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The current state regulations affecting motor vehicle sizes and weights, agencies involved directly or indirectly in the enforcement of these regulations, characteristics of oversize-overweight vehicle movements within the state (both legal and illegal movements), and the cost of these vehicle movements to the state were developed and are presented in this report. The characterization of oversize-overweight movements in the state is emphasized.

To study the economic effects to the state a 100 percent compliance case was set up to compare with the actual case. The study showed that, while the current oversize-overweight movements may save the trucking industry up to 1.4 billion dollars over the next twenty years at current conditions, these movements are estimated to cost the state an additional 261 million dollars over the same twenty-year period. Similarly, enforcement of the state laws is estimated to result in only 84 million dollars if the current fine and permit fee structure is maintained. It is recommended that the current fine and fee structure be revised so that violators would pay for their share of the estimated damage to highways. A highway cost allocation study is also recommended.

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AN ASSESSMENT OF THE ENFORCEMENT OF TRUCK SIZE AND WEIGHT LIMITATIONS IN TEXAS

by

C. Michael Walton
Chien-pei Yu

Research Report Number 241-6F

Truck Use of Highways in Texas
Research Study Number 3-18-78-241

conducted for

Texas State Department of Highways and Public Transportation

by the

CENTER FOR TRANSPORTATION RESEARCH
BUREAU OF ENGINEERING RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN

April 1983

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

There was no invention or discovery conceived or first actually reduced to practice in the course of or under this contract, including any art, method, process, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant which is or may be patentable under the patent laws of the United States of America or any foreign country.

PREFACE

This is an interim report on Research Project 3-18-78-241, "Truck Use of Highways in Texas," representing another effort of an ongoing study to assess the various issues and effects of an increase in truck size and/or weight on intercity highways in Texas. One joint report, 241-1, "Effects of Heavy Trucks on Texas Highways," was published in September 1978. Another report, 241-2, "An Assessment of Changes in Truck Dimensions on Highway Geometric Design Principles and Practices," was published in June 1981. Three other reports were also prepared while this report was in progress: 241-3, "Evaluation of Selected Operational Issues of Increased Truck Size and Weight," 241-4, "An Assessment of Recent State Truck Size and Weight Studies," and 241-5, "Modeling and Forecasting Selected Effects of Motor Vehicle Size and Weight Laws."

Several persons at the Texas Department of Public Safety have contributed greatly to the preparation of the study reported herein. The authors would like to express their appreciation to Inspector James Earl Haddock, DPS License and Weight Division, and to Mr. Charles Kruse, DPS Statistics Division. Mr. Robert R. Guinn and Mr. John Moorman, D-18, SDHPT, helped in the oversize-overweight permit issues, and Mr. Robert Mikulin, D-8, contributed extensively to the estimation of the pavement rehabilitation cost of the two cases. Nim Graves, Assistant Director, Enforcement, Transportation Division, Texas Railroad Commission, and Lambeth Townsend, Assistant Attorney General, Environmental Protection Division, also contributed greatly to the section on the Railroad Commission and Attorney General's Offfice activities in size and weight enforcement. The authors also wish to thank their fellow Center researchers, Chon Phung Lim and How-ming Shieh, for their programming assistance and John Pester and Ogilvie Gericke for their work during the first phase of this study.

Additionally, the authors would like to acknowledge the guidance, direction, and support given to the study by the Size and Weight Committee of SDHPT. That committee is composed of the following members:

Chairman——Byron C. Blaschke, Chief Engineer of Maintenance and Operations

R. L. Lewis, Chief Engineer of Highway Design

Wayne Henneberger, Bridge Engineer

Phillip L. Wilson, State Planning Engineer for Transportation

Robert W. Townsley, Director, Motor Vehicle Division

C. Michael Walton

Chien-pei Yu

ABSTRACT

The current state regulations affecting motor vehicle sizes and weights, agencies involved directly or indirectly in the enforcement of these regulations, characteristics of oversize-overweight vehicle movements within the state (both legal and illegal movements), and the cost of these vehicle movements to the state were developed and are presented in this report. The characterization of oversize-overweight movements in the state is emphasized.

To study the economic effects to the state a 100 percent compliance case was set up to compare with the actual case. The study showed that, while the current oversize-overweight movements may save the trucking industry up to 1.4 billion dollars over the next twenty years at current conditions, these movements are estimated to cost the state an additional 261 million dollars over the same twenty-year period. Similarly, enforcement of the state laws is estimated to result in only 84 million dollars if the current fine and permit fee structure is maintained. It is recommended that the current fine and fee structure be revised so that violators would pay for their share of the estimated damage to highways. A highway cost allocation study is also recommended.

KEY WORDS: truck, size, weight, enforcement, motor carrier, tractor/trailer, rural highways, intercity carriers, intra- and inter-state commerce, truck laws and regulations

SUMMARY

Discussed in this report are various aspects of motor vehicle size and weight enforcement-related issues, including the background of motor vehicle size and weight laws, related Texas civil statutes, agencies involved directly or indirectly in enforcement and their functions, and a characterization of the actual oversize-overweight vehicle movements within the state.

The first part of the section characterizing actual oversize-overweight vehicle movements deals with illegal movements; data on violation cases filed by DPS troopers as well as the truck weight survey conducted by SDHPT were analyzed. The data were analyzed according to type of violation, monthly frequency, highway class, location, vehicle type, body type, lease status, carrier type, fine levied, etc. Data showed that independent truckers are the most frequent violators. Interviews and data also showed that rock, gravel, sand, grain, and log haulers are major violators.

With respect to highway class, approximately 28 percent of all violation cases filed were associated with the interstate highway system; however, the same interstate highway system had the highest rate of violation cases when compared on a per mile or per lane-mile basis. Almost one-third of all cases filed were found on "other main rural highways", which, in Texas, refers to all remaining state system highways that are not included in the interstate highway network or the farm-to-market network. Truck weight survey data, however, show that "other main rural highways" have a higher actual rate of violation (32 percent versus 23 percent on interstate highways). Violations by dump trucks constituted 41.8 percent of all cases filed, while float trucks were responsible for 29.1 percent.

There was no significant relationship found between amount of excess gross vehicle weight and amount of fine charged by the judge. Oversize-overweight permits issued by SDHPT were characterized according to type, distribution among state highway districts, and length. Revenue and cost associated with this operation were also documented.

Overall, historical truck weight survey data have suggested that there has been a sharp surge in the number of oversize-overweight movements on highways since 1976. Overweight truck operations have increased from a system average of 7.75 percent in 1974 to a system average of 26.33 percent in 1976. Since 1976, the percentage of operations has remained in the twenties.

Economic benefits and costs of oversize-overweight truck movements were evaluated on the basis of two cases: the first represents the existing condition and the second, a hypothetical 100 percent compliance. Results indicate that overweight truck movements will cost the state 261 million dollars for administration and pavement rehabilitation over the next 20 years; however, these movements could save the trucking industry up to 1.4 billion dollars over the same time frame, if the existing condition is maintained. Nevertheless, truckers would pay the state only 84 million dollars over the next 20 years given the current fine and permit fee structure. The findings of this study suggest that the current fine structure be evaluated and that a highway cost allocation study be initiated to determine each highway user group's fair share of highway cost responsibility.

IMPLEMENTATION STATEMENT

Current size- and weight-related civil statutes are summarized in this report. The functions and programs of various state agencies involved directly or indirectly in size and weight law enforcement are also described. The characteristics of current oversize-overweight violations with respect to vehicle type, body type, violation category, location, etc. are discussed in the first half of Chapter 4, and the characteristics of oversize-overweight permit vehicle movement with the state are explored in the second half. Economic effects were considered by establishing a hypothetical 100 percent compliance condition to compare with the existing condition. The comparison indicates that there are substantial benefits to be gained by the trucking industry from oversize-overweight operations. It also suggests that the trucking industry is underpaying their portion of the excess damage costs to the highway system. A method which would base fines on the magnitude of the violation may be appropriate. Such a fine structure would not only deter violations, but would arrange for truckers to accept financial responsibility for their fair share of any resultant damage. To facilitate this effort, a highway cost allocation study would be required for the purpose of determining each highway user group's fair share of highway cost responsibility.

Figures for the 20-year forecast in Chapter 5 are based on current data available. When future conditions are unknown, it is usually assumed that current conditions will prevail during the 20-year period.

DEFINITION OF TERMS AND ACRONYMS (OR NOMENCLATURES)

Size and Weight Laws	Laws or regulations contained in Texas Civil Statutes governing the maximum allowable dimensions and weight of a motor vehicle. These laws can be broken down into two parts: the size law limits the maximum allowable length, width, and height of a vehicle, while the weight law limits the maximum allowable weight on a single or tandem axle and the gross vehicle weight of a motor vehicle.
GVW	The weight of a vehicle, including its weight and its cargo
Tandem Axle	Two or more axles spaced 40 inches or more apart from center to center, having at least one common point of weight suspension
DPS	Department of Public Safety
SDHPT	Texas State Department of Highways and Public Transportation
RRC	Texas Railroad Commission
AG	Office of the Texas Attorney General
CTR	Center for Transportation Research at The University of Texas at Austin
Oversize-Overweight Permits	Permits issued through SDHPT under the authorization of the Texas Legislature to motor vehicle owners or operators for traveling with oversize or overweight loads

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CHAPTER 1. INTRODUCTION

BACKGROUND

The motor transport industry has a unique role in the State of Texas. Almost two-thirds of all Texas communities depend entirely on trucks for service, with 98 and 99 percent of the fresh fruits and vegetables and of the livestock, respectively, being transported to principal markets by trucks (Ref 1). The importance of load limits and highway design practices was recognized early in the history of highway development. This interrelationship led directly to limitations on vehicle loads, and laws were enacted in many states to establish maximum allowable motor vehicle sizes and weights (Ref 2). The first such law in Texas was enacted in 1929 (Ref 3). Since then, the law has been modified several times. The most recent major changes of the law occurred in 1975, when the maximum gross vehicle weight was raised to 80,000 lb, the maximum single axle load to 20,000 lb, and the maximum tandem axle load to 34,000 lb.

As the highway system in Texas has matured and the emphasis shifted from construction to maintenance and rehabilitation, the enforcement of motor vehicle size and weight laws has become a highlighted issue to the transportation planners and administrators. To them, strict enforcement of motor vehicle size and weight laws is a step toward reducing motor vehicle size and weight violations and heavy truck accidents and, even more, a reduction in highway maintenance and rehabilitation expenditures.

PURPOSE

The purpose of this report is to summarize the current size- and weight-related activities in the state of Texas, and to present an analysis of current oversize-overweight truck movements within the state based on existing available data. It is hoped that such analysis will aid the transportation professionals in their policy-making concerning motor vehicle size and weight limits.

SCOPE

This report covers the following major areas:

1. Texas laws concerning motor vehicle sizes and weights——a brief overview of the various laws affecting motor vehicle sizes and weights is presented.
2. Agencies involved in motor vehicle size and weight regulation——various state agencies and their roles in the size and weight regulation are discussed.
3. Characteristics of size and weight violations and legal oversize-overweight permit operations——this section characterizes both the size and weight violations and legal permit operations in the state.
4. Selected measures of effectiveness of current enforcement program.
5. The cost of oversize-overweight operations to the state——an estimate of the costs is prepared with the objective of bounding the significance of this particular aspect of the more global issue.

METHODOLOGY

The Statistical Analysis System (SAS) package on The University of Texas and IBM system and the CALFORM plotting subroutines were used to perform statistical analysis and generate maps and plots for the study. For evaluation of pavement rehabilitation cost, programs based on AASHO Road Test results were used to calculate single axle load (ESAL). The REHAB model in the State Department of Highways and Public Transportation was used to translate ESAL figures into dollar costs. A methodology identical to that used and documented in the first aspect of the study was used to compute vehicle operating cost and fuel consumption (Ref 3).

To evaluate the cost of highway rehabilitation due to oversize and overweight trucks, two cases were selected for comparison. Case 1 represents actual conditions as reflected in the 1980 truck weight survey, where oversize and overweight trucks were included in all computations. Case 2 represents an artificial 100 percent compliance condition in which 1980 data were modified so all vehicles were running at or below the legal maximum. Total payload for both Case 1 and Case 2 remained the same. These two cases were selected in order to bound the cost of highway rehabilitation due to oversize-overweight trucks, and the benefits in terms of truck operating cost differences between violators and non-violators.

DATA SOURCE

The following are the major pieces of data used in the study:

1. Truck size and weight violation data, January-September, 1980, from the Department of Public Safety (DPS);
2. Status of vehicles where cases filed, from DPS;
3. Texas truck weight study survey, 1980 and before, from SDHPT and FHWA (Federal Highway Administration); and
4. Oversize-overweight permit data, from SDHPT.

Other miscellaneous data were also obtained from DPS, SDHPT, the Texas Railroad Commission (RRC), and the Office of the Attorney General. The study was restricted to data for the first nine months of 1980 since comparable data were not available after September 1980 and prior years' data were not maintained by DPS.

CHAPTER 2. MOTOR VEHICLE SIZE- AND WEIGHT-RELATED LAWS

After the turn of the century, rapid growth in automobile and truck use fostered the highway development boom. However, it was soon apparent to highway engineers and administrators that, if roads were to be built to last long enough for reasonable economy, some limitations must be put on highway vehicle loads (Ref 2). This problem was basically stated by Mr. H. E. Breed in 1919 in Public Roads magazine:

> There must be an arbitrary limit of load for which we can design our roads. Otherwise, as fast as they are built, roads will attract to themselves traffic heavier than they are designed to bear. The road and the load will forever be outstripping each other with great economic loss both of original investment in the road and in the appalling high maintenance (Ref 2).

In discussing the Bates Road Test, Mr. Clifford Older stated in the Transactions of ASCE for 1924:

> A knowledge of wheel-loads imposed by highway traffic is a fundamental requirement for rational design. It is believed that until more is known regarding the design of the economic highway transport freight unit, wheel-loads must be arbitrarily limited by law, in order to safeguard the many millions of dollars already invested in pavements (Ref 2).

It is in recognition of the aforementioned principles that states began in 1913 to enact laws limiting maximum motor vehicle sizes and weights. The first law in Texas regulating motor vehicle sizes and weights was enacted in 1929.

Over the years, a number of laws have been enacted in the Texas Legislature affecting motor vehicle sizes and weights. These laws can be found in Vernon's Annotated Revised Civil Statutes of the State of Texas (Ref 9). These statutes can be broken down into the following general categories.

1. General provisions concerning maximum motor vehicle sizes and weights. These laws, found in Vernon's Annotated Revised Civil Statutes of the State of Texas (Ref 9), can be classified as follows:

a. Definitions and general statements governing motor vehicle sizes and weights on Texas highways (art. 6701d-11, sections 1 and 2)

b. Width, length, and height of the vehicle (art. 6701d-11, section 3)

c. Weight of load (art. 6701d-11, section 5)

d. Width of wheels (art. 6701)

e. Loads on farm-to-market and ranch-to-market roads (art. 6701d-11, section 5½)

f. Registration to show the weight and maximum load of the vehicle and the license receipt (art 6701d-11, section 5d)

g. Length of connections between vehicles (art 6701d-11, section 7)

h. Requirement for lights or flags on extended loads (art. 6701d-11, section 4)

2. Statutes governing the issuance of oversize-overweight permit rules. These statutes can be divided into the following areas:

a. Short-term commercial motor vehicle permits to haul loads of larger tonnage (art. 6675a-6b)

b. Permits for heavy trucks on highways (art. 6701a)

c. Permits for overlength or overwidth mobile homes on highways (art. 6701½)

d. Permits for movement of oversize and overweight oil well servicing and drilling machinery (art. 6701d-16)

e. Special permits for unladen lift equipment exceeding weight and width limits (art. 6701-18)

3. Provisions for special truck categories:

a. Vehicles transporting fertilizers (art. 6701d-11a)

b. Vehicles transporting ready-mixed concrete (art. 6701d-12)

c. Vehicles transporting milk (art. 6701d-12a)

d. Vehicles transporting poles, piling, or unrefined timber (art. 6701d-13)

e. Length of vehicles transporting electric power transmission poles (art. 6701d-14)

f. Length of oil well servicing unit (art. 6701d-15)

g. GVW and axle weight on vehicles transporting fixed load oil well servicing equipment (art. 6701d-11, section 5a)

h. Length of vehicles transporting poles or pipe (art. 6701d-17)

i. Cotton truck regulation (art. 6701d-19)

   j. Transportation of certain loose materials (art. 6701d-11, section 3a)
   k. Vehicles transporting seed cotton modules (art. 6701d-11, section 3b)
   l. Weight of lumber to be transported (art. 6701a-1)

4. Statutes governing the enforcement of motor vehicle sizes and weights
   a. The weighing of loaded vehicles by inspectors (art. 6701d-11, section 6)
   b. State highway patrolmen (art. 6701d-11, section 16)
   c. Penalty for violation (art. 6701d-11, section 15)
   d. Special provision which eliminates vehicles loaded with timber, pulp wood, or agricultural products in their natural state from hauling to unloading their excess load (art. 6701d-11, section 6, subdivision 6)
   e. Penalty for failing to register maximum GVW and/or carry the license receipt showing the maximum GVW (art. 6701-11, section 5a)

To aid in the implementation of these statutes, the "Texas Administrative Code" was also compiled under the authorization of Acts of 1977, 65th Legislature, p. 1703, chapters 6, 7, and 8 (Texas Civil Statutes, art. 6252-13b). These codes provided details of the statutory provisions so that the statutes enacted by the Legislature can be implemented. The "Texas Administrative Code" regarding motor vehicle sizes and weights can be broken down into three major areas:

1. Oversize-overweight permits (Title 43, section 25.61-25.76)
2. Oversize-overweight permits for certain oil well-related vehicles (Title 43, section 25.91-25.96)
3. Size and weight law enforcement
   a. Weight law enforcement (Title 37, section 11.51-11.53)
   b. Vehicle size limitations and special permits (Title 37, section 11.61)

Table 1 presents the evolution of the motor vehicle weight limits in Texas from 1929 to the present weight limits, which were created in 1975. Table 2 provides comparable information on the evolution of motor vehicle size limits. As observed, the weight components of the legal limits have steadily increased over the years, while the size has remained relatively stable. One interesting statistic is with respect to the height limit, which was 12 in. more in 1929 than allowable today.

TABLE 1. EVOLUTION OF MOTOR VEHICLE WEIGHT LIMIT

Year	Max. GVW (lb)	Max. Single Axle Weight (lb)	Max. Tandem Axle Weight (lb)
1929	22,000 (4 wheels or less)	16,000	
	30,000 (6 wheels)	10,400 (when axles are spaced less than 8 ft apart) or 18,000 (no more than 2 axles and 1 axle mounted on 4 wheels with 2 wheels at the edge of the axle operating in tandem)	
1941	38,000		
1945	48,000		
1951	58,420		
1960	72,000	18,000	32,000
1975	80,000	20,000	34,000

TABLE 2. EVOLUTION OF MOTOR VEHICLE SIZE LIMIT

Year	Length		Height	Width
	Single Unit Truck	Combinations		
1929	35 ft	65 ft	14 ft 6 in.	96 in.
1931	35 ft	45 ft	12 ft 6 in.	96 in.
1947	35 ft	45 ft	13 ft 6 in.	96 in.
1955	35 ft	50 ft	13 ft 6 in.	96 in.
1965	40 ft	65 ft	13 ft 6 in.	96 in.
1973	45 ft	65 ft	13 ft 6 in.	96 in.
1975	45 ft	65 ft	13 ft 6 in.	96 & 102 in.*

*For trucks carrying cylindrical half bales, buses, or trolley buses

Source: Compiled from Ref 9

CHAPTER 3. AGENCIES INVOLVED IN MOTOR VEHICLE SIZE AND WEIGHT REGULATION

The previous chapter outlined the various laws and regulations relating to sizes and weights of motor vehicles. This chapter will cover the various governmental units in Texas which are involved in regulating or enforcing the regulations on motor vehicle sizes and weights. These units include the Department of Public Safety (DPS), the State Department of Highways and Public Transportation (SDHPT), the Office of the Attorney General (AG), the Texas Railroad Commission (RRC), and the Justices of the Peace (or the county court system). Among these governmental units, the DPS plays the most direct role in enforcing the size and weight laws. Hence, the role, function, and approach employed by the Department of Public Safety in size and weight law enforcement will be highlighted.

DEPARTMENT OF PUBLIC SAFETY

Organization

The DPS was created with a basic broad objective, "To maintain public safety in the State of Texas" (Title 37, Texas Administrative Code, Section 1.1). It functions within existing laws and regulations and in cooperation with other agencies or persons with the related responsibility to attain this objective. It seeks to preserve the peace and to protect the persons, property, rights, and privileges of all people in the state. The enforcing of size and weight laws——which has been assigned to the Traffic Law Enforcement Division——is, of course, only one of its responsibilities.

The Traffic Law Enforcement Division does not carry out its responsibility directly from its central office. Rather, the state is divided into six regions and in each region there is a License and Weight Service, headed by a captain who is in charge of enforcement activities with respect to vehicle size and weight laws. The chart on the next page (Fig 1) shows the organizational structure of the DPS. Under each captain there are one lieutenant,

ORGANIZATIONAL STRUCTURE
TEXAS DEPARTMENT OF PUBLIC SAFETY

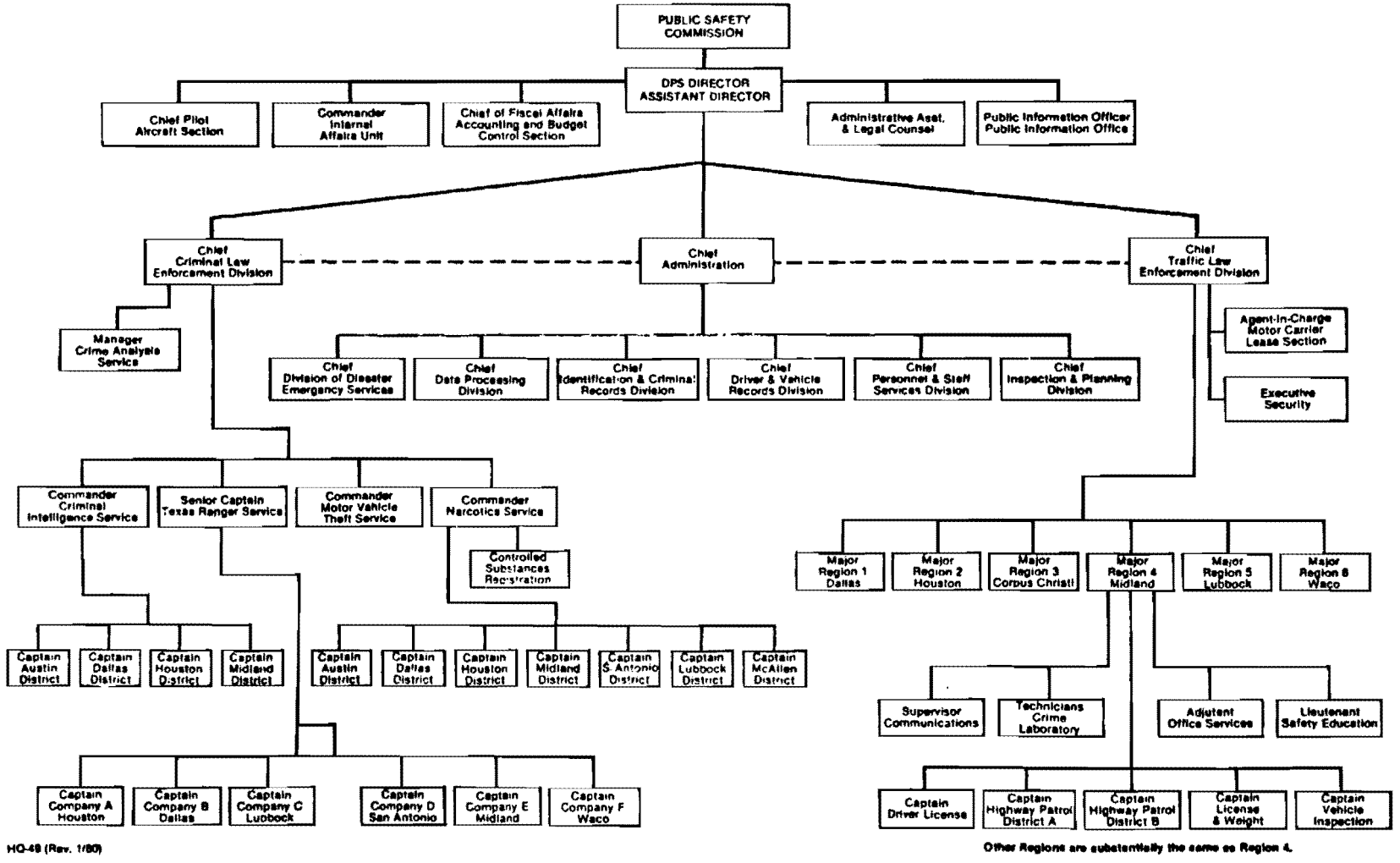


Fig 1. Organizational structure of the Texas Department of Public Safety.

two or three sergeants, and 24 to 28 patrolmen. Each sergeant is assigned a sergeant area, and each region has two or three sergeant areas. Figure 2 gives boundaries of the six regions in the state and the sergeant areas within each region. Sergeant areas shown in Fig 2 are those existing in January, 1980. The sergeant area lines, however, are more flexible than regional boundary lines and are subject to adjustment or change. Table 3 shows the License and Weight Service strength for each region as of March 30, 1981.

Objective, Mission, and Program of License and Weight Service

As mentioned previously, the License and Weight Service is the major agent within the DPS for enforcing size and weight laws.

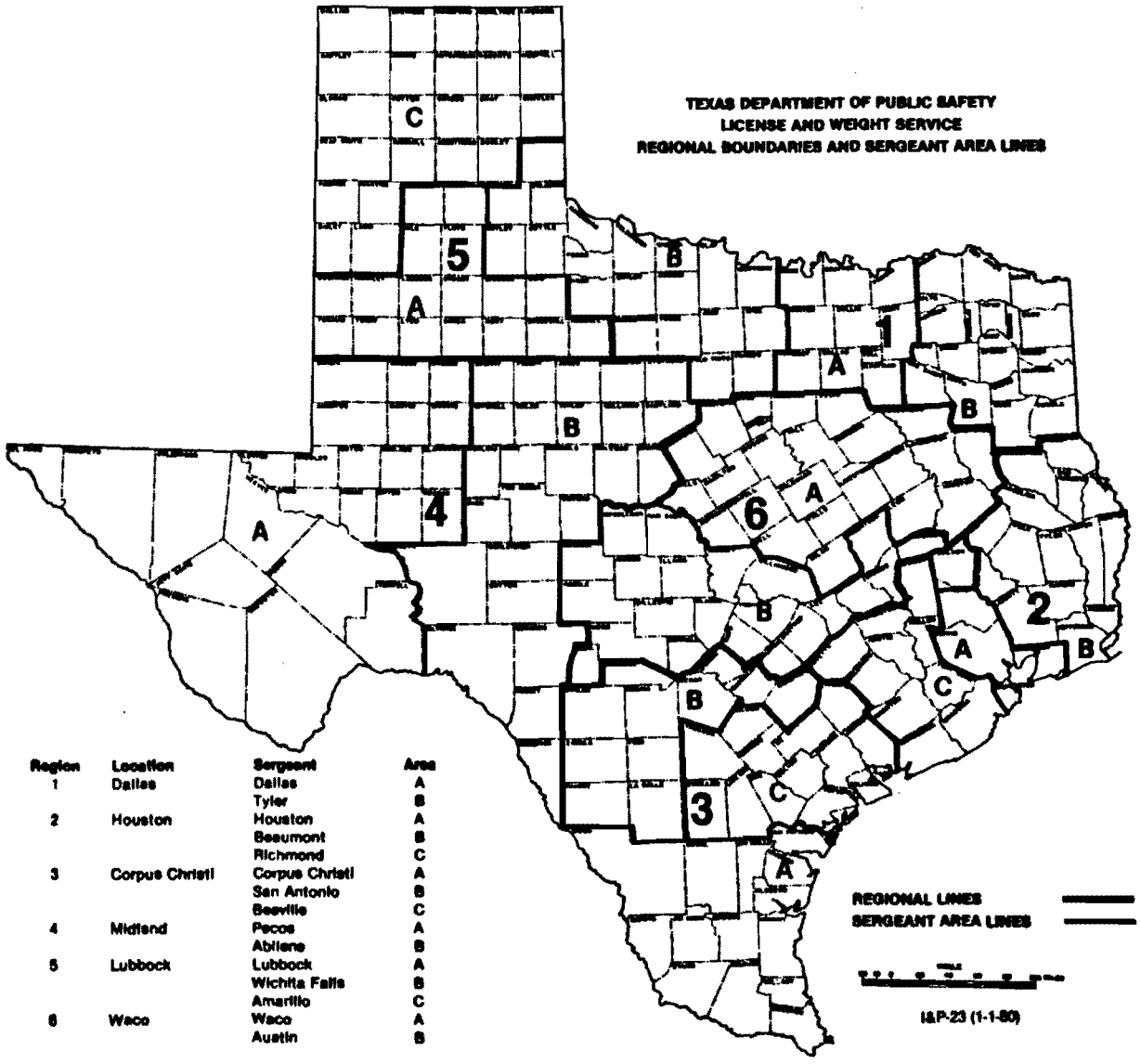
> The objective of the License and Weight Service is to protect the highways from unnecessary damage by securing compliance with the statutory provision of law regulating weight of commercial vehicles, to insure equitable payment of license and other fees imposed on operators of commercial vehicles who use the public highways by enforcement of registration laws, and to protect the rights, privileges, and safety of the general public in the use of the highway system by securing compliance with all traffic regulations applicable to the operation of commercial vehicles and all vehicular traffic in general (Ref 5).

