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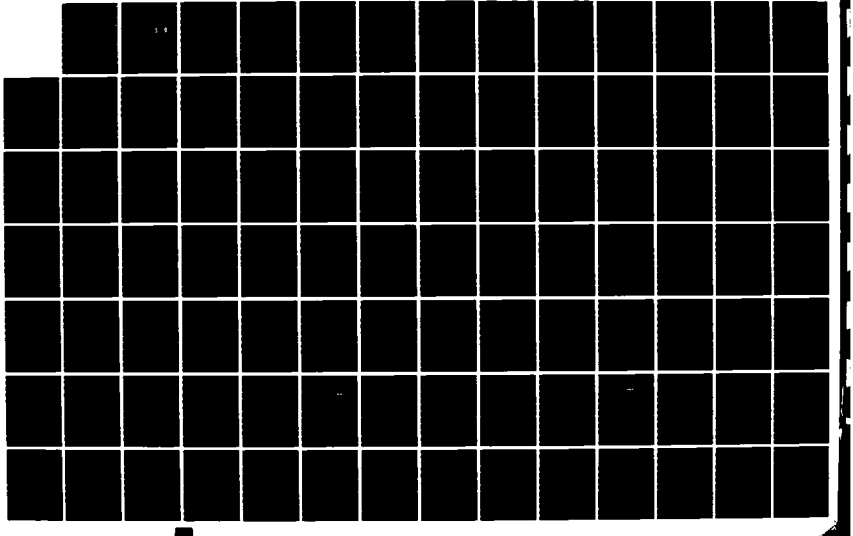

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AN ANALYSIS AND DEVELOPMENT OF A RATIONALE FOR ESTABLISHING A COMMON REGIONAL SYSTEM FOR ISSUING PERMITS FOR OVERSIZE AND OVERWEIGHT TRUCKS ENGAGED IN INTERSTATE TRAVEL IN NEW ENGLAND

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A thesis submitted to the MASSACHUSETTS INSTITUTE OF TECHNOLOGY in partial fulfillment of the requirements for the degrees of CIVIL ENGINEER and MASTER OF SCIENCE IN CIVIL ENGINEERING.

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>This ~~report~~ reviews the oversize and overweight vehicle regulations of the New England states and compares these regulations to previous research in the area of size and weight regulation and its effects on the economics of interstate commerce. An analysis of the oversize and overweight permits issued in 1985 by five of these states was performed to determine if there would be a sufficient reduction in the number of permits that would have to be issued to justify the

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establishment of a system for issuing permits which would be valid in more than one state. Most of the states could realize a 30% reduction in the number of permits issued for interstate travel. KEYWORDS:

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RICHARD FRANCIS DAVIS II

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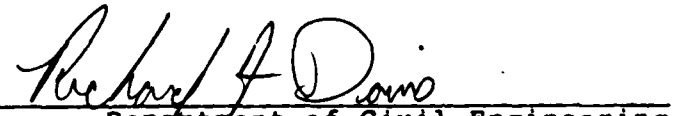
Signature of Author 
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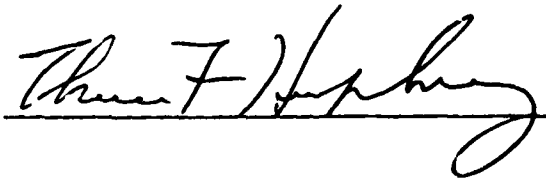
Certified by 
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Thesis Supervisor

Accepted by _____
Professor Ole S. Madsen, Chairman
Departmental Committee on Graduate Students

AN ANALYSIS AND DEVELOPMENT OF A RATIONALE FOR ESTABLISHING A COMMON REGIONAL SYSTEM FOR ISSUING PERMITS FOR OVERSIZE AND OVERWEIGHT TRUCKS ENGAGED IN INTERSTATE TRAVEL IN NEW ENGLAND

by

RICHARD FRANCIS DAVIS II

Submitted to the Department of Civil Engineering
on May 9, 1986 in partial fulfillment of the
requirements for the Degrees of Civil Engineer
and Master of Science in Civil Engineering.

ABSTRACT

One of the major problem areas affecting each of the New England states is the control of oversize and overweight vehicles. Each state has developed its own set of rules and regulations for dealing with these vehicles. However, many of the state regulations are in direct conflict with the regulations of neighboring states.

Earlier research has shown that the lack of uniformity between states' size and weight regulations places a heavy economic burden on shippers and consumers alike. A review and analysis on the oversize and overweight regulations of the New England states was conducted in order to determine the extent of non-uniformity between the these states. The dimensional regulations are in somewhat close agreement. The weight regulations differ substantially among the states. The safety and travel regulations are even less uniform.

A sample of the oversize and overweight permits issued by the five of the New England states in 1985 was analyzed to determine the types and numbers of vehicles affected by the non-uniformity between the states. Over 80,000 of these permits were issued in 1985. By adopting more uniform requirements for vehicle size, weight, and safety regulations, and by agreeing to recognize permits issued in the other states, the states could reduce the number of permits required. A cut of 19 percent, attributable to those vehicles simply transiting a state, would be immediately available. Additional cuts would depend on the degree of reciprocity among the states.

The New England states should adopt a uniform set of vehicle size, weight, and safety regulations for the entire region, and establish a system for issuing a regional oversize or overweight permit. Additional research into the economics of size and weight regulation is also required.

Thesis Supervisor: Thomas F. Humphrey
Title: Research Associate

BIOGRAPHICAL NOTE

Richard F. Davis II graduated from High Point High School in Beltsville, MD in June 1973. He graduated from the United States Military Academy, West Point, NY as a Distinguished Cadet in June 1977 with a Bachelor of Science Degree with a Concentration in Applied Science and Engineering. Upon graduation from West Point he was commissioned as a Second Lieutenant in U.S. Army Corps of Engineers. CPT Davis is a graduate of the U.S. Army Engineer Officer Basic Course, Engineer Officer Advanced Course, and the Combined Arms and Services Staff School. He has completed a number of engineer troop unit assignments, most recently as the Commander of the 13th Engineer Company (Construction Support) at Fort Knox, KY, and as the Senior Engineer Instructor at the U.S. Army Armor School, Fort Knox, KY.

CPT Davis is a registered Professional Engineer in the Commonwealth of Virginia and is a member of Sigma Xi, Phi Kappa Phi, and the Society of American Military Engineers.

Throughout his two years at MIT, CPT Davis concentrated his studies in the field of construction engineering and management. Upon graduation he will be joining the staff of the Dean of the Academic Board at the United States Military Academy where he will be involved in the design, supervision, and management of a large-scale renovation of the academic facilities.

ACKNOWLEDGEMENTS

My Thesis Supervisor, Mr. Thomas Humphrey, has been the driving force behind the formation of the New England Surface Transportation Infrastructure Consortium. As such he has had a great influence on the direction and scope of this study. Without his leadership and guidance there would have been no Consortium and this study would not have been possible.

Individual members of the state Departments of Transportation also played a key role in the development of this study and without their assistance this report would have been much harder to complete. They are: From Maine, Mr. Doug McCobb; Massachusetts, Mr. Joe McCarthy; New Hampshire, Mr. Bob Hogan; Rhode Island, Mr. John DiTomasso; Vermont, Ms. Mary McDonald.

I also extend my thanks to my officemates who made life that much easier over the past two years: Bill Seymour, John Kucinski, Wayne Whiteman, Chuck Protasio, Tom Sydelko; and to my Faculty Advisor, Professor Dave Marks, who got me started in the right direction.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Ever since the first trucks were manufactured in the United States in the late 1890's, there has been disagreement over what should be the maximum size truck allowed on the public highways (50). The primary governmental involvement in the early days of these disagreements was at the state level. By as early as 1913 some of the states had enacted legislation controlling the size and weight of trucks on their highways. With the passage of the Federal-Aid Highway Act of 1916, even more of the states adopted such legislation, and by 1931 all of the states had some type of limits on the size and weights of trucks on their books (59).

The years after World War I saw many rapid advances both in truck technology and in highway capacity. These improvements allowed trucks to carry heavier loads faster and for greater distances. With these improvements came many requests for the states to increase the limits they had imposed on the size and weight of trucks. The reactions to these requests were different across the country. As each state sought to respond to the truck operator's demands, they enacted laws and regulations designed to protect not only their investment in the highway system, but the general public as well. These laws reflected each state's synthesis of its needs, its

highway design practices, and the varying soil, topographic and climatic conditions. Surprisingly, these independent state actions resulted in regional similarities in size and weight requirements. Unfortunately, major differences in axle and gross weight limits, as well as size restrictions, developed between regions (50,66).

By 1932 the disruptive effects of the different restrictions in each state were such that the American Association of State Highway Officials[1] undertook the task of formulating uniform policy recommendations for consideration by the states. In addition to the AASHTO policy recommendations, which were updated in 1946, the Congress, in both 1935 and 1940, directed the Interstate Commerce Commission (ICC) to study the problem of diverse state truck requirements. However, it was not until passage of the Federal-Aid Highway Act of 1956, which provided for the Interstate highway system, that any Federal action was taken to reduce the confusion caused by so many different sets of truck regulations.

The Congress believed the Interstate system required Federal intervention because of the large degree of Federal funds involved in the project. Speaking for the Congress, the Committee on Public Works stated that the Congress...

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[1] The name of this organization was later changed to the American Association of State Highway and Transportation Officials (AASHTO). All further references to this group will use its current name.

> ...recognizes the maximum weight limitations ...are fundamentally a problem of State regulations, but feels that if the Federal Government is to pay 90 percent of the cost of the Interstate System improvements, it is entitled to protection of the investment against damage caused by heavy loads on the highway.... H.Rep. 2022 (H.R. 10660)

These initial Federal regulations were tentative in nature. There were no restrictions as to the height or length of a vehicle, only on the axle weight, the gross weight, and the width. The maximum single axle weight was set at 18,000 pounds and the maximum tandem axle weight at 32,000 pounds. The maximum gross weight was 73,280 pounds and the maximum width was 96". These limits were developed from the 1946 AASHTO policy recommendations and were applicable only to the Interstate system. Since these were maximum limits, the states were free to establish lower limits if they so desired. Those states which had higher limits in effect on or before 1 July 1956 were allowed to keep those limits by a "grandfather" clause (59).

The 1956 Federal-Aid Highway Act predicated the release of Federal funds for the Interstate system upon a state's enactment of the appropriate laws and regulations recognizing the Federally established limits. This was Congress' way of inducing cooperation from the states in controlling vehicle sizes and weights without resorting to direct Federal regulation through Federal statutes. In this way the Congress was able to recognize and reinforce the authority of the states

to control vehicle size and weight, and at the same time make known the seriousness of its desire to preserve the highways and to protect the Federal investment in the Interstate system (59).

The 1956 Act also directed the Secretary of Commerce to conduct certain tests and studies to determine the maximum desirable dimensions and weights for vehicles on the Federal-Aid system. So, in effect, the Federal restrictions placed on vehicle size and weight in the 1956 Act were only temporary, and were designed to be changed once more and better information was available. The report of the Secretary of Commerce, presented in 1964, recommended changes in trucking regulations based on maximizing the efficiency of the Nation's total transportation system. The report recommended increasing the single axle weight limit to 20,000 pounds, the tandem axle limit to 34,000 pounds, and establishment of gross weight maximums on the basis of a formula (the National Bridge Formula (NBF)) using the number of axles and the distances between extreme axles of a group. The report also recommended Federal standards in the areas of enforcement, vehicle weighing, tolerences, and other issues, emphasizing the need for uniformity to reduce confusion and increase productivity (59).

When the legislation implementing these recommendations was presented to Congress there was much opposition to increasing the Federal restrictions on size and weight. The

American Automobile Association (AAA) was against increasing the limits primarily for safety considerations, and in fact characterized the legislation as "really an antisafety bill." (66) The Association of American Railroads (AAR) also opposed the recommendations, primarily because they felt the "'present existing inequitable' situation between motor carriers and railroads would be aggravated." (66) Although the American Trucking Association (ATA) was in favor of the recommendations, their influence was insufficient to overcome the objections raised by those opposed to increasing the Federal limits. Thus, no major changes were made in the Federal limits until the Arab oil embargo of 1973 (59,66).

The 55 MPH speed limit enacted in December 1973 to reduce the consumption of gasoline reduced the productivity of the trucking industry by increasing trip times. At least this was the argument of the truck operators. To help offset this reduction in productivity, the Federal government enacted legislation in 1975 (the Federal-Aid Highway Amendments of 1974) which increased the weight limits allowed on the Interstate system. These new limits were 20,000 pounds on a single axle, 34,000 on a tandem axle, and a gross weight figured by the NBF, up to a maximum of 80,000 pounds. The Department of Transportation had recommended that these limits be made mandatory across the country to promote uniformity and to ensure that the productivity increases sought by the trucking industry would be realized across a nationwide network. How-

ever, the Congress specifically rejected making the new limits mandatory. Thus, the states were still free to set their limits lower than those required by the Federal government. In addition, another "grandfather" clause was added exempting states with different gross weight formulas or tables from the requirements of the NBF (59).

Enforcement of the requirements of the 1974 Amendments was provided by requiring each state to report to the Secretary of Transportation on an annual basis that it was enforcing all state size and weight laws on the Federal-Aid system. The Secretary was barred from approving any Federal-Aid highway project in a state found to be in noncompliance with the Federal regulations. In 1978, as part of the Surface Transportation Assistance Act of 1978 (STAA), the Secretary of Transportation was given the power to require such information from the states as was necessary to verify state compliance with Federal weight and size restrictions. The Secretary was also required to review each state's system of permits for oversize and overweight vehicles and to report to the Congress the results of the certification reviews. The penalty for noncompliance with the Federal regulations was changed to ten percent of the states apportionment of highway funds (59).

Though the 1978 STAA increased the Federal size and weight limits, and imposed additional reporting requirements on the states, the Congress continued to preserve a great

deal of state control by not adopting a requirement for uniformity. However, beginning in 1973 there was increasing recognition of the need for uniformity in truck regulations across the states. The independent owner-operators were the most vocal proponent of uniformity, as the lack of it increased their operating costs. While most of the states changed their weight limits to meet those in the 1978 STAA, there were still some states which refused to raise their limits because they believed the higher limits would damage their highway systems (59).

Opposing the reluctance of these states to raise their weight limits has been the continuing trend towards longer truck-tractor semitrailer combinations, as well as towards truck-tractor semitrailer combinations pulling one or more additional trailers. While there has not been much change in the overall length limits applied to truck-tractor semitrailer combinations over the years, advancing automotive technology has allowed for shorter tractors and longer trailers, thus increasing the load carrying capacity of these combinations (50).

There has also been considerable growth in the legalization and use of multiple trailer combinations. The most common of these is a truck-tractor towing two trailers. These combinations are commonly called "double bottoms" or "tandems". Generally, each of the trailers in a double bottom combination is less than 30' in length so that the whole unit

can still meet the standard length restrictions. A somewhat larger version of the double bottom combination is the so-called "turnpike double". These combinations of a truck-tractor towing two 40' trailers have been permitted on the toll roads of various states for a number of years. Several western states have gone so far as to authorize the use of "triples", a truck-tractor towing three of the trailers normally used in the double bottom combination. These combination vehicles have lengths of about 98' and could attain weights of over 122,000 pounds (18) and still meet the requirements of the NBF (50).

1.2 THE 1982 SURFACE TRANSPORTATION ASSISTANCE ACT

Even as late as 1 January 1981 there were still six states which had either axle or gross weight limits less than those allowed by the 1978 STAA. These states were all located along the Mississippi river basin and thus were a barrier to coast-to-coast truck traffic (59). Given the continued reluctance of these states to raise their limits and the continuing trend towards larger and longer vehicles, it is not surprising that the Federal government, in the 1982 STAA, finally set some mandatory limits for the Interstate system.

The 1982 STAA requires all states to allow single axle weights of up to 20,000 pounds and tandem axle weights of up to 34,000 pounds or lose their right to any Federal highway funds. All states must also allow gross weights of up to 80,000 pounds, or that weight allowed by the NBF for the

vehicle in question, whichever is less. The maximum allowable weights for the Interstate system were set at these same values unless the states had higher limits in effect before 1 July 1956 for axle weights, or the date of the enactment of the 1974 STAA for gross weights. The only other exceptions allowed are for loads which cannot be easily dismantled or divided and which have been issued special permits in accordance with applicable state laws.

The 1982 STAA also instituted national limits on the lengths of semitrailers, trailers in double bottom combinations, and eliminated overall length limits for any combination vehicle. Specifically, the 1982 STAA prohibits any state from enforcing...

> any regulation of commerce which imposes a vehicle length limitation of less than forty-eight feet on the length of the semitrailer unit operating in a truck tractor-semitrailer combination, and of less than twenty-eight feet on the length of any semitrailer or trailer operating in a truck tractor-semitrailer-trailer combination, on any segment of the National System of Interstate and Defense Highways and those classes of qualifying Federal-aid Primary System highways as designated by the Secretary.... (58)

Additionally,

> No state shall establish, maintain, or enforce any regulation of commerce which imposes an overall length limitation on commercial motor vehicles operating in truck-tractor semitrailer or truck tractor semitrailer trailer combinations.(58)

And finally,

> No State shall prohibit commercial motor vehicle combinations consisting of a truck tractor and two trailing units on any segment of the National System of Interstate and Defense Highways, and those classes of qualifying Federal-aid Primary System highways as designated by the Secretary....(58).

The passage of the 1982 STAA represents a major positive step for those urging uniformity among state truck weight and size regulations. No longer are there "barrier" states to block the efficient flow of trucked commodities. However, the 1982 STAA applies only to the Interstate system and to selected portions of the Federal-Aid Primary system. It does not require the states to allow 48' semitrailers or double bottom combinations on any state or local roads, except for reasonable access to food, fuel, services, and terminals. Thus, those truck operators who are using double bottoms or 48' semitrailers must first obtain a special permit from the state, allowing them to travel off the Interstate system when making deliveries. Given the historical trend towards larger and heavier loads, the states which restrict the access of 48' semitrailers and double bottom combinations can expect an increasing demand for oversize and overweight permits for these vehicles.

1.3 OVERSIZE AND OVERWEIGHT VEHICLE PERMITS

In addition to the permits requested for double bottom and 48' semitrailer access, the states are required to main-

tain a system of oversize and overweight permits for vehicles on the Interstate system, as well as on other state and local roads. These permit systems are required because of the design characteristics of the state highway systems.

The state highway systems have been designed to carry certain specified design loads and vehicle sizes. Vehicles which exceed these specifications affect the ordinary use of the highway. Nevertheless, there are some loads which can only be moved economically by truck. Large pieces of machinery and construction equipment are two examples. Other typical loads include both construction materials and mobile and modular homes. Thus, the states have a clear need for a system that will allow these loads to move on the highway while minimizing their impact on the highway structure and on the motoring public.

Operators of vehicles which exceed a state's legal limits for height, width, length, or weight may request a special permit from the state exempting the vehicle from the state's legal limits. By issuing such permits the state authorities can safely allow the movement of these extra-legal loads while at the same time exercising some degree of control over their size, weight, location, and timing. Thus, the purpose of an oversize and overweight permit system is to allow the state to benefit from the economic growth due to these extra-legal loads while at the same time protecting its investment in the highway system, and providing for the

safety of its citizens.

Federal law specifically identifies loads which cannot be "easily dismantled or divided" as the only loads eligible for oversize or overweight permits (57). However, the grandfather clause exceptions have been used by many states to authorize overweight and oversize permits for divisible loads as well. (50)

As the number and size of these "permit" vehicles and loads, both divisible and non-divisible, grow, both the states and the Federal government can expect increasing requests from the trucking industry to either increase their size and weight limits, or to liberalize their permit issuing policies. These requests will be made in the name of uniformity since the state regulations for oversize and overweight vehicles still represent the diversity of independent state action.

For those vehicles which exceed the Federal restrictions, even the Interstate system is no protection from the separate and uncoordinated permitting policies of the separate states. Each state is free to impose whatever requirements it deems appropriate on oversize and overweight vehicles. While these differences may not be very important in the western part of the country where state borders are literally hundreds of miles apart, they are of particular concern to carriers operating in the northeastern part of the

country, where the states are much smaller.

The size of the individual New England States is relatively small. Even all of New England is smaller than many western states. Thus, in a single day a motor vehicle can easily traverse the entire region more than once. In addition, truck travel represents a major element of the economy of the region both because of the significant movement of goods through the region, and because the size of the region makes other forms of freight movement uneconomical. Thus any differences in the state requlations regarding oversize and overweight vehicles could have a major impact on the trucking industry, as well as the rest of the economy, in New England.

Each of the relatively small New England States has its own individual regulations for dealing with the flow of trucks on its highways. However, many of the state regulations are in direct conflict with the regulations of neighboring states. The reasons for these inconsistencies are in many instances historical, and based upon the individual needs and experiences of the different states. These inconsistencies create a technical, economic, and political burden for the states, and also a significant burden on the shippers, the trucking industry, and ultimately the consumers.

1.4 RESEARCH OBJECTIVE AND OUTLINE

Each of the different players involved in the operation and control of oversize and overweight vehicles faces some-

what different problems. The individual states want to protect the physical condition of the highway system and the safety of the motoring public. Although the larger combination vehicles which are most often involved in the oversize and overweight controversy make up only about 30,000, or about 3 percent, of the trucks in New England, they account for over 12 percent of the total traffic volume and over 89 percent of the total load imposed on the highway (19). Additionally, over the past few years the number of requests for special permits has increased at such a rate as to place increasing demands on the state permit agencies. For example, New Hampshire has seen an increase in total permit requests of almost 70 percent since 1980. The total number of permits issued in New Hampshire in 1985 was over 20,000. This is over 80 permits per day. Such a workload makes it impossible to give each request the time and attention it deserves. Any reduction in this workload would be of benefit to the state in many ways.

The trucking companies are potentially faced with the problem of obtaining up to six different permits for one day's travel in New England alone. Each of the states has its own regulations and requirements, which complicates the procedures which must be followed by the truck operators as they try to comply with these different rules. They would benefit from a more uniform system of permits among the states.

The shippers, consumers, and taxpayers are the ones who

ultimately pay for the inefficiencies in managing oversize and overweight vehicles. Thus, any reductions in these costs would benefit all the citizens of New England.

Since the movement of goods by truck throughout the region represents a significant economic need, the New England states have decided to investigate the possibility of joining together to establish a common basis for issuing truck permits for oversize and overweight trucks that are engaged in interstate travel. The immediate benefits and advantages in achieving such an objective are numerous to a number of state government agencies within each state, to the motor vehicle industry, and to the motoring public. A longer term economic benefit will also be realized by the taxpayers and the consumers of the region. Thus, the purpose of this project is to study the various policies and regulations for issuing permits to, and controlling the operation of, overweight and oversize vehicles throughout the New England region, and to present recommendations for actions which could be implemented in a relatively short period of time to increase the uniformity, and hence the efficiency, of the oversize and overweight permit policies of the New England states. Additional recommendations for longer term research, leading to solutions for some of the more difficult problems in this area, are also developed and presented as part of this study.

This investigation is being carried out under the aus-

pices of the New England Surface Transportation Infrastructure Consortium, which was formed to research topics and problems unique to the New England region. The member states of the Consortium are Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Of the many possible research areas, this area, oversize and overweight vehicle permits, was chosen as one of two highly important topics deserving of immediate attention.

The results of this research project are presented in the following five chapters. Chapter Two presents a review and synthesis of the most relevent research already completed in this area. The findings of these research efforts were used to guide the investigation of the current situation in the Consortium states.

Chapter Three presents a review and analysis of the current statutes and regulations controlling oversize and overweight vehicles in the New England states. The major differences and agreements between the states are highlighted and compared to the results of the earlier research to identify the most serious problem areas. The statutes and regulations are also compared to the most recent AASHTO recommendations for size and weight restrictions to see how they compare to the nationally recommended policies.

Chapter Four presents the results of research into the actual composition of the oversize and overweight vehicle permits issued by the Consortium states in 1985. A sample of

each state's permit population for 1985 was taken and broken down into different components to determine the types and sizes of loads being issued permits.

Based upon the analysis of the state regulations conducted in Chapter Three and the analysis of the permit populations presented in Chapter Four, Chapter Five presents the findings and recommendations of this study.

CHAPTER TWO

SUMMARY OF COMPLETED RESEARCH

2.1 INTRODUCTION

Since the late 1960's a number of research projects have been completed on the subjects of truck size and weight and oversize and overweight vehicle operation. The purpose of this chapter is to present the most important findings and recommendations of these research efforts. These research results provided important background material and were used to guide the investigation of the current situation in the Consortium states.

2.2 PREVIOUS RESEARCH FINDINGS AND RECOMMENDATIONS

2.2.1 ECONOMICS OF THE MAXIMUM LIMITS OF MOTOR VEHICLE DIMENSIONS AND WEIGHTS

In 1968 the Federal Highway Administration (FHWA) published an extensive report on the economics of vehicle sizes and weights. This two volume report was the result of several exhaustive studies involving truck sizes and weights and their effects on the general economy, and the physical characteristics of the roadways themselves.

In particular, the report reviewed the then current state regulations regarding truck sizes and weights. It also developed "desirable maximum limits on motor vehicle dimensions" (67) after an analysis of the needs of the transport

industries, government agencies, and the motoring public. These "maximum desirable dimensions" were found to be:

1) WIDTH 8' - 6"

2) HEIGHT 13' - 6"

3) LENGTH

a) For use on all highways and streets:

(1) Bus	45'
(2) Single unit truck	40'
(3) Single trailer	40'
(4) Tractor-semitrailer combination	55'
(5) Tractor-semitrailer-trailer (two 27' cargo trailers)	65'
(6) Truck and full trailer	65'

b) For use on multilane divided highways with controlled access:

(1) Tractor-semitrailer-trailer (two 40' cargo trailers)	100'
(2) Tractor-semitrailer-two-trailers (three 27' cargo trailers)	100'

In addition, the report also developed data and statistics on the effect of gross vehicle weight on both highway safety and on the performance of trucks in traffic. In general this data showed that truck performance had improved over the years with continuing design advancements, but more importantly, the data indicated that there should be no decline in highway safety factors due to increasd vehicle gross weights.

In generating the data and conclusions regarding the maximum desirable axle and gross weight limits for trucks, the authors developed methods to compare the incremental increases in construction costs required to support increased axle and gross weights on the highways to the incremental economic benefits derived from these increases. The results of this cost-benefit analysis were rather startling. Even allowing for errors of up to 30 percent in their cost and benefit calculations, the authors found that the

> benefit-cost analyses...support the economic justification, on the Federal-aid Highway Systems, of increasing the single axle weight limitation to 26 kips (a "kip" equals 1,000 pounds) with accompanying tandem axle weight limitations going up to 44 kips. Gross loads could either be increased to 120 kips or no gross load specified and instead axle weight and spacing employed as the control. (55)

Thus, just as with the conclusions about the most desirable vehicle dimensions, the findings for vehicle axle and gross weights also indicate that the then current limits could be economically increased. In their final summary, the authors noted two areas requiring improvement. The first was

> the lack of uniformity among the states in maximum limits on dimension and weight, and its unfavorable consequences to the costs of highway transportation. (67)

The second factor was

> the high percentage of vehicles with

> overweight axles and excessive gross weights. Overloading combined with liberal enforcement tolerences, higher legal limits for certain commodities, and unprecedented issuing of special permits for trips made by overdimension and overweight vehicles actually have nearly the same effects on the pavement as would be expected from an increase in legal limits without tolerance and without legal exceptions for hauling of certain local commodities. (67)

The authors also concluded that "without doubt, unexpectedly high economy can be realized by increasing axle-weight limits, gross weight limits, and vehicle length limits." (67) Furthermore they dispute the argument that existing pavements would be destroyed by these increased weight limits. They note that

> over the last 45 years that these increases (previous weight limit increases) have been experienced, improvement and reconstruction of highways for this reason alone has been a gradual yearly factor. The highways have been financed year to year without pinpointing any particular part of the financing that has resulted from increasing axle and gross weight limits. (67)

2.2.2 OVERSIZE-OVERWEIGHT PERMIT OPERATION ON STATE HIGHWAYS

The above titled report was published by the Highway Research Board (later called the Transportation Research Board, TRB) in 1969. The objectives of this project were:

1) to study in depth the characteristics of oversize-overweight permit operations on U.S. highways,

including characteristics of laws, procedures, and permit movements;

2) to develop a national inventory of permits issued during a one-year period, with appropriate breakdowns of permit features;

3) to determine the extent and nature of reciprocity relative to permit operations;

4) to determine foreseeable needs of industry for extension or alteration of permit operations;

5) to make a start in evaluating economic benefits of oversize-overweight permits.

To satisfy the first two objectives, the authors visited each of the 48 contiguous states and the District of Columbia. These visits resulted in a sample of over 61,000 permits representing a total population of over 2,151,000 permits. This sample was then broken down into various catagories such as:

1) Number of permits by type of overweight.

2) Number of permits by commodity.

3) Number of permits by interstate, intrastate, or through state.

4) Number of permits by month, etc.

The development of this national inventory of permits lead to the following findings regarding the types and uses

of oversize and overweight permits:

1) The major users of permits are the construction and mobile home industries, which, respectively, accounted for 39.90 and 31.53% of the permit issuance in 1966.

2) Other major users of permits include the areospace, agriculture, forest, boating, mining, oil and gas, and public power industries, and the military.

3) The greatest number of permits were issued for overwidth moves. 85.05% of the permits issued in 1966 were for overwidth moves. 58.18% were issued for overlength moves, and 18.65% for overheight.

4) 33.14% of the permits were for overweight moves. Non-uniformity in legal weight limits and in methods of determination of safe bridge loads creates many problems for movers of overweight commodities.

For Objective 3 the major finding was that there was no reciprocity between the states in the area of oversize and overweight vehicle permit operations. The author identifies six major problem areas within the problem of non-uniformity and provides possible solutions for each sub-area. These six areas are:

1) Legal Limits
2) Method of Application
3) Fee Schedules

4) Permit Limits and Vehicle Configurations

5) Exceptions to Legal Limits

6) Multiple-Trip Permits

LEGAL LIMITS

The author notes that the differences in the legal limits between the states do not really affect the movement of non-divisible loads, but do have an affect on the movement of divisible commodities. However, he points out, uniformity between the states in this area would serve as a basis for developing more uniform regulations for permit operations.

METHOD OF APPLICATION

Most states require that all necessary permits be carried in the vehicle in question at all times. This policy limits the means for obtaining a permit to mail, wire, or in person. However it is done, seperate permits must be obtained from each of the states traversed during a move. To reduce the time and money expended on obtaining these effectively duplicate permits, the author proposes two possible solutions. The first is to have the state of origin issue a single permit for the entire move; the second is to have the origin state issue permits for each of the states to be traversed during the move, each according to the rules and regulations of the corresponding state. The author notes that each of these solutions would present many problems for the permit officers in the issuing states. Such problems include

lack of knowledge of the highway systems in other states, as well as the problems of managing and auditing the collection of fees for each state. However, the author suggests that a communication system serving a compact of states could be used to help alleviate some of these problems.

FEE SCHEDULES

The fee structures of the different states reflect their different philosophies. Some states collect fees as a source of revenue for particular operations, while others charge no fee at all. Thus the philosophies behind these schedules would have to be changed before uniformity could be acheived. The author suggests a uniform fee based on the cost of permit operations as a solution to this problem.

PERMIT LIMITS AND VEHICLE CONFIGURATION

The author states that one of the largest problems facing oversize and overweight moves is the variance in permit limits and allowable vehicle configurations between the states. He also notes that most states have instituted dimension and weight limits below which granting a permit is considered routine, and that establishing a uniform definition of these routine limits would be a major accomplishment in the development of an interstate permit. Such a permit, he suggests, would allow interstate moves up to the routine limits. Moves involving dimensions or weights beyond these limits would have to be approved individually by each state

involved in the move.

EXCEPTIONS TO LEGAL LIMITS AND MULTI-TRIP PERMITS

Statutory exceptions to state legal limits are often granted to favor important industries within a state, as are some types of multi-trip permits. The author states that while some truck operators would benefit from some uniformity in this area, most interstate moves are not affected by these special exceptions.

Objective 4 of this study, to determine the foreseeable needs of industry for extension or alteration of permit operations, was accomplished with relative ease. The author found the most pressing problem to be the lack of uniformity discussed above.

Because of funding limitations, the fifth objective of this study, the evaluation of the economic benefits of oversize and overweight permits, was not completed. The author did, however, recommend several areas of interest for additional research. It is obvious that this report was written before the FHWA report described at the beginning of this chapter was released, for many of the author's research recommendations were fulfilled by the FHWA report.

In addition to his recommendations for research into the economics of vehicle size and weight limits and the use of oversize and overweight vehicles, the author made some

important recommendations for actions which could be taken to help reduce some of the operational problems of oversize and overweight permit use and administration. These recommendations included:

1) AASHTO should develop a national policy for uniformity between the states on oversize and overweight permits.

2) State permit authorities should take the lead in forming, by regions, permanent committees composed of representatives of the regional states and representatives of the regional permit user interests, to develop joint recommendations for improving the uniformity of oversize and overweight permit administration within the region.

3) The laws and regulations controlling the size and weight of vehicles on the Interstate system should be made uniform throughout the country.

2.2.3 ECONOMIC EVALUATION OF MOBILE AND MODULAR HOUSING SHIPMENTS BY HIGHWAY

The objective of the above titled report, published in 1974 by the Midwest Research Institute, under contract to the FHWA, was to "...obtain (the) data needed to reach rational decisions regarding state regulations so that wide load movements can be made as safely as possible without undue economic burdens to the purchasers of such homes, to the states, or to other users of the highways." (25) Extensive use was

made of photographic and visual observations of traffic in the vicinity of 12 and 14 foot wide mobile homes. These observations were made in 20 different states during 63 trips covering over 12,000 miles. In addition, over 3,000 motorists were stopped and interviewed. Extensive cost and operational information was obtained from carriers of mobile and modular homes, and additional cost and regulatory information was obtained from the permit officials of most states.

The authors developed or modified methods for calculating the cost implications to the motoring public of wide load movements. These methods were then applied to the gathered data to develop the incremental operating costs, the delay costs, and the changes in air pollutant emmissions caused by the interactions of wide loads and the rest of the motoring public. The authors also developed data on the costs incurred by the mobile home manufacturers, carriers, and purchasers due to state permit regulations. The cost to the states of issuing these permits was also developed. Finally, the authors provide an in depth discussion of state permit policies and operations, as well as the state regulations which govern the movement of mobile and modular homes.

The conclusions and recommendations presented in the report are rather lengthy, but nonetheless they still bear repeating as many of them are unique to this study. They are broken into five seperate areas: Traffic Safety, Motorists' Opinions and Attitudes, Costs Imposed on the Motoring Public,

Costs of Regulations to Shippers ands Carriers, and Safety Hazards. The author's conclusions include the following:

1) Traffic Safety

a) Reported accident rates and severities involving mobile and modular homes are similar to those involving other commercial vehicles.

b) Slow moving wide loads create more traffic impedances and initiate driver responses of a more hazardous nature than do faster moving wide loads.

c) The use of escort vehicles does not measurably reduce hazardous reactions of other motorists to the wide load movement; some situations, such as passing on two lane roads, are worsened by the presence of escorts.

d) The low intensity, flashing, warning lights presently used on the rear of some wide loads have no effect on motorists' responses; evidence indicates that high intensity flashers on escort vehicles do elicit early driver responses.

2) Motorists' Opinions and Attitudes

a) Only rarely did a motorist who had recently passed a wide load suggest, without prompting, that he had encountered a delay or safety hazard at that time. Neither did he spontaneously rank mobile homes extremely high as problem vehicles--trucks, campers, other cars, and farm

equipment were more commonly mentioned.

b) When asked to specifically rank mobile homes against other types of vehicles, motorists tended to rank mobile as the most hazardous, most impeding, and most likely to cause problems in general. Ranking nearly as high were trucks, campers, farm vehicles, and cars pulling trailers.

3) Costs Imposed on the Motoring Public

a) On two lane highways, the motoring public often saves money by following a wide load because the reduction in operating expenses is greater than the increase in delay costs.

b) Dollar savings or costs to other traffic brought about by delays, modified fuel consumption, tire wear, etc., were much larger on two-lane than on multilane highways.

c) Time delays and increased pollutant emissions were much higher on two-lane highways than on multilane highways.

d) Where differences were noted, greater costs, delays, and incremental pollutant emissions were associated with 14-wides rather than 12-wides, slow moving rather than fast moving wide loads, and with loads accompanied by escort vehicles rather than without.

e) The total cost imposed on all traffic on multilane highways is generally less than 2 cents for each mile of travel of a wide load. On two-lane highways the cost is much more variable, is often negative, and seldom exceeds 5 cents for each mile of travel of a wide load.

