. The facility owner and operator, Southern Pacific Corporation believed a "near-dock" facility was in the mid-1980's a better choice than "on-dock" facilities. The ICTF was two-thirds full upon opening and is now in need of expansion. In fact, container unit trains are longer than the original design allows (5000 feet) and must be split in

two.[7]

Another response is the development of on-dock rail facilities. The Port of Long Beach has an on-dock facility in the planning stage. It is the next step in closing the gap between rail/truck yard facilities and direct shipside service.[8]

Time effectiveness means little if the cargo is damaged. Some carriers emphasize easy access, speed, and low damage rates to cargo. The Santa Fe advertises a ninety-nine percent and better damage-free cargo record.[9] In general, the intermodal industry is making significant strides. Rail haulage of freight continues to get safer, with only 37 cents per $100 of revenue now paid out in L&D claims. Intermodal is setting the pace, with 1990 L&D payout down 11.55%"[10]

Without doubt, a premium value is placed on time savings. Yet, in so competitive an operating environment, time along with speed, safety and damage are strong selling points.

If customer service and time value are ineffective disciplines upon transportation carriers and public agencies, then **cargo diversion** is the ultimate enforcer. Cargo can "walk" away, especially if it is discretionary in its port of exit or entry. Diversion is the source of two kinds of threats to the dominance of Southern California seaports.

The domestic threat is from other ports better able to exploit market niches and/or actually handle substantial volumes with good surface transportation networks. The niche markets, for example, could be served by Port Hueneme, California. Favorable freight rates offered by port shipping affiliates can be tempting.[11] Larger volumes might be handled by San Diego, Oakland, Seattle/Tacoma if low rail/trucking rates offset the potential cost of distance from the Southern California markets. If the cargo is

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[7]Southern Pacific Corporation, Intermodal Container Transportation Facility Brochure (Los Angeles: ICTF, 1989), pp. 1-3.

[8]Port of Long Beach, Maersk On-Dock Container Transfer Facility Environmental Impact Statement (Long Beach: Port of Long Beach, Final Environmental Impact Statement, February 5, 1992).

[9]Santa Fe Intermodal, Los Angeles Intermodal Facility -- Today! and Quality Stack Services (Los Angeles: Santa Fe, undated promotional brochures).

[10]"The proof is in the payout," Railway Age (August 1991), pp. 50-52.

[11]Gary Taylor, "The Port Less Traveled Might Harbor a Bonus," International Business (June 1992), pp. 24-25.

destined inland or is export, it is even more attractive to bypass Southern California.

The second threat is from foreign ports. The U.S.- Mexican border industrial zone, "Maquiladoras" has grown so quickly that U.S. jobs and cargo are heading south.[12] Vancouver, Canada is a more distant threat to through cargo shipments not destined to or staring in Southern California.

For the moment, cargo still lands at Southern California seaport hubs and is transhipped by stack container trains to Mexico. "About 10 percent of Mexico's total trade now flows through the U.S. gateways of Los Angeles and Long Beach, with a significant portion entering through the Port of Houston." On the other hand, Mexican national policy is to increase the efficiency and competitiveness of its ports. Pacific ports given national priority are Manzanillo and Lazaro Cardenas.[13]

Closer competition may come from the Port of Ensenada, Baja California, Mexico. Local volume is growing.[14] At some point, it may become an extremely attractive alternative altogether as a "satellite" port in the Southern California extended region (about 150 miles from Los Angeles). Mexican officials state that Ensenada will serve only its regional zone. The requisite rail and highway infrastructure are not in place to serve adequately the border industrial zone or Southern California.[15]

Though Canadian and Mexican Pacific Coast seaports potentially offer alternatives for "bridge"-type shipments, cargo diversion need not move internationally. If Southern California problems are severe enough, San Diego, Oxnard, Ventura and Santa Barbara may be developed more. But citizens, communities and local governments may prevent such cargo flows.