> The basic mission of responsibility of the License and Weight Service is weighing and checking commercial vehicle traffic operating over the highways of this State so that compliance with the statutory provisions of law regulating weight, registration, and the transportation of person and property for hire can be obtained. It has joint responsibilities with the Highway Patrol Service for enforcing traffic laws on commercial vehicle traffic and all vehicular traffic if the violation is dangerous in nature or if traffic conditions require additional assistance (Ref 5).

Phrases or sentences which are underlined relate to size and weight law enforcement. The License and Weight Service program is divided into six principal parts. This program is shown in Table 4. All those activities related to the enforcement of size and weight regulations are underlined.

Approach

To aid enforcement of size and weight laws, DPS has established a number of vehicle checkpoints in the state. Figure 3 shows the locations of these checkpoints. Currently, there are 15——nine located along interstate



Region	Location	Sergeant	Area
1	Dallas	Dallas	A
		Tyler	B
2	Houston	Houston	A
		Beaumont	B
		Richmond	C
3	Corpus Christi	Corpus Christi	A
		San Antonio	B
		Beeville	C
4	Midland	Pecos	A
		Abilene	B
5	Lubbock	Lubbock	A
		Wichita Falls	B
		Amarillo	C
6	Waco	Waco	A
		Austin	B

Fig 2. Regional boundaries and sergeant area lines of license and weight service, Texas Department of Public Safety.

TABLE 3. STRENGTH REPORT FOR LICENSE AND WEIGHT SERVICE

PT-15

TEXAS DEPARTMENT OF PUBLIC SAFETY

STRENGTH REPORT FOR LICENSE AND WEIGHT SERVICE

March 30, 1981

	Patrolmen			Supervisors			Region Total		
Region	Available	Vacancies	Authorized	Captain	Lieutenant	Sergeant	Vacancies	Available	Authorized
1	24	3	27	1	1	2	0	28	31
2	27	1	28	1	1	3	0	32	33
3	27	0	27	1	1	3	0	32	32
4	23	3	26	1	1	2	0	27	30
5	24	3	27	1	1	3	0	29	32
6	24	0	24	1	1	2	0	28	28
	149	10	159	6	6	15	0	176	186

TABLE 4. PROGRAM OF THE LICENSE AND WEIGHT SERVICE

1. Enforcement of weight laws

   a. Check commercial vehicles operating upon the public highways outside the incorporate limits of cities and towns for the following weight limitations:

      (1) Gross weight allowed

      (2) Axle limitations

      (3) Tire size limitations

      (4) Wheel weight limitations

2. Enforcement of registration laws applicable to commercial vehicles

   a. Inspect the license receipts and weigh all commercial vehicles for the following reasons:

      (1) To determine if the vehicle is registered for the proper amount relating to load being transported

      (2) To determine if vehicle is displaying license plates assigned to that vehicle

      (3) For temporary registration and permits

      (4) For exemptions and exceptions to registration laws

      (5) To determine if nonresident is operating in accordance with reciprocity agreement from state of residence

      (6) For general provisions of statutes regulating registration of all vehicles in this state

3. Enforcement of statutory regulations applicable to the transportation of persons and property for hire, officially referred to as the Motor Carrier Act

   a. This Act requires the following two methods of enforcement:

      (1) On-the-road enforcement by checking freight invoices, bills of lading, and commodities carried

      (2) Intensive investigation of transportation records of shippers and carriers

4. Enforcement of traffic laws applicable to commercial motor vehicles and enforcement of all traffic laws applicable to vehicular traffic when the operation is so hazardous as to require immediate attention or when conditions require additional assistance

   a. This includes:

      (1) Size limitations

      (2) Equipment requirements

      (3) All traffic regulations that might affect the safety of the general public

5. Provide information to the general public relating to statutes enforced by the License and Weight Service

   a. Assist operators of commercial vehicles to:

      (1) Determine maximum gross weight allowed

      (2) Assist with registration problems

      (3) Explain regulations covered by Motor Carrier Act and lease requirements for commercial vehicles

      (4) Answer questions relating to registration and reciprocity with other states and countries

6. Maintain liaison with police agencies and the transportation industry

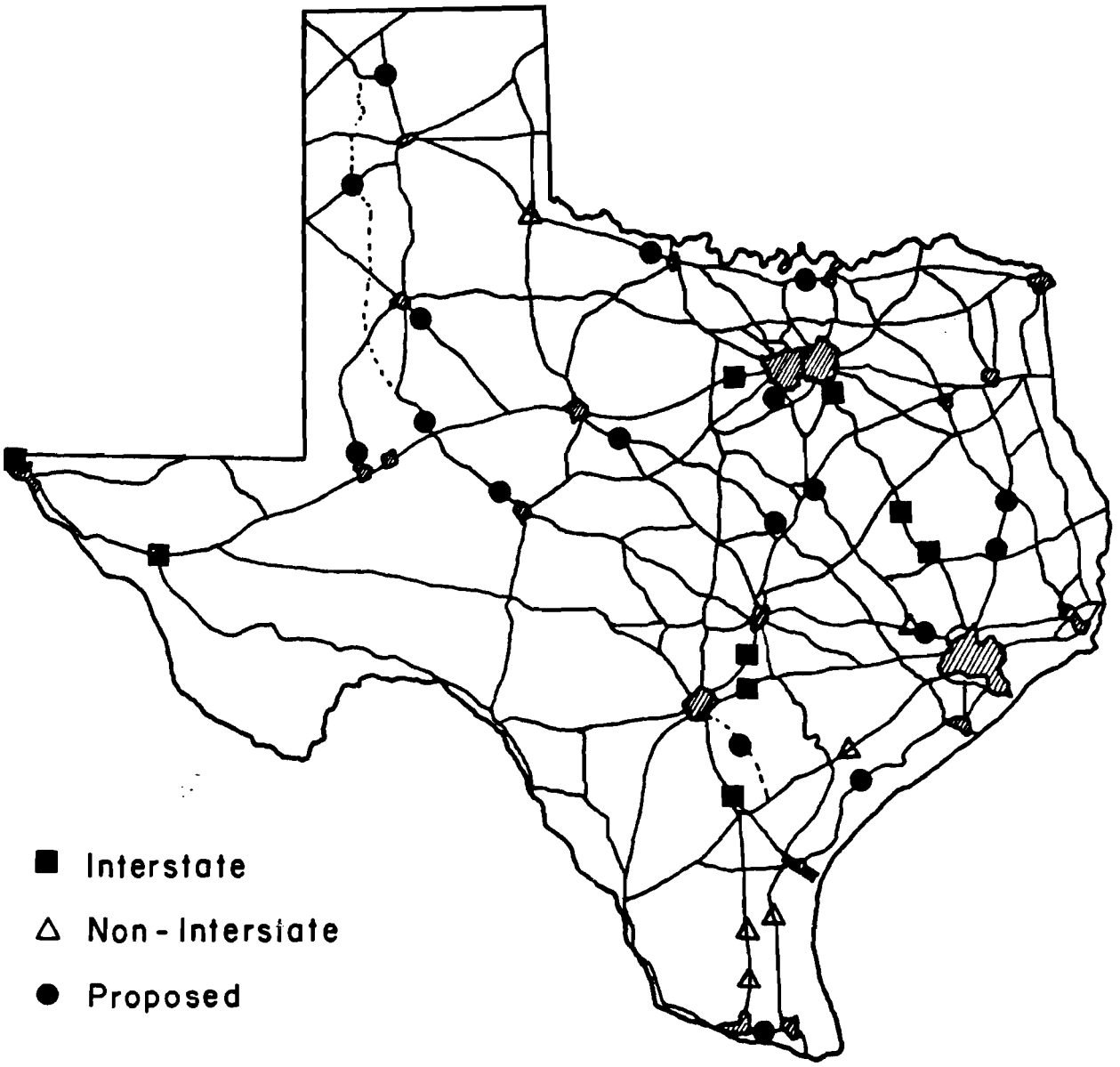


Fig 3. DPS checkpoints.

highways and six along non-interstate highways. Eighteen additional checkpoints have been proposed to fill the current lack. In an attempt to address the current imbalance between interstate and non-interstate enforcement activities, all but one of the proposed checkpoints are located on non-interstate routes.

The License and Weight Service has a total authorized work force of 186 persons. These include a captain and lieutenant for each region, a sergeant for each sergeant area, and 24 to 28 patrolmen for each region. It currently has 12 new and two old portable scales. Most vehicles are weighed and measured at permanent checkpoints; however, temporary checkpoints using portable scales are employed. Vehicles suspected of overloading may also be stopped and weighed at the nearest checkpoints. Once a truck is found in violation of legal size and weight limits, the driver of the vehicle is issued a citation with instructions to appear before a Justice of the Peace. In the past, patrolmen could require the driver to unload the vehicle until the limit was reached. This practice, however, is no longer required.

Budget

DPS License and Weight Service budget appropriations, present and requested, are as follows:

Year	Budget
1979-1980	$3.311 million
1980-1981	3.845 million
1981-1982	4.97 million
1982-1983	5.67 million

The average annual increase in budget from 1979 to 1983 is about 20 percent.

THE COUNTY COURT SYSTEM

Texas' court system may be considered second to the DPS in responsibility for enforcement of size and weight regulations. When a person is cited for a violation of size and/or weight laws, he is notified to appear before a local Justice of the Peace at a specified time. The Justice of the Peace hears evidence to determine innocence or guilt. If the accused is found guilty, the Justice of the Peace then determines the fine. Minimum fine for a driver violating size and weight laws is $25.00 and maximum is $200.00 for the

first offense. In addition, a $3.50 court fee is assessed. When a driver is found guilty of a second size and/or weight law offense, he or she can be fined a minimum of $50.00 and a maximum of $200.00. For a second offense citation, the accused should appear before a county judge; however, in an attempt to alleviate the current backlog in county courts, many second offenses are being treated as first offenses.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

As discussed in the previous chapter, the State legislature has made allowance for vehicles or loads which cannot be reasonably dismantled or disassembled and transported as a legal load. The State legislature assigns the jurisdiction over such vehicles or loads to the State Department of Highways and Public Transportation. SDHPT assigns the responsibility to its Maintenance Operations Division. The Maintenance Operations Division considers applicants' qualifications to determine permit eligibility.

Under its jurisdiction, the Department issues five types of permits:

1. Permit 598——a permit for the movement of concrete beams.
2. SB 290 Permit——a special provision permit, based on Senate Bill 290, which allows for operations of those oversize-overweight vehicles constructed solely for oilwell servicing, clean-out, and/or drilling purposes; fee for this permit is calculated on a mile-fee and/or axle-fee basis (Ref 7).
3. Permit 591——a permit for the movement of mobile homes.
4. Permit 438——a permit for general oversize-overweight movements; it may be obtained at local district offices.
5. Permit 1407——an oversize-overweight permit obtained through telecommunications with SDHPT's central office in Austin, Texas. All permits are transmitted via facsimile methods.

Samples of each of the permit forms are shown in Appendix A.

Fees charged for each type of permit are normally as follows:

Permit Type	Length (days)	Fee Charged ($)
438	Single trip	5
	Thirty-day	10
	Sixty-day	15
	Ninety-day	20

Permit Type	Length (days)	Fee Charged ($)
SB290	Normally 90	No standard fee At least $50.00 to $300.00. Calculated on a mile-fee or axle-fee basis.
591	Single trip	5
598	Single trip	5
1407	Single trip	5

Budget

State funds which have been channeled into oversize-overweight permit operations during the last three years are as follows:

Year	Amount ($)
1978	1,592,806.75
1979	1,678,522.38
1980	1,942,858.05

Clearly, there has been a steady increase in the amount of money spent for such operations.

TEXAS RAILROAD COMMISSION

The Texas Railroad Commission, established in 1891, has, among its duties, the responsibility of certificating motor carriers, buses, and pipelines.

The Railroad Commission is routine in its auditing of certificate motor carriers' records and certifying of carriers under its supervision. In 1979, the RRC was asked by AG and DPS to join in a concerted action to stem the increasing number of overweight trucks on highways. RRC concurred and, beginning in September of that year, built a new item into its auditing procedure, that of checking for carriers' compliance with the maximum gross vehicle weight limit (80,000 lb). This concerted effort by the RRC and the AG was announced to shippers, truck operators, and receivers participating in seminars held in eight locations in the state during the summer of 1979. It was explained to the seminar participants that carriers found to be

continually overloading their trucks might have their certificates revoked or suspended. In the period following these meetings, several carriers have been put on probation or suspension, although no certificates have been revoked.

The RRC's action to stem the overload trend seems to be very successful with truck lines under its supervision, even though its power over the whole trucking industry is restricted. Only 30 percent of the truck traffic (representing certificate motor carriers) is under the supervision of RRC. The remaining 70 percent, including private independent truckers (found to be the most frequent violators), are not under RRC's supervision and, hence, are not affected by this action. In addition, since the carriers' records contain only gross weight carried and not type of vehicle or axle weight, the RRC is able to penalize only those vehicle operators who have obviously violated the 80,000 lb maximum gross vehicle weight limit. For example, a vehicle able legally to carry not more than 47,000 lb, based on its axle arrangement and tire size, can carry 79,000 lb undetected by RRC's routine auditing procedure because of the lack of recorded tire size and axle arrangement. Hence, the RRC's effort to help reduce highway overloads is hampered in this respect. This record limitation also prevents RRC from checking vehicle compliance with the bridge formula (Ref 12).

OFFICE OF THE ATTORNEY GENERAL

The AG's effort to stop highway overloading was initiated as a joint effort with DPS and RRC. During September of 1979, representatives from the AG, DPS, and RRC announced in joint seminar sessions throughout the state their combined effort to stop truck overloading. The RRC's role was as discussed in the previous section, while the DPS was to continue its on-the-road enforcement, and the AG would take legal action against shippers, carriers, and receivers of overloaded vehicles. During these meetings, the AG advanced the theory that shippers, carriers, and receivers of overloaded vehicles are all violating public interest and are, therefore, involved in aggravating highway damage. Hence, the AG would monitor DPS citations to identify shippers, carriers, and receivers of overloaded trucks and file damage suits against them. The AG also proposed the option of suits against operators of dangerously overweight trucks for abatement of a public nuisance.

The effect of the AG's action was considerable. In an attempt to discourage the overloading of trucks, many grain elevator operators began to post signs on their elevator sites. They voluntarily complied with the AG requirement and refused to accept overloaded shipments, even from ICC-exempt carriers.

Most overloading was found to be committed by private and ICC-exempt carriers. Gravel haulers were extensively involved in these violations. The timber industry, as a whole, was also a frequent violator. In a further attempt to reduce overloading, the AG filed the first suit for an injunction against Continental Dredging, a Houston area firm. The court denied the request for a restraining order, but the company agreed to a temporary injunction. The company later agreed to stop overloading its trucks, making the AG's action a success.

The AG's office then filed a suit for an injunction and damages against St. Regis, a timber-hauling company, for receiving overloads. The judge granted a temporary restraining order. A temporary injunction hearing was held later but, due to a lack of sufficient proof, the temporary injunction was denied. Since then, there has been a gradual revival of overloading by the timber industry as well as by other industrial sectors. Many log haulers are unwilling to stop overloading because their competitiveness with other log haulers would be undercut and their profits reduced. Similar attitudes are held by other carrier operators.

The real deterrent, as noted by an official of the AG's office, is a stronger statute. Although the AG's effort did help to reduce size and weight violations for a short period of time, it was not a real solution. The current average fine for oversize-overweight violators is only $41.00, not much of a threat to any violator. Stronger legislation is needed in the long run to eliminate the profit opportunities open to motor carriers when operating overloaded vehicles (Ref 13).

CHAPTER 4. CHARACTERISTICS OF ILLEGAL OVERSIZE-OVERWEIGHT VEHICLES ON TEXAS HIGHWAYS

There are three types of oversize-overweight vehicles on Texas highways—those operating (1) illegally; (2) with a permit; and (3) under special, separate legislations (e.g., ready-mixed concrete trucks; vehicles transporting seed cotton modules, fertilizer, milk, poles, piling, unrefined timber, electric power transmission poles, and unladen lift equipment; and cotton trucks). This chapter deals primarily with the first group, and the next chapter concentrates on the second. The third group is not dealt with because of a lack of any definitive, pertinent data.

Three data sources available to the researchers provided information on the nature of illegal oversize-overweight operations. The first was the "Texas Weigh" data, published by the DPS and listing the dispositions of cases filed by the License and Weight officers of the DPS; data for the first months of 1980 only were available on magnetic tape from DPS. The second data source was the "Status of Vehicles Where Cases Filed", by the DPS, for the first nine months of 1980, in printed form. The third was the "Truck Weight Survey" data for 1980, from SDHPT. This last source contains information gathered when trucks pass by active SDHPT weight stations which use in-motion weighing equipment; hence, it is not known whether the oversize-overweight trucks in this data set were operating with legal permits or not. For this reason, DPS data are consulted more frequently than the truck weight data for characterizing illegal oversize-overweight trucks.

Operation of illegal oversize-overweight trucks was characterized according to the following items:

- Category of violation (oversize, overweight, etc.)
- Monthly
- Location
- Highway class
- Vehicle category
- Vehicle body type

- Permit category
- Vehicle lease status
- Carrier type
- Amount overweight
- Disposition
- Fine levied

Category of Violation

There are four categories of size or weight violations:

(1) Single axle weight in excess of 20,000 lb;

(2) Tandem axle weight in excess of 34,000 lb;

(3) Gross vehicle weight (GVW) in excess of the permissible maximum. The permissible maximum for both 3-S2 and 2-S1-2 is 80,000 lb. For 2D it is 40,000 lb and for 3A, 54,000 lb. Legal maximum gross vehicle weight for other vehicle types is the sum of all legal axle weights (GVW not to exceed 80,000 lb); and

(4) Vehicle size in excess of those permitted by law.

Table 5 illustrates frequency and percentage of violations for each category. Data show that 62.57 percent of cases filed were for exceeding maximum GVW, with 20 percent for exceeding maximum tandem axle weight. Cases violating maximum single axle weight are minimal——only about 1.7 percent. Size violations make up the remaining 15.69 percent.

TABLE 5. DISTRIBUTION OF SIZE AND WEIGHT VIOLATIONS BY CATEGORY, JANUARY-SEPTEMBER 1980

Violation Category	Frequency	Cumulative Frequency	Percent	Cumulative Percent
1	391	391	1.74	1.74
2	4,500	4,891	20.00	21.74
3	14,080	18,971	62.57	84.31
4	3,531	22,502	15.69	100.00

Monthly Frequency

Violations were also studied according to the month of occurrence. Table 6 is a cross-tabulation of violation cases that were later filed versus the month of their occurrence for each category as well as total for all four categories. Figure 4 plots frequency of violation versus month. It seems, from the tabulation, that weight violations peak during the months of April, May, June, and July, while size violations show relatively the same peak all the way into September. Appendix B provides a more detailed view of the monthly frequency of each category of violations.

Location

An effort was made to determine the spatial distribution of size and weight violations throughout the state. A CALFORM map-plotting program was used to generate a map of Texas in which all county boundaries are outlined. Violation data were then sorted according to county in which the case was filed. Data arrayed from the sorting routine were then fed into the CALFORM program and plotted on the map. Figures 5, 6, and 7 show the distribution of overweight, oversize, and total violations, respectively, in each county. Violation data were regrouped according to highway district for a comparison of the number of overweight violation cases filed in each highway district (Fig 8). Districts 2 and 15 show the highest violation rate among all districts. Another comparison was made by dividing the number of violation cases filed by truck vehicle-mileage to give an indication of the number of violation cases filed in relation to truck activity in each district. The analysis shows District 2 to have the highest ratio, District 12 the second, and District 15 the third (Fig 9).

Table 7 shows counties with high size and weight violation rates, major cause of violation, county seat, and major business of the county. The data suggest that independent grain, gravel, and log transporters are the major recorded violators in the state (Ref 3).

Highway Class

The violation data were also arranged according to highway class. Table 8 shows all four different types of violations on each class of highway. Data show that 61.1 percent of the cases filed took place on U.S. and state

TABLE 6. CROSS-TABULATION OF FILED VIOLATION CASES VS THEIR MONTHS OF OCCURRENCE

Month	Violation 1	2	3	4	Total (%)
January	4 0.02 1.36 1.02	58 0.26 19.73 1.29	186 0.83 63.27 1.32	46 0.20 15.65 1.30	294 (1.31)
February	19 0.08 2.38 4.86	114 0.51 14.27 2.53	512 2.28 64.08 3.64	154 0.68 19.27 4.36	799 (3.55)
March	21 0.09 0.97 5.37	422 1.88 19.52 9.38	1422 6.32 65.77 10.10	297 1.32 13.74 8.41	2162 (9.61)
April	61 0.27 1.65 15.60	768 3.41 20.75 17.07	2355 10.47 63.63 16.73	517 2.30 13.97 14.64	3701 (16.45)
May	67 0.30 1.87 17.14	699 3.11 19.51 15.53	2313 10.28 64.57 16.43	503 2.24 14.04 14.25	3582 (15.92)
June	74 0.33 2.21 18.93	730 3.24 21.78 16.22	2081 9.25 62.08 14.78	467 2.08 13.93 13.23	3352 (14.90)
July	60 0.27 1.85 15.35	627 2.79 19.38 13.93	2057 9.14 63.59 14.61	491 2.18 15.18 13.91	3235 (14.38)
August	42 0.19 1.45 10.74	587 2.61 20.30 13.04	1742 7.74 60.26 12.37	520 2.31 17.99 14.73	2891 (12.85)
September	43 0.19 1.73 11.00	495 2.20 19.91 11.00	1412 6.27 56.80 10.03	536 2.38 21.56 15.18	2486 (11.05)
Total	391	4500	14080	3531	22502
Percent	1.74	20.00	62.57	15.69	100.00

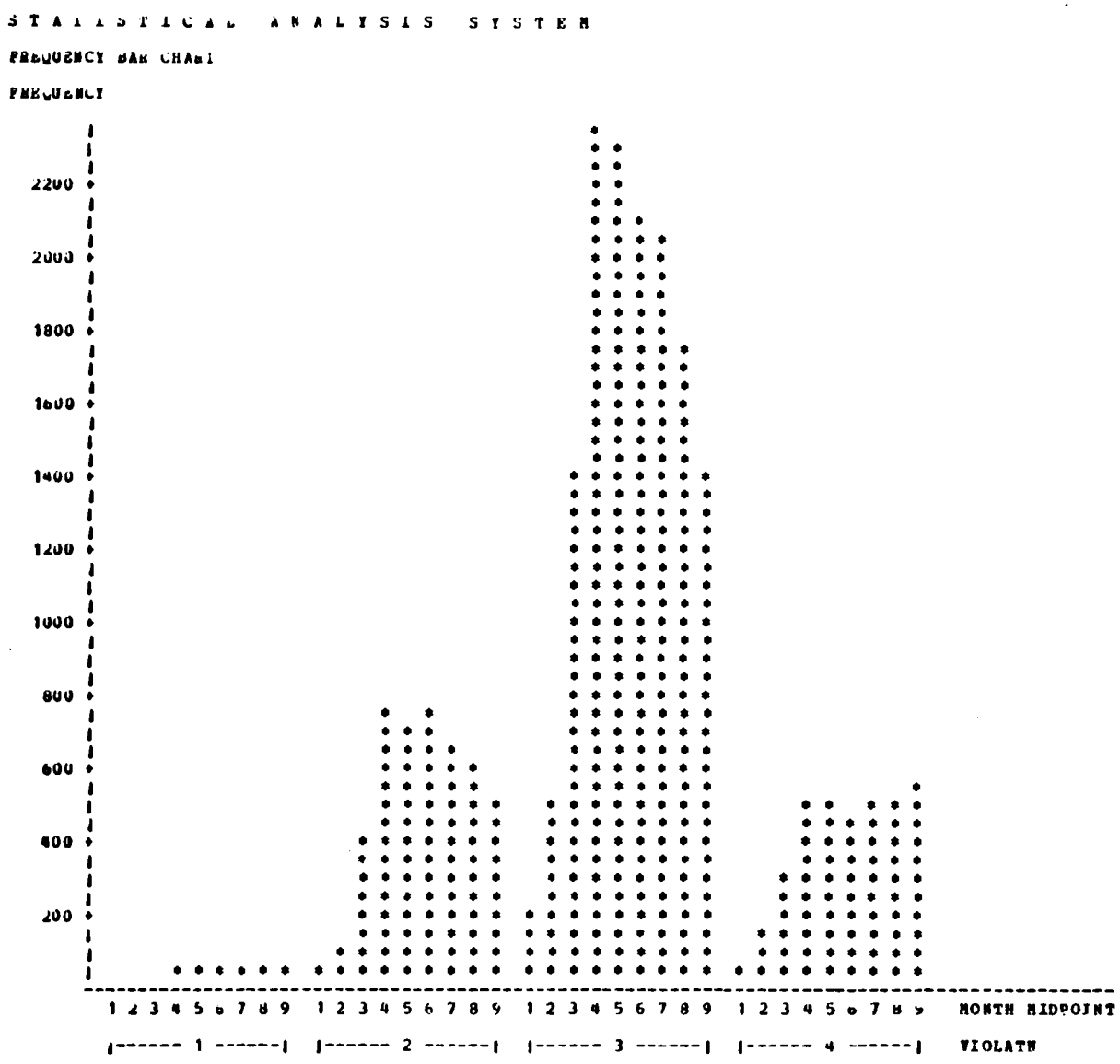


Fig 4. A histogram of violation frequency versus months, by category.

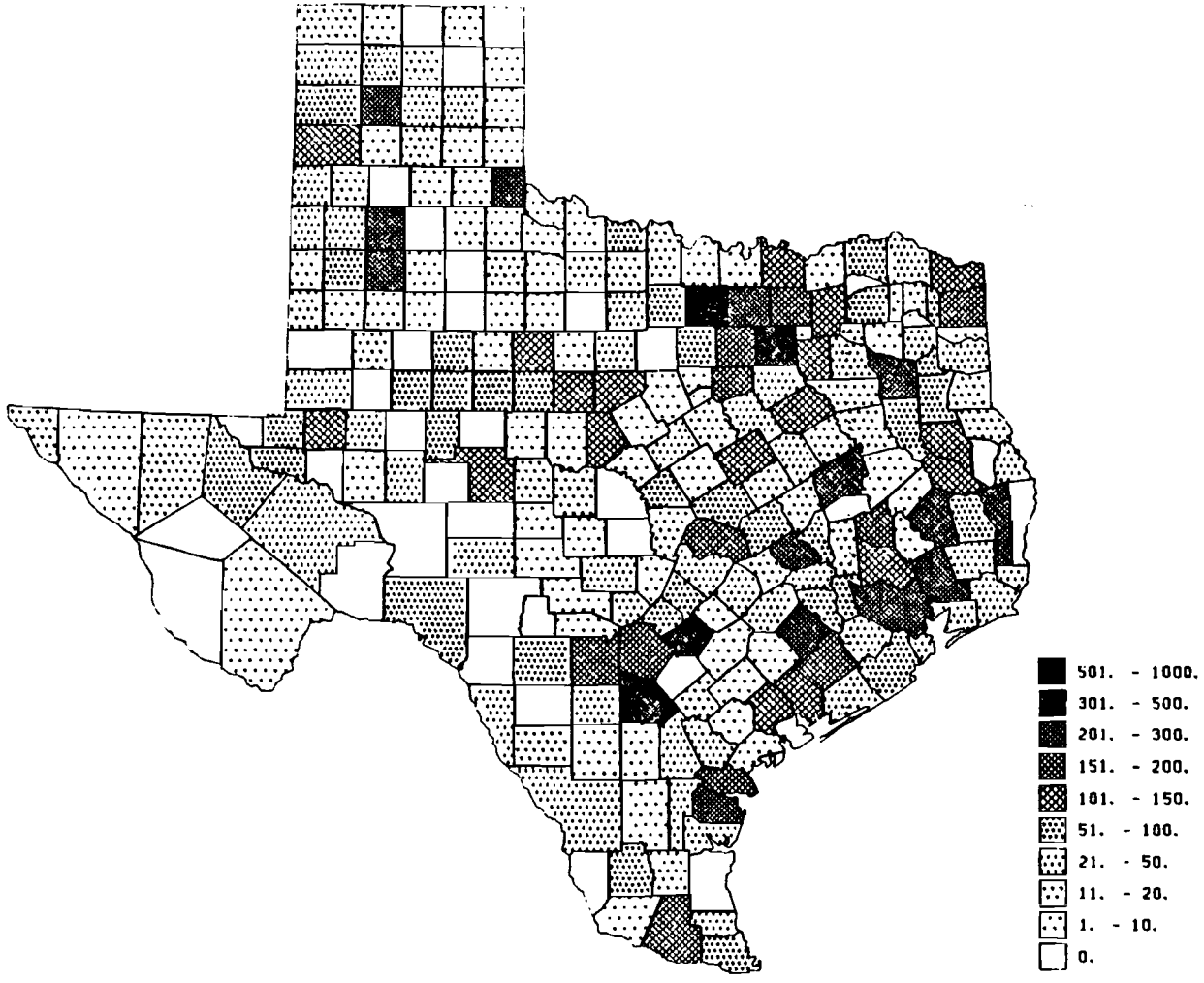


Fig 5. Distribution of overweight violations by county.