4) Costs of Regulations to Shippers and Carriers

a) The costs to mobile home shippers and carriers brought about by permit and transportation regulations is highly variable. These costs can range from a small fraction of basic line-haul charges to several times the cost of transportation alone. For the interstate shipment of a 12 foot mobile or modular home for 250 miles the typical cost of regulatory compliance is about $50 to $100. Costs increase for 14-wides.

b) The costs associated with permits can add 10-25% to the basic transportation charges, with permit acquisition costs often equaling or exceeding the state permit fee.

c) Where used, multitrip permits are a boon to the state and shipper alike.

d) Escort vehicles are extremely costly, adding 30-35 cents per mile to the basic transportation charge for each escort vehicle.

e) Regulations pertaining to signing,

flagging, and warning lights are extremely variable from state to state. Contrary to common belief, however, these variations have relatively little cost impact.

5) Safety Hazards

a) Escorts, although presumably employed to make a wide load movement safer, often result in degraded safety. Lack of two-way radio communication, misunderstanding of the functions of an escort vehicle, lack of training, and blantly unsafe practices are all reasons for such degradation.

b) Faulty or inadequate tires are a very common problem in the movement of mobile and modular homes.

The author's recommendations are very detailed. They include the following:

1) Conditions Under Which Permits Should be Required

a) In general, 12- and 14-wides should move only under permit, as presently required.

b) To encourage wide loads to travel on the roads most capable of handing them,the Federal-Aid Highway Act should be amended to allow loads as wide as 12 feet to move on the Interstate system without permits.

c) All states should compile a route system suitable for use by mobile and modular homes and publish it

in the form of a route map.

2) Use of Multitrip Permits

a) Multitrip permits should be issued by the states for frequent and standard movements of coaches of widths up to and including 12 ft.

b) Consideration should be given to granting multitrip permits to 14-wides on a limited system of routes.

c) Published route systems should be disseminated by the states to aid in controlling routing under multitrip prmit operations.

3) Permit Reciprocity

a) Permit reciprocity should be a goal of the states in order to better serve the infrequent carrier and to encourage standardization of institutions and regulations among the states.

b) Municipalities and counties should universally honor state permits which would include, if necessary, special city and county requirements, thus eliminating city and county permits.

4) State Permit Fees

a) Permit fees should be charged for the right to transport extra-legal loads.

b) Permit fees should reflect only the incremental costs directly associated with the extra-legal vehicle.

5) Speed of Wide Load

Regulated, statewide , maximum speeds for wide loads should not be less than 45 MPH on two lane roads, and 50 MPH on multilane roads.

6) Special Lighting

Where special lighting is required, either on an escort vehicle, or on a wide load, it should be of high intensity as specified in SAE J-5956 or equivalent.

7) Use of Escorts

a) Escort vehicles should not be used on divided highways.

b) Front escorts should be required whenever short sight distances, narrow clearances, etc., dictate the need for motorist and wide load driver warnings.

c) The states should publish route maps showing where escorts are required.

d) High intensity rear lighting should be specified in lieu of a rear escort.

e) All escort vehicles should be required to

have two-way radiocommunication with the wide load driver.

8) Additional Research Requirements

a) A study to establish reasonable axle, braking, and tire requirements for mobile homes.

b) A study to determine reasonable size and power requirements for towing vehicles for 12- and 14-wides.

c) A study to investigate wind effects on the stability of mobile and modular homes.

2.2.4 STATE LAWS AND REGULATIONS ON TRUCK SIZE AND WEIGHT

The above titled report, published by the TRB in 1979, investigated the then current situation concerning state laws and regulations regarding vehicle size and weight, studied the benefits and disadvantages of increased uniformity among the states, and proposed alternatives for achieving this uniformity.

In general, the author found that nonuniformity in state laws and regulations places an expensive burden on both the taxpayer and the consumer. By his estimates, from $1.6 billion to $2.8 billion is wasted every year due to nonuniformity. This estimate was derived from the author's comparison of current truck transportation costs to different possible "levels of uniformity" or "uniformity options" between the states. For example, one option might allow twin 40 foot trailers on divided highways while a second option

might only allow triple 27 foot trailers. Both vehicles have approximately the same overall length, but their cargo capacities and axle spacing are somewhat different.

Naturally, the benefits to be gained from greater uniformity have some cost associated with them. For the most part these costs are associated with the increased deterioration of the highway surface due to the changes in axle and vehicle loading characteristics. For this project the author used he following method to calculate the future incremental highway costs for each of the "uniformity options." First he calculated the increased 20 year equivlent 18,000 pound axle loadings that would occur due to the uniformity option in question. These increases were then applied to highway sections in different states of repair to determine the amount of overlay that would be required to provide for the originally designed service life. These costs were then regionalized to account for regional variations in soil conditions, topography, and materials and labor costs. The total estimated one-time cost came out to about $1.95 billion.

As a result of this research, the authors came to the following specific conclusions:

1) Current nonuniformity among state laws and regulations concerning vehicle sizes and weights results in inefficient use of the highways for commercial transportation.

The major inefficiencies include circuitous routings, inability to use optimum vehicle types, and unnecessary trips.

2) Complete uniformity between all states in every aspect of size and weight regulation is not likely, nor is it necessary to adequately provide for optimum interstate commerce.

3) With optimum uniform provisions for truck sizes and weights, annual operating cost savings could range from $1.2 billion to $2.8 billion annually.

4) The maximum additional highway costs for the optimal uniformity provisions will not exceed $2.0 bilion on a one-time basis.

5) The following vehicle dimensions and weights were found to be the optimal "uniformity option", that is the option which will provide the greatest savings in transportation costs for the fewest and smallest changes in state regulations, and should be adopted by all the states:

a) Width 102"

b) Height 13' - 6"

c) Length

(1) Single truck 40'

(2) Bus 45'

(3) Trailer 45'

(4) Tractor semitrailer combination 60'

(5) Tractor semitrailer full trailer combination 65'

(6) Full truck full trailer combination 65'

(7) Other combinations 105'
(On designated routes only; routes will be limited to 4 or more lane divided highways with full access control and on other highways within a given number of miles of a designated interchange (1 mile recommended))

(8) Auto carriers 66'

d) Number of towed units 3

e) Axle loads

(1) Single 20,000 lb

(2) Tandem 34,000 lb

f) Operating tire inflation pressure 95 PSI

g) Gross weight NBF

The author's recommendations for increasing uniformity between the states include:

1) A three level organizational approach to provide the capability for fully implementing uniformity in size and weight regulations. The three levels are:

a) A national AASHTO committee to coordinate uniformity initiatives.

b) Regional AASHTO committees to do the same for the region; concentrating on regional issues which might not gain national recognithion or approval.

c) Meetings or committees of representatives

of adjacent states to futher the uniformity requirements of the local area.

2) Research into the following areas to provide more and better information on the economics of vehicle size and weights:

a) Adequate Up-to-date Commodity Flow Data

b) Effective Operational Control of Trucking

c) Vehicle Performance Characteristics

d) Vehicular Safety

e) Effective Enforcement Procedures

f) Truck Versus Rail Competition

2.2.5 MOTOR VEHICLE SIZE AND WEIGHT REGULATIONS, ENFORCEMENT, AND PERMIT OPERATIONS

In 1980 the TRB published a Synthesis of Highway Practice titled as above. The purpose of this report was to synthesize the then current practices of the states and to provide recommendations for improvement and further research. The TRB found:

1) That truck weighing programs are the cornerstone of a successfull size and weight enforcement program.

2) Great differences between the states in both the levels of vehicle size and weight enforcement, and its effectiveness in controlling violators.

3) That the differences in permit issuance policies

between the states had a greater impact on those affected than did enforcement differences.

4) That permit requirements which are difficult to comply with reduce a state's ability to control the size and weight of vehicles as some truck operators will risk getting caught rather than comply with the permit requirements.

5) That if voluntary action is not taken by the states, the Federal government may have reason to become involved in the interests of interstate commerce as most of the arterial routings are on the Federal-Aid system.

As a partial solution to the problems of oversize and overweight vehicles and the nonuniformity of permit operations, the TRB made the following recommendations:

1) That the recommendations first outlined in an earlier TRB report, Oversize-Overweight Permit Operations on State Highways (Section 2.2.2) are still valid and should be implemented.

2) That fine schedules with deterrent effect should be instituted in each state.

3) That the standards of accessory warning devices, such as flags, signs, lights, and escort vehicles should be uniform in all states.

4) That reciprocity arrangements should be worked out between state permit agencies to facilitate, as much as

possible, interstate permit travel.

5) State authorities, through AASHTO and the National Governor's Association, and with the assistance of the FHWA, need to develop a model of uniform permit practices similar to the uniform traffic laws developed in the 1950s.

2.2.6 AN INVESTIGATION OF TRUCK SIZE AND WEIGHT LIMITS

In August 1981, pursuant to the 1978 STAA, the Department of Transportation (DOT) submitted the above titled report to the Congress. The purpose of this report was to examine the need for, and the desirability of, uniformity in maximum truck size and weight limits throughout the United States. The report also covered several complementary issues including state enforcement and permit practices. Most of the findings relating to oversize and overweight vehicles came from a 1979 Government Accounting Office (GAO) report entitled Excessive Truck Weight: An Expensive Burden We Can No Longer Support. The DOT concluded that:

1) Many states devote only minimal resources to weight enforcement.

2) Most fines and penalties for weight violations are to low to deter potential violators.

3) State agencies enforce weight laws on only 40 percent of the highways, and very little at all in urban areas.

4) As many as 12 states may be issuing permits for divisible loads in accordance with policies that were not in effect in 1956 and thus not grandfathered.

5) Up to 22 percent of fully or partially loaded trucks exceed state weight limits.

6) Non-divisible loads do not account for a high percentage of overloads, nor do commodities for which legal exceptions have been granted.

2.2.7 OVERWEIGHT VEHICLES - PENALTIES AND PERMITS: AN INVENTORY OF STATE PRACTICES

The annual report by the FHWA to the Congress on overweight vehicles, titled as above, provides an excellent summary of the activities of the different states in the area of overweight vehicle operations and enforcement. In the most recent report, released in December 1985, the FHWA notes that truck weight enforcement activities continue to increase nationwide. In FY 1984 over 100 million trucks were weighed, representing an increase of 11.3 percent over FY 1983. Citations for overweight truck violations totaled 674,386 in FY 1984, an increase of 14.3 percent. Citations for exceeding the requirements of the NBF increased 58.1 percent to 164,211.

The FHWA attributed the continuing increase in enforcement actions as the direct result of the initiation and use of the annual truck weight enforcement plan required

from each state. The requirement for such a plan ensures each state approaches the problem of overweight trucks in a systematic manner, annually reviewing the progress made in the previous year, and placing more emphasis and resources on those parts of the plan proving weaker than others.

The FHWA also identified three problem areas that still need some help. The first is the interpretation of grandfather rights under the 1956 and 1974 STAAs. "The proliferation of state grandfather claims has a direct bearing on two practices which, if uncontrolled, can have serious deterioration implications: issuance of divisible load permits and NBF enforcement." (23) The second is the operational problem of trying to find the overweight truck before he can avoid the weigh station, and the third is the problem of weak penalties for those violators who are issued citations.

The proposed solutions for the operational problems include increased use of portable and semi-portable scales and the implementation of administatve, rather than judicial, procedures for dealing with truck weight violators. To better understand the total magnitude of the overweight truck problem the FHWA has joined with several states in developing comprehensive plans for measuring the extent of overweight vehicles and their relationship to pavement damage. Eventually the FHWA wants to expand this program to all the states so that each state will understand the relationship between their truck weight policies and the condition of the

highways in the state.

2.2.8 OVERWEIGHT TRUCKS - THE VIOLATION ADJUDICATION PROCESS: UMBRELLA OF COMPLIANCE

The purpose of this report, published by the FHWA in July 1985, was to closely examine what happens to a truck weight violator after he has been caught, and to analyze the adjudication process of overweight vehicle violations to identify the major factors which influence its effectiveness. The authors found the following five factors to present the most significant problems in the adjudication process:

1) Judges. Many judges do not appreciate the gravity of the truck overweight problem, and they generally view the offense as benign and insignificant.

2) Prosecutors. Like the judges, many prosecutors have little understanding of the truck overweight problem, and often fail to effectively prosecute these cases.

3) Wrong Defendant. The defendant is usually the truck driver. But it is the owner or the shipper who is the one most likely to profit from overweight shipments. To be effective, the penalties for overweight violations must reach the ones most likely to profit from the violation.

4) Ineffective Penalties. The fines specified in the laws of most states are too low when compared to the gains to be made from operating overweight. They do not deter overweight operation.

5) Criminal Courts. Most states still define weight violations as a crime. Thus these cases are thrown into a crowded court system where they are readily classified with the minor traffic law offenses the court handles. This classification may preclude recognition of the appropriate status of overweight truck offenses.

As remedies for the above listed problems, the author reccommended the following solutions:

1) Judges. A training program to increase judical awareness should be developed and presented as part of the existing structure of judicial education.

2) Prosecutors. Attorneys from the State Attorney General's office, or from the State Department of Transportation, should be assigned to assist local prosecutors with overweight truck cases, or to intervene in these cases whenever such action is warranted.

3) Wrong Defendants. For those states which continue to keep the adjudication of these cases in the criminal courts, the author suggests implementing a law presuming the holder of the motor carrier certificate to be the one responsible for the overweight violation. The strongest recommendation, however, is to remove the adjudication process from the criminal courts and to replace it with an administrative assessment system as outlined

below.

4) Ineffective Penalties. Fines should be realistically related to the cost of overweight truck operations and sufficiently high so as to deter overweight operation.

5) Crimanal Courts Remove the overweight vehicle adjudication process from the criminal courts and replace it with an administrative system. This system should have the following provisions:

a) Presumption of highway damage due to overweight.

b) Immediate assessment of penalty.

c) Immediate payment of assessment.

d) Impoundment of vehicle if payment is not immediate, or at least guaranteed.

e) Due Process provided by an opportunity for a hearing before a magistrate when seizure is contemplated and an opportunity for a full hearing with judicial review at a later date.

f) No criminal prosecutions for overweight violations.

2.2.9 THE FEASIBILITY OF A NATIONWIDE NETWORK FOR LONGER COMBINATION VEHICLES

The 1982 STAA required the DOT to report to the Congress on the possibility of a Longer Combination Vehicle (LCV) network. This report was completed and sent to Congress in

June 1985.

The primary Federal constraint preventing the use of LCVs at the present time is the gross weight limit of 80,000 pounds on the Interstate system. States with grandfathered weight limits and states with higher limits on their state roads already allow these vehicles to operate. However, there are still many unresolved issues. Questions relating to the cost of changing the highway geometrics to accomodate LCVs, the safety of LCVs, and the effects of modal shifts between highway and rail transportation were only briefly touched upon in the LCV report. They still need to be addressed in much more detail.

The final conclusion of the report was that "there is no compelling evidence that LCVs are so desirable that increased Federal intrusion into state size and weight regulation authority is justified at this time."

2.2.10 FINAL REPORT OF THE TRUCK ISSUES ADVISORY COMMITTEE

The Maine Department of Transportation has recently (March 1986) issued the above titled report. The Truck Issues Advisory Committee was established by Executive Order to investigate the issues of truck size and weight, vehicle configurations, overweight fines, and the economic use of the highway system. The Committee made many recommendations in the areas of Administration, Truck Productivity, Safety Improvement, and Protection of the Highway System. The most

significant among these recommendations included:

1) Increase overall vehicle length to 65'.

2) Legislate the 48' semitrailer.

3) Explore development of a weight distribution formula to allow greater gross weights.

4) Increase size and weight enforcement.

5) Remove fine cap on overweight violations.

6) Establish fine schedule for violating posted bridge weight limits.

Many of the recommendations in the report were made with only the situation in Maine in mind. However, the report does show that the areas of truck size and weight regulations and oversize and overweight vehicle permit operations can be addressed by committees made up of state officials and trucking industry representatives working together to best satisfy the needs of the state. Similar organizations may be appropriate for other states as well.

2.2.11 THE ROADS AND TRANSPORTATION ASSOCIATION OF CANADA

The Roads and Transportation Association of Canada (similar to the TRB) is in the process of completing a study focussed on the design characteristecs of heavy trucks and how these characteristics affect the handling of the truck. They are also studying how these characteristics affect the pavements the trucks pass over. Increased knowledge of new truck designs and their effects on highway pavements is

directly applicable to the issue of oversize and overweight permits. Should these studies show that vehicle axle or gross weights could be raised without adversely affecting roadway pavements, the requirement to issue overweight permits would be greatly reduced. The final report should be available sometime in August 1986.

2.3 SUMMARY OF RESEARCH FINDINGS AND RECOMMENDATIONS

The research reviewed in the last section covers at least 15 years of study of the problems associated with legal vehicle limits and oversize and overweight permit operations. Throughout this period there were several findings which kept repeating themselves from one study to another. They are:

1) The lack of uniformity between the states, both in legal limits, and in permit operations, represents a major problem to interstate commerce. It has resulted in substantial economic loss to all parties concerned, both public and private.

2) Overweight trucks are a major factor that must be included when determining life cycle costs for roadway pavements.

3) Enforcement of state weight regulations has not achieved the desired results, for many complicated reasons.

The recommendations for solving these problems have also repeated themselves over the past 15 years. They include:

1) Establishment of nationally uniform limits on the Interstate system.

2) Formation of regional committees to formulate policies for developing uniform legal limits and permit regulations within the region.

3) Establish a system of fines that will produce the intended result of deterring potential weight law violators.

4) Develop a more systematic evaluation of the costs and benefits of various policies concerning truck permits, including a better understanding of how these policies affect all the parties concerned.

The 1982 STAA implemented some of these recommendations on the Interstate system. However, there is still much work to be done in the other areas, especially in the different regions of the country. The rest of this document focuses its attention on the New England region; the problems particular to this region and their solution.

CHAPTER THREE

ANALYSIS OF CURRENT STATE REGULATIONS

3.1 INTRODUCTION

The purpose of this chapter is to analyze the similarities and differences that exist between the overweight and oversize permit regulations of the New England States. In some instances the regulations of the different states are almost identical. In other instances, they are significantly different. An analysis of these regulations, combined with a review of the findings of earlier research and a comparison with AASHTO recommended procedures should provide an opportunity for developing more uniformity between the states. A detailed summary of the current regulations of each is included in Appendix 1, and it provides the basis for the analysis in this chapter.

3.2 FEDERAL LIMITS

3.2.1 THE NATIONAL NETWORK OF HIGHWAYS

The National Network of Highways was created by the Department of Transportation in accordance with the 1982 STAA. The National Network includes the Interstate system and certain Federal-Aid Primary System routes as designated by the Secretary of Transportation in Part 658 of Chapter 1 of Title 23 of the Code of Federal Regulations. These highways are the ones authorized for use by the 48' semitrailers and

the 28' double bottom trailers allowed under the 1982 STAA.

3.2.2 FEDERAL WIDTH LIMITS

Paragraph 658.15 of the above mentioned Federal Regulation requires that "No state shall impose a width limitation of more or less than 102 inches. . . on a vehicle operating on the National Network. . .", except for Hawaii, which is excepted by section 416 (a) of the 1982 STAA. (20)

3.2.3 FEDERAL LENGTH LIMITS

Federal length limits apply only to truck tractor-semitrailer combinations and to truck tractor-semitrailer trailer combinations and apply only on the National Network or in transit between the National Network and terminals or service locations. No state shall impose a length limit of less than 48' on a semitrailer in a truck tractor-semitrailer combination, or less than 28' for any semitrailer or trailer in a truck tractor-semitrailer-trailer combination. Except for some special grandfather provisions, no state may impose an overall length limitation on the above listed combination vehicles, and no state may prohibit truck tractor-semitrailer-trailer combinations from operating in the state.(58)

3.2.4 FEDERAL WEIGHT LIMITS

Federal weight limits apply only on the Interstate System. No vehicle or combination of vehicles shall be moved or operated on any Interstate highway when the gross weight on

two or more consecutive axles exceeds the limitations prescribed by the following formula, referred to as the National Bridge Formula (NBF):

$$W = 500\ ((LN/N-1) + 12N + 36)$$

where N is the number of axles in question and L is the distance between the centers of the extreme axles of the group of axles in question. Two consectutive sets of tandem axles may carry a load of 34,000 pounds each if the distance between the extreme axles is 36 feet or more. In no case may the total gross weight of the vehicle exceed 80,000 pounds. The maximum gross weight allowed upon any one axle, including any one axle of a group of axles, or a vehicle, is 20,000 pounds. The maximum gross weight allowed on tandem axles is 34,000 pounds. (57)

3.3 STATE HEIGHT LIMITS

Effectively all the states have the same height requirement. Maine does allow an extra 6" for the height of the load on the vehicle (from 13'-6" to 14'-0"). (See Table 3-1).

3.4 STATE WIDTH LIMITS

The Federal requirement to allow vehicles with widths up to 102" (8'-6") on the National Network of Highways has been expanded by most of the New England states to include all state roads. The only exception is New Hampshire where the width limit is still 96" on roads with lane widths less than

TABLE 3-1

SIZE LIMITS

	HEIGHT	WIDTH
CONNECTICUT	13'-6"	8'-6"
MAINE	13'-6" vehicle 14'-0" vehicle + load	8'-6"
MASSACHUSETTS	13'-6"	8'-6"
NEW HAMPSHIRE	13'-6"	12' lanes or buses 8'-6" All others 8'-0"
RHODE ISLAND	13'-6"	8'-6"
VERMONT	13'-6"	8'-6"
AASHTO RECOMMENDS	13'-6"	8'-6" on Interstate 8'-6" on state roads as appropriate with highway geometrics

12'. Of the 4600 miles of roadway reported for New Hampshire in the 1983 Highway Statistics manual published by the DOT, over 2600 miles have lane widths less than 12'. (19) (See Table 3-1).

3.5 STATE LENGTH LIMITS

3.5.1 SINGLE UNIT TRUCKS

The length limits for single unit trucks vary widely accross New England (35'-60'). The two states with the lowest limits, New Hampshire and Massachussetts, might be expected to be an impediment to the travel of the longer vehicles allowed in the other states. However, there are not very many single unit trucks over 35 feet registered in the other New England states. The 1982 Census of Transportation indicates that in that year there were only about 600 single unit trucks over 35' in all of New England. (2,3,4,5,9,11) Even if we consider the number of single unit trucks over 35' in the neighboring states of New York, Pennslyvania, and New Jersey, the total is only about 5000 trucks. (6,7,8) On a national basis, single unit trucks over 35' represent only about 0.1 percent of all single unit trucks. The Census also indicates that the great majority of these trucks travel less than 50 miles from their home base. (See Table 3-2).

3.5.2 COMBINATION VEHICLES

Massachusetts, and Vermont restrict the length of combination vehicles to 60' or less. In Maine the limit is 65'.

TABLE 3-2

SIZE LIMITS

	SINGLE UNIT	COMBINATION UNIT	SEMI TRAILERS	DOUBLE TRAILERS
CONNECTICUT	60'	-	48'	28'
MAINE	45'	65'	48'	28.5'
MASSACHUSETTS	33' 35' Trucks 40' Buses	60'	45'	28'
NEW HAMPSHIRE	35' 40' Buses	-	48'	28'
RHODE ISLAND	40'	-	48.5'	28.5'
VERMONT	60'	60'	48'	28'
AASHTO RECOMMENDS	40'	65'	48'	-

The data in the 1982 Census of Transportation only shows vehicle lengths up to "45 feet or more" so it is difficult to determine how many vehicles in New England are affected by these restrictions. However, the 1982 STAA prohibits states from restricting the length of semitrailer or double bottom combination vehicles on the National Network so the only places where these length restrictions apply is on the state and local roads of these three states. Even with the 48' semitrailers approved for use on the Interstate system, a truck tractor-semitrailer combination can probably meet the 60' requirement if the truck tractor is of the "cab over" design. (See Table 3-2).

3.6 STATE WEIGHT LIMITS

3.6.1 SINGLE AXLE

The 1956 Federal-Aid Highway Act established weight limits for the Interstate system. It also "grandfathered" the existing weight laws of the states. For the most part the northeastern states, including all the New England states, had weight limits higher than those imposed by the Federal government. This is why the single axle limits in most of New England are 22,400 pounds when the Federal limit imposed by the 1974 STAA, and made uniform by the 1982 STAA, is only 20,000 pounds.

However, while the above explanation may seem clear, the possibility of confusion still exists. The grandfathered axle

weight rights of the states only apply up to the gross weights that were in effect in the states in 1956. Since the 1982 STAA raised the Federal gross weight limits above the 1956 state gross weight limits, the grandfathered axle weight limits do not apply at gross weights above the the 1956 state gross weight limits. Thus, for vehicle gross weights above 73,280 pounds, the Federal axle weight restriction of 20,000 pounds applies, while for vehicle gross weights below 73,280 pounds the grandfathered axle weight limit of 22,400 pounds applies.

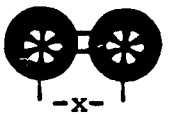
Maine's grandfathered axle weight limit is only 22,000 pounds, not 22,400 pounds, as it is in the other New England States. Additionally, among the different states there are several definitions of what constitutes a single axle. While these differences may seem small by themselves, they are symptomatic of the differences which exist between the states in almost every area of overweight and oversize vehicle regulation. (See Table 3-3).

3.6.2 TANDEM AXLES

What is a Tandem Axle? In New England alone there are at least four definitions of how close two axles must be before they are considered a Tandem Axle. Naturally, each definition has its own weight limit associated with it. Sometimes, even those states which share a common definition of axle spacing for tandem axles do not share a common weight limit for that definition. The weights allowed on tandem axles in New

TABLE 3-3

WEIGHT LIMITS



	SINGLE AXLE	TANDEM AXLES
CONNECTICUT	22,000 lb	36,000 lb x ≤ 6'
MAINE	22,400 lb 22,000 lb Interstate 20,000 lb Interstate if GVW > 73,280 lb	34,000 lb Interstate 38,000 lb state roads 4' ≤ x ≤ 8'
MASSACHUSETTS	22,400 lb	36,000 lb x ≤ 6'
NEW HAMPSHIRE	22,400 lb 20,000 lb Interstate if GVW > 73,280 lb	36,000 lb state roads x ≤ 10' 34,000 lb Interstate x ≤ 8' if GVW > 73,280 lb
RHODE ISLAND	22,400 lb	Not Specified
VERMONT	22,400 lb	36,000 lb 4' ≤ x ≤ 8'
AASHTO RECOMMENDS	20,000 lb	34,000 lb

England range fromm 32,000 pounds to 38,000 pounds, depending not only on the state the vehicle is in but also whether or not it is on the Interstate system or a state road. The same problems that affect the grandfathering of single axle limits also affect the weight limits of tandem axles.
(See Table 3-3).

3.6.3 TWO AXLE VEHICLES

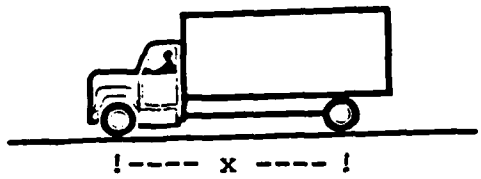
The gross weight limits for two axle vehicles range from 32,000 pounds in Rhode Island to 46,000 pounds (effectively 44,800 pounds due to single axle limits) in Massachussetts. There are several intermediate levels in between based on axle spacing and location on or off the Interstate system. Some of the states apply a flat limit to these vehicles regardless of the axle spacing, while others impose the axle spacing limitations inherent in the National Bridge Formula (NBF). However, the effects of these differences on interstate commerce a likely to be quite small for the same reasons given in the discussion of the single unit length restrictions. There simply are not very many single unit trucks engaged in interstate commerce in New England.
(See Table 3-4).

3.6.4 THREE AXLE SINGLE UNIT VEHICLES

The maximum weights for three axle single unit vehicles are as spread out as the ones for two axle vehicles, ranging from 40,000 pounds to 60,000 pounds. Again some states have

TABLE 3-4

WEIGHT LIMITS



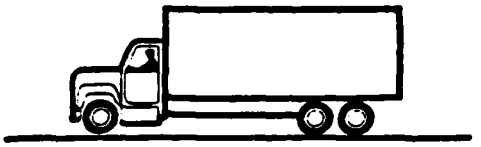
TWO AXLE VEHICLES

CONNECTICUT	36,000 lb x ≤ 8'	40,000 lb x ≥ 10'
MAINE	State Roads 34,000 lb	Interstate *NBF Max = 34,000 lb for 4'≤x≤8'
MASSACHUSETTS	46,000 lb (effectively due to single axle limit of 22,400 lb)	44,800 lb
NEW HAMPSHIRE	33,400 lb	
RHODE ISLAND	32,000 lb x < 6'	36,000 lb x ≥ 6'
VERMONT	34,000 lb x ≤ 8'	40,000 lb x ≥ 10'
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)	

*The National Bridge Formula (NBF) is the same as the above AASHTO recommendation. Thus the actual value depends on the characteristics of the vehicle in question.

TABLE 3-5

WEIGHT LIMITS



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THREE AXLE SINGLE UNIT VEHICLES

CONNECTICUT	53,000 lb	60,000 lb if NBF OK
MAINE	State Roads 54,000 lb	Interstate NBF
MASSACHUSETTS	NBF	
NEW HAMPSHIRE	State Roads 55,000 lb	Interstate 47,000 or NBF if greater
RHODE ISLAND	40,000 lb x < 15'	44,000 lb x ≥ 15'
VERMONT	State Roads 55,000 lb	Interstate NBF
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)	

only a flat limit while others impose axle spacing requirements either explicitly, or through the requirements of the NBF. (See Table 4-5).

3.6.5 TRIAXLES

Most states control the weight on triaxle units by the NBF, however, Maine and Vermont set explicit limits of 48,000 pounds and 54,000 pounds respectively. Most triaxles are found on special heavy duty equipment such as cement trucks, dump trucks, truck mounted cranes, and forest product trucks. Since these vehicles are rarely involved in interstate travel the effect of the differences in weight limits between the states is very small, if any. (See Table 3-6).

3.6.6 FOUR AXLE SINGLE UNIT VEHICLES

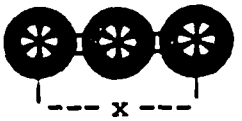
The weight limits for four axle single unit vehicles range widely between the states. Rhode Island allows 47,500 pounds, depending on the wheelbase of the vehicle, while Connecticut allows up to 73,000 pounds. But, since these are for the most part special purpose vehicles, the effects of these differences on the commerce between the states is probably negligible. (See Table 3-7)

3.6.7 THREE AXLE COMBINATION VEHICLES

As vehicle size increases, more of the states use the NBF to set the maximum weights for operation on the highway systems. In fact, Maine and Rhode Island are the only two

TABLE 3-6

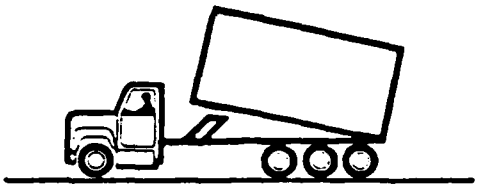
WEIGHT LIMITS



	TRIAXLES	
CONNECTICUT	NBF	
MAINE	STATE ROADS 48,000 lb	Interstate 42,000 LB
MASSACHUSETTS	NBF	
NEW HAMPSHIRE	NBF	
RHODE ISLAND	NBF	
VERMONT	State Roads 54,000 lb	Interstate NBF
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)	

TABLE 3-7

WEIGHT LIMITS



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FOUR AXLE SINGLE UNIT VEHICLES

CONNECTICUT	67,400 lb x < 28'	73,000 lb x ≥ 28'
MAINE	State Roads 69,000 lb	Interstate NBF
MASSACHUSETTS	NBF	
NEW HAMPSHIRE	State Roads 60,000 lb	Interstate 47,500 lb or NBF if greater
RHODE ISLAND	40,000 lb x < 15'	44,000 lb x ≥ 15'
VERMONT	State Roads 60,000 lb	Interstate NBF
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)	

states with explicit weight limits for this category of vehicle. Maine even uses the NBF for the limit on the Interstate system. Thus, as vehicle size grows, the state weight regulations tend to converge to a more uniform system. (See Table 3-8).

3.6.8 FOUR AXLE COMBINATION VEHICLES

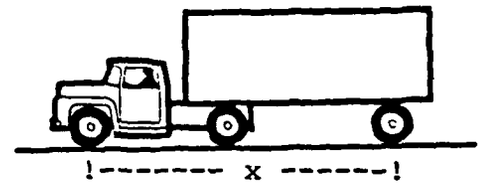
Four axle and five axle (described in the next paragraph) combination vehicles make up to bulk of the trucks engaged in interstate commerce. For the most part the weight of four axle combinations is controlled by the NBF. Connecticut, Maine, and Rhode Island all set explicit limits for the weight of these vehicles based on either a flat limit or on axle spacings. The 1982 Census of Transportation estimated there were about 11,000 of these vehicles registered in the New England states. The neighboring states of New York, New Jersey, and Pennsylvania have an additional 107,000 of these vehicles. (6,7,8) On a national basis these vehicles represent over 913,000 registrations and over 12 percent of the traffic volume on the highways. (10) Thus, any differences in the weight limits between the states will have a profound impact on the truck operators in New England. This effect will be compounded by the effects resulting from the differences in tandem axle regulations. (See Table 3-9).

3.6.9 FIVE AXLE COMBINATION VEHICLES

In general, the NBF must be satisfied for all five axle

TABLE 3-8

WEIGHT LIMITS

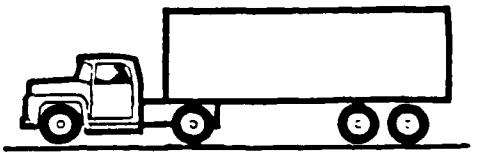


THREE AXLE COMBINATION VEHICLES

CONNECTICUT	58,400 lb		60,000 lb if NBF OK
MAINE	State Roads 54,000 lb		Interstate NBF
MASSACHUSETTS	NBF		
NEW HAMPSHIRE	State Roads 60,000 lb		Interstate 60,000 lb or NBF if less
RHODE ISLAND	40,000 lb x < 22'	50,000 lb 22' ≤ x < 27'	56,800 lb x ≥ 27'
VERMONT	NBF		
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)		

TABLE 3-9

WEIGHT LIMITS



FOUR AXLE COMBINATION VEHICLES

CONNECTICUT	67,400 lb x < 28'		73,000 lb x ≥ 28' or NBF up to 80,000
MAINE	State Roads 69,000 lb		Interstate NBF up to 72,000 lb
MASSACHUSETTS	NBF up to 80,000 lb		
NEW HAMPSHIRE	NBF up to 68,000 lb		
RHODE ISLAND	46,000 lb x < 22'	50,000 lb 22' ≤ x < 27'	67,400 lb x ≥ 27'
VERMONT	NBF		
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)		

vehicles operating in New England. Because of grandfather clause exemptions however, vehicles operating in New Hampshire and Connecticut do not have to satisfy the NBF if they have a gross weight under 73,200 pounds. Vehicles in Rhode Island must meet the specifications of the Rhode Island weight schedule, grandfathered by the 1974 STAA discussed earlier. There are about 14,000 five axle combination vehicles registered in New England (2,3,4,5,9,11). Together with the four axle combinations, they represent the bulk of the trucks involved in interstate commerce and thus run up against the diverse array of state regulations on a regular basis. (See Table 3-10).

3.6.10 MORE THAN FIVE AXLES

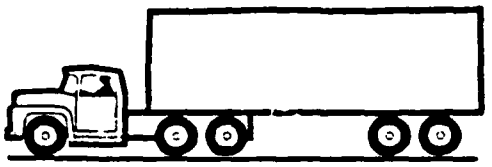
Combination vehicles with more than five axles are limited to a gross weight of 80,000 pounds provided the requirements of the NBF are satisfied. All the New England states agree on this point. (See Table 3-11).

3.6.11 SUMMARY OF WEIGHT REGULATIONS

The truck weight reguirements of the New England states represent a set of conflicting, and often inconsistent, regulations. The conflicts and inconsistencies between the regulations of the six states are brought about by two major factors. The first is simply the independence of the sovereign states. Each state has tried to best provide for the economic well-being of its citizens by regulating the use of

TABLE 3-10

WEIGHT LIMITS

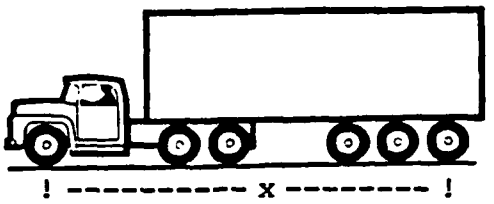


FIVE AXLE COMBINATION VEHICLES

CONNECTICUT	73,000 lb		80,000 lb if NBF OK
MAINE	State Roads 80,000 lb		Interstate NBF Max = 80,000 lb
MASSACHUSETTS	NBF up to 80,000 lb		
NEW HAMPSHIRE	80,000 NBF after 73,280 lb		
RHODE ISLAND	46,000 lb x < 22'	50,000 lb 22' ≤ x < 27'	67,400 lb x ≥ 27'
VERMONT	NBF up to 80,000 lb		
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)		

TABLE 3-11

WEIGHT LIMITS



MORE THAN FIVE AXLES

CONNECTICUT	NBF
MAINE	NBF
MASSACHUSETTS	NBF
NEW HAMPSHIRE	NBF
RHODE ISLAND	NBF
VERMONT	NBF
AASHTO RECOMMENDS	GROSS WEIGHT = 500((LN/N-1)+12N+36)

the highways within the state as it best sees fit. Each state faces a different situation and so regulates highway use in a different manner than its neighbors. Secondly, as the influence of the Federal government into highway regulation has grown more significant through the years, the differences brought on by different grandfather rights, and by the differences in the regulations affecting the Interstate and nonintersate systems, have continued to grow. These differences manifest themselves in states like New Hampshire and Maine where the axle weight limits are different depending on whether the truck is on or off the Interstate system, or if its gross weight exceeds a certain level.

