

Impacts Of Trucks And Railroad Deregulation On Transportation Operations And Economic Activity In The State Of Washington

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Public Transportation and Planning
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| 16. Abstract The Motor Carrier Act of 1980 and the Staggers Rail Act of 1980 have partially set aside decades of rigid regulations of interstate freight movement. These actions have the potential to bring forth significant changes to the networks of interstate freight transportation. The object of this research was to ascertain the impacts of deregulation on the Washington State transportation system. Information was obtained by surveying and interviewing shippers and freight transportation providers throughout the state. Anticipated impacts, e.g., accelerated rail abandonment or loss of motor carrier service to small communities were not present. The study reflects a relative increase in truck service and decrease in rail service since deregulation. Indications are this may be further amplified in certain regions of the state. The study recommends that potential highway impacts be incorporated into pavement management systems. Transportation officials are enjoined to treat issues relative to truck size and weight, highway cost allocation and deregulation as a single issue. Also, the Local Rail Service Assistance Program should be considered for use to offset any adverse impacts resulting from deregulation. During this period of the study, general economic conditions were poor. This resulted in a decrease in freight shipments and would suggest that some of the impacts of deregulation have been suppressed. | | | | | |
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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

RESEARCH REPORT

IMPACTS OF TRUCK AND RAILROAD DEREGULATION
ON TRANSPORTATION OPERATIONS AND ECONOMIC ACTIVITY
IN THE STATE OF WASHINGTON

FINAL REPORT

WA-RD-45.2

Prepared by

Public Transportation and Planning Division
Washington State Department of Transportation

The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the Washington State Department of Transportation or Federal Highway Administration.

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EXECUTIVE SUMMARY

BACKGROUND

The passage into law of the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980 had the effect of partially deregulating the surface freight transportation industry. After years of rigid regulation by the Interstate Commerce Commission (ICC), railroads and motor carriers were granted new latitudes of freedom relative to pricing and levels of service. Ease of entry, simplification of the merger or abandonment of service process, removal of operating restrictions and competitive pricing are among the new freedoms granted to freight carriers.

Ostensibly, the purpose of deregulation was to introduce a greater degree of economic efficiency to the market place. To a degree, it appears this has been done. Unfortunately, subsequent to deregulation general economic conditions have been poor. This would suggest that the full impacts of deregulation have been impeded, and will be slow to emerge.

In addition to introducing increased efficiency to the economic environment, deregulation has the potential to impact the existing transportation system. For example, will motor carriers gain a competitive advantage over railroads, thereby exceeding the capacity of highways and bridges?

The purpose of this research is to ascertain the potential impacts on the Washington State transportation system which may result through deregulation. By doing this, the Washington State Department of Transportation and other organizations can institute action to mitigate any adverse impacts.

METHODOLOGY

The research commenced with a review of the literature. Particular emphasis was placed on the effects of deregulation in other countries, the enabling legislation, anticipated impacts and results to date. Subsequent to this, a series of hypotheses were developed relative to potential impacts in Washington.

Data collection and analysis was the next phase. The data was collected through questions and personal interviews with major shippers and transportation providers located throughout the state. The information collected was then subjected to statistical analysis and compiling techniques. From this, hypotheses were tested, conclusions drawn, recommendations developed and a final report prepared.

CONCLUSIONS

Throughout the study period it was apparent that a weak economy was diminishing freight shipments and masking the full impacts of deregulation. The study was delayed with the hope that economic conditions would improve, but resumed when it became apparent that economic recovery was not at hand. This is not to say that there have not been resultant impacts from deregulation.

The study observes that some of the projections of critics of deregulations, e.g., loss of service to small communities, were not present. Further findings reflect an increase in truck service and decrease in rail service. A major finding of the study centers around the potential for an increase in truck traffic brought about by the introduction of unit trains in certain agricultural areas of the state. Under the unit train concept, commodities that formerly arrived at main rail lines via branch lines potentially will be trucked to the main line. Should this occur, the impact on roads and bridges would be significant.

The findings of the study also reflect that shippers have little adverse opinion concerning what has transpired thus far, and transportation providers appear to be more accommodating in price and level of service.

RECOMMENDATIONS

Transportation officials at all levels should treat deregulation and the issues of truck weights and highway cost allocation as a single issue. As highway programs place greater emphasis on preservation in lieu of new construction, this becomes increasingly important. Deregulation will ease entry for motor carriers and ease the process of rail abandonment which will increase highway utilization. A

program of monitorization is needed to ensure that emerging impacts are incorporated into maintenance schedules and construction prioritization. In addition, the Local Rail Service Assistance Program should be used to off-set any adverse impacts of rail abandonment such as the requirement to up-grade rail facilities, or affected highways.

CHAPTER I

INTRODUCTION

On July 1, 1980, President Jimmy Carter signed the Motor Carrier Act of 1980 into law. Identical action was taken with the Staggers Rail Act of 1980 on October 14, 1980. Adoption of these two Acts set aside decades of rigid regulation by the federal government. Since that time, some significant deregulation has occurred in the motor carrier and rail industries, but it is by no means total deregulation. The two industries are still in a state of flux.

The move to deregulation has the potential to significantly alter the structure of the transportation industry. How quickly and extensively that will occur has been the basis for this recent research effort by the Washington State Department of Transportation.

FOCUS OF THE STUDY

The primary purpose of this study is to ascertain the potential impacts on the Washington State transportation system of deregulation in the rail and motor carrier industries. Specific matters for investigation are:

1. Defining new changes to the law.
2. Observation of traffic and freight flow patterns
3. Any modal changes that may occur.
4. The impact on the state's transportation system, particularly as it affects highways and bridges.
5. Recommendations for the Washington State Department of Transportation.

The study commenced in August of 1980 and terminated in June of 1982. Funding was from a grant by the Federal Highway Administration.

PROBLEM STATEMENT

The deregulation of transportation services in the United States has the potential to significantly impact the transportation system in Washington State. The purpose of this study is, to the extent possible, identify existing or potential impacts resulting from deregulation. This will enable the Washington State Department of Transportation and other organizations to mitigate any adverse impacts.

LIMITATIONS OF THE STUDY

As the research progressed it became apparent that there were existing variables that influenced the analysis and that some limitations must be imposed on the total project. This was because factors were at work that can be expected to modify the likely results.

The primary impetus for deregulation was to introduce a greater degree of economic freedom and competitiveness to the transportation industry. Unfortunately, throughout the study period, general economic conditions nationwide have been depressed, and this has been an inhibiting factor for some sectors of the industry. For purposes of this study, the economic situation has increased the difficulty of identifying impacts of deregulation in both the truck and rail industries.

Although interstate trucking has been deregulated, the same is not true for intrastate trucking in Washington. Intrastate trucking continues to be regulated by the Washington Utilities and Transportation Commission, and thus some of the impacts of federal deregulation will be distorted by state regulation.

It seems clear, also, that the impacts of deregulation will not be immediate, but rather will be phased in over time. There are two reasons for this:

1. The new laws are complex, subject to interpretation and must be ruled upon. The Interstate Commerce Commission has been doing this

throughout the initial phases of deregulation, and will continue to do this during the next few years.

2. Deregulation has provided greater operational freedom for transportation providers and shippers. To many this means a realignment of economic assets that could involve the divergence or aquisition of financial resources and capital equipment and development of new transportation patterns. This process will require considerable time to fully evolve.

LEGISLATIVE REVIEW

The initial task for this study was to review pertinent legislation and the work of others, in order to determine the research needed and the scope of the study. This was an on-going process -- details are contained in Chapter 2.

Adoption of legislation that deregulated trucking and railroads was the most significant change in the federal regulation of freight movement since 1935. Legislation adopted in 1935 allowed the Interstate Commerce Commission (ICC) to regulate interstate trucking. Previous legislation adopted in 1887 gave the ICC regulatory control over interstate rail movements¹. The legislation adopted in 1980 has diminished the role of the ICC in regulating interstate freight movement.

Motor Carrier Act of 1980

The stated goals of this act were to make motor carrier transportation more competitive and energy efficient. Highlights of the act are²:

1. Entry into the market has been eased for new carriers.
2. There has been a removal of operating restrictions relative to commodity categories, territorial limits, service to intermediate points and round-trip authority.
3. There is allowance of certain exemptions for private carriers engaged in intercorporate hauling.

4. Industry participants are given a greater degree of freedom in pricing.

Staggers Rail Act of 1980

The intent of this act is to encourage the restoration, improvement, and financial stability of the railroads. Highlights of this act are³:

1. Railroads are granted greater freedom to increase rates.
2. Shippers' ability to challenge rates is reduced.
3. Authorization of contracts between shippers and railroads has been facilitated.
4. Simplification of the rail merger process has been defined.
5. Simplification of the rail abandonment process has been defined.

Passage of these two acts presents the potential for significant impacts on the transportation systems of the individual states. It should be noted that during the Congressional hearings prior to adoption of the two acts there was much speculation on what the actual impacts would be. To obtain some early perspective on that point, this study reviewed the effects of deregulation in other key countries.

FOREIGN EXPERIENCES

In Canada, adoption of the National Transportation Act in 1967 partially deregulated transportation services. The goal of this act was to achieve:

....an economic, efficient and adequate transportation system making the best use of all possible modes of transportation at the lowest cost....

According to Trevor D. Heaver, the Canadian experience has successfully resulted in carriers designing specific services that result in high equipment utilization⁴.

However, Canadian deregulation is not without its critics. There has been concern in the Prairie Provinces that the ease of rail abandonment has shifted the financial burden for additional highway expenditures to the provinces⁵.

Australia deregulated interstate transportation in 1954. This country is similar to the United States in several respects. Both are large continental countries that are dependent on highway freight transport. In addition, both countries have an industrial/agricultural mix based on the free enterprise system.

The initial phases of deregulation in Australia were chaotic. The freeing of entry on interstate routes, and elimination of ton-mile taxes, brought about a tremendous increase in trucking resulting in vigorous rate cutting, overloading of vehicles, excessive driving hours and damage to the highways⁶.

Subsequent events have brought about a more structured environment. Many individual owner-operators now operate as subcontractors to larger firms. Also a degree of regulation has been reintroduced with the passage of the Inter-State Commission Act of 1975 by the Commonwealth Parliament. This act did not bring back regulatory power, but allowed for investigation of transportation issues⁷.

In looking to the experiences in Canada and Australia valuable insight of anticipated impacts can be gained. It must be recognized though that there are fundamental differences in the structures of the transportation industries.

It should be noted that Canada has only two transcontinental rail services. One of these is government owned, the other is privately owned. There is no substantial competition between them⁸. This is in contrast to the United States which contains numerous private railroads. Also, Australian regulation endeavored to hold down the growth of intercity trucking to protect the state-owned railways. In the United States regulation allowed for the expansion of trucking probably beyond what can be regarded as an efficient allocation of freight⁹.

All of this would suggest that deregulation in the United States and the individual states will be a unique experience. To date little meaningful research is available that addresses this fact. For this reason, WSDOT set up a research project to find the answers to these questions.

RESEARCH DESIGN

As mentioned, the study began with a review of legislation and literature relative to deregulation of the transportation industry, and a basic assumption was made that deregulation would significantly impact the state's transportation system.

A questionnaire was prepared and distributed to freight transportation providers and shippers throughout the state. The data collected from the questionnaire was analyzed and used to evaluate the hypothesis.

In addition, a series of personal interviews was conducted throughout the study period with key individuals involved with transportation issues. The purpose of the interviews was to obtain the perceptions of those directly involved with deregulation.

These two sources provided the basic research data for this study.

This report has been organized into six chapters. Chapter 1 contains a background to the research problem and a preview of the report. Chapter 2 discusses what others have written relative to the subject and an overview of economic conditions present during the study period is presented in Chapter 3. Study methodology is described in Chapter 4, and findings are presented in Chapter 5. Conclusions and recommendations are presented in Chapter 6.

FOOTNOTES

1. The United States Government Manual 1981/82, Office of the Federal Register, pg. 559.
2. Jeffery C. Kline, Highlights of Truck and Rail Regulatory Reform in the 96th Congress, Transportation Research Record 804, pg. 1.
3. Ibid, pg. 3.
4. Trevor D. Heaver, The Canadian Experience with Limited Regulation of Maximum Railway Rates, Transportation Journal, Fall 1981, pg. 12.
5. Trevor D. Heaver and James C. Nelson, The Role of Railway Regulation Policy in Canada, Journal of Transportation Economics and Policy, January 1980, pg. 14.
6. James C. Nelson, The Economic Effects of Transport Deregulation in Australia, Transportation Journal, Winter 1976, pg. 52.
7. Ibid, pg. 48.
8. Harold E. Spencer, Deregulation of Railroads: The Road to Nationalization, Traffic World, February 8, 1982, pg. 90.
9. Nelson, pg. 66.