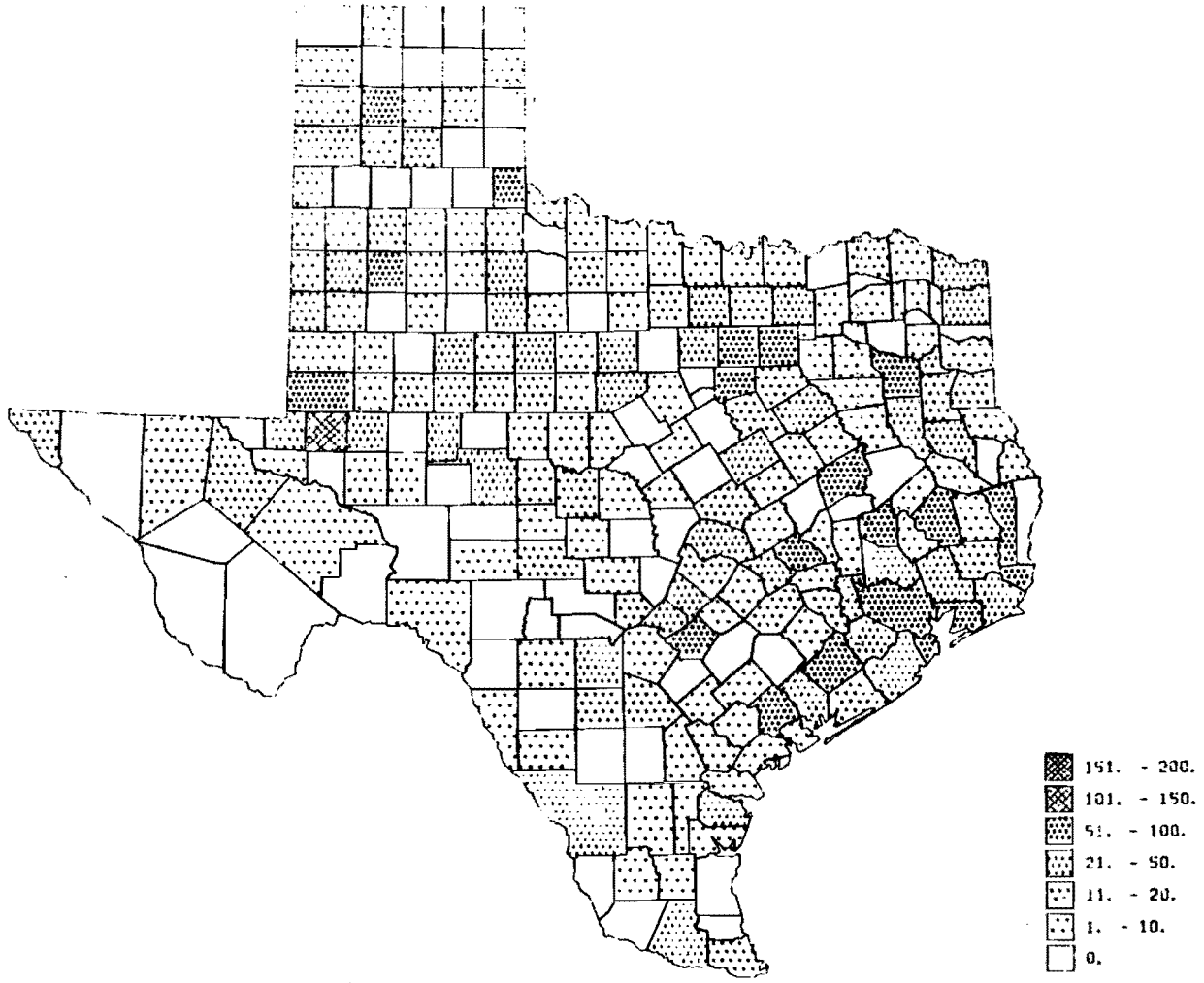


Fig 6. Distribution of oversize violations by county.

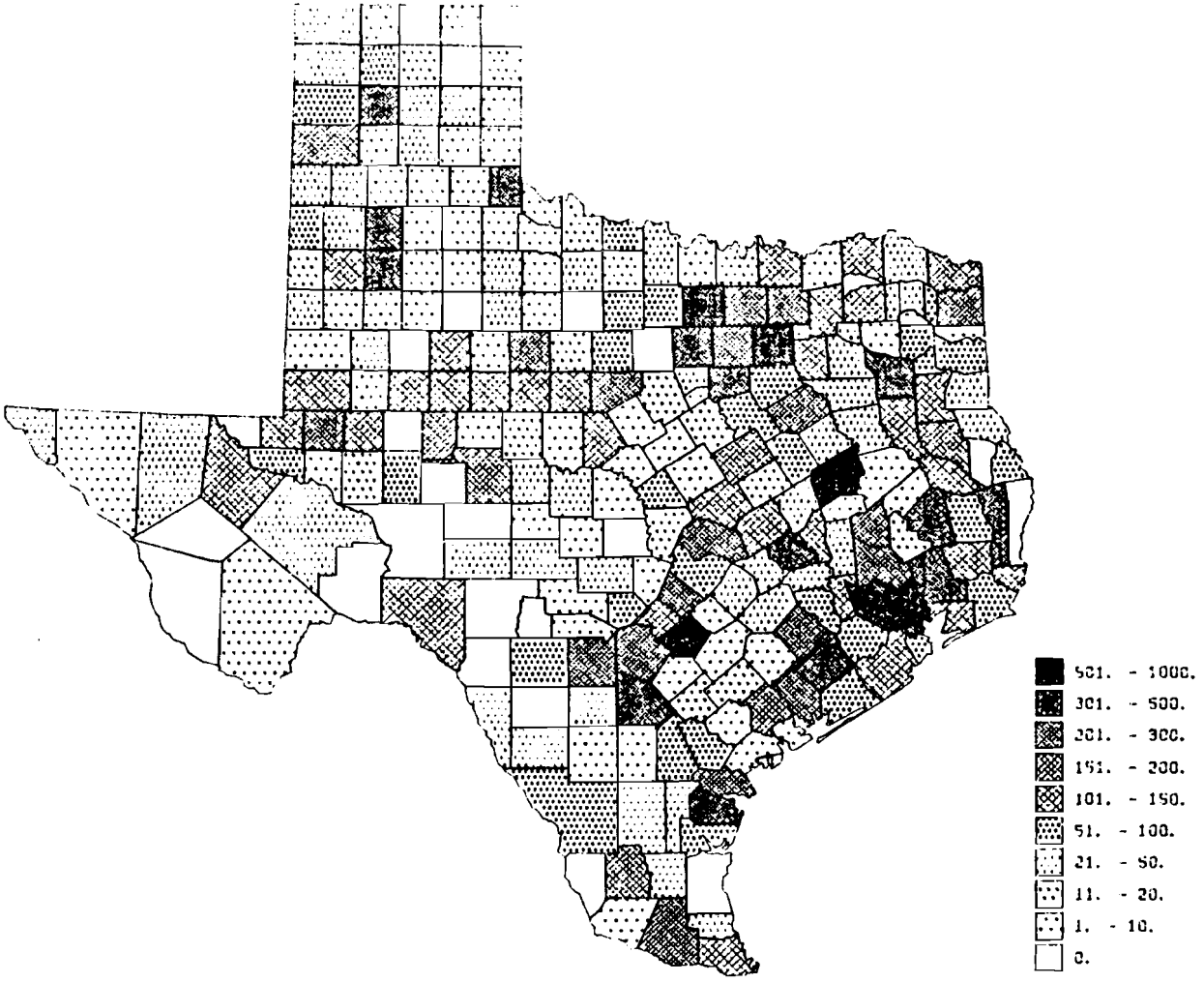


Fig 7. Distribution of all categories of violations by county.

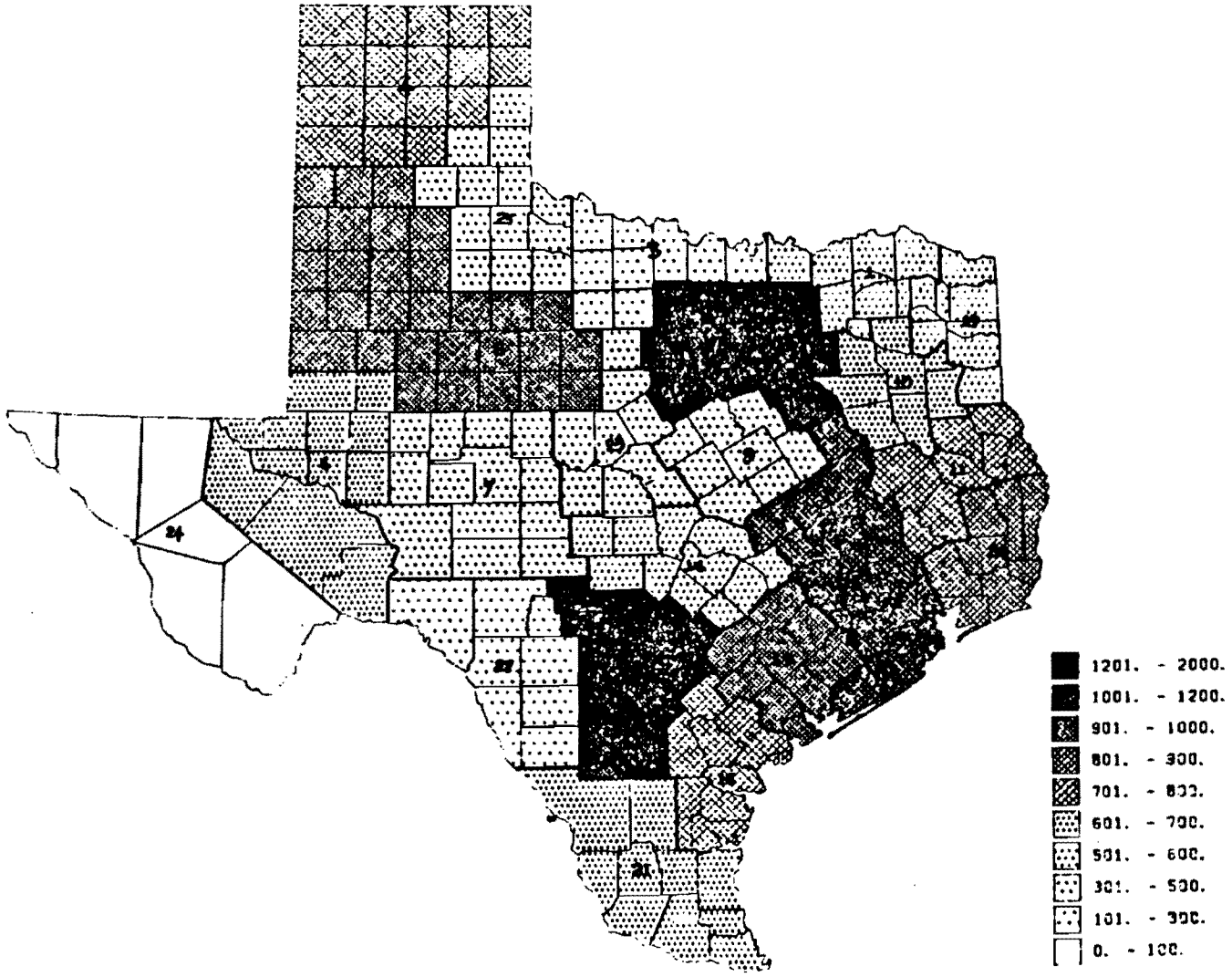


Fig 8. Distribution of Overweight Violations by Highway District

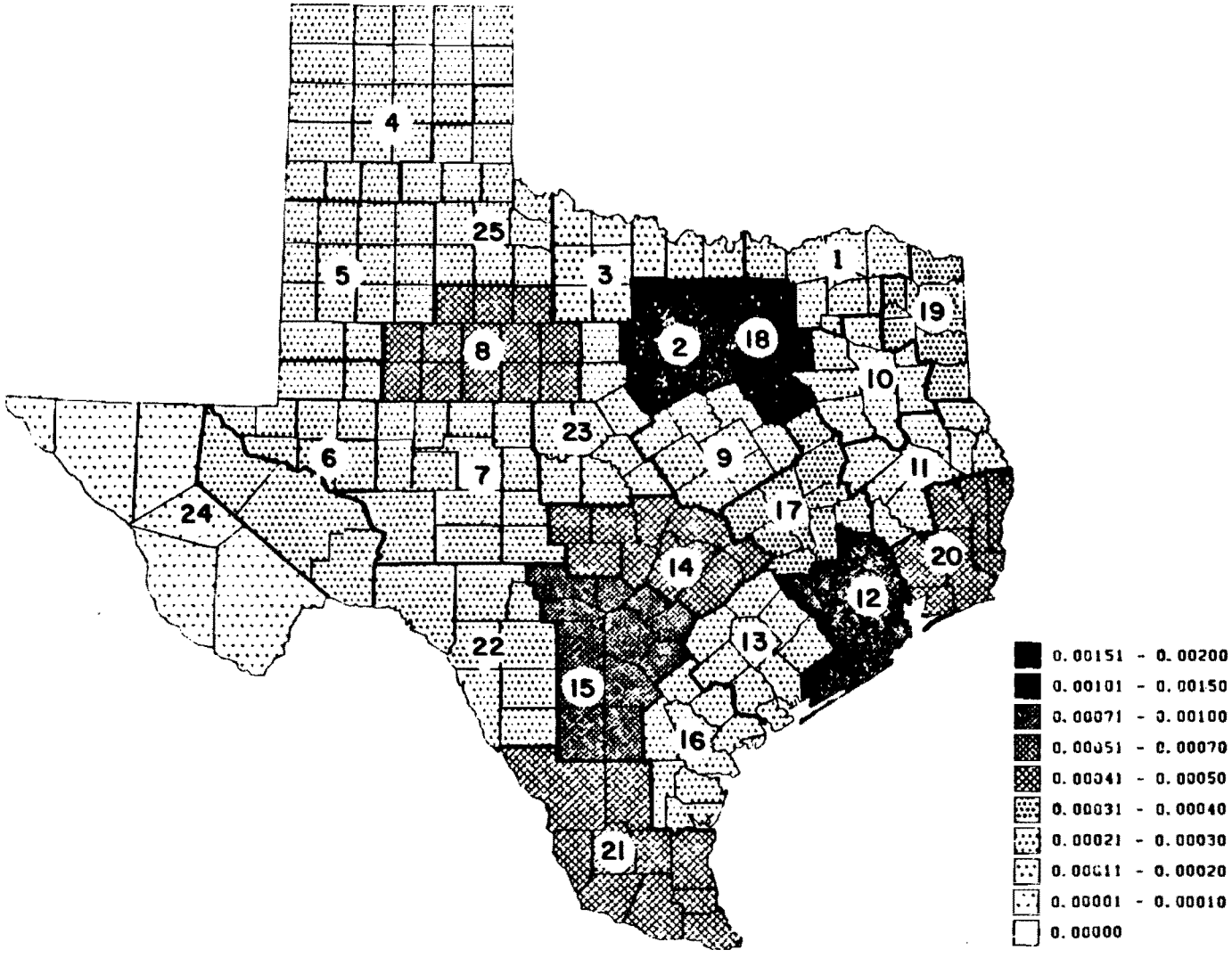


Fig 9. Comparison of violation cases filed per truck VMT among highway districts.

TABLE 7. COUNTIES WITH HIGHEST NUMBERS OF RECORDED SIZE AND WEIGHT VIOLATIONS AND MAJOR CAUSES

County Name	Seat	Major Business	Major Cause
Atascosa	Jourdanton	Agribusiness, oil well supplies, recycling plant.	Oil field activity
Burnet	Burnet	Stone processing, manufacturing, agribusiness, tourist trade, hunting, business.	Sand, rock, gravel, haulers
Childress	Childress	Agribusiness, varied manufacturing.	Location of permanent DPS checkpoints, heavy traffic on Highway 287 between Amarillo and Wichita Falls
Dallas	Dallas	A national center for insurance, banking, transportation, electronics manufacturing, data processing, conventions, and trade shows. More than 3,000 manufacturing plants make apparel, building material, food, oil field supplies, electronics, and many other products.	Location of permanent checkpoints. Sand, rock, and gravel haulers
Guadalupe	Seguin	Agribusiness, varied manufacturing, many employed in San Antonio.	Location of permanent checkpoints in the county. Heavy traffic along I-10, which is the major arterial between Houston and San Antonio
Hale	Plainview	Many agribusiness and food processing plants. One of the leading farm-producing counties.	Agricultural products hauler

(continued)

TABLE 7. (continued)

County Name	Seat	Major Business	Major Cause
Harris	Houston	Highly industrialized county, with more than 28,000 manufacturing plants, 3rd largest U.S. seaport, ranked 2nd in tonnage and value of foreign trade. Petrochemical industry.	Mainly sand, rock, and gravel haulers (Houston ranks 2nd among nation's cities in annual values of building permits); also steel and other commodities out of the port of Houston.
Jasper	Jasper	Timber industries, oil, tourism, poultry raising	Log haulers
Johnson	Cleburne	Agribusiness, manufacturing, distribution, lake activities, employment in Fort Worth and other parts of metro areas.	Livestock, agriculture, sand and gravel haulers
Leon	Centerville	Agribusiness	Location of permanent checkpoints. Heavy traffic between Dallas and Houston on I-45. Violation from a variety of commodity haulers.
Liberty	Liberty	Agribusiness, chemical plants, varied manufacturing, forest industries ($8 million in annual sales)	Log haulers
Lubbock	Lubbock	World's largest cottonseed processing center, Texas' leading agribusiness center, headquarters for large cotton cooperative, manufacturing.	Livestock, agriculture, sand, gravel, and rock haulers
Nueces	Corpus Christi	Diversified economy includes petroleum, agriculture, tourism, coastal shipping, manufacturing, military complex.	Agriculture, sand, gravel, and grain haulers

(continued)

TABLE 7. (continued)

County Name	Seat	Major Business	Major Cause
Polk	Livingston	Timber, lumber production, tourism, oil. (Polk is the leading county in timber production. Of its $24 million income, $19.5 million are from timber.)	Log haulers
Potter	Amarillo	Transportation, distribution hub for large area, petrochemicals, gas processing, agribusiness	Rock, gravel, cattle, and livestock haulers
Smith	Henderson	Oil, lumbering, agribusiness, and tourism	Log haulers
Wharton	Wharton	Oil, sulfur, other minerals, agribusiness, varied manufacturing	Agriculture, chemical, sand, any gravel haulers
Wise	Decatur	Agribusiness, petroleum, and recreation. Part of Dallas-Fort Worth SMSA.	Gravel and aggregates haulers

Source: Ref 3.6

TABLE 8. OVERSIZE-OVERWEIGHT VIOLATION CASES ACCORDING TO HIGHWAY CLASS

	Violation Code	Road Class			
		Interstate	Other Main	Farm-to-Market	Other
Overweight Violations	1	276	512	89	24
	2	2,752	3,240	481	100
	3	4.498	13,468	2,246	298
	Sum	7,526	17,220	2,816	422
	Percent	26.9	61.5	10.1	1.5
Oversize Violations	4	1,668	3,029	377	79
	Percent	32.4	58.8	7.3	1.5
Overweight and Oversize Violations	Total (1+2+3+4)	9,194	20,249	3,193	501
	Percent	27.7	61.1	9.6	1.5

highways, 27.7 percent on interstate highways, 9.6 percent on farm-to-market roads, and 1.5 percent on other highways. However, a rather different picture emerges when these violation cases are compared on a per mile or per lane-mile basis. Table 9 compares violation rates on both a per mile and per lane-mile basis. On a per mile basis, the number of violations occurring on interstate highways is about six times that on other state highways. This indicates that on a mileage or lane-mileage basis, the interstate highways have the highest rate of recorded violations.

Another comparison was made based on truck vehicle-miles of travel for each highway system. A comparison was made by dividing the number of violation cases filed for each highway system by the total vehicle-miles of travel on each respective highway system. The result is tabulated in Table 10. The computation shows that the other main rural highways (U.S. and other state highways) have the highest rate of violation per VMT, followed by interstate highways and farm-to-market roads).

An analysis was also made on the truck-weight survey data by the weighing-in-motion method. The 1980 truck weight survey data showed that, in 1980, 32.01 percent of all trucks weighed on other main rural highways were overweight, while 22.98 percent of all trucks weighed on interstate highways were overweight. Since comparable surveys are not available for farm-to-market roads, no comparison is available. If one compares the data shown on Table 10 with the data obtained from the truck weight survey, one finds that U.S. and state highways have the highest rate of violation. This suggests that there may be a need to increase the motor vehicle size and weight enforcement effort, particularly on the farm-to-market and other main rural highways.

Figure 10 gives the checkpoint locations from Fig 3 together with the truck flow on major highways in Texas.

Vehicle Type

Table 11 illustrates the comparative rate of violation for the nine truck types used in the 1980 Texas truck weight survey. It was found that, on interstate highways, 22.98 percent of the vehicles are overweight, while, on other state highways, 32.01 percent are overweight. On interstate highways,

TABLE 9. NUMBER OF VIOLATIONS BY HIGHWAY CLASS

(a) Per Mile

Highway System	Mileage*	Number of Violations	Violations/ Mile
Interstate, Rural	1,395	9,194	6.59
Other Main, Rural	17,725	20,249	1.14
Farm-to-Market, Rural	29,674	3,193	.11

(b) Per Lane-Mile

Highway System	Lane-Mileage*	Number of Violations	Violations/ Lane-Mile
Interstate, Rural	9,066	9,194	1.01
Other Main, Rural	40,131	20,249	.50
Farm-to-Market, Rural	59,392	3,193	.05

*Data from SDHPT
Data date: 31 August 81

TABLE 10. NUMBER OF VIOLATION CASES FILED PER TRUCK VEHICLE MILE OF TRAVEL

Highway System (Rural)	Number of Violation Cases Filed	VMT	Violation Cases/ VMT
Interstate	9,194	2,915,839	.0032
Farm-to-Market	3,193	1,126,680	.0028
Other Main Highways	20,249	5,819,056	.0035

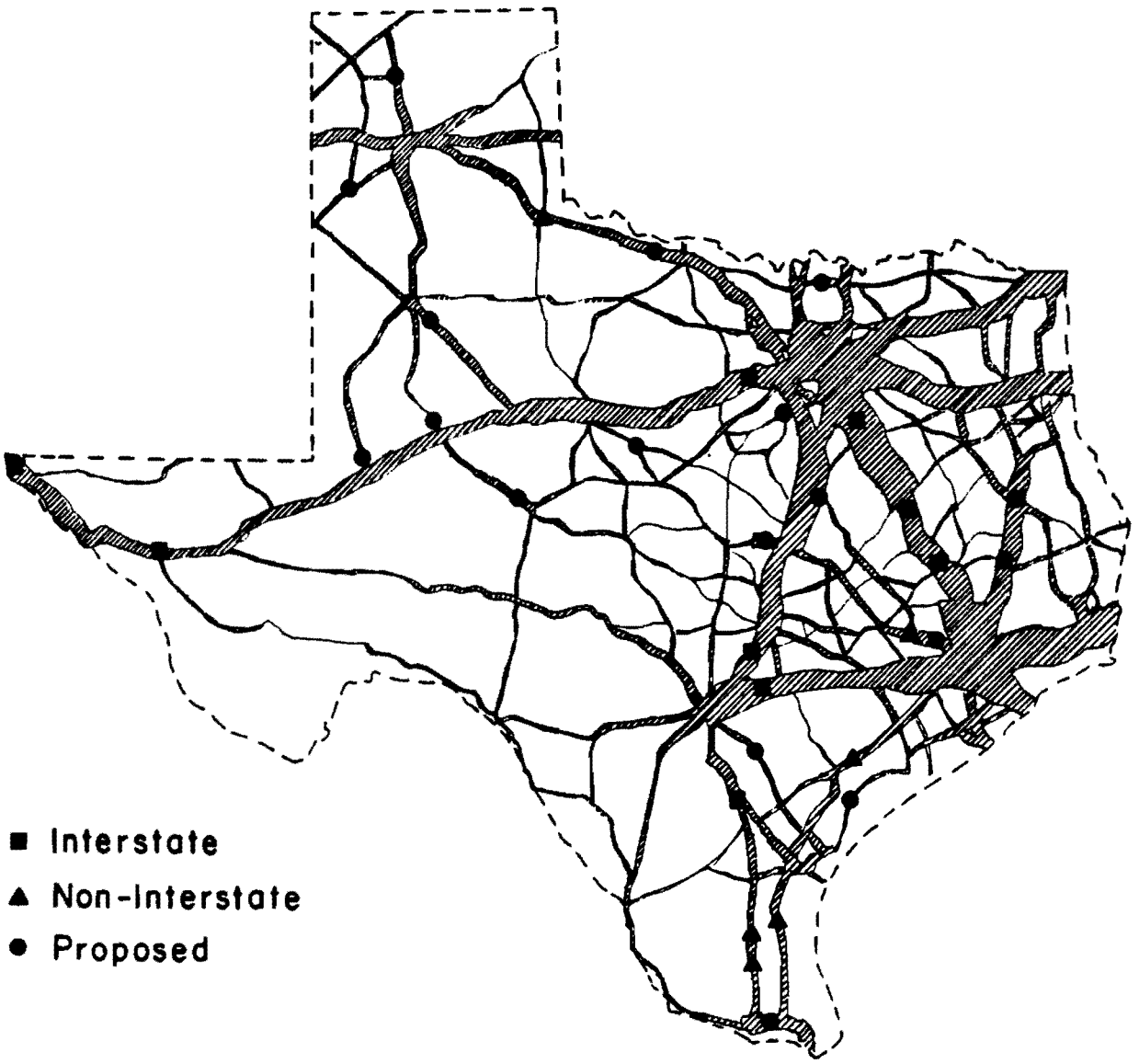


Fig 10. DPS current and proposed checkpoints and Texas highway truck flow (truck flow based on 1978 truck flow map of SDHPT).

TABLE 11. VIOLATION RATES FOR VARIOUS TRUCK TYPES, BY HIGHWAY SYSTEM, 1980 (PERCENTAGE)

Truck Type	Interstate Highways		Other Main Highways	
	% Overgross*	% Overweight+	% Overgross*	% Overweight+
2D	.3	5.6	0	2.9
3A	2.4	2.5	13.3	7.4
2-S1	0	.5	0	0
2-S2	1.7	0	0	0
3-S1	0	0	0	0
3-S2	90.2	87.3	85.9	89.3
3-2	0	0	0	0
2-S1-2	5.1	3.8	.7	.4
3-S1-2	.3	.1	0	0
Total	100	100	100	100

Note: All figures are based on 1980 truck weight study data.

* refers to vehicles exceeding maximum gross vehicle weight limit.

+ refers to vehicles that have exceeded any of the maximum limits on single axle weight, tandem axle weight, and/or gross vehicle weight.

3-S2's represent 87.3 percent of the overweight vehicles and, on other state highways, they represent 89.3 percent of those vehicles overweight.

Another comparison was made on a vehicle-to-vehicle basis (see Table 12). The purpose of the analysis was to determine the percent of vehicles running overweight within each vehicle fleet. Results presented in Table 12 show that, on interstate highways, 2-S1-2's have the highest rate of violation (36.8 percent), followed by 3-S2's (27.5 percent), and 3-S1-2's (16.7 percent). On other state highways, 3-S2's have the highest rate of violation (39.1 percent), followed by 3A's (31.6 percent).

Body Type

The size and weight violation records released by the DPS also give body types of vehicles found oversize and/or overweight. The result of the body-type analysis is summarized in Table 13. It shows that 41.8 percent of all oversize-overweight vehicles are dump trucks and approximately 29.1 percent are float trucks. Dump trucks are the most frequent violators of weight limitations (50 percent), while float trucks (a truck combination with a flatbed trailer having no side boards) violate size limitations most often (66.4 percent).

A more detailed analysis of size and weight violations according to body type is presented in Appendix C.

Permit Category

The DPS size and weight violation data were analyzed according to permit category. Table 14 gives the results of these analyses. Table 14a shows that 52.6 percent of weight violations are committed by private carriers and 42.8 percent by special carriers. Table 14b shows that 59.3 percent of size violations can be attributed to private carriers and 37.2 percent to special carriers. Common carriers, as well as contract carriers, have very low rates of violation. These data correspond to comments rendered by DPS personnel with respect to their observation that independent trucks are the significant challenge to License and Weight officers (Ref 3).

Lease Status

An analysis of size and weight violation data according to lease status is shown in Table 15. More than two-thirds of the violations are by unleased vehicles.

TABLE 12. FREQUENCY DISTRIBUTION AND PERCENT OF VEHICLES OVERWEIGHT FOR EACH VEHICLE CLASS, BY HIGHWAY SYSTEM, 1980

Interstate Highways

Truck Type	Total No. Weighed	No. Overweight*	% Overweight
2D	507	41	8.1
3A	130	19	14.6
2-S1	38	4	10.5
2-S2	174	0	0
3-S1	6	0	0
3-S2	2,317	638	27.5
3-2	3	0	0
2-S1-2	76	28	36.8
3-S1-2	6	1	16.7

Other State Highways

Truck Type	Total No. Weighed	No. Overweight*	% Overweight
2D	107	7	6.5
3A	57	18	31.6
2-S1	9	0	0
2-S2	32	0	0
3-S1	2	0	0
3-S2	552	216	39.1
2-S1-2	13	1	7.7
3-S1-2	4	0	0

*The number of vehicles overweight includes those which are overweight with respect to either single axle load, tandem axle load, or gross vehicle weight.