3.7 PERMIT REGULATIONS

The highway systems of the states have been designed to carry certain specified design loads and vehicle sizes. Vehicles which exceed these specifications affect the ordinary use of the highway. Nevertheless, there are some loads which can only be moved economically by truck. Large pieces of machinery and construction equipment are two examples. Thus, the states have a clear need for establishing an efficient system which can monitor these loads and allow them to pass safely over the highway.

Operators of vehicles which exceed a state's legal limits for height, width, length, or weight may request a special permit from the state exempting the vehicle from the state's legal limits. By issuing these permits the state

authorities can safely allow the movement of these extra-legal loads while at the same time exercising some degree of control over their size, weight , location , and timing.

Thus, the purpose of an oversize and overweight permit system is to allow the state to benefit from the economic growth due to these extra-legal loads while at the same time protecting its investment in the highway system and the safety of its citizens.

3.7.1 PERMIT FEES

The fees charged for oversize and overweight permits vary from state to state. Some states do not even charge a fee. Basically a state's fee structure reflects its philosophy towards the use of the highway. Those states which regard providing a permit as a service to the public will charge a low fee or none at all. Other states will charge a fee more in line with what they believe is the impact or inconvenience caused by the vehicle requiring the permit. (See Table 3-12).

3.7.2 PERMIT DURATION

Oversize and overweight permits are available from the different states for many different durations. Some types of permits are available on an annual basis, others on a quarterly or monthly basis. Some are only available on a per-trip basis. Single trip permits can be valid anywhere from one day

TABLE 3-12

PERMIT FEES

NON-DIVISIBLE LOADS

	SINGLE TRIP	MULTI-TRIP		
		ANNUAL	3 MONTH	6 MONTH
CONNECTICUT	$15.00	N/A	N/A	N/A
MAINE	$3.00 to $15.00	N/A	$15.00/month	N/A
MASSACHUSETTS	No Charge	No Charge	N/A	N/A
NEW HAMPSHIRE	$5.00 Oversize $5.00+ Overweight	$100 or $50	N/A	N/A
RHODE ISLAND	No Charge	No Charge	No Charge	No Charge
VERMONT	$10.00	$35 1st $20 2nd $15 3rd and subsequent	N/A	N/A

DIVISIBLE LOADS

	Single Trip	Annual
MASSACHUSETTS	N/A	Prorated on excess weight
RHODE ISLAND	N/A	Prorated on excess weight
MAINE	N/A	Prorated on excess weight

to two weeks.

The single trip permits offer the states the most control over the item being moved. On the other hand annual and quarterly permits offer convenience to both the state and the vehicle operator by reducing the number of permits which have to be issued. However, the state loses all control over the number of moves a vehicle makes under such a permit. Thus, annual permits become, in effect, an exemption from the requirements of the laws and regulations of the state.

3.7.3 PERMIT TRAVEL DAYS

Permit travel is restricted by all the New England states on the same eight major holidays when traffic conditions would make travel by oversize or overweight vehicles hazardous. In addition, each state has designated certain other holidays during which permit travel is also restricted. These holidays are not consistent from state to state. For example, Rhode Island is the only state to celebrate Victory Day in August, while Maine and Vermont are the only states to restrict permit traffic on President's Day in February. Even more confusing to someone from out of the area is the fact that Memorial Day is not celebrated on the same day in each of the New England states.

Not only are there different holidays in each state, but each state has a different method for dealing with the traffic build-ups which invariably occur on the days before and

after a holiday. Some states treat the whole day, both before and after the holiday, as a holiday as well. Other states only restrict traffic for a half day before or after the holiday.

Futhermore, depending on the size of the load being moved, there may be additional restrictions as to which days of the week loads exceeding certain sizes may be moved. When these additional regulations are coupled with the variable list of holidays from each state, it is a wonder that any company moving oversize or overweight loads can keep track of which days it can move in which states. Because of the numerous differences in permit travel restrictions among the New England states, someone from out of the region could easily find themselves stopped at a state border because of a holiday or other travel restriction which was peculiar to just that state. For example, Maine and Massachusetts both allow permit travel on Saturdays, but New Hampshire does not. (See Appendix 1 for details).

3.7.4 DAYLIGHT HOURS

Vehicles moving through a state under the authority of a permit are usually required to move only during "daylight hours." However, there are four different definitions of what constitutes "daylight hours" in the oversize and overweight regulations of the New England states. They range from 60 minutes before sunrise - 30 minutes after sunset, to 30 minutes after sunrise - 30 minutes before sunset. Some states

TABLE 3-13

DAYLIGHT HOURS FOR EXTRA-LEGAL LOADS

CONNECTICUT	1/2 Hour after Sunrise to 1/2 Hour before Sunset
MAINE	Sunrise to Sunset*
MASSACHUSETTS	Not Defined
NEW HAMPSHIRE	1/2 Hour before Sunrise to 1/2 Hour after Sunset**
RHODE ISLAND	Sunrise to Sunset
VERMONT	1/2 Hour Before Sunrise to 1/2 Hour after Sunset
AASHTO RECOMMENDS	1/2 Hour Before Sunrise to 1/2 Hour after Sunset

---

* 1 Hour before Sunrise to 1/2 Hour after Sunset for Mobile Homes.

** 1 Hour before Sunrise to 1/2 Hour after Sunset for Modular Homes.

TABLE 3-14

WEEKEND RESTRICTIONS FOR EXTRA-LEGAL LOADS

CONNECTICUT	No Travel on Saturdays or Sundays.
MAINE	No Travel on Sundays, or on Saturdays in July and August.
MASSACHUSETTS	No Travel 12pm Saturday to Daylight Monday.
NEW HAMPSHIRE	No Travel on Saturdays or on Sundays.
RHODE ISLAND	No Travel on Saturdays or on Sundays.
VERMONT	No Travel on Satudays or on Sundays. No travel on Fridays after 12pm, July 4th through Labor Day.
AASHTO RECOMMENDS	Restrictions as desired by each state

even have two definitions, depending on the type of load being moved. Given the size of the New England states, a permit load could easily begin its trip within the allotted daylight hours and arrive at the next state's border before it was legal to move in that state. (See Table 3-13).

3.7.5 SUMMARY OF PERMIT REQUIREMENTS

The restrictions placed on permit loads through the regulations governing the days and hours they may travel are designed to protect the safety of the travelling public. By restricting permit loads to daylight hours and to days when the other traffic on the highways will be as light as possible, these regulations accomplish this task quite well. However, when these individual state regulations are thrown together in a area as small as New England, the small differences between the regulations seem to become much bigger. A more uniform system of control over days and times of travel would reduce the problems faced by both the trucking industry and the states.

3.8 SAFETY REQUIREMENTS FOR OVERSIZE LOADS

Each of the New England states has placed special requirements on the movements of certain oversize and overweight loads. These requirements include the use of flags, lights, escort vehicles, and signs. The regulations of each of the states are slightly different, leading to confusion as to the proper equipment required in each state.

3.8.1 FLAGS

Red or orange flags are required in most of the states, but that is where the similarities between the states stops. There are three different size flags required in New England. They range in size from 12" X 12" on up to and including 18" X 18". Some states require them to be placed on all four corners of the transporter. Others only require them on the corners opposite the escort vehicle. Some states do not require them to be on the load, but on the escort vehicle instead; while others require them to be on both the escort and the transporter. (See Table 3-15).

3.8.2 LIGHTS

In addition to the red or orange flags, most of the New England states require at least one flashing amber light on either the transporter or an escort vehicle. However, as with the requirements for the flags, the regulations vary widely between the states. In addition, there are separate requirements detailing whether the escorts or the transporter must keep their headlights on during the day. (See Table 3-15).

3.8.3 ESCORT VEHICLES

Escort vehicles are required by the states to provide a warning to either oncoming or following traffic that there is a unusual vehicle traveling on the road. If there is only one escort it must lead the load on two lane roads and follow the load on four lane divided highways. Escort vehicles can be

TABLE 3-15

SAFETY REQUIREMENTS FOR OVERSIZE LOADS

	FLAGS	LIGHTS
CONNECTICUT	18" X 18" on Four Corners of Load and on Escort	Flashing Yellow Light on Escorts
MAINE	18" X 18" on Corners opposite Escort Vehicle	Two Lights on Escorts, One on Transporter
MASSACHUSETTS	Flags on Escort Vehicle	N/A
NEW HAMPSHIRE	N/A	Flashing Yellow Light on Escort Vehicle
RHODE ISLAND	12" X 12" on Four Corners of Load	Flashing Yellow Lights on Escort Vehicles
VERMONT	16" X 16" on Four Corners of Load	Flashing Yellow Lights on Escort Vehicles
AASHTO RECOMMENDS	18" X 18" at the Widest Extremities of Load	Lights Only at Night

AD-A167 720 AN ANALYSIS AND DEVELOPMENT OF A RATIONALE FOR ESTABLISHING A COMMON REGI..(U) ARMY MILITARY PERSONNEL CENTER ALEXANDRIA VA R F DAVIS JUN 86 2/3

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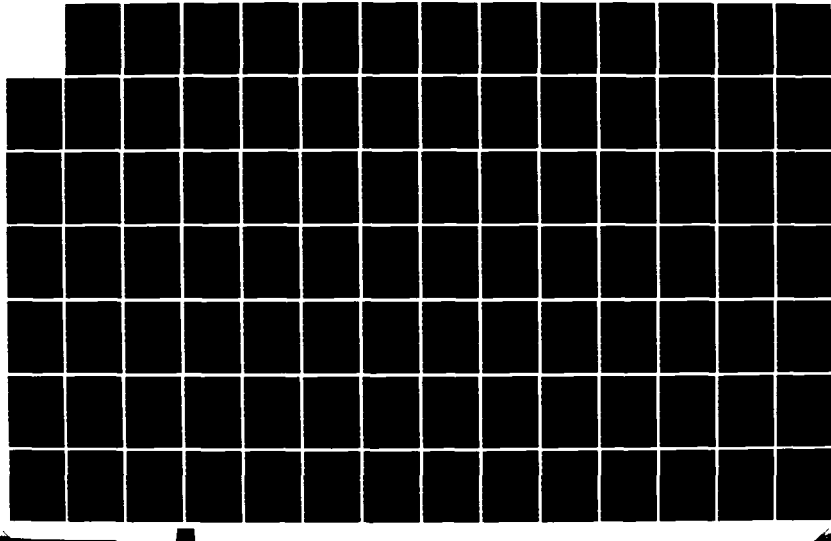

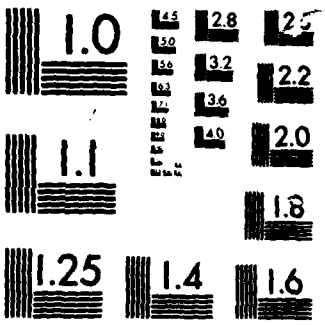

MICROCOPY CHART

required for loads just over the legal width of 8'-6", or may not be required until the width of the load reaches 12', depending the state.

Some states require an escort vehicle for loads which are overly long. The requirement can be for an escort for each load which is just over the legal length, or an escort may not be required until the length reaches 84', again depending on the state. The requirements for two escorts are just as varied as the requirements for one escort. These requirements have a very direct effect on the cost of moving an oversize load. (See Table 3-16).

3.8.4 SIGNS

The New England states require signs to be placed on either the oversize load or the accompanying escorts to warn the rest of the travelling public. However, there is no consistency as to where the sign is to be located. Some states require it to be on the transporter, some on the escort vehicle, and some states require a sign on both vehicles. The size of the sign is also quite variable. Most of the New England states require the sign to be at least 7' X 18", but one state only requires it to be 3' X 3', and another only requires it to be 5' X 18". The lettering on the signs is also of variable sizes. They range from 6" letters in one state to 8" X 1" letters in another to 10" X 1 5/8" in a third. In addition, the wording of the message is equally variable. There are at least four different wordings in the

TABLE 3-16

ESCORTS

CONNECTICUT	Widths greater than 12', or lane width, require one escort. Overhangs more than 25' require one escort. Otherwise as required on permit.
MAINE	Widths over 11'-6" require one escort. Others as required on permit.
MASSACHUSETTS	Widths over 12', lengths over 80' require one escort. Widths over 13', lengths over 95' require two escorts. Overhangs of 15' or more require one escort.
NEW HAMPSHIRE	Widths over 10'-3" and lengths over 75' require one escort. Additional State Police escort required for widths over 18' and lengths over 90'.
RHODE ISLAND	Widths over 12', lengths over 60', heights over 14' require one escort. Widths over 13', lengths over 80' require two escorts.
VERMONT	Widths over 10'-6" and lengths over 84' require one escort. Widths over 14' and lengths over 90' require two escorts on two lane roads.
AASHTO RECOMMENDS	One escort per vehicle. Required for 12' width on two lane highway, 14' width on 4 lane highway. Follow an overlength load; and overwidth load on multi-lane highway. Precede an overwidth load on a 2 lane highway.

TABLE 3-17

SIGNS

	WORDING	SIGN SIZE	LETTER SIZE	LOCATION
CONNECTICUT	OVERSIZE LOAD AHEAD	-	8"x1"	ESCORT
MAINE	OVERSIZE LOAD	5'x18"	10"x1 5/8"	ESCORT & LOAD
MASSACHUSETTS	N/A	N/A	N/A	N/A
NEW HAMPSHIRE	OVERSIZED LOAD or WIDE LOAD	7'x18"	10"x1 5/8"	ESCORT & LOAD
RHODE ISLAND	OVERSIZED LOAD	7'x18"	10"x1 5/8"	ESCORT
VERMONT	DANGER OVERSIZE	3'x3'	6" high	LOAD
AASHTO RECOMMENDS	OVERSIZE LOAD	7'x18"	10"x1.41"	LOAD

six New England states. To actually comply with these regulations as they are written would require a mover to stock several different size signs and to stop and change signs as he crossed each state line. More likely, the people moving oversize loads simply use one sign and ignore the requirements of the different states they pass through. (See Table 3-17).

3.8.5 SPEED LIMITS

The speed limits for oversize and overweight loads differ throughout New England. Some states restrict the speed of oversize loads to as low as 35 MPH, while others let them travel at the speed limit of the road they are on.

3.8.6 VEHICLE SPACING

Rhode Island requires that oversize loads maintain a spacing of at least 1/2 hour. The other states require from 15 minutes to 5 minutes between loads. One state only requires that there be enough space to allow passing vehicles to pull in between the loads.

3.8.7 MOBILE HOMES

Mobile and modular homes make up a large percentage of the oversize permits issued by the states. For example, in New Hampshire, permits for mobile and modular homes represent 38 percent of the total number of interstate permits issued. As such, the states have developed special regulations

governing the movement of these loads. Often these regulations are not the same as the regulations governing the movement of other types of oversize loads. For example, New Hampshire requires all loads greater than 10'-3" to have at least one escort vehicle. However, if the load is a mobile home less than 12' wide, no escort is required on a four lane divided highway. Daylight hours for modular home moves in New Hampshire begin 60 minutes before sunrise. For all other oversize loads they begin only 30 minutes before sunrise.

Some states restrict mobile home moves to only three days a week, typically Tuesday through Thursday. Others allow mobile home moves at the same times as other oversize moves. There are varying requirements for escort vehicles and signs, again different from state to state, and often different from the requirements for similar sized loads.

The purpose of these special regulations for mobile homes is to make the approval and use of these permits more routine. Typically, mobile homes are the largest, as well as the most common, oversize items transported on the highways and any effort to make the issuance and approval of an oversize permit for a mobile home more routine will reduce the workload on the state permit sections. By taking this action one step further, and making the requirements for mobile home permits more uniform across New England, as well as within the states, even greater efficiencies can be achieved. (See Appendix 1 for exact details).

3.9 DIVISIBLE LOAD PERMITS

Currently only two states, Massachussets and Rhode Island, issue permits for overweight loads which could be divided into smaller, legal loads. Connecticut also issues some divisible load permits, but these are only issued if "the Commissioner of Transportation determines; (i) that it is in the best interest of public safety and welfare or (ii) that it is in the best interest of the State." (13) The Connecticut divisible load permits are for axle weight waivers only. The other three states do not issue divisible load permits.

Divisible load permits must require adherence to Federal axle weight restrictions and the NBF, unless there are other state restrictions that are grandfathered. While these special exemptions may meet the requirements of Federal law through the legitimate use of grandfathered rights, such permits circumvent the the intent of the Federal weight limits and contribute to the premature deterioration of the Nation's highway system. (23)

The states which do not currently issue divisible load permits do not want to start issuing them, and the states which are issuing them already probably cannot stop. This one area represents a large difference in philosophies among the New England states. It may be that any attempt to make the state oversize and overweight regulations more uniform across

New England will have to skip over the issue of divisible load permits.

3.10 ENFORCEMENT OPERATIONS

A vitally important part of any oversize and overweight vehicle control system is the enforcement of the legal vehicle limits and the exceptions to those limits granted by permit. Effective truck weighing schemes coupled with stiff fines serve as a deterrent to those truck operators who would attempt to make an extra profit by operating overweight. Overweight trucks destroy roadway surfaces prematurely. "An axle weight of 26,000 pounds is only 30 percent greater than one of 20,000 pounds, but the effect on the roadway is 200 percent greater. One five axle tractor trailer loaded to 80,000 pounds weighs about the same as 20 automobiles, but its impact on the roadway is the same as that of 9,600 automobiles." (22) Thus, strict enforcement of truck weight laws and regulations can help prolong pavement life and reduce maintenance and reconstruction costs.

Currently the New England states use several different methods for enforcing the truck size and weight regulations in their state. Maine has a full time squad of the State Police devoted exclusively to truck enforcement. In fact, the recently completed Truck Issues Study, ordered by the Governor of Maine, recommended increasing the size of the Truck Enforcement Squad by 50 percent. The other extreme is Rhode Island where the truck enforcement duties are also

performed by the state police, but only on a part-time and over-time basis, making them a rather low priority. However, Rhode Island does have one of the stiffest fine structures in the country, as can be seen on the accompanying table. (See Table 3-18).

Four of the five New England Consortium states use their judical systems, either criminal or civil, to adjudicate their enforcement actions. Rhode Island uses an administrative system. The administrative systems have been found to be quite effective in Georgia and Florida. In Florida the law calls for the immediate payment of the required fine or the impoundment of the offending vehicle. Instead of holding the driver, who may have had nothing to do with loading the vehicle, responsible, this procedure directly affects the person who gains the most benefit from operating the vehicle overweight. This person, be it the owner of the truck or some other person, will usually pay his fine quickly so he can get his load back on the road. (22)

By taking the overweight violations out of the courts, the states could save valuable court time for other, more serious cases. The effectiveness of Florida's program bears looking into to see if the same type of program could be effectively applied in the New England states.

As can be seen from Tables 3-19 through 3-22, the level of enforcement activity has generally been on the increase in

TABLE 3-18

FINES FOR OVERWEIGHT VIOLATIONS

CONNECTICUT	$3/100 lbs less than 5% overweight	
	$5/100 lbs 5%-10% overweight	-Min $50
	$6/100 lbs 10%-15% overweight	-Min $100
	$7/100 lbs 15%-20% overweight	-Min $200
	$10/100 lbs 20%-25% overweight	-Min $300
	$12/100 lbs 25%-30% overweight	-Min $500
	$15/100 lbs 30% and more overweight	-Min $1000
MAINE	$10-$100 in $10 step for 1%-10% overweight	
	$120-$500 in $20 step for 11%-30% overweight	
	$525-$750 in $25 step for 31%-40% overweight	
	$800-$950 in $50 step for 41%-44% overweight	
	$1000 for 45% or greater	
MASSACHUSETTS	$30/1000 lbs for the 1st 10,000 lbs overweight	
	$60/1000 lbs thereafter. For nondivisible load	
	$10/1000 lbs, maximum = $500	
NEW HAMPSHIRE	Not more than $100 for a first offense nor more than $250 for a subsequent offense within a calander year.	
RHODE ISLAND	25 cents/lb for up to 1,000 lbs. 15 cents/lb for 1001-5000 lbs. $1.00/lb for over 5,000 lbs overweight.	
VERMONT	$5/1000 lbs for 0-5,000 lbs;	
	$10/1000 lbs for 5,001-10,000 lbs;	
	$15/1000 lbs for 10,001-15,000 lbs;	
	$20/1000 lbs for 15,001-20,000 lbs;	
	$30/1000 lbs for 20,001-25,000 lbs;	
	$50/1000 lbs for over 25,000 lbs. Also,	
	fine + 5% for 2nd conviction within 1 year,	
	fine + 10% for 3rd conviction within 1 year,	
	fine + 15% for 4th + conviction within 1 year.	

TABLE 3-19

TRUCKS WEIGHED WITH PERCENT CHANGE

	FY 1981	FY 1983	% CHANGE FROM 1981	FY 1984	% CHANGE FROM 1983
CONNECTICUT	115,453	193,221	+ 67.2	293,568	+ 51.9
MAINE	88,812	70,473	- 20.6	84,148	+ 19.4
MASSACHUSETTS	20,270	34,660	+ 71.0	33,024	- 4.7
NEW HAMPSHIRE	27,262	66,579	+144.2	16,737	- 74.9
RHODE ISLAND	3,224	3,614	+ 12.1	3,944	+ 9.1
VERMONT	26,108	29,479	+ 12.9	14,485	- 50.9

TABLE 3-20

CITATIONS ISSUED AND PERCENT CHANGE

	FY 1981	FY 1983	% CHANGE FROM 1981	FY 1984	% CHANGE FROM 1983
CONNECTICUT	2,239	3,562	+ 59.1	5,966	+ 67.5
MAINE	3,060	2,060	- 32.7	2,510	+ 21.8
MASSACHUSETTS	2,308	4,759	+106.2	4,136	- 13.1
NEW HAMPSHIRE	1,221	1,305	+ 6.9	1,363	+ 4.4
RHODE ISLAND	127	151	+ 18.9	260	+ 72.2
VERMONT	222	1,232	+455.0	1,198	- 2.8

TABLE 3-21

OTHER NON-FINE PENALTIES FY 1984

	LOAD SHIFTS	OFFLOADS	TOTAL
CONNECTICUT	0	653	653
MAINE	3,239	949	4,188
MASSACHUSETTS	0	3	3
NEW HAMPSHIRE	0	5	5
RHODE ISLAND	0	0	0
VERMONT	0	200	200

TABLE 3-22

MINIMUM OVERWEIGHT FINES FOR SELECTED VIOLATIONS*

	TANDEM AXLE GROUP 400 LB OVERWEIGHT	GROSS LOAD 10,000 LB OVERWEIGHT	GROSS LOAD 20,000 LB OVERWEIGHT
CONNECTICUT	100	100	300
MAINE	1,000	1,000	1,000
MASSACHUSETTS	120	300	1,200
NEW HAMPSHIRE	100	100	100
RHODE ISLAND	600	10,000	20,000
VERMONT	--	100	400

---

*First Offense, Court Costs Extra

New England. While enforcement of truck size and weight laws is secondary to the issue of a common system of oversize and overweight permits in New England, it is still an important area which could bear closer examination and further research in the future.

3.11 CONCLUSIONS

The limitations and regulations described in the preceding paragraphs represent the independent actions of the six New England states, each trying to best satisfy the needs of their citizens and to control the use of their state highways. In the area of vehicle dimensions, the differences between the states are relatively minor and probably can be easily made more uniform. The differences in the area of axle weights and gross weights are more profound, especially when one considers the availability of divisible load permits in Massachusetts and Rhode Island. These differences may require more serious discussions and actions to resolve them. Finally, the areas which demonstrate the most diversity between the states are the areas of safety requirements, and the special requirements for mobile and modular homes. When the effects of all three areas are combined, one can easily see that the New England region suffers from the same lack of uniformity in state weight and size regulations as has been documented in other parts of the country in the research previously discussed.

Furthermore, this lack of uniformity has been found, by

more than one study, to be a serious problem, affecting not only the trucking industry, but the manufacturers, shippers, and consumers that it serves. The total cost of this nonuniformity has been estimated to be in the billions of dollars on a national basis. Thus, in New England alone the cost could easily be several tens of millions of dollars, or more.

CHAPTER FOUR

ANALYSIS OF STATE PERMIT DATA

4.1 INTRODUCTION

The purpose of this report is to present findings and recommendations for improving the uniformity and efficiency of oversize and overweight vehicle permit operations in New England. In order to provide a more complete picture of the current situation regarding the movement of oversize and overweight vehicles in New England, a random sample was taken from the permits issued in calander year 1985 by each of the five Consortium states. The purpose of this chapter is to present the results of that sampling.

The size of the samples from each state are slightly different for a number of reasons including the time available to collect the sample and the size of the permit population for 1985. Despite these differences, each of the samples is large enough to provide the correct values for the proportional makeup of the permit populations to within $\pm$ four percent with a probability of 95.5 percent. In addition, each of the samples has some other individual characteristics which need to be taken into account before any comparisons can be made or any conclusions drawn. These characteristics are more fully described in the following sections, each devoted to a single state.

4.2 MAINE

In 1985 Maine issued approximately 18,000 permits for oversize and overweight vehicles. About 14,000 of these permits were issued by the main office in Augusta. Unlike the other states, which issue permits only from a single, central office, Maine also issues permits from seven regional offices. A quick check of the permits issued by the regional offices showed that less than five percent of these permits were for interstate travel. Thus, any benefits to be gained from a common system of issuing permits in New England would affect only the main office in Augusta to any substantial degree. Therefore, the sample used in this analysis was taken exclusively from the permits issued in Augusta.

Table 4-1 provides an overall view of the permits issued by Maine. Over half of these permits were issued for intrastate moves. However, since this study was concerned exclusively with the permits used by vehicles engaged in interstate travel, only those permits issued to interstate trucks were broken down by type of load and routing. Figure 4-1 presents the information from Table 4-1 in the form of a bar chart. From these two pages we can see that mobile homes make up the largest single category of oversize or overweight loads moving between Maine and its neighbors. This is true for all of the states surveyed.

The category of construction materials, which is the second largest in Maine, represents prefabricated steel and

concrete structures, as well as lumber, prefabricated trusses and assorted other construction items. The construction equipment category represents bulldozers, scrapers, road graders, and other types of construction equipment. The catagory Other represents assorted machinery and other loads. The largest individual item in this category is probably boats.

From Table 4-1 one can also see that very few oversize and overweight permits are for loads which are just travelling through Maine, most are for loads which either began or ended their journey in Maine. In fact, most are for loads which began their journey outside of Maine. This may be due to Maine's geographical location as a border state between the United States and Canada.

Table 4-2, with accompanying Figures 4-2A and 4-2B, shows the breakout of the oversize permits by width and length. Of the 226 permits issued for interstate loads, only 28 did not require an exception for width. The largest width group was the 13'-1" - 14'-Ø" group, which is consistent with the large number of mobile homes involved in interstate travel. The second largest group, 8'-7" - 1Ø'-Ø", represents the most common widths for construction equipment and construction material loads. The breakout of the length permits shows two distinctive peaks, one at 61'-7Ø' and another at 81'-9Ø'. Again, these two peaks relate directly to the lengths of mobile homes and construction materials and equipment.

Table 4-3, along with Figures 4-3A and Figure 4-3B, shows the breakout of the permit requirements for both gross weight and vehicle height. Unlike the requirements for overwidth and overlength permits, comparatively few permits were issued for either overweight or overheight. The permits issued for overweight show a fairly uniform distribution out to 130,000 pounds, while the overheight permits show a peak at 13'-7" - 14'-0".

TABLE 4-1

SAMPLE OF MAINE PERMITS

Approximate Number of Permits Issued in 1985 = 18,000

Sample Population of Permits from 1985 = 535

Number of Intrastate Permits from Sample = 309 (57.76 %)

Number of Interstate Permits from Sample = 226 (42.24%)

Interstate Permit Sample Population = 224

Mobile Homes (MH)*	=	75	(33.19 %)
Const Equip (CE)	=	39	(17.26 %)
Const Matls (CM)	=	64	(28.32 %)
Other	=	48	(21.24 %)

Interstate Moves Originating:

Out of State (OUT)	=	158	(69.91 %)
In State (IN)	=	68	(30.09 %)

Interstate Moves Which:

Are Thru State (THRU)	=	11	(4.87 %)
Begin or End in State (BEGIN OR END)	=	215	(95.13 %)

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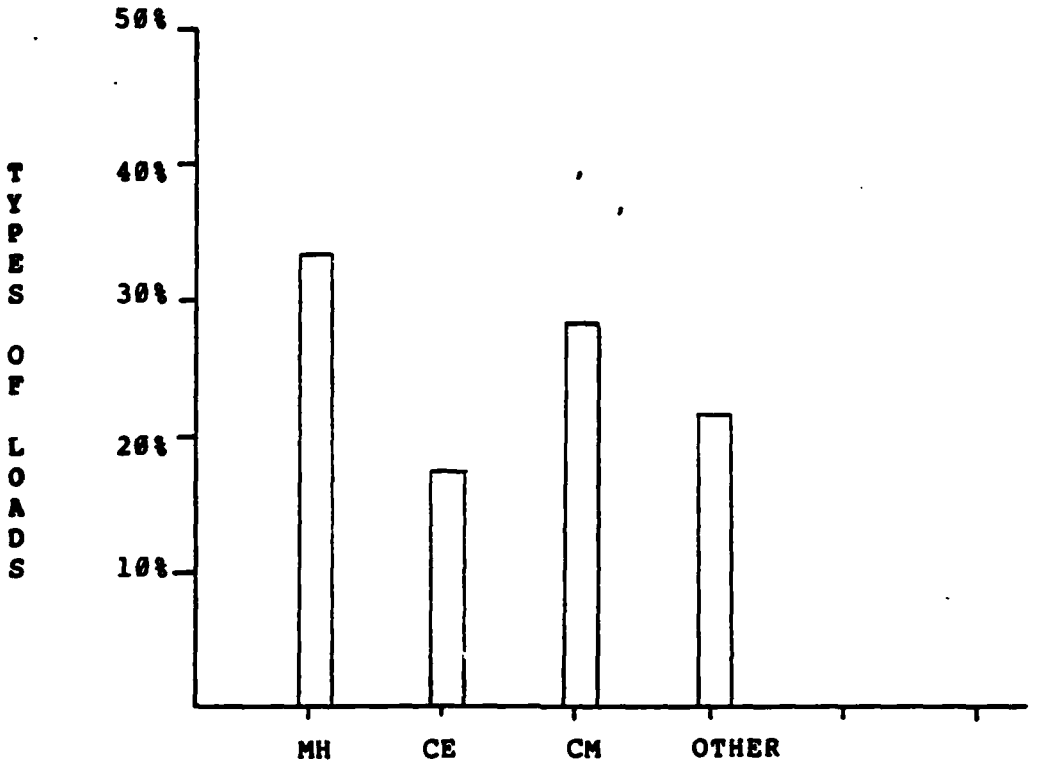
* The abbreviations enclosed in parantheses are used to identify the different categories on the following graphs. The same abbreviations are used for each state throughout this chapter.

FIGURE 4-1 MAINE PERMIT LOADS



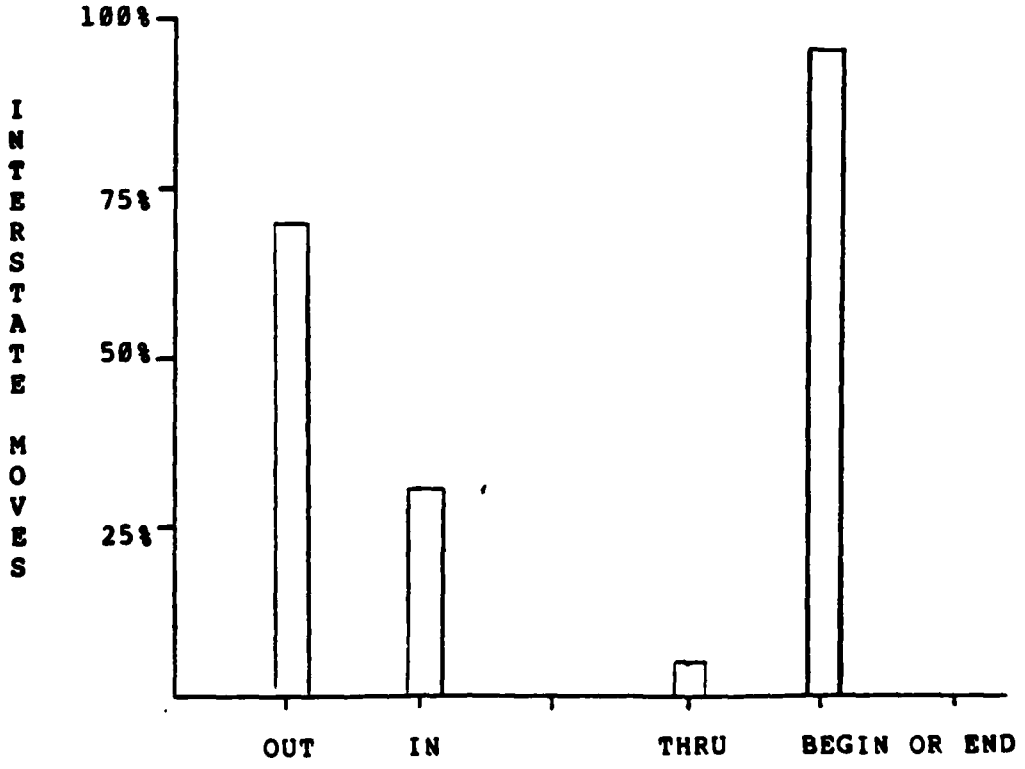


TABLE 4-2

MAINE WIDTHS

WIDTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 8'-6"	28*	12.39%	12.39%
8'-7" - 10'-0"	53	23.45%	35.84%
10'-1" - 11'-0"	20	8.85%	44.69%
11'-1" - 12-0"	33	14.70%	59.29%
12'-1" - 13'-0"	16	7.08%	66.37%
13'-1" - 14'-0"	69	30.53%	96.90%
14'-1" - 15'-0"	4	1.77%	98.67%
> 15'-0"	3	1.33%	100.00%
	226		

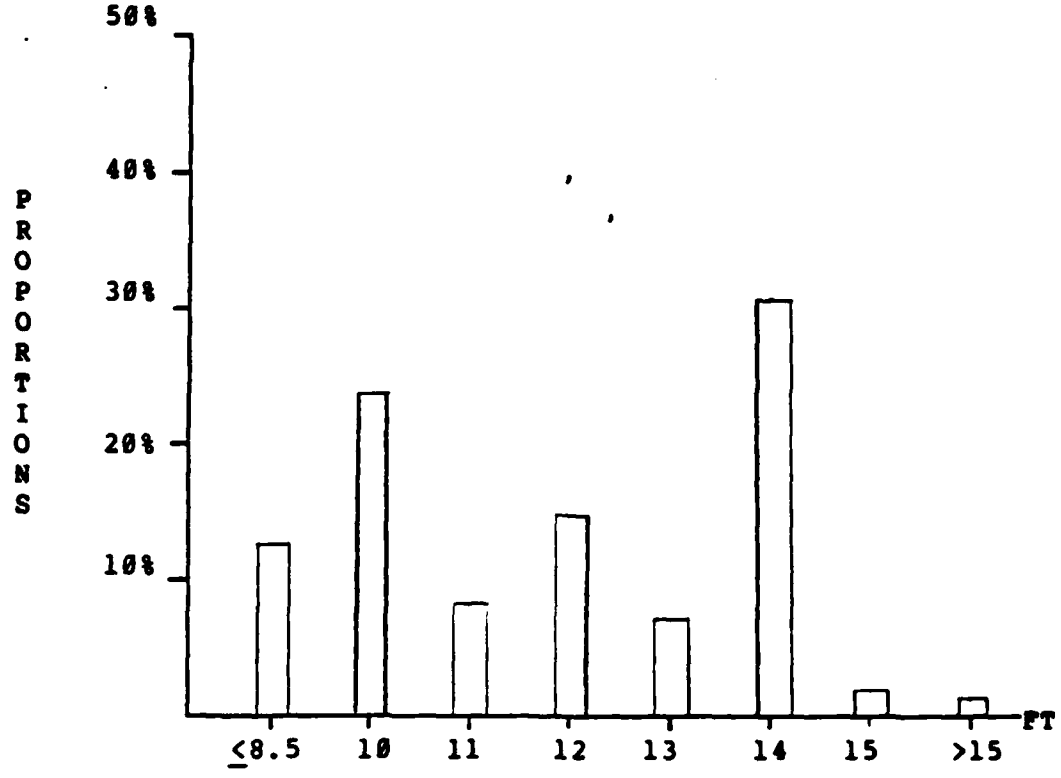
*NO PERMIT REQUIRED FOR WIDTHS ≤ 8' - 6".