If cargo needs grew so large and port land facilities could not handle the demand or urban congestion, other options would come into play first to prevent diversion. There would be calls for

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[12]"Detroit South; Mexico's Auto Boom: Who Wins, Who Loses," Business Week (March 16, 1992, Cover Story).

[13]Valerie Drogus, "Mexico's drive to improve ports may give U.S. harbors competition," Traffic World (Special Section on Port Access, March 9, 1992), pp. 34-35.

[14]Robert P. James, "Hanjin becomes newest player in U.S.-Mexico intermodal market," Traffic World (November 11, 1991), p. 23.

[15]Fernando Castillo, Port Director, General Manager, Port of Ensenada, Port of Ensenada Plans (Long Beach: Propeller Club Conference, March 5, 1992, speech), p. 3.

government to squeeze every bit of productivity out of the Southern California regional system before allowing the loss of any more cargo, jobs or tax revenue.

Technology

One way to increase system efficiencies and reduce undesirable byproducts is to turn to technology.

Discussed above were Just-in-Time operational practices. The very concept relies upon close coordination of several quickly developing technologies:

* packaging and containers

* electronic information flows and time slots

* carrier equipment

Carriers are using technology to gain competitive advantage against intense competition for a shrinking customer base. Consequently, there have been important innovative carrier approaches to **packaging and containers.** Breakthroughs in packaging are rapidly developing.[16] Container development is progressing rapidly too. Maximum sizes and weights are increasing.[17] Some railroads are experimenting with new equipment in the container mode. For example, the Burlington Northern has developed a rack frame to carry automobiles and light trucks within a standard container.[18] Already in use are plastic liners to increase the use of containers for dry and liquid bulk. Others are using a container size rack for liquid/gaseous cargo tanks.

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[16]"Special Report-Freight Packaging; Globalization, new products, technology improve packing methods, containers," Traffic World (August 26, 1991), pp. 38-44.

[17]"Truckload carriers push development of second-generation containers," Traffic World (Special Section on Intermodal Outlook 92, April 27, 1992), pp. 22-23; "Globalization, new products, technology improve packing methods, containers," Traffic World (Special Report: Freight Packaging, August 26, 1991), pp. 38-44.

[18]Burlington Northern Intermodal, BN Innovative Intermodal Service (St. Louis: St. Louis Hub Center, undated).

Electronic information flows promise development of a "seamless" transportation pipeline. Kinks can be smoothed out and customer service improved. Apparently, progress is so swift that more and more shippers are switching traffic from highway to intermodal. Of all shippers last year, 34% switched. Of firms $ 1 billion or greater annual revenue, 52% switched. These are by any standard very impressive numbers. The new information technology will provide useful answers to shipper questions:[19]

* where is my container?

* when will it get there?

* what items are in my container?

* which of my customers are they going to?

* what is the condition of my products (temperature, humidity, damage)?

Until recently, only the "where and when" were knowable.

Another technology helping to make such "seamlessness" possible is the "tagging" of containers. Used in conjunction with satellites or wayside scanners placed along railroad rights of way, automatic equipment identification tags are growing in use. The Santa Fe will use them first on locomotives. Anticipated benefits are:[20]

> AEI will do for the railroad industry what bar codes did for the retail industry. With AEI, Santa Fe will improve the accuracy of all equipment inventories and other on-line data bases so that operations planning and the execution of service plans will be more timely, accurate, efficient and effective.

High-tech innovations (electronic data transfer and container tags) make the use of **"time slots"** more practical. In the basic concept, ocean carriers plan land-side requirements at least forty-

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[19]Lisa Harrington, "Advances in information technology smooth intermodal freight flows," Ibid., pp. 31-33.

[20]"Santa Fe mounting 75,000 AEI tags," Railway Age (February 1992), p. 13.

eight hours in advance for imports. To the extent that export cargo has the same problems, similar arrangements might be appropriate.