CHAPTER II

THE MOVEMENT INTO DEREGULATION

During the 1970s, the performance of the United States' economy became the subject of growing concern. Increases to the cost of domestically produced goods and declining industrial productivity made it difficult for U.S. products to compete in world markets. Also, a significant part of capital expenditures in the private sector were for the purpose of attaining the regulatory requirements of government, rather than the acquisition of new equipment.

From this came a growing realization that government regulation was impeding the growth of the U.S. economy. It thus followed that economic deregulation became high priority issues in both the Carter and Reagan administrations. Under President Carter, significant movement into deregulation was experienced by the transportation and financial sectors of the economy. As reported by Business Week in a feature article (March 9, 1981), deregulation of all aspects of the economy is fundamental to President Reagan's philosophy.¹

Prior to President Carter's success in achieving deregulation of transportation services, there were other recent attempts that failed to pass the Congress.² The Nixon administration put forth the Transportation Regulatory Modernization Act in 1971. This legislation would have partially deregulated rails and motor carriers. President Ford endorsed the Motor Carriers Reform Act of 1975, but failed to attract meaningful Congressional support.

Despite the record of past failures, President Carter was not dissuaded in attempting to deregulate transportation. During his tenure, major legislation was passed that deregulated airlines, motor carriers, and railroads.

Airlines were the first to be deregulated. Deregulation was accomplished by two separate acts of federal legislation. Air freight was addressed in the Air Cargo Deregulation Act of 1977 (PL 95-163) and passenger services in the Airline Deregulation Act of 1978 (PL 95-504). Both of the Acts had immediate and far-

reaching impacts within the industry. These impacts are more visible to the traveling public than those of rail and truck deregulation, the reason being that personal involvement is much more likely to occur with an air carrier.

The deregulation of air cargo had the effect of allowing air freight forwarders the option of operating aircraft. Also, in an attempt to consolidate freight movement, many airlines went into the trucking business.

The deregulation of passenger traffic had a traumatic effect on the air carrier industry. Under passenger traffic deregulation, carriers became free to compete in routes, service, scheduling and pricing. It was anticipated that deregulation would lead to lower fares and choice of carriers.³

At the onset of deregulation, this appeared to be true. Passengers enjoyed cut-rate air fares and the airlines experienced an unprecedented boom in passenger traffic.

By 1982 the story was quite different. Half of the 12 major carriers were losing money. One major carrier was forced into bankruptcy, and two others appear on the brink. Layoffs in the industry exceed ten percent, and many of those who are still employed have had their wages frozen or cut.

Small communities are complaining they are losing air service and many passengers complain that the quality of service has declined. The only bright spot remaining is that many passengers continue to enjoy bargain rates.

Despite the problems being experienced by the air carriers, there appears to be little call for a return to regulation. Rather, it is the opinion of many that what is happening is due to the introduction of free market competition. Market forces will eventually eliminate the inefficient and out of the travail could come a stronger industry.⁴

Subsequent to deregulation of the airlines, legislation was enacted to deregulate railroads and motor carriers.

RAILROADS

The nation's railroads provide service over an extensive physical network that includes approximately 184,500 miles of rail lines and 300,000 miles of track. In conducting their operations, the railroads utilize more than 28,700 locomotives, approximately 1.7 million freight cars, and nearly 4,200 passenger cars.

Although the railroad industry might appear to be a grouping of homogeneous companies, in reality it consists of several quite different components. Predominant among these are the 40 class I railroads. According to ICC standards, class I railroads are those which generate annual operating revenues in excess of \$50 million. There are also approximately 300 class II railroads, companies that earn less than \$10 million annually. To a great extent these companies function in an auxiliary capacity, either originating or terminating shipments that have their line haul movements over a class I railroad line.

The dominance of the class I railroads in our national railroad system is illustrated by the fact that they account of 94 percent of total mileage operated, 92 percent of railroad employment, and 98 percent of both freight and passenger traffic as measured in freight-ton miles and passenger miles.⁵

Railroads have been troubled by many problems in recent years. A combination of competitive forces and government programs such as construction of the interstate highway system have led to a significant reduction in the industry's share of intercity freight movements.

Recognizing this, in the 1970s, the federal government took several steps in an attempt to aid the industry. Among the actions taken were:

- . The creation of Amtrak by the Rail Passenger Service Act of 1970. This action created a federally supported rail passenger service and allowed private carriers to phase out their passenger operations.
- . The Regional Railroad Reorganization of 1973 (3R) facilitated a financial restructuring of seven bankrupt railroads through government subsidies.

- The Railroad Revitalization and Regulatory Reform Act of 1976 (4R) provided massive financial assistance to Conrail. Also, it allowed greater latitude throughout the industry in pricing and rail abandonment.

Many in the railroad industry viewed the Staggers Rail Act as the final phase of a transformation that railroads have been undergoing for the past several years. Finally, rails would operate free from government controls. This would enable them to further reduce inefficient operations, and offer more specialized customer-oriented services. This is in sharp contrast to the former heavily regulated, do-everything, go-everywhere system.⁶

Similar to airlines, the period immediately following deregulation was very positive for the railroads. Ton-miles increased 2.5 percent in 1980 over 1979 and the return on investment was the best in 25 years.⁷ Unfortunately, in 1981 the previous year's gains slowed, resulting in a slight reduction in ton-miles.

This failure to register gains in 1981 can be attributed to a depressed economy rather than trauma resulting from deregulation such as was experienced by the airlines. Indeed, it appears that in 1981 the rails out performed the economy in general.

Particularly noteworthy was the performance of trailers on flatcars (TOFC) and containers on flatcars (COFC). Despite total revenue car loading declining by 3.4 percent in the first ten months of 1981, TOFC/COFC increased by two percent. This is significant because historically this type of traffic was vulnerable to a weak economy. For example, in 1975 TOFC/COFC declined by 19 percent.⁸

Deregulation has placed the railroads in a position similar to that of air cargo service operations. They now have the freedom to innovate, enter into long term contracts and tailor services for specific customers. Thus it would appear that the future success of the rails is dependent to a large degree on their ability to market and efficiently operate their new flexibility.

There are those in the rail industry who believe this will be difficult. It is the opinion of Richard H. Steiner, Conrail's Vice President for Marketing, that many

rail executives are more attuned to asset management, rather than increasing sales volume.⁹

The initial record of the rails under deregulation indicates that they are aware that innovation is required if they are to prosper. They are competing with truckers for agricultural commodities by providing reliable service at lower rates. Their ability to offer long term contracts is making them more receptive to specialized requests by shippers.

MOTOR CARRIERS

The trucking industry became subject to regulation by the Interstate Commerce Commission (ICC) in 1935. There were two reasons for regulation. First, the economic conditions at the time were threatening to collapse the industry. Second, the railroads which were already regulated were exerting pressure for the federal government to exercise a degree of control over the trucking industry.

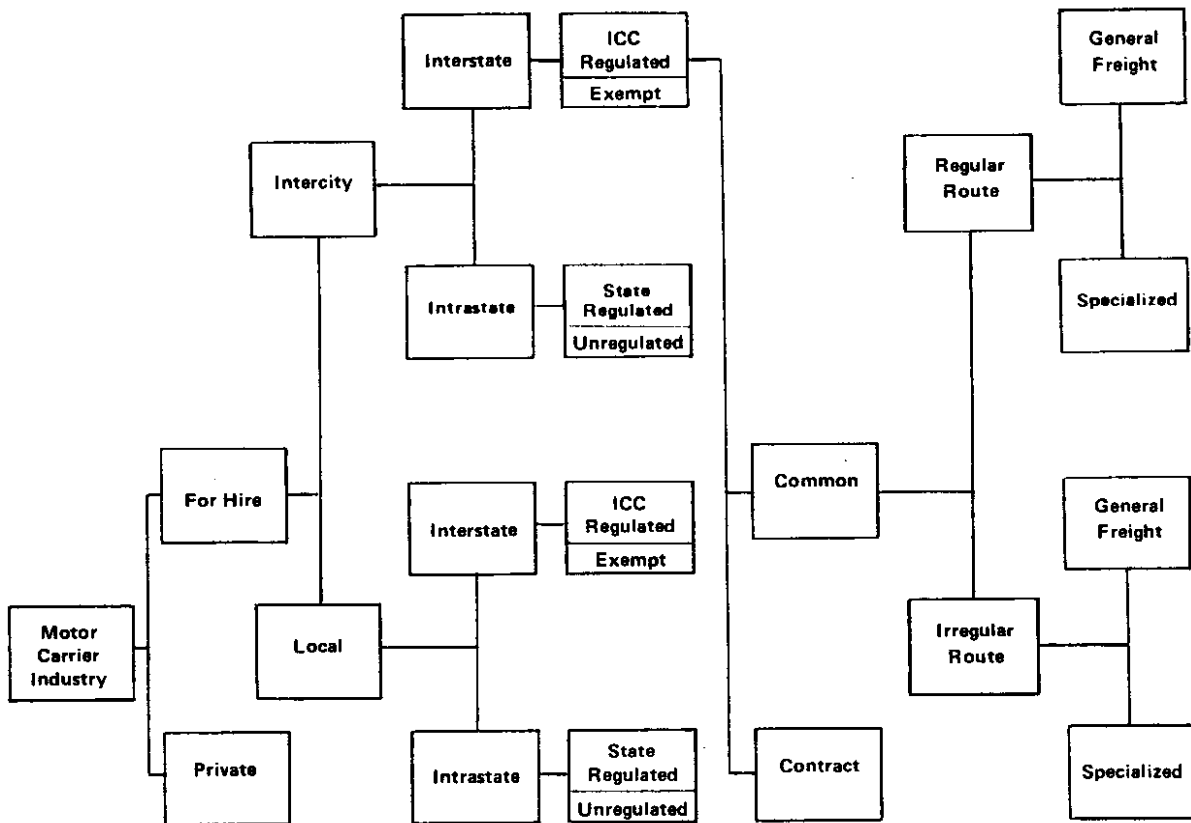
What has emerged is an industry that is surprisingly complex in its structure. This structure is illustrated in Figure 1. A brief definition of the individual entities within the structure is as follows:

Private Carriers consist of the trucking operations of manufacturers, wholesalers, merchants, and other shippers for transporting their own goods by means of equipment which they themselves own or lease. If their principal business is not transportation services, they qualify as private carriers. Those firms which meet the criteria which define private carriers are not subject to Interstate Commerce Commission regulation.

For-Hire Carriers transport freight which belongs to others. They may be classified by jurisdiction served such as interstate, intrastate, and local, the last two classes being regulated by local or state authorities, or exempt from regulation. They may also be classified by kind such as Common Carriers, Contract Carriers and Exempt Carriers.

Figure 1

LEGAL STRUCTURE OF THE MOTOR CARRIER INDUSTRY



Source: *Financial Analysis of the Motor Carrier Industry*, CITIBANK, 1981

I. Common Carriers by definition offer their services to any shipper to transport his goods between designated points at published rates under authority granted them by the ICC under a certificate of public convenience and necessity. This certificate spells out both the types of commodities which may be carried and the service routes, whether irregular route service between areas on a nonscheduled basis or regular route service over designated roads on a scheduled basis. The ICC must also approve the tariffs established for various classes of freight by the numerous regional rate bureaus. In general, any service which is not specified by the terms of an operating certificate is forbidden.

II. Contract Carriers, as the name implies, were restricted through 1979 to serving one or a few shippers under specific contractual arrangements and could not, unlike the Common Carriers, offer their services to the public-at-large.

III. Exempt Carriers transport certain specialized goods, such as unprocessed agricultural products, livestock, and newspapers, and are exempt from ICC regulations about routes, areas and rates.

