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16. Abstract

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EVALUATION OF OVERSIZE/OVERWEIGHT PERMIT POLICY AND FEE STRUCTURE

by

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and

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Research Report 1109-1F
Research Study Number 2-18-88/8-1109
Evaluation of Oversize/Overweight Permit Policy and Fee Structure

Sponsored by

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ABSTRACT

The current Texas policy for oversize/overweight vehicles has been evaluated in this report. The current fee structure should be revised to incorporate both weight and distance factors in the fee assessment. The safety record of oversize load movement is difficult to quantify. It is apparent, however, that the Texas policy on escort vehicles must be improved to include a complete description of the escort vehicle and duties of escort drivers. For urban areas, routing of permit loads should avoid highly congested areas and/or peak time periods if possible. The current curfew system should be continued until such time that continuous monitoring and communicating of traffic congestion information from urban district offices to the Central Permit Office becomes feasible. Investigation of a higher level of sophistication should then be considered.

SUMMARY

The principal objectives of this study include: review current policies in Texas and other states, evaluate impacts of overweight trucks on pavements and structures, evaluate safety and capacity impacts of oversize trucks on the highway system, and develop appropriate fee structure for oversize/overweight loads. The following states provided permit policies for review and comparison with the Texas policy: Arkansas, California, Louisiana, New Mexico, Oklahoma, and Tennessee.

Attempts to evaluate the safety record of permit loads were only marginally successful. The only two types of loads with any accident information at all in Texas were manufactured housing and concrete beams. According to information received from the Precast Concrete Manufacturers Association (PCMA), concrete beam movement has been a relatively safe endeavor. In the case of manufactured housing, numbers of accidents are recorded by the Texas Department of Public Safety (DPS), but determining mileage traveled is practically impossible. Changes to the current escort policy for all oversize loads have been recommended based on weaknesses identified in the current policy.

Compliance with the state permitting requirements is also difficult to determine. A field study on IH-10 in the Houston area indicated that approximately 40 to 60 percent of

the vehicles which should be permitted actually are permitted.

Capacity considerations are important in the movement of oversize loads. Large urban areas currently use a curfew system to limit the movement of these loads to off-peak periods. Recommendations of the study are to continue with the current curfew system until greater sophistication is available in monitoring traffic levels and in conveying information to the Central Permit Office. At that time, the SDHPT computer network might be able to restrict the movement of oversize loads based upon congestion levels rather than a pre-established time period.

A large sample of vehicle weights and travel distances from the Central Permit Office records was used to determine a suitable fee structure. An appropriate fine structure must also accompany any change to the fee structure. The fee structure is based on the premise that each vehicle class should pay for actual usage or damage done to the highway infrastructure plus the cost of administering the permit system. Damage assessments are according to the AASHTO equation of pavement damage. This fee structure proposed for immediate use is in the form of a simple look-up table in order to keep the permit issuance time to a minimum. Axle weights and distance traveled are the primary input variables which each permit clerk will use to determine the fee. The level of sophistication can and should be increased when the SDHPT incorporates automated routing techniques and develops the type of data base necessary.

Increases in the administrative costs for super-heavy permit evaluations are also proposed based upon current SDHPT personnel and overhead costs. For all proposed changes, compatibility with the Central Permit Operation is extremely important. Phasing of proposed changes is included.

IMPLEMENTATION STATEMENT

It is apparent from the analysis involved in this study that an increase in permit fees is justified. This also means a commensurate increase in the fine structure. One permit category which should be given high priority is super-heavy permits. These permits usually require structural engineering evaluations of each structure on a proposed route. Thus the administrative cost of a single permit can be quite high in comparison to the current permit cost.

SDHPT should begin implementing the recommendations contained in this report as soon as possible. Because the fee structure is more equitable than the existing system, it should be easily justified, even though for many long distance trips, the permit fee will be greater than it now is.

The SDHPT should continue in its current plan to implement an automated routing scheme as soon as possible. This will facilitate full implementation of the fee structure proposed in this report. Even though the network coding is very labor intensive, many other benefits can be realized in areas other than permitting. Once implemented, the system can instantly reflect a change in status of a particular roadway segment.

DISCLAIMER

The views, interpretations, analysis, and conclusions expressed or implied in this report are those of the authors. They are not necessarily those of the Texas State Department of Highways and Public Transportation.

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CHAPTER 1. CURRENT TEXAS PRACTICE

INTRODUCTION

Although there is a gross weight limit of 80,000 pounds for trucks on Texas highways, many loads cannot be reasonably reduced to be transported within the 80,000 pound gross weight limit. Therefore, truckers need to operate at heavier weights, but within an appropriate permit system. This need conflicts with the design of most of the State's highway mileage, which does not adequately account for these excessive loads. The effect of these loads is an increased rate of deterioration of pavements and structures at higher rates than originally expected. Some loads must also be transported which are larger in size than the statutory limits; these too should be handled within an appropriate permit procedure. Oversize loads which are wider than the nominal 8 feet or 8 feet 6 inches, and/or longer than the regular tractor-semitrailer combination vehicle can easily cause operational and safety problems due to their size.

Operational (capacity) problems are caused when other vehicles cannot maneuver as freely as they normally would. Oversize loads cause delays to vehicles traveling in the same direction on the open highway where passing opportunities are more limited due to the oversize vehicle. They also cause delays in urban areas, especially in a constricted environment. Safety concerns must also be considered, especially when adequate measures are not taken to warn approaching motorists with warning signs, flashing beacons, or properly marked escort vehicles.

The Texas State Department of Highways and Public Transportation (SDHPT) is currently in the process of centralizing the permit issuing operation and making permits available by telephone through toll-free lines. At the present time, permits are still being issued in a few districts, but by the end of Calendar Year 1988, the remaining districts are scheduled to be implemented into the Central Permit Operation (CPO). This centralization process will expedite the permitting procedure and will expand the hours of operation as compared to the previous district permit issuance. Many other advantages will be realized as discussed below.

IMPLEMENTING THE CENTRALIZED PERMIT PROCESS

Centralization of permitting started in 1986, providing truckers the capability of acquiring permits by calling a toll-free number. SDHPT Division 18 tested the system in District 14, fixed the initial problems, then took over the permit operation in that district on September 27, 1987. Division 18 immediately relocated the whole district staff over to the Promontory Point office, located on the east side of Austin at the interchange of US 290 and US 183. Previously, District 14 had permitting offices in Austin, Fredericksburg, and Giddings. The only time the district got involved after the changeover was if a trucker had to use cash to pay for the permit instead of using the new credit card system. This innovation provided for the purchase of permits or payment for temporary vehicle registration via the credit card.

At first, many truckers still wanted to use cash. Some truckers would travel from Fredericksburg to Kerrville where they could use cash. Cash transactions have

continued to be problematic for SDHPT (also referred to herein as the Department. Initial electrical problems were solved, and in November of 1987 the CPO added eight West Texas Districts. The general plan for incorporating districts into the CPO was to begin in the west and proceed eastward until all districts were brought into the new system.

Another unanticipated problem was the telephone system. Telemarketing was used to pass incoming calls around to various available operators. Because the initial telephone system for the CPO used parts of three telephone networks and was thus very cumbersome, special legislation was passed so that all downtown Austin offices could be on one system. SDHPT's 42 "800" numbers went through a single exchange, making the call-in process much more efficient. Even then, when the CPO added the West Texas districts, callers began complaining that the CPO did not answer its phones. They were getting a ring with no answer, which was a result of call blocking. Another complaint was that a caller would get in the queue, then get kicked out of line and get a dial tone. SDHPT finally realized the telephone company had provided a faulty system.

In December of 1986, the legislative council had a private consultant study the phone situation. Study results significantly impacted the legislature. The study indicated that the Department had bought a state-of-the-art piece of equipment designed for only 8,000 lines, when there were 15,000 lines going into it. It was operating well above capacity.

A consultant suggested switching to a different exchange, which was accomplished in June, 1987. CPO has had a noticeable improvement in service. Since that time, two more districts have been added: District 3 (Wichita Falls) and District 21 (Pharr). Eleven districts were now included in the system. CPO immediately started looking for its own call distributor system. To further upgrade the telephone system, SDHPT began evaluating voice response units (VRU), which are basically very sophisticated answering systems. It will allow routing calls by geographic area, according to the origin of the load.

One operational goal was to complete a permit on the phone in 10 minutes. It was taking operators from 15 minutes to an hour with their current system. However, district personnel had been doing this job 8 to 10 years and had dealt with local customers who used the same route over and over. Familiarity with the customer across the counter allowed their time to be shorter.

Some permits still have to be coordinated with districts. The new permit office asked for authority to issue permits for loads up to 16 feet high and 16 feet wide without coordination with the districts. Most districts have relinquished this much control. Some districts like Dallas want a call on anything 14 feet high or 14 feet wide, and they have good reasons for doing that (low underpasses, etc.). Another district wanted to be contacted on everything 15 feet high and 14 feet wide during the week, but on the weekend they gave CPO full control to handle it. These are things which increase processing time.

Training cadre consisted of 34 experienced people. When telephone call wait time reached 30 minutes, 20 part-time college students were hired. CPO realized that it could hire twice as many part-time people as full time. Students function as call takers; in other

words, they take the place of the voice response unit. They take a call, screen information, and ask for a number for call-back. A problem developed, however. Many truckers called from phone booths, and SDHPT could not return the call. So the trucker had to call again.

It takes from six weeks to three months to train a CPO officer with no permit experience. The permit officer has to have a good knowledge of permit statutes, and some of those are complex and need interpretation. Initially, truckers complained that interpretation was a big problem -- 24 highway departments with different interpretations. Hence, the SDHPT is now trying to bring about uniformity. Probably the most difficult challenge for a new permit officer is learning the state's 73,000 mile roadway network. That's one reason why the Department is looking to the voice response unit -- to be able to route calls geographically according to origin of load from six geographic areas. Quick response times will be developed when officers become familiar with a particular region. The voice response unit tells the operator to call a ticket number for the next trucker in the queue from that particular geographic area. Obviously, this system is sophisticated.

SDHPT even has the capability to issue permits for emergency movements at night. A duty clerk carries a telephone pager, district maps and the appropriate forms with him at night. The voice response unit will actually interface with the computer data base and allow the Department to authorize an emergency move. Each trucking company must purchase SDHPT maps so they can successfully route themselves and they must keep a bond and their credit card number on file at the Central Office. The Department will put a night script on the answering system which asks if the request is for an emergency move. If it is, routine information is given, such as origin, destination, and other appropriate permit information. The operator must then signal the computer to issue the next permit number in its queue.

The permit number is a combination of the year, month, day (6 digits), issue station (2 digits), and P (for permit) or R (for registration). When all information is exchanged, the trucker has a valid permit. The Department of Public Safety (DPS) will not hesitate to issue a citation if a trucker is not permitted at night, even if it is an emergency move.

The Department had originally estimated the telephone bill to be $700,000 per year. At the time when half the state was implemented, the bill is approximately $47,000 per month. With full implementation, the annual bill could be over a million dollars. Of course, callers on hold contribute greatly to this cost. However, the voice response unit and other planned improvements should reduce the cost. In June of 1987, the Department was able to add Districts 9 and 15, bringing the total to 13 districts in the system. There are 11 more districts to add. On July 20, 1987, the CPO broke the 1,000 permit barrier (in a single day); they issued 1,011 permits. Monday is typically the big day in the centralized permit operation. The districts collectively wrote 1,034 permits that same Monday, so SDHPT was about halfway through the complete centralization process.

One big concern was getting more productivity out of the telephone system. Initially, the central office could only work one incoming call at a time, and if they had to coordinate with a district, they had to hang up on the customer and call him back. A

proposed addition will give them 100 preprogrammed speed-dial numbers, so they only need to hit three numbers to call any district. It has a re-dial feature on the previous number, so it will give them a 20 to 40 percent increase in handling of the calls. The system will allow them to work two calls at one time at each station. If the route is a difficult one, a three-way conversation is possible between the permit officer, the permit coordinator in the district, and the trucker. The system has many other unique functions, but it does not provide routing assistance.

Each district has a set of permit maps which contain a data base of the highway system in that district, to include: weight bearing capacity of pavements, widths and heights of structures, and type of structures (impediments to movements). The CPO operators rely on these maps quite heavily. They also use an interactive graphics design system. All of the districts now have at least one of these devices. They have digitized all of these district permit maps and have stored them in graphics files. The districts are linked together through an ethernet network so they can transmit whole graphic files. It works very well for transmitting files as long as the person on the receiving end knows it has been sent.

When a district plans to place reinforced concrete beams on a structure, the central permit office must be informed immediately so they can route loads accordingly. If a resurfacing job changes the vertical clearance, the CPO needs to know about it. The Department has a very easy way to communicate such changes by simply entering the appropriate graphics file, making the change, and then sending an "E-mail" message so that everybody gets the information. CPO operators rely heavily on accurate information from the districts.

Department personnel feel that the graphics system holds the potential for automated routing. The parameters of the load -- weight first, then height, then width, and sometimes turning radius -- would be the system input. The output could be the actual route rather than graphical format. CPO is currently considering some routing packages proposed by various consultants.

One problem encountered quite frequently is temporary construction restrictions. The Department may have to monitor 200 to 300 of these at any given time. The first thing the district does is post the construction zone for "no permit loads." Usually, New Jersey barriers are placed at some point within the construction zone, reducing the roadway width. One construction restriction can affect an entire route. Available clearance might easily vary by direction; a 16-foot clearance in one direction may be 15 feet 6 inches in the other. Obviously, routing can be a complex problem.

The central office has also contemplated upgrading their computers. The Department's mainframe computer is an IBM 3084Q, but it is subject to malfunctioning at any time. Therefore, the Department decided not to use it for permit issuance. Instead, a local area network was selected using IBM XT PC's as issue machines linked together in a network. The system includes four AT file servers with tasks of network management divided, such as print server and upload server. The fourth file server is a spare. The primary file server manages the network and goes around every three minutes, gathers

any permits which have been issued, and passes them over to the upload file server. It sends the data to the mainframe. The Department has a permit enforcement file on the mainframe which contains vehicle registrations. Within three minutes of issuance of a permit, DPS can check the files on this permit.

Improvements anticipated in the future include upgrades in computers to 80386 based machines with up to 280 megabytes of storage capability and upgrading from the PC network to the token ring network. A customer database is necessary because as many as 70 to 80 percent of permit customers are repeat customers. The process of permit issuance for repeat customers could be expedited by asking a trucker when he calls in if he uses this route three or more times a year. CPO could allow the company to simply give them a number, thus saving keystrokes.

The Central Permit Office uses a recorder which records all conversations between truckers and operators. Within three minutes, the operator can review a previous telephone conversation. The tapes are kept for three years.

The benefits of the new centralized system will be many. In terms of total number of employees required, a total of 85 to 100 people will be needed with a fully centralized system as compared to the total decentralized figure of 130 equivalent full-time positions. The better enforcement which has resulted is well worth the additional effort. The Texas Department of Public Safety (DPS) has provided positive reaction to this system, especially to being able to access permit information immediately. Availability to truckers was increased from 40 hours a week to 88 hours a week. Hours of operation at the central permit office are 5:00 a.m. to 7:00 p.m. Monday through Saturday and 8:00 a.m. to noon on Sunday. The office is closed for only six major holidays.

The permit account card was initiated by one of the local Austin banks so truckers could pay only for the permit and nothing else. This overcomes the problem with other cards such as VISA which can be used to purchase any number of goods and services. Also, the permit account card has limited liability. The bank uses electronic funds replenishment so that if the account balance is zero, the bank will still cover the permit if the company or individual has a good credit record. As of the end of 1987, 60 percent of permit customers were using credit cards.

Prepaid permits are also available. Book permits are available to concrete beam manufacturers, portable builders, and manufactured housing. Consideration is being given to extending the prepaid permit option to everyone. A control number is put on the prepaid permit form so the trucker is buying a control document. The permit office checks a computer data base for the number. If the number is found, CPO issues the permit and removes the number so it cannot be used a second time. This procedure has been very effective. A flow chart of the central permit office activities is shown in Figure 1-1.

Fluctuations in permit issuance depend on permit locations, as well as other factors. For example, the Tourist Bureau in Orange has its busiest weekday on Tuesdays. This is probably because Louisiana does not allow permit movement on Sunday, and

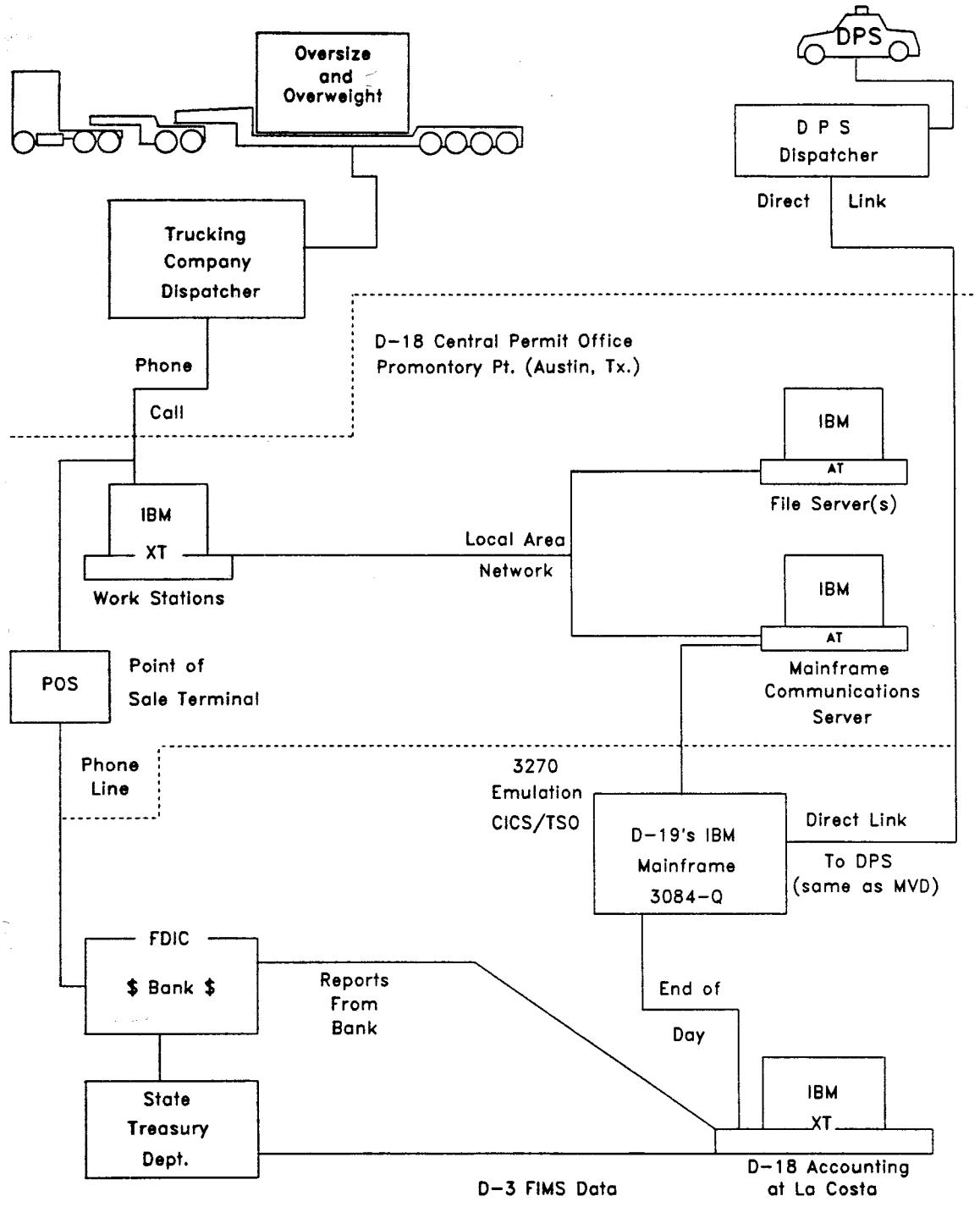


Figure 1-1. Central Permit Operation Overall System Flowchart

most permit loads do not arrive in Orange until Tuesday. So far, there is no accurate way to tell how many out-of-state permit requests are being honored.