Time slots has great appeal. As with JIT, sophisticated coordination would be valued highly. All assets would be used to their highest level of productivity. If working as designed, the concept would have tremendous positive spill-over effects to the issues of regional mobility and congestion. Otherwise briefly put, fewer trucks would be necessary on the surface transportation system. Each transport asset (ship/truck/container/train) would be fully loaded and fully utilized (no "empties on backhaul).

How would time slots be introduced in Southern California?

> Would it be voluntarily introduced by the **private sector** as a way to be more competitive?
>
> Or, would **government** be compelled to introduce time slots in order to offset declining mobility, congestion and air pollution?

Perhaps, the approach could be modelled on the "gate" concept used in commercial aviation. Only so many seaport gates are available. They could be sold, purchased or traded on the open market. Government might establish price incentives and operating restrictions to attain significant public goals:

* time of day
* day of week
* mileage zones (local, regional, hinterland)
    - imports: domestic destination zone
    - exports: domestic origin zone
* special permits to use freeways

Closing the high-tech loop, the concept ultimately would be fully integrated with IVHS and smartcars and trucks. Lockheed and AT&T foresee a market of "$200 billion over the next 20 years in the United States."[21]

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[21]"Lockheed, AT&T Unveil 'Smart Highway' Plans," Los Angeles Times (April 13, 1992), pp. D-1, 10.

Carrier Equipment

Dedicated container unit trains are a two-edged sword. Clearly, they offer tremendous economies of scale for the shipper and the carrier. So long as the origin and destination areas have the large scale ship-container-rail infrastructure to handle the trains, the potential is realizable.

But what if they do not have the necessary facilities? That is the very case for many freight origins and destinations. They are unable to take advantage of the real benefits if they are not near the system hubs. The implications for crowded seaport areas and land transportation systems is vast.

The American Association of Railroads had such situations in mind when it developed a prototype called "The Iron Highway"[22] (Figure V,1). According to specifications, the "push-pull" train has significant advantages:

> 1. Better market potential because of elimination of normal piggyback trailer size/strength restrictions, better ride quality, potentially improved turnaround time and a simple low cost terminal.
>
> 2. Decreased fuel consumption both because of lighter weight and the unique "low drag" truck.
>
> 3. Lowered maintenance cost through use of high production lightweight engines and power transmission equipment; continuous systems monitoring; and quick change engines and major components which keep the train in service while components are repaired.
>
> 4. Increased opportunity for labor savings through automation of terminal inspection, train makeup or break-up and of train operation itself.
>
> 5. Decreased damage/increased customer satisfaction through use of good riding suspension and elimination of shocks due to coupling and slack action.

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[22]New York Air Brake and the American Association of Railroads, The Iron Highway -- High Performance Piggyback. Watertown, N.Y.: New York Air Brake, April 1991, Technical Brochure, pp. 1-7.

6. Decreased terminal cost by elimination of the need for cranes or loading ramps, and reduction of site preparation requirements.

Should the prototype prove out in testing, the new design train may be quite advantageous in the short-haul market. Five elements (up to 1050'each) may be combined into a train of 5250'. This is competitive with many unit trains, though the longest now exceed 8000'.

Technological changes as this concept might well make smaller, less infrastructure intensive ports and interior points more competitive with the larger load-center seaport locations. The potential for significant cargo diversion is real. From the load-center seaport point-of-view, this idea is not too attractive. From the urban congestion perspective, the Iron Highway Train could eliminate the number of container trucks on local roads and Interstate in two ways: shorter hauls in the local and regional markets; long hauls for distant markets.

On the horizon is still another possibility with real potential. Initially for air quality considerations, electrification of rail commuter lines in Southern California may spill over to freight lines too. In many corridors the trackage is the same.[23] Should electrification occur, some believe that urban transportation congestion would lead to a container modal shift from trucks to rail within the region. Major transfer facilities would be constructed at selected regional rail gateways.

To the extent that freeway truck congestion is perceived as high, the convergence of air and mobility concerns could very well make electrification and regional border transfer tempting. If forty percent of seaport cargo is passing through Southern California, this might be a strong potential.