MAINE LENGTHS

LENGTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 60'	53**	23.45%	23.45%
61' - 70'	73**	32.30%	55.75%
71' - 80'	29	12.83%	68.58%
81' - 90'	62	27.43%	96.02%
91' - 100'	9	3.98%	100.00%
> 100'	0	0.00%	100.00%
	226		

**NO PERMIT REQUIRED FOR LENGTHS ≤ 65' EXCEPT FOR SINGLE UNIT VEHICLES, THEN THE LIMIT IS 45'

FIGURE 4-2A MAINE WIDTHS



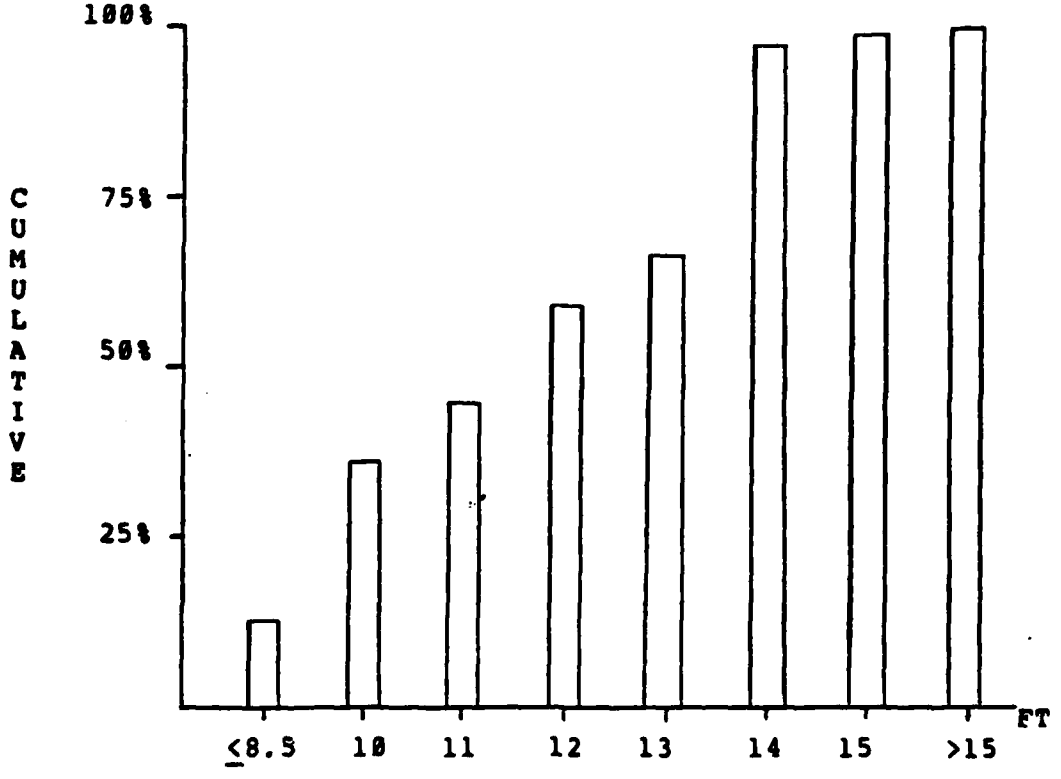
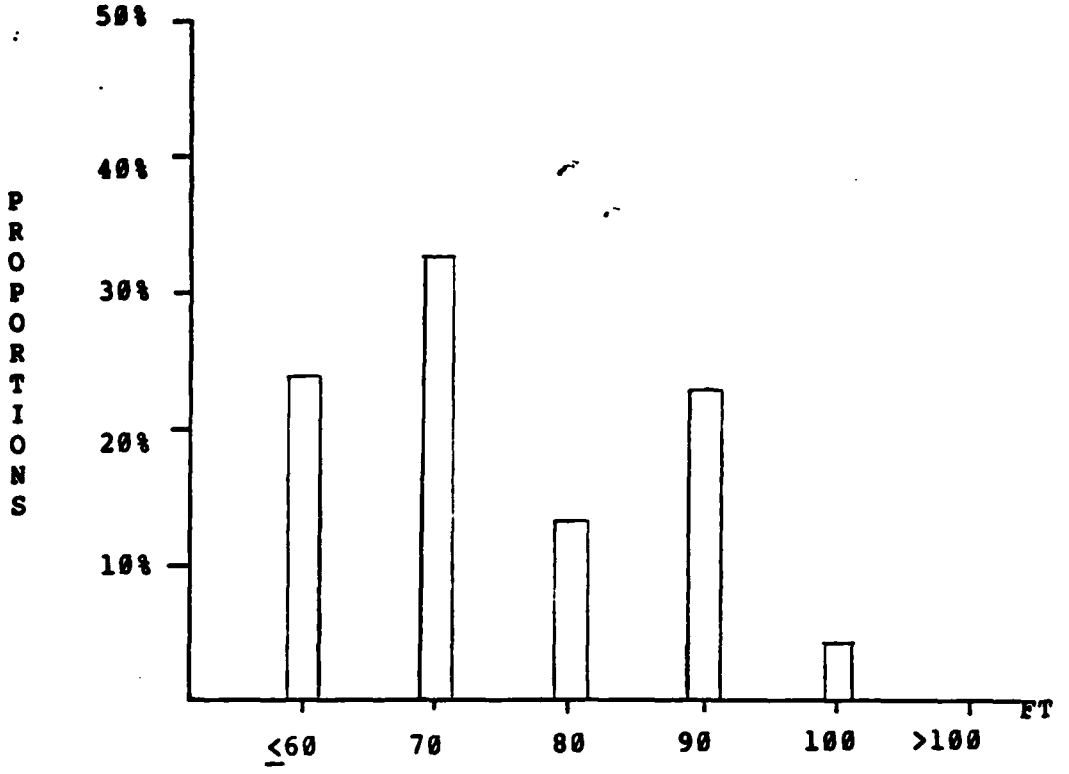


FIGURE 4-2B MAINE LENGTHS



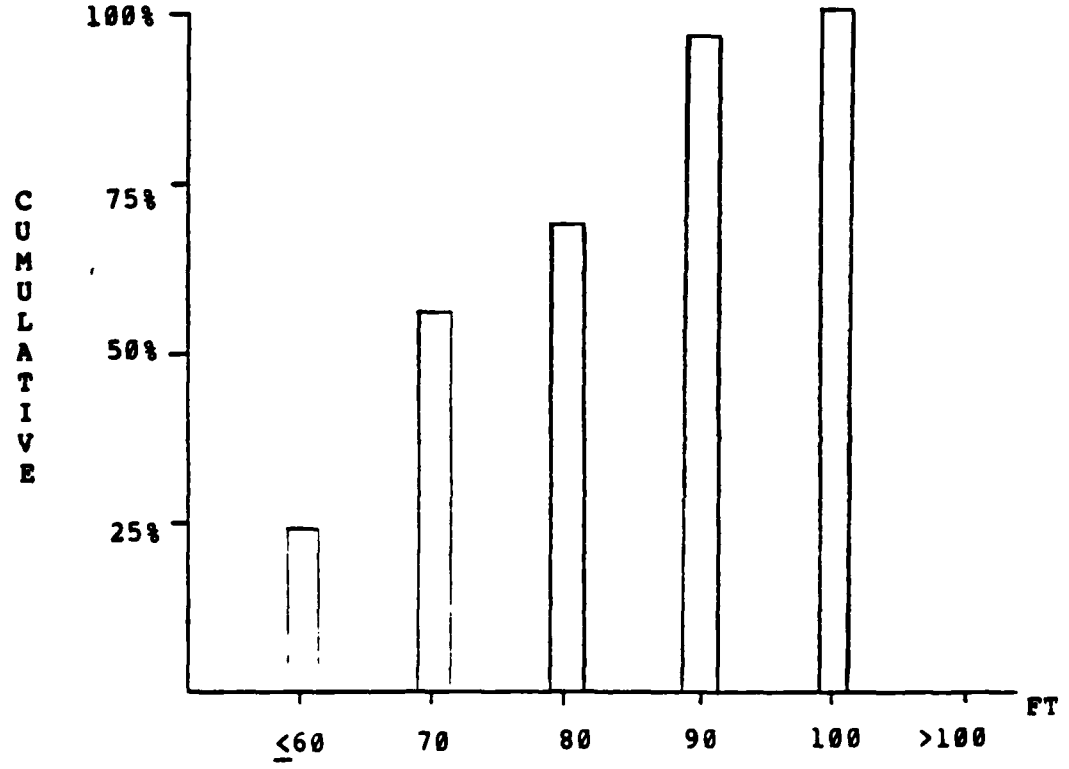


TABLE 4-3

MAINE GROSS WEIGHTS

WEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 80K	195	86.28%	86.28%
81K - 90K	8	3.54%	89.82%
91K - 100K	4	1.77%	91.59%
100K - 110K	4	1.77%	93.36%
111K - 120K	5	2.21%	95.57%
121K - 130K	8	3.54%	99.11%
131K - 140K	2	0.89%	100.00%
> 140K	0	0.00%	100.00%
	226		

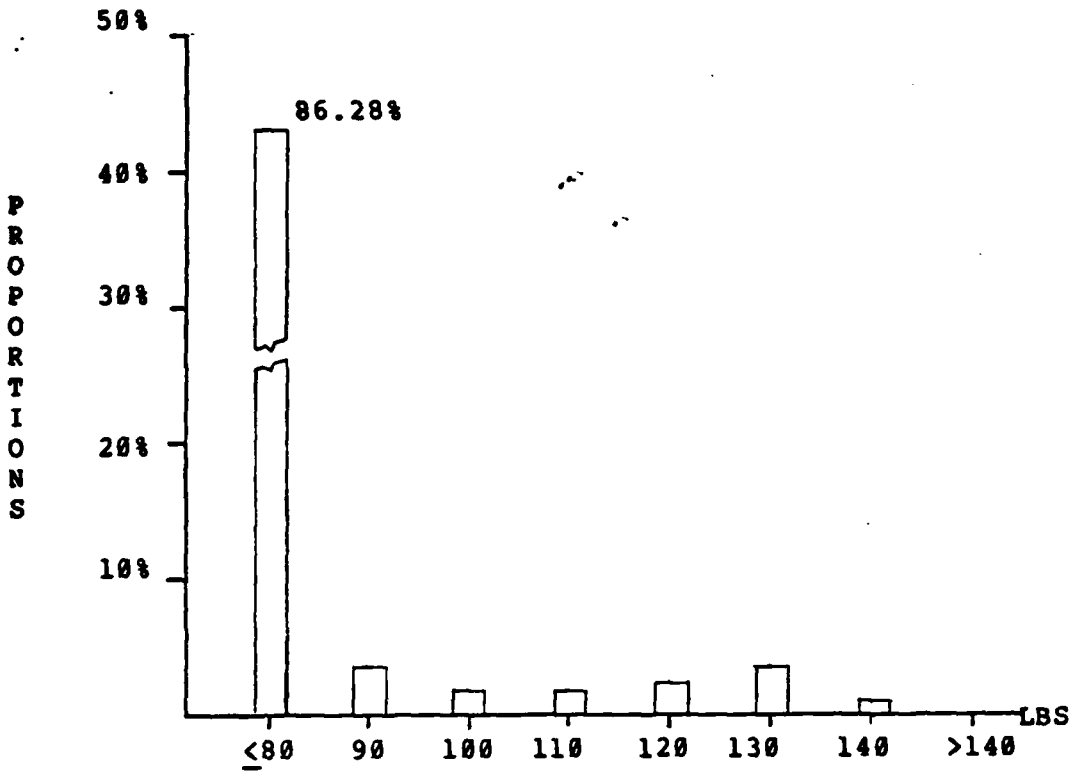
*NO PERMIT REQUIRED FOR GROSS WEIGHTS ≤ 80,000 POUNDS PROVIDED AXLE SPACING REQUIREMENTS OF THE NBF ARE SATISFIED.

MAINE HEIGHTS

HEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 13'-6"	215**	95.13%	95.13%
13'-7" - 14'-0"	7	3.10%	98.23%
14'-1" - 14'-6"	2	0.88%	99.11%
14'-7" - 15'-0"	1	0.44%	99.55%
15'-1" - 15'-6"	0	0.00%	99.55%
15'-7" - 16'-0"	1	0.44%	100.00%
> 16'-0"	0	0.00%	100.00%
	226		

**NO PERMIT REQUIRED FOR HEIGHTS ≤ 13' - 6".

FIGURE 4-3A MAINE GROSS WEIGHTS (000'S)



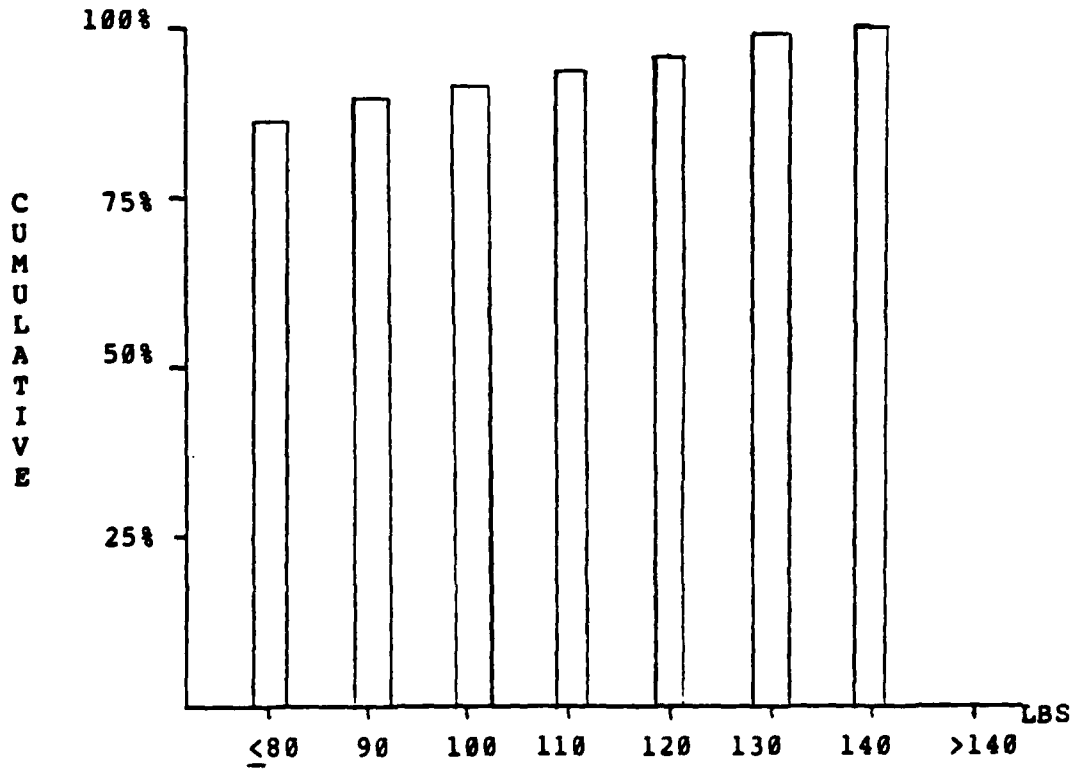
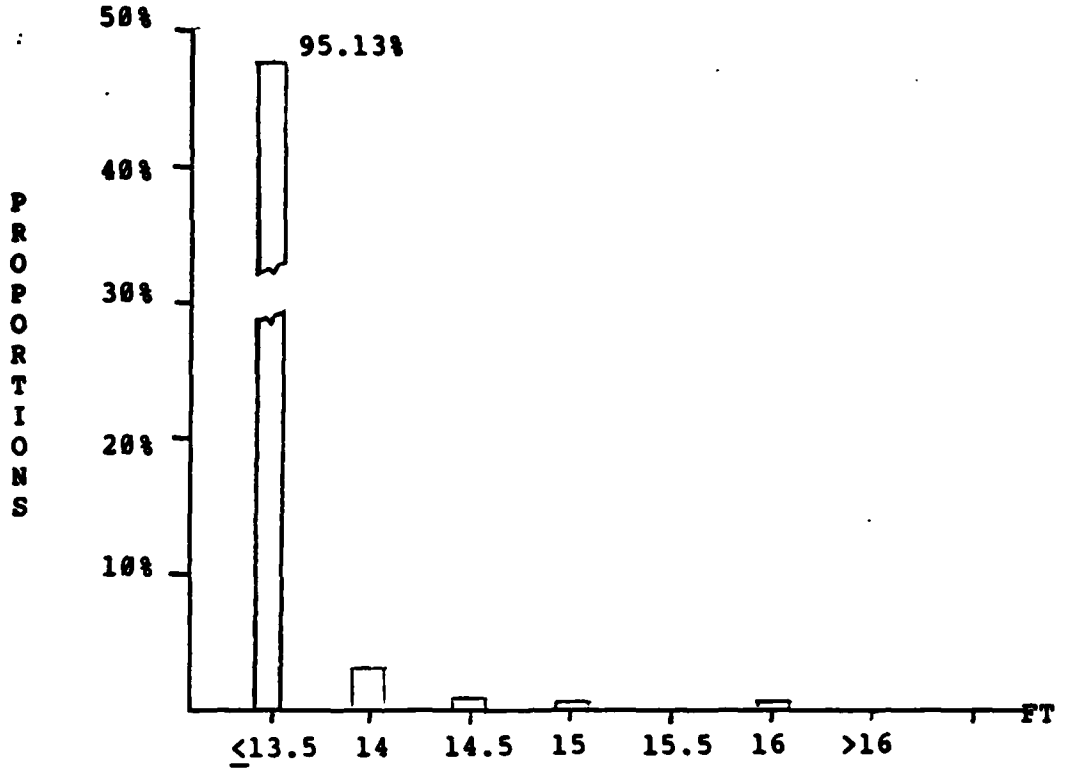
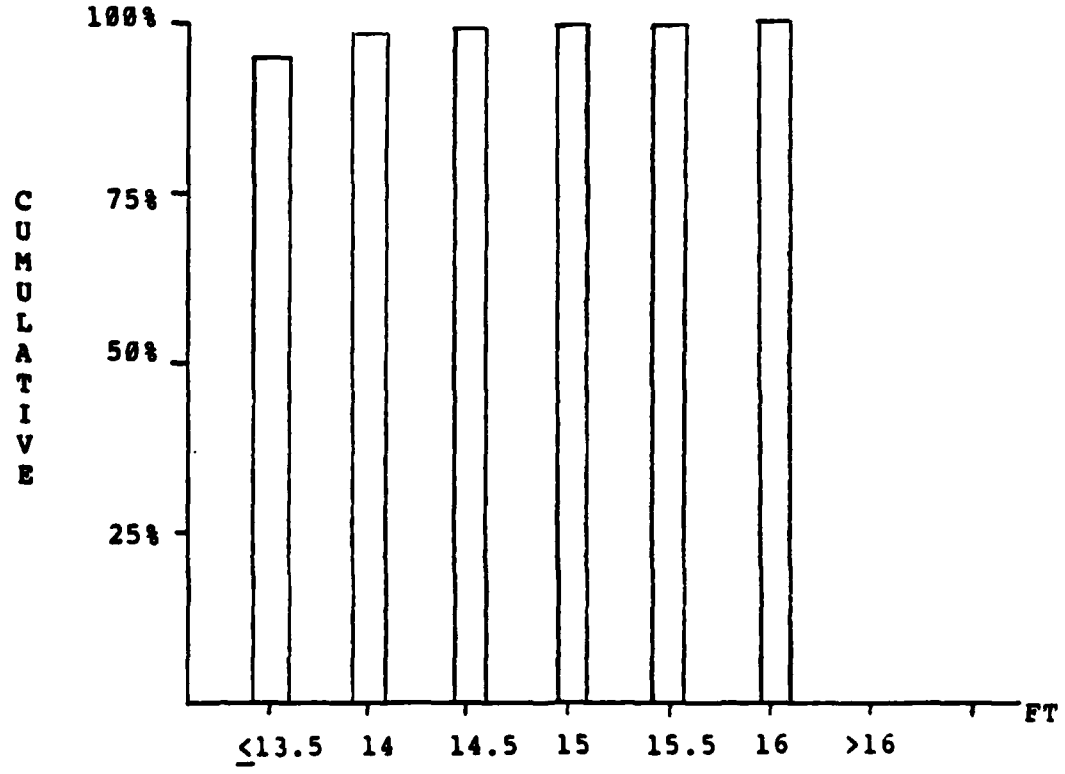


FIGURE 4-3B MAINE HEIGHTS





4.3 MASSACHUSETTS

In 1985, Massachusetts issued about 30,300 permits for oversize and overweight loads. This figure does not include the permits issued for divisible loads, only non-divisible loads. Almost two-thirds of these permits were for interstate moves (See Table 4-4). However, one should remember that Massachusetts, like the other states, issues some permits for extended periods of time. In Massachusetts one can obtain a permit good for a whole year. These annual permits are especially popular with the construction industry. Thus, many of the oversize loads moving only within in the state will not show up but once a year in the permit records.

Mobile homes make up approximately 33 percent of the interstate permit traffic in Massachusetts, almost exactly the same percentage as in Maine. In Massachusetts the Other category is the second largest. Again boats make up a large part of this category, however, the heavily industrialized nature of the Massachusetts economy means that there are many more loads of machinery and larger industrial products being shipped in Massachusetts. This may be the reason for the large size of this category.

Massachussets' central location in New England means that many of the loads destined for northern New England must travel through the state. This is apparent from the number of interstate permit loads which are merely passing through. In fact, almost 30 percent of all the oversize or overweight

permits issued by Massachusetts are for loads with an origin and destination in another state (See Table 4-4 and Figure 4-4).

As was the case in Maine, most of the loads moving in Massachusetts under the authority of a permit, needed the permit because they were overwidth. Only 9 percent of permit loads did not need a width permit. The peak points on the widths chart again correspond to the most popular widths of mobile homes. The other permit breakouts, length, gross weight, and height are all very similar to percentages seen in Maine (See Tables 4-5 and 4-6 and Figures 4-5A & B and 4-6A & B).

TABLE 4-4

SAMPLE OF MASSACHUSETTS PERMITS

Approximate Number of Permits Issued in 1985 = 30,300

Sample Population of Permits from 1985 = 643

Number of Intrastate Permits from Sample = 235 (36.55 %)

Number of Interstate Permits from Sample = 408 (63.45 %)

Interstate Permit Sample Population = 408

Mobile Homes	= 135	(33.09 %)
Const Equip	= 98	(24.02 %)
Const Matls	= 65	(15.93 %)
Other	= 110	(26.96 %)

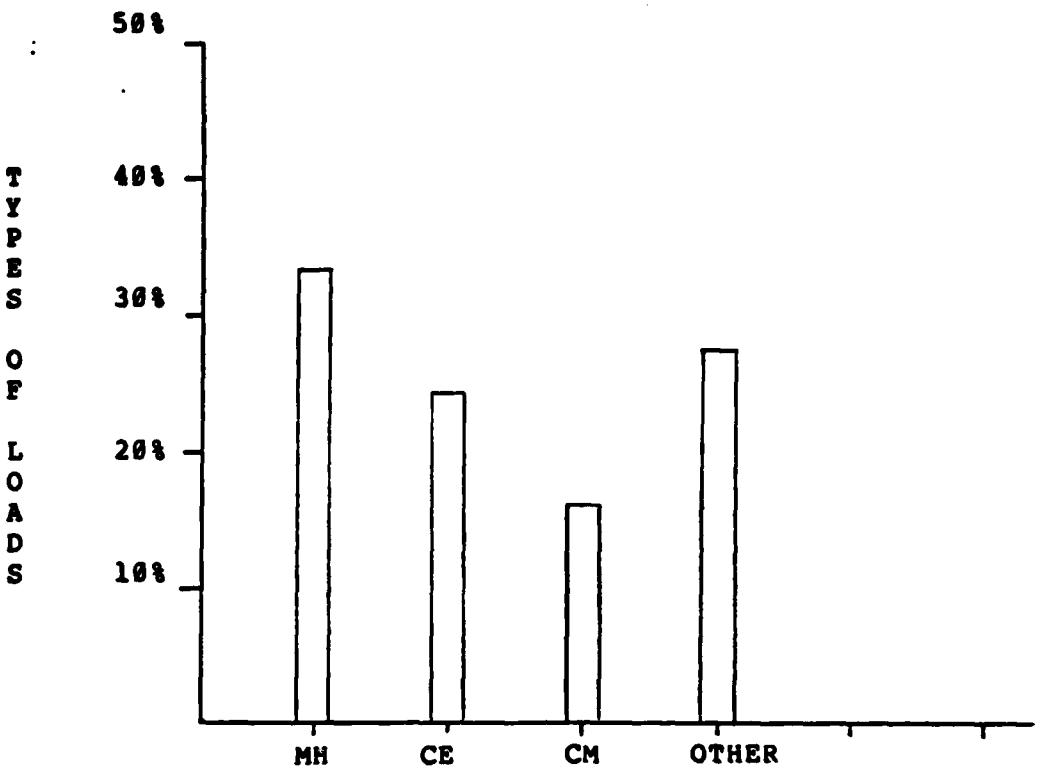
Interstate Moves Originating:

Out of State	= 313	(76.72 %)
In State	= 95	(23.28 %)

Interstate Moves Which:

Are Thru State	= 114	(27.94 %)
Begin or End in State	= 294	(72.06 %)

FIGURE 4-4 MASSACHUSETTS PERMIT LOADS



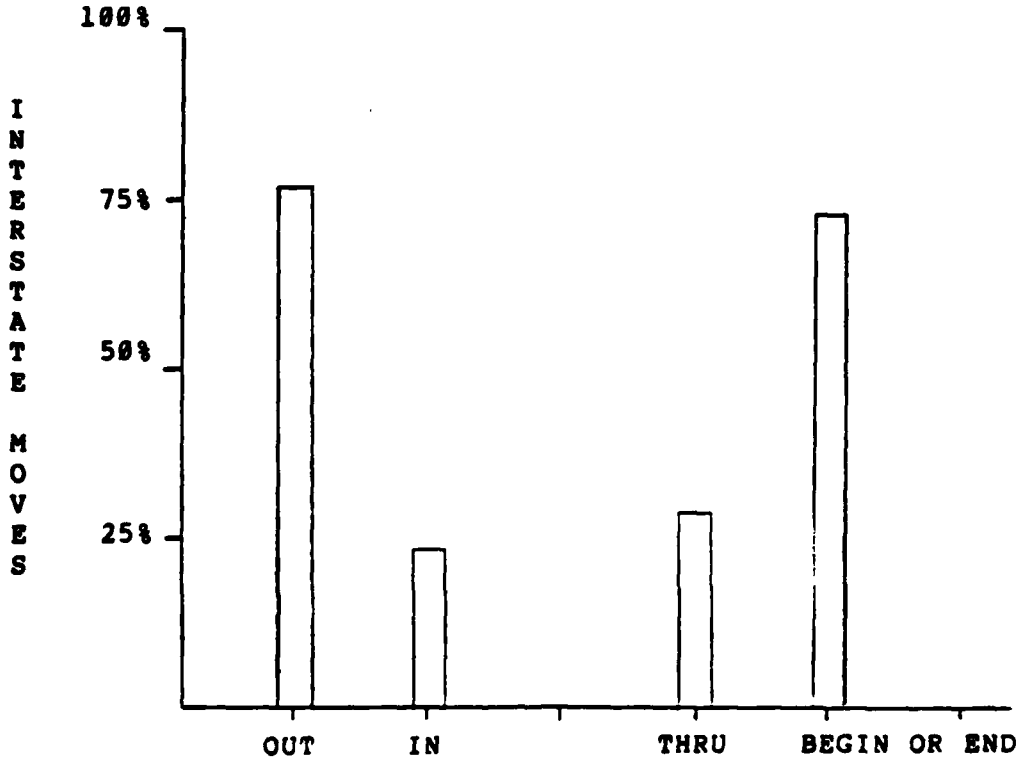


TABLE 4-5

MASSACHUSETTS WIDTHS

WIDTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 8'-6"	37*	9.07%	9.07%
8'-7" - 10'-0"	95	23.28%	32.35%
10'-1" - 11'-0"	51	12.50%	44.85%
11'-1" - 12'-0"	107	26.23%	71.08%
12'-1" - 13'-0"	34	8.33%	79.41%
13'-1" - 14'-0"	77	18.87%	98.28%
14'-1" - 15'-0"	4	0.98%	99.26%
> 15'-0"	3	0.74%	100.00%
	408		

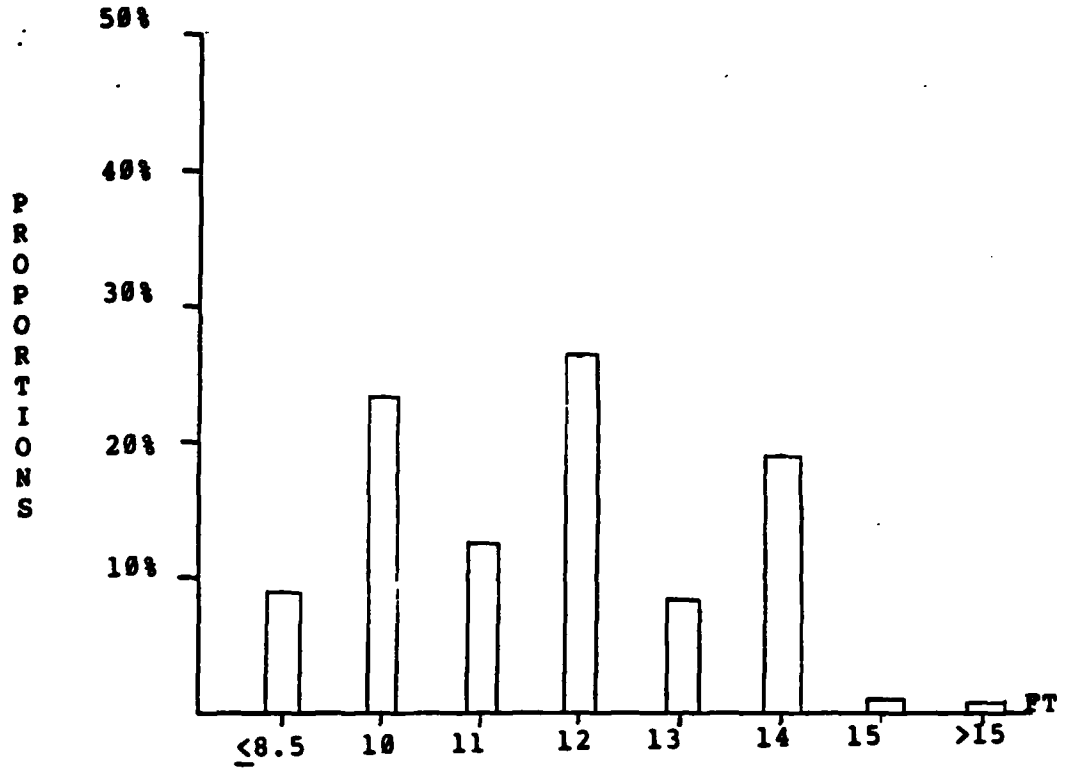
*NO PERMITS REQUIRED FOR LOADS WITH WIDTHS ≤ 8' - 6"

MASSACHUSETTS LENGTHS

LENGTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 60'	146**	35.78%	35.78%
61' - 70'	137	33.58%	69.36%
71' - 80'	77	18.87%	88.24%
81' - 90'	48	11.76%	100.00%
91' - 100'	0	0.00%	100.00%
> 100'	0	0.00%	100.00%
	408		

**NO PERMITS REQUIRED FOR LENGTHS ≤ 60' EXCEPT FOR SINGLE UNIT VEHICLES SUCH AS CRANES, THEN THE LIMIT IS 35'.

FIGURE 4-5A MASSACHUSETTS WIDTHS



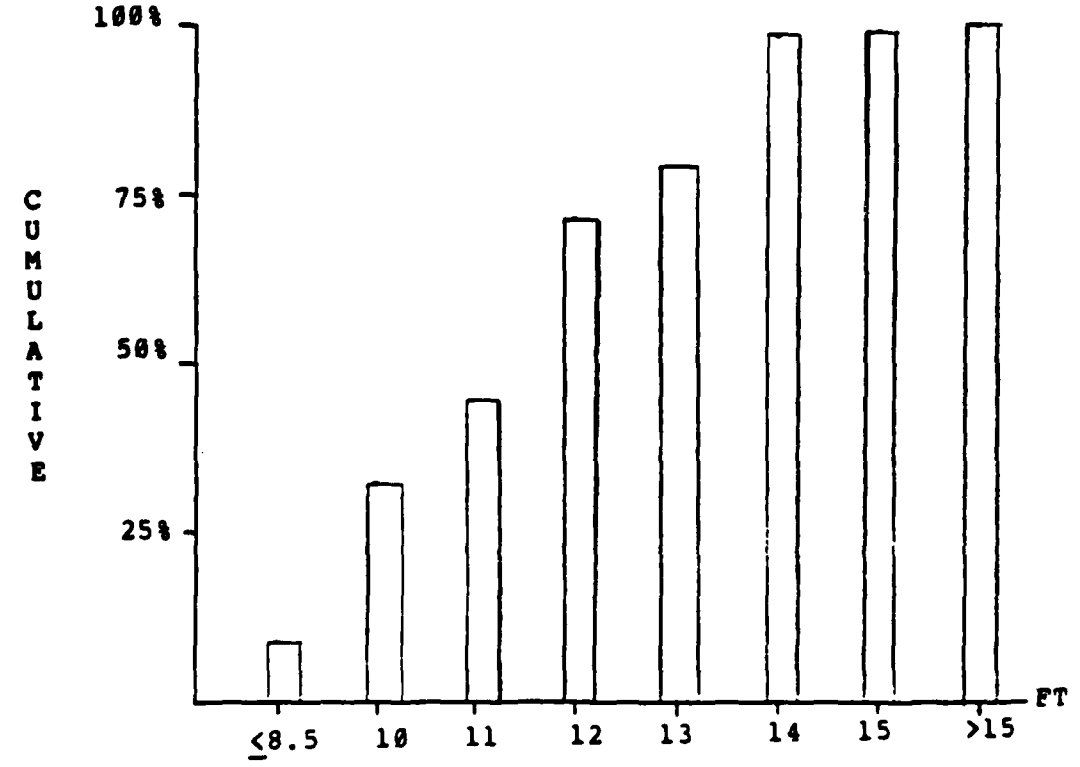
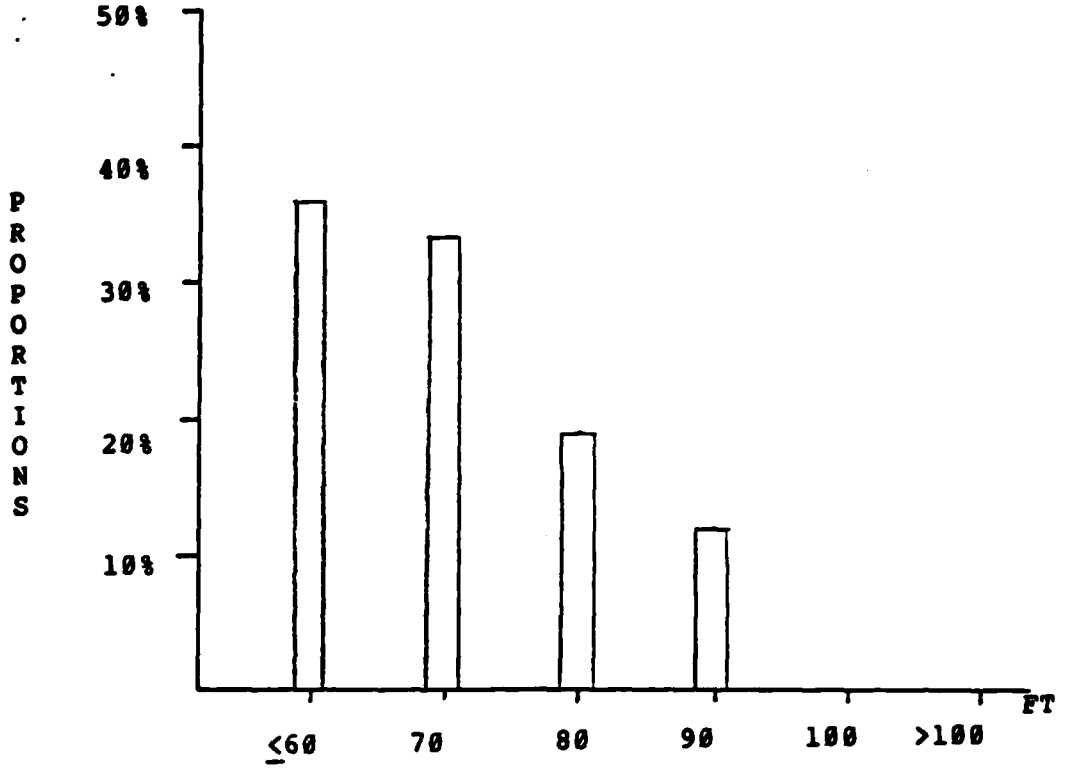