PERMIT ACTIVITY IN FISCAL YEAR 1988

Approximately 288,190 permits (not fully validated, subject to change) were issued by the Central Permit Office in Fiscal Year 1987-88. The percentages of permits issued by type of load are provided in Figure 1-2 (2). Several districts were also issuing permits while the central office gradually incorporated remaining districts. Table 1-1 provides a summary of permits issued by districts during the most recent 5-year period. The number issued by districts decreased substantially for the two most recent years represented due to district permit issuance being turned over to the central office. Because there is probably some duplicate counting in SDHPT records of permits issued, no attempt is made herein to provide a statewide total. For instance, many of the mobile home and portable building permits listed in Table 1-1 were thought to include prepaid book permits actually issued by the Central Permit Office.

Permits issued by dimensional elements -- length, width, and height are also included in Figures 1-3, 1-4, and 1-5 (2). Figure 1-3 indicates that a number of permits were issued in 1987/88 for lengths over 75 feet; over 60,000 permits were issued for vehicles which were 90 feet or more in length. Figure 1-4 illustrates that most of the vehicles permitted during this time period were at least 10 feet wide. Over 100,000 permits were issued for loads 14 feet wide or wider. Figure 1-5 shows that all but 15,000 permits issued were over the legal height of 13 feet, 6 inches. Figure 1-6 indicates the distribution of gross vehicle weights permitted during this same year. As expected, most loads exceed the maximum legal gross vehicle weights normally operating on the state's highways.

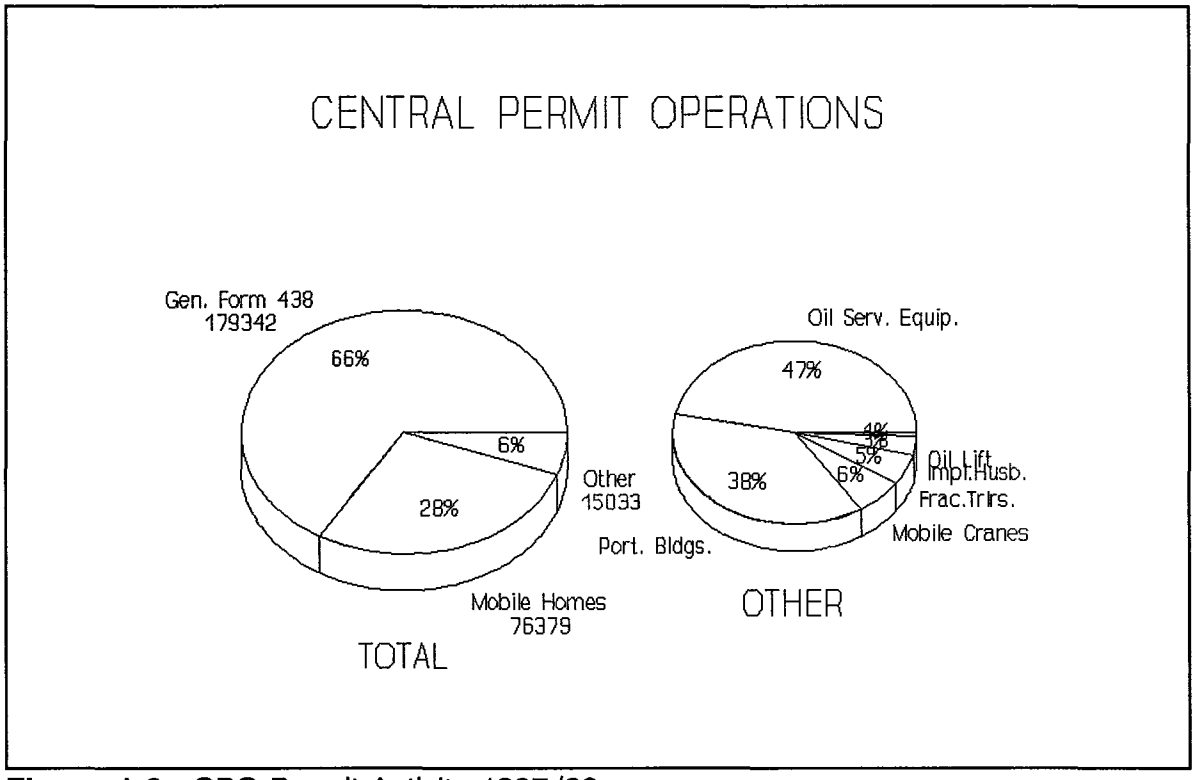


Figure 1-2. CPO Permit Activity 1987/88

Table 1-1. Permits Issued by Field Offices

TYPE	83/84	84/85	85/86	86/87	87/88
Single Trip	423,226	393,700	376,827	169,258	91,518
30-Day	21,793	21,892	19,362	8,597	2,393
90-Day	4,915	5,398	4,451	2,703	2,337
Mobile Home	45,501	20,591	30,537	29,661	20,067
Portable Bldg.	8,541	5,931	4,905	3,549	2,550
Annual	1,556	2,002	1,628	719	151
TOTAL	505,532	449,520	437,710	214,487	119,016

Source: Reference (1)

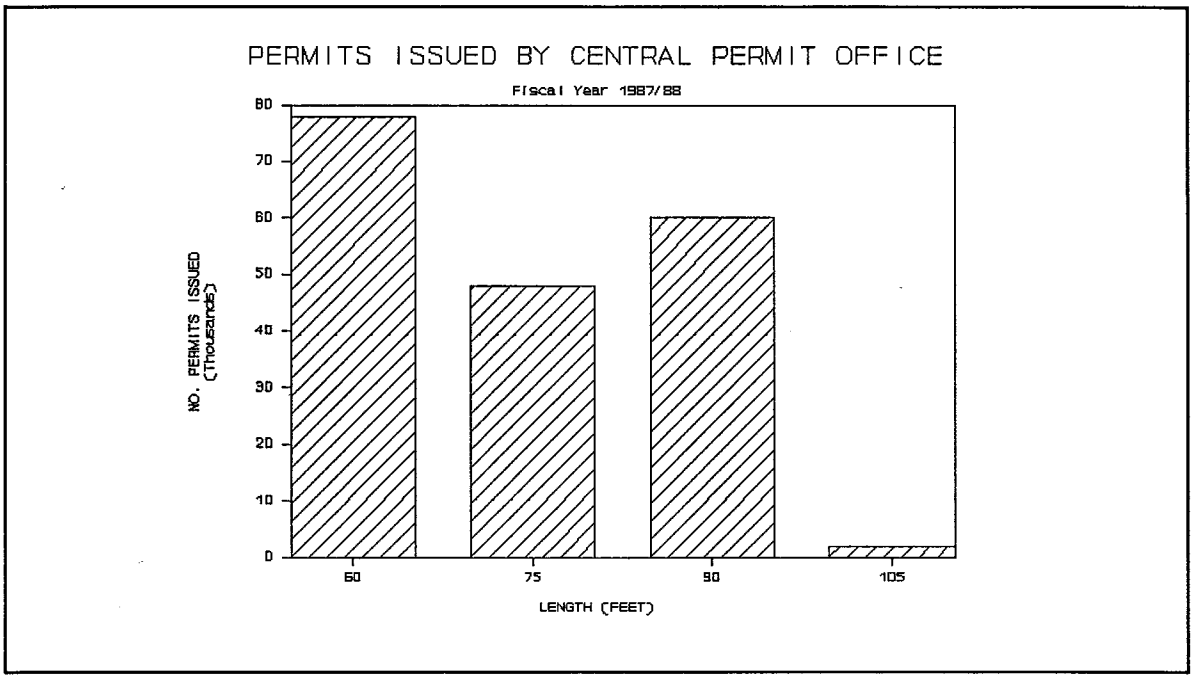


Figure 1-3. CPO Vehicle Length Distribution

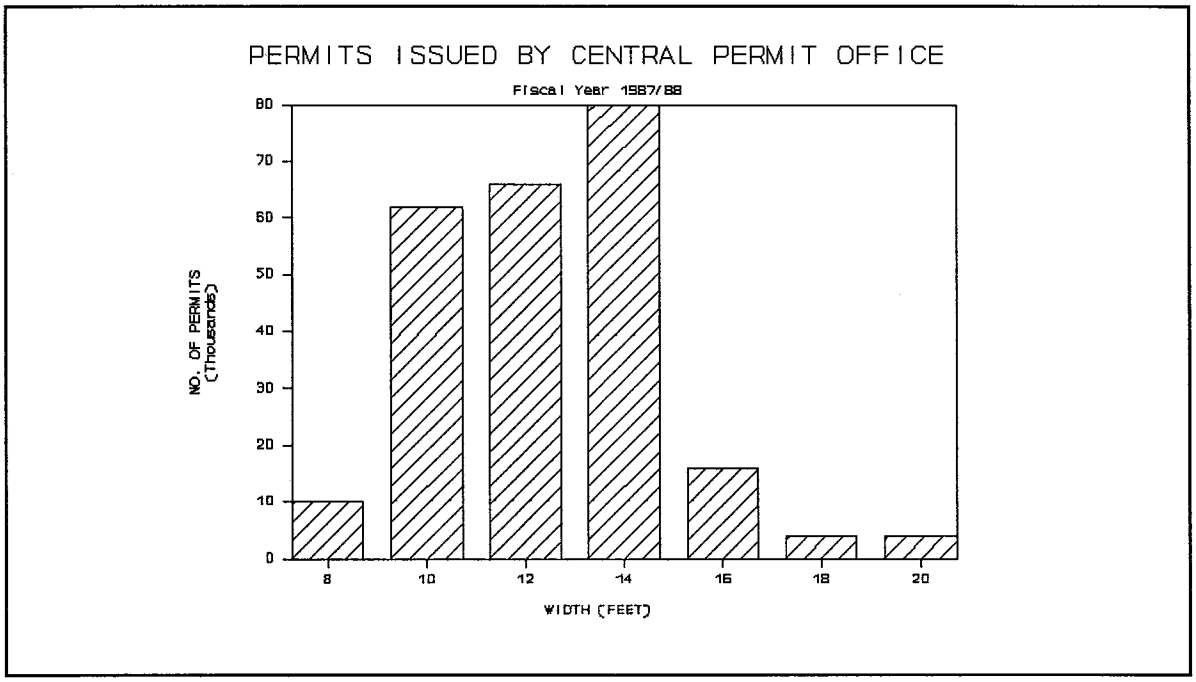


Figure 1-4. CPO Vehicle Width Distribution

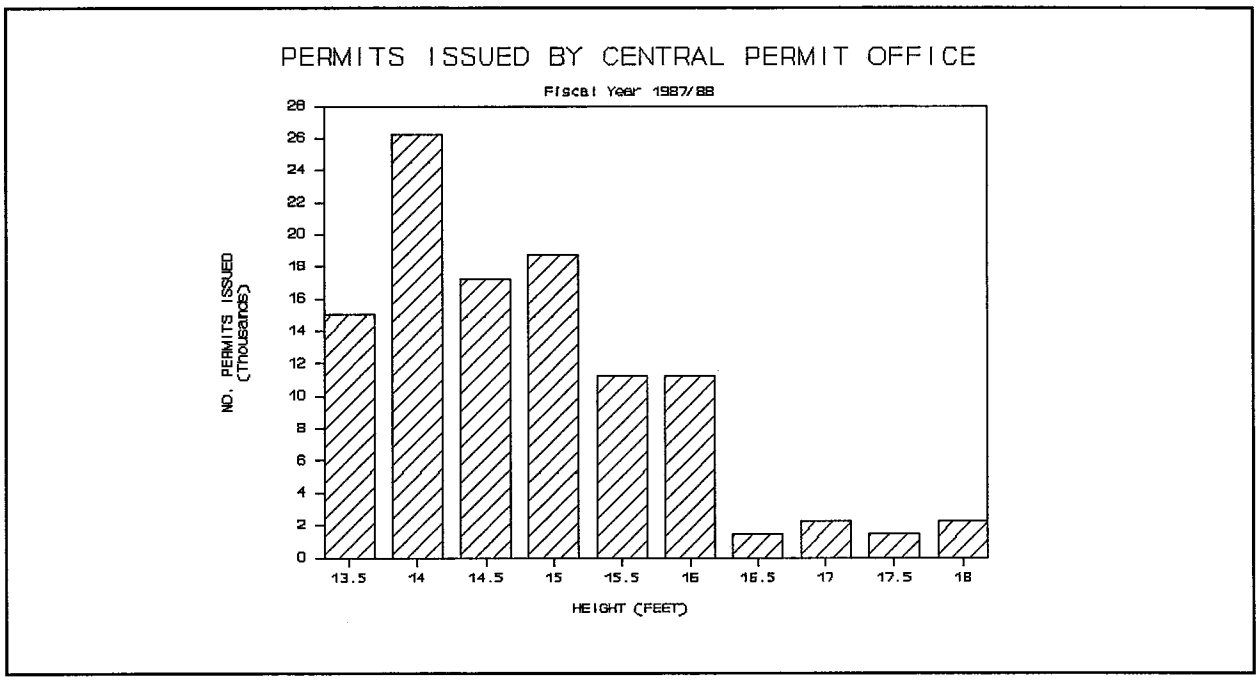


Figure 1-5. CPO Vehicle Height Distribution

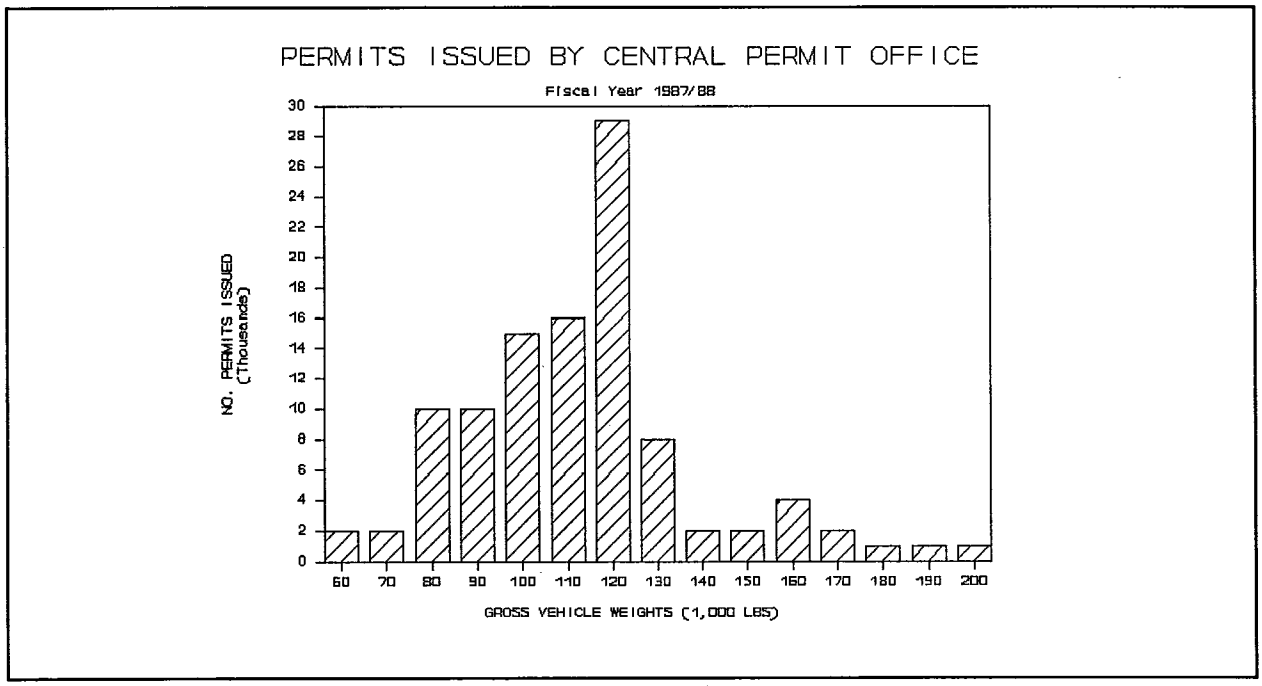


Figure 1-6. CPO Gross Vehicle Weight Distribution

MANUFACTURED HOUSING

According to the Texas Oversize-Overweight Permit Booklet, manufactured housing or manufactured home is defined as "a HUD-code manufactured home, a mobile home, or a modular home and collectively means and refers to all three" (3). It goes on to define a HUD-Code Manufactured Home as a structure, constructed on or after June 15, 1976, according to the rules of the United States Department of Housing and Urban Development (HUD), which is at least 8 feet by 40 feet in the travel mode, has a permanent chassis, and includes the plumbing, electrical, heating, and air conditioning systems. A mobile home is defined essentially the same, being constructed prior to June 15, 1976. A modular home is distinguished by permanent foundation; otherwise, it consists of modules built elsewhere and moved to the homesite to be joined together.