If electrification, regional border transfer and the AAR experimental train are actually used together, considerable productivity increases in the truck/rail system will occur. Corresponding gains in air quality and mobility would appear quite likely.

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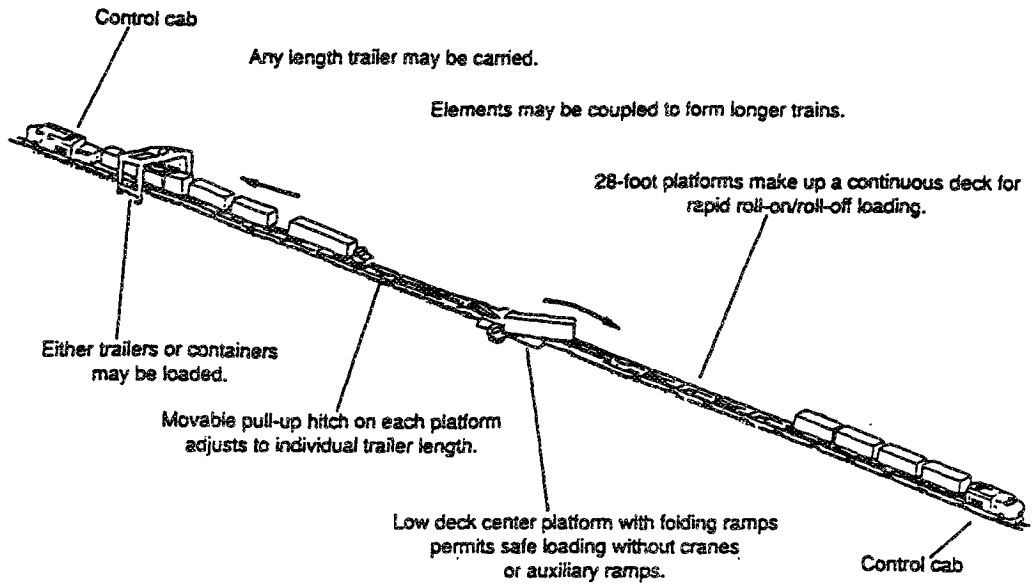
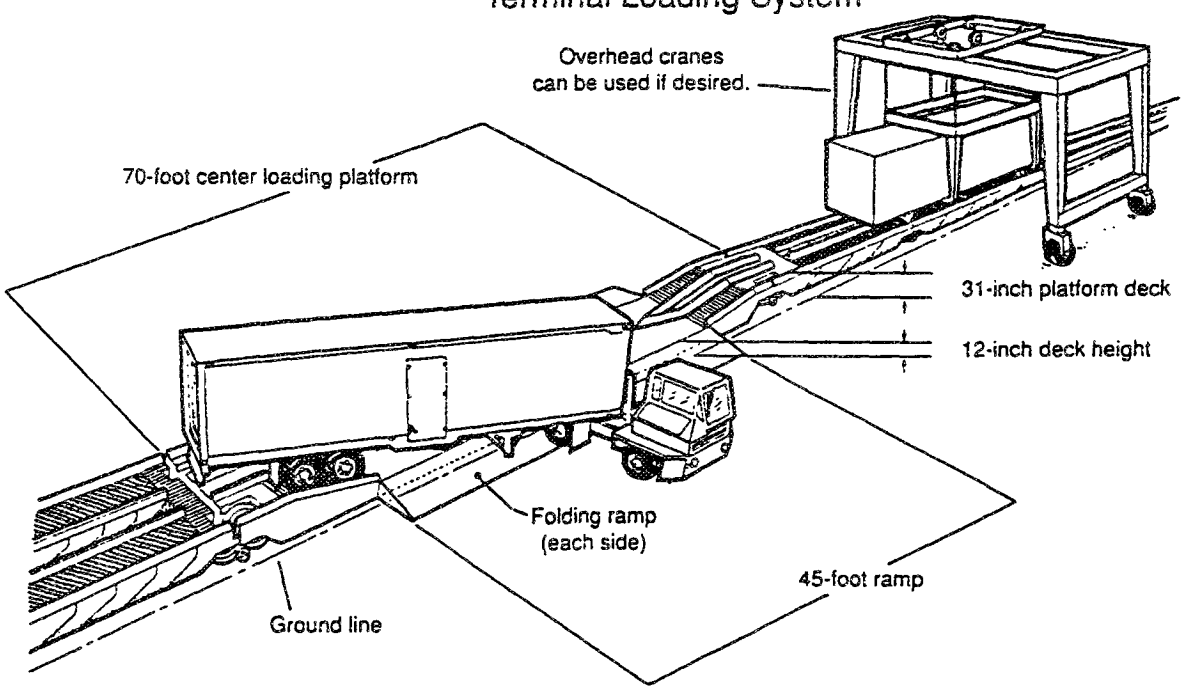
[23]Southern California Regional Rail Authority, Southern California Accelerated Rail Electrification Program (Los Angeles: SCRA, Draft Executive Summary, February 10, 1992).