Although today's trucking industry consists of approximately 150,000 firms, only about 16,000 of those firms are regulated by the ICC. These regulated carriers, however, account for roughly 40 percent of total intercity ton-miles. Thus, regulated carriers exert a great deal of influence over the industry.¹⁰

The Motor Carrier Act of 1980 was the third attempt in nine years by the Congress to deregulate the trucking industry. Each attempt was opposed in the form of a massive lobbying campaign by the American Trucking Association, the Teamsters Union, farmers, rural communities, and other special interest groups. It was the contention of these groups that deregulation would bring chaos to the industry, resulting in loss of service and predatory pricing. They also claimed that service to small communities would be lost. Special exception was taken to those portions of the legislation which eased entry requirements into the industry and diminished collective rate making.¹¹

It was the position of the supporters of the legislation that the industry was over-protected and current regulations bordered on the ridiculous. For example, commodity restrictions allowed some carriers to haul frozen chickens but not frozen turkeys. The supporters also held that deregulation would increase competition that would result in lower prices to the consumer. Also, it was contended that existing regulations made for an excessive number of partially loaded trucks and empty backhauls which resulted in a significant waste of energy.

There appear to be three reasons why the legislation was able to pass the Congress. They are:

1. The personal commitment of President Carter to deregulation;
2. The perceived success of air carrier deregulation; and
3. The fuel shortage of 1979 which resulted in an energy conservation awareness.

The latter two reasons probably had more of an impact than President Carter's support, as both Presidents Nixon and Ford had backed unsuccessful deregulation bills. It is interesting to note, however, that a three year legislative deadlock was broken when an unlikely partnership between President Carter and Senator Edward Kennedy emerged to support the legislation.

When the Congress was considering trucking deregulation they were keenly aware of the boom enjoyed by the airlines immediately following their deregulation. They were also aware of the favorable response from the public to lower air fares.

The energy issue provided additional impetus to the Congress to pass the legislation following the 1979 fuel shortage, and the President and the Congress were under pressure to reduce oil imports. It was recognized that the existing structure in trucking was not conducive to fuel conservation.¹²

During March of 1982, the Federal Trade Commission (FTC) completed an evaluation of the Motor Carrier Act of 1980. Among the findings were the following:¹³

Entry. The number of applications for ICC grants of operating authority increased from 6,700 in fiscal 1976 to 29,300 during the first year of the Act. The percent of applications approved rose from 70 percent to 95 percent during the same period. During the first year of deregulation, some 2,500 new firms entered the industry, despite a slump in freight movement.

Rates. Deregulation and a slack economy have created downward pressure on rates. Discounts and across-the-board cuts are commonplace.

Wages. It appears deregulation combined with the slack economy have moderated wage demands. Teamsters in March of 1982 agreed to a freeze in basic wage scales and reduced cost of living allowances.

Profits. After tax equity for general freight truckers was negative in 1980. Little improvement is expected for 1981 or 1982.

Small Communities. The cost and availability of service to small rural communities has remained virtually unchanged since deregulation.

It would appear that the chaos that the opponents of deregulation predicted has not occurred. It is apparent though that discounting of rates has hurt industry profits. This is a benefit for the public in the form of lower prices for freight movement.

Deregulation has added additional capacity to the trucking industry by easing entry and operating controls. Unfortunately during the same period, freight volume has decreased due to a depressed economy.

The state of the economy is fundamental to the effects of deregulation. The impacts of deregulation for all modes are not what was anticipated by the Congress. What would have otherwise transpired in a strong economy is unknown.

A brief discussion of the general economic conditions is contained in the following chapter.

FOOTNOTES

1. Deregulation: A Fast Start for the Reagan Strategy, Business Week, March 9, 1981, pg. 62.
2. Leo Abruzzese, Motor Carrier Reform, Commercial Car Journal, December 1980, pg. 67.
3. Morris & Farris, Meaning and Goals of Deregulation, Transportation Journal, January 1982, pg. 45.
4. Allan F. Dobbs, Airlines, Forbes, January 4, 1982, pg. 197.
5. Robert C. Lieb, Transportation in the Domestic System, Weston Publishing, 1978, pg. 105.
6. Tom Shedd, Advancing the Transition, Modern Railroads Rail Transit, December 1980, pg. 41.
7. Tom Shedd, Learning to Walk Again, Modern Railroads Rail Transit, December 1981, pg. 47.
8. Gus Welty, TOFC/COFC: A Growth Market Again, Railway Age, November 30, 1981, pg. 22.
9. Frank Malone, Marketing: Do Railroads Really Know What It's All About?, Railway Age, February 23, 1981, pg. 39.
10. Edison R. Zayer, Motor Carrier Regulation and Small Truckers, Business Economics, January 1981, pg. 59.
11. Donald V. Harper, The Federal Motor Carrier Act of 1980: Review and Analysis, Transportation Journal, Winter 1980, pg. 6.
12. Arbuzzese, pg. 68.

FOOTNOTES

13. James C. Miller III, First Report Card on Deregulation, The Wall Street Journal, March 8, 1982, pg. 42.

CHAPTER III

THE ECONOMIC CLIMATE FOLLOWING DEREGULATION

The movement and volume of freight in the United States is directly tied to the vitality of the general economy.

It should be noted that the Staggers Rail Act and Motor Carrier Act were conceived during a period when the nation's economy was undergoing a reasonably strong recovery from the 1975 recession. Following a decline of 1.1 percent in the Gross National Product (GNP) during 1975, the economy averaged almost a five percent annual growth rate for the next four years. During 1980, the year deregulation was enacted, GNP declined 0.2 percent, followed by a modest increase of two percent in 1981.¹ It appears that GNP will reflect only small growth for 1982.²

Symptomatic of this poor economic performance were exceptionally high interest rates which suppressed consumer spending and business expansion. During 1980 and 1981 high levels of inflation and dramatic increases to the cost of fuel were also dominant factors in the economy. Although the impacts of fuel prices and inflation abated during the first half of 1982, a combination of high interest rates, rising unemployment, and decreased consumer spending suppressed any real economic growth.

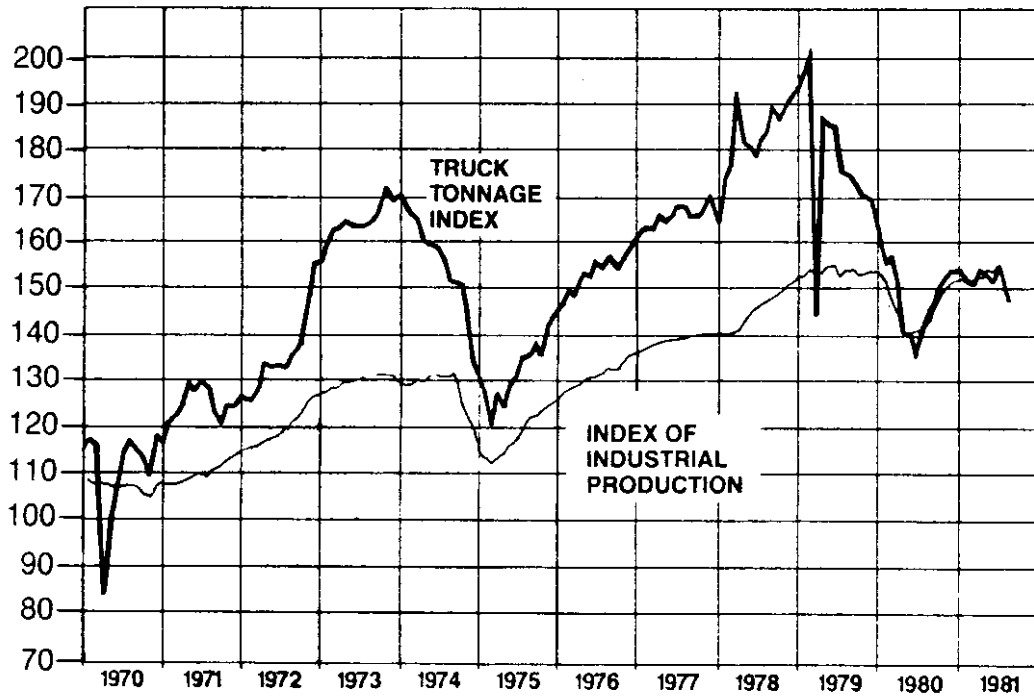
The effects of a flat economy have been felt by the freight services industry. Although during 1981 the volume of freight moved by rail declined only slightly over 1980 levels, tonnage moved by truck declined 13.5 percent during the same period.^{3,4}

The impact that economic conditions have had on the trucking industry is reflected in Figure 2, which depicts the linkage between truck tonnage and industrial production.

Deterioration of general economic conditions have been more severe in Washington State than the nation as a whole. Unemployment in the state during the first quarter of 1982 reached 12 percent as compared to 9 percent for the rest of the nation.

FIGURE 2

**Truck Tonnage Index
and Index of Industrial Production
(1967 = 100)**



SOURCE: ATA Monthly Truck Tonnage Report;
Federal Reserve Board

The vitality of Washington's economy is measured by changes in real personal income. Whereas in 1979 real personal income increased by 7.9 percent, the rate of change in 1982 is projected to be a modest 0.2 percent.⁵ There are several reasons for this drastic slowdown in the growth in real personal income which in effect measures the performance of the state's economy. Among them are:

1. The slowdown in the timber and wood products industry that resulted from the near collapse of new home construction.
2. The reductions in aerospace employment that resulted from cancellation of orders for new passenger airliners.
3. The suspension of construction on three of five nuclear plants that were under construction in the state has led to the loss of approximately 10,000 jobs.

In summary, it can be said that recent economic performance at the national level, or in Washington, has not been conducive to the creation of freight. As previously mentioned, although deregulation increased the capacity of the transportation services industry, economic conditions have decreased the volume of freight.

This would strongly suggest that the impacts of deregulation have been masked by a suppressed economy.

FOOTNOTES

1. U.S. Long-Term Review, Data Resources Inc., Winter 1981-82, pg. 11.3.
2. Review of the U.S. Economy, Data Resources Inc., June 1982, pg. 1.8.
3. News Highlights, Modern Railroads, March 1982, pg. 10.
4. Intercity Tonnage, Traffic World, February 1, 1982, pg. 89.
5. Economic and Revenue Forecast, Washington State Office of Financial Management, June 1982, pg. 9.

CHAPTER IV

RESEARCH BACKGROUND

This chapter presents an overview of the research methodology. A detailed explanation of this methodology is contained in Appendix A.

The study began in September 1980, with an intended completion date of June 1981. As the study progressed, it became obvious that the impacts of deregulation were minimal. This was due to depressed economic conditions and the relatively short amount of time that had passed since enactment of the deregulation legislation.

Consequently, it was decided to publish a Phase I Report (Interim) during June 1981. The reader is referred to Impacts of Truck and Railroad Deregulation on Transportation and Economic Activity in the State of Washington, Phase I. The study was held in abeyance for six months with the anticipation that more visible impacts would emerge. Research for the Phase II Report (Final) commenced during January 1982.

Based on what was learned from the Phase I research, it was anticipated that the following five areas had been or were likely to be impacted by deregulation:

- a. The quality of truck and rail service;
- b. The frequency of truck and rail service;
- c. Motor and rail carriers' acceptance of damage liability;
- d. The annual volume of freight shipped and received;
- e. The distribution of freight among modes.

From the above, a series of hypotheses were formulated.

Data Collection and Development

Data relative to the Phase II research were collected by a survey questionnaire and personal interviews directed to shippers in Washington. The population of shippers was estimated to be 4,263.

The primary vehicle used to gather information was the survey questionnaire which was distributed to 355 shippers. A total of 102 questionnaires were completed by the shippers and returned.

The questionnaire contained 10 questions relative to level, type, frequency and quality of service. Respondents were asked to rate conditions before and after deregulation. A copy of the questionnaire is contained in Appendix B.

Data received was statistically tested and interpreted using the Chi square formula. Processing of the data was accomplished via the SPSS Batch System, OS/360 Version M program.

A series of personal interviews were conducted to supplement and verify the information received from the survey questionnaires. All toll, 50 persons who responded to the questionnaire were also interviewed. Twenty-three persons were interviewed twice, once during Phase I and again during Phase II. Information gained during the personal interviews appeared consistent with that received via the survey questionnaires. Persons interviewed are listed in Appendix C.

The statistical results yielded from the research are contained in the following chapter.

CHAPTER V

RESULTS

This chapter presents an overview of the statistical analysis relative to the data collected during Phase II of the research. A detailed analysis can be found in Appendix D of this report.

In order to determine if in fact there were impacts resulting from deregulation, a series of hypotheses were developed and tested. Statement of the hypothesis and the relative findings are as follows:

Hypothesis I

With the change in interstate motor carrier and rail shipping regulations, shippers will report, at a statistically significant level, a change in the frequency of motor carrier and rail service, the quality of both services, and the ease in determining motor carrier and railroad freight rates.