The Texas Department of Labor and Standards is one of the agencies which regulates manufactured housing. Most of the manufactured homes being built now are 14 feet wide or wider. The maximum practical length is about 80 feet. A few were built at 90 feet. The maximum widths are about 18 feet. A few 19-foot widths have been built, but these were difficult to fit into many mobile home parks and are more of a problem to move. There is a definite trend toward more multi-wide homes as illustrated by Figure 1-7 (4). The Texas Railroad Commission regulates the width and other size elements of manufactured housing.

The Texas Manufactured Housing Association (TMHA), headquartered in Austin, and the Texas Real Estate Center at Texas A&M University provided information on the number of homes sold. Even though the number of title transfers can be quantified, the relationship of the number moved to the number sold is virtually impossible to determine. The TMHA provided some rules of thumb which might provide a start in determining the number of moves based on sales. However, even with their information, not enough is known to establish a reliable estimate. Approximately 60 to 70 percent of the sales by manufacturers or individual owners have to be transported to the retailer for sale. This leaves about 30 percent as on-site sales, but these too may be moved. For the number of permit loads which move in a given year, one must know the percentage of multi-wide homes of the total number moved. This proportion is also difficult to estimate. Multi-wides are more difficult to relocate than single-wides, and thus are moved less frequently. A large number of repossessed homes were also available to buyers in 1987, further complicating the sales and movement picture. No attempt has been made in this report to estimate the number of moves per year simply because of so many unknowns.

Table 1-2 contains a summary of manufactured housing sales for the years 1984 through 1987 as provided by the Texas Real Estate Center (5). This information in its original form was provided by the Department of Labor and Standards. Information from this source which is less than two years old is subject to change, according to economists at the Texas Real Estate Center. The reason is that information on title changes sent to the Department of Labor and Standards may not arrive until several months after an actual transaction occurs. The numbers presented in Table 1-2 have been adjusted using a mathematical model developed from historical data. Therefore, these numbers should not be viewed as fixed except those at least two years old.

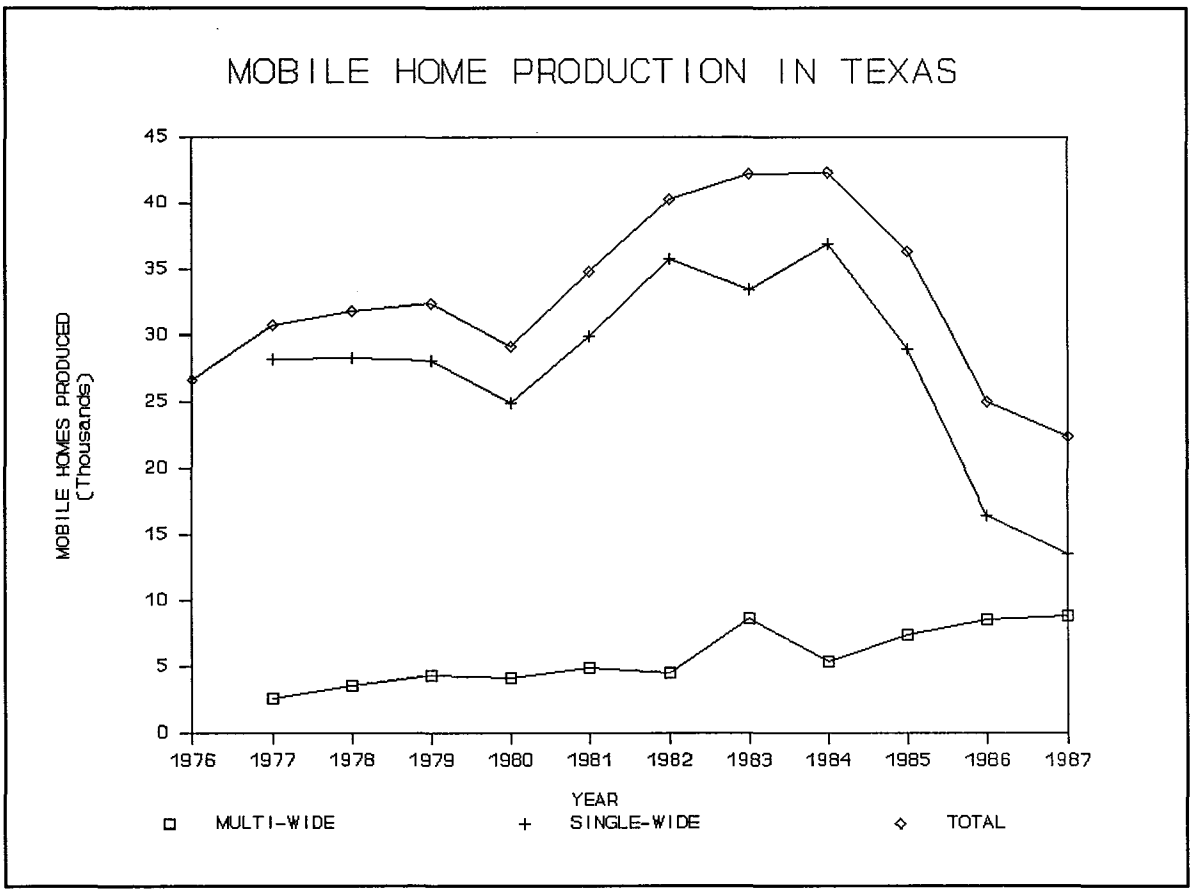


Figure 1-7. Mobile Home Production in Texas

Table 1-2. Mobile Home Sales Trends

YEAR	NEW	USED	SALES TOTAL
1984	38,111	39,968	78,079
1985	27,470	42,174	69,644
1986	17,015	38,271	55,286
1987	9,433	31,745	41,178

Any attempt to quantify the total mileage traveled during the transport of manufactured housing would probably be even less accurate than the number of moves. For one fairly large company which moves houses both within the state and interstate, the total loaded permit mileage for 1987 was 1,522,282 miles, which included some trips outside the state. For intrastate only, for the period of January to September of 1987, this company's loaded mileage was 873,912 miles. This mileage was covered during 5,496 moves, for an average intrastate trip length (loaded) of 159 miles. Many smaller movers probably transport these homes a much shorter distance than this average. A relatively small mover in the Houston area with 6 trucks moves an average of 100 miles (one way) per move. His range of distances is from a few blocks to 200 miles.

A site visit to a large factory in Austin which produces manufactured housing yielded the following information. This factory produces single-, double-, and triple-wide homes. The singles are typically 16 or 18 feet wide. About 65 percent are now double-wides, with 35 percent singles. The triple wide consists of two full-length units and a third section which is smaller, perhaps the size of one large room. The triple requires three tractors to move -- one for each piece. About 75 percent of the homes transported from this plant are moved by certified carrier, while 25 percent are moved by dealers. Most of the homes are sold in Texas and New Mexico, but some are also sold in Oklahoma, Colorado, Kansas, and Missouri. When a shipment is ready, a person responsible for shipment contacts a carrier and provides information on size and destination. The carrier then requests the permit.

CONCRETE BEAMS

The number of concrete beams moved annually in the state through the permit system can be approximated by two methods -- by using survey results from the Precast Concrete Manufacturers Association (PCMA) and by records kept by the Central Permit Office (CPO). First, the survey by PCMA was intended to determine the number and lengths of beams which have been moved over the past few years. The survey spanned the period from January 1983 through June 1987. Table 1-3 incorporates the survey results.

The second method attempts to estimate the number of permits issued statewide. The total is actually the sum of those issued by the Central Permit Office and those issued by districts. Only the CPO totals are available, however, because districts did not keep records on load descriptions which could be easily retrieved. The CPO totals (2) for Fiscal Year 1988 in Table 1-4 are most useful because by the end of FY 88, all but three of the remaining districts had been added to the central operation. The 1986/87 values are obviously much lower than the statewide totals for this reason. Concrete beams are estimated to be about 90 percent of the total long beams moved in the state, according to industry contacts.

Determining the actual number of concrete beams moved which would have required a permit is difficult at best. According to PCMA estimates, approximately 75 percent of the beams in the 0- to 99-foot category needed permits. These were generally over 80 feet in length. Using this percentage and extrapolating for the remaining six

remaining six months of 1987, the number of beams in this length category requiring permits from January through December of 1987 would be 8,814. All of the longer beams would have required permits, for a total PCMA permit requirement of 11,412. PCMA members haul about 80 percent of the total beams hauled in the state. Assuming an equal percentage of permit-to-total beams hauled by non-PCMA members as for PCMA members, the resulting total statewide concrete beam movement would have required 14,265 permits during the 1987 calendar year. This is about double the number shown in Table 1-3 for 1987, but again, the 1987 values are only through June.

Table 1-3. PCMA Survey Results

LENGTH	1983	1984	1985	1986	1987	TOTALS	%
0 - 99	5,311	6,976	8,463	11,254	5,876	37,880	86
100-120	607	913	536	1,203	1,047	4,306	10
121-130	60	448	441	208	252	1,409	3
131-140	13	38	38	126	0	215	1
TOTALS	5,991	8,375	9,478	12,791	7,175	43,810	100%

Source: Reference (6).

Table 1-4. Summary of Concrete Beam Permit Issuance by CPO

Month	86/87	87/88
September	133	448
October	220	602
November	151	563
December	128	290
January	343	697
February	178	795
March	470	1,259
April	339	1,034
May	445	729
June	486	967
July	580	1,097
August	312	955
YEARLY TOTALS	3,785	9,438

Source: Reference (2).

The number of permits issued by the Central Permit Office for the 1988 fiscal year was 9,438. No attempt was made to estimate the remaining five districts which were not implemented -- the Dallas District, the Ft. Worth District, and three other smaller districts. To accurately compare the number of permit loads with the actual number of loads moved would require total implementation of all districts into the central office so that storage and acquisition of data by computer is available. This implementation should be complete by the end of December 1988.

OILFIELD ACTIVITIES

The Oilfield Haulers Association (OFHA) was instrumental in getting the centralized permit operation accepted. The reason the OFHA needed this setup was that in Texas they have 260 to 270 member carriers that regularly carry oversize/overweight loads. These are primarily oilfield related, carrying rigs, tanks, and so forth. The "old" process was basically an 8 a.m. to 5 p.m. operation and required someone making a trip to the local permit office. The Central Permit Operation makes the process much more convenient for OFHA members, and makes permits available on weekends and other days when they were not available before CPO was initiated. If permits are not available and a client with an urgent need calls, chances are very good that the move will occur without a permit. Oilfield haulers stated they need permits seven days a week and all holidays except Christmas. One suggestion was to open the permit office during the morning hours only on holidays.

The number of permits varies depending on the ups and downs of the oil industry. OFHA members commonly use as many as 1,000 to 1,500 permits per week. Many loads are only oversize; an example is a tank with a capacity of 210,000 barrels, which when empty only weighs 7,000 pounds. It is 10 feet in diameter. Members also transport road construction equipment such as loaders, bulldozers, and scrapers.

The Oilfield Haulers Association currently has 346 members who operate a total of 20,000 to 25,000 trucks, but not all are moving in Texas on a given day. However, one must be careful in simply using number of members. For example, a particular large carrier runs 1,200 trucks, but they may not all be in Texas. In fact, they probably are not. The number in this state varies from day to day. A truck may be registered with the Railroad Commission to operate in Texas but may be out of state. Another company is based in Seattle, Washington, but the company is licensed to operate in Texas. When a drill rig moves, it requires about 15 oversize permits. These move on the average about every 15 days. Fluctuations in the price of oil may be used to estimate the number of permits currently used.

The OFHA spokesperson had previously worked for a trucking company which operated a total of 70 trucks. They used 50 to 75 permits per week, or about one permit per truck per week. Of course, this was during the oil boom. With the current economy being depressed, this number may be considerably less. Another factor is that numerous repossessed trucks were bought by drilling contractors for 10 to 20 cents on the dollar. These contractors now move their own rigs, instead of contracting for-hire truckers. The time element is not quite as critical now with the lower price of oil.

An oilfield hauler in Alice, Texas provided information on the current status of this industry and their permit needs. This trucking firm is primarily a mover of oil rigs and oilfield related equipment. Their other offices are located in Edinburg, Freer, Victoria, Corpus Christi, El Campo, Laredo, and Gonzales. The office in Alice has 160 employees. During the oil boom, this company was requesting 500 to 600 permits per month, but with the price of oil being lower, the current number is much less. The number of trucks required for a rig move depends on the size of the rig. A smaller one might be 8 to 10 loads; a larger one may be 15 to 20, with perhaps 10 to 12 being the average number of permitted loads. In October of 1987, 24 rigs moved which was 52 percent of their work for that month. Oilfield movers typically haul rigs, mud pumps, bunk houses, and compressors (for gas wells). Large oil rigs are designed to be moved as two loads -- the motor weighs about 45,000 pounds and the draw works weighs 60,000 pounds. A smaller rig actually creates a bigger (single) load than either of the two loads of a larger rig.

CHAPTER 2. CURRENT PERMIT PRACTICE IN OTHER STATES

INTRODUCTION

The states which have been thoroughly evaluated for comparison with the current Texas policy are Arkansas, California, Louisiana, New Mexico, Oklahoma, and Tennessee. Each of these states was contacted by telephone and asked to send a copy of their current legal and permit policies. In some cases, telephone conversations revealed portions of policies which were not apparent from the written policy. The process of comparison began with evaluating legal sizes and weights in all these states so as to establish the "lower limits" of each state's permit policy. Then the various permit policies were compared by first listing salient parts of the Texas policy, and second, comparing other states to Texas. Therefore, in each of the summary tables which follow, the Texas policy will be listed first, followed by the other six states in alphabetical order.

MAXIMUM STATUTORY WEIGHTS AND SIZES

Table 2-1 is a summary of each state's statutory (nonpermitted) weight and size limitations. Perhaps the most striking result of this comparison is the numerous differences which exist between these states, even though four of them are states which border on Texas. Of course, any of the various state policies are subject to interpretation to some degree, which makes interstate movement of permit loads difficult, to say the least. Table 2-1 provides a comparison of the following legal requirements: width, height, length of single vehicle, length of truck and trailer combination, and length of truck-tractor and semitrailer combination.

On width, all states were mandated by the Surface Transportation Assistance Act of 1982 to provide a network for movement of vehicles which are 8 feet, 6 inches wide (without permit). For legal height, California was the only state which allowed 14 feet. Legal limits on single unit vehicles was similar in that all allowed 40 feet, except Texas and Oklahoma where the limit is 45 feet. For length of combination vehicles, 65 feet is the general rule. California allows 70 feet for car transports, and if certain conditions are met, a length of 75 feet is allowed. Texas allows a semitrailer length of 57 feet, while Oklahoma allows 59 feet 6 inches. Arkansas recently increased its allowable semitrailer length to 53 feet 6 inches. However, if the combination length is over 60 feet, they issue an oversize permit. California stipulates kingpin to rear axle dimensions of 38 feet for single axle trailer and 40 feet for tandem axle trailer. As of January 1, 1989, Tennessee allows a semitrailer length of 50 feet "from the point of attachment to the tractor."

Table 2-1. Legal Weight and Size Limitations

STATE	WIDTH	HEIGHT	LENGTH OF S.U.
Texas	8 ft 6 inches	13 ft 6 inches	45 ft 0 inches
Arkansas	8 ft 6 inches	13 ft 6 inches	Not specified
California	8 ft 6 inches	14 ft 0 inches	40 ft 0 inches
Louisiana	Interstate & Buses: 8' 6" Other: 8' 0"	13 ft 6 inches	40 ft 0 inches
New Mexico	8 feet 0 inches	13 ft 6 inches	40 ft 0 inches
Oklahoma	8 ft 6 inches	13 ft 6 inches	45 ft 0 inches
Tennessee	8 ft 6 inches	13 ft 6 inches	40 ft 0 inches

Table 2-1 (Continued). Legal Weight and Size Limitations

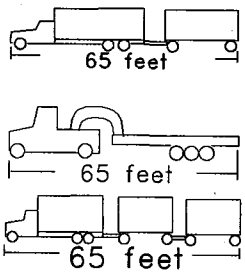
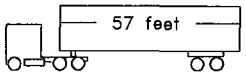
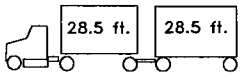
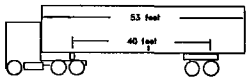
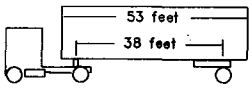
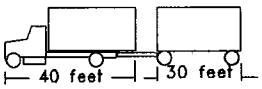
STATE	LENGTH TRUCK/TRAILER COMBINATION	LENGTH SEMITRAILER COMBINATION	LENGTH DOUBLES VEHICLE
Texas			 No overall length limit for tractor combinations
Arkansas	60 ft 0 inches	53 ft 6 inches semitrailer;	60 ft 0 inches: 28'0" trailer and semitrailer
California	Car Transport: 70 ft, 75 ft under specific conditions on interstate	 	28 ft 6 inches 28 ft 6 inches 75 ft 0 inches
Louisiana		50 ft 0 inches semitrailer	30 ft max trailer and semitrailer
New Mexico	65 ft 0 inches	65 ft 0 inches	Length of a tractor, semitrailer and trailer is 60 ft
Oklahoma	70 ft 0 inches	59 ft 6 inches Semitrailer Length	Semitrailer, and trailer 29 ft each
Tennessee	65 ft 0 inches	50 ft from king-pin to rear of load	50 ft from king-pin to rear of load

Table 2-1 (Continued). Legal Weight and Size Limitations

STATE	SINGLE AXLE WEIGHT	TANDEM AXLE WEIGHT	GROSS WEIGHT	LOAD/INCH TIRE WIDTH
Texas	20,000 lbs	34,000 lbs	80,000 lbs	650 lb/inch
Arkansas	20,000 lbs	34,000 lbs	80,000 lbs	650 lb/inch[1]
California	20,000 lbs or 10,500 lbs on one end of axle	34,000 lbs Tolerance for timber trucks	80,000 lbs	Max for one wheel 9,500 lbs but steer axle max. 12,500 lbs.
Louisiana	20,000 lbs Interstate 22,000 lbs Non-Interstate	34,000 lbs Interstate 37,000 lbs Non-Interstate	80,000 lbs[2]	650 lb/inch
New Mexico	21,600 lbs	34,320 lbs	80,640 lbs	600 lb/inch
Oklahoma	20,000 lbs	34,000 lbs	Bridge Formula	650 lb/inch
Tennessee	20,000 lbs	34,000 lbs	80,000 lbs	Not used

[1] Used for "vehicles of special design" (rubber-tired mobile construction equipment), total allowable weight based on number of tires and width.