Figure V,1 The Iron Highway Element and Terminal Loading System



The Iron Highway Element

Terminal Loading System



Source: New York Air Brake and the American Association of Railroads, The Iron Highway -- High Performance Piggyback. Watertown, N.Y.: New York Air Brake, April 1991, Technical Brochure, pp. 1, 3.

Labor

About six years ago railroads preferred subcontractors to operate intermodal yards. Recently, some have decided that it would be less expensive and better service to operate the yards directly. The Southern Pacific ICTF serving the ports of Long Beach and Los Angeles suffered a serious longshoreman strike on this very point. The question, therefore, is:[24]

> When a cargo container arrives in port, and is moved by truck to a rail yard for inland movement by train, which labor union gets the work?

These kind of questions exemplify concerns that have started to arise. Teamsters, longshoremen and other unions are vying for representation.

Work rules, pay scales, contracts and the like provide institutional challenges for the often rocky management-labor relationship. Many ideas discussed above affect:

* workdays
* work time
* location
* equipment
* education and training
* pay scales and fringes
* contract phasing, seniority and "grandfathering"

If new technology were introduced such as the AAR train or timeslot systems, how would labor fit in? Very possibly fewer workers would be necessary as the industry became more automated, high-tech and productive.

Would labor and management be more agreeable if cargo diversion to domestic or foreign seaports became a substantial threat?

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[24]"Trend toward intermodalism puts railroads, ports, labor at odds," Traffic World (Port Access Special Section, March 9, 1992), pp. 33-34.

How would the relationship work if the public sector as well forced dramatic changes in cargo handling and routing? The City of Los Angeles is considering a partial truck ban in the central business district. If night service substantially adds to business costs and thus competitiveness, would accommodations be made? Earlier the Maquiladoras industrial zone on the U.S.- Mexican border was mentioned. American industry and manufacturing plants are moving domestic plants and jobs to the zone. Southern California, likewise, may be losing plants and jobs to out-of-state and out-of-country competitors. Given that realistic challenge, would it be easier for labor and management to change contracts, accept new technology and work more productively? Clearly, much is at stake.

A Complex Web: Choice and Competitive Advantage

If the goal of the private sector is to make money, how do shippers and carriers make key cargo routing decisions?

This chapter has explored the complex web of

1. institutional change
2. business forces
3. technology
4. carrier equipment
5. labor

At each stage, important decisions are possible for business and government. Through this decision sequence, business must determine the right mix to have the best utilization of assets, return on investment and, simply, to make money.

For business, it boils down to one basic question:

where can money be made?

Thus it may not matter much where the cargo enters or exits? So long as delivered cost and service are acceptable and better alternative locations available, then business will seek them out.

For Southern California, and any other seaport-urban area affected by poor mobility and severe congestion, the answer is frightening. Business has little commitment to Southern California, except for private facilities already in place.

Consider the examples of export and import.

Export Origin -- outside the region

This case has perhaps the most flexibility. More transportation choices are available to the shipper. There is little incentive to use Southern California seaports unless price or service advantages are visible.