Source: Texas Truck Weight Survey Data, 1980.

TABLE 13. ANALYSIS OF SIZE AND WEIGHT VIOLATION CASES FILED BY BODY TYPE

Violation Code	Type of Vehicle									
	Float	Pole	Tank	Refrig-erator	Van	Live-stock	Dump	Special	Unknown	Pass Car
1	170	22	33	12	55	25	257	31	4	
2	1,858	178	827	155	369	139	2,482	513	52	
3	3,831	1,470	2,342	192	505	238	11,060	749	96	
4	3,589	194	20	64	176	360	147	783	64	9
Total	9,718	1,864	3,222	423	1,105	762	13,946	2,076	216	9
% of Total	29.1	5.6	9.7	1.3	3.3	2.3	41.8	6.2	.6	0.

TABLE 14. VIOLATION CASES FILED ACCORDING TO PERMIT CATEGORY

(a) Weight Violations (Codes 1, 2, and 3)

Region	Permit Category	Private	Contract	Special	Common	Un-authorized	Passenger
1	A	955	6	1,124	4	21	-
	B	1,104	1	870		11	-
2	A	1,103	23	1,529	21	61	-
	B	2,317	7	506	7	29	-
3	A	1,127	769	4		46	-
	B	1,984	6	1,585	31	17	-
4	A	539	6	499		5	-
	B	1,282	5	1,118	1	10	-
5	A	1,259	1	930	1	36	-
	B	1,031	6	1,270	2	9	-
6	A	907	13	1,193	14	32	-
	B	673	8	992	12	19	-
TOTAL		14,281	851	11,620	93	296	-
Percent		52.6	3.1	42.8	.3	1.1	-

(continued)

TABLE 14. (continued)

(b) Size Violations (Code 4)

Region	Permit Category	Private	Contract	Special	Common	Un-authorized	Passenger
1	A	305	4	105	4	5	1
	B	223		108		2	
2	A	283		271	4	15	1
	B	415	12	291		12	
3	A	167	1	65		5	3
	B	231	1	169	36	7	
4	A	253	2	197		1	
	B	293	2	139	2	4	1
5	A	210	0	101	7	0	1
	B	266	1	148			
	A	198	1	144	11	4	2
	B	169	1	152	15	8	1
TOTAL		3,013	25	1,890	79	63	10
Percent		59.3	.5	37.2	1.6	1.2	.2

TABLE 15. SIZE AND WEIGHT VIOLATION CASES FILED BY LEASE STATUS, JANUARY-SEPTEMBER 1980

Area	Lease Status	Leased Vehicle	Not Leased	Status Unknown	Passenger Car
1	A *	721	1,812	0	2
	B *	845	1,497	2	2
2	A	1,671	1,807	4	2
	B	627	3,077	2	3
3	A	654	1,578	0	5
	B	1,601	2,525	3	1
4	A	243	1,338	1	0
	B	762	2,102	1	2
5	A	376	2,239	1	1
	B	719	2,031	6	1
6	A	1,074	1,442	1	3
	B	1,024	1,032	3	2
TOTAL		10,317	22,480	24	24
Percent		31.4	68.4	.1	.1

*A and B are the sergeant areas by DPS classification. During 1980, there were two sergeant areas for each of the six regions. The division of the sergeant areas has since been revised and the current division is shown in Fig 2.

Type of Carrier

Table 16 shows truck size and weight violations according to type of carrier. Intrastate carriers commit 83.4 percent of all weight violations and 82.9 percent of all size violations.

Amount Overgross

DPS violation records provided the distribution of excess over registered weight each vehicle was carrying (Fig 11). It is observed that most vehicles exceed their registered weight by 4,000 to 8,000 lb, while a few exceed by as much as 50,000 lb.

Disposition of Cases

During the first nine months of 1980 there were 22,833 size and weight violation cases filed by DPS License and Weight officials. Of these cases, 22,502 (98.6 percent) resulted in fines administered in the courts, while 323 (1.4 percent) met other dispositions. Table 17 contrasts the different dispositions these 323 cases experienced.

The same 323 cases were also analyzed according to category of violation. Results indicate that violations of maximum gross vehicle weight comprise approximately 50 percent of no-fine cases, while violations of size limitations represent approximately 32 percent. These results are presented in Table 18. For fined cases, readers may refer to Table 6.

Fine Analysis

Section 15(b) of Article 6701d-11 of the Revised Civil Statutes of Texas states, "Any person, corporation or receiver, who violates any provision of this Act shall, upon conviction, be punished by a fine of not more than Two Hundred Dollars ($200.00)." Previous law stipulates a minimum of $25 for first conviction. The court fee for processing a case is usually $3.50. Figure 12 shows distribution by amount of fine charged. This figure indicates that most judges assess violators with fines between $20 and $30. A detailed plot showing fine distribution for each category of violation is contained in Appendix D. A correlation is made between amount of fine charged and the amount of excess weight each vehicle is charged with having. The resulting coefficient of correlation is .353. A linear regression model on the data

TABLE 16. VIOLATION CASES FILED ACCORDING TO TYPE OF CARRIER

(a) Weight Violations (Codes 1, 2, and 3)

Region	Type Carrier	Intrastate	Intrastate Exempt	Interstate	Interstate Exempt	Passenger Car
1	A	1,932	4	158	16	
	B	1,274	16	687	29	2
2	A	2,665	7	193	15	1
	B	2,708	7	207	46	
3	A	1,431	7	408	148	
	B	3,463	38	136	32	
4	A	996	6	111	13	2
	B	1,758	194	211	263	
5	A	1,479	363	137	313	
	B	1,828	131	209	171	2
6	A	1,905	25	128	102	
	B	1,648	10	45	12	
TOTAL		23,087	808	2,630	1,160	7
Percent		83.4	2.9	9.5	4.2	.0

(continued)

TABLE 16. (continued)

(b) Size Violations (Code 4)

Region	Type Carrier	Intrastate	Intrastate Exempt	Interstate	Interstate Exempt	Passenger Car
1	A	350		73	1	1
	B	237	1	98	2	
2	A	542		57	3	1
	B	550	2	183	6	
3	A	226		12	1	4
	B	425	2	34		
4	A	359		95		
	B	390	4	43	3	1
5	A	250	13	34	7	1
	B	321	3	20		2
6	A	297	2	59		2
	B	321	3	20		2
TOTAL		4,272	34	805	30	12
Percent		82.9	.7	15.6	.6	.2

TABLE 17. FREQUENCY DISTRIBUTION BY TYPE OF DISPOSITION FOR CASES FILED BUT NOT FINED

No Fine	Frequency	Cumulative Frequency	Percent	Cumulative Percent
DEC	2	2	0.619	0.619
LD	172	174	53.251	53.870
NG	3	177	0.929	54.799
NL	100	277	30.960	85.759
NP	18	295	5.573	91.331
OD	14	309	4.334	95.666
WD	14	323	4.334	100.000

Note: The meaning of the codes are as follows:

DEC Deceased
LD Local Dismissal
NG Not Guilty
NL Not Located
NP Not Prosecuted
OD Other Disposition
WD Withdrawn by DPS

TABLE 18. FREQUENCY DISTRIBUTION BY CATEGORY OF VIOLATION FOR CASES FILED BUT NOT FINED

Violation	Frequency	Cumulative Frequency	Percent	Cumulative Percent
1	10	10	3.021	3.021
2	51	61	15.408	18.429
3	164	225	49.547	67.976
4	106	331	32.024	100.000

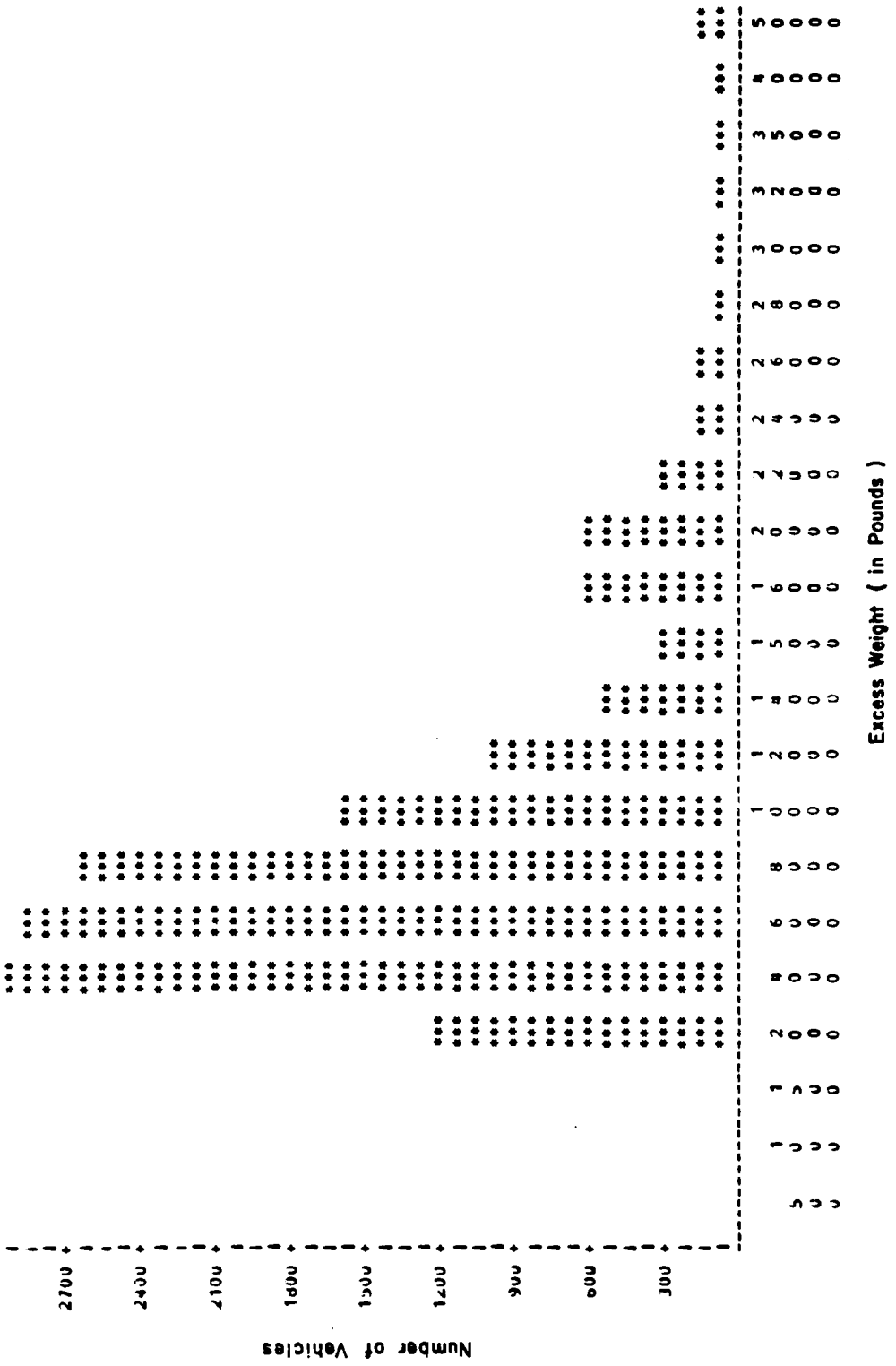


Fig 11. Amount of vehicle actual weight over its registered GVW of vehicles where violation cases filed.

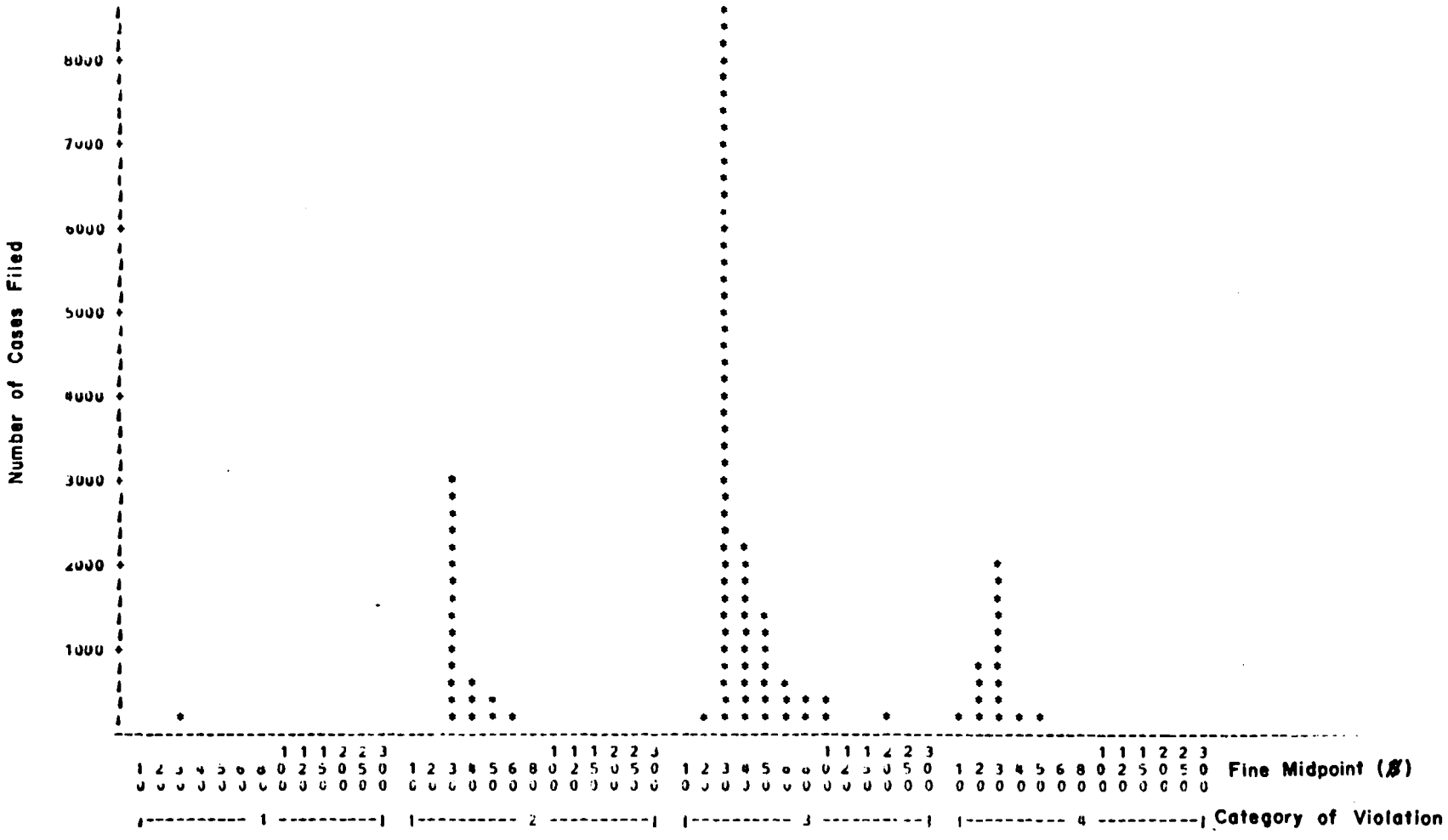


Fig 12. Distribution of fines charged by the court for each category of violation.

prints was also attempted. Using fine as the dependent variable and amount of excess gross vehicle weight as the independent variable, the model has the following form:

$$Y \text{ (fine)} = 30.16625 + .001053X$$

where X = amount of excess gross vehicle weight in lb.

Analysis of the model suggests, however, that the model does not explain the variation in data well. The R^2 for the linear model, which is usually employed to measure the success of the model, was only .1264. This, together with the previous correlation analysis, suggests that, on a scale of 0 to 1, there is not a consistent, proportional relationship between the amount of excess weight a trucker is charged with and the amount of fine levied in the courts. Figure 13 is a plot of fine value versus excess GVW.

The mean, standard deviation, minimum value, and maximum value of the fines levied in the court for each category of violation are tabulated in Table 19. Average fines range from $28.75 to $40.41. This is definitely not a significant loss to the trucker if he is found overloading. A paper written by Glickert and Paxson also discussed the influence of the inadequate fine structure on truckers' tendency to overload (Ref 14). When the amount of fine likely to be charged times the probability of being caught is far below the profit that a trucker may obtain by running overloaded, an incentive exists for the trucker to run overloaded. Hence, a good statute would be such that the incentive for truckers to overload is nonexistent or even negative. The enactment of such a statute is the responsibility of the legislature.

It also seems reasonable that the amount of fine charged should be made proportional to the amount of illegal load each vehicle carries. This is consistent with the principle of equity and would make the statute a stronger deterrent to truckers who tend to overload as much as possible.

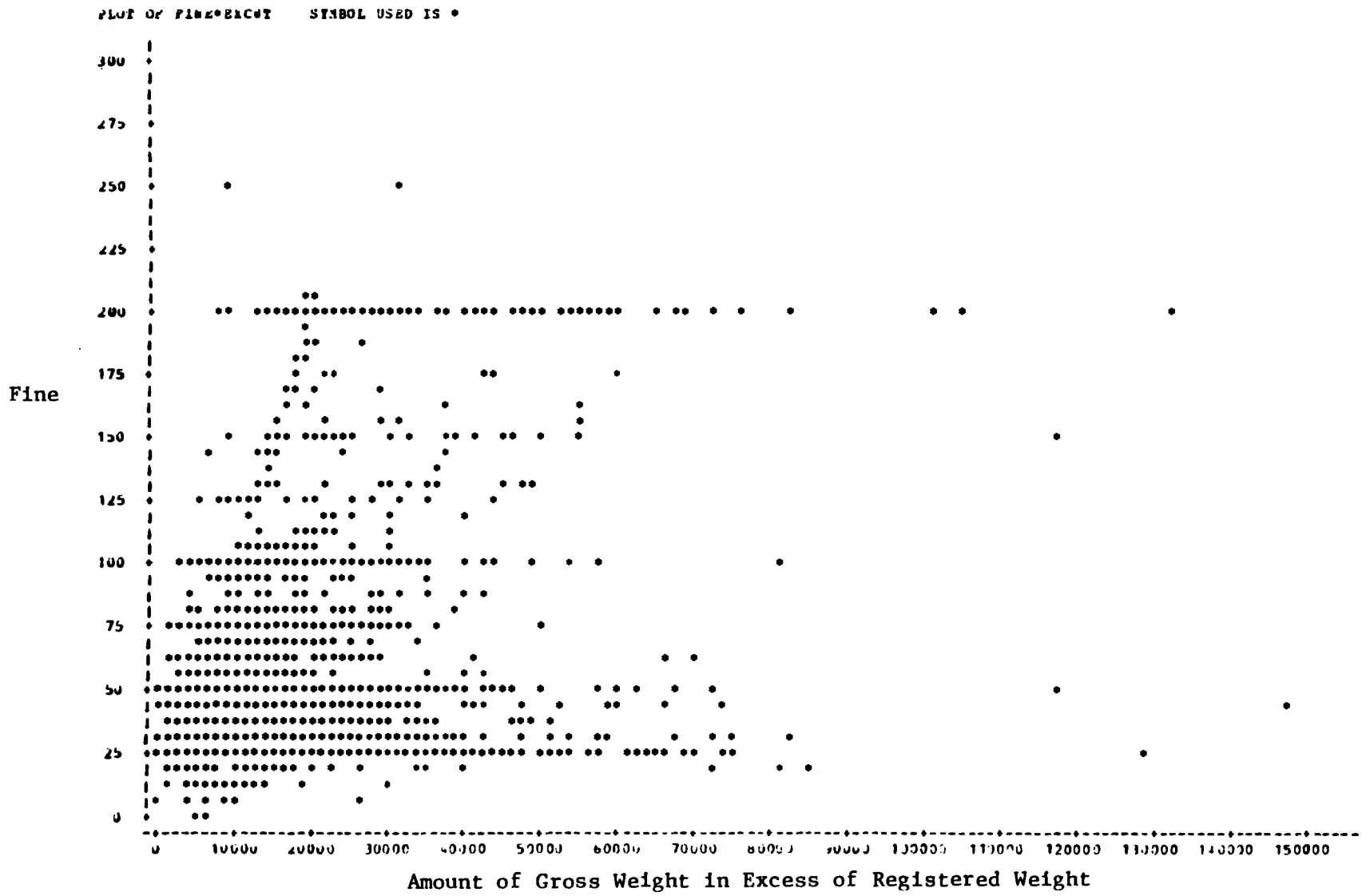


Fig 13. Fine vs. amount of gross weight in excess of registered weight.

TABLE 19. ANALYSIS OF FINES CHARGED BY THE COURT FOR ALL CASES FILED, JANUARY——SEPTEMBER 1980

Variable	N	Mean	Standard Deviation	Minimum Value	Maximum Value	Standard Error of Mean	Sum	Variance	C.V.
Violation 1 Fine	391	35.19	17.76	4	203	.90	13,760	315.62	50.48
Violation 2 Fine	4,500	36.19	15.88	2	203	.24	162,838	252.30	43.89
Violation 3 Fine	14,080	40.41	24.56	2	253	.21	568,944	603.32	60.79
Violation 4 Fine	3,531	28.75	10.21	4	203	.17	101,535	104.18	35.49

CHAPTER 5. CHARACTERISTICS OF OVERSIZE-OVERWEIGHT PERMIT OPERATIONS

Characteristics of vehicles violating size and weight limitations are described in the previous chapter. This section presents characteristics of legal oversize-overweight permit operations. Characteristics of oversize-overweight permits issued shall be discussed according to

- Permit type
- Time length of the permit
- Location where permit is issued
- Historical trend

Permit Type

As indicated earlier, SDHPT issues five types of permits to applicants for oversize-overweight movement. These types are

- Permit 598——movement of concrete beams
- Senate Bill 290 permit——oil field activities such as oil well drilling, cleaning, and servicing equipment
- Permit 591——movement of mobile homes
- Permit 438——general oversize-overweight vehicle movement
- Permit 1407——oversize-overweight permit issued through telecommunication

Detailed permit issuance data from September 1, 1979, to August 31, 1980, were made available to the researchers. Table 20 gives the number and percent of each type of permit issued. Oversize-overweight permits represent 77.6 percent of the permits issued.

Based on another set of data, obtained from SDHPT, which classified all permits as oversize only, overweight only, or oversize and overweight, the distribution of permits issued from October 1, 1978, to September 30, 1980, is illustrated in Table 21.

TABLE 20. DISTRIBUTION OF PERMITS ISSUED FROM SEPTEMBER 1, 1979, to AUGUST 31, 1980, ACCORDING TO TYPE OF PERMIT

Permit Type		Number Issued	Percent
598	Concrete beam	3,270	.7
SB290	Oil field	4,812	1.0
591	Mobile home	80,650	17.3
438	Oversize-Overweight	361,368	77.6
1407	Telecommunication	15,643	3.4
		465,743	

TABLE 21. DISTRIBUTION OF PERMITS ISSUED FROM OCTOBER 1, 1978, to SEPTEMBER 30, 1980, BY SIZE AND WEIGHT CATEGORIES

	October 1, 1978, to September 30, 1979		October 1, 1979, to September 30, 1980	
Type of Permit	No. Issued	Percent	No. Issued	Percent
Overweight Only	6,518	1.5	6,137	1.3
Oversize Only	102,961	24.2	105,924	22.7
Oversize and Overweight	315,464	74.2	353,682	75.9
TOTALS	424,943	100.0	465,743	100.0

Time Length of Permit

The Revised Civil Statutes of Texas (Ref 4) allow four types of permits, according to time length. These are (1) single trip, (2) 30-day, (3) 90-day, and (4) annual permits. Table 22 shows the distribution of permits according to time length.

TABLE 22. DISTRIBUTION OF PERMITS ACCORDING TO TIME LENGTH, OCTOBER 1, 1978, TO SEPTEMBER 30, 1980

	October 1, 1978, to September 30, 1979		October 1, 1979, to September 30, 1980	
Time Length	No. Issued	Percent	No. Issued	Permit
Single trip	397,836	93.6	436,685	93.8
30-day	22,595	5.3	24,175	5.2
90-day	3,470	.8	3,718	.8
Annual	1,042	.2	1,165	.3
TOTALS	424,943	100.0	465,743	100.0

Location

Data obtained from the DPS were fed into a computer and, with the use of the CALFORM program, distribution of permits issued was plotted for each district in Texas. Figures 14-17 show distribution of permits issued according to type, and Figs 18-21 show distribution of permits according to time length. Figure 22 gives distribution for all permits.

Due to the presence of concrete beam manufacturers and construction activities in and around Houston, District 13 issues the highest number of Permit 598 (see Fig 14). Districts 6 and 8 issue the greatest number of Permit 290 because of the existence of mobile home industries in each of these districts (see Fig 16). Overall, Districts 6 and 12 issue the greatest number of permits; the former due to the oil field activities and the latter because of construction and oil refinery activities (Ref 4).

Table 23 lists fees collected from each type of permit and their share of the total.

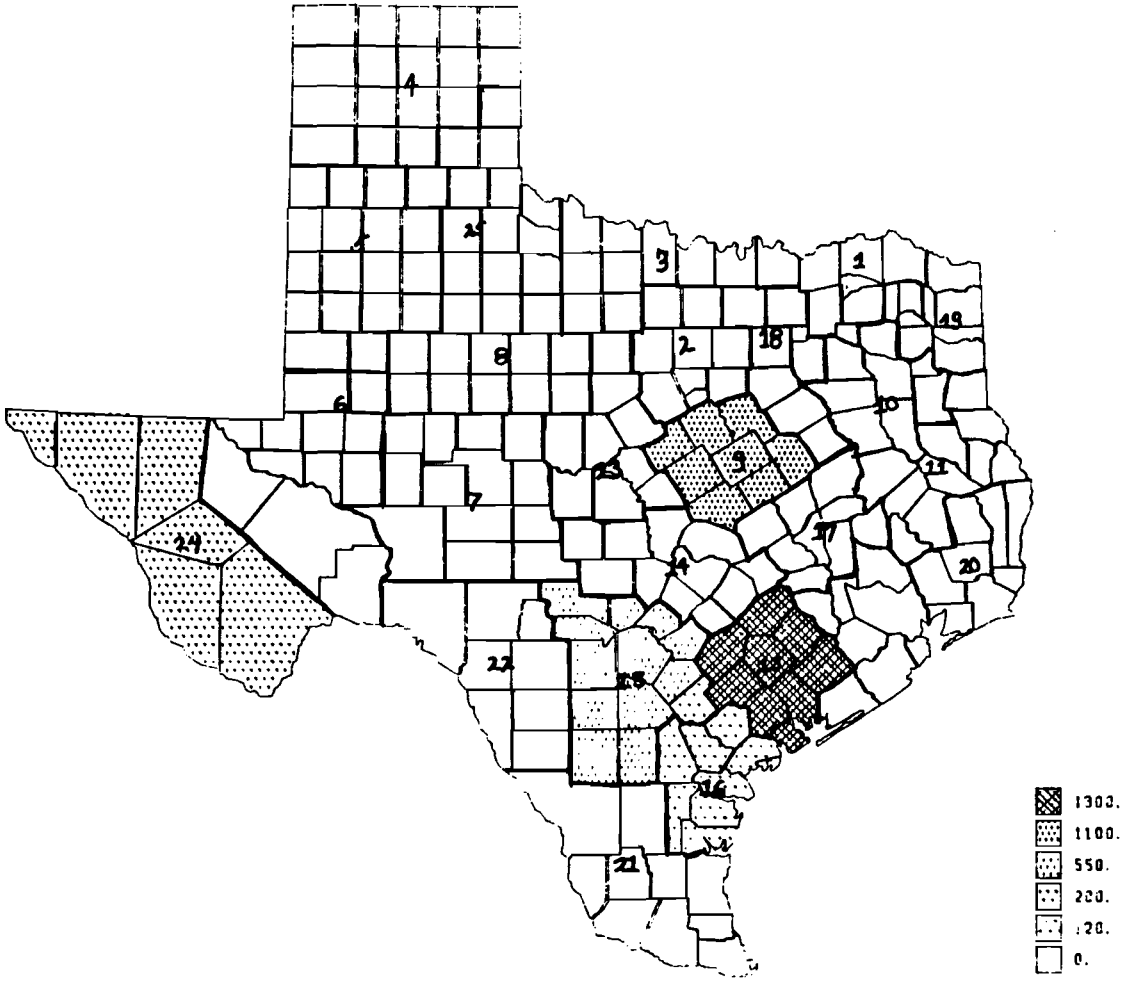


Fig 14. Permit 598 issued by highway district.