[2] Tridem or Quadrum: 83,400 pounds Interstate, 88,000 pounds non-Interstate.

MAXIMUM PERMIT WEIGHTS AND SIZES

Table 2-2 summarizes the requirements of each of the same states compared with Texas. The requirements of the Texas policy which were used to compare other states by are permit fees, bonding requirements, exemptions for governmental agencies, maximum weight for single axles, maximum weight for multiple axles, overlength (pipes and poles), overlength (poles, piling, and unrefined timber), overwidth, overheight, manufactured housing, portable buildings, requirements for moving buildings, oil well clean-out and drilling equipment permits, permits for water well drilling machinery, permits for implements of husbandry, and permits for unladen lift equipment (mobile cranes). Each state policy will be briefly summarized below in somewhat more detail than shown in the table.

Permit Fees. Texas assesses a fee of $20.00 for standard single trip permits. For portable buildings, a fee of $5.00 is assessed and for manufactured housing, a fee of $10.00 is charged. Also, 30-day, 90-day, quarterly, and annual permits are available for certain types of loads. Arkansas assesses a $5.00 fixed fee for each special permit plus a per ton charge for each ton or major fraction thereof hauled in excess of legal weight. There is also a fee for vehicles of special design (rubber tired mobile construction vehicle or equipment). California charges a straight fixed fee of $5.00 for single trip permits. Louisiana has a number of fees, depending on the type of oversize/overweight condition. The following types of permits are available: oversize, overweight, monthly oversize, forest product, forest management equipment, waste vehicle, steering axle, harvest season, oilfield equipment, house movers equipment, and pleasure craft. Effective September 1, 1986, the price of permits in Louisiana went from $8.00 to $10.00 per day or per trip for oversize permits and an increase in cost from $0.03 per ton mile plus $8.00 to $0.07 per ton mile plus $10.00 for an overweight permit. The three tables of permit fees currently used in Louisiana are included in Appendix A.

An example of fee cost for movement of a vehicle in Louisiana which has five or more axles and has a gross weight of 100,000 pounds and which will move a distance of 200 miles is as follows. To the fixed cost of $10.00 is added an amount representing $0.07 per ton mile for gross weight exceeding 80,000 pounds. The fees have been tabulated in ranges of weights and distances to simplify and expedite permit issuance. The "Third Overweight Permit Fee Schedule" in Appendix A is the appropriate table in this example. The appropriate value is from the gross weight range of 80,001 to 100,000 pounds and the distance range is 151 to 200 miles. The weight-distance fee, therefore, is $80.00 and the fixed fee is $10.00 for a total permit fee of $90.00.

New Mexico uses two basic fee types -- a single trip permit and a multiple trip permit. The single trip permit costs $15.00 and is valid for 3 days. The multiple trip permit costs $60.00 and is valid for up to one year. In Oklahoma, the fee for overweight loads is $10.00 for each permit issued plus an additional $5.00 for each additional 1,000 pounds when the load exceeds the Bridge Formula. If the load is oversize, an additional $10.00 is charged. Special fees for forest products or for self-propelled construction equipment are also assessed. The time period in Tennessee for a single trip permit is six weekdays; the other option is the annual permit. The fees vary by type of load. For excessive width,

Table 2-2. State Permit Policies

STATE	PERMIT FEE	MAX. WEIGHT SINGLE AXLE	MAX. WEIGHT MULT. AXLES	POUNDS/IN. TIRE WIDTH
Texas	$20, $10 for Mobile Homes, $5 Portable Buildings	25,000 lbs.[4]	Tandem: 45k Tridem: 60k Quadrum: 70k	No Permit if Load Exceeds 650 lb/inch
Arkansas	$5 Plus Wt-Distance Fee[1]	Steering: 18,000 lbs. Load carrying: 25,000 lbs.[5]	Tandem: 45k[5] Tridem: 70k[5] Quadrum: 68k if >108k GVW	650 lb/in: Used for Veh. of Special Design
California	$5 Fixed Fee	28,000 lbs	Tandem: 46.2k Tridem: 50.4k[6] Quadrum: N/A	Max for Any Load is 800 lb/inch
Louisiana	$10 Plus $0.07 per Ton-Mile[2]	Off-rd. Equip. 30,000 lbs., Other vehs. 24,000 lbs.	Tandem: 48k[7] Tridem: 60k Quadrum: 80k	Max Legal Weight
New Mexico	$15 Fixed Fee	Not Specified	Tandem: 46k Tridem: 60k[8] Quadrum: 68k	Max Legal Weight is 600 lb/inch
Oklahoma	$10 Plus $5/1,000 lb. Over Bridge Formula	20,000 lb.	Tandem: 40k Tridem: 60k Quadrum: 65k	For Self-Propelled Constr. Equip. 650 lb/inch
Tennessee	$10-$30 Width Plus $15 Height Plus $15 Wt. Plus $.05/Ton-Mile[3]	20,000 lb.	Tandem: 40k Tridem: 60k Quadrum: 80k	Not Specified

[1]For distance <100 miles: 0-5 tons, $1/ton; 5-10 tons, $2/ton: >10 tons, $3/ton.
[2]If GVW > 212,000 lb, cost of bridge evaluation: $125 - $850 per bridge.
[3]If GVW > 200,000 lb, add structure cost $200 to $300 per permit.
[4]Not to exceed 650 lb/in tire width.
[5]Up to GVW 108,000 lb; Then reduced to 20,000 single, 34,000 tandem.
[6]Not to exceed 800 lb/in tire width.
[7]Up to GVW 120,000 lb; Over 120,000 lb: Single = 20,000, Tandem = 40,000 lb.
[8]Interstate only, two subordinate classes, each with lower limits.

Table 2-2 (Continued). State Permit Policies

STATE	OVERWIDTH PERMITS	OVERLENGTH PERMITS	OVERLENGTH PIPES AND POLES	OVERLENGTH POLES, PILING TIMBER
Texas	Daylight Only Maximum 20'[1]	Not Specified	Yes	No Permit Needed. Total Combination Length < 65 ft. Excluded
Arkansas	Maximum 20' Escorts Needed for > 12'	Not Specified	No	No Permit Needed. Extension Past Center of Rear Tandem <25'
California	14' Most Loads 14'-6" Equip.[2]	135' Total Tractor and Trailer[2,4]	135' Total Tractor and Trailer	Overhang < 2/3 Wheelbase. No Permit.
Louisiana	18 feet[2]	Not Specified	Yes	Not Specified
New Mexico	30 feet[2]	101 feet	Yes	Not Specified
Oklahoma	12 feet[3] Loads < 10' Allowed Sat. Afternoon	Not Specified	Yes	Raw Forest Products May Be Permitted
Tennessee	Allows 8' to 14' But > 14' Usually Not Permitted	Not Specified	Not Specified	Logs in Single Lengths = 75' Total

[1] Evaluated on individual merit.
[2] Over this value requires Headquarters approval.
[3] Applies to specified highways only.
[4] Length over 100 feet requires steerable rear dollies.

Table 2-2 (Continued). State Permit Policies

STATE	MANUFACTURED HOUSING PERMITS	PERMITS FOR PORTABLE BUILDINGS	PERMITS FOR HOUSES AND BUILDINGS
Texas	Only Single Trip Permits	Only Single Trip Permits. Max Width 20', Max Length 95'	Distinction: Old and New Bldgs. Max W: New 32', Old 20'
Arkansas	Permits Reqd. For Widths > 8' Liability Ins. Required	Not Specified	Same for Old and New. Max 28'6", Escort Required front and rear
California	Axle Loads <6000 lb. No. Axles, Brake, Tractor Wt., Tire Rating and Open Side Requirements[1]	Not Specified	Not Specified
Louisiana	No Specific Treatment of Manufactured Housing	Not Specified	Same for Old and New. W > 18', Dist. Off. Must Approve
New Mexico	No Permit Issued W > 16' or Ht. > 15'-10"	Not Specified	Same for Old and New. Over 30' Requires Director Approval
Oklahoma	Liability Ins. Required Daylight Hours Only. Max W=16'	Permits Same as for Manufactured Housing	Same for Old and New. Max 30' Base, 32' Top. Max Ht. 21'
Tennessee	No Permits Issued for W > 14' Daylight Hours Only	Permits Same as for Manufactured Housing	Same for Old and New. Only After Dept. Assures Safety Escort Reqd.

Table 2-2 (Continued). State Permit Policies

STATE	OIL WELL CLEAN-OUT, DRILLING EQUIP.	PERMITS FOR MOBILE CRANES	PERMITS FOR WATER WELL DRILLING MACHINERY	PERMITS FOR IMPLEMENTS OF HUSBANDRY
Texas	Single trip & 30 or 90 Day Permits Avail. Fees Based on Wt., Size, and Mileage[1]	Single trip & 30- or 90-Day Permits Avail. Fees Based on Wt., Size, and Mileage[1]	No Overwidth Permit Req'd During Daylight Hours	Permit Not Required if Comply with Various Rules
Arkansas	Not Specified	Covered Under "Vehicles of Special Design"	Not Specified	Not Specified
California	Not Specified	Not Specified	Not Specified	Integral Components Need Not Be Removed if Width < 14'
Louisiana	Special Permit for Empty Oil-Field Equip. Lowboys	Not Specified	Not Specified	$5.00 Annual Permit to Haul Farm Prod. in Their Natural State
New Mexico	Not Specified	Not Specified	Not Specified	Not Specified
Oklahoma	Not Allowed on Interstates, Two Counties: Curfew Weekdays	Gross Weight of 90,000 lbs.	Not Specified	Round Baled Hay W < 11' Can Obtain Annual Permit for $25.00
Tennessee	Not Specified	Max Axle Loads 24,000 lbs.	Not Specified	Not Specified

[1] Cost: 4.5 to 5.5 cents per mile per 1,000 lb. over legal weight.

Table 2-2 (Continued). State Permit Policies

STATE	GOVERNMENT EXEMPTION	BONDING	ESCORT POLICY
Texas	Yes	Yes	No
Arkansas	Yes	No	Yes
California	Yes	Not Required for Permit	Yes
Louisiana	Yes	Yes	Yes
New Mexico	Yes	Can Be Required	Yes
Oklahoma	Not Specified	None	Yes
Tennessee	Not Specified	Must Show Responsibility or Furnish Bond	Yes

the fee would be $10.00 to $30.00, plus for excessive height $15.00, plus for excessive weight $15.00 plus 5 cents per ton mile. Movements over bridges may cost $100 to $500, or actual cost. Annual permits cost $500 for gross vehicle weights up to 120,000 pounds, $1,000 for GVW over 120,000 pounds, and $150.00 for loads of natural resources or products.

Maximum Weight for Single Axles. The Texas policy states that the maximum weight is 25,000 pounds, provided the 650 pounds per inch of tire width is not exceeded. The exception to this maximum is mobile cranes and oilfield equipment. The policy, effective May 27, 1987, requires mobile cranes exceeding 650 pounds per inch of tire width or exceeding 25,000 pounds per axle to obtain a fee calculation permit, for which fees are assessed by mileage. For axle weight from 20,000 pounds to 25,000 pounds, the fee is 4.5 cents per mile; for axle weight from 25,000 to 30,000 pounds, the fee is 5.5 cents per mile; and for axle weight from 30,000 to 35,000 pounds, the fee is 8.0 cents per mile. By comparison, Arkansas sets a maximum of 18,000 pounds on steer axles and 25,000 pounds on load carrying axles. California sets the steer axle maximum at 12,500 pounds, but several exemptions are allowed including auto transporters. Single load carrying axle maximums depend upon distance from the nearest axle group. In Louisiana, off-road equipment is allowed single axle weights up to 30,000 pounds; all other vehicles only go up to 24,000 pounds if the gross weight is 120,000 pounds or less. If the GVW exceeds 120,000 pounds, the single axle load is limited to 20,000 pounds. New Mexico allows 14,000 pounds on the steer axle and 26,000 pounds on other axles on Interstates only. Oklahoma allows 15,000 pounds on steer axles and 20,000 pounds on others. Tennessee policy provides for a 20,000 pound maximum on single axles.

Maximum Weight for Multiple Axles. In Texas, if spaced at least 12 feet from the nearest single axle or tandem axle group, the following maximums are allowed: tandem -- 45,000 pounds at 4-foot spacing to 50,000 pounds at 12-foot spacing; tridem -- 60,000 pounds at 4-foot spacing to 75,000 pounds at 12-foot spacing; quadrum -- 70,000 pounds at 4-foot spacing to 90,000 pounds at 12-foot spacing. Arkansas allows a maximum of 45,000 pounds on tandem axles and a total gross weight of 108,000 pounds. California has developed a set of color-coded tables which provide maximums based on track width, axle spacing, number of tires per axle, and number of axles. For example, on the purple or maximum condition, with two axles (tandem) and four tires per axle spaced at 4 feet on an 8-foot track width, the maximum allowable weight would be 46,200. A comparison of the Texas and California maximum allowable tandem and tridem loads for 4 tires per axle and an 8-foot track width is provided in Figure 2-1. The California maximums are based on number of tires per axle, the axle spacing, and track width. If the number of tires is increased from 4 to 8 on the same track width as shown by Figure 2-1, the allowable tandem load goes from 46,200 pounds to 53,130 pounds. By increasing track width to 10 feet (still 8 tires) the allowable permit load becomes 57,750 pounds. For a 3-axle group (tridem) at 10-foot-0-inch spacing, the maximum allowable "purple" load is 52,500 pounds. Beyond this 10-foot-0-inch spacing, steerable axles are required. Therefore, a quadrum axle group is not applicable, as indicated in Table 2-2. Another important aspect of the California permit policy is the "beam and dolly" allowances where speeds are restricted to 5 or 10 miles per hour and greater axle widths are used. For example, if an axle spacing of 4 feet 6 inches were used with a width of 20 feet, the

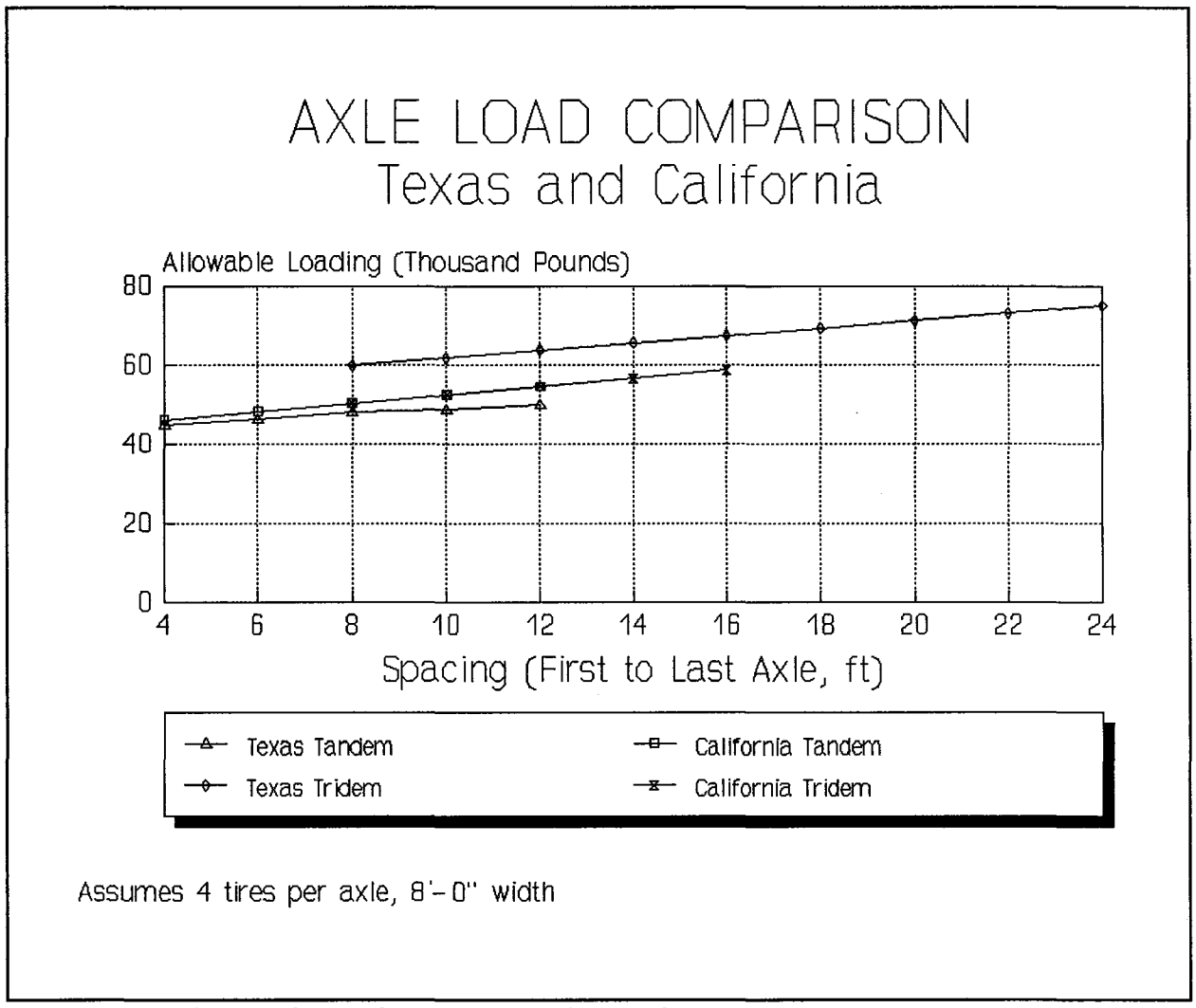


Figure 2-1. Comparison of Maximum Axle Loads

allowable axle group load would be twice the "straight purple" value of 46,725 pounds. The California overload tables are provided in Appendix B.