Export Origin -- inside the region

There are two basic decisions available to the shipper. The choice may rest on more than transportation factors. For the shipper, the production facility may choose to remain in Southern California **or** move out of the area.

If the decision is to continue in Southern California, than the shipper will support every kind of decision to lower transport-related costs. This group might be a strong, natural constituency to support public-private programs to improve mobility and congestions.

Import Destination -- outside the region

The decision process in this situation appears similar to the out-of-region export case. However, other elements come into play. Foreign manufacturers (shippers) have more flexibility. They are not required to choose Southern California. They also be able to take advantage of special relationship with their own national flag ocean carriers or "dumping" excess production to create or maintain market share.

Import Destination -- inside the region

The market for the foreign shipper is enormous -- over fifteen million people -- and growing to well over twenty million by the next century. It must be pretty hard for any to resist so large an opportunity. Even if all hinterland import traffic was diverted, there would still be substantial volumes.

Whichever situation, at some point costs are driven up enough and service drops, either shippers divert cargo or local consumers pay much higher prices and employees fear for their jobs.

The competitive advantage of Southern California erodes significantly for discretionary cargo. Captive cargo, that is - locally oriented, will not be served as well.

Public Policy Implications

In the final analysis, all may depend upon how well the intergovernmental system and its view of authority and responsibilities work.

If the key transport decisions are left to local governments, there is a good chance that the regional, state and national interests would be overlooked. If the funds are principally local, and the votes are local, the other interests would be a very hard sell.

If any of the larger geographic interests and responsibilities take hold, there is a better chance of wider perspectives, more funds and leadership. Given, the current economic and political environments, these hopes do not look promising.

Without doubt, it must be tempting to look ahead and say -- our local governments will only support projects that serve local transportation -- and cargo -- needs. If other jurisdictions external to the Southern California systems benefit, than the federal government should exercise its prerogative to be federal and represent all national interests. The Intermodal Surface Transportation Efficiency Act of 1991 recognizes the importance of intermodalism, access to seaports and congestion but funds little.

The decision tree has come to some economic basics -- where will the jobs be and does the transport system enhance or detract from business, employment and tax revenue. To the extent that surface transportation access to seaports is affected by congestion, there is much that could be done to increase system productivity. This report has suggested many possibilities. the public and private sector should form partnerships to make it work. The sunk investment in terms of capital and human resources is too great to write off.

The next steps should be:

Short-term: squeeze best productivity possible out of system by effectively using

1. technology: electronic data linkages
   time slots
   equipment changes
2. operations: dedicated rights-of-way
3. labor: night and weekend flexibility

Medium-term: shift cargo to electrified rail system

1. move truck containers to rail
2. sell time slots for ocean carriers and and freeway access
3. encourage ondock/near-dock rail

Long-term: develop total plan balancing people and freight transportation needs

1. accept ceiling to system capability
2. lift ceiling only if large landside transportation investments are made and technology improve
3. attempt to keep cargo coming through Southern California and prevent diversion
4. develop plan to relieve major hub landside stress (Long Beach and Los Angeles) by encouraging partnerships ports (Oxnard to San Diego) to take overload and niche services