Shippers reported at a statistically significant level that they perceived a change in the frequency of both motor carrier and rail service after deregulation. No statistically significant answer was given to whether the quality of service had changed or remained the same. The shippers reported at a statistically significant level that the ease in determining rail rates had remained the same. No statistically significant answers were given for the ease in determining motor carrier rates.

In answering the question on frequency of motor carrier and rail service, shippers as a group, reported they utilized motor carrier service 6,144 times per month prior to deregulation and 7,255 times per month after deregulation. The statistics on rail service indicate that shippers as a group reported utilizing rail service 1,073 times per month prior to deregulation and 939 times per month after deregulation.

Hypothesis II

With a change in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level a change in the willingness of motor and rail carriers to accept liability for goods which are lost or damaged in transit.

Shippers reported at a statistically significant level that the willingness of motor carriers to accept liability for goods lost or damaged in transit had remained about the same.

Hypothesis III

With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level a change in the time it takes to transport goods to and from common origins.

Shippers reported at a statistically significant level that the time it took to transport their goods to and from common origins remained the same before and after deregulation.

Hypothesis IV

With the changes in motor carrier and rail shipping regulations, shippers will report at a statistically significant level a change in how they distribute their freight among common carriers, private trucks, or railroads.

Shippers reported at a statistically significant level that there was no change in how freight was distributed before or after deregulation.

Hypothesis V

With changes in interstate motor carrier and rail shipping regulations, a statistically significant number of shippers will report a change after deregulation in the number of motor carriers they utilize to transport their freight.

Shippers reported at a statistically significant level that the number of motor carriers they utilize did not change after deregulation.

Summary

Statistical analysis of the survey data determined that the largest percentage of the shippers reported they receive (36.27 percent) and ship (51.96 percent) 50,000 tons or more of freight per year. The shipping and receiving of freight by Washington State shippers is positively skewed. Shippers reported at a statistically significant level that they perceived a change in the frequency of both motor carrier and rail service after deregulation. Motor carrier service increased from 6,144 times per month prior to deregulation to 7,255 times per month after deregulation. Rail service decreased from 1,073 times per month to 939 times per month after deregulation. Thus, shippers reported an 18.08 percent increase in frequency of motor carrier service and a 12.49 percent decrease in the frequency of rail service after deregulation. The shippers reported no statistically significant change in the quality of rail service before or after deregulation. After deregulation, shippers reported at a statistically significant level that the ease in determining rail rates had remained about the same. No statistically significant findings were yielded relative to the ease in determining motor carrier rates after deregulation.

Sixty-seven shippers (65.68 percent) a statistically significant number reported the willingness of motor carriers to accept liability for lost or damaged goods had not changed. Fifty-eight or 56.82 percent reported at the .05 level of significance no change in the willingness of rail carriers to accept liability for lost or damaged goods. Shippers reported at a statistically significant level the time it took to transport goods to and from common origins by motor and rail carriers remained the same after deregulation. No statistically significant change occurred in the distribution of freight among common carrier trucks, contract carrier trucks, private carrier trucks, exempt carrier trucks, carload rail, or TOFC-COFC. When asked to estimate the number of motor carriers they utilized before and after deregulation, the majority of shippers estimated they used 11 or less motor carriers before deregulation and 15 or less after deregulation.

In sum, only one statistically significant change was reported to have occurred after deregulation, an increase in the frequency of motor carrier service and a decrease in railroad service.

CHAPTER VI

CONCLUSIONS

The purpose of the Motor Carrier Act and the Staggers Rail Act was to achieve a greater degree of economic efficiency in the movement of interstate freight. Unfortunately, since the enactment of the legislation in 1980, general economic conditions have been far from optimal. Symptomatic of this poor economic performance has been a decline in the volume of freight moved by either rail or truck. This would suggest that the anticipated impacts resulting from deregulation have not fully emerged.

Despite this, the research contained herein has been able to identify the following impacts or potential impacts to Washington's economy and transportation system that resulted from deregulation:

Rate flexibility: The majority of shippers interviewed perceived that railroads and motor carriers were more flexible in negotiating freight rates. For example, a representative from a leading plywood manufacturer reported that had the company not been able to obtain lower rail rates they would have had to close a mill located in Tacoma. The same representative reported that when his company ascertained that Oregon manufacturers had gained an economic advantage due to lower freight rates to California, the railroad providing service lowered the rate for plywood originating in Washington. Virtually all shippers reported that discounting of rates was commonplace with truckers.

Quality of service: The critics of deregulation projected that a poorer quality of service, particularly in trucking would result after deregulation. It was their contention that small communities would receive reduced service and ease of entry would bring forth an influx of independent "fly-by-night" truckers. The research indicates that the quality of service has not suffered under deregulation.

Modal choice: Washington shippers reported that motor carrier service increased by 18.08 percent and rail service decreased by 12.49 percent. The reported increase in truck service is surprising in light of economic conditions but not

altogether inconsistent. During a period of increased competition truckers have a greater degree of flexibility than rails in modifying degrees of service and rates. Also, heavy manufacturing which has a propensity to ship by rail has been affected to a greater degree by the suppressed economy. Agriculture and retail food products which are prone to ship by truck have been impacted by economic conditions to a lesser degree.

Railroads: Although the research reflects that rail utilization in Washington has decreased since deregulation, there are mitigating factors. Freight tonnage increased 1.4 million tons in 1978 and again in 1979. This trend was reversed in 1980 when tonnage decreased by 1.1 million tons. The decline in tonnage is due in part to termination of service from the Milwaukee Road and the weak economy. Under existing conditions the rails should retain their share of the market. An improved economy will stimulate rail movement. Also, with leading Washington ports being able to accommodate containerized freight, the potential for an increase in COFC - TOFC exists.

During the period of the study a major development within the state's rail system took place with the introduction of unit trains in certain agricultural areas located in eastern Washington. Unit trains limit the number of loading sites and usually run to a single destination. Under this concept shippers receive lower rates. Commodities that now arrive at main rail lines via branch lines, potentially will be trucked to the main line. A potential impact is the abandonment of branch lines that have low traffic density. Should this occur, large quantities of grain will be transported by truck. The rail or road systems with the greatest potential to be impacted by unit trains are located in Douglas, Adams, Lincoln, Grant, Spokane and Whitman Counties.

Motor carriers: The research indicates that deregulation will increase motor carrier freight movement in Washington. This is brought about to a large degree by the new spirit of competition in the industry resulting from ease of entry and flexibility in rates. Also, deregulation has eased the process of rail abandonment. Should this happen, freight formerly moved by rail will be moved by truck.

A significant increase in trucking can quickly translate into major highway impacts. For example, should the Burlington Northern rail line between Mansfield and the Columbia River be abandoned under the unit train concept, some 7,500 truck trips will be required to transport the annual grain harvest.

As it regards motor carriers, there are other issues in addition to deregulation which are of concern to transportation officials. A study completed by the U.S. Department of Transportation in August 1981, entitled An Investigation of Truck Size and Weight Limits, indicates that greater economic efficiencies can be obtained by increasing truck size and weight. A subsequent study, Final Report on the Federal Highway Cost Allocation Study, released by FHWA in May 1982, states that large trucks are not paying their share of highway costs.

Motor carrier deregulation was brought about by the desire to bring about a greater degree of competition to the industry that would benefit the nation's consumers and the economy in general. To a degree this is happening. However, deregulation also will bring forth changes in modal choice and traffic patterns that can impact the existing system of streets, roads and highways.

RECOMMENDATIONS

It should be recognized that the impacts of deregulation that have emerged thus far, may only be the tip of the iceberg. The 1980 legislation partially modifies decades of rigid regulation that governed surface freight movement and has taken place during a period of poor national economic performance. Logically, when the economy improves and individual firms make further adjustments into a deregulated environment, the impacts will be accentuated. It thus follows that federal, state and local transportation officials should be alert to the potential for adverse ramifications and take mitigating action. Measures that should be considered are as follows:

U.S. Department of Transportation: Federal transportation officials should recognize that deregulation, truck size and weight and highway cost allocation are not separate issues. This is particularly important at this point in time as federal highway programs are transitioning from construction to preservation and restoration. Research into the affects of volume and weight on the federal

highway system should retain a high priority. Such research should include a goal of obtaining a procedure to ensure that various vehicle classes are paying their fair share. During this period of scarce financial resources, this is of paramount importance.

Federal transportation officials are making increasing use of the recently devised highway performance monitoring system (HPMS) to administer highway programs. HPMS should be structured to provide an early warning when patterns or volumes of freight undergo significant change. The FHWA recently published HPMS Truck Weight Case Study appears consistent with the above recommendation. (Author's note: This study was completed in June 1982 and not utilized in conjunction with this research.)

It is recommended that Local Rail Service Assistance Program (P.L. 94-210) be continued and adequately funded. This program will prove valuable to local governments in providing federal financial assistance. Candidates for such assistance would include: highway improvements required to offset the impacts of rail abandonment; rehabilitation of lines being considered for abandonment due to poor physical condition; and, construction of new rail facilities, e.g., loading facilities to accommodate grain coming to unit trains.

Washington State Department of Transportation: It is recommended that the State Department of Transportation continue the effort to examine the impacts of deregulation on state's transportation system. Subsequent to an improvement in the economy this becomes especially important. The examination can take the form of additional research, special studies or a monitorial program. The latter seems the most preferable, particularly if interfaced with the monitoring of rail and highway commodity flows. Information received and analyzed should be incorporated into short- and long-range state transportation plans.

The state should continue its involvement in Local Rail Service Assistance Program. A goal of this program should be not only to off-set any adverse aspects resulting from deregulation, but to enhance the positive impacts.

Any significant changes in traffic patterns or commodity flows should be considered for incorporation into the Washington State Pavement System (PMS).

PMS is an essential part of network programming that has features which include forecasted serviceability, pavement ratings, project performance and project optimizing, e.g., providing the most cost effective time and type of pavement rehabilitation.

Finally, the effects of intrastate regulation of freight movement should be examined. Questions concerning the ramification of a combination of intrastate regulation and interstate deregulation have yet to be answered. To a degree this question is now being addressed. The Washington State legislature has appointed a special committee to ascertain if changes to state transportation regulatory policy are needed. This committee is striving to complete a report which will be presented to the legislature during January 1983.

In summary, it can be said that the tasks that lie ahead are similar for both state and federal transportation officials. Transportation deregulation provides the opportunity for increased efficiency in the existing system. By the same token it is incumbent upon transportation officials to obtain early recognition of any adverse impacts and institute mitigating action.

REFERENCES

- Abruzzese, Leo, "Motor Carrier Reform," Commercial Car Journal, December 1980.
- Barret, Collin, "Showdown for Rate Bureaus," Distribution Worldwide, September 1979.
- Boyer, Kenneth, "Minimum Rate Regulation, Modal Split Sensitivities and the Railroad Problem," Journal of Political Economy, June 1977.
- Business Week, "Deregulation: A Fast Start for the Reagan Strategy," March 9, 1981.
- Casavant, K., "Energy, Transportation and Location of Economic Activity," Washington State University.
- Chow, Marlon, "Studies of Intrastate Trucking Regulation - A Critique," Transportation Journal, Summer 1980.
- Cook, James, "Nothing Left to Lose?" Forbes, May 28, 1979.
- Data Resources Inc., "U.S. Long-Term Review," Winter 1981-82.
- Data Resources Inc., "Review of the U.S. Economy," June 1982.
- Dobbs, Allan F., "Airlines," Forbes, January 4, 1982.
- Due, John, "State Rail Plans and Programs," Quarterly Review of Economics and Business, Summer 1979.
- Dun's Review, "The Deregulation Battle," March 1978.
- Farris, Martin, "Meaning and Goals of Deregulation," Transportation Journal, Winter 1982.
- Forbes, "Getting Used to Deregulation," January 7, 1980.
- Forbes, "A Railroad for the Long Haul," April 27, 1980.
- Gaddy, Bob, "New Horizons in Trucking," Nation's Business, October 1980.
- Harper, Donald V., "The Federal Motor Carrier Act of 1980: Review and Analysis," Transportation Journal, Winter 1980.
- Hauck, Warren, "Transportation Challenges of the 80s. Energy, Deregulation and Costs," Industrial Management, Nov/Dec 1979.
- Heaver, Trevor, "The Canadian Experience with Limited Regulation of Maximum Railway Rates," Transportation Journal, Fall 1981.

Heaver, Trevor and Nelson, James, "The Role of Railway Regulation Policy in Canada," Journal of Transportation Economics and Policy, January 1980.

Heaver, Trevor and Nelson, James, "The Roles of Competition and Regulation in Transport Markets," The Logistics and Transportation Review, Volume 14, NBR 4.