In Louisiana, tandem axles on off-road equipment are allowed to go up to 60,000 pounds. For all other vehicles, the maximum is set at 48,000 pounds if gross vehicle weight (GVW) is 120,000 pounds or less, but 40,000 pounds if GVW is over 120,000 pounds. The New Mexico permit policy allows 46,000 pounds on tandems and 60,000 pounds on triples on Interstate Highways; 40,000 and 54,000 pounds on secondary for tandems and triples, respectively; and 36,000 and 48,000 pounds for tandems and triples, respectively, on a third (lower) class of roadways. Oklahoma and Tennessee allow 20,000 pounds per axle for axle groups.

Pounds per Inch of Tire Width. In Texas, no permit load except mobile cranes, oil well service equipment, and oilfield lift equipment may exceed 650 pounds per square

inch of tire width. In Arkansas, vehicles of special design utilize this measurement to establish the maximum wheel load. These vehicles are defined as "any rubber tired mobile construction vehicle or equipment carrying no load other than its own weight, which has been reduced in size and/or weight until further reduction is impractical." These permits are issued on the basis of actual tire width (in inches) multiplied by 650 pounds per inch of tire width. California allows a maximum tire load based on 800 pounds per lineal inch of tire width. This width is the maximum inflated width as specified on the tire by the manufacturer, or as measured, if less than specified by the manufacturer. Louisiana allows 650 pounds per inch of tire width.

Overwidth Permits. Permit loads exceeding 12 feet wide are generally prohibited from moving on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. For any permit request, loads exceeding 20 feet wide are studied on an individual basis and the Department makes a decision on each one. Front and rear escorts are required for all loads exceeding 16 feet wide. In Arkansas, the maximum width of a vehicle is 20 feet. Vehicles or cargo which exceed the legal allowable width are required to display a sign with the legend "OVERSIZE LOAD" displayed in the front and rear of the load. Vehicles with cargo in excess of 12 feet must be accompanied by a minimum of one escort vehicle. Cutter blades and other hazardous cargo in excess of 14 feet must be cradled to reduce the maximum width to 14 feet. California allows districts to approve widths up to 14 feet or 14 feet 6 inches for dozer blades and scraper arms; wider loads must submit a written request to headquarters. For dozer blades wider than 14 feet 6 inches the blade must be removed for moving. California theoretically has no absolute maximum on widths except as dictated by a particular route. In Louisiana, a Department of Transportation and Development (DOTD) district representative is required when the load exceeds 18 feet in width. In New Mexico, permits for vehicles over 14 feet wide require prior approval by municipal authorities, but there is no absolute maximum. Permits in excess of 30 feet wide are not issued without approval of the Director of the Motor Transportation Division. At least one amber flashing light is required to be on the overwidth load. Oklahoma law requires that permits not be issued for loads in excess of 12 feet for certain specified highways. Loads not exceeding 10 feet in width can be issued a permit to travel on Saturday afternoon on all but a few specific highways. Tennessee has requirements for widths between 8 feet and 14 feet, whereas for loads over 14 feet in width, permits generally are not granted.

Overheight Permit. Permits are required in Texas for vehicles or loads over 13 feet, 6 inches in height. Loads exceeding 20 feet in height may be issued permits on an individual basis only if there is no other method to move the load. Escorts are not normally required for loads which are overheight only. Permits are issued in Arkansas for loads over 13 feet 6 inches in height, but if the height exceeds 17 feet, the move must be accompanied by public utilities personnel. The legal height in California is 14 feet; however, the permit maximum on height depends only on route restrictions. The Louisiana, New Mexico, and Oklahoma permit policies did not specify a maximum on height. In Tennessee, permits for heights in excess of 15 feet are generally not issued.

Overlength Permit. The Texas permit policy distinguishes between combination vehicles using a truck as power unit versus a truck-tractor as power unit. The policy

states that a truck combination which exceeds 65 feet in length but not exceeding 95 feet in length may be issued a single trip permit, but is restricted to daylight-only movement. Furthermore, any truck combination vehicle plus load exceeding 95 feet will be restricted to daylight-only movement Monday through Friday. A rear escort is required when the overall length exceeds 100 feet, or when a load has a rear overhang in excess of 20 feet. When the power unit is a truck-tractor pulling a semitrailer not exceeding 57 feet in length with front overhang of more than 3 feet or rear overhang of greater than 4 feet, the vehicle may be issued a single trip overlength permit if the load cannot be feasibly dismantled. Vehicle combinations where load plus semitrailer lengths are between 60 feet and 80 feet must be moved during daylight hours only. Vehicles with semitrailer plus load exceeding 85 feet, or when the rear overhang exceeds 20 feet, are required to provide a rear escort and are restricted to daylight-only movement.

In Arkansas, no overlength permit is required for vehicles operated in the daytime when transporting poles, pipes, machinery or other objects of a structural nature which cannot be readily dismembered. An escort in back of the loaded vehicle is required when the total length exceeds 75 feet. No load can extend more than 25 feet past the center of the rear tandem axles. In California, the maximum permitted length is 135 feet. Louisiana does not specify a maximum length in its permit policy. New Mexico law states that permits will not be issued for movement of a combination vehicle when the towing unit increases the overall length to more than 101 feet. Overlength permits will not be issued when: (1) pipe, when welded together, exceeds 80 feet in length; and (2) crane or tower booms, when bolted or pinned, are in excess of 40 feet in length. Neither the Oklahoma nor the Tennessee permit policies specify a maximum length. However, Tennessee policy establishes requirements for the following length ranges: 65 to 85 feet, 85 to 120 feet, and over 120 feet.

Overlength Permit (Pipes and Poles). These loads in Texas may exceed the 3-foot front and 4-foot rear overhang without requiring a permit, provided the total length does not exceed 65 feet. Arkansas does not require an overlength permit for vehicles operating in the daytime, but an escort is required when the total length exceeds 75 feet. Neither California nor Tennessee state conditions specifically for hauling overlength pipes and poles. In Louisiana, vehicles utilizing a balance type utility trailer (or fifth wheel) do not need a permit as long as the poles do not extend more than 35 feet past the rear of the vehicle and a 1.5-foot ground clearance is maintained. Also, no permit is needed if the load does not exceed 65 feet plus 1 foot, and the overhang does not exceed 15 feet. Poles that are untreated do not need a permit if the load does not exceed 65 feet with 20 feet of rear overhang and at least 2 feet of ground clearance. In New Mexico, single unit trucks cannot exceed 40 feet in length, while combinations cannot exceed 65 feet except by permit. When pipes are welded together and thus become longer than 80 feet in length, no permit will be issued. If crane or tower booms are bolted or pinned together and become longer than 40 feet, a permit will be denied. Oklahoma allows poles and pipes up to 80 feet in length to be hauled without permit only when hauled from a stockpile to the point where they will be installed. All other poles and pipes require permits when the vehicle and load exceed 70 feet in overall length.

Overlength Permit (Poles, Piling, and Unrefined Timber). For unrefined timber, Texas does not require bond or permit, but requires that the length must not exceed 90 feet and the trip length must not exceed 125 miles from forest to wood processing plant. These moves are allowed in daylight only. Arkansas does not require an oversize permit for the operation of any vehicle transporting forest products. The law stipulates that the load shall not extend more than 25 feet past the center of the rear axles and the load must clear the pavement by 2 feet. If the total length exceeds 75 feet, an escort is required in the rear of the loaded vehicle. California, Louisiana, and New Mexico do not specify requirements for hauling this particular overlength load. In Oklahoma, annual permits may be purchased for the movement of tree-length logs. Tennessee law allows a total length of 75 feet for truck tractor and semitrailer when transporting logs or timber in single length pieces.

Manufactured Housing Permits. Only single trip permits are issued in Texas, and in this case, bonds are not required. Manufactured housing that exceeds 16 feet wide but does not exceed 18 feet wide must have a front escort on 2-lane highways and a rear escort on a highway of 4 or more lanes. If the home exceeds 18 feet in width, it must have a front and rear escort. The Arkansas law requires permits for homes wider than 8 feet and liability insurance. Special permits for homes up to 12 feet wide may be obtained by persons moving their own home. Escort vehicles are required both front and rear for all homes in excess of 14 feet in width. Homes in excess of 10 feet wide may not be moved on Saturday, Sunday, or any holiday. Neither California nor Louisiana specifically identify manufactured housing moves in current permit documentation. New Mexico requires that the towing vehicle have a wheelbase of at least 99 inches. Flags are required at each corner of the load and on the front of the towing vehicle. No permits are issued for homes exceeding 16 feet in width or 15 feet 10 inches in height. When the overall length of the combination (towing vehicle plus home) exceeds 65 feet, the length of the towing vehicle shall not exceed 16 feet. The towing vehicle must meet the following specifications: (1) 1 1/2-ton rating for homes 50 to 60 feet long, (2) 2-ton rating for homes 60 to 80 feet in length, and (3) 2 1/2-ton rating for homes 80 to 85 feet in length. Escorts are required for all homes exceeding 14 feet in width. In Oklahoma, oversize movement on Interstate Highways through Oklahoma and Tulsa Counties are not permitted from 7 a.m. to 9 a.m. or 4 p.m. to 6 p.m. Monday through Friday. The minimum length of the towing vehicle is specified; and liability insurance is required. Travel is only allowed during daylight hours. Any combination vehicle over 80 feet in length requires an escort vehicle. Specific requirements are stated in the Oklahoma policy depending on the width of the mobile home, with the maximum width being 16 feet. Tennessee requires permits for homes exceeding 8 feet in width or for combination length exceeding 60 feet. Special requirements (escorts, etc.) must be met for vehicles from 10 feet to 14 feet in width. No permits are issued for widths in excess of 14 feet. Movement is allowed during daylight hours only Monday through Saturday.

Portable Building Permits. In Texas, only single trip permits are issued. Permits for widths exceeding 16 feet must have front and rear escorts. The maximum width is 20 feet, while the maximum length is 95 feet. No bond is required. Arkansas, California, Louisiana, and New Mexico do not identify portable buildings in their policies. In Oklahoma and Tennessee the permit requirements for portable buildings are the same as

for manufactured housing.

Permits for Houses and Buildings. The Texas permit policy makes a distinction between new and old houses and buildings. No permit is issued for new houses or buildings exceeding 32 feet. For old houses or buildings exceeding 20 feet in width, the permit office may require removal of projecting porches or single rooms. No other states make a distinction between old and new buildings. Movement of these buildings in Arkansas requires a surety bond of $500 for building widths in excess of 20 feet. The maximum allowable width is 28 feet 6 inches. An escort vehicle is required in the front and rear, and liability insurance is required. The current California policy reviewed for this summary did not identify permits for buildings. In Louisiana, buildings which exceed 18 feet in width must be approved by the district office. Movement in New Mexico of any building in excess of 30 feet wide must be approved by the Director. Oklahoma does not allow movement of buildings which exceed 30 feet at the base and 32 feet at the top nor does it allow heights to exceed 21 feet. Loads which are 14 feet or more in width or exceed 80 feet in overall length must have an escort. In Tennessee, inspection of the move by the Department is required; the permit is issued only after Tennessee DOT is satisfied the move can be made safely. Two escort vehicles (front and rear) are required.

Oil Well Clean-Out and/or Drilling Equipment Permits. The State of Texas issues special permits for oil well servicing, clean-out, and drilling equipment for time periods of 30 days or 90 days. The fees are calculated on a weight, size, and mileage basis. The maximum weight for any single axle or any axle within an axle group shall not exceed 25,000 pounds and the weight shall not exceed 650 pounds per inch of tire width. Arkansas, California, New Mexico, and Tennessee do not specifically identify these permits. Louisiana law provides for special permits for empty lowboys designed to transport oilfield equipment. The Oklahoma policy only states that permits will not be issued for these vehicles on Interstate Highways through Oklahoma and Tulsa Counties between 7 a.m. and 9 a.m. and 4 p.m. and 6 p.m. Monday through Friday.

Permits for Unladen Lift Equipment (Mobile Cranes). The Texas policy (See Appendix C for Minute Order 85613), effective May 27, 1987, changed permits for mobile cranes. The new rule stated that when the weight of mobile cranes exceeds 25,000 pounds per axle or 650 pounds per inch of tire width, a fee calculation permit must be obtained. The fee for movement under this scheme was based on a cost per mile. For axles weighing 20,001 pounds to 25,000 pounds, the cost per mile is 4 1/2 cents; for axles weighing 25,001 to 30,000 pounds, the cost per mile is 5 1/2 cents; for axles weighing 30,001 to 35,000 pounds, the cost per mile is 8 cents per mile. The last (heaviest) category became obsolete January 1, 1988; the second category will be disallowed January 1, 1989. At that time, the maximum single axle load will become 25,000 pounds or will be based upon the 650 pounds per inch of tire width criteria. Permits are issued in Arkansas for this category of vehicle based on the 650 pounds per inch of tire width criteria. The total vehicle weight allowed is the sum of all tires multiplied by this value. California, Louisiana, New Mexico, and Tennessee do not specifically identify these permits in their policy. Oklahoma has the same 650 pound per inch of tire width requirement as Arkansas, but sets the gross weight limit at 90,000 pounds. Mobile cranes which exceed this maximum must remove the boom, the bucket, and counter

weight to reduce the gross weight as much as possible.

Permits for Water Well Drilling Machinery. No state but Texas specifically identifies requirements for this type of equipment. In Texas, equipment used exclusively for this purpose does not require an overwidth permit provided the unit moves during daylight hours only. These vehicles must have a permit and bond when they exceed legal weight, height, or length.

Permits for Implements of Husbandry. If this equipment is overwidth only, Texas does not require an oversize permit provided these rules are followed: (1) the equipment does not exceed legal height, length, or weight; (2) movement is restricted to daylight hours only; and (3) Interstate highway travel is prohibited. These same requirements are stated for vehicles carrying farm equipment, with one additional stipulation -- movement must be made by, or on behalf of, the owner. Vehicles carrying cylindrically shaped bales of hay, if limited to a maximum width of 12 feet, do not require a permit or bond. Arkansas, California, New Mexico, and Tennessee do not specifically identify requirements for implements of husbandry. In Louisiana, a $5.00 fee is charged for an annual permit to haul farm products in their natural state. No special permits are described for farm implements. The Oklahoma policy provides for annual permits for round baled hay at a cost of $25 if the total outside width is less than 11 feet.

Bonding. In Texas, the permit applicant must have an oversize permit bond with the following exceptions:

1. Manufactured housing and portable buildings,
2. Oil well clean-out and/or drilling equipment,
3. Mobile cranes, and
4. Farm equipment (if transported by owner).

Bonding (or similar requirement) for acquiring a permit is not required in Arkansas, California, or Oklahoma. In Louisiana, a bond is required for overweight loads or for loads which are 14 feet wide or wider. The fee is $1,500 for one trip or $10,000 per year. In New Mexico, a bond can be required by the Motor Transportation Division or by a municipality. In Tennessee, the applicant must either: (1) show that he or she is in a position to indemnify the state or counties, or (2) provide a bond to cover the state or counties.

Governmental Exemptions. In Texas, governmental subdivisions must request approval and secure approved route, but are not required to purchase oversize/overweight permits or bonds. The Arkansas law states that "no fee shall be charged to any governmental agency when the vehicle is public property and the move is on official business." In California, steer axle weight limits are exempted for: public utility vehicles furnishing service for electricity, gas, water, or telephone; trucks transporting garbage; state and local weights and measures vehicles; and governmental fire service vehicles. Both Louisiana and New Mexico require governmental agencies to have permits, but these are issued without charge. Neither Oklahoma nor Tennessee policies mention exemptions for governmental agencies.

Escort Policy. The current Texas policy specifies situations which justify escorts, but no details are currently stipulated concerning the appearance of the escort. Rules are currently being prepared, however, to cover escort vehicles. The Arkansas policy states that the movement of vehicles or cargoes in excess of 12 feet in width and/or 75 feet in length shall be accompanied by a minimum of one escort vehicle on all 2-lane primary and secondary highways. Escort vehicles are not required on multilane highways or the interstate highway system unless specified by an enforcement officer. Escort vehicles are required for each 14-foot manufactured home on specific highways. No escort vehicles are required for movement of any manufactured home up to and including 14 feet wide while traveling on Interstate or other fully controlled access facilities. Escort vehicles are required both front and rear of all manufactured homes in excess of 14 feet wide. The requirements for escort vehicles describe: type of vehicle, signing of vehicle, requirements for fire extinguisher, flares, displays, lights (rotating or strobe), flags, clearance bar, radio equipment, and distance between escort and towing vehicle. California defines escort vehicle including specifications on the following:

1) Lights: top-mounted flashing amber light(s);
2) Warning Sign: bright yellow background, black lettering, minimum protected area of 440 square inches, 48 inch height;
3) Warning Flags: red warning flags with a minimum area of 16 inches square are to be mounted on each side of the escort vehicle;
4) Placard: sign showing name of company, driver, or owner; address, telephone number, letters of 2 1/2 inches minimum height;
5) Equipment: hand flag, orange vest, shirt or jacket, one STOP/SLOW paddle, two-way radio, vehicle clearance measuring device in excess of 14 feet.

The Louisiana escort policy requires the following types of escorts. State Police escorts are required for all vehicles and loads: (a) over 14 feet wide on a 2-lane highway, (b) over 16 feet wide on a multi-lane highway, and (c) over 125 feet long. City police escorts are required by the city of New Orleans for all vehicles and loads over 13 feet, 6 inches high, 12 feet wide, or 90 feet long except for movement on the interstate system. Private escorts are required for all vehicles and loads: (a) over 12 feet wide and up to 14 feet wide on a 2-lane highway, (b) over 12 feet wide and up to 16 feet wide on a multi-lane highway, and (c) over 90 feet long and up to 125 feet long. All private escort vehicles must have a Louisiana Approved Escort Permit. This permit certifies that the required safety equipment and proof of liability insurance have been verified.