Appendix A Summary of Tools for Alleviating Traffic Congestion

Congestion Reduction Tool	Impact	Cost	Implementation
Freeway Incident Management Systems	Could reduce congestion on about 30 percent of an urban freeway system; could reduce incident duration by an average of 10 minutes; Benefit/Cost of 4:1	$1 million to design and construct; $100,000 maintenance	Long timeframe to implement; requires multiagency approach
Freeway and Arterial Surveillance and Control	Similar to freeway incident management systems, only over wider geographic area	Expensive; few systems in existence today	Multiagency effort required; public education needed
Motorist Information Systems	Significant reductions in delay on specific facilities	Can be designed for low cost	Long timeframe required; Outreach needed to local officials and media.
Ramp Metering	Highway speeds increased by 24 percent; volumes increased from 12 percent to 40 percent; and 20 to 58 percent reduction in accidents	Depending on type of system, can be low to moderate cost	Long timeframe; need detailed planning effort to avoid local area problems
Add Lanes Without Widening	Significant increases in capacity possible; Benefit/Cost of 7:1	About $1.3 million per mile for design and construction; $12,000 per year for maintenance	Requires joint effort with enforcement agencies; need public education effort
High Occupancy Vehicle Lanes	Potentially significant increases in person-moving capacity; reduced vehicle miles traveled by 5 percent, and travel times by 6 percent; Benefit/Cost of 6:1	Varies by type; taking an existing lane can be low cost; providing new lanes may cost up to $5 million per mile	Extensive planning required; multiagency cooperation; need public education and marketing campaign
Super Street Arterials	Could increase capacity by 50 to 70 percent	Very expensive; possibly $4 to $5 million per mile	Long timeframe required; possible controversy about land takings and access to arterial
Traffic Signal Improvements	From 8 percent to 25 percent improvement in travel time; Benefit/Cost of 10:1	Low cost; approximately $3,000 per signal update	Requires strong traffic engineering expertise
Intersection Improvements	Varies by level of improvement	Minimal	Need to follow engineering principles
Turn Prohibitions	Reduction of accidents from 38 to 52 percent	Minimal	Often requires outreach to abutters
One-Way Streets	Reduces intersection delays; Redistributes traffic; simplifies signal timing; increases road and pedestrian safety.	Minimal	Need to follow engineering principles; public outreach required
Reversible Traffic Lanes	Substantial increase in capacity; Could produce operational problems	Minimal, although operating costs are required	Enforcement agencies need to be involved in the planning and operations stages
Improved Traffic Control Devices	High Benefit/Cost ratio; substantial benefit in channelizing traffic	Minimal	Need to follow engineering principles; Long-term maintenance strategy required

Source: Institute of Traffic Engineers, A Toolbox for Alleviating Traffic Congestion (Washington, D.C.: ITE, 1989), pp. 151-153.

Congestion Reduction Tool	Impact	Cost	Implementation
Parking Management	Reduces single occupant driving for specific sites	Additional costs to drivers of single occupant cars	Several characteristics of the site and of the travel behavior need to be considered
Goods Movement Management	Reduces congestion on specific roads; reduces truck-related accidents	Minimal	Needs regulatory or legislative authority; outreach with trucking and business community needed
Arterial Access Management	Reduces vehicle delays and accidents; Impacts mainly over long-term	Minimal	Politically very controversial; Planning studies that justify such a program are needed
High Occupancy Vehicle Lanes on Arterials	Increases person-carrying capacity of arterial; could defer need to widen road; reduces travel time	Varies by type of facility used	Multiagency effort needed; public outreach critical
Enforcement	Substantial benefits can accrue for successful project implementation	Costs can be significant in the early stages of implementation	Advanced planning is essential for success; enforcement agencies need to be involved in the planning process
New Highways	Significant increase of capacity possible; does have long run development impacts; can have environmental impacts	Costs vary by type of highway constructed; in dense urban areas can be very expensive	Can be controversial, especially if environmental impacts; Finance a key issue
Access Control and Management	Reduces accident rates; improves traffic flow; can save future dollars by preserving highway capacity	Could be substantial if land takings required	Needs engineering specifications; public outreach effort to educate abutters
Geometric Design	Proper design will increase mobility, reduce congestion and right-of-way costs, increase traffic flow, improve safety, and provide better aesthetics	Costs vary by type of design	Design principles need to be adhered to
Reconstruction	Can have dramatic effect on traffic flow and safety	Costs can vary by type of strategy	Careful coordination between design and construction required
Traffic Management During Reconstruction	Significant reductions in motorist delays possible, some diversions to other routes and modes likely	Costs can be substantial; Enforcement and transit costs can be important	Requires thorough planning and public education; Public and media outreach critical
Fixed Guideway Transit Construction	Can move large numbers of riders; Transitways carry three times volume of freeway lane; can influence development patterns	Costs for construction are substantial, transitways can be less costly	Implementation for all transit options relates to land use and density conditions, urban form, extent of highway availability, extent of transit service availability, difference in travel times between modes, parking costs and availability, transit price, service reliability, site design, perceived safety of service
Fixed Route and Express Bus Services	Provides flexible service to large areas; service can respond to changing markets; can provide high levels of service	Costs will vary by type of service provided; can be very cost effective	
Paratransit Services	Reduces per trip cost; programs can be established quickly; need coordination	First-year cost between $50,000 to $150,000	