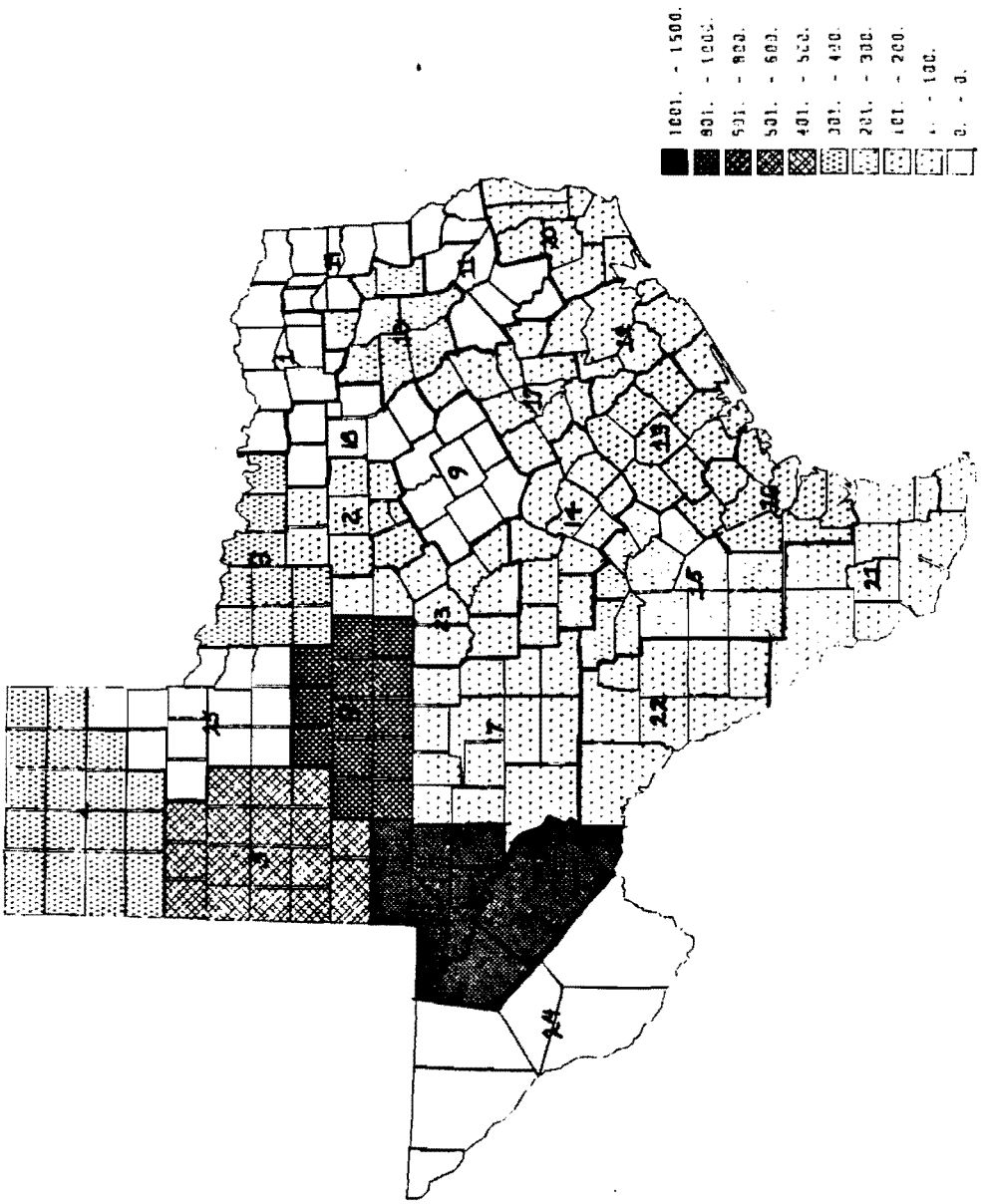


Fig 15. Permit 290 issued by highway district.

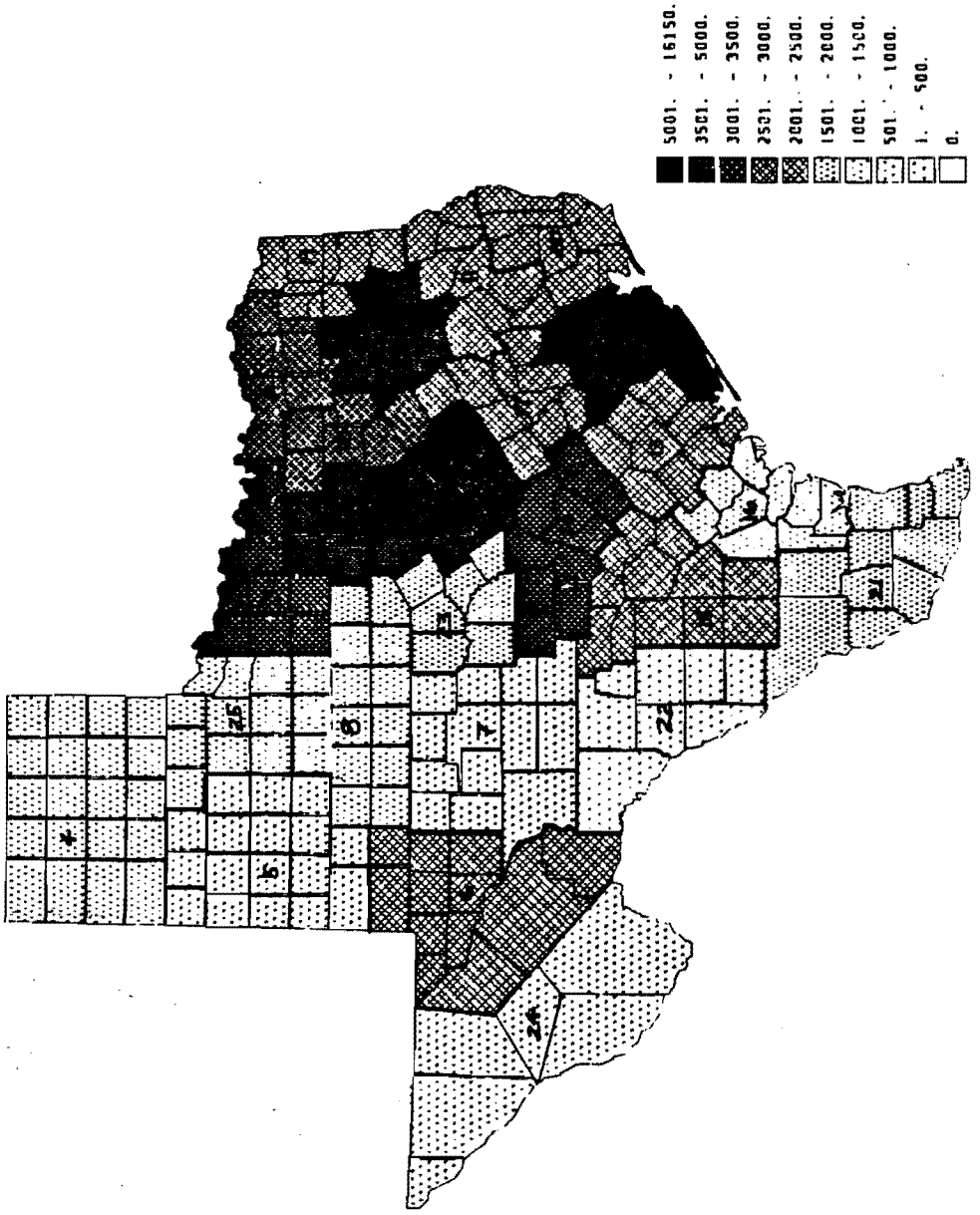


Fig 16. Permit 591 issued by highway district.

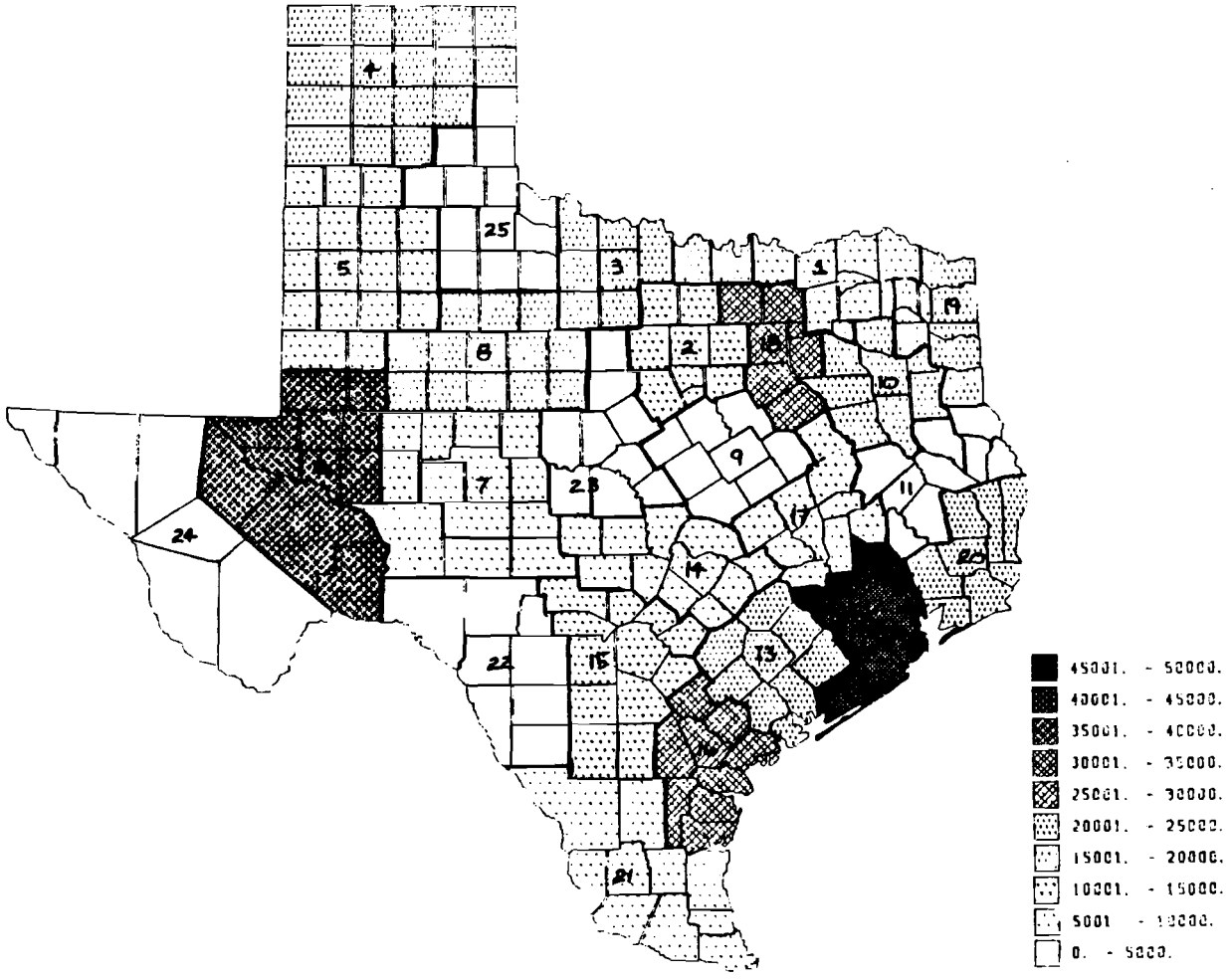


Fig 17. Permit 438 issued by highway district.

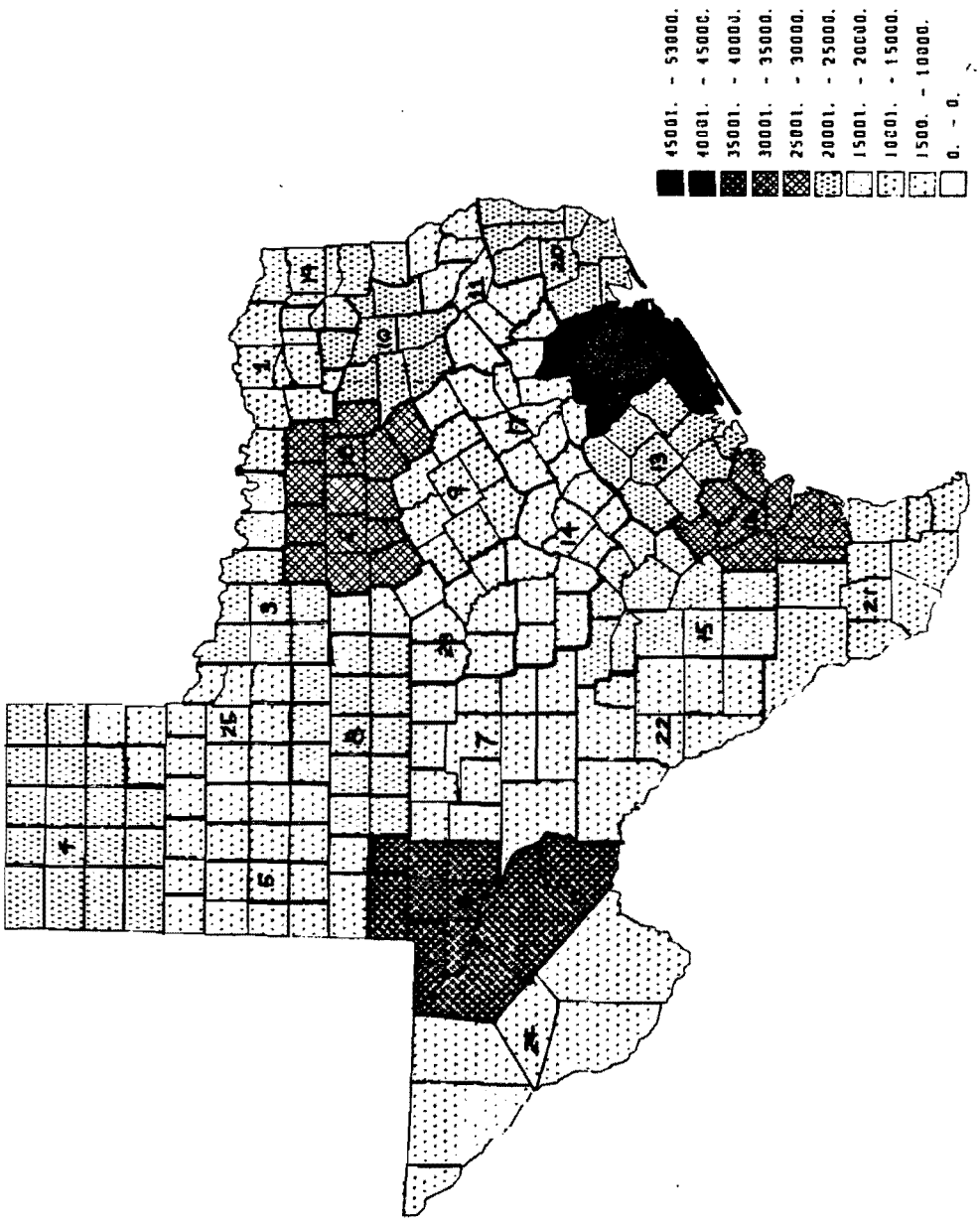


Fig 18. Single trip permits issued by highway district.

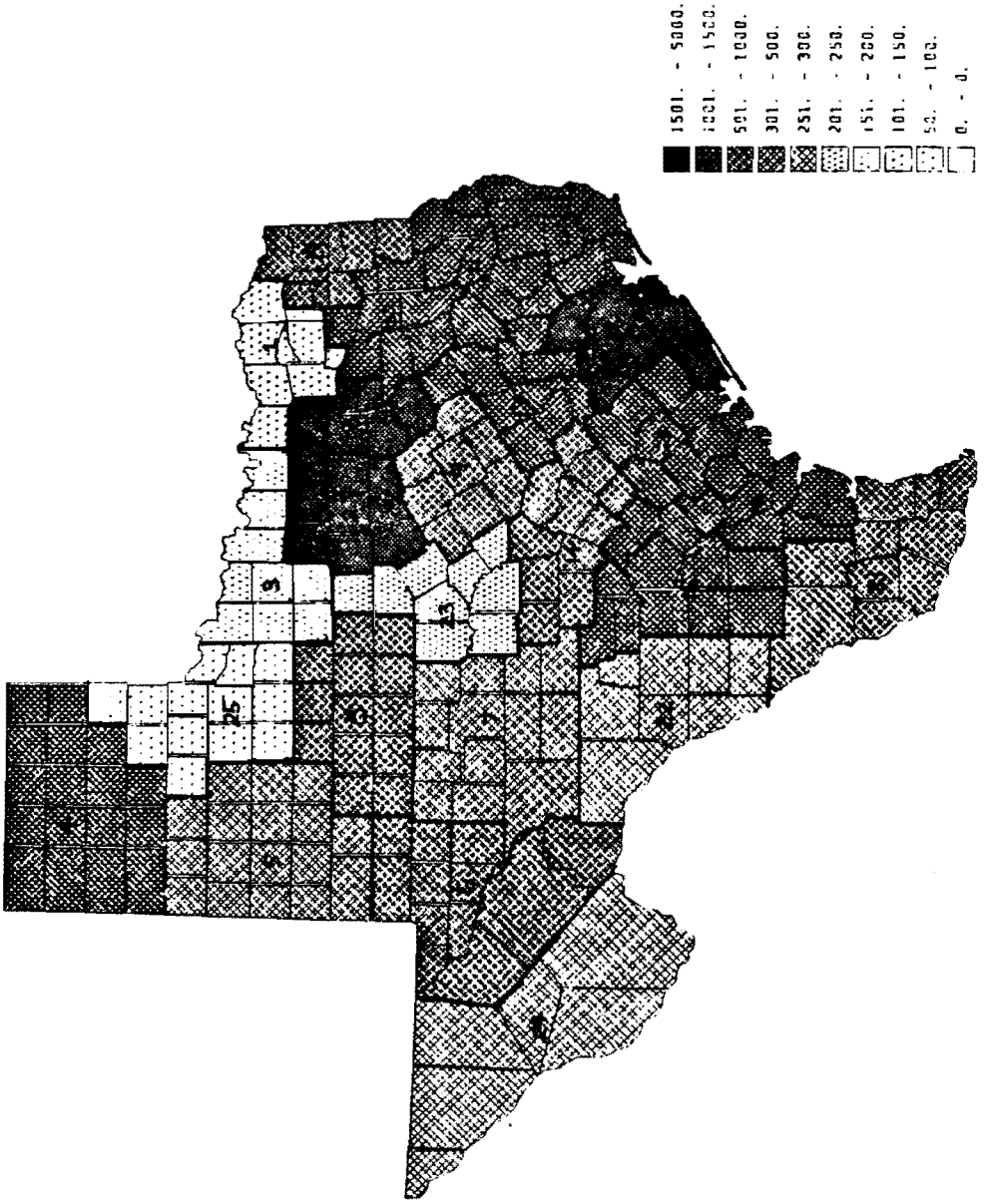


Fig 19. 30-day permits issued by highway district.

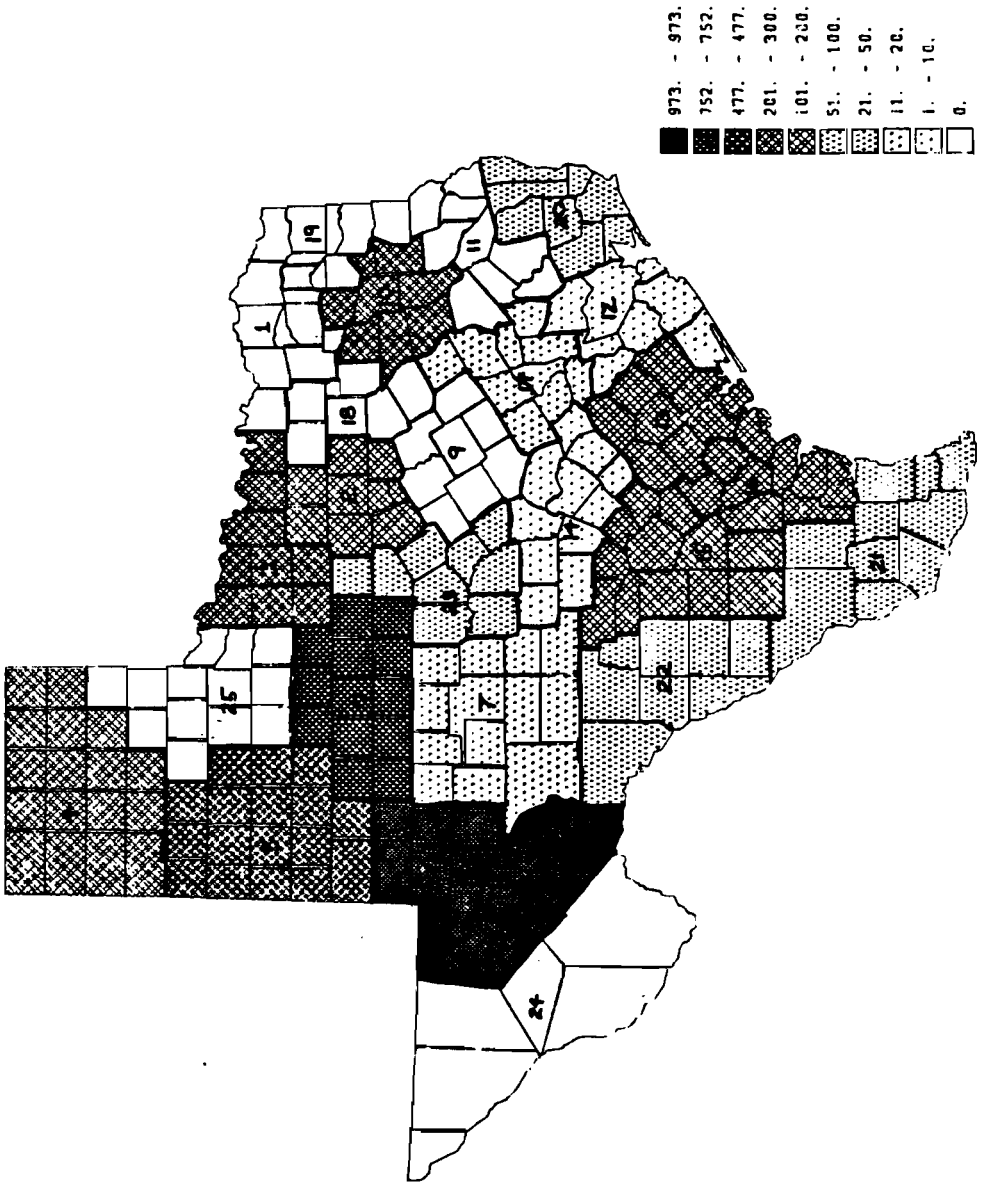


Fig 20. 90-day permits issued by highway district.

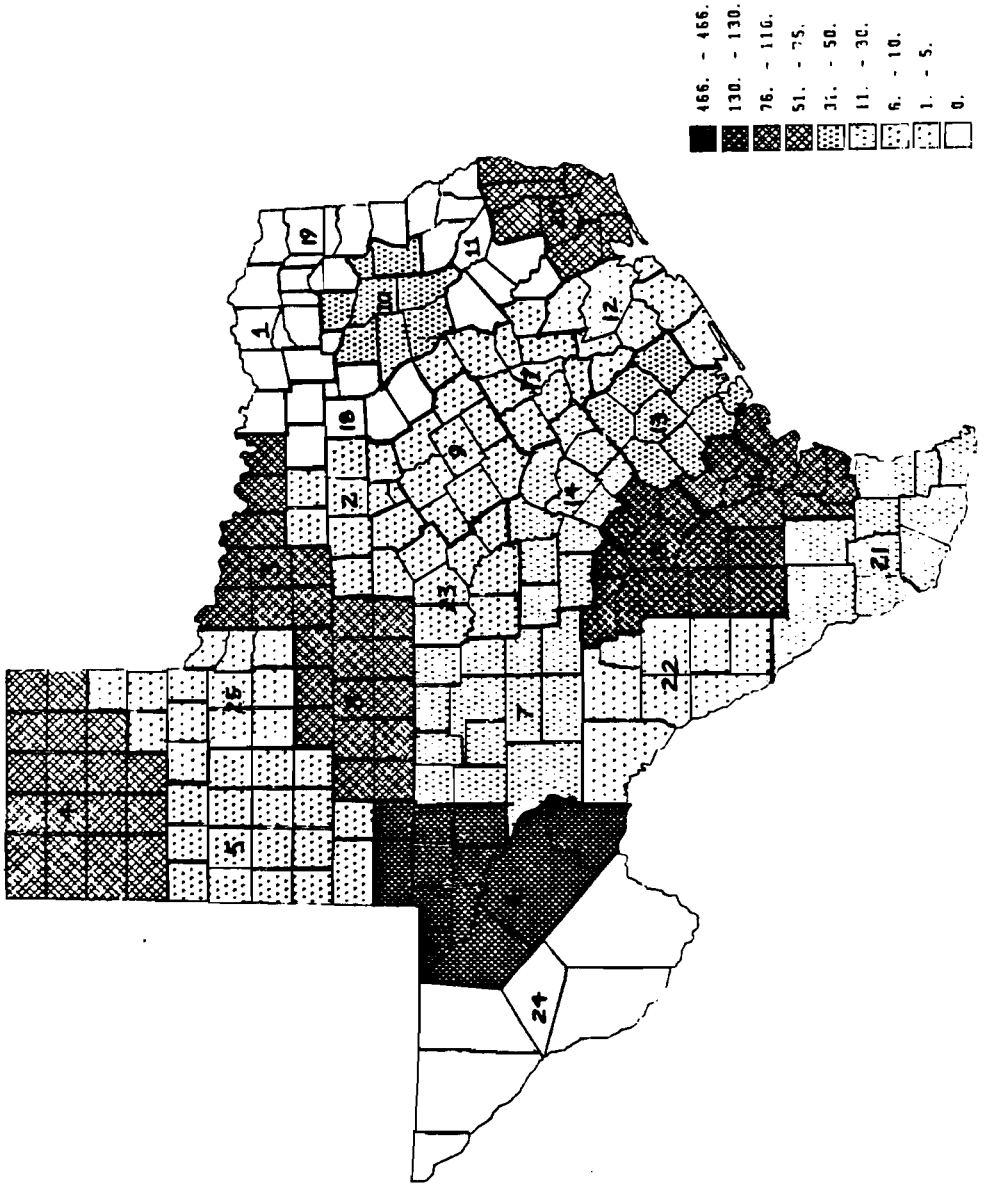


Fig 21. Annual permits issued by highway district.

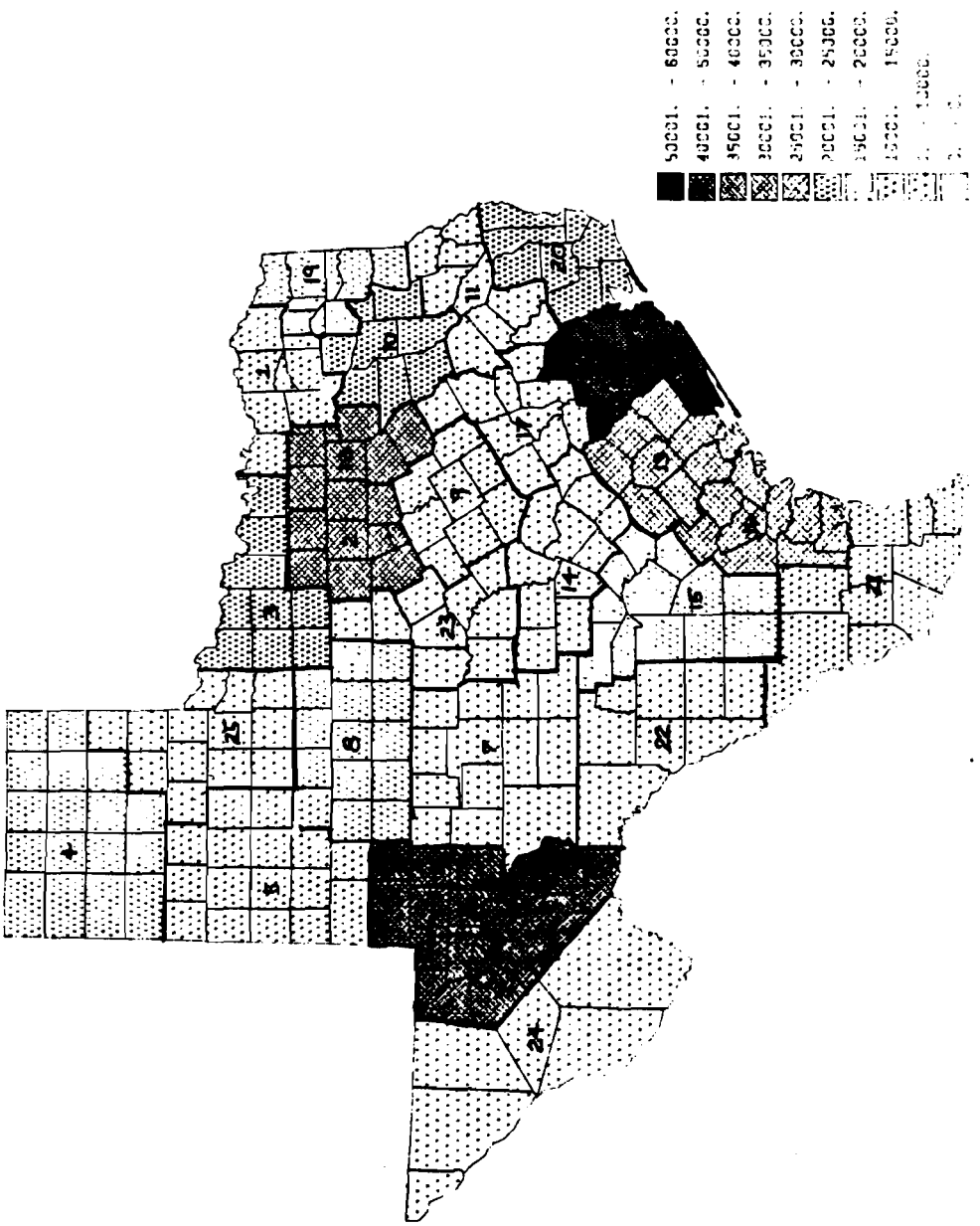


Fig 22. All permits issued by highway district.