New Mexico policy defines three types of escorts: non-police escort, permittee escort, and state police escort. The following are included in the policy: General Escort Equipment Requirements, General Escort Procedures, and General Regulations Pertaining to Escort Service. Specified escort vehicle signs and equipment include the following: flags, flashing lights, and oversize load signs.

Oklahoma requires escort vehicles (front and rear) on all highways of less than 4 lanes when the width of the load is 14 feet or more. One escort vehicle is required for

movement of loads 12 feet or more in width. One escort vehicle with flagman is required when the overall length exceeds 80 feet, except for manufactured homes moving on highways with 4 or more lanes. Two escort vehicles (front and rear) will be required when the overall length is 100 feet or more and/or when the overall height is 17 feet or more. Requirements are specified for escort vehicles.

Tennessee requires vehicles which exceed 15 feet in height to provide an escort vehicle in front of the load which has a clearance bar equal in height to the load to check the height of structures. Escorts are required for overwidth vehicles as follows. If the width is over 8 feet but does not exceed 10 feet, no escort is required. For width of over 10 feet but not exceeding 12 feet 6 inches: (a) no escort is required on the interstate highway system, 4-lane highways, or 2-lane highways with a minimum pavement width (excluding paved shoulders) of 24 feet, (b) one escort vehicle is required in front of the load when the pavement width is less than 24 feet wide, and (c) a flagperson is required at all bridge structures if the roadway width is less than 20 feet. If the width of the load is over 12 feet 6 inches but not over 14 feet, the following criteria must be met. One escort vehicle is required to follow the load on the Interstate system or on four-lane highways. One escort is required to precede the movement on two-lane highways. Specifications for signing and marking escort vehicles are provided. If the load is over 85 feet long but not over 120 feet long, one escort is required to follow the load. If the length is in excess of 120 feet, two escorts are required, one in front and one in the rear. Tennessee escort requirements for manufactured housing are similar in some ways to those noted above for other overwidth loads. For widths of 10 to 12 feet, no escort is required on the interstate system, 4-lane highways, or 2-lane highways which are 24 feet in width. One front escort is required when the width of 2-lane highways is less than 24 feet. A flagperson is required at bridges where pavement width is less than 20 feet. For widths from 12 to 14 feet, front and rear escorts are required on all 2-lane roadways. Front escorts are not required on interstates or four-lane highways. Radio communication is required for this width between escort and towing vehicle. The towing vehicle for 14 feet wide moves must be at least 14 feet 6 inches in length. The maximum width now permitted (effective 1988) in Tennessee is 16 feet. Table 2-3 is a summary of some of the requirements which occur most frequently in the various state policies.

Table 2-3. State Escort Requirements

Requirement	TX	AR	CA	LA	NM	OK	TN
Type Vehicle	No	Yes	Yes	No	Yes	Yes	No
Sign	No	Yes	Yes	Yes	Yes	Yes	Yes
Flares	No	Yes	No	Yes	Yes	No	No
Beacon	No	Yes	Yes	Yes	Yes	Yes	Yes
Clearance Bar	No	Yes	No	No	No	No	Yes
Radio	No	Yes	Yes	Yes	Yes	No	Yes
Placard	No	Yes	Yes	Yes	Yes	No	No
Headway	No	Yes	No	No	No	No	No

Chapter 3. CAPACITY AND SAFETY CONSIDERATIONS

INTRODUCTION

The pavement structures of this nation's streets and highways are designed to withstand certain axle loads applied by trucks. It has been estimated that one 5-axle truck loaded to its maximum legal weight of 80,000 pounds has the same loading impact as 9,600 passenger cars (7). Therefore, attention to truck axle loads is extremely important in maintaining the street and highway systems' structural integrity.

There is no question that many of our nations roadways are wearing out much sooner than expected. In some cases, design traffic projections were grossly underestimated and the life of the pavement structure was quickly shortened. However, many states attribute early pavement deterioration to overloaded trucks, both permitted and illegally operating without permits.

States do not want to prohibit the movement of industrial equipment, shipment of local commodities, or unique personal items (mobile homes for instance) for fear of negatively impacting local economy or curtailing business operations. At the same time, states have the responsibility for maintaining roadways in a safe and efficient manner, and pavement management is a primary area of responsibility.

Most states recognize that 10 to 25 percent of trucks operating on their roadways are overloaded. Similar information indicates that about 20 percent of trucks on federal-aid highways have axle loads greater that what is permitted by statutory limits (8). Many of these trucks which qualify for a nondivisible load permit are operating without one. Others would not qualify for this type permit and are simply overloaded.

There is no uniformity of practices in pavement design, permit issuance, and enforcement among the states, although all states recognize that overloaded trucks affect the lives of their roadway pavements (8). Permit fees among the states are also inconsistent and typically do not reflect the cost of damages inflicted by these heavy trucks. In comparison with other states, Texas has a very lenient permitting policy. In general, restrictions are minimal and fees are very inexpensive.

It is apparent that Texas should make some modifications to its existing oversize/overweight permitting policy. The current centralized permitting operation has been a significant recent improvement in regards to the operational aspects of the policy. However, additional policy changes are necessary to provide better enforcement, more feasible permitting fees and fine structures, and safer movement of oversize/overweight vehicles on state highways.

In order to preserve the integrity of highway pavements, axle weight loads must be kept to the legal limits. Hence, overweight vehicles must be restricted from state highways unless they can be permitted. Convenient methods for truck weighing (weigh-in-motion for example) are crucial for enforcement purposes. If enforcement cannot be provided in an effective manner, it essentially will be ignored.

In most states (Texas included), the penalties for being caught with very heavy loads are relatively small in comparison to the economic advantages afforded the trucker who hauls overloaded (8). Transportation engineers generally agree that most truckers are not paying a fair share of the roadway structural damages inflicted by their vehicles. This is especially true for grossly overweight vehicles that are either permitted or are operating illegally. Hence, permit fees should probably be based and calculated on the potential damages that a vehicle will inflict on the pavement structure (weight and distance of travel) and fines for overweight vehicles should be substantially greater than permitting fees to encourage compliance with the permitting process.

The presence of an oversize/overweight vehicle on a roadway usually affects the safety and efficiency of traffic flow. These effects become greater as the size of the vehicle increases and as the speed of the vehicle (usually directly related to its weight) decreases. Removal of these vehicles from the roadway during certain time periods is one element that offsets the flow deficiencies. Visible and uniform application of appropriate warning devices and escort vehicles are important elements of safe traffic operations.

Consideration must be given both length and width of oversize vehicles and how to provide adequate warning to other drivers. Extremely long vehicles pose a problem in turning situations because of excessive offtracking. A good example is movement of reinforced concrete or steel beams. Two turning situations are critical -- at-grade intersections (including those at diamond interchanges) and loop ramps.

Because turning vehicles produce such large track widths, they may create operational problems. As shown in a later section, most of these beams are under 100 feet in length, but the trend is toward longer beams. A comparison of the maximum track width of an 80-foot beam vehicle and the WB-40 and WB-62TX design vehicles is shown in Table 3-1. These values were determined by using the FHWA Offtracking Model (9) which is basically a simulation of the tractrix integrator. The user can determine low-speed offtracking, given spacings between articulation points. Beam lengths of up to 140 feet are being moved by truck in Texas, but not as often as those under 100 feet. For Table 3-1 values which apply to the beam truck, the tractor wheelbase is 22 feet and the wheelbase for the trailer (beam) is 70 feet. The program uses the distance from the connecting point to the rearmost axle. It was assumed that this distance would be 10 feet less than the beam length (5 feet on each end).

Right turns at intersections are especially difficult for these long vehicles. A number of intersection configurations might be encountered -- two-lane roadways intersecting with other two-lane roadways, two-lane roadways intersecting with four-lane roadways, and one-lane roadways (e.g. ramps) intersecting with two- or four-lane roadways. All of these turns become more difficult if channelization is present at the intersection. Obviously, all intersections cannot feasibly be built to accommodate these seldom-occurring demands. Therefore, the escort vehicle driver becomes extremely valuable in making intersection operations safe under these conditions. In some cases, the escort driver must stop all other traffic to allow the overlength vehicle to negotiate the turn.

Table 3-1. Maximum Track Width (feet)

Geometric Feature	WB-50	WB-62TX	80' Beam
Loop Ramp 300 ft. R	N/C[1]	N/C[1]	18
Intersection 100 ft. R	14.5	19.1	N/C[1]
Intersection 45 ft. R	20	26	44

[1] Not calculated.

In order to determine how much intersection pavement area would be needed for the 80-foot beam vehicle, an intersection with a two-lane roadway intersecting with a four-lane roadway was drawn to scale. Curb returns were 25 feet and lanes were 12 feet wide. The FHWA Offtracking program output for the beam vehicle was then superimposed over the intersection drawn at the same scale such that the beam truck was making a right turn from the two-lane roadway onto the four-lane roadway. The results indicated that the beam truck could not make the turn without using the entire two-lane roadway and the full width of the four-lane roadway. However, this left absolutely zero margin for error, which is unrealistic. For the case of four lanes intersecting four lanes (48 feet of pavement width), the beam vehicle must cross the centerline on the approaching roadway by about 12 feet and still use all of the cross street width.

In negotiating loop ramps such as at cloverleaf interchanges, extremely long vehicles such as the 80-foot beam truck may also create operational problems. The FHWA program was used to determine the offtracking characteristics of this vehicle on a ramp of 300-foot radius. According to this program, the maximum track width was 18 feet for this turn. In Table X-3 of the AASHTO Green Book, pavement widths for such ramps should be 22 feet in width. This represents the width for "Design Traffic Condition C," which means sufficient bus and combination-types of vehicles to govern design. Using this design width would allow only two feet on each side of the beam vehicle. This is certainly a bare minimum and represents a slow-speed situation.

Even on tangent sections on two-lane two-way roadways, other drivers are often intimidated in attempts to overtake these long vehicles. Adequate warning devices which clearly identify the load as overlength, along with qualified escort drivers, are absolutely essential in maintaining a reasonably safe environment for all motorists.

ROADWAY CAPACITY CONSIDERATIONS

Development and operation of the Texas permit policy for oversize and overweight vehicles is essential to protect the integrity of the state roadway structure. The policy also provides direct benefits or protection to the motoring public. Every oversize or overweight vehicle affects the normal operation of a roadway to some degree. Hence, motorists who share the use of a roadway with an oversize or overweight vehicle "suffer" some economic loss due to delays or inconveniences. Recognizing that total prohibition of oversize and overweight vehicles from all state roadways is not logical, feasible, or desirable, the intent of a permitting program would be to insure that these unique vehicles do not unduly endanger or inconvenience the general public.

Traffic engineers analyze roadway operational conditions by computing a theoretical "capacity" (traffic volume) of the roadway, determining the existing (or anticipated) traffic volume using (or expected to use) the roadway, and assigning a value (level-of-service identification) that defines the operational efficiency of the roadway. When traffic volumes are much less than the theoretical capacity of the roadway, a level-of-service designation of "A" or "B" is assigned to the operational efficiency. As volumes approach the theoretical capacity, level-of-service designation of "C" or "D" are assigned. Level-of-service designations of "E" or "F" represent congestion (or forced flow) that is typical during peak hours on major city freeways.

Accident statistics clearly indicate that as traffic volumes increase on a roadway, the number of accidents on that roadway usually increases as well. Hence, as the operational level-of-service of a roadway decreases, the number of accidents on that roadway is expected to increase. If a roadway operates at high efficiency (high level-of-service), accidents are expected to be at a minimum. Therefore, operational safety is optimized as operational efficiency is optimized.

There are many factors which affect the determination of roadway capacity and, therefore, operational safety and efficiency as well. These factors are defined by the Highway Capacity Manual (10) and are listed below.

Design Speed - Roadways designed for high speed operation do not have sharp horizontal curves, short vertical curves, or steep slopes which negatively affect operational capacity.

Lane Width - Lane widths less than 12 feet and greater than 10.5 feet are somewhat restrictive and reduce the capacity of a roadway by a small percentage. Lane widths less than 10.5 feet have a more significant negative effect on roadway capacity.

Shoulders - The presence of shoulders increases roadway capacity by a substantial margin. Shoulders narrower than six feet or the total absence of shoulders obviously restricts vehicular movement and reduces capacity.

No Passing Zones - The lack of passing zones leads to a reduction in operational capacity.

Vehicle Distribution - A roadway carrying 1,000 passenger cars in an hour would experience much less congestion and operational restrictions than a similar roadway carrying 1,000 trucks in an hour. The type (or distribution) of vehicles using a roadway

significantly affects operational capacity. As the percentage of trucks, buses, and recreational vehicles increases on a roadway, operational capacity (and efficiency) decreases.

Directional Split - Most roadways accommodate traffic in two directional flows. The theoretical capacity of a roadway assumes an even split in directional flows. Hence, if one direction of flow is much greater than the other, the capacity of the roadway is reduced.

Terrain - A roadway built in rugged or rolling terrain often must sacrifice ideal horizontal and vertical alignments for more economically feasible alignments. Consequently, construction of "sharp" horizontal curves, short vertical curves, and steep slopes may be necessary. Less than desirable geometric conditions will reduce operational capacity and efficiency.

The presence of an oversize or overweight vehicle on a roadway may negatively affect the operational efficiency (or capacity) of the roadway. Oversize vehicles may block a portion of a lane, thus lessening its effective width. These vehicles may block the view of motorists and restrict or negate the opportunity to pass. Overweight vehicles may travel at speeds much slower than the roadway's operational speed resulting in the potential blockage of other vehicles from normal through movements.

Permitting an oversize or overweight vehicle to use a roadway facility may result in operational restrictions characteristic of what might result from adding a large number of additional smaller vehicles to the traffic stream. Capacity analysis assumes that large vehicles and turning vehicles "equate" to a certain number of through passenger cars. This procedure allows the traffic engineer to convert all vehicles to one standard, the passenger car. Using this analogy, it is possible to estimate the impact that a very large, slow moving vehicle would have on a roadway. Realistically, such a vehicle might equate to 200 vehicles. Permitting such a vehicle to use a roadway would be similar to placing 200 passenger cars on the roadway at essentially the same location. The impact of such an action would be significant if the roadway is operating at or near capacity. If the roadway is isolated or operating at a very high level-of-service, the impact would be minimal.

It is not advisable to permit certain oversize or overweight vehicles to use some roadways at any time or during certain times of a day. Such restrictions already exist in some major cities in Texas. Some states (Virginia, California, and Louisiana, for example) publish pamphlets or booklets that identify restricted areas which are helpful to interested parties.

It is probable that many urban and rural roadways in Texas operate at or near capacity at certain times of the day and are not restricted to oversize or overweight vehicles because the centralized permitting office is unaware of the roadways' operational conditions. It would be advisable for all SDHPT district offices to provide the centralized permitting office with a map or listing (possibly via a computer data base) of restricted roadways with applicable dates and times. Permanent restrictions may be necessary in some instances.

Another alternative is to establish in the computer data base the most recent traffic volume counts and geometric cross sections for all roadways on the state system. Theoretical capacities for all roadways could be determined and compared with traffic volume counts to estimate level-of-service conditions. Restrictions could be applied on a roadway during peak hours (or possibly during the entire day) if certain ranges of volume to capacity ratios were identified. This is an extreme oversimplification of what would be comprehensive and detailed analyses of numerous roadway segments throughout the state. Such a system could be developed and implemented if sufficient time and funds were made available. At the present time, however, time restrictions on oversize load movement (curfews) identified at the SDHPT district level appear to be more feasible because of the districts' proximity, and thus awareness, of the situation. The simplicity of curfews is a good reason for their use. As traffic monitoring capabilities improve, along with the ability to communicate traffic conditions to the Central Permit Office, a higher level of sophistication may become feasible.

OPERATIONAL SAFETY CONSIDERATIONS

Because the placement of oversize or overweight vehicles on a roadway has the potential to impact operational capacity and efficiency, it also has the potential to impact operational safety as well. Efforts to determine accident rates relative to oversize and overweight vehicles were, for the most part, unsuccessful. Two categories of permit loads are evaluated below based on information available in the State of Texas. Only one specific designation was found on the Department of Public Safety accident report form which identified the involvement of a permitted oversize or overweight vehicle. This was referred to as a "truck towing a trailer house" on the DPS accident report form, which means mobile homes. The second evaluation addresses the movement of concrete beams.

Mobile Home Safety Record. Even though numbers of accidents involving mobile homes can be established, the number of homes moved and the distance they moved cannot. Values which might be useful to future studies are presented anyway for information. Characteristics of mobile homes which affect their safety during movement are also presented. The Texas Department of Public Safety (DPS) records indicated that a total of 100 accidents in 1987 involved manufactured housing. Not enough information was available to establish the cause of the accident. The average intrastate trip length of a large carrier was 159 miles; for a smaller one, it was 100 miles. According to the Texas Real Estate center, the number of new and used homes changing ownership during the 1987 calendar year was 41,178. Unfortunately, the number of these homes which were moved on the public streets and highways is impossible to estimate with any degree of accuracy.

One weakness in the current design of mobile homes is the axle design. Each axle is designed to carry 6,000 pounds. When the unit leaves the factory, this design is adequate, but after furniture items and other household furnishings are added, the weight is increased significantly. Some movers will not move the unit if such items as pianos and water beds are left inside the home. Other problems may relate to tires which deteriorate with long periods of storage. When used again, they may not sustain the load, especially

during hot weather. Movers of mobile homes stated that if a tire blows out on a two-axle home, the other one on the same side is also likely to go due to the immediate weight transfer. One mover recently moved an 88-foot home equipped with 6 axles. He stated that every time he had to make a 90-degree turn, he blew out the extreme front and rear tires on the house because of the scrubbing action during the turn. This mover strongly believed that unless better undercarriage and suspension can be developed for mobile homes, the size should be limited to something less than currently allowed. In another situation, a mover was having so much trouble moving a heavily laden home, he had to hire a welder to come out to his location and add another axle to help support the load.