Hirschey, Mark, "Rail Service Subsidies - A Critical Analysis of the Program," Quarterly Review of Economics and Business, Summer 1979.

Henry, R. L., "Economic Deregulation of U.S. Railroads," National Association of Wheat Growers, April 1979.

Huston, Douglas, "A Note on Railroad Shipper Transactions: Appropriations, Private Contracts and Regulation," Transportation Journal, Winter 1979.

ICC Practitioners Journal, "An Empirical Assessment of Traffic Executives Perceptions Regarding Controversies in Transportation Regulation - A Recent Note," January/February 1981.

Kline, Jeffery, "Highlights of Truck and Rail Regulatory Reform in the 96th Congress," Transportation Research Record 804.

Latimer, R. R., "The Challenge of Rate Freedom," Railway Age, May 28, 1979.

Lawrence, Martin, "Proceed with Caution - Deregulation Can Have Negative Effects," Price Waterhouse Review, 1979.

Levin, Richard, "Allocation in Surface Freight Transportation: Does Rate Regulation Matter?" The Bell Journal of Economics, Spring 1978.

Lieb, Robert C., "Transportation in the Domestic System," Weston Publishing, 1978.

Malone, Frank, "Marketing: Do Railroads Really Know What It's All About?" Railway Age, February 23, 1981.

Miller III, James C., "First Report Card on Deregulation," The Wall Street Journal, March 8, 1982.

Modern Railroads, "News Highlights," March 1982.

Transportation Research Record 758, "Motor Carrier Operations," 1980.

Nelson, James, "The Economic Effects of Transportation Deregulation in Australia," Transportation Journal, Winter 1976.

Office of the Federal Register, "The United States Government Manual 1981/82."

Plowman, Grosvenor, "Whipsaw," Distribution Worldwide, January 1978.

Pustay, Michael, "Industry Inefficiency Under Regulatory Surveillance," Journal of Industrial Economics, September 1978.

Rakowski, James, "Motor Carrier Size and Profitability," Transportation Journal, Summer 1977.

Scott, W. G., "A Railroad Perspective on Regulation and Subsidies," Logistics and Transportation Review, Volume 14, NBR 4.

Shedd, Tom, "Advancing the Transition," Modern Railroads Rail Transit, December 1980.

Shedd, Tom, "Learning to Walk Again," Modern Railroads Rail Transit, December 1981.

Spencer, Harold, "Deregulation of Railroads: The Road to Nationalization," Traffic World, February 8, 1982.

Strickland, James, "Will You Be Here in 1989?" Distribution, November 1979.

Taff, Charles, "A Study of Truck Brokers of Agricultural Commodities Exempt from Economic Regulation," Transportation Journal, Spring 1979.

Traffic World, "Air Industry News," February 22, 1982.

Traffic World, "Intercity Tonnage," February 1, 1982.

U.S. Department of Transportation, "Railroad Freight Traffic Flows 1990," December 1980.

Wall Street Journal, "Trucking, Layoffs May Be Due More To The Recession Than Deregulation," July 6, 1982.

Washington State Office of Financial Management, "Economic and Revenue Forecast," June 1982.

Welty, Gus, "TOFC/COFC: A Growth Market Again," Railway Age, November 30, 1981.

Williams, Ernest, "U.S. and Common Market Transport, a Comparative Study," Columbia Journal of World Business, Spring 1976.

Zayer, Edison R., "Motor Carrier Regulation and Small Truckers," Business Economics, January 1981.

APPENDIX A

METHODS

To answer the question how has deregulation in the rail and motor carrier industries impacted the Washington state transportation system, shippers were asked to answer questions concerning their shipping patterns. This project was divided into two phases. Both phases utilized a survey and personal interviews to ascertain what changes have occurred. This appendix describes the specific methodology utilized in conducting Phase II research (Final Report). In particular, selection of subjects, development and administration of the survey, and the individual tasks will be covered under the subheadings subjects, apparatus, and procedures. Before describing Phase II, it is appropriate to summarize what was learned from Phase I research (The reader is referred to Impacts of Truck and Railroad Deregulation on Transportation and Economic Activity in the State of Washington, Phase I.):

1. The population of shippers in Washington State was estimated at 4,263. This figure was obtained by combining the major shippers listed in 1980/81 Washington Manufacturers Register with 403 shippers taken from a list provided by Fred Tolan. Fred Tolan is a major shipping consultant in Washington State. His list was utilized in order to include in the population estimate, shippers of agricultural goods.
2. During Phase I, the research team gained valuable information by conducting personal interviews with shippers. It was decided to continue these interviews during Phase II.
3. A four page survey with 19 multi part questions was sent to shippers in Washington State. The response to the survey was very poor. The length of the first survey may have accounted for why so few shippers answered it. This point was suggested by the shippers themselves. It was decided, therefore, to develop a shorter survey for Phase II in order to achieve a better response.

4. The results from the first survey indicated that three primary choices for freight transportation within the Pacific Northwest are: common carrier, private truck, and railroad.

5. Phase I research indicated the following five areas had been or were most likely to be impacted by deregulation.
 - a. The quality of truck and rail service;
 - b. The frequency of truck and rail service;
 - c. Motor and rail carriers acceptance of damage liability;
 - d. The annual volume of freight shipped and received;
 - e. The distribution of freight among the three modes. It was found common carriers and private trucks were beginning to carry a greater percentage of the shippers' total freight.

Definition of Variables

The findings from Phase I assist in determining which variables should be examined when measuring the changes which have occurred as a result of deregulation. Based on Phase I research these variables were chosen: the frequency of motor carrier and rail service; the quality of both services; the ease in determining motor carrier and railroad freight rates; the rate charged to transport goods; the time it takes to transport goods; the distribution of freight among transportation modes and the number of carriers shippers used to transport their freight.

The independent variable is defined as the deregulation of shipping laws and the variables listed above function as the dependent variables. Using the independent variable and dependent variables, the following hypotheses are presented as operational definitions for the statement, "The impacts occurring to Washington State's transportation system as a result of deregulating motor carrier and rail shipping laws."

1. With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in: the

frequency of motor carrier and rail service, the quality of both services, and the ease in determining motor carrier and railroad freight rates.

2. With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in the rate charged by motor and rail carriers to transport their freight.
3. With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in the time it takes to transport goods to and from their common origins.
4. With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in how shippers distribute their freight among common carriers, private trucks, or railroads.
5. With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in the number of carriers they use to transport their freight.

In testing these five hypotheses, shippers were asked to rate prevailing conditions, such as quality of service, before and after deregulation.

Subjects

The 1980/81 Washington Manufacturers Register and Fred Tolan's client list were reviewed to estimate the population of shippers in Washington. The population was statistically estimated to be 4,263 shippers. The methodology used in Phase I, to estimate the population, was repeated in Phase II. A statistical formula was used to determine that given a population 4263, a sample of 353 subjects would be needed. This sample size establishes the level of precision at .05. Having established the required sample size, 355 major shipping firms were randomly chosen. These were located throughout the state of Washington. In selecting the firms, these criteria were used:

1. Only firms with six or more employees were sent surveys. A decision was made to eliminate firms with five or fewer employees. These firms usually do not transport enough goods to qualify as "major shippers."
2. Firms were contacted on a statewide basis.
3. Both industrial and agricultural businesses were contacted.
4. Small and large businesses with shipping volumes ranging from 100 tons to over 50,000 tons annually were contacted.

All of the 355 firms selected were assigned to the test group. Since this research was not of an experimental nature, a control group was not established.

Of the 355 firms sent surveys, only 102 responded. With 102 firms responding, the precision level was determined to equal .10. It is customary in determining the validity of a sample to interview some of those firms that did not respond to the survey. This is done to ensure that the survey was not written in such a way as to offend and hence exclude the answers of a particular group, thus biasing the field data. For this study those firms which did not answer the survey were not recontacted. It was felt to do so would create a public relations problem for the Department. If they did not wish to answer the questions in the first place, no attempt was made to force them to do so. Some undetermined biases may be reflected in this project's findings. It should be noted, however, that 102 responses from 355 surveys mailed out equals a 28.73 percent response, which is traditionally considered an adequate response to a mail survey. Thus, not utilizing at least 353 completed surveys to draw statistical inferences from is probably due as much to not "over sampling" the population, as to a built-in bias in the survey, that arbitrarily influenced a particular group of shippers not to respond to the survey. "Over sampling" is a technique used, where at least two-thirds more surveys are sent out than would be required to form a statistically valid sample. This helps ensure that the number of subjects responding equals a statistically valid sample.

Of the 102 firms responding to the survey, 73 firms or 72.54 percent reported they were located in western Washington, while 26 or 25.49 percent reported being located in eastern Washington.

In summary, a sample of 355 firms, representing 80 different businesses, was randomly chosen from a statewide population of 4,259 firms. Of the 355 firms, 102 firms responded to the survey, which yields a precision level equal to .10.

Apparatus

A survey of 10 questions was developed. The respondent was asked to rate shipping conditions before and after deregulation. The survey asked questions on the eight topics addressed in the hypotheses. Questions on the volume of freight each firm ships and receives were also asked. No "trick" questions, checking on the consistency of the shippers answers, were built into the survey. No attempt was made to arrange the questions in such a way as to guide the reader's train of thought. With only 10 questions, asking for factual, non-threatening information, it was judged unnecessary to check the answers for internal consistency.

In developing the survey these steps were followed:

1. The findings and conclusions of Phase I were reviewed to determine how many and what type of questions should be asked on a second survey.
2. A survey was developed.
3. The survey was pretested on the Washington State Department of Transportation's planning staff for content, readability, flow, and answerability.
4. Recommended changes were incorporated into the survey and a cover letter was written.
5. All of the surveys were mailed out to shippers on the same day.

Throughout the second phase of the project, the researcher went out and personally interviewed several of the shippers who responded to the second survey. The same set of questions used to conduct personal interviews during Phase I were also used

during Phase II. The interview questions correspond to the questions on the second survey. A copy of the first and second surveys can be found in Appendix B, and a listing of persons interviewed can be found in Appendix C.

Procedures

Eleven different tasks were performed in conducting Phase II research. The following is a description of each of those tasks. Following the list of tasks is a discussion of the control techniques used in eliminating or isolating the intervening variables. An intervening variable is an element from the outside environment which impacts the cause and effect relationship established between the independent and dependent variables. When intervening variables are present it is difficult to determine if the changes occurring in the dependent variables are due to the manipulation of the independent variable or simply an intervening variable acting upon the dependent variables. Any environmental factor other than deregulation which impacted motor carrier or rail shipping, would in the case of this particular study, be considered an intervening variable.

In this subsection some of the procedures mentioned in the Subjects and Apparatus subsections are briefly repeated to give the reader some understanding of the chronological order of tasks. The individual research tasks are:

1. Phase I research was reviewed. The findings from Phase I were used to determine what type and how many questions should be asked on the second survey.
2. Using the finding from Phase I, a second survey was developed.
3. The survey was pretested on the Planning staff of Washington's Department of Transportation.
4. The 1980/81 Washington Manufacturers Register and a list of shippers provided by Fred Tolan were used to estimate the number of shippers located in Washington.

5. A sample of 355 shippers were randomly chosen. The shippers were located throughout the state.
6. Personal interviews were conducted with 23 of the shippers using the same questions utilized in Phase I. Fifty different shippers were interviewed during Phases I and II. Prominence and accessibility were the criteria used for interview selection.
7. The survey was mailed out to 355 shippers, 102 shippers responded.
8. Survey results were edited, checked for reliability and validity, collated, and copied onto computer sheets.
9. Chi square was the statistical formula used to interpret the raw data. This formula was chosen because the independent variable "regulation vs. deregulation" is a nominal measurement. Had the independent variable been an interval measurement, like the dependent variables, a more sophisticated statistical formula would have been used.

Additional measurements were taken including the: degrees of freedom, level of significance, confidence level and correlation coefficient.

10. The SPSS Batch System for OS/360 Version M program was used to process the data.
11. The statistical results were reviewed, conclusions were drawn and a draft of the final report was written.

Control techniques were used to isolate the intervening variables associated with the economy, state shipping laws, selection of subjects and the reliability of the survey data. The economy itself acted as an intervening variable. It was not possible to determine if the decrease in the amount of freight shipped by truckers and railroads was due to deregulation or simply that there was less freight available to ship. The General Accounting Office of the U.S. Government takes the position¹ that the decrease in shipping was due to poor economic conditions

causing a decrease in the total amount of freight available for shipping. To help diminish and/or eliminate the economy's influence on the dependent variables, Phase II was postponed for six months, in hopes that economic conditions would improve. The recession continued and Phase II was begun, since it could not be determined when industrial production would again increase. In Chapter 3 the economy's impact on the statistical results is discussed.