TABLE 23. FEES COLLECTED FROM EACH TYPE OF PERMIT AND THEIR SHARE OF THE TOTAL

Permit Types	Permits Issued	% of Total	Fees Collected	% of Total
598	3,270	.7	16,350.00	.5
SB290	4,812	1.0	556,298.52	18.6
591	80,650	17.3	403,255.56	13.5
438	361,368	77.6	1,939,347.06	64.8
1407	15,643	3.4	78,215.00	2.6
TOTALS	465,743		2,993,466.14	

SB 290 permits constitute only one percent of the total issued, yet fees collected from the sale of this permit constitute 18.6 percent of the total collection. This is explained by the fact that a large number of SB290 permits are 30-day, 90-day, or annual——all of which cost a substantially higher fee than single trip permits. Table 24 shows the revenue generated from the permit fees with respect to valid time length of the permit.

Historical Trend

Over the past few years there has been a steady increase in issuance of oversize-overweight permits. Table 25 summarizes the number of permits issued over the past four years.

From the Texas Truck Weight Survey data, Table 26 and Fig 23 were prepared to provide one perspective of the percent of vehicles running overweight since 1959. The data suggest that there has been an upsurge in overweight trucks on highways since 1974. Hence, in 1980, 22.98 percent of all trucks on interstate highways and 32.01 percent on other state highways were overweight. This is a significant increase from the 5.08 percent on interstate and 8.60 percent on other state highways noted from the same data files for 1974.

A separate historical analysis was made for 3-S2, which is the truck type most frequently seen on Texas highways. Figures 24 and 25 show the number of 3-S2 trucks overweight on interstate highways as well as other state highways since 1959. Figures 26 and 27 illustrate the rate of violation, given

TABLE 24. COLLECTION FROM PERMITS ISSUED ACCORDING TO TIME-LENGTH

Permit Types	Permits Issued	% of Total	Fees Collected	Total
Single trip	436,685	93.8	2,183,948.35	73.0
30-day	24,175	5.2	244,014.74	8.2
90-day	3,718	.8	421,448.45	14.1
Annual	1,165	.3	144,054.60	4.8
TOTALS	465,743		2,993,466.14	

TABLE 25. NUMBER OF PERMITS ISSUED ANNUALLY FROM OCTOBER 1976 TO SEPTEMBER 1980

Year	No. of Permits	Percent Increase Over Previous Year
Oct 1976-Sep 1977	360,000	12.7
Oct 1977-Sep 1978	406,000	4.7
Oct 1978-Sep 1979	425,000	4.7
Oct 1979-Sep 1980	466,000	9.6

TABLE 26. TREND OF OVERSIZE-OVERWEIGHT MOVEMENT ON TEXAS HIGHWAYS, 1959-1980

Year	Highway System: Interstate Rural	OMR	Urban	Total System
1980	22.98	32.01	NA	24.78
1979	24.57	27.88	NA	25.75
1978	20.01	22.73	NA	21.07
1976	24.50	29.41	NA	26.33
1974	5.08	8.60	4.46	7.75
1973	5.06	11.32	3.17	9.66
1972	5.82	6.86	3.20	6.36
1971	4.26	7.66	4.63	6.31
1970	2.42	6.06	3.07	4.69
1969	6.22	6.89	3.47	6.39
1968	6.22	6.00	2.52	5.62
1967	3.74	5.09	3.04	4.50
1966	4.73	4.53	3.82	4.56
1965	6.00	4.57	2.49	4.84
1964	5.11	3.79	2.88	3.98
1963	3.64	4.68	5.56	4.53
1962	4.17	6.13	5.31	5.67
1961	5.55	7.68	8.04	7.39
1960	6.06	6.25	10.93	6.60
1959	5.49	6.90	12.79	7.47

NA = not available

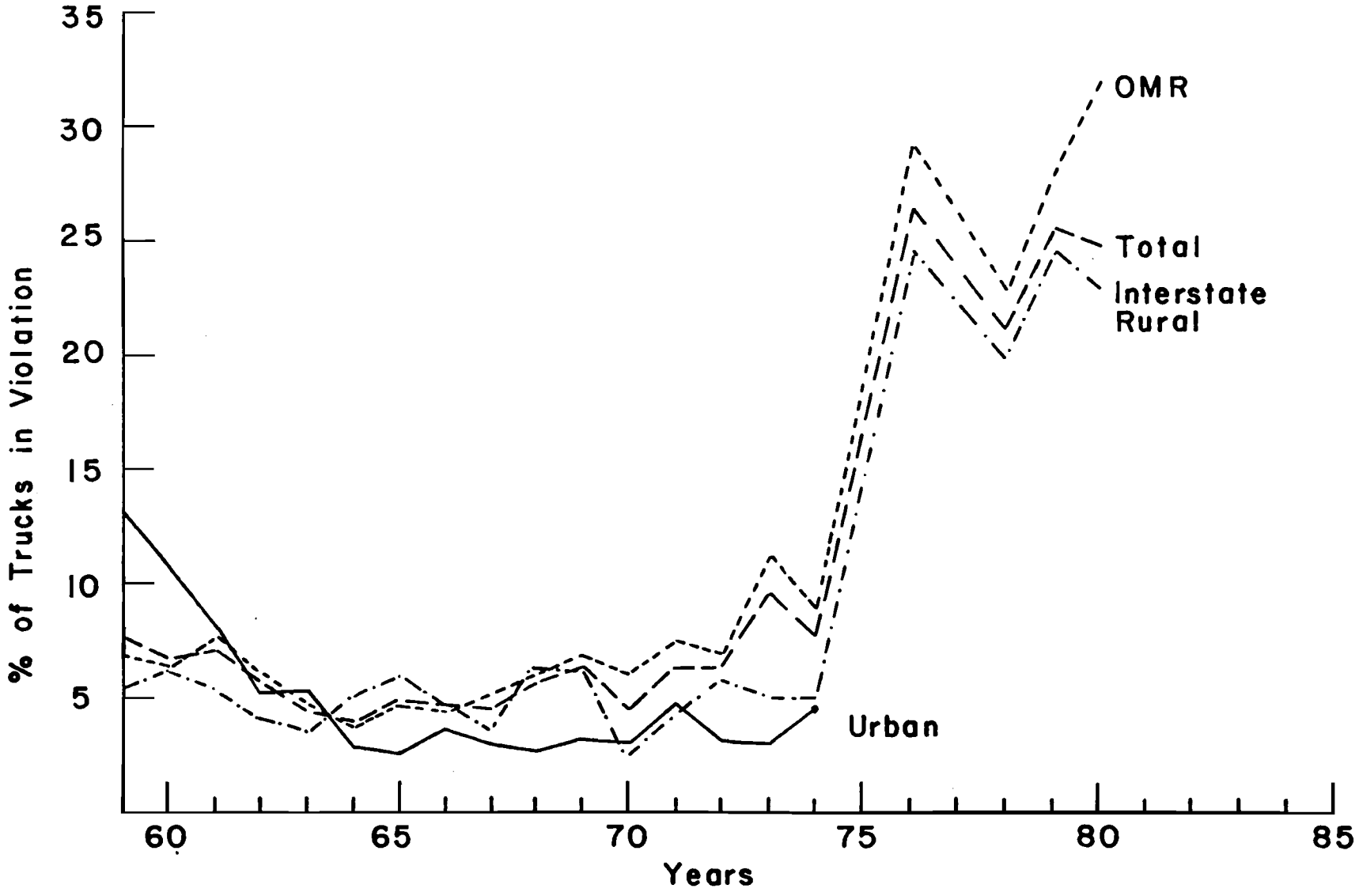


Fig 23. Historical trend of oversize-overweight movements on Texas highways, 1959-1980.

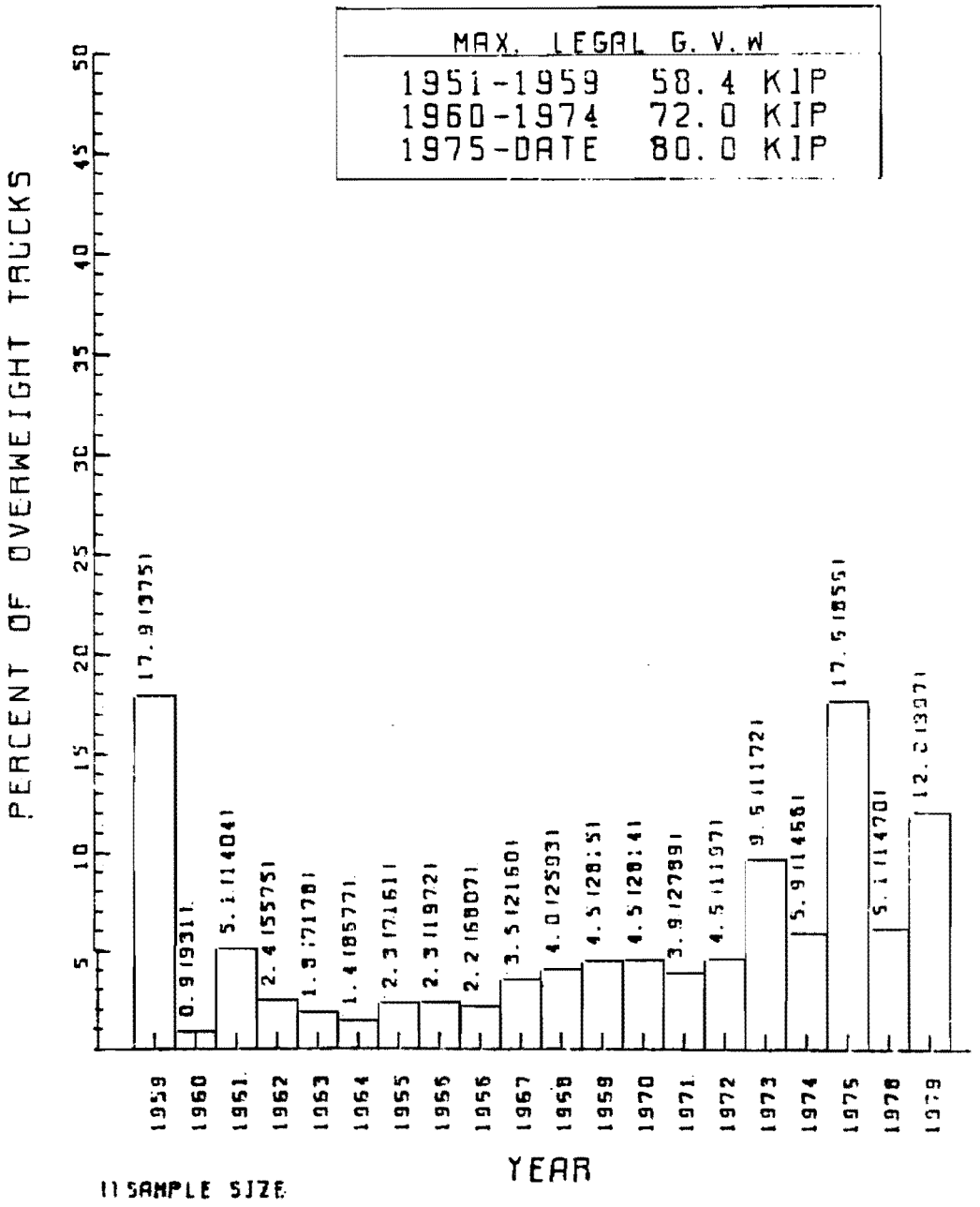


Fig 24. Percent of 3-S2 exceeding maximum legal GVW on other main rural highways, 1959-1980.

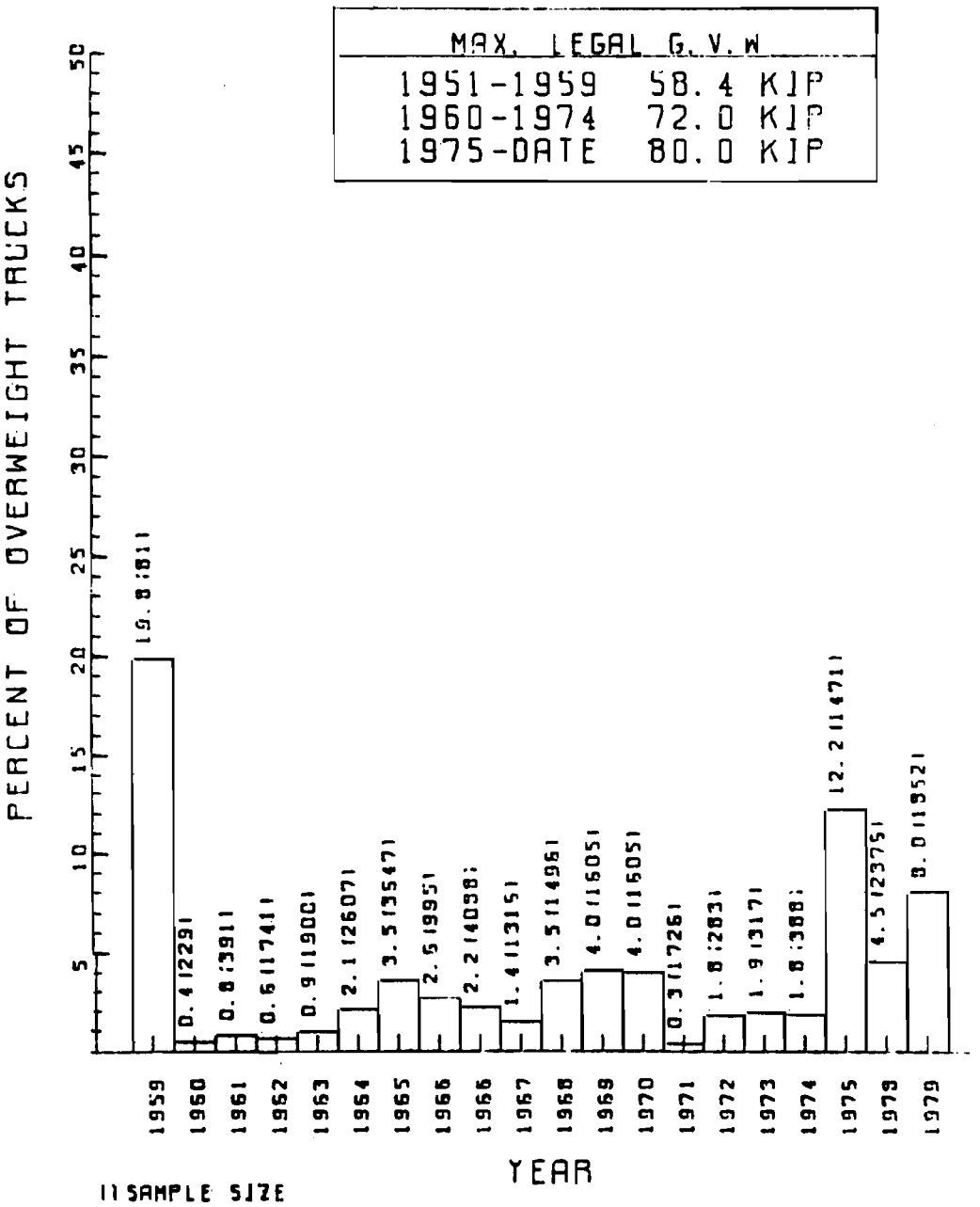


Fig 25. Percent of 3-S2 exceeding maximum legal GVW on interstate rural highways, 1959-1980.

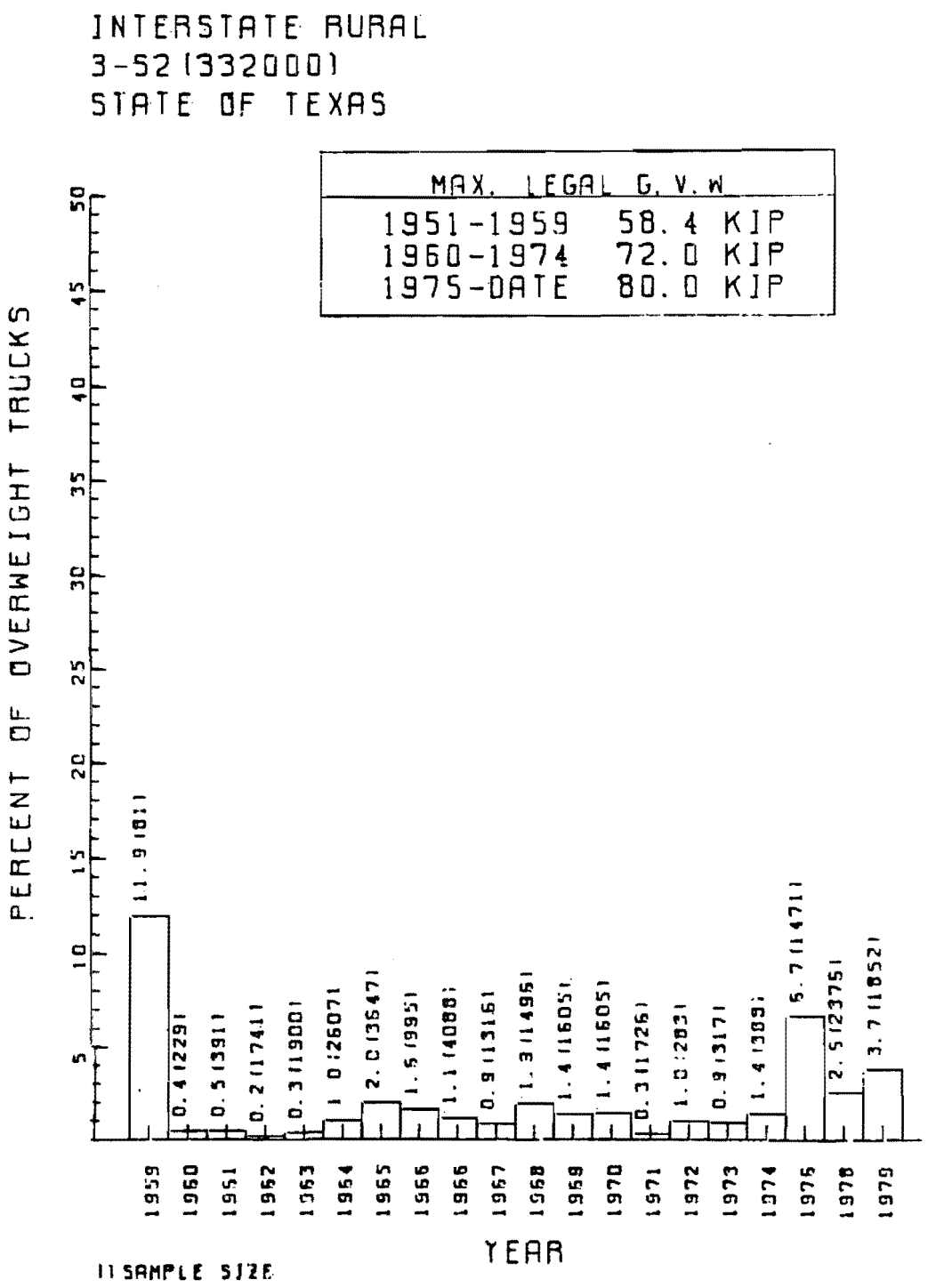


Fig 26. Percent of 3-S2 exceeding maximum legal GVW on interstate rural highways with 5 percent tolerance considered, 1959-1980.

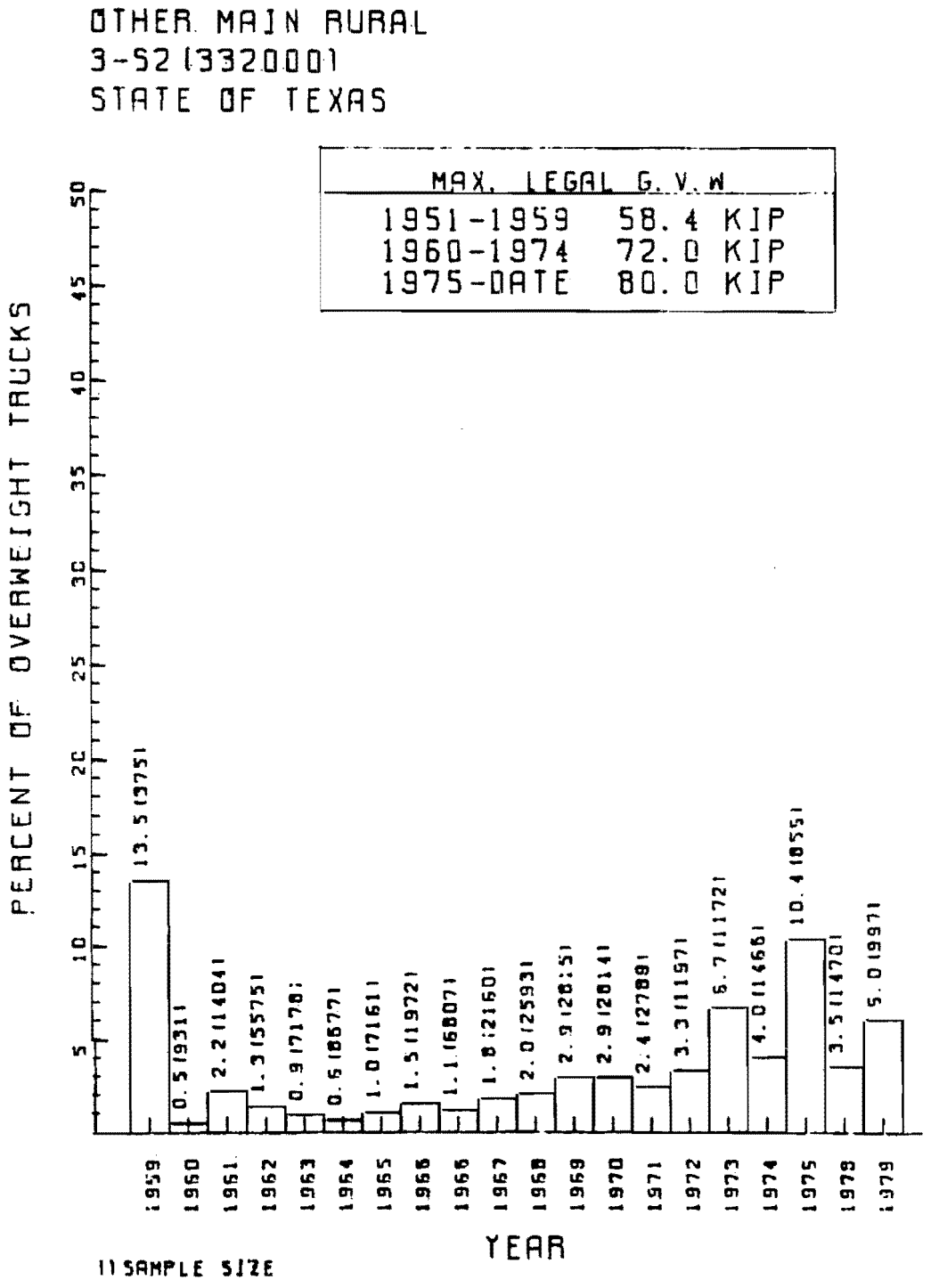


Fig 27. Percent of 3-S2 exceeding maximum legal GVW on other main rural highways with 5 percent tolerance considered, 1959-1980.

a 5 percent tolerance for overloading. However, the truck weight survey data, unlike DPS records, reflect vehicles operating with oversize-overweight permits. Hence, figures obtained from the truck weight survey do not represent the actual number of vehicles illegally operating overloaded. Nevertheless, they are indicators of oversize-overweight vehicle movements.

CONCLUSIONS

This chapter has presented a perspective of the oversize-overweight motor vehicle movements within the state. The frequency of violations has been examined by type, vehicle body type, location, amount of fine charged, and various other parameters. The distribution of oversize-overweight permits across the state, revenues received, and types of permits issued were also presented.

These illustrations have been assembled to provide state administrators and planners a better view of some of the issues characterizing the current motor vehicle size and weight enforcement program in the state of Texas.

CHAPTER 6. COST OF OVERSIZE-OVERWEIGHT OPERATIONS TO THE STATE

The previous chapter characterizes oversize-overweight vehicle operations in the state, including both legal and illegal operations. One additional area, however, which should be addressed is the economic effect of oversize-overweight vehicle operations in the state. These economic effects can be classified as follows:

- Increased pavement maintenance and rehabilitation cost due to increased pavement damage;
- Increased highway structure (bridges, culverts, etc.) maintenance, and rehabilitation cost due to accelerated damage by oversize-overweight trucks;
- State expenditures to enforce vehicle size and weight laws. These include DPS expenditure for License and Weight Service and SDHPT expenditure for maintaining permit issuance operations;
- Savings to the owner-operators of oversize-overweight trucks from reduced vehicle operating cost; and
- Economic benefits accrued through the issuance of oversize-overweight permits for special truck movements (e.g., concrete beams, mobile homes, etc.

The foregoing list is only a brief and partial summary of the economic effects of oversize-overweight vehicle operations. To arrive at an estimated cost of the economic effects of oversize-overweight vehicle operations, two cases were structured. The first case represented the existing condition with respect to current distribution of sizes and weights of vehicles operating on the highway system. In this case, truck weight data from the 1980 truck weight survey were used. The second case represented an artificial 100 percent compliance condition in which all vehicles were running at or below maximum size and weight limits. To represent the second case, data from the 1980 truck weight survey in Texas were modified by removing all overweight vehicles from the truck fleet and reassigning their payloads to a fleet of vehicles that would carry these payloads at maximum permissible load. This analysis was based on 1980 truck weight survey data and, hence, its results must be

qualified by the reliableness and the representativeness of the 1980 truck weight survey.

Data representing Case 1 and Case 2 were used in conjunction with a computer program, "Trucky", which calculates total payload per 100 vehicles, total number of load vehicles, truck operating cost, fuel consumption, and equivalent single axle load on rigid or flexible pavement. These figures, together with ton-mileage and truck traffic forecasts were input into a program called "Twenty" which generates a 20-year forecast for ESAL for rigid and flexible pavements, vehicle operating cost, and fuel consumption (Ref 1). Table 27 shows program Twenty's computation for both Case 1 and Case 2. It is clear that in Case 2, the 100 percent compliance condition, pavement damage is lessened and pavement life is extended.

Estimated ESAL figures for each highway type were then input into the REHAB program at SDHPT. This program generated pavement rehabilitation cost estimates for the next 20 years. Pavement rehabilitation cost figures were based on unit cost data taken from the 12-month moving average of statewide bid prices, January 1980——December 1980. Resulting cost figures are shown in Tables 28 and 29. Costs for 1980 as well as the next 20 years are given. For 1980, estimated extra pavement cost due to oversize-overweight trucks is approximately nine million dollars. Estimated damage for the next 20 years is approximately 125 million dollars. An estimate was not made for the impact on bridges.

Attempts were also made to estimate governmental expenditures associated with the enforcement of size and weight laws. Expenditures for permit operations by DPS License and Weight Service and SDHPT were considered as the two major outlays in this area. The 1980-81 fiscal year budget for DPS License and Weight Service is 3.845 million dollars. The budget level proposed for 1981-82 and 1982-83 reflects substantial increases. To estimate expenditures for the next 20 years at the current enforcement level, an average of the annual budget from 1980-83 is used. In forecasting 20-year permit operation expenditures for SDHPT, the 1980 expenditure figure is used. Hence, the combined expenditure estimate for the License and Weight Service of DPS and the oversize-overweight permit issuance of SDHPT is

TABLE 27. COMPARISON OF ESTIMATED 18-KIP EQUIVALENT SINGLE AXLE LOAD FOR BOTH CASE 1 AND CASE 2, FROM 1980 THROUGH 1999

	18-kip Equivalent Single Axle Loads for Next 20 Years		Ratio of Pavement Life in Case 2 to Case 1
	Case 1*	Case 2**	
Interstate Highways			
Rigid Pavement	15,333,025	14,387,704	1.07
Flexible Pavement	9,865,324	9,329,357	1.06
Farm-to-Market Roads			
Rigid Pavement	161,797	136,040	1.19
Flexible Pavement	101,014	84,770	1.19
Other State Highways			
Rigid Pavement	1,634,257	1,402,829	1.16
Flexible Pavement	1,037,768	899,565	1.15

*Case 1 is based on actual field data

**Case 2 is an artificial case in which no overloading exists

NOTE: All figures shown above are per-mile figures.

TABLE 28. COMPARISON OF PAVEMENT REHABILITATION COST, 1980 (IN MILLIONS OF CONSTANT 1980 DOLLARS)

Highway Class	Case 1	Case 2	Case 1-Case 2
Interstate	98.244	97.898	.346
Farm-to-Market	276.639	272.647	3.992
U.S. and State	459.365	454.695	4.670
TOTAL	834.247	825.239	9.008

TABLE 29. COMPARISON OF ESTIMATED PAVEMENT REHABILITATION COST, 1980-1999 (IN MILLIONS OF CONSTANT 1980 DOLLARS)

Highway Class	Case 1	Case 2	Case 1-Case 2
Interstate	2,780.407	2,770.454	9.953
Farm-to-Market	3,157.280	3,111.674	45.606
U.S. and State	6,921.897	6,852.352	69.545
TOTAL	12,859.571	12,734.466	125.105

	Estimated 20-Year Expenditure (in millions of constant 1980 dollars)
License and Weight Service, DPS	$ 96.607
Oversize-Overweight Permits, SDHPT	38.857
	$135.464

The state costs from oversize-overweight vehicle movements for 1980 as well as for the next 20 years are summarized in Table 30.