Another requirement which should be considered is for multi-wides to be covered (with plastic) on their open side. Without this covering, the contents of the home are subject to being blown out as it is pulled at highway speeds. Yet another safety issue is the mobile home's electric brakes. They are required from the factory and stopping distances are specified by law, but these brakes often do not work, according to movers interviewed. Obviously, stopping distance is increased significantly, especially on wet pavements and/or at speeds higher than about 40 to 45 miles per hour.

Permitted mobile homes are required to have a flashing yellow beacon on the top of the truck cab and on the rear of the home. The beacon is eight inches high. Sometimes the route involves marginal overhead clearances, and beacons get knocked off. The beacon becomes a 20-pound projectile which could possibly go through a windshield. One mover mounted the beacon on the back of the home near to, but below, the roof line. Law enforcement officers stopped him and informed him that the beacon in the back did not comply with the law.

Interviews with movers of manufactured housing units, called "toters," provided interesting insights into their movement on the state's highways. One in the Houston area stated that there are only six legal carriers located there, even though there are twenty listed in the telephone directory. These others are called "bootleggers" by the industry. They apparently can operate much cheaper illegally and thus increase their profit margin.

Concrete Beam Safety Record. The Precast Concrete Manufacturers Association (PCMA) conducted a survey of its members to determine the number and lengths of beams which have been moved over the past few years. Table 3-2 incorporates the survey results (6).

In the same survey of PCMA members noted above, the safety record was investigated by asking how many accidents these beam trucks were involved in. PCMA members only reported three accidents which their beam trucks were involved in during this same four-and-one-half year time period. Two of these were reported to be minor, while one major accident resulted in a fatality. One additional fatality involving a non-PCMA member was also acknowledged. Yet other accidents by non-PCMA members may have gone unreported. Any evaluation of these accident data must recognize they are potentially biased. Unfortunately, the Texas Department of Public Safety does not identify concrete beams in records which they maintain.

Table 3-2. PCMA Survey Results

Length (feet)	1983	1984	1985	1986	1987	TOTALS	%
0 - 99	5,311	6,976	8,463	11,254	5,876	37,880	86
100-120	607	913	536	1,203	1,047	4,306	10
121-130	60	448	441	208	252	1,409	3
131-140	13	38	38	126	0	215	1
TOTALS	5,991	8,375	9,478	12,791	7,175	43,810	100%

Assuming only two fatalities in four and one-half years, one can compute an accident rate for the movement of beams during this time period. PCMA used an average round trip travel distance of 275 miles to compute an accident rate. If this is a valid round trip distance, the more appropriate comparison of accident rate should be made using loaded mileage rather than total. If trucks are always loaded in only one direction, the travel distance would be approximately half the mileage quoted. Any difference would be primarily due to an authorized route for the loaded vehicle being longer than the return trip which would usually be more direct. If half the average of 275 miles is used, the total loaded mileage traveled during this time period would be just over 6 million miles. This is equivalent to one fatality in three million miles. Obviously, using one sample of vehicles with two different samples of accidents is not scientifically accurate. However, if these numbers are reasonably close to being representative, the safety record for concrete beam movement appears to be good.

From the PCMA survey results, it would appear that the number of accidents is small. More important, perhaps, is the severity of accidents when they do happen. The weights of these vehicles is a factor in stopping distance, but the braking system is even more critical. According to truck drivers who transport these beams, the delay in trailer brake application from the moment the pedal is depressed can be as long as 5 to 10 seconds. Consequently, stopping distances of these trucks are extremely long, in comparison to other vehicles. Because roadway design elements do not always encompass these unique vehicles, additional safety precautions must be consistently used. The escort driver is an extremely important element in making up the difference between the "design vehicle" and vehicles which are atypical in their operational characteristics. SDHPT has recently evaluated the number of escorts which should be required for convoys of beams. The outcome will, no doubt, result in new rules. This must also include severe penalties for noncompliance in order to be effective. Without proper training and knowledge of these unique vehicle characteristics, however, escort drivers will not cause the movement of these oversize/overweight loads to be as safe as they should be.

The current Texas policy states that an escort is required for a beam over 99 feet in length. As of August of 1987, the Precast Concrete Manufacturers' Association (PCMA)

and the Texas State Department of Highways and Public Transportation were each proposing the ratios shown in Table 3-3.

Table 3-3. Comparison of PCMA and SDHPT Proposals

PCMA PROPOSAL		SDHPT PROPOSAL	
Beam Length	No. of Escorts	Beam Length	No. of Escorts
99' to 130'	6 Trucks, 2 Escorts 8 Trucks, 3 Escorts	99' to 140'	3 Trucks, 2 Escorts 1 Truck, 1 Escort
130' to 140'	4 Trucks, 2 Escorts		Change 95' overall length to 110' on 90 day permits.

The standardization of escort requirements became important for several reasons. When beam haulers bid a job, they need to know how many escorts to plan for when the move occurs. Also, if an unusually large number of beams is scheduled to be moved, the contractor needs to know how many escorts will be needed. The number of escort drivers available may dictate how many beams are moved at one time. A prevalent argument against higher numbers of escorts is that too many rotating beacons too close together are confusing to other motorists. Also, when a large number of beams are being moved by a contractor, a requirement for more escorts may tax the normal supply and require hiring people who are less qualified, thus making the move less safe.

Literature Review. Only one publication was found that addressed the evaluation of oversize vehicles on the roadway. It was a November 1976 report by the Virginia Highway and Transportation Research Council entitled "An Evaluation of the Movement of 14-Foot Wide Manufactured Housing Units in Virginia." The purpose of the Evaluation Study was to determine if 14-foot-wide loads should be allowed on the highways in the Commonwealth of Virginia. The study was "intended to provide information concerning the transportation aspects of wide housing units which, along with other data such as economic and societal factors, must be weighed by decision makers to determine whether or not 14-foot wide loads should be allowed on the highways in Virginia." (VA) The study report provided some information that is relevant to analyzing the movement of all oversize/overweight vehicles on highways.

The Virginia study identified the following:

1. There was little conflict between typical vehicles and oversize vehicles on divided highways; however, there was substantial conflict between typical vehicles and oversize vehicles on two-lane roadways and on urban four-lane undivided facilities.

2. An analysis of speed, volume, impedance, and conflict data indicated that safety of the motoring public is improved when the speed of the oversize vehicle closely matches the speed of other vehicles on the roadway.

3. Vehicles typically moved onto the shoulder when meeting oversize vehicles, especially when the roadway was narrow and when the oversize vehicle was wider than 12 feet.

4. Oversize vehicles frequently encroached onto the adjacent lane of travel when negotiating sharp curves and where narrow lane widths, narrow structures, or narrow shoulders were present.

5. Vehicle queuing occurred often on two-lane roadways but not on multilane facilities.

6. Several instances of "safety incidences" (unbalanced loads, wheel failures, etc.) were observed during field tests.

These results are not necessarily surprising; rather, they confirm basic assumptions made concerning operational and safety problems related to oversize/overweight vehicle movements.

Although numerous oversize/overweight vehicle permits are issued daily in Texas, interaction with such a vehicle by the typical Texas motorist is a rare event. Therefore, anytime that a motorist comes into conflict with an oversize/overweight vehicle, his driver expectancy would be "violated." The basic solution to any driver expectancy problem is adequate advance warning. In addition, driver expectancy is reinforced by standard and consistent application of driver information. It is advisable, therefore, that the advance warning for oversize/overweight vehicles be consistent so that motorists will immediately recognize the presence or arrival of an oversize/overweight vehicle on the roadway.

Some oversize/overweight vehicles can use certain roadways without affecting the traffic flow or operational efficiency of the roadway, either because they maintain operational speed or because the traffic volumes are extremely light on the roadway. Markings on the vehicle which indicate that it is a wide or long vehicle would most likely suffice for adequate warning to other motorists.

On the other hand, oversize/overweight vehicles that would restrict normal traffic flow on more heavily traveled roadways because of their length, width, or speed require more positive advance warning. This type of warning is normally provided with "pilot" cars or "escort" vehicles. For the purpose of this report, the term "escort" vehicles will be used.

The "Oversize-Overweight Permit Booklet" (3) published by the SDHPT refers to "escort" or "escort vehicles" in only eight paragraphs. Applicable statements from the Booklet include the following:

"ESCORT VEHICLE - Is defined as a vehicle stationed either in the front or

rear of an oversize and/or overweight load, and whose function shall be to warn either oncoming or trailing traffic of the oversize and/or overweight load."

"Escorts are not normally required for the movement of permit loads that are overweight only."

"A rear escort will be required when the overall length exceeds 100', or whenever a load has a rear overhang in excess of 20'."

"Vehicle combinations powered by a truck-tractor will be required to have a rear escort and will be limited to daylight only movement, when the length of the semitrailer and load exceeds 85', or when the rear overhang exceeds 20'."

"Front and rear escorts are required for all loads exceeding 16 feet wide; however, the issuing Permit Office may require escorts for loads with widths less than 16 feet."

"Escorts are not normally required for overheight only loads."

"Manufactured housing that exceeds 16' wide but does not exceed 18' wide must have a front escort on two-lane highways, and when traveling on a highway of four or more lanes shall have a rear escort. Manufactured housing that exceeds 18' wide shall have front and rear escorts on all highways."

"Only single trip permits can be issued for the movement of portable buildings. Permits that exceed 16 feet wide should have front and rear escorts."

It is readily apparent that Texas does not require any type of "standard" markings for escort vehicles, nor does it require the drivers of escort vehicles to be knowledgeable or proficient in their duties. All states require escort vehicles when the oversize or overweight vehicle exceeds a certain limit. (11) Except for this general policy, there is no uniform provision or requirements for escort vehicles among the states.

Some states have developed extensive guidelines and requirements for escort vehicles and their drivers. These states include: Arizona, California, Louisiana, New York, Oklahoma, Tennessee, and Virginia.

In general, escort vehicles are typically defined as pickup trucks, station wagons, or passenger cars. Motorcycles are not recommended. Escort vehicles are required to be equipped with specific items such as warning lights (of certain size and color), signs (of certain size, color, and text), flags (of certain size and color) and additional markings. To insure that communication between other escort vehicles and the oversize/overweight vehicles is maintained, two-way radios are required.

Other types of equipment that may be required are emergency medical equipment, fire extinguishers, flagman apparel, and a clearance bar to check clearances for oversize loads. Some states (particularly Virginia, Louisiana, and New Mexico) have fairly rigid requirements for escort vehicle drivers. It is apparent that the state places the responsibility for the safe movement of the oversize/overweight load on the escort vehicle driver. Virginia requires that all escort vehicle drivers be separately tested and licensed for driving escort vehicles. New Mexico requires that all escort vehicle drivers have medical certificates. Louisiana requires that all escort vehicles be licensed as "commercial" vehicles and separately insured for escort servicing.

Many states itemize specific duties and responsibilities of the escort vehicle driver. Some of these requirements include:

1. Always drive with headlights and warning lights "on."
2. Maintain a 1,000-foot gap between the escort vehicle and the oversize/overweight vehicle in rural areas, and a 300-foot gap in urban areas.
3. Make sure that traffic following is not detained more than 10 minutes. (In other words, the oversize/overweight vehicle must move off of or to the side of the roadway to provide passing opportunities.)
4. Contact certain individuals in cities before entering their jurisdictional area.

Requirements for consistent escort vehicle markings is a viable goal for any state. Also, specific operational requirements for escort vehicle drivers is also a desirable goal. Benefits of "standardizing" escort vehicle operation include the development of driver expectancies (recognition of oversize/overweight vehicle movements), more knowledgeable individuals who take the responsibility for the safe movement of the oversize/overweight vehicles, and "safer" movements of oversize/overweight vehicles relative to both the motoring public and the special vehicles as well.

It is advisable that the SDHPT develop a policy for escort vehicles as part of its oversize/overweight permit operations. This policy should include as a minimum the following elements:

1. Specific conditions which warrant escort vehicle usage.

2. Standard markings for escort vehicles, including flashing lights, flags, and signs.

3. Equipment to be carried by the escort vehicle, including two-way radios, flagman apparel, fire extinguisher, and flares.

4. Duties and responsibilities of the escort vehicle driver, including operation of flashing lights, gap maintenance, provision of passing opportunities, and proper procedures for stopping traffic when necessary. (A listing of do's and don'ts would be appropriate as well.)

CHAPTER 4. ENFORCEMENT ISSUES

INTRODUCTION

The trend in overweight citations issued by Texas Department of Public Safety (DPS) is given in Table 4-1. It should be noted that even though gross weight violations have been decreasing from 1983 to 1987, single and tandem axle violations have not. This is probably due primarily to unequal distribution of the load.

Table 4-1. DPS Summary of Weight Citations

YEAR	SINGLE	TANDEM	GROSS	TOTAL
1983	928	13,312	32,554	46,794
1984	1,027	12,126	25,638	38,791
1985	1,168	12,660	18396	32,224
1986	1,175	12,649	12,560	26,384
1987	1,097	12,368	10,421	23,886

One problem currently needing change in Texas is that a peace officer cannot enforce the conditions of a permit. A flagman may be required but there is no provision in the law for a penalty if the flagman is not provided. A permit stamped for speeds not to exceed 40 mph cannot be enforced. The trucker can travel at the posted speed limit.

In terms of keeping accident records on large trucks, DPS will begin keeping more complete records beginning January 1, 1988. These records will be more descriptive and will be much more useful for research and investigative purposes. They will specify hazardous materials for vehicles over 10,000 pounds. A copy of the new form can be found in Appendix D. DPS will also begin keeping a profile on all truckers -- accidents, arrests, and inspections -- so that when drivers are stopped, a quick check via radio of computer records may reveal pertinent information. Safety Net is a Federal program for tracking this same information. A state will be selected soon to be the Federal center for all states' records. Another facet of this will be alcohol/drug abuse by drivers.

The Texas Attorney General's office has made progress in reducing the number of overweight offenders in the state. When they first got involved in oversize/overweight matters, the top offender in the state had 999 outstanding violations. In 1987, that same trucker had only 20 violations. Overweight violations commonly approached and even exceeded 100,000 pounds gross vehicle weight. Now, gross weights are usually much closer to 80,000 pounds for 5 axle tractor-semitrailers. From January to December of 1986, there were a total of 7,497 oversize citations written. A few of these vehicles had

more than one violation. There is no way to know how many citations were issued for only overweight vehicles which could have been permitted and thus become legal. Also, there were permits issued for loads which could have been disassembled, but were not.

Senate Bill 595 gives the Railroad Commission the authority to impose a civil assessment fine of up to $10,000 against a trucker over and above any other fine imposed by DPS. DPS personnel think that in a few years this will have a major impact on truck weights. According to DPS sources, the law which has had the biggest impact thus far on overloads was the one which took effect on January 1, 1984, providing for prosecution of shipper or receiver of overloaded trucks. This is considered as aiding and abetting an illegal offense.

FIELD STUDY

Introduction. A field study was conducted for the ultimate purpose of determining the number of vehicles passing a selected location which should have been permitted, but were not. Even though this single study result cannot be expected to represent all roadway types and geographic areas in the state, it provided a test of the study methodology used and yielded information regarding the vehicle mix on this roadway.

The location selected was Interstate 10 on the east side of the Houston metropolitan area just east of Sheldon Road in Channelview. Figure 4-1 illustrates the location and its proximity to the ship channel and other major roadways. The study was conducted on two consecutive days -- June 29 and 30, 1988 (Wednesday and Thursday). The Department of Public Safety (DPS) assisted in the initial site selection process by identifying appropriate locations to study permit load activities.

Methodology. Site selection was somewhat dependent on the method used to monitor permit load activity. The following criteria were used to select a site where the monitoring system could be deployed: overhead structure which would allow one tripod-mounted camera over the lanes (for width and height measurements) and another beside the roadway (for length measurement), high frequency of oversize/overweight vehicles, parking area for study vehicles, and location where the Central Permit Office could accurately identify the number of vehicles permitted on any given day.

Of the two sites evaluated, the I-10/Sheldon Road location (milepost 794) was selected. A pilot study was conducted at this same site to test the experimental method. The equipment used was as follows: two video recorders mounted on tripods, a 35 mm camera with telephoto lens, a portable weigh-in-motion (WIM) system, and walkie-talkies for communication. The results of the pilot study were favorable for use of this system except for the portable WIM system. Only one lane could be monitored due to limited equipment and vulnerability of the oscillator attached to the outside edge of the WIM mat. The outside lane was the only one of the three eastbound lanes which could be monitored. Due to the roughness of the outside lane, many trucks used the other two and did not cross the WIM mat. Because of this problem and the fact that 98 percent of all permit loads are oversize (detectable by visual measurement), the WIM system was eliminated from further use in this study.