While interstate shipping laws were deregulated, intrastate shipping laws were not. This may have acted as an intervening variable since it was not possible to determine to what extent freight movement was influenced by state rather than federal shipping regulations. Of the fifty subjects personally interviewed, approximately one-third of them expressed concern that while interstate shipping had been deregulated the same was not true for intrastate.

To ensure that the statistical results were not due to chance, the sample was randomly chosen. The respondents to the survey represented eighty different businesses located throughout the state. This broad based sample helped to eliminate biases resulting from either geographic location or economic conditions.

To ensure that if given the second survey again, the respondents would give the same answers, 23 of the same respondents were asked similar questions during personal interviews. In reviewing the answers of the 23 respondents interviewed, there was a positive correlation between the answers they gave during the personal interviews and those reported on the surveys. These same 23 people were interviewed during Phases I and II; each time their answers were consistent. Two different researchers conducted Phase I and Phase II interviews, and since the respondents answers were consistent, no contamination appears to have occurred due to interviewer biases or improper interview techniques.

Presented in Appendix D are the statistical results yielded from implementing the above mentioned procedures.

FOOTNOTES

1. Trucking Layoffs may be Due More to the Recession than Deregulation, The Wall Street Journal, July 6, 1982, Pg. 1.

APPENDIX B

PHASE I AND II
SURVEY QUESTIONNAIRES



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION

Highway Administration Building, Olympia, Washington 98504 206/753-6005

December 22, 1980

Dear TRANSPORTATION SYSTEM USER:

We want to know how you feel about the transportation system in the State of Washington.

The Washington State Department of Transportation is striving to assure the operation of a comprehensive and balanced multimodal transportation system. We would appreciate your assistance in this vital area.

A new law (Motor Carrier Act of 1980) became effective on July 1, 1980 drastically changing the manner of federal regulation of motor carriers. On October 1, companion legislation for railroads (Staggers Rail Act of 1980) became law. We need freight data to determine impacts of these new laws on transportation operations and economic activity in the State of Washington.

Attached is a survey form seeking information that can only come from users of the system which we ask you to complete and return. This information is for planning purposes and will be kept confidential. For assistance, call Don Malloch of this Department at (206) 754-2402.

Also attached for your information is a digest of the State Transportation Plan.

Sincerely,

W. A. BULLEY
Secretary of Transportation

WAB
Attachments

TRUCKING AND RAILROAD DEREGULATION SURVEY

Company Name: _____

Location: _____

1. What (in a general way) is the way you *primarily* ship or receive in the State of Washington area? Interstate as well as intrastate.

| % | WT. | WITHIN PACIFIC NORTHWEST |
|-------|-------|--|
| _____ | _____ | Private truck (yours or customers pick up) |
| _____ | _____ | Railroad |
| _____ | _____ | Common carrier truck |
| _____ | _____ | Exempt carrier truck |
| _____ | _____ | Contract truckers |
| _____ | _____ | Columbia/Snake River |
| _____ | _____ | Maritime export |

| % | WT. | BEYOND PACIFIC NORTHWEST |
|-------|-------|--|
| _____ | _____ | Private truck (yours or customers pick up) |
| _____ | _____ | Railroad |
| _____ | _____ | Common carrier truck |
| _____ | _____ | Exempt carrier truck |
| _____ | _____ | Contract truckers |
| _____ | _____ | Columbia River |
| _____ | _____ | Maritime export |

2. What are the prime areas to which you ship in the State of Washington?
(If you have multiple origins please use representative points to remain in scope of survey.)

From: _____

To: _____ West of Cascades
 To: _____ Spokane Area
 To: _____ Central Washington
 To: _____ Portland-Southwest Washington

From: _____

To: _____ West of Cascades
 To: _____ Spokane Area
 To: _____ Central Washington
 To: _____ Portland-Southwest Washington

3. Indicate primary commodities and in what volume?

| Transportation Commodity Description | Volume (Tons) | |
|--------------------------------------|---------------|------------|
| | Intrastate | Interstate |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

4. In your view, how will rail and truck interstate regulatory change effect your area? Please Check:

- Cost Increase Cost Decrease
 Service Up Service Down
 Mode Changes
Please describe: From: _____ To: _____
 Location Changes: _____ You _____ Competition.
Please explain: _____

5. Is there any specific Washington State transportation law, rule or regulation that you feel is hurting your business?

- Yes No

Please describe: _____

6. What business in the State of Washington has been lost to other states because of truck and rail regulation changes (or may be lost in the future?)

Please describe: _____

7. What changes in *private* trucking have you made since July 1, 1980 when the Federal truck deregulation bill took affect?

Please describe: _____

What changes are you contemplating now?

Please describe: _____

8. Have any trucking operators with whom you do business, terminated operation or gone out of business since January 1, 1980?

- Yes No

Who: _____

9. Have you (shipper) supported any new freight trucking permit or certificate since January 1, 1980?

- Yes No

Please describe: _____

10. Do you know of any truck carrier *you need* who has sought permanent state hauling authority and has been denied the right to serve you?

- Yes No

Please describe: _____

11. Do you have trouble getting adequate service (not rates) from truck lines serving your point(s) on both intra and interstate traffic?

Yes No

Please comment: _____

12. Truckers today propose rates for advanced approval of the State. Should they have more freight rate making freedom than they now have under state regulations? (Regardless of that impact on you.)

Yes No

Please comments: _____

13. Are Interstate Agricultural Marketing Associations trucking any substantial part of your business in interstate commerce?

Yes No

Please describe: _____

14. Today, exempt carriers have no liability requirements and regulated carriers \$50,000. Do you believe the truck carrier (large and small regulated or exempt) serving you can obtain and maintain \$750,000 in public liability insurance required under the Motor Carrier Act of 1980 (it is \$5 million on hazardous materials carriers)?

Yes No

Please comment on what you feel might happen: _____

15. Has the Burlington Northern and Union Pacific been as responsive to your needs (in your opinion since the Milwaukee went out of business this year?

Yes No

Please Comment: _____

16. Listed below are several rail lines which have been abandoned in the State of Washington within the last two years. Please circle area(s) affecting you and explain below. What has been the effect of railroad abandonment (and/or railroad substitution) on your operation in 1980 versus 1979 - (primarily to areas impacted by Milwaukee Road)? Please answer this whether you are on abandoned lines or ship to areas on abandoned lines.

- a. Bellingham to Strandell (abandoned on Milwaukee).
- b. Cedar Falls/Snoqualmie (lost Milwaukee participation).
- c. Chehalis to Aberdeen/South Bend (now served only by Burlington Northern and Union Pacific).
- d. Chehalis to Longview/Vancouver (now served by Burlington Northern and Union Pacific).
- K. Newport, Washington where only Burlington Northern service remains.
- l. Othello to Royal City/Beverly (abandoned).
- m. Palouse area where both Milwaukee Burlington Northern have replaced the Burlington Northern abandoned lines.
- n. Plummer, Idaho to Othello (abandoned by Milwaukee)

(Continued on next page)

- e. Columbia River (Beverly to Black River Junction via Kittitas).
- f. Connell, Washington where Burlington Northern only (use to also have (Union Pacific).
- g. Metaline Falls area (now served by Pend Oreille Valley R.R.
- h. Morton/Mineral area to Tacoma (abandoned but bought by Weyerhaeuser).
- i. Moses Lake to Marcellus (abandoned by Milwaukee).
- j. Moses Lake to Othello (now served by Burlington Northern).
- o. Port Townsend - Port Angeles (Now served by Seattle & NorthCoast Limited).
- p. Seattle to Bellingham (served by Burlington Northern but abandoned by Milwaukee).
- q. Seattle - Tacoma area (where Burlington Northern and Union Pacific have taken over Milwaukee).
- r. Spokane area where only Burlington Northern and Union Pacific remain.
- s. Strandell to Sumas to Lyndon (served by Burlington North.).

Please explain: _____

17. Beside the approximate 12 percent inflation level, what changes in railroad rates would you attribute to your commodities to railroad deregulation and/or railroad rate making freedom??

| | INCREASE | DECREASE | NO CHANGE |
|-----------------------------|----------|----------|-----------|
| Grain Shippers | _____ | _____ | _____ |
| Wood Chip Shippers | _____ | _____ | _____ |
| Flour Shippers | _____ | _____ | _____ |
| Liquified Gas-Propane, etc. | _____ | _____ | _____ |
| Lumber Shippers | _____ | _____ | _____ |
| Log Shippers | _____ | _____ | _____ |
| Feed Shippers | _____ | _____ | _____ |
| Chlorine and Chemical | _____ | _____ | _____ |
| Fertilizer Shippers | _____ | _____ | _____ |
| Ore Shippers | _____ | _____ | _____ |
| Limestone and Rock | _____ | _____ | _____ |
| Sand and Gravel | _____ | _____ | _____ |
| Other: _____ | _____ | _____ | _____ |

Please Comments: _____

18. On the basis of changes in 1981, do you believe you will be using more or less of the highway system?

More Less

19. Your general comments on manner changed freight traffic regulations will impact on transportation operations and economic activity in the State of Washington:

JOHN SPELLMAN
Governor



DUANE BERENTSON
Secretary

STATE OF WASHINGTON

DEPARTMENT OF TRANSPORTATION

Highway Administration Building • Olympia, Washington 98504 • (206) 753-6005

February 24, 1982

Dear Transportation System User:

As you know, the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980 have brought substantial changes to the transportation services industry. This change has the potential to impact the state's transportation system.

This Department is attempting to monitor the effects of the two acts within the State. By doing this, we feel that we can better accommodate any changes that may be forthcoming. For example--if deregulation means a growing dependence on trucking in lieu of rail in certain regions, we would certainly want to incorporate this information into our planning process.

If you could take a moment to answer the 10 questions on the enclosed questionnaire, it would be very helpful. Individual responses will be kept confidential. A stamped return envelope is provided for your use.

Should you have any questions in this matter, call John Doyle of this Department at (206) 753-1772.

Sincerely,

A handwritten signature in cursive script that reads "Robert S. Nielsen".

ROBERT S. NIELSEN
Assistant Secretary
Public Transportation and Planning

RSN:sab
DEM

Enclosures

**WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
FREIGHT SURVEY**

The Washington State Department of Transportation is monitoring the impacts of the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980. By doing this, we feel we can better accommodate the transportation users of the state. If you could take a moment to answer the following 10 questions, it will aid our effort.

A stamped return envelope is provided for your use. Be assured that individual responses will be kept confidential. Should you have any questions call John Doyle of this Department at (206)753-1772.

| | |
|----------------|---------------------|
| FIRM IDENTITY: | REPORTING LOCATION: |
|----------------|---------------------|

PLEASE GIVE YOUR OPINION OF CONDITIONS AT THE PRESENT TIME COMPARED TO THAT PRIOR TO OCTOBER 1980

1. General quality of freight service:

| | RAIL | TRUCK | LESS THAN TRUCK LOAD |
|--------|--------------------------|--------------------------|--------------------------|
| Better | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Same | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Comparative ease of freight rate determination:

| | RAIL | MOTOR |
|--------|--------------------------|--------------------------|
| Easier | <input type="checkbox"/> | <input type="checkbox"/> |
| Harder | <input type="checkbox"/> | <input type="checkbox"/> |
| Same | <input type="checkbox"/> | <input type="checkbox"/> |

3. Frequency of service: (answer only applicable columns)

| | TIMES PER DAY | | TIMES PER WEEK | | TIMES PER MONTH | |
|-------|------------------|-------|-------------------|-------|--------------------|-------|
| | Before | After | Before | After | Before | After |
| Truck | | | | | | |
| Rail | | | | | | |

4. Carrier acceptance of loss or damage liability:

| | BETTER | WORSE | SAME |
|-------|--------------------------|--------------------------|--------------------------|
| Motor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rail | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. Number of motor carriers transporting your freight:

Before _____ After _____

6. Transit time to most common destinations:

| | BETTER | WORSE | SAME |
|-------|--------------------------|--------------------------|--------------------------|
| Motor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rail | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Transit time of freight received from common origins:

| | BETTER | WORSE | SAME |
|-------|--------------------------|--------------------------|--------------------------|
| Motor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rail | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. Please indicate your volume of annual freight tonnage:

| TONS | VOLUME SHIPPED | VOLUME RECEIVED |
|---------------------|----------------|-----------------|
| Less than 1,000 | | |
| 1,001 - 10,000 | | |
| 10,000 - 20,000 | | |
| 20,001 - 50,000 | | |
| Greater than 50,000 | | |

9. Percent of your freight by transport mode:

| MODE | BEFORE | AFTER |
|------------------------|--------|-------|
| Common carrier truck | | |
| Contract carrier truck | | |
| Private carrier truck | | |
| Exempt carrier truck | | |
| Carload Rail | | |
| TOFC/COFC Rail | | |
| Contract Rail | | |
| | 100% | 100% |

10. Approximate freight rate per hundred weight on your primary traffic movements:

| | MODE | BEFORE | AFTER |
|-------------------|------|--------|-------|
| Commodity A _____ | | | |
| Commodity B _____ | | | |
| Commodity C _____ | | | |

APPENDIX C

LISTING OF PERSONS INTERVIEWED

APPENDIX C

Tonny Allegria
Snowkist Growers

Tom Anderson
International Paper Co.