FIGURE 4-5B MASSACHUSETTS LENGTHS



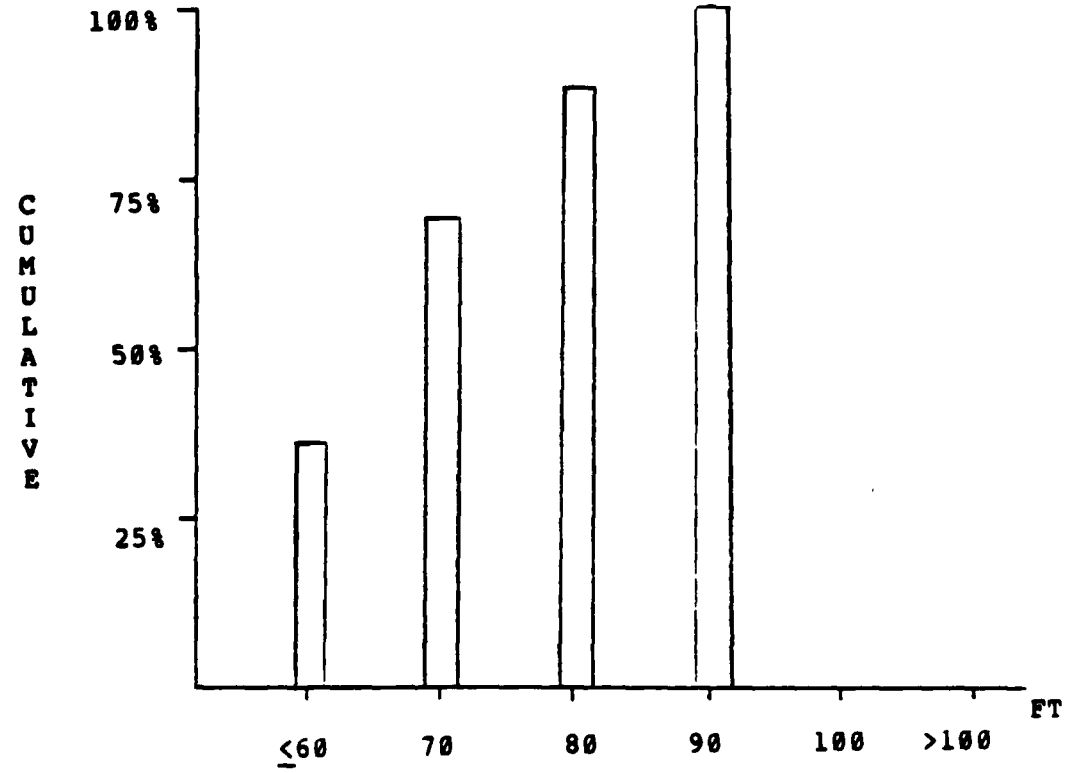


TABLE 4-6

MASSACHUSETTS GROSS WEIGHTS

WEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 80K	324*	79.41%	79.41%
81K - 90K	25	6.13%	85.54%
91K - 100K	24	0.88%	91.42%
100K - 110K	11	2.70%	94.12%
111K - 120K	11	2.70%	96.82%
121K - 130K	12	2.94%	99.76%
131K - 140K	1	0.24%	100.00%
> 140K	0	0.00%	100.00%
	408		

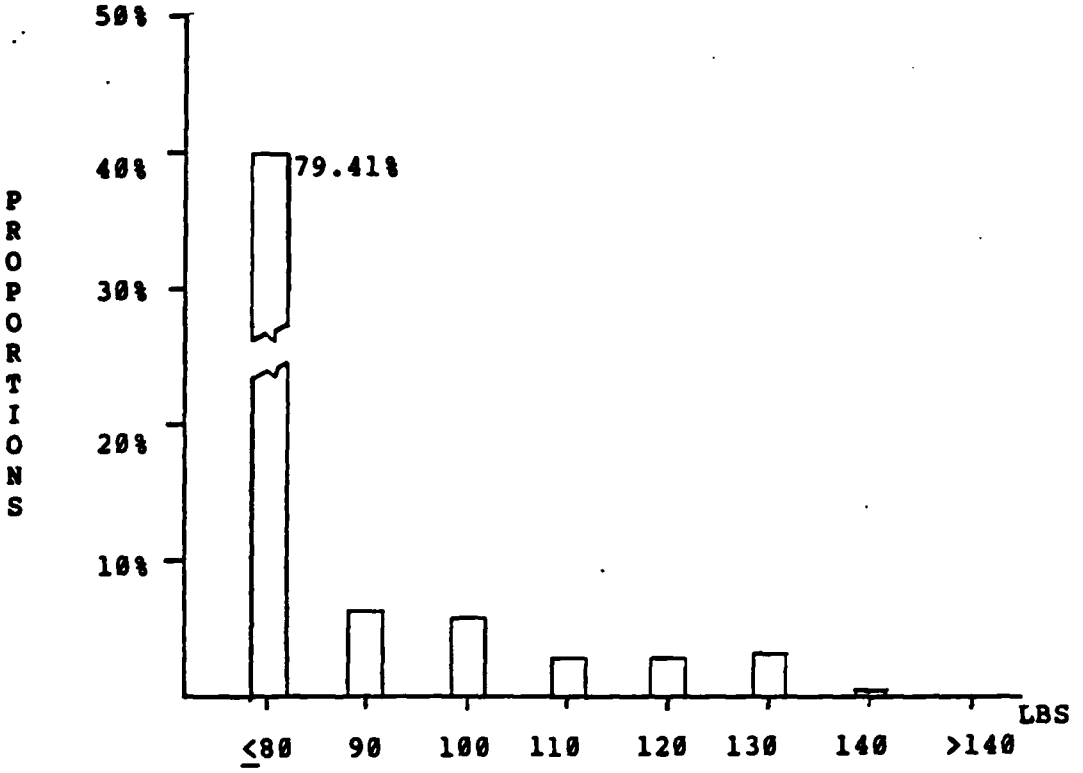
*NO PERMIT REQUIRED FOR GROSS WEIGHT ≤ 80,000 POUNDS PROVIDED AXLE SPACING REQUIREMRNTS OF NBF OR STATUTORY LIMITS ARE SATISFIED.

MASSACHUSETTS HEIGHTS

HEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 13'-6"	382**	93.63%	93.63%
13'-7" - 14'-0"	20	4.90%	98.53%
14'-1" - 14'-6"	4	0.98%	99.51%
14'-7" - 15'-0"	1	0.25%	99.75%
15'-1" - 15'-6"	1	0.25%	100.00%
15'-7" - 16'-0"	0	0.00%	100.00%
> 16'-0"	0	0.00%	100.00%
	408		

**NO PERMIT REQUIRED FOR HEIGHT ≤ 13' - 6"

FIGURE 4-6A MASSACHUSETTS GROSS WEIGHTS (000'S)



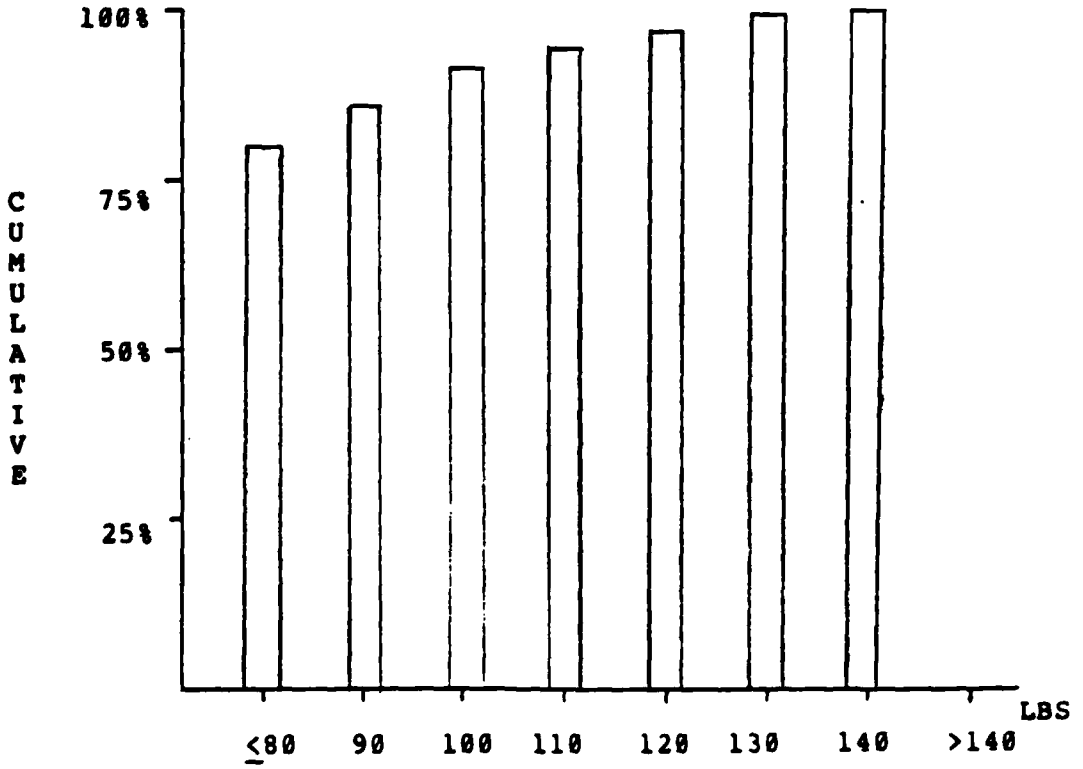
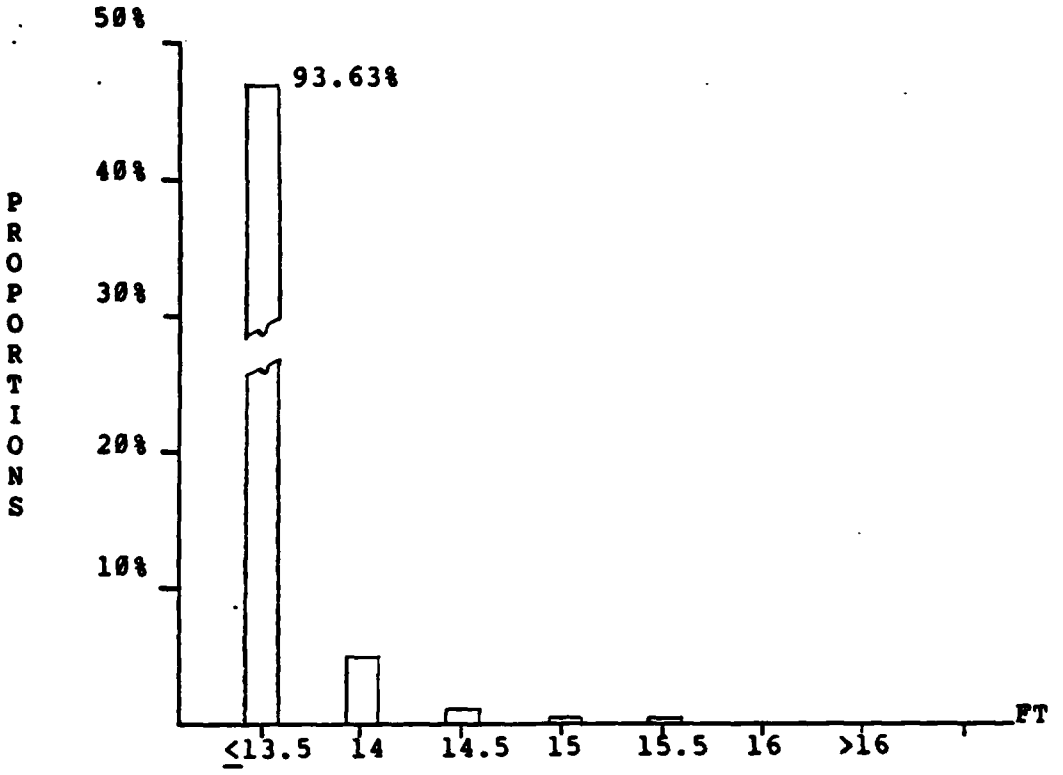
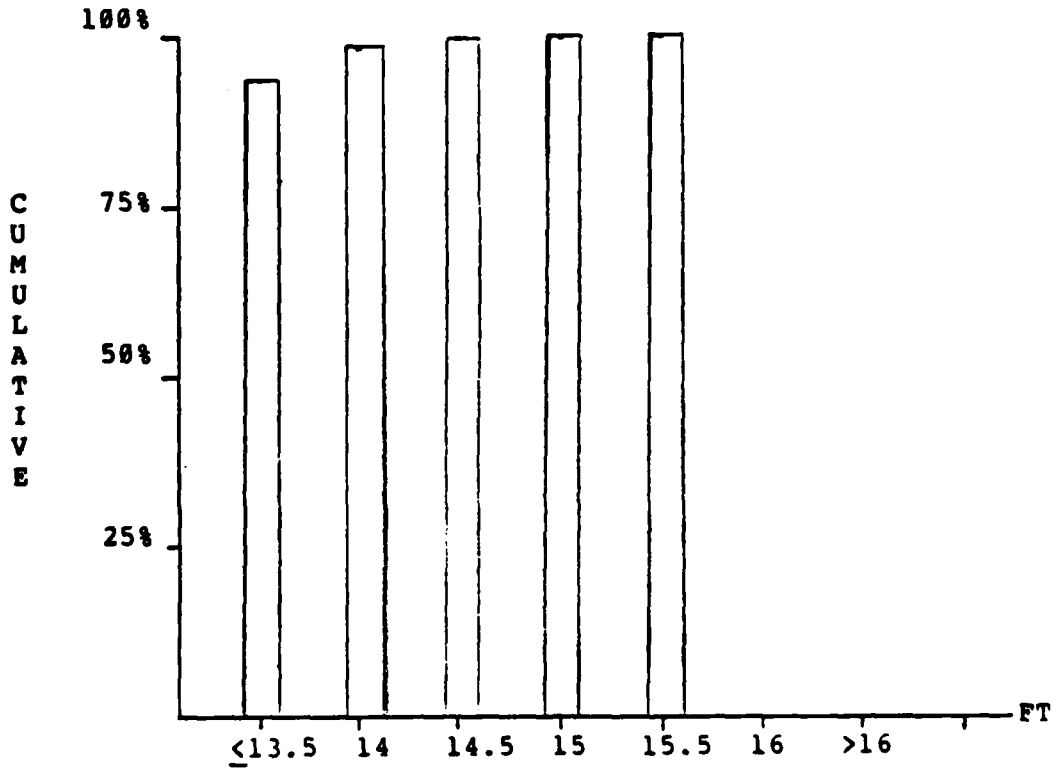


FIGURE 4-6B MASSACHUSETTS HEIGHTS





4.4 NEW HAMPSHIRE

Table 4-7 provides an overall view of the sample gathered from New Hampshire. In 1985, New Hampshire issued approximately 21,000 permits for oversize and overweight vehicles. Almost three-quarters of these permits were for loads involved in interstate travel. Like Massachusetts, New Hampshire issues an annual permit to vehicles registered in New Hampshire. However, this annual permit is good only up to certain limits. Beyond those limits the driver has to obtain a separate permit. Thus, many, but not all, of the intrastate moves will be "hidden" in the annual permits. In 1985 New Hampshire issued about 750 annual permits. Because of the way in which the permits were filed, it was impossible to include the annual permits into the random sample. Thus, when calulating the actual number of vehicles or loads included in any of the proportions, one should first subtract the 750 annual permits from the 21,000 total number of permits.

From Table 4-7 one again sees that mobile homes make up the largest category of permit loads. One can also see that New Hampshire is a net importer of oversize and overweight loads, although a sizeable number of these, over 38 percent of all interstate moves, are only passing through the state (See Figure 4-7).

The large number of mobile homes shows up again quite strongly in the breakdown of the permit widths. Over 93 percent of all permits were for some type of width violation,

and over 37 percent were for widths between 13'-1" and 14'. The slight peak at a length of 81'-90' also demonstrates the preponderance of mobile homes in the use of oversize permits (See Table 4-8 and Figures 4-8A & B).

The gross weight and height permit data is basically the same as in Massachusetts and Maine. There are two minor peaks on the gross weight chart at 120,000 pounds and 130,000 pounds. Most of the loads in these weight classes were different types of earthmoving construction equipment such as bulldozers and excavators. Perhaps these peaks indicate something about construction in New Hampshire (See Table 4-9 and Figures 4-9A & B).

TABLE 4-7

SAMPLE OF NEW HAMPSHIRE PERMITS

Approximate Number of Permits Issued in 1985 = 21,000

Sample Population of Permits from 1985 = 742

Number of Intrastate Permits from Sample = 213 (28.71 %)

Number of Interstate Permits from Sample = 529 (71.29 %)

Interstate Permit Sample Population = 529

Mobile Homes	= 201	(38.00 %)
Const Equip	= 143	(27.03 %)
Const Matls	= 95	(17.96 %)
Other	= 90	(17.01 %)

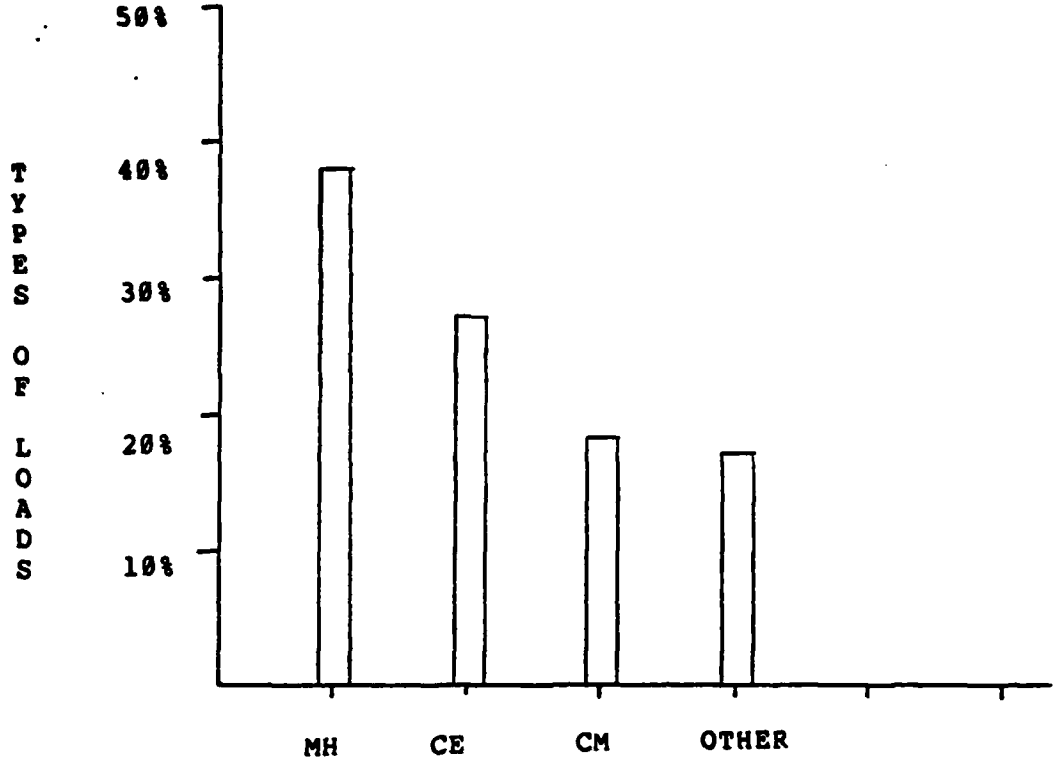
Interstate Moves Originating:

Out of State	= 439	(82.99 %)
In State	= 90	(17.01 %)

Interstate Moves Which:

Are Thru State	= 204	(38.56 %)
Begin or End in State	= 325	(61.44 %)

FIGURE 4-7 NEW HAMPSHIRE PERMIT LOADS



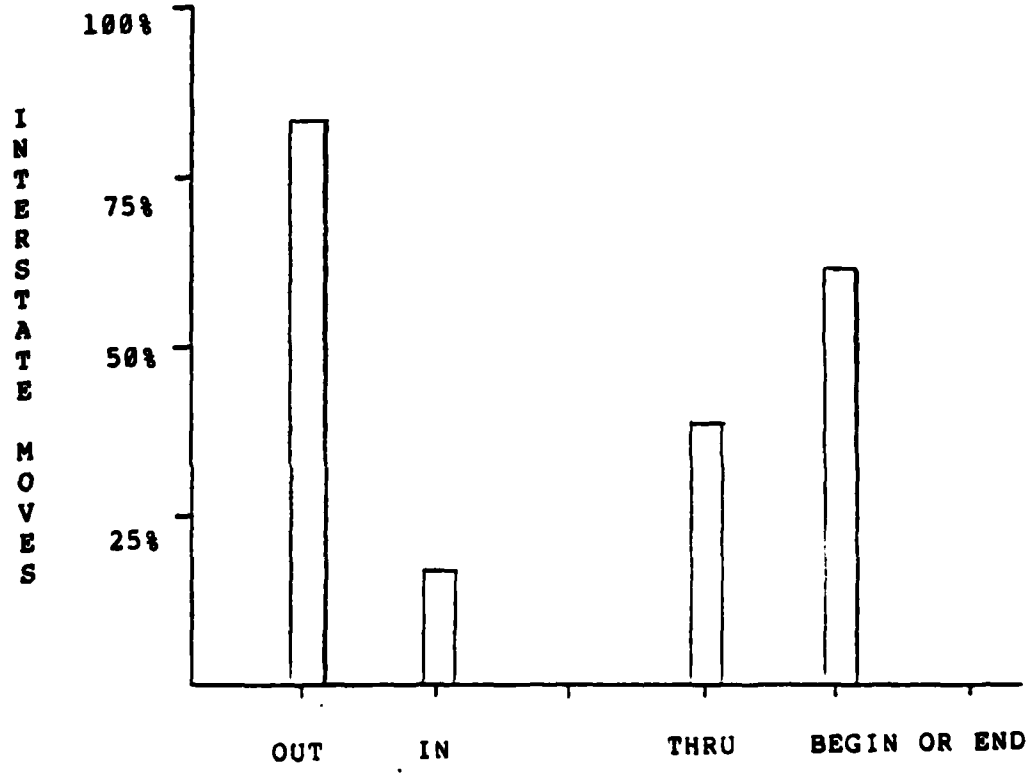


TABLE 4-8

NEW HAMPSHIRE WIDTHS

WIDTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 8'-6"	37*	6.99%	6.99%
8'-7" - 10'-0"	93	17.58%	24.57%
10'-1" - 11'-0"	62	11.72%	36.29
11'-1" - 12'-0"	96	18.15%	54.44%
12'-1" - 13'-0"	33	6.24%	60.68%
13'-1" - 14'-0"	199	37.62%	98.30%
14'-1" - 15'-0"	3	0.57%	98.87%
> 15'-0"	6	1.13%	100.00%
	529		

*NO PERMITS REQUIRED FOR LOADS WITH WIDTHS ≤ 8' - 6" EXCEPT ON ROADS WITH LANE WIDTHS < 12', THEN THE LIMIT IS 8' - 0".

NEW HAMPSHIRE LENGTHS

LENGTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 60'	146**	27.60%	27.60%
61' - 70'	154	29.11%	56.71%
71' - 80'	93	17.58%	74.29%
81' - 90'	118	22.31%	96.60%
91' - 100'	9	1.70%	98.30%
> 100'	4	0.76%	100.00%
	529		

**NO PERMITS REQUIRED FOR LENGTHS ≤ 60' EXCEPT FOR SINGLE UNIT VEHICLES SUCH AS CRANES, THEN THE LIMIT IS 35'.

FIGURE 4-8A NEW HAMPSHIRE WIDTHS

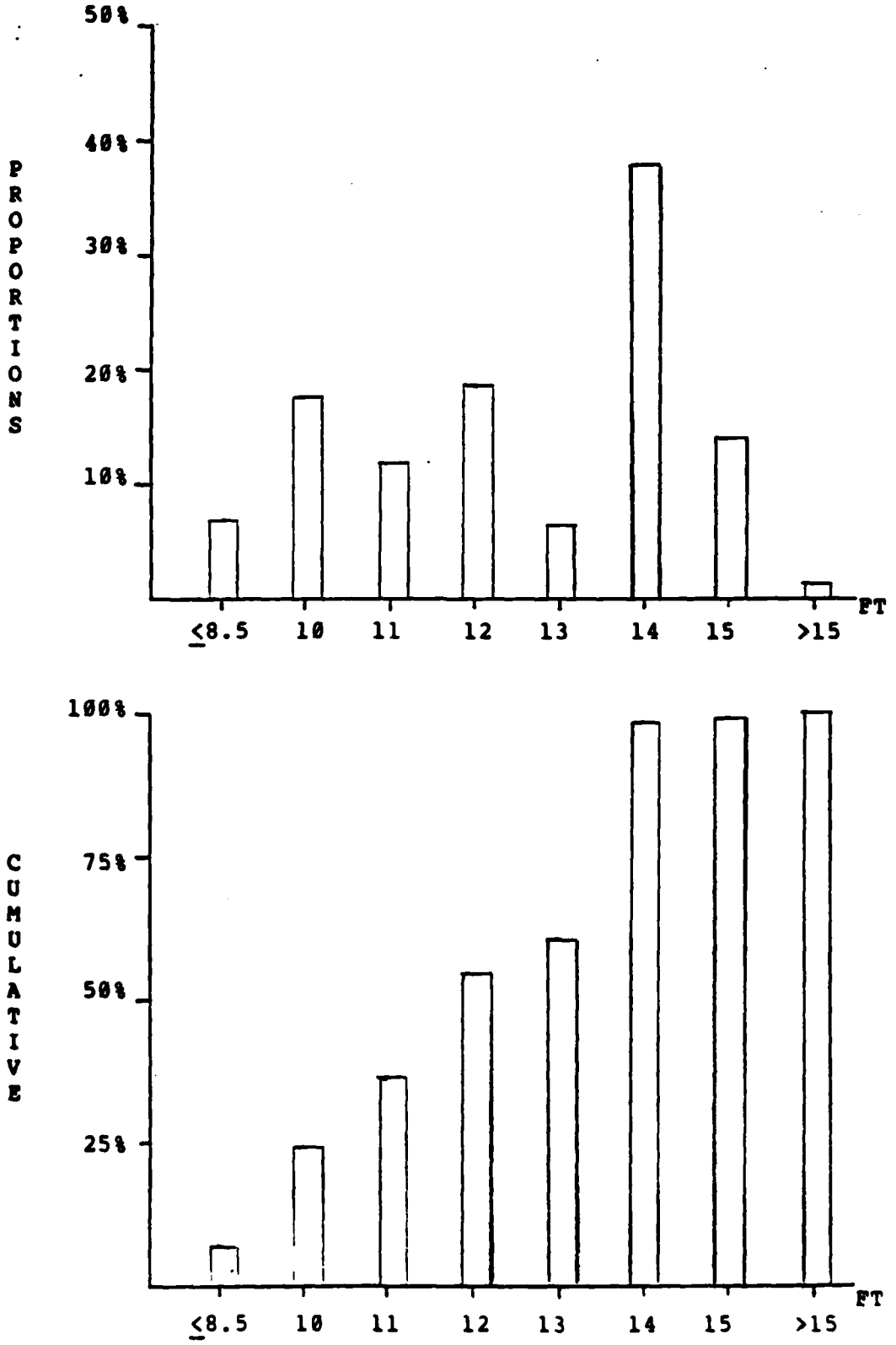


FIGURE 4-8B NEW HAMPSHIRE LENGTHS

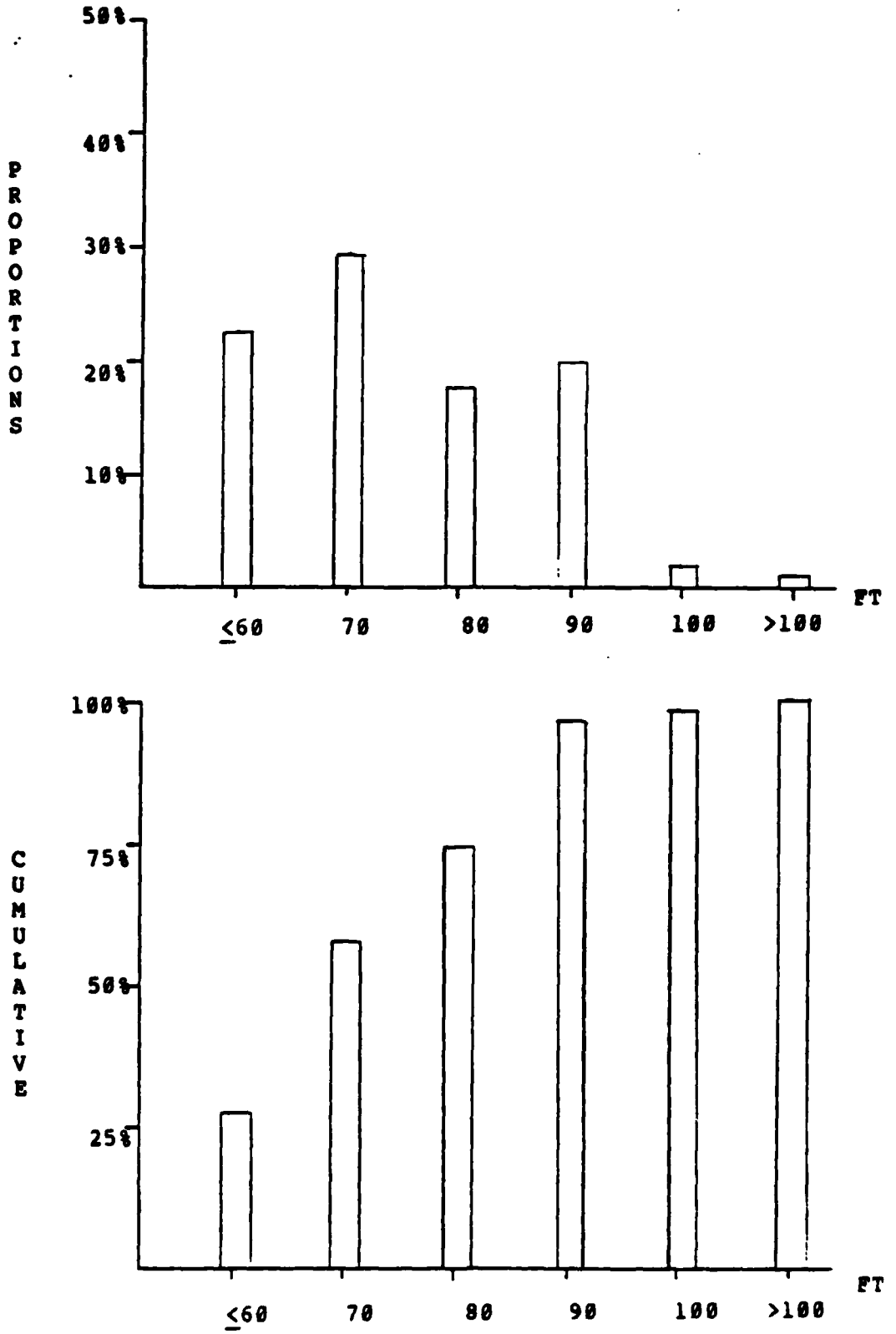


TABLE 4-9

NEW HAMPSHIRE GROSS WEIGHTS

WEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 80K	410*	77.50%	77.50%
81K - 90K	17	3.21%	80.71%
91K - 100K	26	4.91%	85.62%
100K - 110K	10	1.89%	87.51%
111K - 120K	29	5.48%	92.99%
121K - 130K	28	5.29%	98.28%
131K - 140K	8	1.51%	99.79%
> 140K	1	0.19%	100.00%
	529		

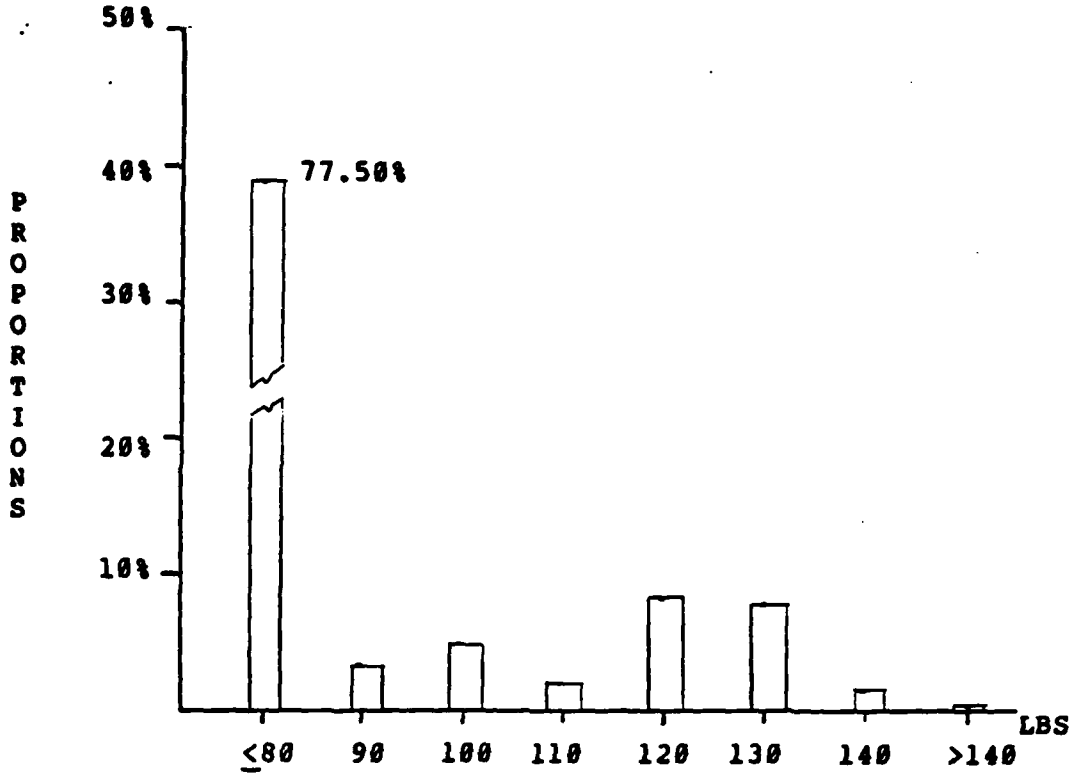
*NO PERMIT REQUIRED FOR GROSS WEIGHT ≤ 80,000 POUNDS PROVIDED AXLE SPACING REQUIREMRNTS OF NBF ARE SATISFIED.