Congestion Reduction Tool	Impact	Cost	Implementation
Land Use Policies To Improve Transit Access	Provides higher ridership potential; lower transit costs; reduced parking needs, reduced highway demand	Additional costs for developer	Requires close coordination between transit and development community
Site Design Criteria To Increase Transit Use	Similar to above	Similar to above	Set criteria need to be developed; coordination between professional community, developers, and transit agency needed
Transit-Oriented Parking Strategies	More efficient use of land; reduced road and maintenance costs	Cost savings per parking space range from $1,000 to $15,000	Parking policies need to be reviewed with transit access in mind
Growth Management	Deals with potential of future congestion; better decisions can be made regarding highway investment	Some administrative costs possible	Can be very controversial; Requires public information and outreach; needs to involve developers and business community
Road Pricing	Substantial reductions in congestion possible	Administrative costs required; installation costs	Can be very controversial; Requires extensive education campaign
Auto Restricted Zones	Can have major impact on area's economic activities; can impact travel behavior	Design costs critical as are enforcement and marketing costs	Important to work with business community
Parking Management	Control of parking can have significant impacts on travel behavior	Depend on strategies chosen	Can be controversial; Needs strong outreach effort
Demand Management Agreements	Can reduce trips generated at specific sites; however, not an areawide solution strategy	Costs associated with administrative oversight and negotiations	Requires bargaining skills and professional staff
Alternative Work Hours	Can reduce peak congestion at local sites	Administrative costs are involved	Criteria need to be established to determine when appropriate
Trip Reduction Ordinances	Ridesharing and transit trips can increase; trips by auto reduced	Same as Demand Management Agreements	Important issues include: extent of coverage, flexibility of means, enforcement, and oversight

Appendix B **Comparison of Freeway/Truck Management Strategies (Millions of Dollars Annually)**

Strategy	Feasible	Freeway Congestion Relief	Economic Impacts: Direct: Motor Carriers (2)	Direct: Other Vehicles (2)	Direct: Shippers/ Receivers (3)	Indirect: CA Business Sales (4)	Air Quality (5)	Implementation Cost (6)
Traffic Management (7)	Yes	++	$8	$121	+	} $8	+	$20-40
Incident Management (7)	Yes	+	$4	$44	+		+	$3-5
Night Shipping and Receiving (8)	Maybe	+	$3	+	− $2,200	− $913	+	$2-3
Peak Period Ban — Core Freeways (8,9)	Unlikely	+	− $43	$7	−	− $28	−	$2-3

Source: reference 4.

Notes:

++ Significant positive impact
\+ Modest positive impact
− Modest negative impact

(1) 1988 Dollars
(2) Time and vehicle operating cost savings (+) or cost increases (−)
(3) Logistics costs savings (+) or cost increases (−)
(4) Changes in volume of business sales (output) in 1988 relative to baseline forecast
Traffic and incident strategies were combined because their individual direct (motor carrier) impacts were too small to be modeled reliably.
(5) Not quantified
(6) Ten-year annualized implementation costs
(7) Los Angeles, San Francisco, and San Diego
(8) Los Angeles and San Francisco only
(9) Assumes 80 percent of peak period truck miles of travel are diverted to arterials; 20 percent diverted to offpeak periods (midday or night)

Source: Institute of Traffic Engineers, A Toolbox for Alleviating Traffic Congestion (Washington, D.C.: ITE, 1989), p. 58.

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