Steve Van Asselt
Weyerhaeuser Company

James W. Austin
Reynolds Metals Company

Lee Benvenick
Kaiser Steel

A. P. Berarz
Kaiser Aluminum

Cecil Brennan
Grain Transportation Consultants of the Pacific Northwest

R. L. Burns
St. Regis

Ken Cassavant
Washington State University

Bruce Dahlquist
Tollycraft Corporation

Geran Dalenius
Intalco Aluminum Corporation

Red Davis
Safeway

Pete Eberle
Pacific Inland Traffic Bureau

Ernie Franklin
Puget Sound Traffic Association

Perry Frazier
N. W. Grain and Feed Association

Randy Garberg
Shuksan Frozen Foods, Inc.

Mike Geherke
Port of Tacoma

Otto Geisert
Balcom & Moe, Inc.

Glen Graham
Pacific Car and Foundry

Ross Gaussoin
Silver Eagle Trucking

Pat Halsted
Washington Railroad Association

Bob Hannus
Port of Seattle

Jim Higgins
Kenworth Truck Company

Jerry White
Inland Empire Freight Traffic

Lewis Holcomb
Washington Public Ports Association

Charles Howard
Howard Manufacturing Corporation

George Katsafouros
Weyerhaeuser Company

John Knapp
Hooker Chemical and Plastics Corporation

Mitch Mitchener
Georgia Pacific Corporation

Matt Moskal
Green River Community College

Don Osborn
Fisher Mills

Burt Osterman
Pennwalt Corporation

Fred Pafquale
ITT Rayonier

Mike Payne
Continental Grain Company

Jack Price
Port of Pasco

Jerry Rawles
St. Regis

Glenn Rodin
The Boeing Company

Robert Robbins
General Service Administration

Marty Sangster
Washington Trucking Association

Don Savage
American Sign and Indicator

John Seaton
Military Traffic Management Command

Dale Seely
Acme Intercity Freight Lines

Olsen Sebert
Columbia Lighting

Fred Swanson
Issacson Steel

Fred Tolan
Freight Traffic Consultant

Roger von Gohren
Association of Washington Business

James Walker
Puget Sound Freight Lines

Jerry White
J. White and Associates

Fred Zylstra
Gifford-Hill and Company

APPENDIX D

RESULTS

Contained in this appendix is the statistical analysis of the results from the Phase II survey. Most of the statistics presented are descriptive, with the answers expressed in terms of percentages. When relevant, variables are compared using cross tabulations. The chi squared formula was used to interpret the data. The level of significance was established at .05. The confidence level was established at .90 with the standard error of estimate being set at plus-or-minus .05.

In analyzing shipping habits, demographic data describing the annual volume of freight shipped and received is presented first. Following this description is a discussion of each of the five hypotheses.

The largest percentage of shippers, 36.27 percent (37 shippers), reported they receive 50,000 tons or more of freight per year. Of those 37 shippers, 33, or 89.18 percent, are located in western Washington. The remaining 4 shippers, 10.81 percent, are located in eastern Washington. Looking at the lower end of the scale, 13.72 percent (14 shippers) of the shippers reported they receive less than 1,000 tons of freight per year. Of those 14 shippers, 9, or 64.28 percent, were located in western Washington and 5, or 35.71 percent, were located in eastern Washington. Looking at the midpoint of the scale, 8 shippers, 7.96 percent, reported they receive between 10,001 and 20,000 tons of freight per year. Four of those 8 shippers are located in western Washington, with the other 4, or 50 percent, being located in eastern Washington. In looking at the graph on page D-3, it is noted that a near equal number of eastern Washington shippers fell into each of the five freight volume categories. The amount of freight received by eastern Washington shippers is fairly evenly distributed among the five categories.

Washington State shippers reported they ship between 1,000 and 50,000 tons of freight per year. The largest percentage of shippers (53 shippers), 51.96, reported they ship 50,000 or more tons of freight per year. Of those 53 shippers, 42 or 79.25 percent, are located in western Washington and 11 shippers, or 20.75 percent, are located in eastern Washington. At the low end of the scale, five, or

4.96 percent of the shippers reported they ship less than 1,000 tons of freight per year of those 5 shippers, 3 are located in western Washington (60.0 percent) and 2 are located (40.0 percent) in eastern Washington. At the midpoint, 8 shippers, 7.96 percent, reported they ship between 10,001 and 20,000 tons of freight per year. Five of those 8 shippers, 62.50 percent, are located in western Washington and 3 or 37.50 percent are located in eastern Washington. In looking at the graph on page D-3, it is interesting to note the patterns reflecting the volume of freight shipped and received are the same.

Stated in the following paragraphs are each of the five hypotheses. Below each hypothesis is a statistical analysis of the data available on each of the dependent variables contained therein.

Hypothesis I

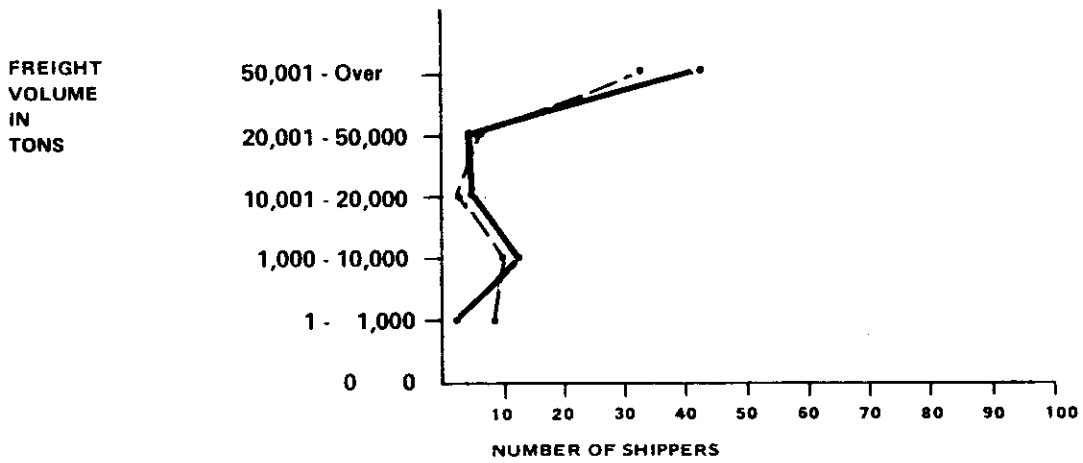
With the change in interstate motor carrier and rail shipping regulations, shippers will report, at a statistically significant level, a change in the frequency of motor carrier and rail service, the quality of both services, and the ease in determining motor carrier and railroad freight rates.

Shippers reported at a statistically significant level that they perceived a change in the frequency of both motor carrier and rail service after deregulation. No statistically significant answer was given to whether the quality of service had changed or remained the same. The shippers reported at a statistically significant level that the ease in determining rail rates had remained the same. No statistically significant answers were given for the ease in determining motor carrier rates.

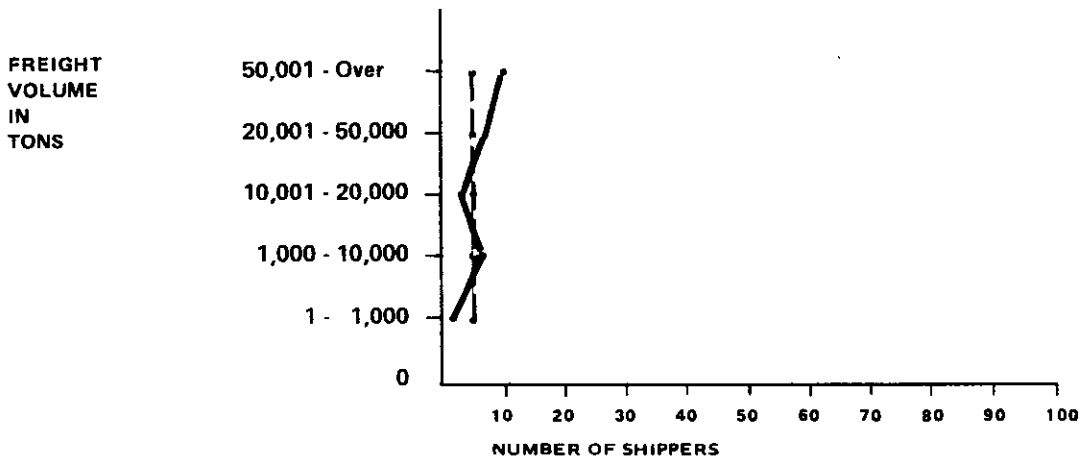
In answering the question on frequency of motor carrier and rail service, shippers as a group, reported they utilized motor carrier service 6,144 times per month prior to deregulation and 7,255 times per month after deregulation. The range for motor carrier service prior to deregulation varied from one carrier using service once a month to two shippers utilizing service 600 times per month. The average amount of motor carrier service prior to deregulation equaled 60 trips, the mode equaled 6 shippers utilizing service 20 times a month and 6 shippers utilizing service 80 times per month. After deregulation the frequency of reported motor

THE AMOUNT OF FREIGHT SHIPPED AND RECEIVED

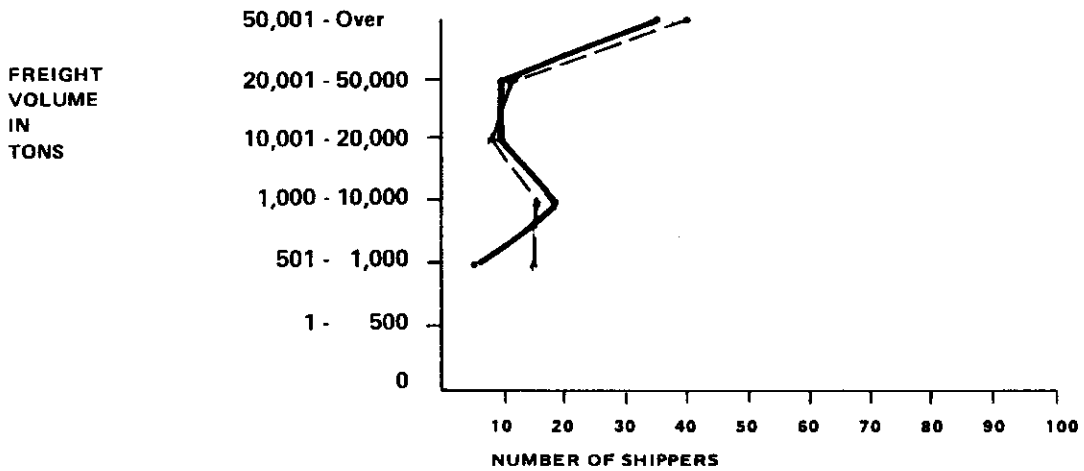
WESTERN WASHINGTON SHIPPERS



EASTERN WASHINGTON SHIPPERS



TOTAL WASHINGTON SHIPPERS



RECEIVED = - - - -
 SHIPPED = —————

carrier service ranged from one shipper utilizing service 4 times per month to one shipper utilizing it over 999 times per month. The average amount of service after deregulation equaled 71 trips per month, the mode equaled to 6 shippers utilizing service 20 times per month.

The statistics on rail service indicate that shippers as a group, reported utilizing rail service 1,073 times per month prior to deregulation and 939 times per month after deregulation. The frequency of rail service prior to deregulation ranged from four shippers utilizing service once per month to one shipper utilizing rail service 200 times per month. The average amount of service equaled 11 trips per month with the mode equaling 15 shippers utilizing rail service 20 times per month. After deregulation the frequency of rail service utilized ranged from five shippers utilizing service once per month to one shipper utilizing the service 90 times per month. The average amount of service equaled 9 trips per month with the mode equaling 18 shippers utilizing service 20 times per month.