NEW HAMPSHIRE HEIGHTS

HEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 13'-6"	498**	94.14	94.14
13'-7" - 14'-0"	27	5.10%	99.24%
14'-1" - 14'-6"	2	0.38%	99.62%
14'-7" - 15'-0"	1	0.19%	99.81%
15'-1" - 15'-6"	1	0.19%	100.00%
15'-7" - 16'-0"	0	0.00%	100.00%
> 16'-0"	0	0.00%	100.00%
	529		

**NO PERMIT REQUIRED FOR HEIGHT ≤ 13' - 6"

FIGURE 4-9A NEW HAMPSHIRE GROSS WEIGHTS (000'S)



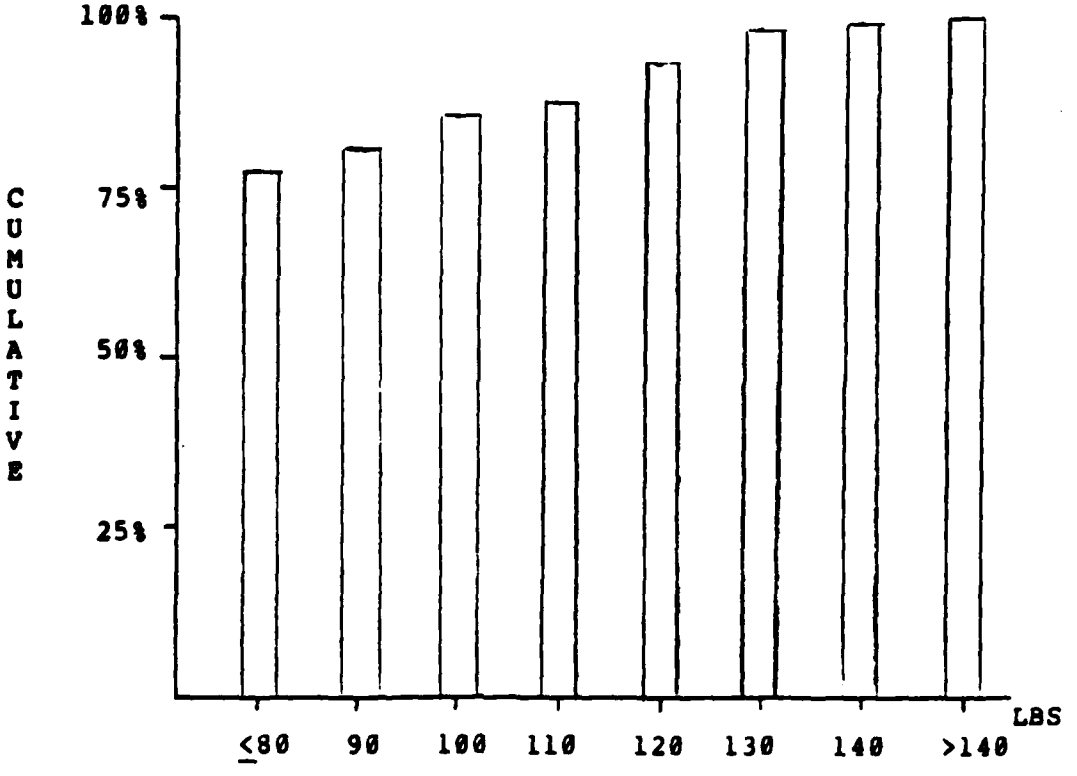
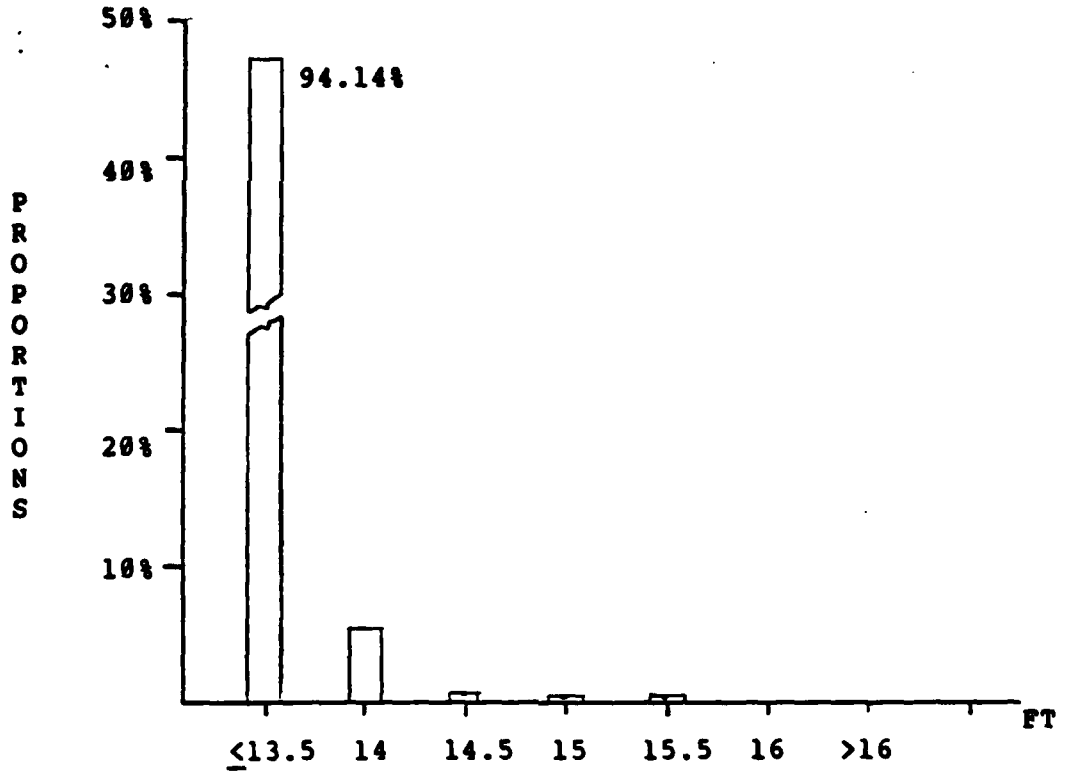
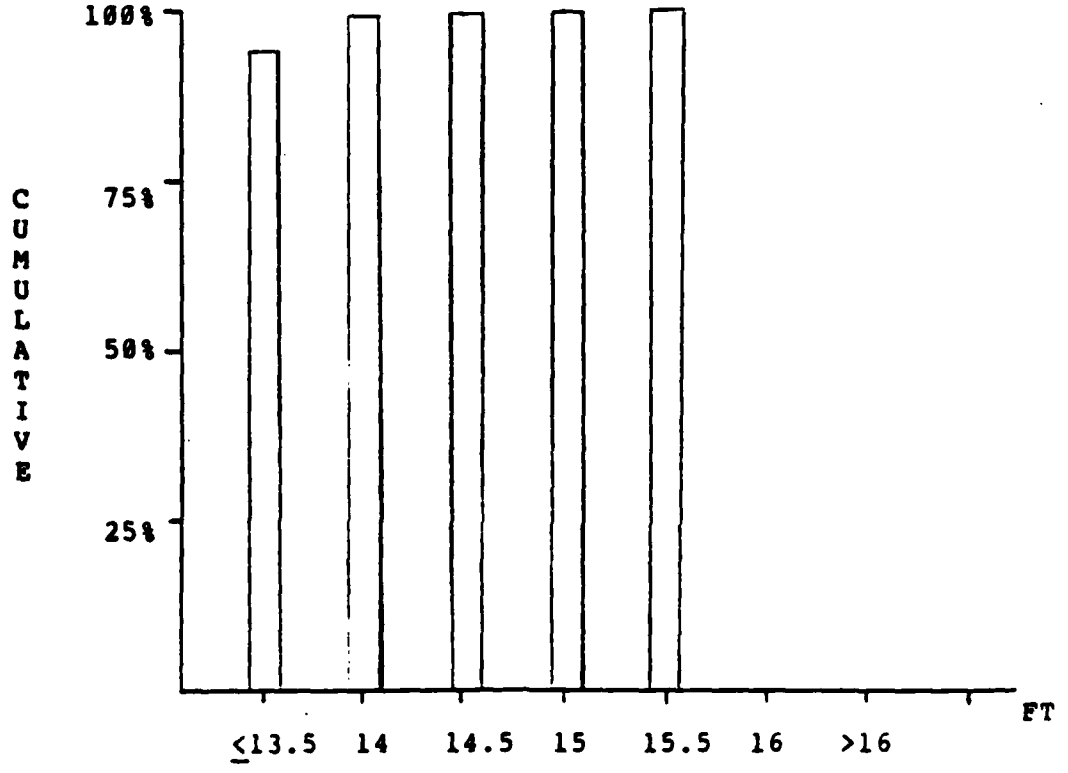


FIGURE 4-9B NEW HAMPSHIRE HEIGHTS





4.5 RHODE ISLAND

Rhode Island issues by far the fewest oversize and overweight permits. In 1985 only about 3900 such permits were issued. However, over 80 percent of these permits were for vehicles engaged in interstate travel. Almost 50 percent of these interstate permits were for vehicles passing through the state. Again, mobile homes represented the largest single category of load types (See Table 4-10 and Figure 4-10).

The breakouts of the permit requirements are all basically the same as in the other states. Almost every load (92%) needed a width permit and there is a peak in the widths at 14'. Very few permits were issued for gross weight or for height. The most interesting item in the Rhode Island data is the large number of vehicles just passing through. Rhode Island would clearly benefit from a program which allowed another state to write permits for Rhode Island highways (See Tables 4-11 and 4-12 and Figures 4-11A & B and 4-12A & B).

TABLE 4-10

SAMPLE OF RHODE ISLAND PERMITS

Approximate Number of Permits Issued in 1985 = 3900

Sample Population of Permits from 1985 = 578

Number of Intrastate Permits from Sample = 95 (16.44 %)

Number of Interstate Permits from Sample = 483 (83.36 %)

Interstate Permit Sample Population = 483

Mobile Homes	= 190	(39.34 %)
Const Equip	= 84	(17.39 %)
Const Matls	= 68	(14.08 %)
Other	= 141	(29.19 %)

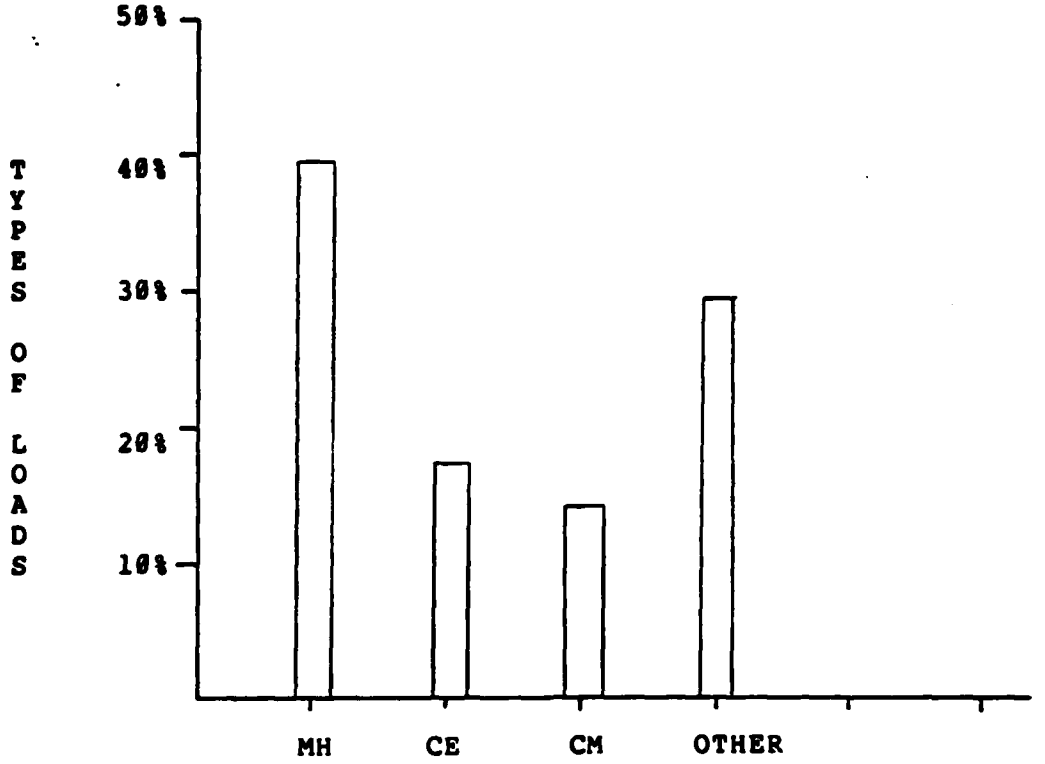
Interstate Moves Originating:

Out of State	= 417	(86.34 %)
In State	= 66	(13.66 %)

Interstate Moves Which:

Are Thru State	= 224	(46.38 %)
Begin or End in State	= 259	(53.62 %)

FIGURE 4-10 RHODE ISLAND PERMIT LOADS



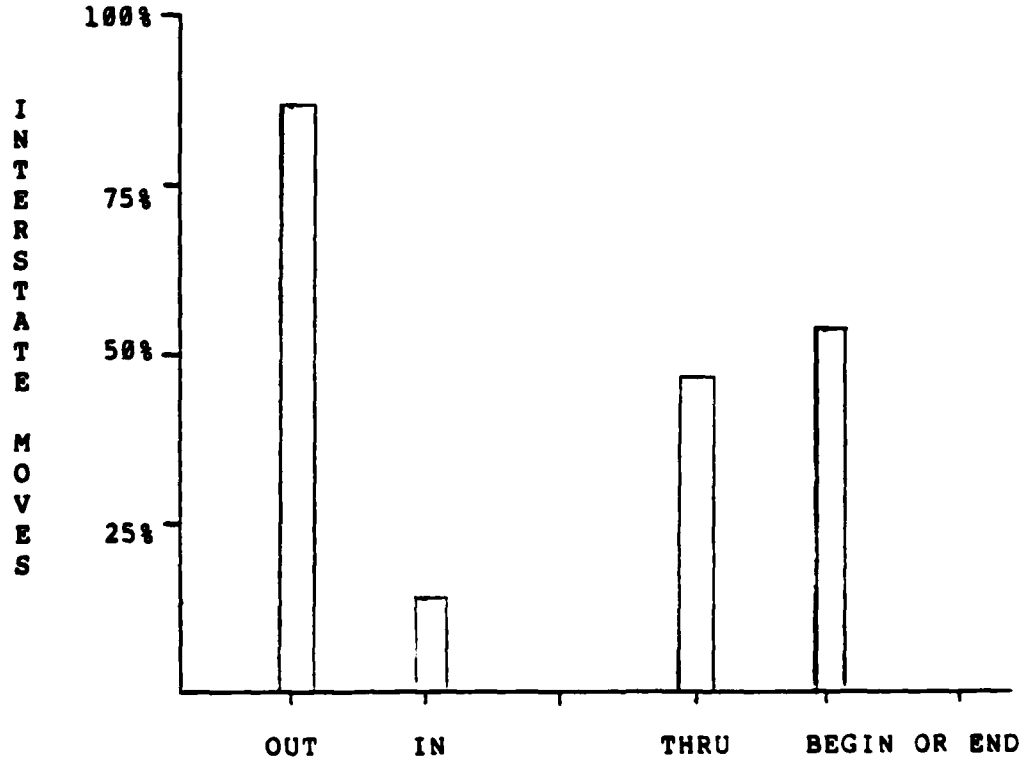


TABLE 4-11

RHODE ISLAND WIDTHS

WIDTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 8'-6"	37*	7.66%	7.66%
8'-7" - 10'-0"	103	21.33%	28.99%
10'-1" - 11'-0"	62	12.84%	41.82%
11'-1" - 12'-0"	105	21.74%	63.56%
12'-1" - 13'-0"	35	7.25%	70.81%
13'-1" - 14'-0"	134	27.74%	98.55%
14'-1" - 15'-0"	3	0.62%	99.17%
> 15'-0"	4	0.83%	100.00%
	483		

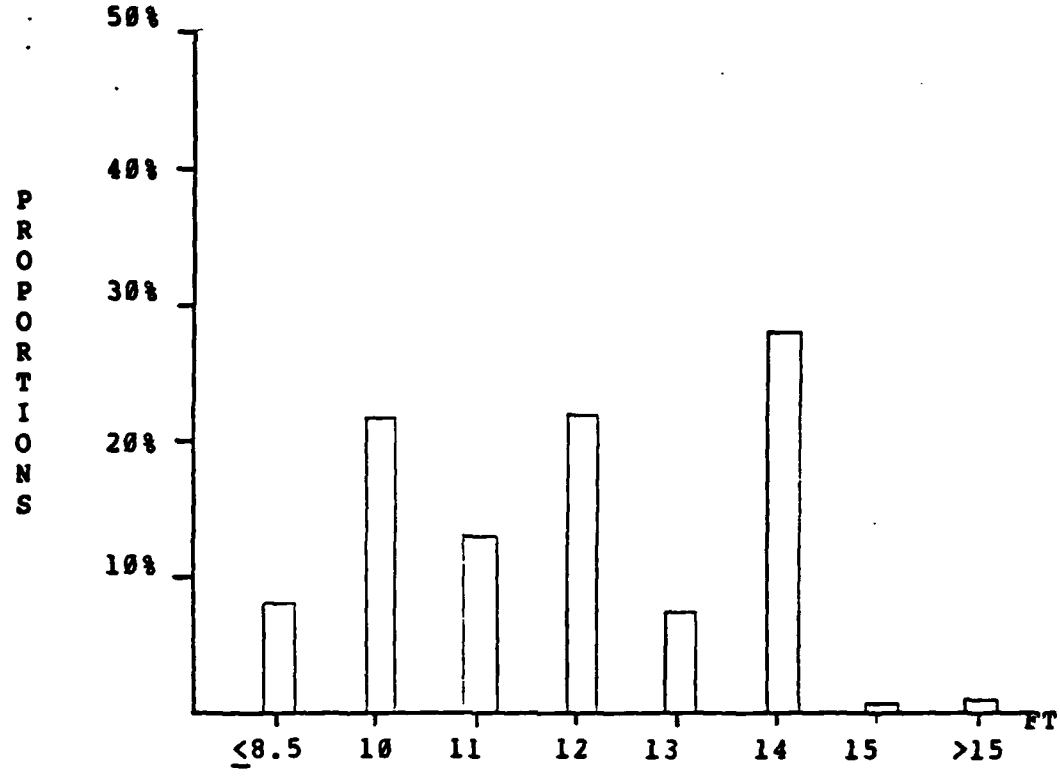
*NO PERMIT REQUIRED FOR WIDTHS ≤ 8' - 6".

RHODE ISLAND LENGTHS

LENGTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 60'	163**	33.75%	33.75%
61' - 70'	130	26.92%	60.66%
71' - 80'	94	19.46%	80.12%
81' - 90'	85	17.60%	97.72%
91' - 100'	5	1.04%	98.76%
> 100'	6	1.24%	100.00%
	483		

**NO PERMIT REQUIRED FOR LENGTHS ≤ 60' EXCEPT FOR SINGLE UNIT VEHICLES, THEN THE LIMIT IS 40'.

FIGURE 4-11A RHODE ISLAND WIDTHS



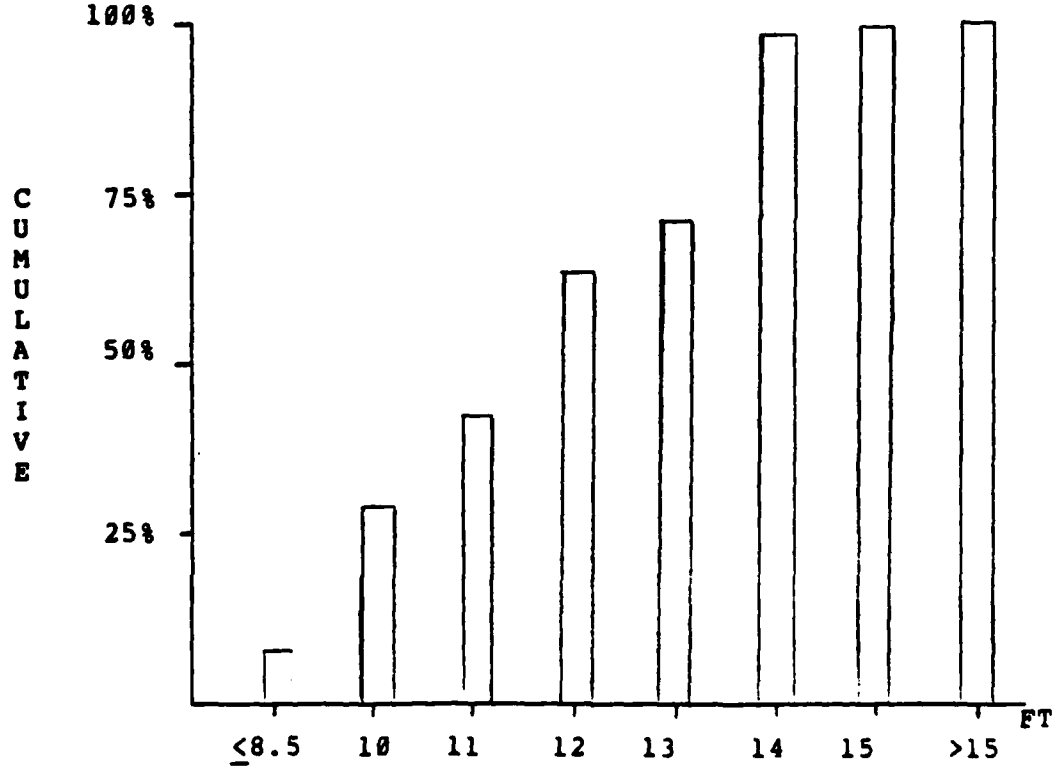
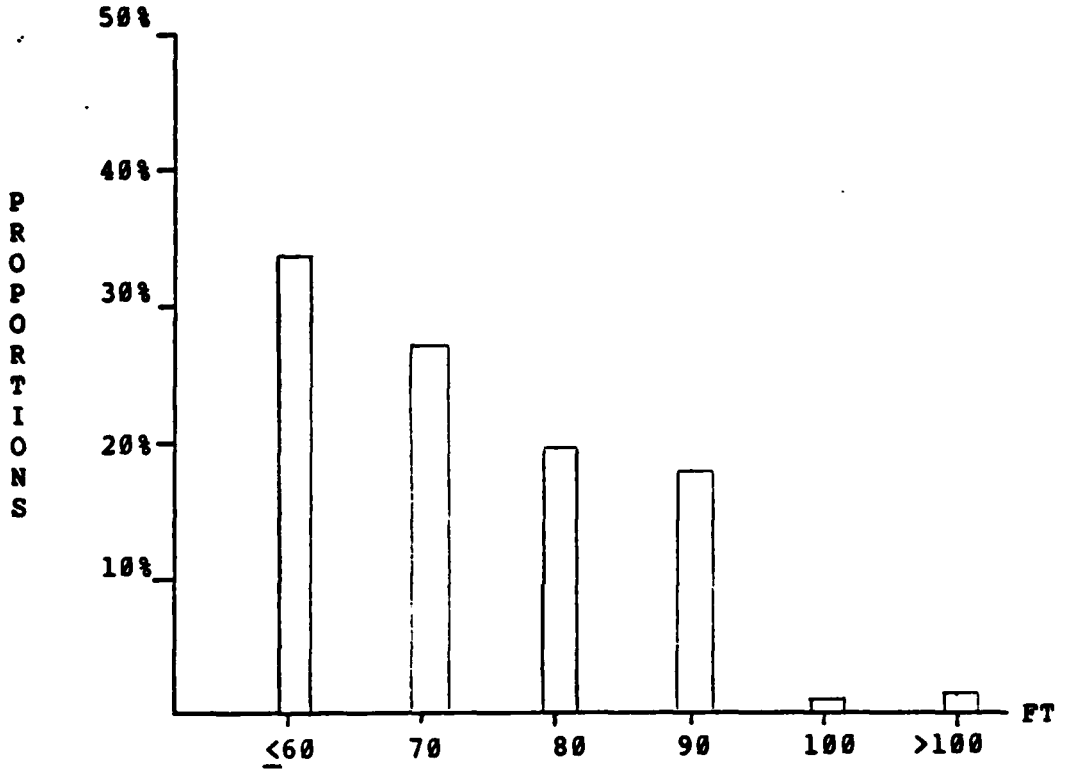


FIGURE 4-11B RHODE ISLAND LENGTHS



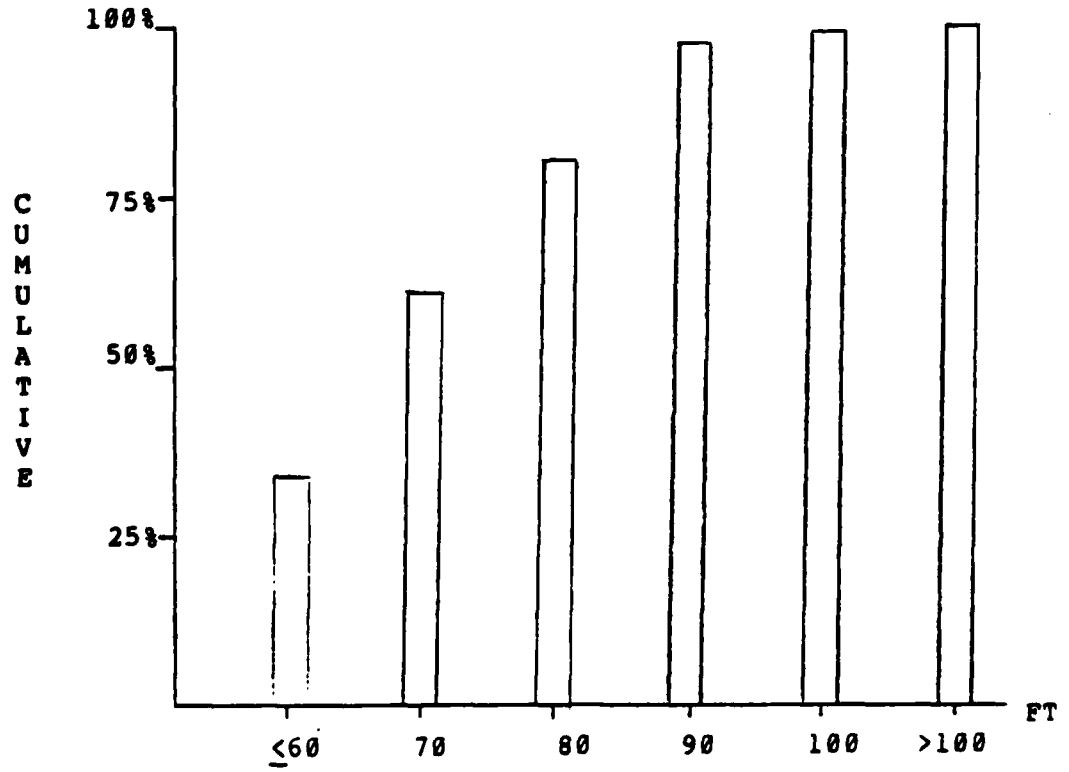


TABLE 4-12

RHODE ISLAND GROSS WEIGHTS

WEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 80K	412*	85.30%	85.30%
81K - 90K	10	2.07%	87.37%
91K - 100K	15	3.11%	90.48%
100K - 110K	5	1.04%	91.51%
111K - 120K	14	2.90%	94.41%
121K - 130K	24	4.97%	99.38%
131K - 140K	0	0.00%	99.38%
> 140K	3	0.62%	100.00%
	483		

*NO PERMIT REQUIRED FOR GROSS WEIGHTS ≤ 80,000 POUNDS PROVIDED AXLE SPACING REQUIREMENTS OF THE NBF ARE SATISFIED

RHODE ISLAND HEIGHTS

HEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 13'-6"	471**	97.52%	97.52%
13'-7" - 14'-0"	11	2.28%	99.79%
14'-1" - 14'-6"	0	0.00%	99.79%
14'-7" - 15'-0"	0	0.00%	99.79%
15'-1" - 15'-6"	1	0.21%	100.00%
15'-7" - 16'-0"	0	0.00%	100.00%
> 16'-0"	0	0.00%	100.00%
	473		

**NO PERMIT REQUIRED FOR HEIGHTS ≤ 13' - 6".

FIGURE 4-12A RHODE ISLAND GROSS WEIGHTS

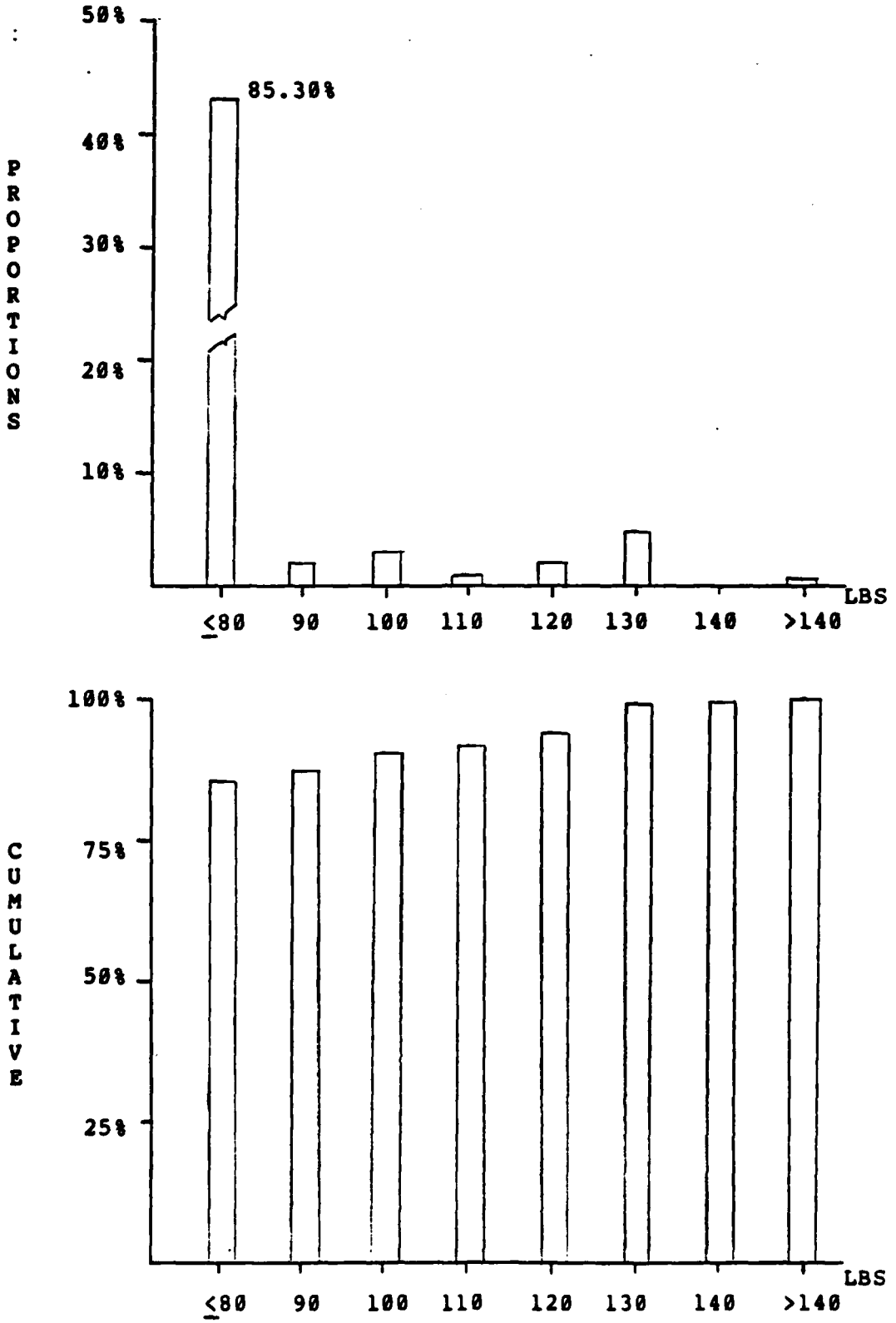
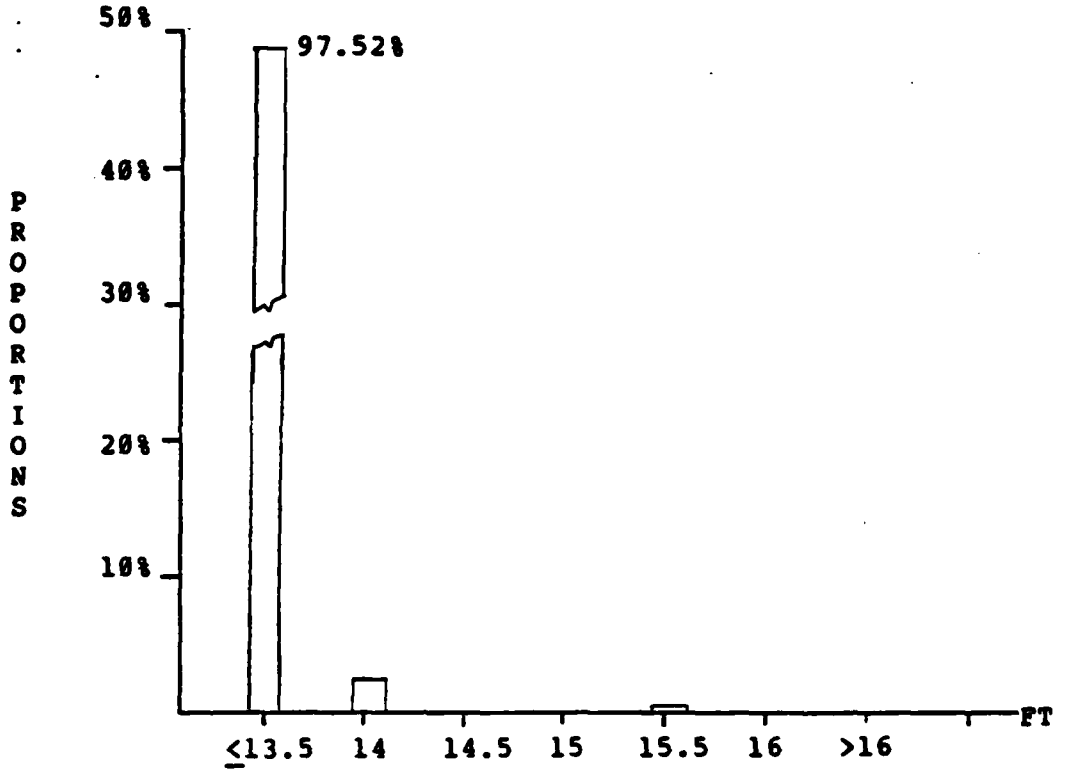
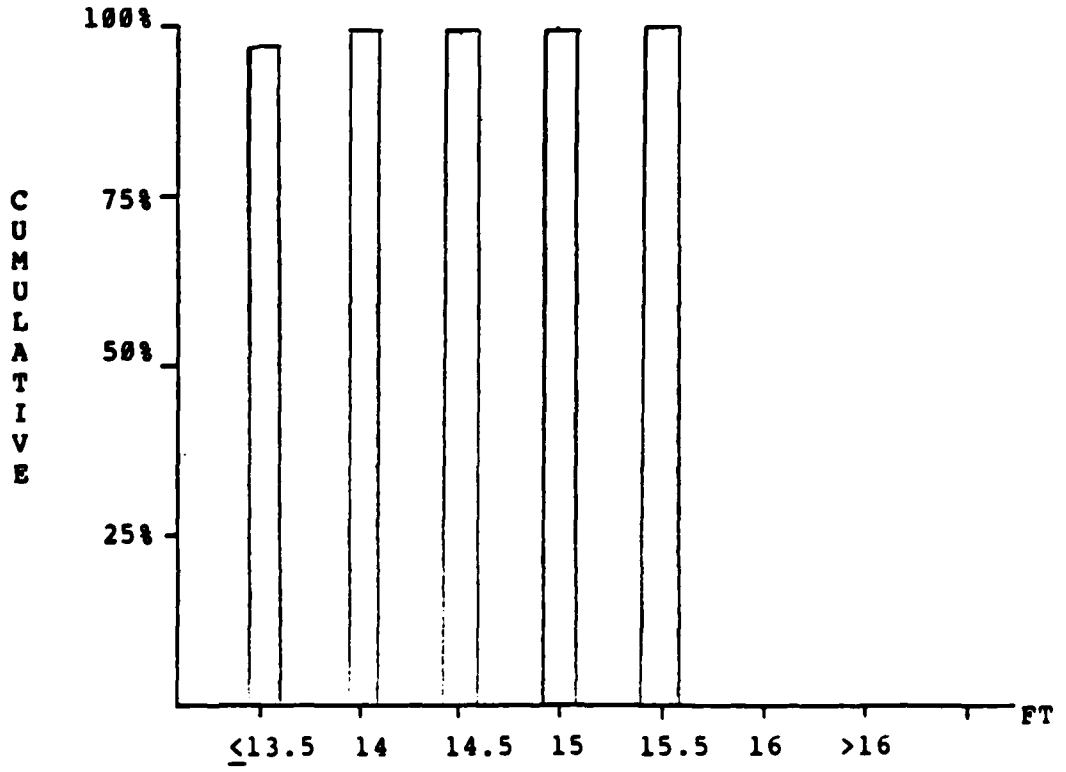


FIGURE 4-12B RHODE ISLAND HEIGHTS





4.6 VERMONT

Table 4-13 presents the overview of the data gathered from Vermont. Approximately 9900 permits were issued by Vermont in 1985. Of these, 162 were for intrastate moves and 615 were for interstate moves, 20.85 percent and 79.15 percent respectively. Of the interstate permits issued, over 60 percent were for mobile homes. Many of these homes were entered Vermont from New York and were bound for one of the other New England states. Another sizeable number were manufactured in Vermont and then shipped out of state. Still, over 37 percent of all interstate moves were loads simply moving through Vermont on their way to another state for delivery (See Table 4-13 and Figure 4-13).

Both the width and the length breakouts show the large number of mobile homes being transported in Vermont. Except for that anomaly, the results are basically the same as from the other states. The gross weight and height breakouts are also the same as for the other states (See Tables 4-14 and 4-15 and Figures 4-14A & B and 4-15A & B).