The trucking industry, nevertheless, is estimated to derive financial savings from oversize-overweight operations. These financial savings accrue primarily in the form of vehicle operating cost savings which include savings on fuel, labor costs, etc. Estimated vehicle operating cost and fuel consumption cost for 1980 as well as the next 20 years are shown in Tables 31 to 34. Table 33 incidates that the vehicle operating cost savings for the next 20 years are estimated to be 1.3 billion dollars or about five times the cost accrued by the state.

Considering these findings, the next question to address is whether the oversize-overweight vehicles have been paying for the damage, if any, to the highways. The operators of oversize-overweight vehicles may reimburse the state in two forms. The first is through fees charged by SDHPT for oversize-overweight permits, and the second is through fines levied by the courts for size and weight violations. The actual amount of fines levied against violators during the first nine months of 1980 was $914,716. This figure was multiplied by four-thirds to obtain the estimated fine for the whole year. Receipts from permits issued during the 1979-80 fiscal year amount to $2,993,466. Various cost and benefit items associated with oversize-overweight operations for 1980 are shown in Table 35. Costs and benefits from oversize-overweight operations for Case 1 and Case 2 over the next 20 years are shown in Table 36. Enforcement activity at the current level is assumed for the 20-year estimate. Based on these considerations, it is estimated that net savings to the trucking industry from oversize-overweight operations in 1980 was about 42.3 million dollars. If current enforcement activity is assumed constant for the next 20 years, the trucking industry's net savings would be approximately 1.23 billion in constant 1980 dollars. However, it must be emphasized that the above figures, particularly pavement maintenance and

TABLE 30. ESTIMATED COST OF OVERSIZE-OVERWEIGHT OPERATIONS TO THE STATE: 1980 BASE YEAR AND 1980-1999 FORECAST (IN MILLIONS OF CONSTANT 1980 DOLLARS)

Categories	1980 Base Year Cost	20-Year Cost Forecast
Administrative		
DPS	$ 3.667	$ 96.607
SDHPT	1.943	38.857
Subtotal	5.610	135.464
Highway Pavement* Maintenance & Rehabilitation	9.008	125.105
TOTAL	$14.618 million	$260.569 million

*Highway bridge structures not inlcuded

TABLE 31. COMPARISON OF ESTIMATED VEHICLE OPERATING COST BETWEEN CASE 1 AND CASE 2 FOR 1980 (IN MILLIONS OF CONSTANT 1980 DOLLARS)

Highway Class	Case 1	Case 2	Case 2-Case 1
Interstate	$1,464.340	$1,479.155	$14.815
Farm-to-Market	313.175	318.098	4.923
Other State Highways	1,277.649	1,304.452	26,803
TOTAL	$3,055.164	$3,101.705	$46,541

TABLE 32. COMPARISON OF ESTIMATED FUEL CONSUMPTION BETWEEN CASE 1 AND CASE 2 FOR 1980 (IN GALLONS)

Highway Class	Case 1	Case 2	Case 2-Case 1
Interstate	376,927,000	381,038,000	4,111,000
Farm-to-Market	78,905,000	80,250,000	1,345,000
Other State Highways	329,234,000	336,768,000	7,535,000
TOTAL	785,066,000	798,056,000	12,990,000

TABLE 33. COMPARISON OF ESTIMATED VEHICLE OPERATING COST BETWEEN CASE 1 AND CASE 2, 1980-1999 (IN MILLIONS OF CONSTANT 1980 DOLLARS)

Highway Class	Case 1	Case 2	Case 2-Case 1
Interstate	$43,015.568	$43,427.682	$ 412.114
Farm-to-Market	9,294.951	9,437.702	142.751
Other State Highways	37,382.574	38,145.109	762.535
TOTAL	$89,693.093	$91,010.803	$1,317.710

TABLE 34. COMPARISON OF ESTIMATED FUEL CONSUMPTION BETWEEN CASE 1 AND CASE 2, 1980-1999 (IN GALLONS)

Highway Class	Case 1	Case 2	Case 2-Case 1
Interstate	11,045,690,000	11,159,919,000	114,229,000
Farm-to-Market	2,339,682,000	2,378,664,000	38,982,000
Other State Highways	9,616,623,000	9,830,908,000	214,285,000
TOTAL	23,001,995,000	23,369,491,000	367,496,000

TABLE 35. ESTIMATED COSTS AND BENEFITS OF OVERSIZE-OVERWEIGHT OPERATIONS IN 1980

Savings in Vehicle Operating Cost	$46,541,000	
Truckers' Payment to the State for Oversize-Overweight Operation		
Fines for Size and/or Weight Violation		1,219,600
Payment for Oversize-Overweight Permits		2,993,466
Subtotal	4,213,066	
Net Savings to the Trucking Industry	$42,327,934	
	(42.33 million)	

TABLE 36. ESTIMATED COSTS AND BENEFITS OF OVERSIZE-OVERWEIGHT OPERATIONS, 1980-1999

Savings in Vehicle Operating Cost	$1,367,710,000	
Truckers' Payment for Oversize-Overweight Operations		
Fines for Size and/or Weight Violations		24,392,000
Payment for Oversize-Overweight Permits		59,869,000
Subtotal	84,261,000	
Net Savings to the Trucking Industry	$1,233,449,000	

rehabilitation cost, are based on 1980 FHWA Truck Weight Survey data, which are a one-day sample of the truck traffic on Texas highways. Since the data are collected through five permanent weight stations, and since these stations cover only selected areas in the state, the weight survey data may not be representative of the actual truck weight situation on the Texas highway system. Hence, the reader must be cautioned in using or quoting these figures.

Some forms of oversize-overweight operations are necessary for the state's economy. Examples of such forms of oversize-overweight operations are the movements of concrete beams and mobile homes; trucks carrying oil well servicing and cleanout equipment; and other oil field-related activities. To prohibit these oversize-overweight movements would slow down the progress of the state's economy. Hence, permits are still necessary for certain types of movements. However, illegal oversize-overweight movements should be strictly regulated to preserve the highway infrastructure and reduce public nuisance. If truck operators desire higher size and weight limits, they should work for legislative change, rather than continuing to illegally overload their vehicles. Such illegal overloading has accelerated pavement deterioration without fair compensation being made by those responsible.

CHAPTER 7. CONCLUSIONS

Previous chapters have presented an assessment of current oversize-overweight operations in the state of Texas. Chapter 2 outlines the laws governing motor vehicle sizes and weights, Chapter 3 describes the roles played by agencies in a common effort to reduce size and weight violations, Chapter 4 characterizes the illegal size and weight violations, Chapter 5 characterizes oversize-overweight permit operations in Texas, and Chapter 6 discusses selected economic efforts of oversize-overweight operations to the state.

Benefits to and need for certain currently permitted oversize-overweight movements are readily apparent. Of primary concern, however, are illegal oversize-overweight movements. As discussed in Chapter 2, highway vehicle loads must be limited in order to avoid rapid deterioration of roadways and the consequent high maintenance and rehabilitation costs which both the SDHPT and, ultimately, the taxpayers must bear.

Hence, size and weight laws should be strictly enforced to insure adequate protection of the state's highway investment. In addition, strict enforcement of size and weight laws leads to a reduction in unfair and illegal competition among the motor carriers.

The findings can be briefly summarized as follows:

1. The joint effort of the DPS, RRC, and AG to reduce overloading on highways has produced some positive results; however, weaknesses remain in this program: (a) RRC's supervision extends only to certificated motor carriers and, hence, it influences only 30 percent of the truck traffic in the state; (b) since RRC keeps records only on gross vehicle weight, and not on the type of vehicle or the axle weight, only violators of gross vehicle weight can be penalized; (c) in the legal realm, filing suit against shippers, carriers, and receivers of overloads is considered an extraordinary measure, making a stronger statute a necessity.
2. On a commodity basis, grain, sand, gravel, and log transporters are the major recorded violators in the state.

3. Overall, U.S. and state highways have the highest number of violation cases filed, followed by interstate and farm-to-market roads. However, on a violation per lane-mile basis, the interstate system ranks first, followed by U.S. and state highways and farm-to-market roads, respectively.

4. On the basis of violation cases filed per vehicle-mile of travel, U.S. and state highways have the highest ratio, followed by interstate and then farm-to-market roads. Truck weight survey data collected by SDHPT show that, in 1980, 32.01 percent of all trucks weighed on U.S. and state highways violated the axle weight limit in some way, and 22.98 percent on interstate highways did the same.

5. Based on the SDHPT truck weight survey, vehicle types 3-S2 and 2-S1-2 are the most frequent violators of size and weight laws (each with more than 25 percent in violation) while on U.S. and other state highways, 3A and 3-S2 are the major violators (each having more than 25 percent).

6. Through DPS violation files, it was discovered that dump trucks are the major violators of weight limitations (50 percent) while float trucks are the major violators of size limitations (66.4 percent).

7. The private and special carriers together constituted 95.4 percent of the weight violation cases filed and 96.5 percent of the size violation cases filed. Only .3 percent of weight violations are filed on common carriers and 3.1 percent on contract carriers; 1.6 percent of the size violations filed are on common carriers and .5 percent on contract carriers.

8. Classified according to lease status, two-thirds of the cases filed come from unleased vehicles and one-third from leased vehicles.

9. Of the weight violation cases filed, 86.3 percent were committed by intrastate carriers and 13.7 percent by interstate carriers. With respect to size violations, 83.6 percent of the cases filed were on intrastate carriers, while 16.2 percent were on interstate carriers. The interstate carriers have a higher percentage of violations of size than of weight limitations.

10. In most of the violation cases, vehicles exceed their registered weight by approximately 4,000 to 8,000 lb, while a few exceed by as much as 50,000 lb.

11. Of the oversize-overweight cases filed by DPS officers, 98.6 percent were fined by the judges.

12. The average fine for a weight violation ranges from approximately $35 to $40 for a gross vehicle weight violation. The average fine for a size violation is $29. The fine is not set in scale to the amount over the limit each vehicle is charged with carrying, so vehicles slightly overweight and those heavily overweight may be levied identical fines. The fine structure should be such that the incentive to overload is nonexistent or even negative.

The following points relate to oversize-overweight permit operations:

13. During the period from September 1, 1979, to August 31, 1980, 81 percent of the permits issued were for oversize-overweight movement (77.6 percent of these through Form 438 and 3.4 percent via telecommunication), 17.3 percent were for mobile home transport, one percent were oil field-related (Form SB290), and .7 percent were for concrete beam movement.
14. Of the permits issued, 93.8 percent were single-day, 5.2 percent were 30-day, .8 percent were 90-day, and .3 percent were annual.
15. Frequency of the type of permits issued in each highway district depends on the types of industries present there. Districts 2, 7, 10, and 12, for example, issued a large number of mobile home permits because of the presence of large mobile home industries in those districts.

By using SDHPT-published data to review the historical trend of oversize-overweight movements, it is seen that

16. There has been an upsurge in oversize-overweight movement since 1974. In 1980, the percent of trucks overweight on interstate highways increased from 5.08 percent to 22.98 percent, while on U.S. and state highways the increase was even higher, from 8.60 percent to 32.01 percent.
17. The economic analysis, based on the 1980 FHWA Truck Weight Survey, indicates that, through overloading, the trucking industry has realized a tremendous savings. Yet, this savings by the trucking industry has been at the expense of the state's highway system, which has been damaged by overloaded vehicles. Moreover, the trucking industry has not fully paid for its share of this damage. However, caution must be exercised in quoting figures from Chapter 6 because of the shortage of sample in the Truck Weight Survey.

In an effort to enhance the current enforcement level, several recommendations are made:

1. The current joint program of enforcement by the DPS, AG, and RRC should be continued. However, since filing suit is presently considered as only an extraordinary measure, a stronger statute is in order to limit the shipping, operating, and receiving of oversize-overweight trucks.
2. Since size and weight violations occur most often in the private, independent carrier, and special carrier sectors and most often are incurred by the haulers of grain, gravel, sand, and timber, special means should be found to curb violations by these groups.
3. Revision of the current fine structure is advised in order to remove the incentive for truckers to operate oversize-overweight. Fines should be scaled so that persistent violators will be punished to a greater degree than occasional violators.

4. A highway cost allocation study to determine the relationship between highway truck size and weight and the cost incurred is advised. Such a study would aid in the determination of a fairer fine structure for size and weight violations.
5. An increase in the DPS License and Weight Service enforcement force and budget is recommended to allow the establishment of additional checkpoints and the purchase of better detection equipment.
6. Establishment of a more effective truck weight survey program for the state is recommended. Such a program would aid the state in the design, planning, and administration of highway-related facilities and other funding-related questions.

The question of the appropriateness of current size and weight limits was addressed in previous phases of the study (Refs 1, 10, 11). The underlying premise of this study is that the highway users should bear their share of the cost. Irrespective of the size and weight limit in effect, the cost burden borne by each highway user should be equitable. This would result in the lessening of unfair competition within the transport industry as well as with other users of the highway infrastructure. Hence, highway cost responsibility and allocation studies are necessary and a natural, consequent step of the current study.

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APPENDIX A

OVERSIZE-OVERWEIGHT PERMIT FORMS

Texas Highway Department
Form 598

63

PERMIT TO MOVE CONCRETE BEAMS OVER STATE HIGHWAYS

TEXAS HIGHWAY DEPARTMENT, _____, Texas

Within the provisions of law, permission is hereby given to

_____

of _____, to transport concrete beams over the routes listed below:

	Make and Model	Engine No.	License No.
Truck			
Trailer		NONE	

Description of Load CONCRETE BEAMS Weight _____ lbs.

Maximum total gross weight of equipment and load to be transported _____ lbs.

Maximum width LEGAL, Maximum height LEGAL, Maximum length _____ feet

Movement to begin not earlier than _____ 19__. Total time allowed for movement shall be three days including beginning date.

LOADING DATA

Axle Spacings

No. of Tires _____

Minimum Tire Size _____

It is expressly understood that the State Highway Department shall not be responsible in any way for any damage of whatever nature that may result from the movement of the above described vehicle and load over State Highways and that all such responsibility is hereby accepted on behalf of the applicant.

Route (List all highways in route starting with beginning point.): _____

Special Conditions: DAYLIGHT MOVEMENT ONLY AND WHEN VISIBILITY IS GOOD.
ESCORTS REQUIRED FOR OVERALL LENGTHS EXCEEDING 110 FEET.

I, the undersigned, certify that I am authorized to sign this permit for the person or firm whose name appears on this permit, and that the above information is true and correct.

ISSUED BY: _____,
DISTRICT ENGINEER

Signed: _____
By: _____
Title: _____

PERMIT IS NOT VALID UNLESS ALL REQUIRED INFORMATION IS GIVEN.

PERMIT NO.

Texas Highway Dept.
Form 433

60)

62217-1166 1mm M quad

PERMIT FOR OILWELL SERVICING, CLEANOUT AND/OR DRILLING MACHINERY ISSUED UNDER P.C. 827a-6

GENERAL NOTE: This Form is to be used with "Form 418 Revised." All weights and dimensions of the unit shall be in even 1000 pounds and even feet except for height which shall be in even half feet. If actual weights and dimensions are fractions they should be rounded off to the next highest even 1000 pounds or feet.

TYPE OF PERMIT

☐ SINGLE TRIP ☐ ANNUAL (Legal Unit) ☐ 30 DAY (Time) ☐ 90 DAY (Time)

BASIC FEE & MINIMUM FEE

Size and Wt of Unit	Legal Size & Weight	Above Legal Limits	Rate per ton or 1000 #	Rate per Mile
GROSS WEIGHT	72		$0.015	
WIDTH	8		$0.[illegible]	
HEIGHT	13.5		[illegible]	
LENGTH	40 Single Unit 60 Comb. Unit		$0.01	
AXLES				
1			$0.04	
2			$0.04	
3			$0.04	
4			$0.04	
5			$0.04	
TOTAL RATE PER MILE				

NOTES

Truck tractor shall be used in computing gross weight of a combination unit.

Truck-tractor shall be used in computing length of a combination unit.

MINIMUM FEES FOR TIME PERMITS
FEE FOR ANNUAL TIME PERMIT

No. of Axles	[1] Fee Per Axle	Fee
Total Minimum or Annual Fee		

[1] Minimum fees are:
$50.00 per axle for Annual Permit;
$[illegible] per axle for 30 Day Permit;
$25.00 per axle for 90 Day Permit.

Map Mileage	[2] Mileage Use Rate	Total Rate/Mile from Above	[3] Registration Reduction	Basic Fee	Minimum Fee

[2] Mileage Use Rate (0.50 - All Single Trip) (0.10 - 30 Day) (0.20 - 90 Day)
[3] Registration Reduction (0.75 Fully Registered) (1.00 Permit Plate)

NOTE: Single Trip Permits use Basic Fee plus Issuance Fee. Annual Time Permits use Minimum Fee with no Issuance Fee. For 30 or 90 Day Time Permits use Basic Fee plus Issuance Fee or Minimum Fee, whichever is greater.

Fee From Above ..... $ _____

Issuance Fee ($5.00 - Single Trip) ($10.00 - 30 Day) ($20.00 - 90 Day) (None - Annual) ..... $ _____

TOTAL FEE ..... $ _____

☐ Property Damage Insurance Calculated By: _____ Permit No. _____

Texas Highway Department
Form 501

PERMIT TO MOVE A MOBILE HOME OVER STATE HIGHWAYS

TEXAS HIGHWAY DEPARTMENT, _____, Texas Date _____, 19____

Within the provisions of law, permission is hereby requested by _____

of _____, _____ to transport the following mobile home over the routes given below (Give beginning and ending points on each highway with distances):

Make and Model Engine No. License No.

Truck _____

Mobile Home. _____ License No. _____ Serial No. _____

Maximum width _____ feet, Maximum height legal feet, Maximum length _____ feet

Movement to begin not earlier than _____ 19____. To be completed by _____ 19____

Time of day permit issued _____

Routes: _____

_____

_____

Remarks: Daylight movement only and then only when visibility is good. No part of the mobile home to extend over center line except where flagged 300 feet in front and rear of vehicle.

It is expressly understood that the State Highway Department shall not be responsible in any way for any damage of whatever nature that may result from the movement of the above described vehicle and load over State Highways and that all such responsibility is hereby accepted on behalf of the applicant.

I, the undersigned, certify that I am authorized to sign this application for the person or firm whose name appears on this application committing the above obligation, and that the statements in this application are true and correct.

I further certify that the equipment covered by this application is under lease from _____

_____

Signed: _____

By: _____

Title: _____

ISSUED BY: _____, DISTRICT ENGINEER

PERMIT Nº

PERMIT IS NOT VALID UNLESS ALL REQUIRED INFORMATION IS GIVEN

57

Texas Highway Department
Revised Form 424

72466-1261-150m in quad.

APPLICATION AND PERMIT TO MOVE SUPER HEAVY OR OVERSIZE EQUIPMENT OR LOAD OVER STATE HIGHWAYS

FEE $ ____

TEXAS HIGHWAY DEPARTMENT, _____, Texas Date _____, 19____

Within the provisions of law, permission is hereby requested by _____

of _____ to transport the following equipment and maximum load over the routes given below (Give beginning and ending points on each highway with distances):

	Make and Model	Engine No.	License No.	Weight
Truck				lbs.
Trailer				lbs.
Description of Load				lbs.

Maximum total gross weight of equipment and load to be transported _____ lbs.

Maximum width _____ feet, Maximum height _____ feet, Maximum length _____ feet

Movement to begin not earlier than _____ 19____. To be completed by _____ 19____.

LOADING DATA

Type of vehicle _____ (See other side of this page for diagrams of different types of vehicles, conditions, etc.)

AXLE SPACING		MAXIMUM AXLE LOADS		TIRE SIZES	
Distances	Distances Between Axles	on Axle No.	Gross Axle Load Which Will Not Be Exceeded	TIRES ON AXLE No.	Size
A		1	lbs.		
B		2	lbs.		
C		3	lbs.		
D		4	lbs.		
E		5	lbs.		
F		6	lbs.		
G		7	lbs.		
TOTAL		8	lbs.		

It is expressly understood that the State Highway Department shall not be responsible in any way for any damage of whatever nature that may result from the movement of the above described vehicle and load over State Highways and that all such responsibility is hereby accepted on behalf of the applicant.

Routes: _____

Special conditions: _____

I, the undersigned, certify that I am authorized to sign this application for the person or firm whose name appears on this application committing the above obligation, and that the statements in this application are true and correct.

I further certify that the equipment covered by this application is under lease from _____

Signed: _____

By: _____

Title: _____

WITHIN THE PROVISIONS OF LAW, and in accordance with the conditions expressed above and on the other side of this page, permission is hereby granted to transport the above described equipment and maximum load over routes listed.

ISSUED _____M. BY _____ COUNTERSIGNED _____

Cashier's Check _____ Express M. O. _____

U. S. M. O. _____ W. U. M. O. _____ District Engineer, District No. _____

Bank M. O. _____

THIS PERMIT VOID IF ALTERED PERMIT

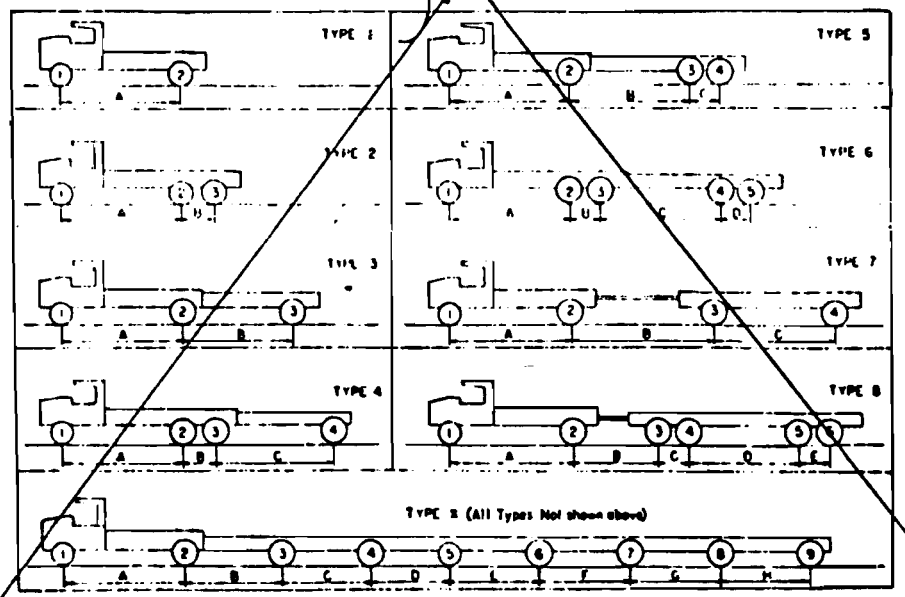
CONDITIONS

Weight on any wheel may not exceed the maximum legal weight per inch width of tire. If the description of the load is wrong or the maximum width, height, or length is exceeded or if the gross load on any axle is in excess of the load shown for that axle or if the distance between any two axles is less than the distance shown or if the total gross weight of vehicle and load is in excess of that shown, this permit is void. If any route or detour not specifically listed is used, this permit is void unless written permission is obtained from a District Engineer of the Highway Department. Continuous violation of these conditions will be cause for refusal to issue other permits. The Texas Highway Department, in issuing this permit, expresses that to the best of its knowledge, the structures on the routes listed are adequate to carry this load; but it is expressly stipulated that the Department does not guarantee the load capacity of the structures, and accepts no responsibility for the safe movement of the vehicle and load over these routes.

INSTRUCTIONS

1. List all detours that are to be used under "Routes" on the reverse side.
2. To be made in quadruplicate, original to applicant; two copies to District Office, one copy later to Austin. Fourth copy to remain in sub-office.

DIAGRAMS OF VARIOUS TYPES OF VEHICLES



State Department of Highways and Public Transportation
Form 1407
9 79

TEXAS OVERSIZE/OVERWEIGHT PERMIT

PERMIT NO. T

ISSUING OFFICE _____ PERMIT FEE $ 5.00 DATE _____

State D.H.&P.T. grants permission to _____

to move _____ weighing _____ lbs. using a _____ truck,

Eng. # _____ Lic. # _____; _____ trailer, Lic. # _____

Dimensions: _____ Ft. wide; _____ Ft. high; _____ Ft. long; Gross weight _____ lbs.

Movement begins _____ & ends _____

LOADING DATA: TIRE SIZE
TRACTOR _____
TRAILER _____

O O O O O O O O O O O O O O O

_____ lbs. _____ lbs. _____ lbs. _____ lbs.

ROUTE: _____

Special Conditions: DAYLIGHT MOVEMENT ONLY.

It is expressly understood that the State Department of Highways and Public Transportation shall not be responsible in any way for any damage of whatever nature that may result from the movement of the above described vehicle and load over State Highways and that all such responsibility is hereby accepted on behalf of the applicant. I, the undersigned, certify the above information is true and correct.

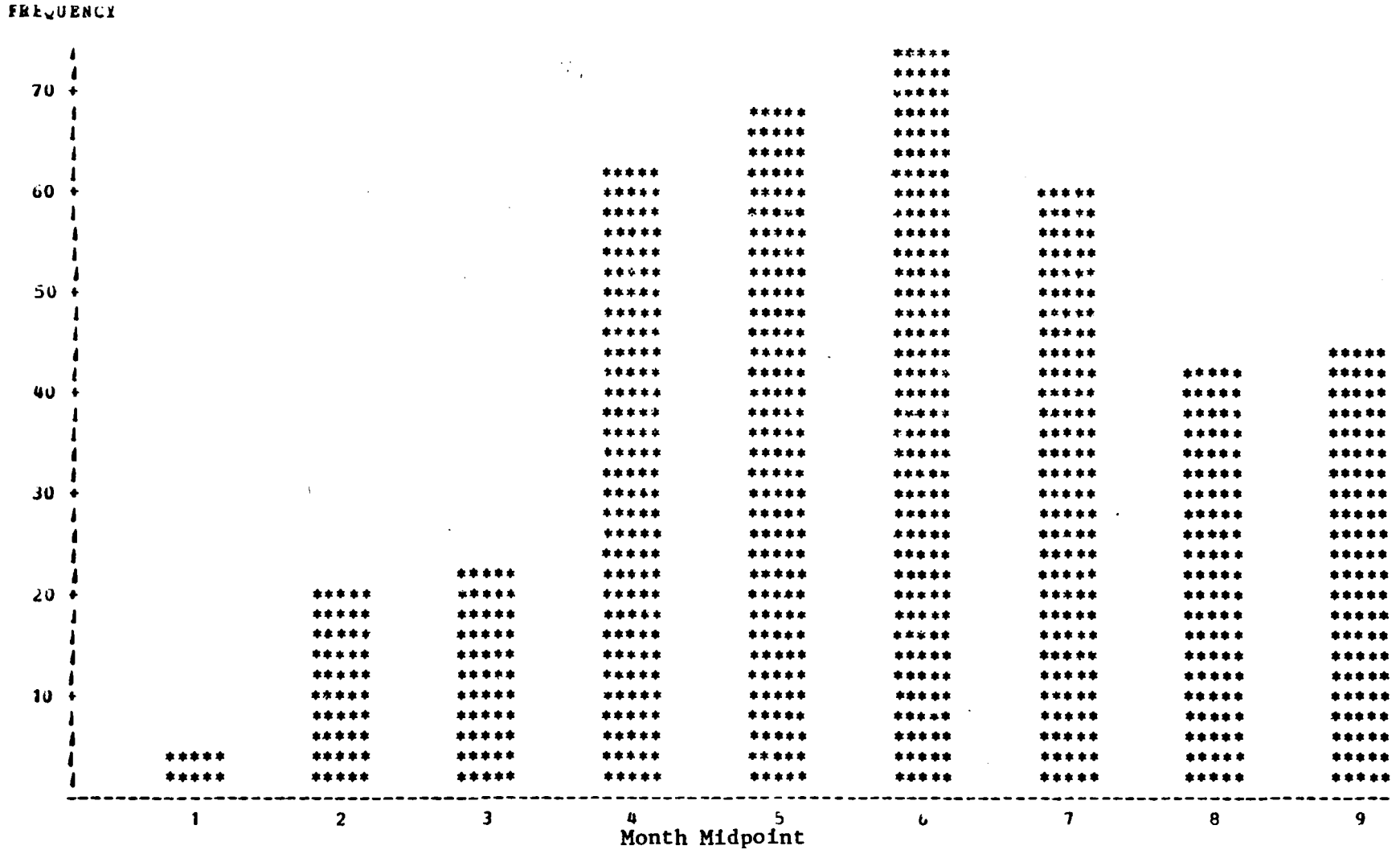
BY. _____
DIVISION/DISTRICT ENGINEER

ISSUED BY: _____ Signed:

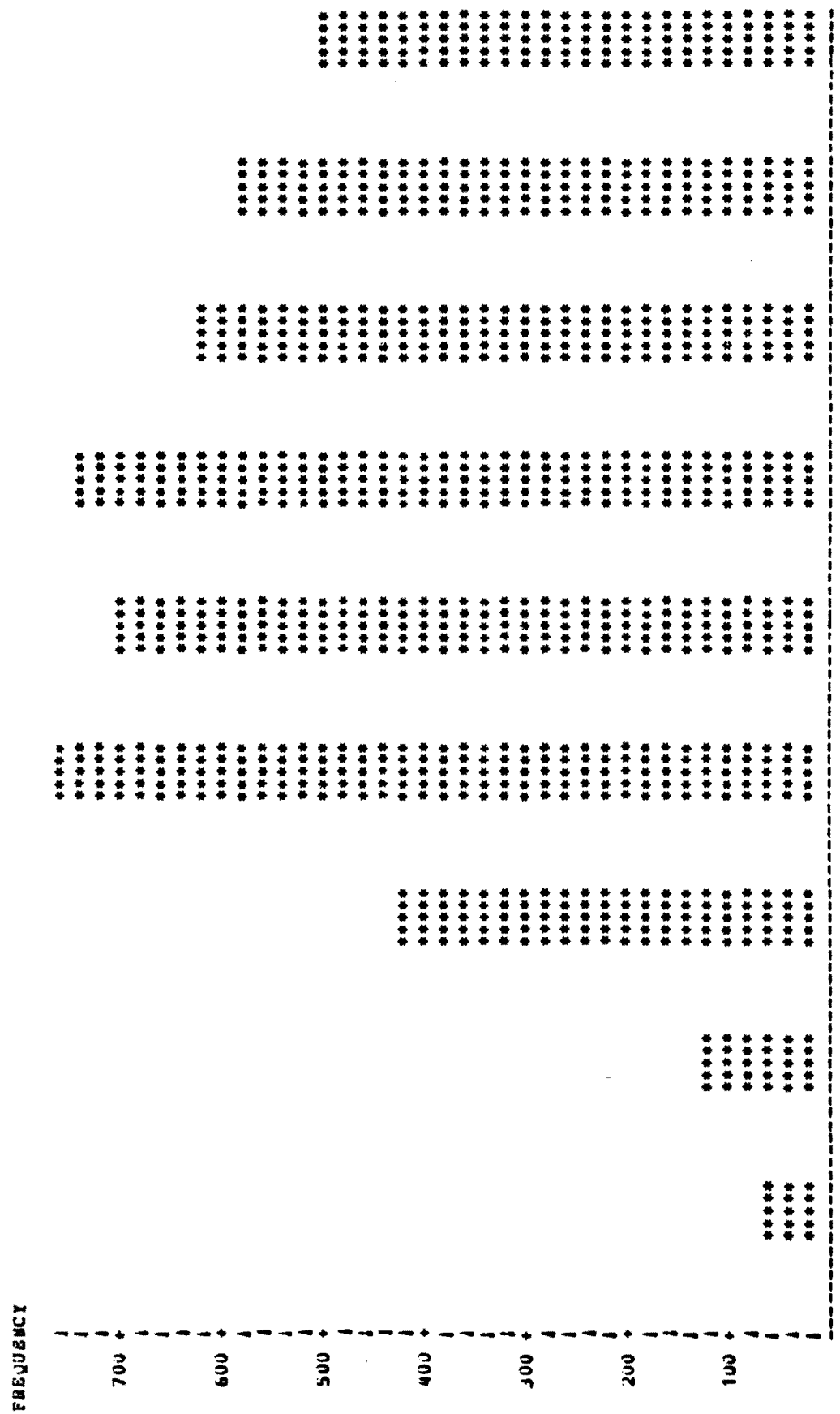
TIME: _____ : _____ M; CHECK NO. _____

APPENDIX B

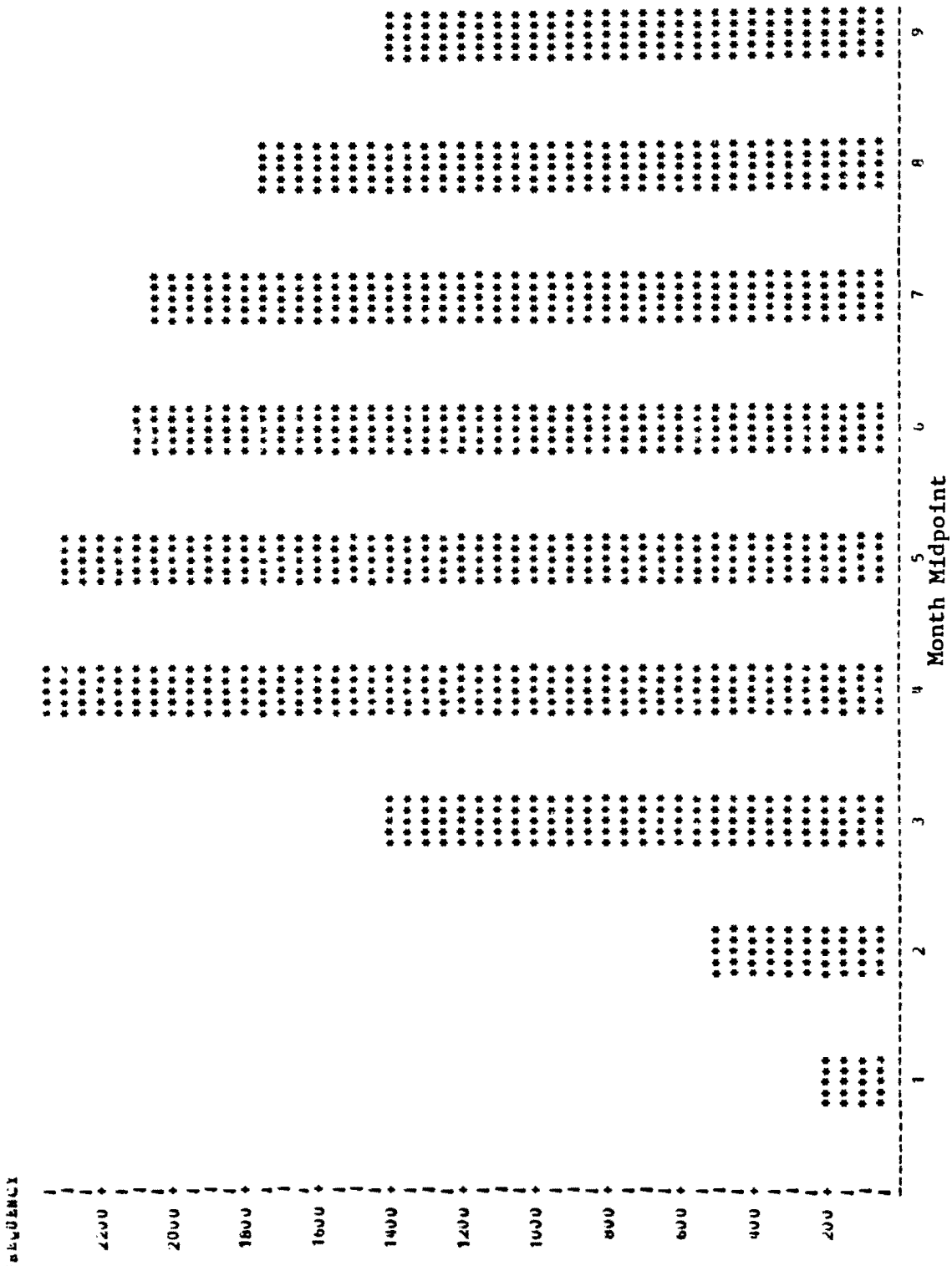
MONTHLY FREQUENCY FOR EACH OF THE FOUR TYPES OF SIZE AND WEIGHT VIOLATIONS



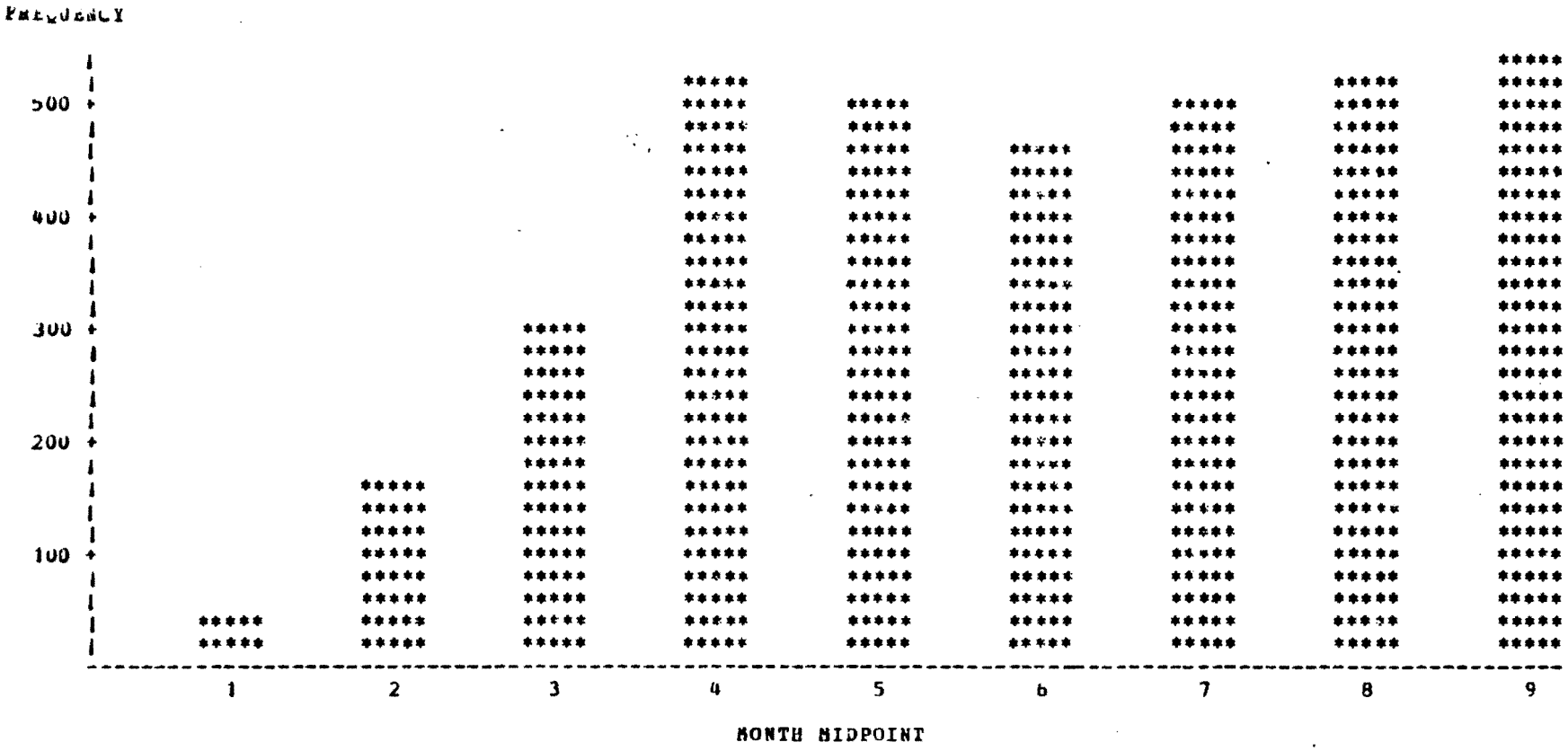
B.1. Monthly frequency of cases filed for violation of maximum single axle weight limitation (20,000 lb), January-September 1980.



B.2. Monthly frequency of cases filed for violation of maximum tandem axle weight limitation (34,000 lb), January-September 1980.



B.3. Monthly frequency of cases filed for violation of maximum gross vehicle weight limitation, January-September 1980.



B.4. Monthly frequency of cases filed for violation of maximum size limitation, January-September 1980.

APPENDIX C

SIZE AND WEIGHT VIOLATIONS

BY VEHICLE BODY TYPE

C-1. FREQUENCY OF CASES FILED FOR VIOLATION OF MOTOR VEHICLE WEIGHT LIMITATIONS BY VEHICLE BODY TYPE

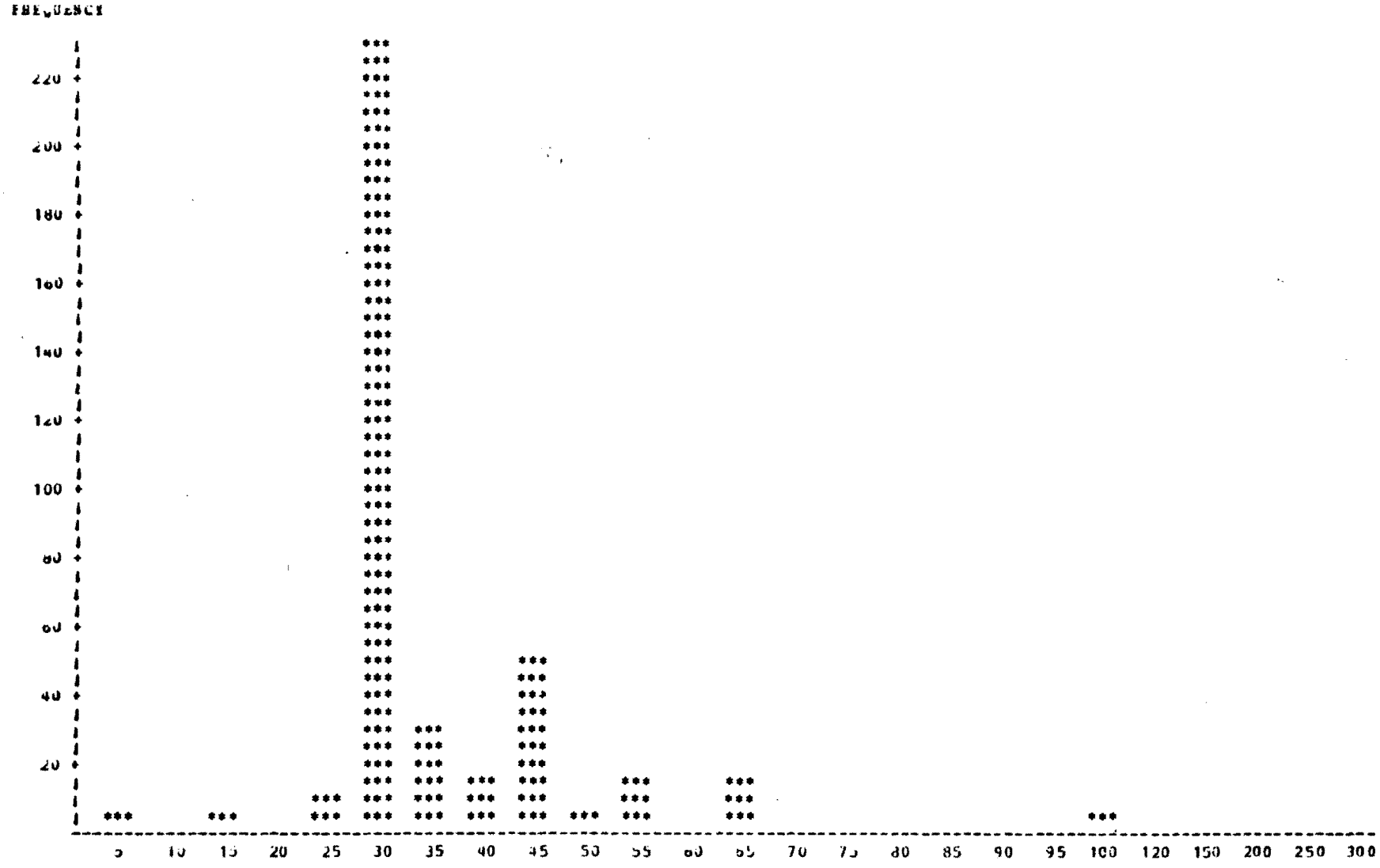
Region	Sergeant Areas	Type of Vehicle								
		Float	Pole	Tank	Refrig-erator	Van	Live-stock	Dump	Special	Unknown
1	A	101	4	51	6	6	12	1,884	35	11
	B	115	130	66		90	1	1,448	141	17
		216	134	117	6	96	13	3,332	176	28
2	A	822	80	341	13	67	3	1,365	180	10
	B	598	1,387	110	8	253	6	511	80	15
		1,420	1,467	451	21	320	9	1,876	260	25
3	A	453	5	187	31	18	4	848	426	222
	B	857	26	555	63	203	71	1,844	48	2
		1,310	31	742	94	221	75	2,692	474	24
4	A	135	6	409	2	41	26	453	52	4
	B	949	4	613	38	56	61	544	148	13
		1,084	10	1,022	40	97	87	997	200	17
5	A	692	4	254	34	22	96	1,123	55	12
	B	387	2	170	86	36	92	1,545	17	6
		1,079	6	424	120	58	188	2,668	72	18
6	A	521	16	228	55	78	1	1,168	71	22
	B	229	6	218	24	59	29	1,066	66	18
		750	22	446	79	137	30	2,234	137	40
Totals		5,859	1,670	3,202	360	929	402	13,799	1,319	152
% of Total		21.2	6.0	11.6	1.3	3.4	1.4	49.8	4.8	.5

C-2. FREQUENCY OF CASES FILED FOR VIOLATION OF MOTOR VEHICLE SIZE LIMITATIONS BY VEHICLE BODY TYPE

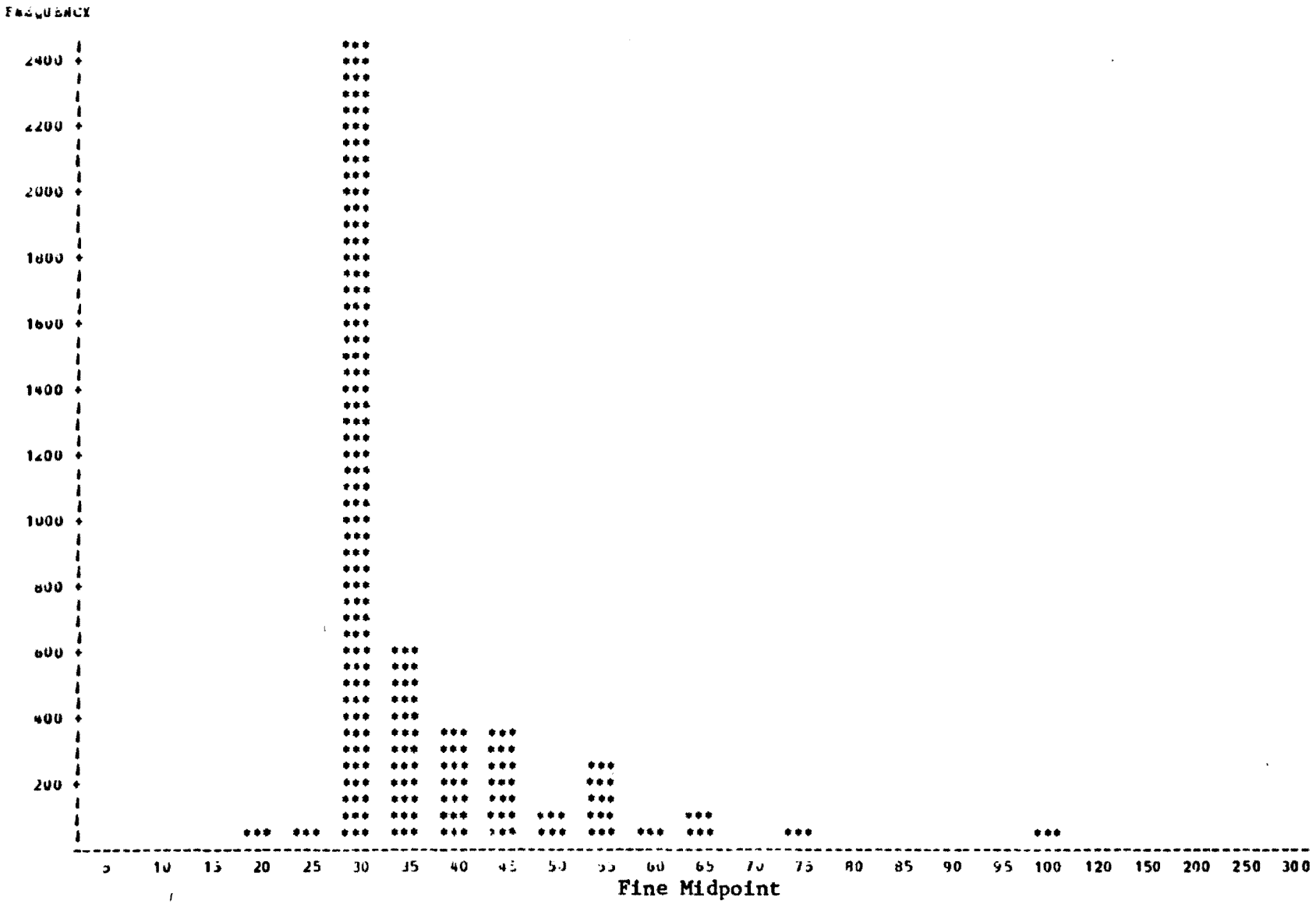
Region	Sergeant Areas	Type of Vehicle									
		Float	Pole	Tank	Refrig-erator	Van	Live-stock	Dump	Special	Unknown	Pass Car
1	A	262	3		1	15	39	15	78	11	1
	B	196	12	2			18	4	98	8	
		498	15	2	1	15	57	19	176	19	1
2	A	486	14	1		5		4	85	7	1
	B	500	107	1		5	21	6	93	8	
		986	121	2		10	21	10	178	15	1
3	A	186		4	49	45	96	98	14	2	2
	B	315	16	5	8	46	27	6	35	3	
		501	16	9	57	91	123	104	49	5	2
4	A	336	2			2	51	5	57	1	
	B	293	11		1	5	15	1	109	5	1
		629	13		1	7	66	6	166	6	1
5	A	216	2	2	1	20	36	2	45		1
	B	295	17	1			21	1	78	3	
		511	19	3	1	20	57	3	123	3	1
6	A	285	5	3		17	8	5	25	10	2
	B	219	5	1	4	16	28		66	6	1
		504	10	4	4	33	36	5	91	16	3
Totals		3,589	194	20	64	176	360	147	783	64	9
% of Total		66.4	3.6	.4	1.2	3.3	6.7	2.7	14.5	1.2	.2

APPENDIX D

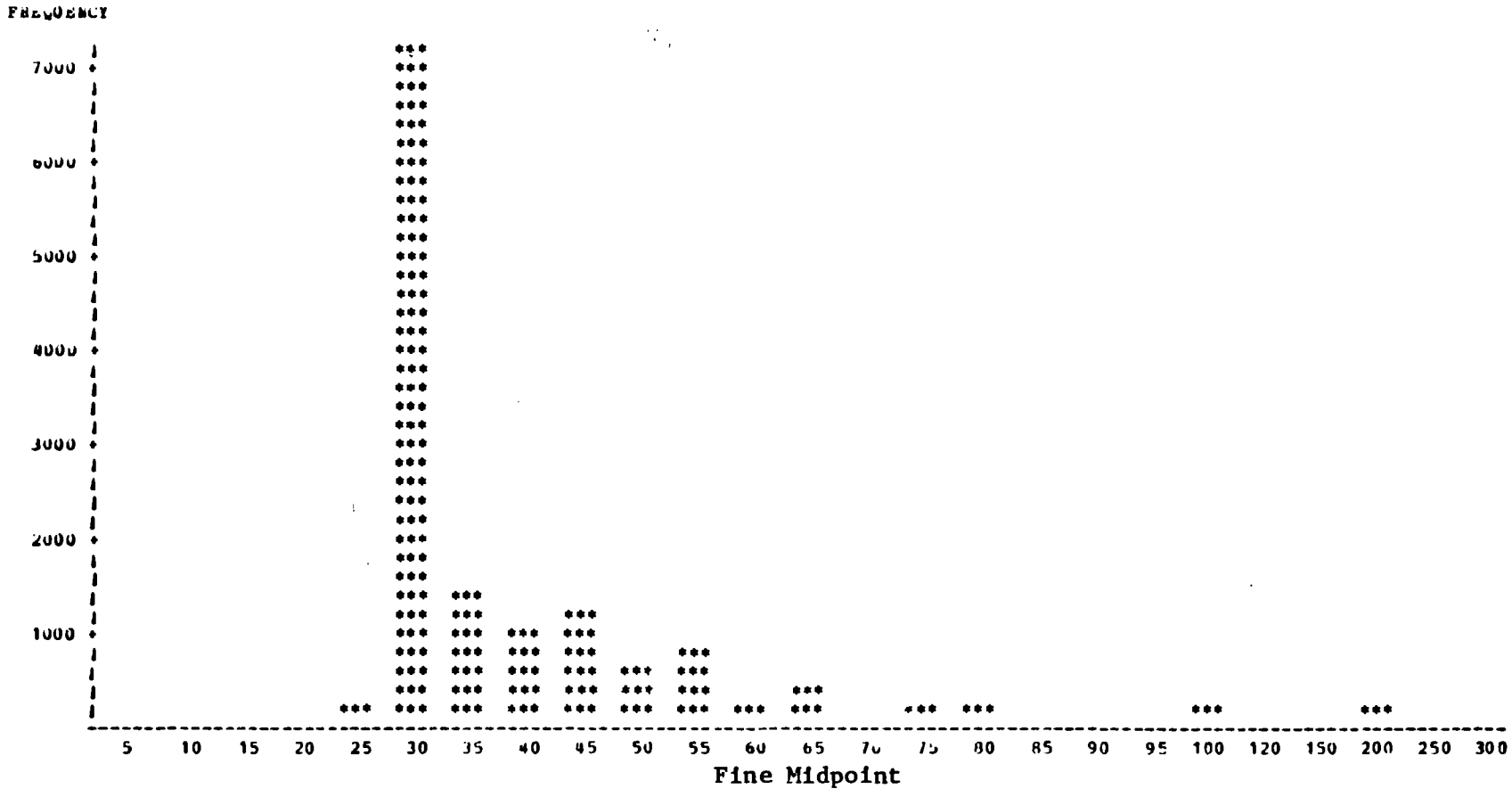
FINE DISTRIBUTION FOR EACH OF THE FOUR TYPES OF SIZE AND WEIGHT VIOLATIONS



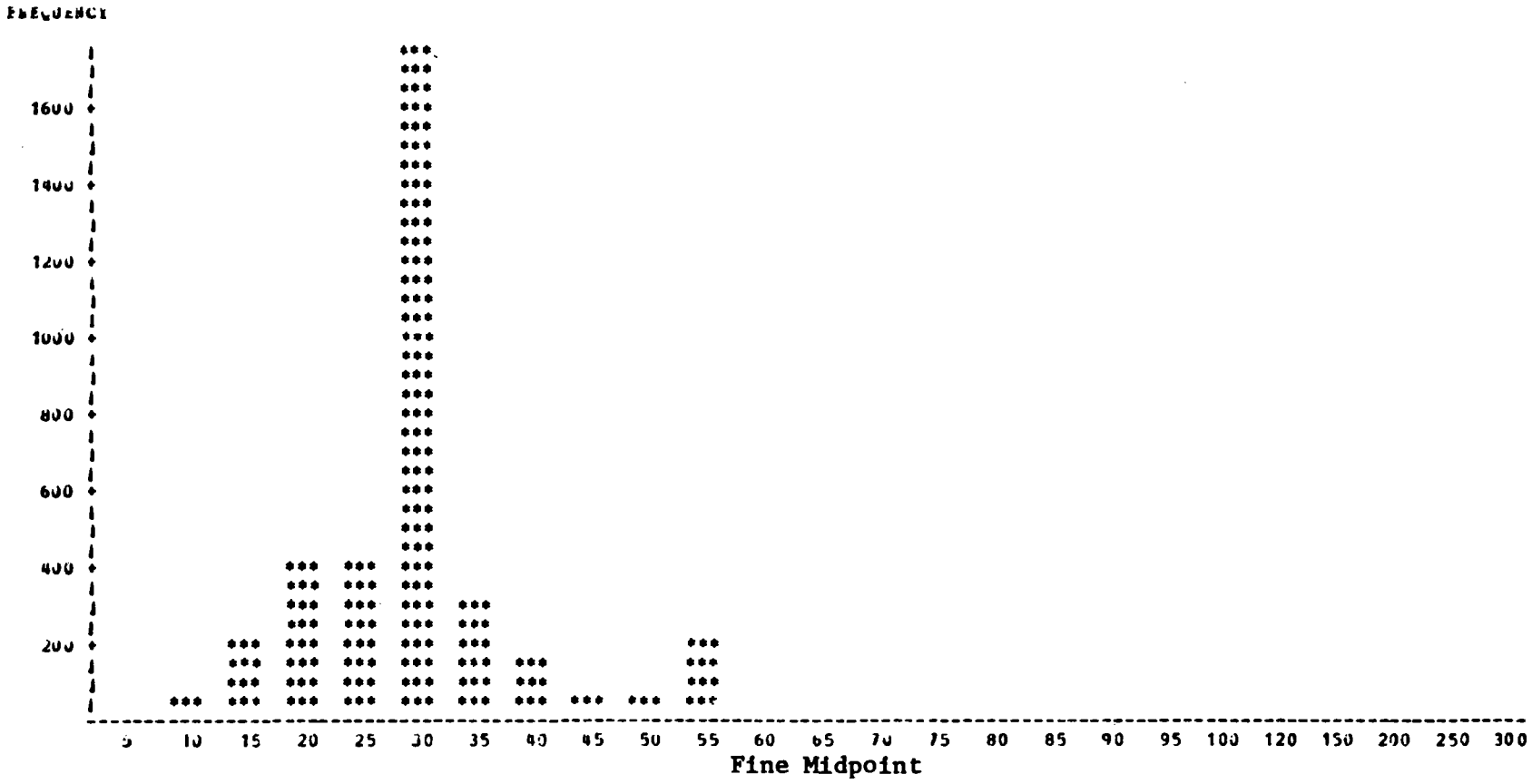
D.1. Distribution histogram of fines charged by court for violation of maximum single axle weight limitations (20,000 lb), January-September 1980.



D.2. Distribution histogram of fines charged by court for violation of maximum tandem axle weight limitation (34,000 lb), January-September 1980.



D.3. Distribution histogram of fines charged by court for violation of maximum gross vehicle weight limitation, January-September 1980.



D.4. Distribution histogram of fines charged by court for violation of maximum size limitations, January-September 1980.