In sum, motor carrier service increased from 6,144 times per month prior to deregulation to 7,255 times per month after deregulation. The average increased from 60 trips per month prior to deregulation and 71 trips after deregulation. Rail service on the other hand, decreased from 1,073 times per month prior to deregulation to 939 times per month after deregulation. The average number of trips decreased from 11 trips per month to 9 trips per month.

In reviewing the data on quality of service, 39 shippers (38.24 percent) located in western Washington and 10 shippers (9.80 percent) located in eastern Washington reported the quality of motor carrier service remained the same. Only one shipper, located in eastern Washington, reported motor carrier service to be poorer after deregulation. A total of 44 shippers, or 43 percent, reported the quality of motor carrier service had improved after deregulation. Shippers shipping less than a full truck load, 52, or 50.98 percent, reported the quality of service remained the same while 16, or 15.68 percent, reported it had improved. Thirteen, or 12.75 percent, of the shippers reported that after deregulation, the quality of truck service deteriorated.

A large percentage of shippers, 40.20 percent (41 shippers), reported rail service quality remained the same. While 18 shippers or 17.65 percent, reported rail

service improved after deregulation. Seventeen shippers or 16.66 percent reported the quality of service decreased. The only noticeable numerical difference between eastern and western Washington shippers' responses is that 16 western Washington shippers reported after deregulation a decrease in the quality of rail service, while only one eastern Washington shipper reported a decrease.

Of the shippers responding, it was not possible to measure at a statistically significant level how difficult it was after deregulation to determine motor carrier shipping rates. Shippers reported at a statistically significant level that after deregulation the ease in determining rail shipping rates had remained the same. Forty of the 81 shippers responding (49.38 percent) reported the ease in determining rail shipping rates was the same. Ten or 12.35 percent reported it was easier to determine rail shipping rates while 28 or 34.57 percent reported it was harder.

In summary, the shippers reported at a statistically significant level an increase in the frequency of motor carrier service and a decrease in the frequency of rail service after deregulation. No statistically significant change was found in the quality of service provided by either motor or by rail carriers. Shippers reported at a statistically significant level that after deregulation the ease in determining rail shipping rates had remained about the same. No statistically significant answer was found for the ease in determining motor carrier shipping rates.

Hypothesis II

With a change in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level a change in the willingness of motor and rail carriers to accept liability for goods which are lost or damaged in transit.

The majority of shippers reported at a .05 level of significance that the willingness of motor carriers to accept liability for goods lost or damaged in transit had remained about the same. Sixty-seven shippers or 65.69 percent report no change after deregulation in the willingness of motor carriers to accept liability for lost or damaged goods. Fourteen shippers or 13.73 percent of those responding reported motor carriers were more willing to accept liability and sixteen shippers

(15.69 percent) reported that they were less willing. Five subjects or 4.77 percent did not answer the question.

Fifty-eight shippers (56.86 percent) reported at a significant level that the willingness of rail shippers to accept liability for lost or damaged goods had not changed. Seventeen, or 16.66 percent reported that after deregulation rail carriers were less willing to accept liability while 4 or 3.92 percent reported they were more willing to accept liability for lost or damaged goods.

In sum, deregulation of motor carrier and rail shipping laws appears not to have impacted the willingness of carriers to accept liability for lost or damaged goods. In fact, at a .05 level of significance, shippers report that after deregulation, the willingness of motor and rail carriers to accept liability remained the same.

Hypothesis III

With changes in interstate motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in the time it takes to transport goods to and from common origins.

Shippers reported at a statistically significant level, that the time it took to transport their goods to and from common origins remained the same before and after deregulation. This was true for both motor and rail carriers. Seventy-three shippers (71.57 percent) reported it took motor carriers the same amount of time to transport their goods to a common origin. Twenty-six (25.49 percent) reported it took motor carriers less time after deregulation while 2 (1.96 percent) reported it took more time.

Fifty-one of the 81 respondents answering the question (60 percent of those answering the question) reported the time to transport their goods by rail carrier to a common destination remained the same. Fifteen shippers or 14.71 percent reported it took less time and 18 shippers or 17.65 percent reported it took more time.

Ninety-two of the 102 respondents asked, answered the question, has deregulation impacted the time it takes motor carriers to transport your goods from common

origins? Sixty-five shippers or 63.73 percent reported it took the same time. Twenty, or 19.60 percent responded it took less time while 7 shippers or 6.86 percent reported it took more time.

Seventy-three shippers answered the question on the time it took rail carriers before and after deregulation to transport their goods from common origins. Forty-eight (47.06 percent) reported it took the same time. Five or 4.90 percent reported it took less time and 20 or 19.60 percent said it took more time.

In sum, deregulation did not significantly change the time it took to transport goods to and from common origins by either motor or rail carriers. A statistically significant number of the respondents reported it took the same time.

Hypothesis IV

With the changes in motor carrier and rail shipping regulations, shippers will report at a statistically significant level, a change in how they distribute their freight among common carriers, private trucks, or railroads.

To test the above hypothesis, shippers were asked to list before and after deregulation what percentage of their freight each of 7 different modes transported. The seven modes listed were: common carrier truck, contract carrier truck, private carrier truck, exempt carrier truck, carload rail or TOFC-COFC rail. Twelve percent of the shippers responding to the survey did not list how their freight was distributed prior to deregulation. Nine percent did not list how their freight was distributed after deregulation. The number of shippers responding to these questions, was not large enough to allow for subgroup analysis. That is, it was not possible, due to the limited sample size, to analyze, for example, all shippers who reported 40 percent or more of their freight was transported by private carrier truck.

Respondents to this question reported prior to deregulation their freight was distributed among the seven modes in the following manner: common carrier truck 36.97 percent, contract carrier truck 9.31 percent, private carrier truck 14.31 percent, exempt carrier truck 9.49 percent, carload rail, 24.42 percent and TOFC-COFC rail 4.10 percent. Following deregulation those answering the

question reported they distributed their freight among the seven modes as follows: common carrier truck 36.00 percent, contract carrier truck 11.81 percent, private carrier truck 14.79 percent, exempt carrier truck 10.00 percent, carload rail 21.90 percent, and TOFC-COFC rail 4.10 percent.

Table I on the following page directly compares distribution of freight before and after deregulation. In analyzing the data, no statistically significant change occurred in the distribution of freight. The changes which did occur after deregulation were minimal, the largest being a 2.52 percent decrease in carload rail shipping, and the smallest equaling a no change in the distribution of freight assigned to TOFC-COFC carriers. No statistical pattern appeared to be readily apparent. Within both truck and rail categories, increases and decreases of freight occurred.

In summary, no major impacts occurred after deregulation in the distribution of freight among the seven carriers; no statistically significant changes were reported.

Hypothesis V

With changes in interstate motor carrier and rail shipping regulations, a statistically significant number of shippers will report a change after deregulation in the number of motor carriers they utilized to transport their freight.

Shippers estimated the number of motor carriers providing service to them prior to deregulation to be from 2 to 400 carriers. Their estimates of the number of motor carriers providing service to them after deregulation varied from 1 to 500. Using their reported estimates, the "statistical range" was computed to equal 400 prior to deregulation and 500 after deregulation. The mean of the number of carriers shippers utilized prior to deregulation equals 16.60; however, the midpoint or median equals 7. Seventy-five percent of the shippers answering this question estimated they utilized 11 or less shippers prior to deregulation. The mode equaled 11 shippers utilizing 5 motor carriers prior to deregulation. In computing the mean, median, and seventy-fifth centile, N = 75 because 27 of the shippers

TABLE 1

DISTRIBUTION OF FREIGHT AMONG MODES

| | Percentage of Freight Transported Before Deregulation | Percentage of Freight Transported After Deregulation | Absolute Degree of Change |
|------------------------|---|--|------------------------------------|
| Common Carrier Truck | 36.97 | 36.00 | -.97% |
| Contract Carrier Truck | 9.31 | 11.81 | +2.50% |
| Private Carrier Truck | 14.31 | 14.79 | +.48% |
| Exempt Carrier Truck | 9.49 | 10.00 | +.51% |
| Carload Rail | 24.42 | 21.90 | -2.52% |
| TOFC-COFC Rail | 4.10 | 4.10 | 0 |

answering the survey either did not fill this question in or reported they didn't know how many motor carriers they utilized prior to deregulation.

Seventy-six respondents gave an estimate of the number of motor carriers they utilized after deregulation. Their answers ranged from 1 to 500. The "statistical range" was computed as equaling 500. The mean equaled 18-49 and the median 9 motor carriers. Seventy-five percent of those answering the question reported the number of motor carriers they utilized after deregulation to be 15 or less.

In comparing the ranges, means, medians and seventy-fifth centiles of the number of motor carriers shippers estimated they used prior to and after deregulation, two points are notable:

1. The data is positively skewed.
2. Of those shippers perceiving a change in their use of motor carriers, the majority reported they utilized more motor carriers after deregulation.

The data is positively skewed because for both sets of data (before and after deregulation) only one respondent estimated they utilized 400 motor carriers before deregulation and 500 after deregulation. The next closest estimate was 100 motor carriers before deregulation and 120 motor carriers after deregulation. In examining the median and seventy-fifth centile (the 75th centile equals that point at which 75 percent of the answers either equal or fall below) it is clear the majority of shippers reported they utilize 15 or less motor carriers.

It is not enough to determine that of those shippers who reported a change, the majority reported an increase in the number of motor carriers they used. Relevant to that fact is the issue the hypothesis raises "did a significant number of shippers report a change?" The answer is no, 37 shippers reported a change, and this was not a large enough response to be statistically significant at the .05 level. Of the 37 shippers reporting a change, 19 reported an increase in the number of motor carriers they utilized after deregulation and 16 reported a decrease. So while the point raised is true, that a majority of those reporting a change, estimated an increase in the number of motor carriers they used, that majority is very weak. What is just as relevant is that 39 respondents, a majority of those answering the question, reported no change after deregulation in the number of motor carriers they utilized.

In sum, the hypothesis is rejected, a statistically significant number of shippers did not report a change in the number of motor carriers they utilized after deregulation. Nor did a statistically significant number of shippers report the number of motor carriers they utilized had remained the same. Computations of the mean, median, mode, and seventy-fifth centile showed the majority of shippers estimated they utilized 11 motor carriers or less prior to deregulation and 15 motor carriers or less after deregulation.

Finally, of the 76 respondents estimating the number of motor carriers they used before and after deregulation, 19 reported an increase in use, 16 reported a decrease and 39 reported the number of motor carriers they utilize remained the same.

Summary

Statistical analysis of the survey data determined that the largest percentage of the shippers reported they receive (36.27 percent) and ship (51.96 percent) 50,000 tons or more of freight per year. The shipping and receiving of freight by Washington State shippers is positively skewed. Shippers reported at a statistically significant level that they perceived a change in the frequency of both motor carrier and rail service after deregulation. Motor carrier service increased from 6,144 times per month prior to deregulation to 7,255 times per month after deregulation. Rail service decreased, from 1,073 times per month to 939 times per month after deregulation. Thus, shippers reported an 18.08 percent increase in frequency of motor carrier service and a 12.49 percent decrease in the frequency of rail service after deregulation. The shippers reported no statistically significant change in the quality of rail service before or after deregulation. After deregulation shippers reported at a statistically significant level that the ease in determining rail rates had remained about the same. No statistically significant findings were yielded relative to the ease in determining motor carrier rates after deregulation.

Sixty-seven shippers (65.68 percent) a statistically significant number reported the willingness of motor carriers to accept liability for lost or damaged goods had not changed. Fifty-eight or 56.82 percent reported at the .05 level of significance no change in the willingness of rail carriers to accept liability for lost or damaged goods. Shippers reported at a statistically significant level the time it took to transport goods to and from common origins by motor and rail carriers remained the same after deregulation. No statistically significant change occurred in the distribution of freight among common carrier trucks, contract carrier trucks, private carrier trucks, exempt carrier trucks, carload rail or TOFC-COFC rail. When asked to estimate the number of motor carriers they utilized before and after deregulation, the majority of shippers estimated they used 11 or less motor carriers before deregulation and 15 or less after deregulation.

In sum, only one statistically significant change was reported to have occurred after deregulation, an increase in the frequency of motor carrier service and a decrease in railroad service.