TABLE 4-13

SAMPLE OF VERMONT PERMITS

Approximate Number of Permits Issued in 1985 = 9900

Sample Population of Permits from 1985 = 777

Number of Intrastate Permits from Sample = 162 (20.85 %)

Number of Interstate Permits from Sample = 615 (79.15 %)

Interstate Permit Sample Population = 615

Mobile Homes	= 381	(61.95 %)
Const Equip	= 103	(16.75 %)
Const Matls	= 82	(13.33 %)
Other	= 49	(7.97 %)

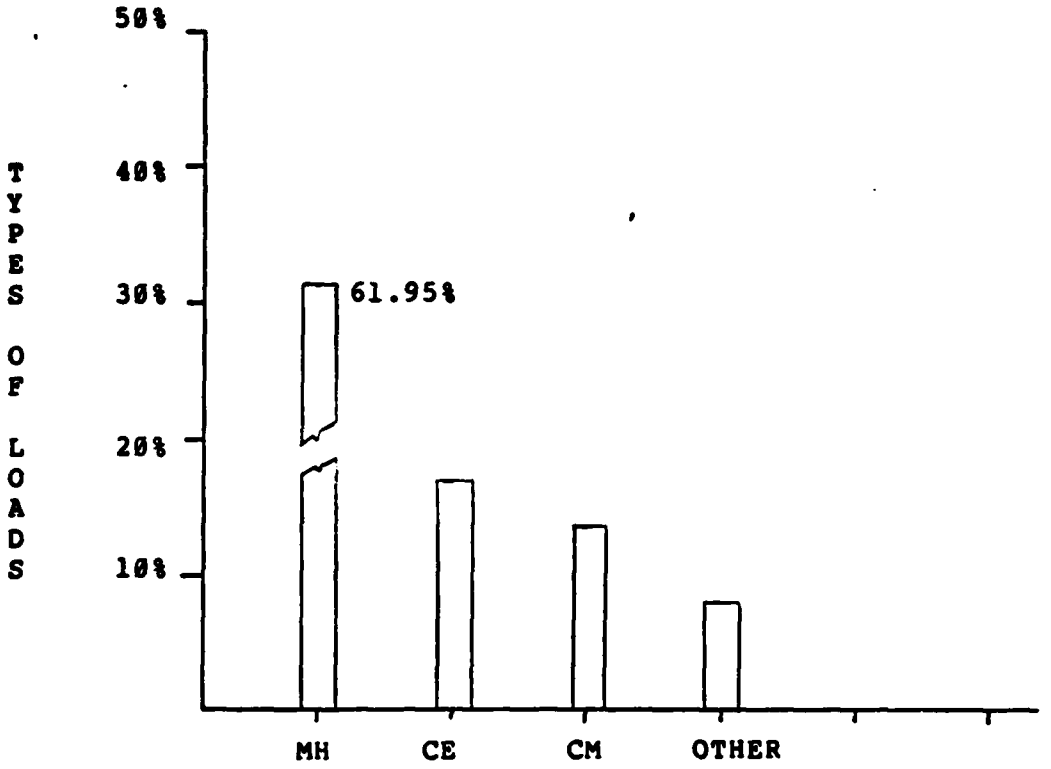
Interstate Moves Originating:

Out of State	= 470	(76.42 %)
In State	= 145	(23.58 %)

Interstate Moves Which:

Are Thru State	= 232	(37.72 %)
Begin or End in State	= 383	(62.28 %)

FIGURE 4-13 VERMONT PERMIT LOADS



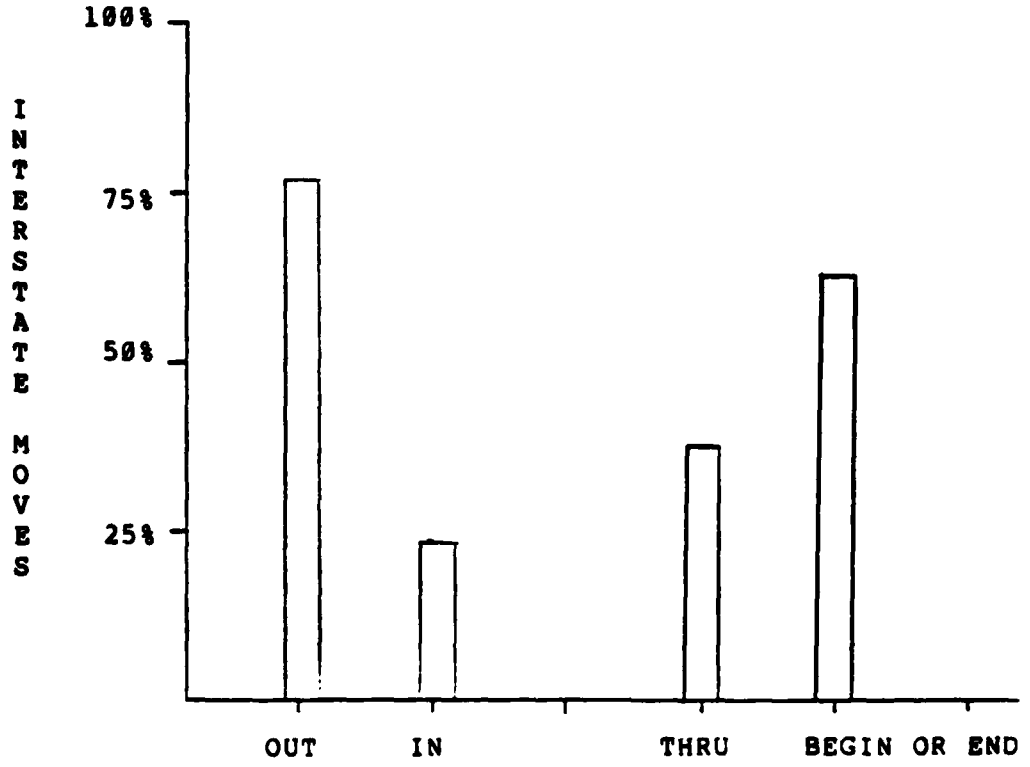


TABLE 4-14

VERMONT WIDTHS

WIDTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 8'-6"	57*	9.27%	9.27%
8'-7" - 10'-0"	62	10.08%	19.35%
10'-1" - 11'-0"	44	7.15%	26.50%
11'-1" - 12-0"	62	10.08%	36.58%
12'-1" - 13'-0"	24	3.90%	40.49%
13'-1" - 14'-0"	364	59.19%	99.67%
14'-1" - 15'-0"	1	0.16%	99.84%
> 15'-0"	1	0.16%	100.00%
	615		

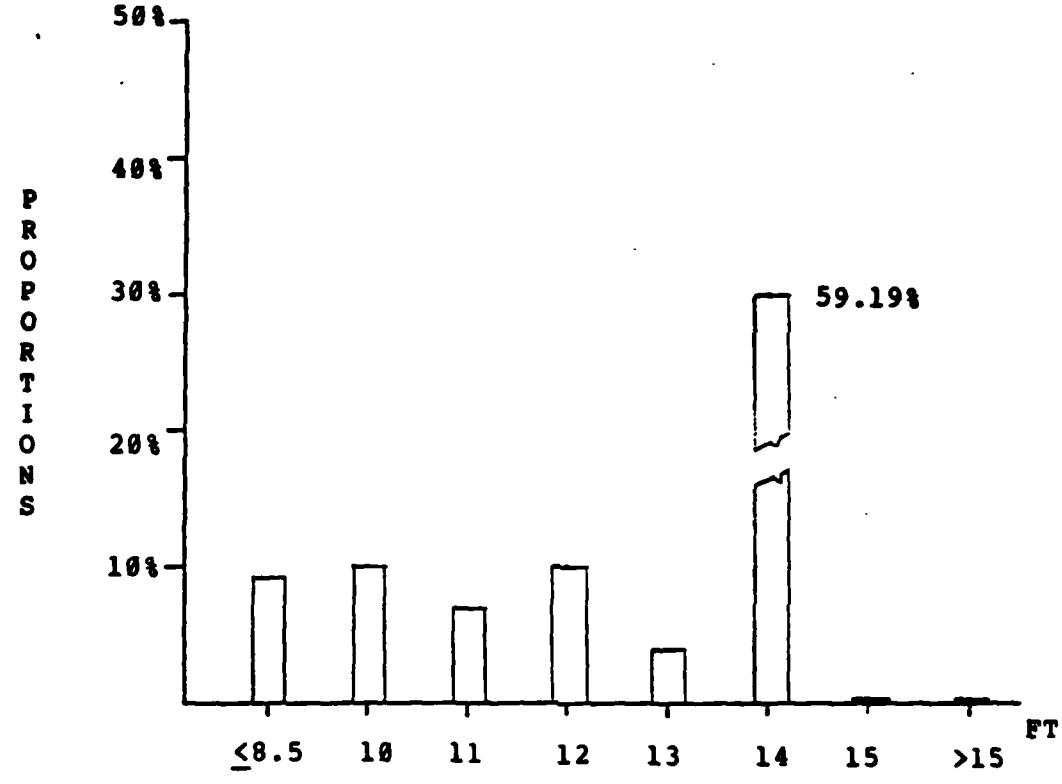
*NO PERMIT REQUIRED FOR WIDTHS ≤ 8' - 6".

VERMONT LENGTHS

LENGTH	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 60'	110**	17.89%	17.89%
61' - 70'	116	18.86%	36.75%
71' - 80'	127	20.65%	57.40%
81' - 90'	240	39.02%	96.42%
91' - 100'	20	3.25%	99.67%
> 100'	2	0.33%	100.00%
	615		

**NO PERMIT REQUIRED FOR LENGTH ≤ 60'

FIGURE 4-14A VERMONT WIDTHS



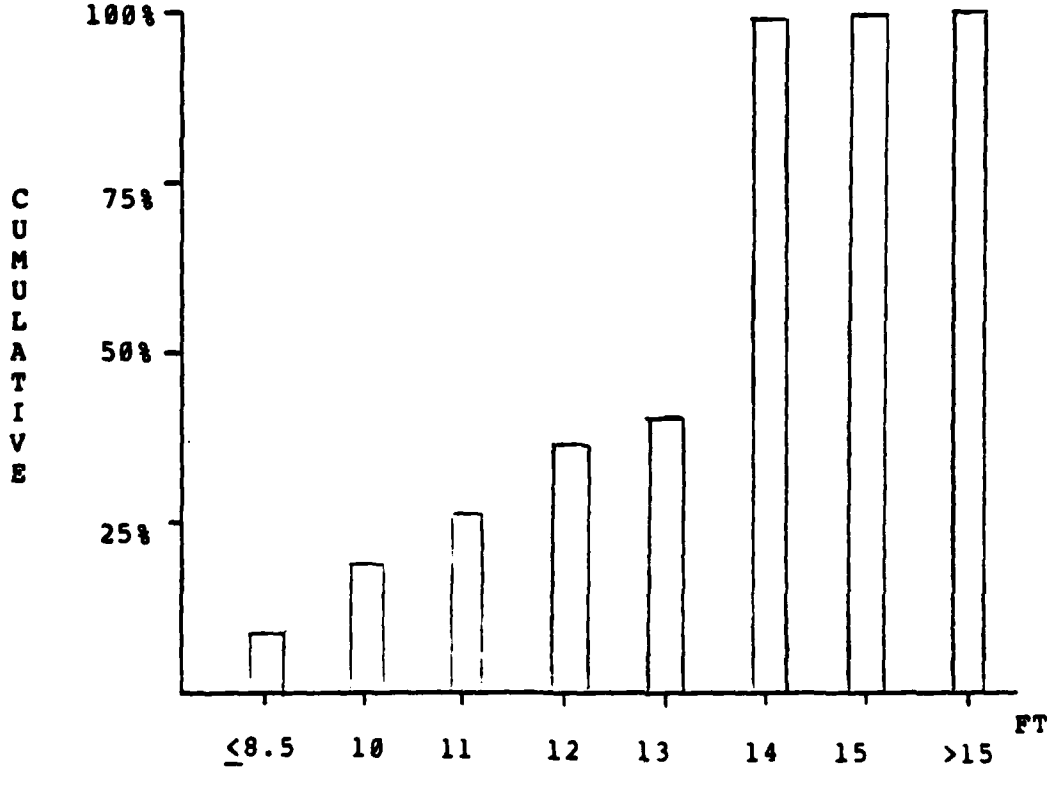
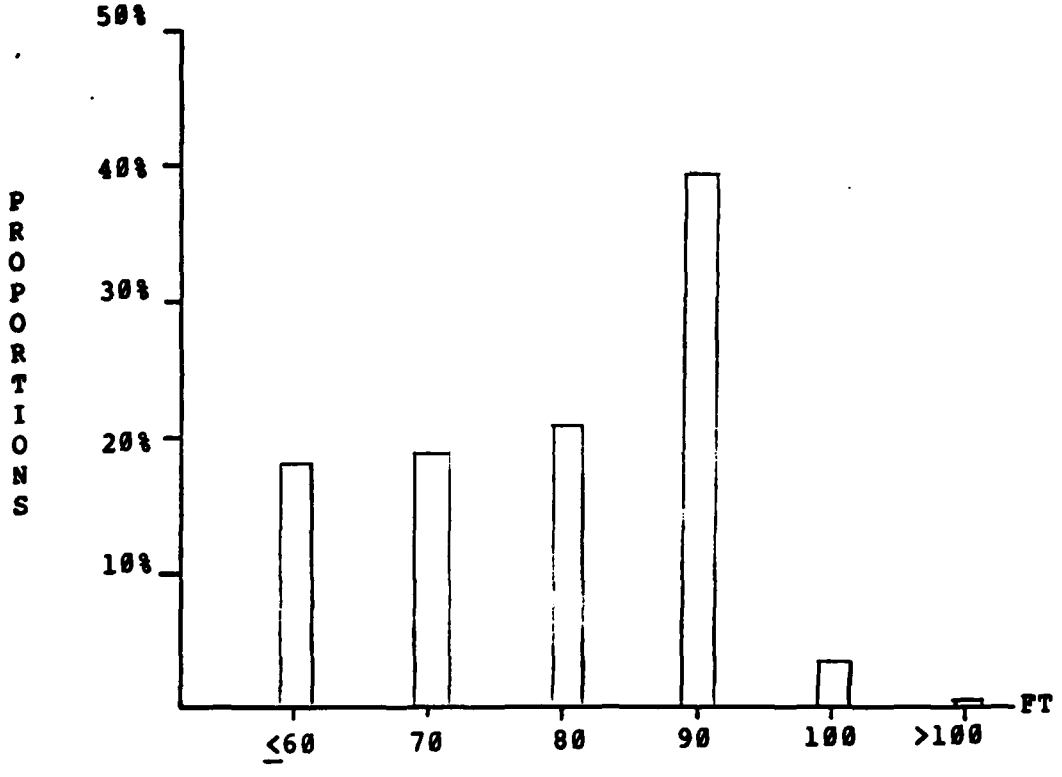


FIGURE 4-14B VERMONT LENGTHS



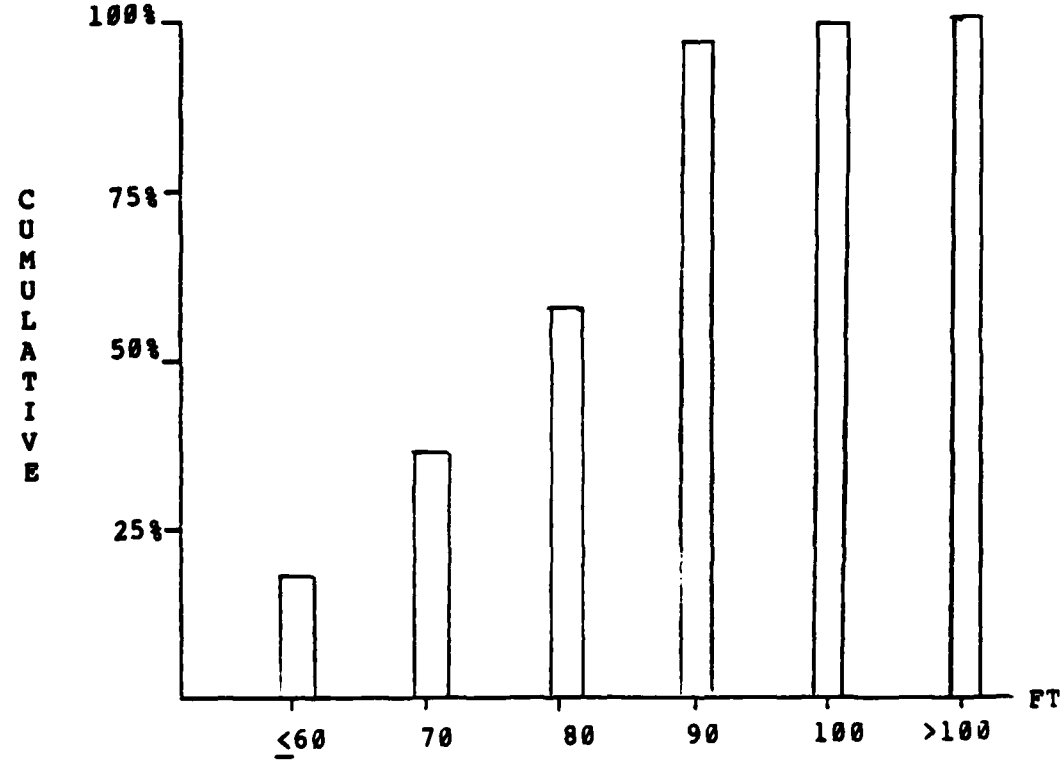


TABLE 4-15

VERMONT GROSS WEIGHTS

WEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 80K	546*	89.11%	89.11%
81K - 90K	14	2.28%	91.38%
91K - 100K	13	2.11%	93.50%
100K - 110K	4	0.65%	94.15%
111K - 120K	15	2.44%	96.59%
121K - 130K	15	2.44%	99.03%
131K - 140K	5	0.81%	99.84%
> 140K	3	0.49%	100.00%
	615		

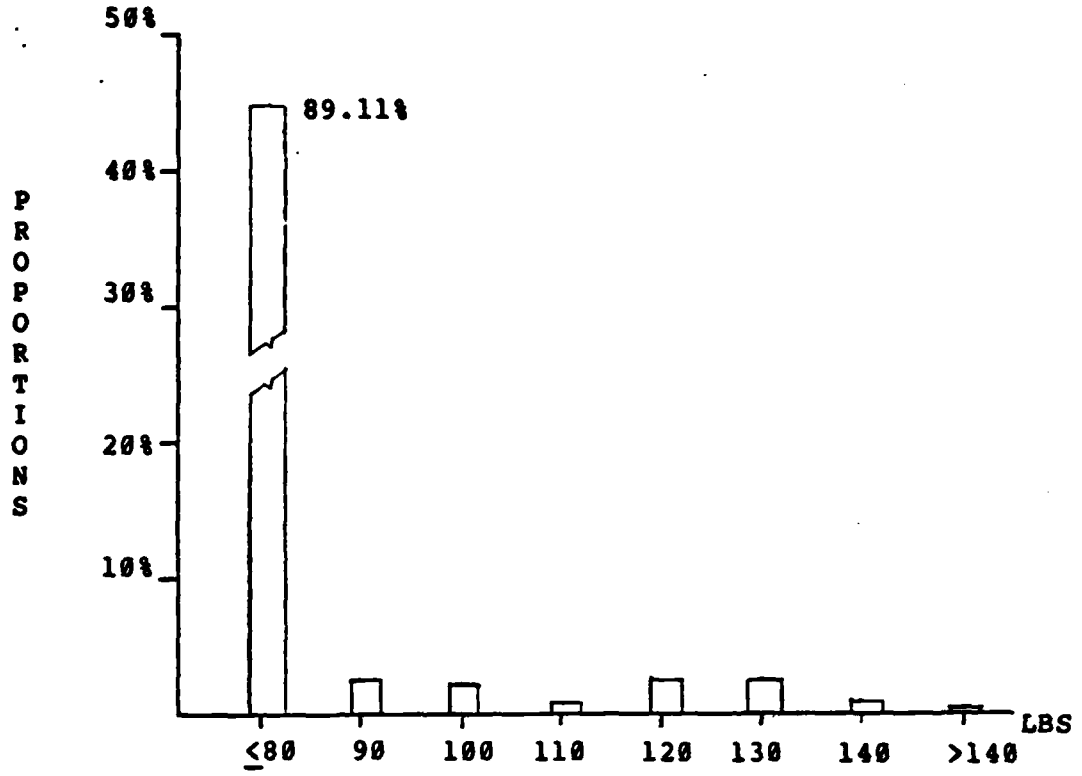
*NO PERMIT REQUIRED FOR GROSS WEIGHTS ≤ 80,000 POUNDS PROVIDED NBF AXLE SPACING REQUIREMENTS ARE SATISFIED.

VERMONT HEIGHTS

HEIGHT	NUMBER OF PERMITS	PERCENT	CUMULATIVE PERCENT
≤ 13'-6"	582**	94.63%	94.63%
13'-7" - 14'-0"	25	4.07%	98.70%
14'-1" - 14'-6"	7	1.14%	99.84%
14'-7" - 15'-0"	2	0.32%	100.00%
15'-1" - 15'-6"	0	0.00%	100.00%
15'-7" - 16'-0"	0	0.00%	100.00%
> 16'-0"	0	0.00%	100.00%
	615		

**NO PERMIT REQUIRED FOR HEIGHTS ≤ 13' - 6".

FIGURE 4-15A VERMONT GROSS WEIGHTS (000'S)



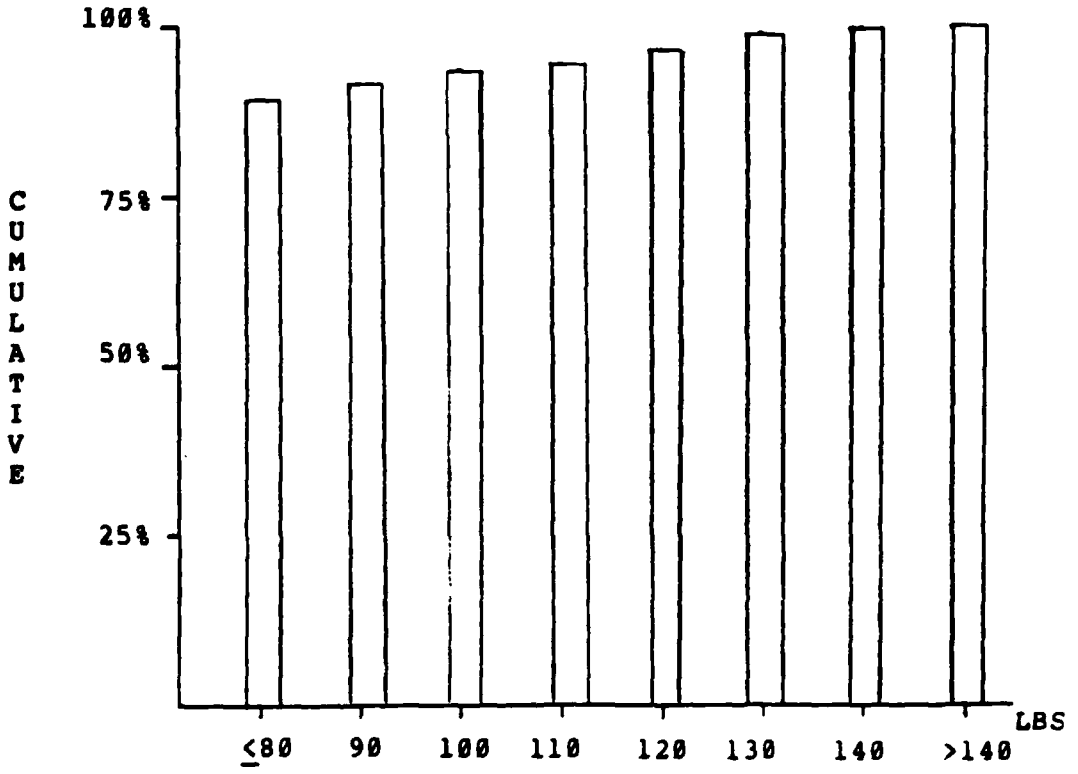
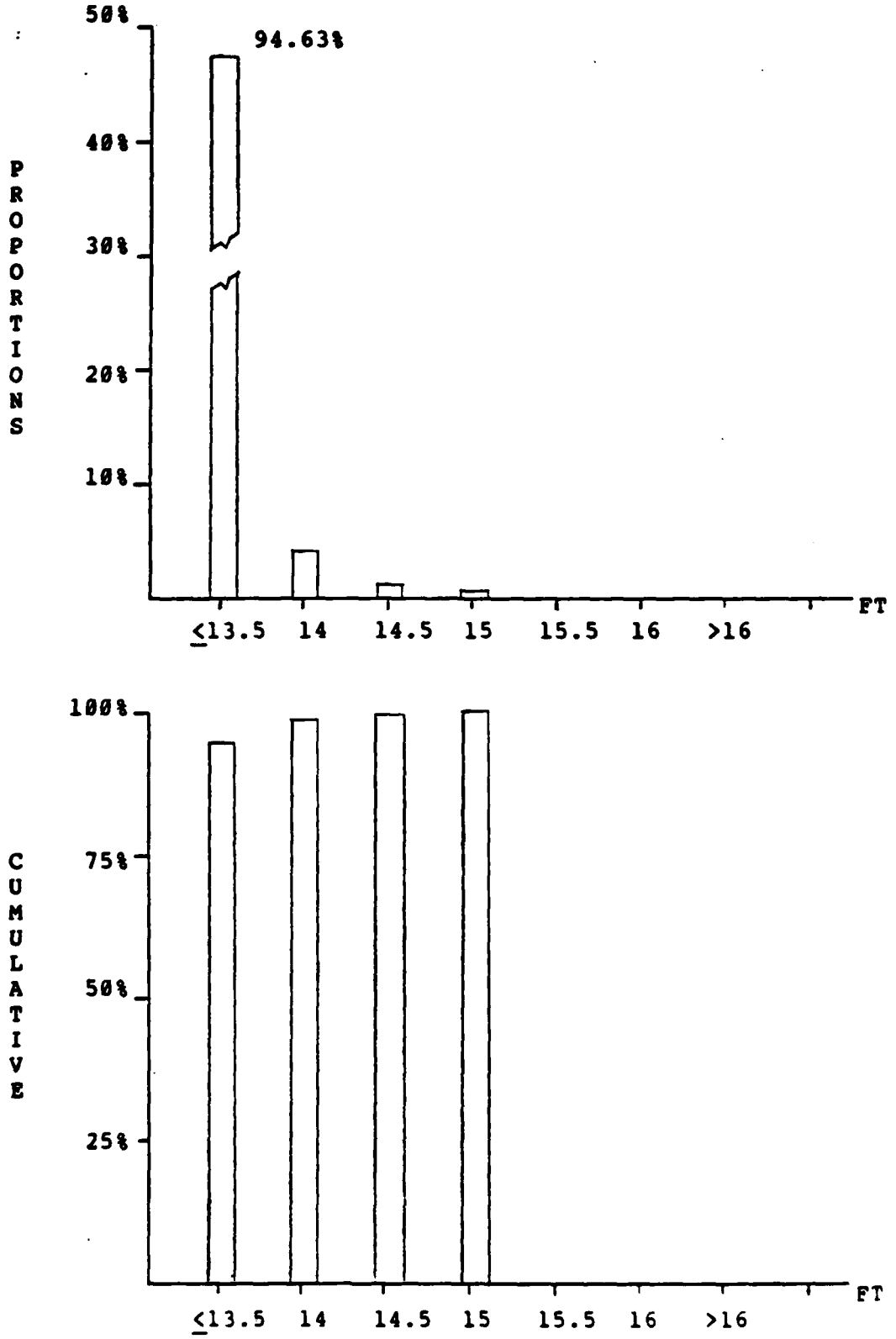


FIGURE 4-15B VERMONT HEIGHTS



4.7 SUMMARY OF STATE PERMIT DATA

In 1985 the five Consortium states together issued over 83,000 permits for oversize and overweight vehicles. 52,000 of these permits (about 63%) were issued to vehicles engaged in interstate travel. The largest single type of vehicle issued these permits was mobile homes. In each state at least 33 percent of all interstate permit loads were mobile homes. In Vermont the proportion of mobile homes was over 60 percent.

Most of the interstate permits were issued to authorize a vehicle with an excessive width. Over 90 percent of all the interstate permits issued in each state were for width exceptions. On the other hand, no more than 10 percent of the permits were for height exceptions and no more than 20 percent were for gross weight exceptions.

All of the Consortium states appear to be net importers of oversize and overweight loads. In each state the number of moves requiring permits which began out of state greatly exceeds the number of moves which began in the state. This is still true even after subtracting out the number of through state moves. However, it may be that the number of oversize and overweight moves originating in a given state may be understated. The use of an annual or quarterly permit would allow a vehicle operator to begin his trip in his home state without any additional record. Only when he crossed into a neighboring state would there be a record of his trip in the

state permit files. Thus, there would be a record of most of the trips which began out of state, but many of the interstate moves which began in-state might not show up in a state's permit files.

Approximately 16,000 of the interstate permits issued by the Consortium states are for vehicles passing through a state on its way to make a delivery in another state. These vehicles, for the most part, are travelling on the main roads of a state so they can reach their destination as soon as possible. These vehicles are prime candidates for a common system of issuing permits in New England. If the states could eliminate the need to issue permits to vehicles simply passing through a state they could reduce their total workload by up to 20 percent. Such a large reduction would be worth the effort required to set up such a system.

CHAPTER FIVE

FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

The focus of this report is on the analysis and development of a rationale for establishing a common system for issuing oversize and overweight permits for vehicles engaged in interstate travel in New England. The purpose of this chapter is to summarize the findings presented in each of the previous chapters and to make recommendations to the New England states for incorporating these findings into a regional system for issuing oversize and overweight vehicle permits.

5.2 FINDINGS

To provide the necessary background material for this report, Chapter One touched on the history surrounding the development of the current system of truck size and weight laws. From this review we learned of the slow but steady Federal encroachment into the traditional state areas of highway and vehicle policy. This encroachment has culminated, so far, in the passage of the 1982 STAA which mandated uniform weight and size requirements for the Interstate and other Federal-Aid systems.

More recently, a bill has been introduced in the U.S. Senate to futher deregulate the trucking industry and at the

same time impose additional requirements on the states to adopt uniform standards in the areas of truck registration and taxation. The bill would also increase the access of 48-foot semitrailers to the same as that enjoyed by household goods carriers. Unless the states can work together to establish more uniform regulations, additional Federal involvement in these areas seems inevitable.

Chapter Two presented the research already conducted in this area, as well as some still underway, to see how it might apply to the New England region, and so that there would be a minimum of repetition. The research reviewed covered over 15 years of investigation in the areas of vehicle size and weight laws, oversize and overweight permit policies and operations, and other related issues such as size and weight law enforcement. The major finding of these research efforts was that the lack of uniformity between the states, both in legal limits, and in permit operations, represents a major problem to interstate commerce which results in a substantial economic loss to all the parties concerned. The recommended solutions included the imposition of more uniform regulations on the Interstate system, and the establishment of regional, state sponsored committees to formulate policies for developing uniform legal limits and permit policies and regulations within the region.

Chapter Three reviewed and analyzed the current size and weight regulations of the New England states. From this

analysis we learned that the New England states suffer from the some of the same problems previously revealed in the earlier research; namely, a lack of uniformity in almost all areas of size and weight regulation. However, we also learned that the degree of non-uniformity varies betwen the different areas of regulation. The dimensional requirements of the states are fairly similar while the weight requirements, especially when one considers the different special permits available in each state, are much further apart. The operational items such as safety equipment, escorts, authorized travel days, etc. are even less uniform among the states.

Chapter Four presented the results of a random sampling of the permits issued in the five Consortium states in 1985. From this sampling we learned that over 63 percent of the permits issued by the states were for vehicles involved in interstate travel. Thus any program which was directed at reducing the number of interstate permits which had to be issued could possibly affect over one-half of the permit workload of the states. Of particular importance is the number of permits issued to vehicles which are simply passing through a state, neither beginning nor ending their trip in the state. From the sampling we learned that there was great variability between the states in the number of vehicles in this category. However, overall this category of vehicle makes up over 19 percent of the interstate vehicles requiring a permit. This category of vehicle is a prime candidate

for a common system of issuing oversize and overweight permits.

From Chapter Four we also learned more about the make-up of vehicles requiring oversize and overweight permits. Mobile homes were identified as the single largest group of vehicles requiring permits. Over 30 percent of all the vehicles requiring permits in all the states were mobile homes. Construction industry items such as heavy equipment and construction materials made up another large portion of the oversize and overweight permits issued by the states.

The above listed findings give a clearer picture of the current situation in New England with regards to oversize and overweight permit policies and operations. They also provide a better understanding of the results of the previously conducted research and how these two areas, the current situation in New England and the previous research, relate to one another. Basically, the New England states, as has been stated before, suffer from many of the same problems identified in previous research. However, because of the findings presented in this report, the advantages of dealing with these problems in a regional manner are readily apparent. The rest of this chapter presents recommendations to the New England states for realizing these advantages.

5.3 RECOMMENDATIONS

The recommendations for improving the situation

regarding the issuance of oversize and overweight permits in New England are broken into two seperate areas. The first represents recommendations which can be implemented fairly rapidly without the need for further research. The second area represents additional research topics which need to be pursued in order in gain a better understanding of the total effects of public policy on the trucking industry.

5.3.1 RECOMMENDATIONS FOR IMMEDIATE IMPLEMENTATION

The New England states should seek complete uniformity in the area of vehicle size and weight regulations and the operation of their oversize and overweight permit policies. As a first step in this program they should establish a regional committee made up of state transportation officials and industry representatives as proposed in the earlier research. The Truck Issues Advisory Committee of the State of Maine, who's report was reviewed in Chapter Two, is an example of just such a committee. Their work resulted in many sound recommendations and increased the ability of the state regulators and the industry to work together sucessfully. The purpose of this committee is to review the current policies and to recommend model regulations for adoptation by the states. One of the first areas which should be addressed is the area of safety and travel regulation.

Interviews with representatives of the mobile home industry indicate that they have a difficult time keeping track of the different safety and travel regulations affecting

oversize and overweight loads in each of th New England states. In fact, to some extent they depend on commercial companies such as Transceiver or Xero-Fax, which are in the buisness of obtaining permits for truck operators, to keep them up-to-date on the requirements in each state. However, they report that even these companies are caught unawares by changes in permit issuing hours or travel restrictions.

There is no apparent reason for the wide differences in safety requirements and travel restrictions imposed on oversize and overweight loads by the different states. Certainly there are special circumstances in each state which require a unique solution. The Boston metropolitan area is one example. Even so, the remainder of the state could easily operate within the same set of regulations as the other states in New England. The adoptation of uniform requirements in these areas could be accomplished relatively easily and would provide a good first step for the regional committee and for the states.

Adopting uniform requirements for safety items such as signs, flags, escorts, etc., and for travel requirements such as special holiday restrictions and travel hours will simplify the movement of oversize and overweight vehicles in New England. However, the vehicle operators will still be required to obtain one permit for each state they travel through. The next step in implementing a more uniform set of permit policies and operations is to establish some type of

common system for issuing oversize and overweight vehicle permits so that a permit issued in one of the New England states would be recognized in another.

There is good reason for attempting to implement such a system. As shown earlier in this chapter, over 60 percent of all the oversize and overweight permits issued are issued to vehicles engaged in interstate travel. If all of the vehicles which were just passing through a state could do so with a permit written in another state, this would immediately reduce the total permit workload by about 19 percent.

Obviously there will be different reductions in each state. Maine will see very little reduction as they have very few vehicles making through trips. On the other hand New Hampshire and Rhode Island could see reductions of about 27 percent and 39 percent respectively. This is a significant reduction in the workload of the permit office.

The trucking industry would also enjoy several advantages under this concept. They would have fewer permits to obtain, thus saving time and reducing costs. These costs not only include the actual fees charged by the states for the permit, but also the transmission fees charged by the organizations in the business of obtaining permits for truck operators. One New England mobile home firm estimated their total permit cost to average about $20 per state per trip. When one considers that Massachusetts and Rhode Island do not

charge a fee for a permit and that the permit fee in New Hampshire for oversize loads is only $5, one can see that the fees paid to these permit companies represent a large part of the cost to obtain oversize and overweight permits.

The adoptation of a common system for issuing and recognizing oversize and overweight permits in New England would of itself promote increased uniformity among the states. Some uniformity would be required just to implement the program. With this start the states would find it easier to bring other aspects of their size and weight regulations in line with each other. As this and previous research has shown, this goal alone is worthy of the effort required to achieve it.

As with any endeavor, there will be some problems in implementing such a system. The states would be required to give up some control over the movement of oversize and overweight vehicles in the state. But, it would be no more than that given up through the use of annual, semi-annual, and quarterly permits. Another problem area would be the identification of special problem conditions, such as road closures or constrictions due to construction or other activity, to the other states in the system which might be issuing permits for that route. Still another problem is the distribution of the fees collected for these multi-state permits. These are operational problems which will take time to work out. They should not be allowed to detract from the benefits to be

gained by the use of such a system.

One possible solution to some of the problems associated with the lack of state control over the movement of oversize and overweight vehicles in the state, and to some degree, to the problems associated with road conditions is for the states to restrict the type of vehicle which would be issued multi-state permits and to restrict the number of routes that could be travelled on with such a permit. In this way the states could control where these loads traveled and how large or heavy they might be. Any vehicle which exceeded the weight or size limitations or wanted to use an unauthorized route would necessarily have to obtain a permit from the particular state in question.

The states should chose enough routes so that most of the vehicles could be accomodated under this system. The size and weight restrictions should also enclose a large enough "envelope" so that most of the vehicles currently travelling under a size or weight permit would at least qualify for the system. Based on the sample of permits taken from the consortium states, 90 percent or more of the vehicles which travelled under an oversize or overweight permit in 1985 had dimensions or weights less than or equal to the following limits:

1) Width	14'
2) Length	90'
3) Height	14'
4) Gross Weight	130,000 lbs

The states should consider using these limits for their envelope. In effect, the permit issuing system would become an exception reporting system. Only those loads which needed to exit from the prescribed routes, or which exceeded the prescribed limits would need to contact any given state. Thus, the states would be able to concentrate their efforts on the special cases really requiring their attention.

The development of a common system of permits for oversize and overweight vehicles engaged in interstate travel in New England, based on the concept of an "envelope vehicle" and state prescribed routes, should be one of the major tasks assigned the above mentioned "uniformity" committee.

5.3.2 LONG TERM RESEARCH RECOMMENDATIONS

Despite the research conducted over the past 15 years there are still many unresolved problems related to the issue of vehicle size and weight restrictions and oversize and overweight vehicle operations. The imposition of uniform size and weight limitations among the New England states, along with the adoption of a common system for issuing oversize and overweight vehicle permits and the standardization of safety and travel regulations will have an impact on the economy of the region. Yet, the magnitude of this impact is unknown. With the increasing competition among surface transport modes, likely changes in the methods of financing both new highway construction and renovation and reconstruction, and the development of new technologies in both highway and

vehicle design, there is a critical need for research in several key aspects of vehicle size and weight regulation. These aspects can be characterized as engineering, economic, financial, and operational.

The engineering aspects of size and weight limits deal with the physical interaction between the vehicle and the pavement structure. Currently, the Civil and Mechanical Engineering Departments at MIT are jointly working on a project involving the modeling of vehicle suspension systems. A similar program is being run by the Roads and Transportation Association of Canada (See Chapter Two). Such models can be used to study the effects of heavy vehicles on pavements for much less cost than if done with field testing. These models could be used to reexamine the weight limits and distributions allowed under the recommended common permit system. If the states could determine which vehicles and vehicle configurations did less damage to the pavements, they could take special measures to encourage the use of these less damaging vehicles.

Traditionally, it has been the economic benefits of increased size and weight regulations that have been used to justify larger and heavier vehicles. However, as was stated earlier, the impacts of future changes in vehicle size and weight regulations on the ecnomy of the region are unknown. Additional research into the value of commodities transported by vehicles using oversize and overweight permits

is required in order to determine these effects. In fact, a good model of the economic interactions involved in vehicle size and weight regulations could be used by the states to test different regulatory schemes to see how each would affect the economies of the different states.

Another issue which needs to be addressed in more detail is the issue of transforming the economic benefits of any chosen regulatory scheme into the finances required by the states to provide highway services. At the present time only relatively modest fees, if any at all, are charged for oversize and overweight permits. The question of whether or not these fees accurately reflect the true cost of the service provided by the state, not just the administrative cost of issuing the permit, but the cost of maintaining the highway, as well as the costs imposed on the other users of the highway, needs to be addressed in more detail.

The operational concerns of the state include the distribution of oversize and overweight loads on the different highways of the state. Such concerns manifest themselves in such areas as increased maintenance costs for the more heavily travelled routes. From the truck operators standpoint the operational question includes the effects of permit policies on the routing of different types of loads. As is usually the case, both of these areas also affect the economic impact of the regulatory scheme.

The four research areas mentioned above encompass a broad spectrum of policy decisions. Each has its own charactristics, yet each has some relation with the others. The optimum solution would be the development of a grand system which could incorporate all the above issues into one model. Then the states could study the effects of policy changes on all the associated areas at the same time.

With the formation of the New England Surface Transportation Infrastructure Consortium the New England states have taken a bold step in the direction of regional collaboration and cooperation. By implementing the recommendations outlined above for immediate resolution the New England states can lead the nation in establishing more uniform size and weight requirements. By undertaking the additional, long-term research just discussed they can continue to demonstrate the benefits to be gained from regional cooperation in transportation operations and research.

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APPENDIX 1

SUMMARY OF STATE REGULATIONS

A1.1 INTRODUCTION

The purpose of this appendix is to present the statutes, rules, regulations, and procedures used by the New England States to control the operation of oversize and overweight vehicles on their road systems. The interaction of these regulations with the trucking industry and its customers is especially important in New England because of the relatively small size of the individual States. For example, a trip from New London, CT to Portland, ME with an oversize load could easily be made made in one day, but would require permits from as many as five different States. Each State's regulations and procedures differ slightly from those of its neighbors. These differences can easily result in confusion and extra costs to the trucking industry and hence, to the public. With a better understanding of the current situation, the New England States should find it easier to forge a more uniform system of oversize and overweight permits.

A1.2 THE LEGAL LIMITS

Legal limits for vehicles are defined for height, width, length, and weight. The weight limits are further broken down by the number of axles on the vehicle, as well as by the spacing of those axles.

A1.3 HEIGHT

13'-6" is the legal limit for the combined height of vehicle and load in all the New England States except Maine. Maine allows 13'-6" for the vehicle plus an additional 6" for the load for a total height of 14'-0".

A1.4 WIDTH

Except for New Hampshire, all the New England States allow widths up to 8'-6" on their highways. New Hampshire allows 8'-6" on roads with 12' lanes, or for buses. Otherwise the limit is 8'-0".

A1.5 LENGTH

Length requirements differ markedly between the six New England States. Single unit lengths vary from 35' in Massachusetts and New Hampshire (40' for buses in both States), to 40' in Rhode Island, 45' in Maine, and 60' in Connecticut and Vermont. Combination units are limited to 60' Massachusetts and Vermont, and to 65' in Maine but are not limited in the other States. Single trailers of truck-tractor semitrailer combinations are limited to 45' in Massachusetts (special permit to 48' available) and 48' in the other States, except Rhode Island. The limit in Rhode Island is 48'-6". Trailers or semitrailers in a truck-tractor semitrailer trailer combination are limited to 28', except in Maine and Rhode Island. The limit in Maine and Rhode Island is 28'-6".

A1.6 WEIGHTS

A1.6.1 SINGLE AXLE

For the most part all the New England States allow 22,400 pounds on a single axle. However, there are some exceptions, as well as some special definitions of a "single axle". Two axles less than 40" apart, center-to-center, are considered to be one axle in New Hampshire and Rhode Island. Connecticut and Massachusetts list no such minimum distance, while Maine and Vermont consider axles up to 48" apart to be one axle. New Hampshire reduces the per axle load to 20,000 pounds when the vehicle is on the Interstate system and the gross vehicle weight is over 73,280 pounds. The general limit in Maine is 22,400 pounds, but the limit on the Interstate system is 22,000 pounds (20,000 pounds if the gross vehicle weight is over 73,280 pounds).

A1.6.2 TANDEM AXLES

Notwithstanding the limits on single axles described above, the States have reduced the allowable single axle loads on axles which are not far enough apart (similar to counting two axles closer than 40" as one). Connecticut and Massachusetts reduce the per axle load to 18,000 pounds for axles less than 6' apart. Rhode Island reduces the per axle load for axles less than 6' apart to 16,000 pounds. Axles closer than 12' are reduced to 18,000 pounds. Axle loads less than 8' apart in Maine are reduced to 17,000 pounds on the

Interstate system and 19,000 pounds on state roads. Vermont reduces axle loads greater than 4' and less than 8' apart to 18,000 pounds. New Hampshire reduces per axle loads to 18,000 pounds for axles less than 10' apart (except for three axle single unit vehicles) unless the vehicle is on the Interstate system with a gross vehicle weight greater than 73,280 pounds. Then the reduction is to 17,000 pounds per axle for axles less than 8' apart.

A1.6.3 TWO AXLE VEHICLES

The limit in New Hampshire is 33,400 pounds. In Massachusetts it is 46,000 pounds (although with single axle limits of 22,400 pounds, the limit is realistically 44,800 pounds). Rhode Island limits the weight of two axle vehicles to 32,000 pounds when the axles are less than 6' apart and 36,000 pounds when they are 6' or more apart. Maine allows up to 34,000 pounds on the non-interstate system. On the Interstate system the allowable weights are based on the National Bridge Formula with a maximum of 34,000 pounds for axles 4' to 8' apart. This limit increases with axle distances greater than 8'. Connecticut and Vermont allow weights up to 36,000 pounds for axle distances less than 8', up to a maximum of 40,000 pounds for axle distances of 10' or more. Of course, t single axle restrictions also apply to this and all other classes of multi-axle vehicles.

A1.6.4 THREE AXLE SINGLE UNIT VEHICLES

Connecticut allows a maximum of 53,800 pounds per vehicle. This increases to 60,000 pounds if the wheelbase requirements of the National Bridge Formula are met. For non-interstate operation the limit in Maine is 54,000 pounds. On the Interstate system the weights derived from the National Bridge Formula are the limits. In New Hampshire the limit is 55,000 pounds on state roads and 47,500 on the Interstate system, unless the National Bridge Formula (NBF) allows a greater weight. Rhode Island allows weights up to 40,000 pounds for axle distances less than 15' and 44,000 pounds for axle distances of 15' or more. Massachusetts restricts vehicle loads to those allowed by the NBF. Vermont also restricts vehicle weights to those allowed by the NBF, except that vehicles with both rear axles powered and braked are limited to a gross vehicle weight of 55,000 pounds.

A1.6.5 TRIAXLES

Triaxles are commonly found on heavy duty semitrailers, some truck-mounted cranes, heavy duty dump trucks, forest product trucks, or other heavy duty four axle single unit vehicles. Generally, the maximum loads on triaxles are figured using the NBF. Maine allows triaxle loads on its state roads up to 48,000 pounds while Vermont allows triaxle loads up to 54,000 pounds on its state roads.

A1.6.6 FOUR AXLE SINGLE UNIT VEHICLES

Connecticut allows gross vehicle weights of up to 67,400 pounds for axle distances less than 28'. If the wheelbase is 28' or more, 73,000 pounds is allowed. Maine allows a maximum of 69,000 pounds, except on the Interstate system. There the NBF limits apply. New Hampshire allows up to 60,000 pounds on their non-interstate system and 47,500 pounds on the Interstate system, unless the NBF allows more. Rhode Island allows up to 40,000 pounds when the axle distance is less than 15' and 44,000 pounds when the distance is 15' or more. The weight limit in Massachusetts is governed by the NBF. Vermont allows up to 60,000 pounds on its state roads. The Interstate system in Vermont is governed by the NBF.

A1.6.7 THREE AXLE COMBINATION VEHICLES

Connecticut allows gross weights up to 58,400 pounds for three axle combination vehicles. This can increase up to 60,000 pounds if the NBF allows it. Maine has the same limits as for three axle single unit vehicles, 54,000 pounds on the non-interstate system and NBF limits on the Interstate system. New Hampshire allows weights which meet the NBF requirements except that on the Interstate the load on a single axle cannot exceed 20,000 pounds. Rhode Island allows weights up to 46,000 pounds for axle distances less than 22', 50,000 pounds for axles distances between 22' and 27' and 56,800 pounds for axle distances of 27' or more. Again, Massachussetts and Vermont allow loads which meet the requirements of

the NBF.

A1.6.8 FOUR AXLE COMBINATION VEHICLES

For an axle disance of less than 28' Connecticut allows a gross vehicle weight of up to 67,400 pounds. If the axle distances 28' or more, 73,000 pounds is allowed, unless the NBF allows more, up to a maximum of 80,000 pounds. Maine restricts vehicle weights to 69,000 on the state road system and restricts the Interstate system to the weights allowed by the NBF up to a maximum of 72,000 pounds. New Hampshire limits the weight of four axle combination vehicles to 68,000 pounds. Rhode Island allows weights up to 46,000 pounds for four axle combination vehicles with axle distances less than 22'. 50,000 pounds is the limit for axle distances between 22' and 27'. For distances of 27' or more,the limit is 67,400 pounds. Massachusetts and Vermont restrict their vehicle weights to those allowed by the NBF.

A1.6.9 FIVE AXLE COMBINATION VEHICLES

Connecticut allows a maximum gross vehicle weight of 73,000 pounds for five axle vehicles. If the requirements of the NBF are satisfied the limit can go as high as 80,000 pounds. Maine allows up to 80,000 pounds on its non-interstate system, but subtracts some weight for short wheelbases. Only those loads allowed by the NBF are allowed on the Interstate system. New Hampshire allows maximum vehicle weights up to 73,280 pounds, provided single axle loads of 22,400 pounds

and tandem axle loads of 36,000 pounds are not exceeded. If the gross vehicle weight is over 73,280 pounds then the NBF must be satisfied for any set of axles and the total weight cannot exceed 80,000 pounds. For vehicles with axle distances of less than 22' the weight limit in Rhode Island is 46,000 pounds. Vehicles with axle distances between 22' and 27' are limited to 50,000 pounds. Vehicles with axle distances of 27' or more can weigh up to 80,000 pounds. Massachusetts and Vermont require all vehicles to meet the requirements of the NBF with a maximum load of 80,000 pounds.

A1.6.10 MORE THAN FIVE AXLES

In general the maximum gross vehicle weight of any vehicle is limited to 80,000 pounds and the requirements of the NBF must be satisfied.

A1.6.11 OTHER CONSIDERATIONS

The gross vehicle weight and the NBF are not the only factors which must be considered in determining if a vehicle exceeds the legal weight limits. Other factors include the per axle limits, tire size and rating, the statutory road limits, and the registered weight of the vehicle. For example, four of the New England states, Connecticut, Maine, New Hampshire and Vermont limit vehicle and axle weights to 600 pounds per inch of tire width.

A1.7 PERMITS

A1.7.1 APPLICATIONS

Connecticut accepts permit applications in person or by mail or telephone. Massachussets accepts applications by mail, phone, and also by facsimile transceiver. Maine also accepts applications by transceiver, as well as in person or by mail. Maine also has a system of "instant permits" available only to Maine businesses. The user can purchase a book of blank permits and then call in the appropriate information for each move. This is the only way permits may be obtained over the telephone, although changes to issued permits will be accepted over the phone. New Hampshire also has an instant permit program, in addition to telephone, transceiver, mail and in person application systems. Rhode Island will only accept permits by mail, telephone, or transceiver. Vermont accepts applications by phone, mail, or transceiver, as well as in person.

A1.7.2 PERMIT FEES

Connecticut charges a basic fee of $15.00 for a single trip permit. An extra charge of $2.00 is levied if the permit is issued over a facsimile transmitter. Maine permit fees range from $3.00 to $15.00, based on a sliding scale of how much a limit is exceeded. Long term permits (for up to three months) are available for $15.00 per month, provided certain restrictions are met. The Instant Permit books cost $75.00

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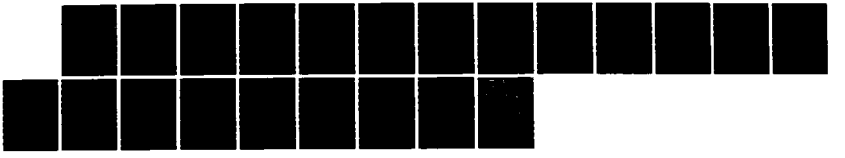

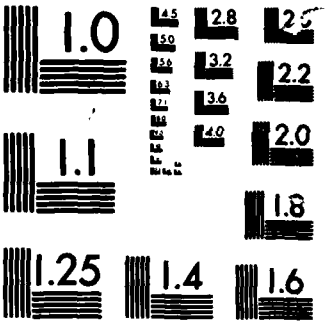

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for a book of 25 permits. The actual fee for each permit is deducted from an escrow account when the the permit is actually used. Vermont charges $10.00 for each single trip permit. $35.00 is charged for the first blanket permit (blanket permits are for state-wide operation), $20.00 for the second, and $15.00 for each subsequent permit. If an engineering assessment of the proposed route is required an additional fee of $20.00 is charged. New Hampshire charges $5.00 for an oversize permit. The fee for an overweight permit is based on a sliding scale of $5.00 for the first 50,000 pounds of gross weight plus $1.00 for each 10,000 pounds between 50,000 and 100,000 pounds. An additional $2.00 is charged for each 10,000 pounds beyond 100,000 pounds. Special annual permits for state-wide moves are available for $100. Annual permits for moves limited to a radius of 100 miles are $50, but are available only to businesses or vehicles based in New Hampshire. Books of 25 instant permits are $5.00. Neither Rhode Island nor Massachusetts charge for overweight or oversize permits for non-divisible loads. Massachusetts does charge a fee for overweight divisible load permits.

A1.7.3 PERMIT DURATION

Connecticut single trip permits are valid for three days. Maine permits are valid only on the dates listed on the permit. A special three month permit is available if certain special restrictions are met. New Hampshire single trip permits are good for five business days. Special annual permits

are available if certain special restrictions are met. Single trip permits in Rhode Island are only good on the days specified on the permit. Special blanket permits good for three or six months are available under certain conditions. Vermont single trip permits are good for two weeks. Blanket permits are available. Massachusetts single trip permits are valid for one month. Annual permits are available.

A1.7.4 PERMIT TRAVEL DAYS

In general, permit travel is not allowed on Sundays or holidays. All six states restrict traffic on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day and Christmas Day.

Connecticut publishes its holiday list on an annual basis and it can contain additional restricted travel periods either before or after the above holidays. Connecticut does not allow travel on Saturdays either. Travel is also generally restricted to daylight hours also. Connecticut defines daylight as 30 minutes after sunrise to 30 minutes before sunset.

Maine allows permit travel on Saturdays, except for those in July or August. Additional hours, before or after the holidays listed above may also be restricted at the discretion of the Commissioner. Daylight hours in Maine are from sunrise to sunset.

New Hampshire restricts traffic on Saturdays, Sundays and the above listed general holidays. They also include President's Day as a holiday. Daylight hours in New Hampshire are defined as 30 minutes before sunrise to 30 minutes after sunset. Loads which are overweight only, and which can keep up with traffic, may travel at any time.

Rhode Island restricts travel on Victory Day in August, in addition to the other general holidays. For holidays which fall on weekdays (MON-SAT) travel is restricted beginning at noon the day before. For holidays which fall on Sunday, travel is restricted for all of the following Monday. Daylight hours are defined as from sunrise to sunset.

Vermont restricts travel on President's Day, as well as the other general holidays. Permit travel is also restricted on Saturdays, as well as on Fridays after 12PM from the fourth of July through Labor Day. Saturday holidays include the preceding Friday and Sunday holidays the following Monday. Daylight hours are from 30 minutes before sunrise to 30 minutes after sunset. Overweight only vehicles with gross vehicle weights less than 90,000 pounds may travel without restriction.

Massachusetts restricts permit traffic between Saturday noon and Monday morning. Traffic is also restricted on days immediately preceding or following a holiday weekend when, in the opinion of the Maintenance Engineer, the safety of the traveling public may be compromised. It is important to note

that Memorial Day is not celebrated on the same day all across New England. New Hampshire, Vermont, and Maine celebrate it on 30 May, while the other states celebrate it on the last Monday in May.

A1.8 SAFETY REQUIREMENTS FOR OVERSIZE LOADS

A1.8.1 VERMONT

16" X 16" red or orange flags are required on all corners of an oversize load. An oversize load sign is required for a load with width greater than 8'-6" or length over 60'. The sign must be at least three foot square with six inch high black letters. It should read DANGER on the first line and OVERSIZE on the second. Signs which are legal in other states are allowed. Escort vehicles are required for widths over 10'-6" or lengths over 84'. Widths over 14' and lengths over 90' feet require two escorts on state roads. The escort vehicles must have flashing yellow lights on their cab and the required sign on the front or rear as appropriate. As is true in all the New England states single escorts on dual lane highways must lead the load; on four lane divided highways they must follow the load. Police escorts may be required at the discretion of the permit authority.

A1.8.2 RHODE ISLAND

12" X 12" red or orange flags are required on the four corners of an oversize load. Vehicles with widths less than

12' do not require an escort vehicle while those with widths over 12' require one escort. Vehicles with widths over 13' require two escorts. Vehicles with heights over 14' also require an escort. Vehicles which are over length up to 80' require one escort. Beyond 80' in length they require two escorts. Cranes over 12' in width traveling on state roads require two escorts. Only one escort is required if they are just traveling through the state on a divided highway. All escorts are required to have a sign mounted either in the front or rear as appropriate. The sign should read OVERSIZED or WIDELOAD. These signs must be at least 7' X 18" with black letters 10' X 1 5/8". The escort vehicles and the transporter must be in radio contact and the escorts must have flashing amber lights.

A1.8.3 NEW HAMPSHIRE

Vehicles with widths greater than 10'-3" or lengths greater than 75' require one escort. An additional state police escort is required when the width exceeds 18' or the length exceeds 90'. All escort vehicles must have a flashing amber light and operate with their headlights on low beam. Both the escort vehicle and the transporter must have an appropriately placed sign which reads OVERSIZE LOAD. The sign on the loaded vehicle must have 10" X 1 5/8" black letters and have dimensions of at least 7' X 18". The sign on the escort must have letters at least 10" X 1".

A1.8.4 MAINE

All loads or vehicles with a width of 11'-6" or more in Maine require at least one escort. The escort vehicle must have two outside mirrors and two amber lights. The driver must be at least 20 years old and have had a driver's license for at least three years. An OVERSIZE LOAD sign must be on the front or rear of the escort vehicle and the transporter, as appropriate. The sign must be at least 5' X 18" with letters 10" X 1 5/8". The transporter must carry red or orange flags, 18" X 18", on the corners opposite of the escort vehicle. The transporter must have at least one amber light and operate with its headlights on low beam. On moves which require two escorts, radio contact must be maintained between both of the escort vehicles and the transporter. In all cases, the escorts should stay close enough to the transporter so that other vehicles cannot come between the escort and the transporter. Loads longer than 125' or wider than 15' may require a state police escort. Extra wide loads may be required to display a DO NOT PASS MOVING LOAD sign of the same dimensions as the oversize load sign described earlier.

A1.8.5 MASSACHUSETTS

Vehicles with widths over 12' or lengths over 80' require one escort with red flags. Widths over 13' or lengths over 95' require two escorts. Any load overhanging the transporter by more than 15' requires an escort with red flags.

Structural beams greater than 95' require an escort with flashing warning lights. State police escorts may be required for beams greater than 120'.

A1.8.6 CONNECTICUT

Escorts are required in Connecticut as stated on the permit. Vehicles with widths greater than 12', or greater than the lane width, will require at least one escort. Overhangs, either in the front or rear, greater than 25' will require an appropriately placed escort. Escort vehicles must have a flashing amber light visible for 1000', and a sign which reads OVERSIZE LOAD AHEAD (FOLLOWING). The letters on the sign must be 8" X 1". Two-way communications must be maintained between the escorts and the transporter. Red or orange flags, 18" X 18", are required on all corners of the transporter, and on the front or rear of the escort, as appropriate. The escorts should maintain a distance from the transporter such that other vehicles can fit between them while passing.

A1.8.7 SPEED LIMITS FOR PERMIT LOADS

Maine, Massachusetts, and Connecticut set no special speed limits for permit loads. Rhode Island requires permit loads to travel at a safe speed. They must maintain the minumum speed on the Interstate system. In New Hampshire, loads greater than 12' wide or over 80,000 pounds are limited to 45 MPH, unless they are on a four lane divided highway

where the limit is 50 MPH. Vermont restricts loads greater than 90,000 pounds or over 10' wide or overheight to 35 MPH on state roads. The speed limit on the Interstate system is 50 MPH.

A1.8.8 VEHICLE SPACING FOR PERMIT LOADS

Neither Maine nor New Hampshire list any required spacing between permit loads. Connecticut requires that passing distance be maintained between loads. In Vermont, permit loads must maintain a five minute spacing. The spacing in Massachusetts must be at least 15 minutes. Rhode Island requires permit loads to be at least 10 miles and 1/2 hour apart.

A1.8.8 BOND AND INSURANCE REQUIREMENTS FOR PERMIT LOADS

Maine, New Hampshire, and Massachusetts list no specific bond requirements. Rhode Island requires liability insurance, and may require a bond in special cases. Connecticut requires an "acceptable bond". Vermont requires a certificate of liability insurance to be on file with the state for a minimum of $75,000 for property damage and $75,000/$300,000 for personal injury/liability. All the states, as a condition of issuing a permit, require the hauler to assume full responsibility for any damage to personal or public property, and to relieve the state of any such liability.

A1.9 SPECIAL REQUIREMENTS FOR MOBILE AND MODULAR HOMES

Mobile and modular homes make up a large portion of the permit traffic allowed on New England's highways. As such, the States have adopted special rules which only apply to the movement of these loads. Because of these differences from other permit loads, the regulations concerning mobile and modular homes will be addressed in this special section.

A1.9.1 CONNECTICUT

Connecticut requires the vehicle towing a mobile or modular home to be rated for at least 10,000 pounds and have dual drive wheels. Generally mobile homes are restricted to moving during daylight hours Monday through Friday. Mobile homes with widths greater than 12' are restricted to the hours between 9 AM and 4 PM, Tuesday through Thursday. The maximum width allowed for mobile or modular homes is 14'. The combined length of the tractor and the trailer is limited to 85'. This restiction is increased to 90' if the trailer is less than 66' long.

A1.9.2 MAINE

The towing vehicle in Maine must have a capacity of two tons and have dual drive wheels. It must be equipped with 18" X 18" red or orange flags on the corners. All overwidth mobile or modular homes require an escort vehicle on state highways, unless the width is less than 12'. Then no escort is required on multi-lane highways. For homes with widths

between 11'-6" and 13'-6" travel is restricted to the hours from 60 minutes before sunrise to 30 minutes after sunset. Travel is not permitted on Saturdays. For homes with widths between 13'-6" and 14'-6" travel is not permitted after 12 PM on Friday. The escort and the transporter must be in radio contact and the transporter must be equipped with two flashing amber lights. For homes with widths between 14'-6" and 16'-8" travel is restricted to Monday through Wednesday. Two escorts are required on two lane highways and the mobile home itself must have two flashing amber lights mounted on it. Additional state police escorts may be required and speeds in excess of 45 MPH are prohibited.

A1.9.3 MASSACHUSETTS

All mobile or modular home loads with widths greater than 8'-6" must have red flags on the four corners of the load. Loads with lengths greater than 75' are restricted to operating during daylight hours. If the length of the load is greater than 80', one trailing escort is required. If the length is greater than 85', the load cannot travel between 7 and 9:30 AM or after 5:30 PM. If the length is greater than 90', an escort is required both front and back. Loads with widths of 14' or more are restricted to traveling Monday noon through Friday noon from 9:00 AM to 3:30 PM.

A1.9.4 NEW HAMPSHIRE

Towing vehicles in New Hampshire must have a rating of

at least two tons and have dual drive wheels. Escort vehicles and transporters must be in contact by radio. Loads with a width greater than 10'-3", but less than 12' do not require an escort on four lane divided highways, but do need one on other highways. Loads with widths between 12' and 14'-6" require one escort per convoy on four lane roads and one per unit on all other roads. A convoy may contain a maximum of two homes. Travel must be during daylight hours, which is from 60 minutes before sunrise to 30 minutes after sunset, Monday through Friday noon. An escort vehicle is also required for any length over 75'. In general, mobile and modular home permits are restricted to widths less than 14'-6", lengths less than 85', and heights less than 13'-6". Mobile home moves should be made on pavements at least 24' wide. The escort vehicle must be equipped with an amber flashing light and must operate with their headlights on low beam.

A1.9.5 RHODE ISLAND

Rhode Island does not permit convoys of mobile or modular homes. They must be spaced as any other permit load. Mobile and modular homes that have widths greater than 12' are restricted to moving Tuesday through Thursday from 9 AM to 3:30 PM, and before 7AM. Homes with widths of 12' require one escort; those with widths greater than 12' require two escorts. Each escort must have a flashing amber light and a WIDE LOAD sign. Loads with a length greater than 80' also require an escort. 12" X 12" red flags are required on the

four corners of the transporter, which also must have an OVERSIZE LOAD sign attached. The escorts and the transporter must be in constant radio contact.

A1.9.6 VERMONT

Vermont requires that the towing vehicle have dual drive wheels and be rated for two tons. Both the transporter and the escort vehicles must have a flashing amber light.

A1.10 DIVISIBLE LOAD PERMITS AND MAXIMUM PERMIT LOADS

New Hampshire, Vermont, and Maine do not issue permits for overweight or oversize loads which can be reasonably reduced to meet the legal limits. Maine limits permit loads to a maximum of 120,000 pounds for four axle vehicles, 130,000 pounds for five axle vehicles, and 140,000 pounds for six axle vehicles. The other three states do not list any maximum permit loads.

Connecticut issues permits for divisible loads when it is in the best intrest of the public or the state. However, it will only issue permits for axle weight violations. The total gross weight of the vehicle must not exceed the manufacturer's rating nor the statutory limit for that size vehicle. Four axle single unit vehicles are an exception to this rule. They are allowed a gross weight up to 73,500 pounds, but must meet axle weight limits. Divisible load permits are issued in six-month increments. They may be

issued to vehicles within a construction site subject to certain restrictions. The maximum permit loads in Connecticut are 127,000 pounds for five axle vehicles and 130,000 pounds for six axle vehicles. No permits will be issued for less than 80,000 pounds on five axles (no axle weight permits).

Massachusetts does not list any limits on non-divisible permit loads. However, all requests for permits for loads in excess of 130,000 pounds must be accompanied by a structural analysis of all the bridges along the proposed route. The analysis must be done by a Professional Engineer and demonstrate that the bridges will not be overstressed. Any request for a permit for a load over 200 tons may required a pavement analysis. Masachussetts does set maximums for its divisible load permits. The limits are 73,000 pounds for three axle vehicles, 87,000 pounds for a four axle vehicle, and 99,000 pounds for five axle vehicles. The fee for such permits is $10.00 for each 1,000 pounds over the statutory limit. They are issued on an annual basis. Vehicles which operate under a divisible load permit must be registered to the maximum weight shown on the permit. This weight cannot exceed the gross weight rating of the vehicle.

Rhode Island issues divisible load permits up to the following maximum weights. The maximum weight for a two axle truck is 44,800 pounds. For a three axle truck it is 76,650 pounds. the maximum divisible load permit available for a three axle combination vehicle is 62,000 pounds. For a four

axle combination it is 87,000 pounds and for five or more axles the maximum is 104,800 pounds. Vehicles issued divisible load permits must meet the minimum axle spacing requirements and these permits do not authorize the use of bridges or other structures posted for a lower weight.

A1.11 TURNPIKE REGULATIONS

Often the Turnpikes in the different states around the country are operated by Turnpike Authorities which are seperate from the state highway or public works departments. The seperate nature of these Authorities sometimes results in differences in the permitting procedure for overweight and oversize vehicles between the Turnpikes and the roads operated by the highway or public works departments. Such is the case with two of the state turnpikes in New England.

A1.11.1 CONNECTICUT TURNPIKE

Permits to operate overweight or oversize vehicles on the Connecticut Turnpike are issued by the same office and under the same rules and regulations as permits for the other state roads in Connecticut.

A1.11.2 MAINE TURNPIKE

The legal limits on the Maine Turnpike are the same as for the rest of Maine. Vehicles which exceed the state width or length limits may use the Turnpike by obtaining a turnpike permit. No permits are issued for widths greater than 13'

(14' for mobile homes), heights greater than 13'-6", or overweight vehicles. Vehicles using the turnpike under a permit may enter and exit only at certain specified interchanges, although vehicles with widths under 10' may use all interchanges. These vehicles must have a regular Maine permit in addition to their turnpike permit. Turnpike permits are available for $10.00 from toll booth attendents. Travel is restricted to daylight hours only. Permit vehicles must maintain at least 45 MPH and must exit the Turnpike before nightfall. Escort vehicles are required as for the rest of the state.

A1.11.3 MASSACHUSETTS TURNPIKE

Overweight permits for the Massachusetts Turnpike are available for both divisible and non-divisible loads. A Special Hauling Permit (SHP) is required for non-divisible loads if the gross vehicle weight exceeds 46,000 pounds on two axles, 60,000 pounds on three axles, or 80,000 pounds on four axles. The SHP is valid for a one-way trip up to the following limits: 73,000 pounds for a single vehicle or a three axle combination truck, 87,000 pounds for a four axle combination truck, and 99,000 pounds for a five axle combination truck. The fee for these permits is $5.00 plus two cents per mile per 1,000 pounds in excess of 80,000 pounds. The fee is payable upon entry to the Turnpike or by mail. Permits for vehicle exceeding the above limits are available only by mail at a cost of $250.

Divisible load permits are also limited as listed above, or to the limit on the required Department of Public Works (DPW) divisible load permit, whichever is less. The fee for a divisible load permit meeting these requirements is 25% of the fee paid for the DPW permit. The permit is good for one year.

Oversize permits will only be issued when it is impossible or impracticable to reduce the size of the load. Vehicles in excess of the following limits require a SHP: Widths greater than 8'-6", Heights greater than 13'-6", Lengths greater than 35' (40' for a bus and 60' for a combination vehicle). Toll personnel may issue permits up to the following limits: Width - 13', Height - 13'-9", Length - 100' (for combinations). the fee is $5.00 plus two cents per mile per foot (or fraction thereof) of excess width and length. For vehicles exceeding 13' in width or 100' in length, for combination vehicles (35' for singles, 40' for busses), or 13'-9" in height, a special permit must be obtained by mail from the Turnpike Authority. The fee is $250. Oversize vehicles may not travel on the Boston extension of the Turnpike between 7 and 10 AM Eastbound or between 3 and 7 PM Westbound. The minimum speed for oversize or overweight vehicles is 20 MPH.

One escort is required for vehicles with lengths over 70' or widths greater than 12'. An escort is also required if the load overhangs the transporter by 10' (4' if it is a load of poles, booms, etc.), and for cranes, drilling rigs, or odd

shaped loads. Two escorts are required if the vehicle length exceeds 85' or if the width exceeds 13'. Escort vehicles must have two flashing amber lights and two 24" X 24" red flags on their rear corners. An OVERSIZE LOAD sign is required either on the escort vehicle or on the rear of a vehicle not requiring an escort. The transporting agency must carry an insurance policy for at least $1 million / $2 million for bodily injury or death, and $500,000 for property damage.

A1.12 SPECIAL EXEMPTIONS AND TOLERANCES

A1.12.1 CONNECTICUT

Connecticut does not list any tolerance for being overloaded, nor do they have any special exemptions for certain types of commodities.

A1.12.2 MAINE

The normal length limit in Maine is 60'. However, tree-length logs may be hauled on a vehicle with a length up to 68'-6" without a permit. Special long-term permits, good for up to three months, are available for lengths up to 80'. The fee is $15.00 per month. Permits are not required for utility poles, no matter what their length. Vehicles are allowed a 2 1/2% or 500 pound, which ever is greater, tolerance over their registered weight provided gross, axle, or tire weight limits are not exceeded.

While actively engaged in the exclusive transport of

certain commodities, vehicles are allowed special weight limits. These commodities include:

a) Highway construction materials in dump or transit-mix trucks.

b) Concrete products.

c) Raw ore between mine and processing plant.

d) Refrigerated products.

e) Building materials or incinerator ash which absorbs moisture (intrastate only).

f) Unconsolidated rock materials including limestone.

g) Bark, bolts, lumber, farm produce, firewood, pulpwood, road salt, sawdust, soils, solid waste, wood chips.

Vehicles hauling such commodities must have a special commodities permit. The special commodities allowances are:

a) 10% of the maximum gross weight.

b) Special axle weight limits - 24,200 pounds for single axle, 46,000 pounds for tandem axles, and 54,000 pounds for triaxles.

c) Special gross weight limits - 64,000 pounds for four axle single unit vehicles hauling forest products, and 100,000 pounds for a three axle tractor with a triaxle semi-trailer.

A1.12.3 MASSACHUSETTS

Vehicles traveling on an overweight or an oversize per-

mit are not allowed on the Central Artery in Boston, nor are they allowed north of exit 15 on the Southeast Expressway. They are also restricted from using the circumfrential portions of I-93 and I-95 between 7and 9:30 AM and after 3:30 PM. Massachusetts allows a 5% tolerance for overweight vehicles.

A1.12 4 NEW HAMPSHIRE

New Hampshire allows a 5% tolerance for overweight vehicles, except on the Interstate system. In addition, vehicles used exclusively in surfacing the ways of the state are exempt from the statutory weight limits. However, the commodities of tar, asphalt, or combinations thereof, are restricted to 2,000 gallons on two axle vehicles and 4,000 gallons on 3 axle vehicles.

A.12.5 RHODE ISLAND

Rhode Island does not list any tolerances for overweight vehicles. However, refuse trucks are exempt from axle weight limits when hauling refuse, except on the Interstate system.

A1.12.6 VERMONT

Vermont issues a special permit for the transportation of unprocessed forest products. This is an annual permit which is only issued to a combination vehicle of at least five axles. The maximum gross load allowed under this permit is 90,000 pounds. The vehicle must be registered for the

gross weight shown on the permit and the single and tandem axle weights are limited to 22,400 pounds and 40,000 pounds respectively. Additionally, an "all products" overweight permit is also available. This permit is issued on an annual basis up to the following maximums: Three axle truck, 60,000 pounds; four axle single unit truck, 69,000 pounds; four axle combination vehicle, 72,000 pounds; five axle or larger combination vehicle, 76,000 pounds. Other restrictions on axle spacing and load distribution also apply to this permit. Vermont gives a tolerance of 10% on axle weights, limited to 36,000 pounds or less. Gross weights are allowed a tolerance of 5%. No tolerances are allowed on the Interstate system.

END

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