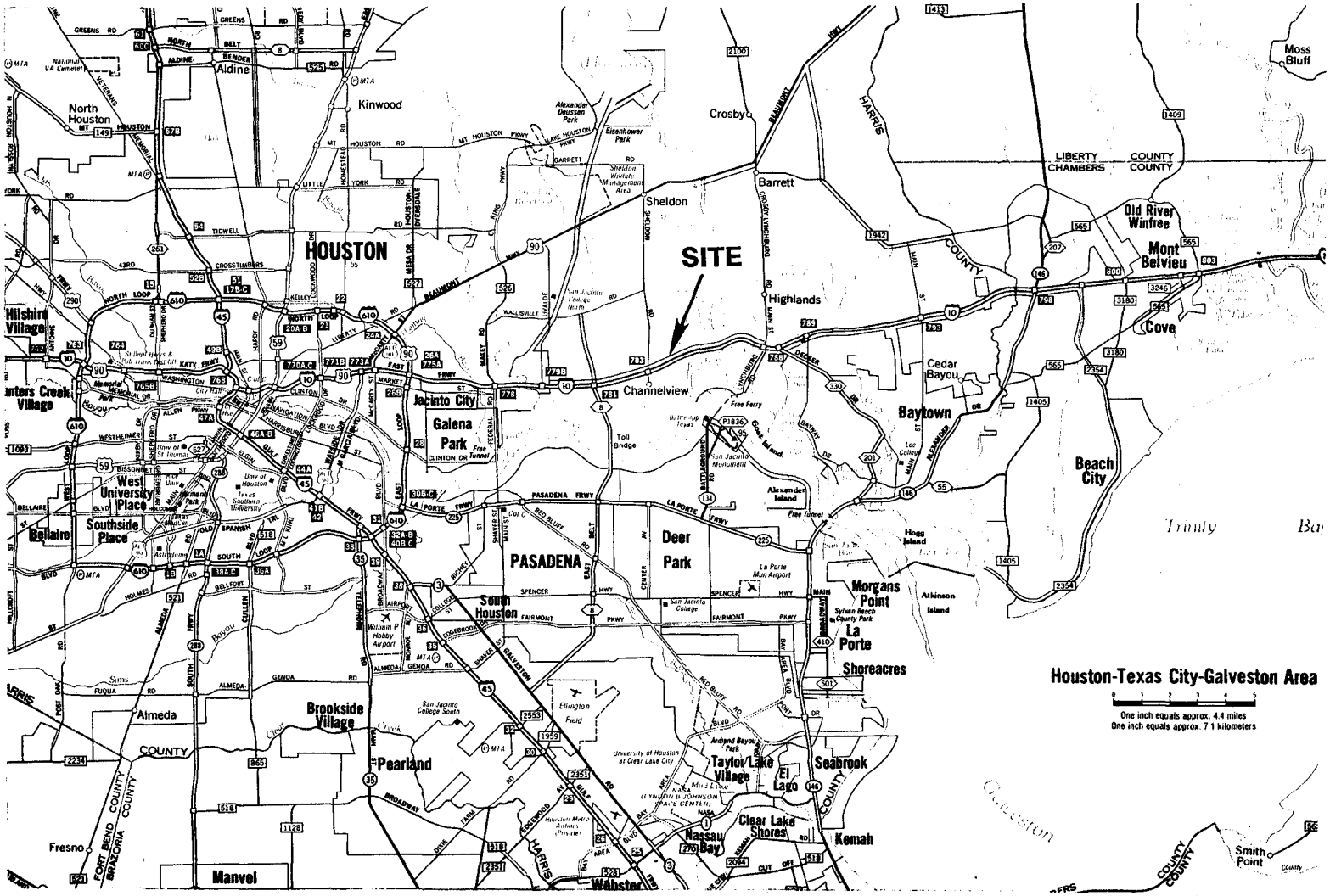


Figure 4-1 Field Study Site

Visual clues used by field crews to initially identify permit vehicles were as follows: escort vehicles, the use of rotating beacons and/or headlights, use of WIDE LOAD or OVERSIZE LOAD signs on the front of vehicles, loads which are wider than the trailer on which they are loaded, and particular classes of vehicles such as mobile cranes and tractor-semitrailer combinations with more than five axles. Field personnel were shown slides of all the major types of vehicles typically using permits prior to the field study to help them in identifying these vehicles.

Along the section of Interstate 10 selected for study, a pedestrian overpass was found which met the necessary criteria. It had very little pedestrian traffic, and it provided opportunity for use of both overhead and side-mounted cameras, high enough above the travel lanes to monitor target vehicles even in the center and left lanes. For recording the width and height of each vehicle and load, one camera was mounted directly over the traffic lanes being studied -- over the center of the outside (right) lane. A second camera was mounted at a 90-degree angle to traffic to capture the side view of each target vehicle. Only the eastbound lanes were monitored because of limitations in the number of available recorders and personnel. Figure 4-2 illustrates the layout.

The profile and alignment of the freeway in the eastbound direction was conducive to early vehicle recognition by both its horizontal and vertical alignment. The freeway crossed over Sheldon Road within one-quarter mile of the pedestrian overpass, creating a crest vertical curve and a horizontal curve to the left for eastbound traffic. Therefore, both the front view and the side view of each vehicle was visible through binoculars as it crossed over Sheldon Road. The most serious limitation to the site selected was the limited line of sight of the side camera operator due to trees.

The "target" point for the overhead camera was 400 feet downstream of the pedestrian structure. For the side-mounted camera, there was no flexibility in this distance. It was simply the distance available to each lane from the point on the structure (see Figure 4.2). By using a known dimension and its scaled measurement on the video monitor, a scale was determined which was used to measure the length, width, and height of vehicles identified in the field as potentially oversize. This scale was different for each lane. The 35 mm camera with telephoto lens was used to photograph the fronts of vehicles to capture license tag numbers or to photograph vehicles on the frontage road. Video recorders were kept stationary.

Each day of the field study began at 7:00 a.m. and ended at 8:30 p.m., essentially dawn to dusk. The curfew in Houston from 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. discouraged most of the oversize traffic, however the study site was outside the city limits of Houston and some vehicles may have still been legal within the curfew time period. Two shifts were operated each day, the first began at 7 a.m. and the second began at 2 p.m. Summary tables in Appendix E show the vehicles observed each day by field crews and the vehicles routed past the study site by the Central Permit Office.

Difficulties encountered during the field study were as follows. Video recorders use rechargeable batteries which operate for about 30 minutes of continuous recording, or for about 2 to 3 hours in this field study if placed on standby mode following a recording

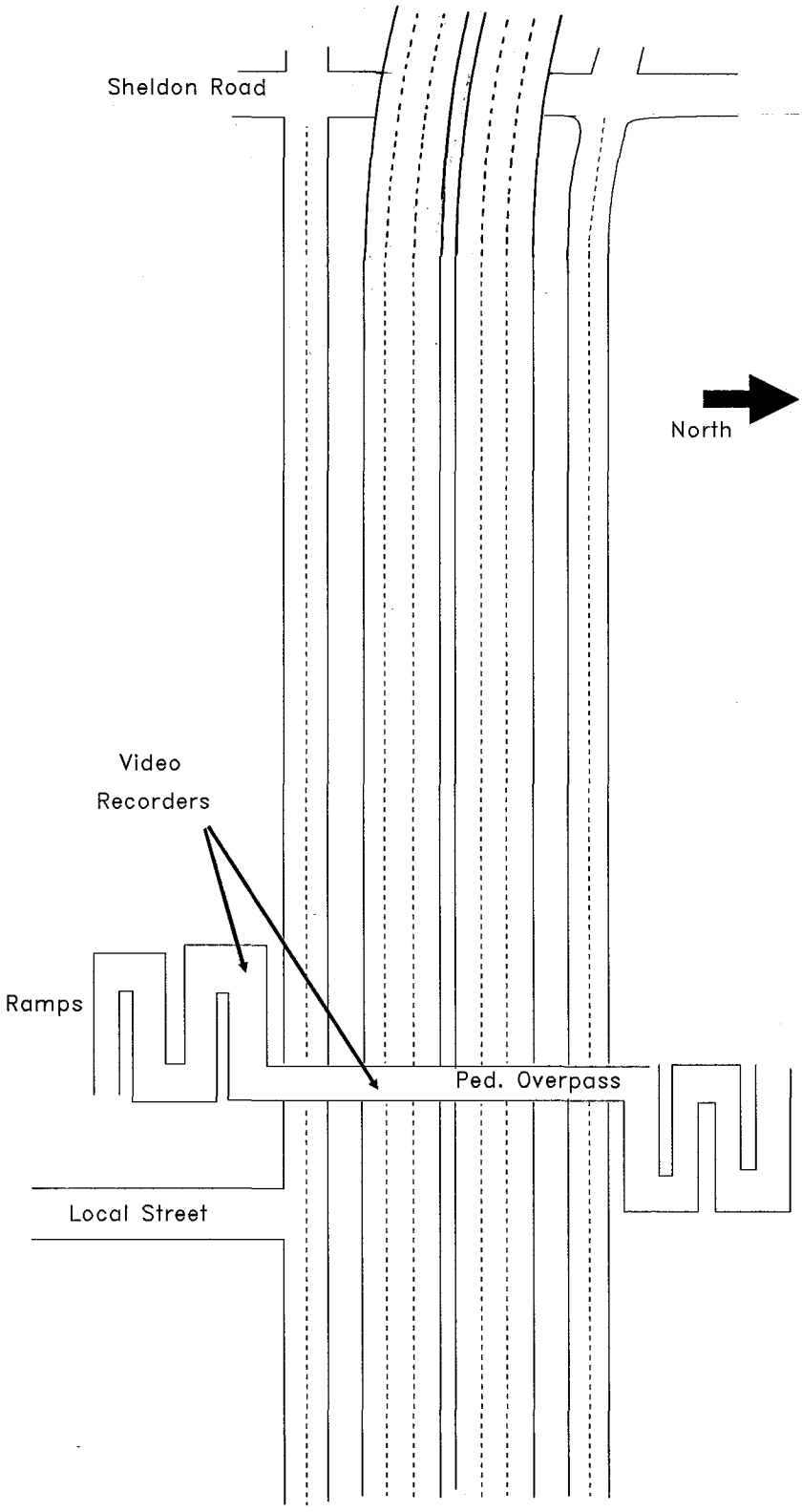


Figure 4-2. Field Study Site Layout

session. The only disadvantage to keeping cameras on standby was the delay of about 5 seconds required before the camera was ready to record. Because the side camera operator's view was obscured in the upstream direction, several important length measurements were missed. A few vehicles were missed due to batteries becoming discharged during the standby period. Usually, the operator did not realize the problem until the vehicle was too close to the target. Then it was too late to change batteries and still record that vehicle. Another problem in attempting to take photographs of license tags was many of them were covered with the WIDE LOAD signs fastened to the bumper. For many others, the tags were mounted on a hinged plate beneath the front bumper. This plate swung backwards as the truck traveled at highway speeds, making the license plate difficult to read, especially at the bridge elevation. Another problem was that 35 mm photography did not always cover enough of the vehicle to make positive identification and thus coordinate with the video.

The sequence of events which occurred each time an oversize/overweight vehicle was identified was as follows. Observer number 1 scanned the traffic stream with binoculars to identify potential oversize vehicles. He was also responsible for taking 35 mm photographs of the front of the truck to include the license tag(s). Observer number 2 monitored the overhead video recorder. Because it was mounted on a tripod and positioned at exactly the same position all day, the only action necessary when a vehicle approached was to take the recorder off standby and switch it into the record mode. The recorder typically recorded the vehicle for several hundred yards, partly before and partly beyond the 400-foot mark downstream. It was important to keep the focal length of each camera constant throughout the two-day study in order to keep the scale constant during play-back later. The rear of the vehicle was recorded (as opposed to the front) simply because the truck cab obscured the load in many cases. Following recording, the camera was again switched to standby, unless another permit vehicle passage was imminent. If the field crew consisted of only two persons, the duties of both observers 1 and 2 were handled by one person. Observer number 3 operated the side camera. He had to be constantly alert for signals from one of the other operators to be able to switch his camera from standby to the record mode before the vehicle arrived. All observers used synchronized watches and recorded the time when each vehicle passed. They also recorded a brief description of the vehicle. This was quite helpful in the data reduction phase conducted later. Both video recorders had the capability of recording time and date on the tape, but one had to be reset each time it was changed from standby to record. Therefore, writing the time down with each vehicle was simply a safeguard.

Data reduction required viewing two video monitors simultaneously, one showing the rear of the vehicle and the other showing the side. As the vehicle was viewed passing the target location, the pause mode was initiated and the vehicle image was scaled. The scale factor for each lane was calculated by measuring the recorded distance (as viewed on the monitor) and comparing that with the known actual distance on the ground. Lane widths were used for the overhead monitor and concrete pavement joint spacing was used for the side camera.

Data reduction was further complicated by the need to view 35 mm slides or prints simultaneously with the two video monitors. These were used to record license tag

numbers because video resolution is not good enough to read license plates. Therefore, if field data collection was completely successful, three pictures of the same vehicle had to be coordinated and viewed simultaneously to get all information desired. All three were not absolutely necessary, however, to determine whether or not a vehicle needed a permit. In most cases, the video resolution was sufficient to get an accurate scaled measurement of the vehicle's size. One infrequently encountered problem was when an odd-shaped load was widest near the center (lengthwise) of the trailer. An accurate measurement was difficult because matching the widest point and the downstream target was based on approximation.

Comparison with CPO Permits Issued. After completion of the field study, the number of permits issued by the Central Permit Office on these two days for this section of I-10 was requested. The ultimate goal was to match as many of the observed vehicles to permitted vehicles through license tag numbers or load description, or both. A less accurate method would be to simply compare total vehicles observed to total vehicles permitted. The problem was that a few vehicles actually permitted on these two days may not have used the permits (due to break downs, scheduling problems, etc.). This would leave some illegal movements undetected because they were erroneously accounted for by unused permits. Another consideration is that a small percentage of permits are issued for other than single trips. A few of the vehicles observed could have fit this category. These longer term permits can be used without additional contact with the central office as long as they are oversize in only one dimension (e.g. a bulldozer which is overwidth, not overlength or overheight). These can be traced by license tag numbers, but again problems were encountered in accurately reading front tag numbers.

The number of permits issued by the Central Permit Office for this segment of I-10 for Wednesday, June 29, 1988 was 25. The number for Thursday, June 30, 1988 was 22. The number observed was 43 on Wednesday and 51 on Thursday. Unfortunately, positive identification between issued permits and observed vehicles was impossible on some vehicles due to problems stated above. Even with this limitation, the results should still be quite close to the range of 40 to 60 percent shown in Table 4-2 which shows the percentage of illegal vehicles determined from the study. It should be noted that the covering of the front license plate by the OVERSIZE LOAD sign is a violation of the law and may void the permit, even if the permit is otherwise valid. Therefore, the percent illegal in Table 4-2 would be higher.

A two-hour vehicle classification count was conducted on Wednesday, June 29, from 9:00 a.m. to 11:00 p.m. in order to determine the percentage of trucks in this I-10 Eastbound traffic steam and to estimate the percentage of oversize vehicles to total trucks. Trucks accounted for 22 percent of total traffic from 8:00 a.m. to 9:00 a.m. and 19 percent from 10:00 a.m. to 11:00 a.m. Permit vehicles were 1.4 percent of all trucks using the 9:00 a.m. to 10:00 a.m. count and 2.0 percent during 10:00 a.m. to 11:00 a.m.

Table 4-2. Field Study Summary

	Date: 6/29/88		Date: 6/30/88	
	PERMITTED	OBSERVED	PERMITTED	OBSERVED
General Form 438	19	28	11	33
Mobile Homes	3	9	9	12
Portable Buildings	3	2	1	0
Mobile Cranes	0	2	1	4
Oil Service Equip.	0	2	0	2
	25	43	22	51
	42 % ILLEGAL		**57 % ILLEGAL**	

OTHER EVIDENCE OF COMPLIANCE

Concrete Beams. The Precast Concrete Manufacturers Association (PCMA) conducted a survey of its members to determine the number and lengths of beams which have been moved over the past few years. The survey spanned the period from 1983 through 1987. Table 4-3 incorporates the survey results.

Table 4-3. PCMA Survey Results

LENGTH	1983	1984	1985	1986	1987	TOTALS	%
0 - 99	5,311	6,976	8,463	11,254	5,876	37,880	86
100-120	607	913	536	1,203	1,047	4,306	10
121-130	60	448	441	208	252	1,409	3
131-140	13	38	38	126	0	215	1
TOTALS	5,991	8,375	9,478	12,791	7,175	43,810	100%

To make a comparison of the compliance rate for concrete beam movement, estimates must be formulated. These estimates, even though not definitive at present in establishing a compliance rate, may prove useful for future needs. Comparing the PCMA calendar year totals with CPO fiscal year totals is probably the best comparison available at the present.

First, the number of permits issued statewide must be estimated by adding those issued by the Central Permit Office and those issued by districts. Only the CPO totals are available because districts did not keep records on load descriptions which could be easily retrieved. The CPO totals for Fiscal Year 1988 in Table 4-4 below are most useful because by the end of FY 88, all but three of the remaining districts had been added to the central operation. The 1986/87 values are obviously much lower than the statewide totals for this reason.

Table 4-4. Summary of Concrete Beam Permit Issuance by CPO

Month	86/87	87/88
September	133	448
October	220	602
November	151	563
December	128	290
January	343	697
February	178	795
March	470	1,259
April	339	1,034
May	445	729
June	486	967
July	580	1,097
August	312	955
YEARLY TOTALS	3,785	9,438

The second estimate which must be made is in the number of beams moved. According to PCMA estimates, approximately 75 percent of the beams in the zero to 99 foot category needed permits. These were generally those over 80 feet in length. Using this percentage and extrapolating for the remaining 6 months of 1987, the number of beams in this length category requiring permits during 1987 would be 8,814. All of the longer beams would have required permits, for a total PCMA permit requirement of 11,412. PCMA members haul about 80 percent of the total beams hauled in the state. Assuming an equal percentage of permit-to-total beams hauled by non-PCMA members as for PCMA members, the resulting total statewide concrete beam movement would have required 14,265 permits during the 1987 calendar year.

The number of permits issued by the Central Permit Office for the 1988 fiscal year was 9,438. No attempt was made to estimate the remaining five districts which were not implemented -- the Dallas District, the Ft. Worth District, and three other smaller districts. To accurately compare the number of permit loads with the actual number of loads moved would require total implementation of all districts into the central office where storage and acquisition of data by computer is available. This implementation should be complete by the end of December 1988.

Manufactured Housing. It is desirable to determine the number of mobile homes moving in the state without permits. The Texas Manufactured Housing Association, headquartered in Austin, provided some information on the number of homes which are moved on the state's highways. Even though this agency does not maintain records on the exact number which are moved, they provided some rules of thumb which can be used to determine the number of moves based on the number of sales recorded for each year. Approximately 60 to 70 percent of the sales by manufacturers or individual owners have to be transported to the retailer for sale. This leaves about 30 percent as on-site sales, but these too may be moved. Assuming a conservative number of 60 percent of sales being moved to a retailer, then moved again upon resale, the number of trips (and number of permits) can be estimated. Table 4-5 below is a summary of these totals for the years 1984 through 1987 as provided by the Texas Real Estate Center (5). Information on title changes which is less than two years old is subject to change, according to economists at the Texas Real Estate Center. Therefore, data for 1986 and 1987 should be viewed as approximate. The numbers presented in the table below have been adjusted using a mathematical model developed from historical data.

Table 4-5. Mobile Home Sales Trends

YEAR	NEW	USED	SALES TOTAL
1984	38,111	39,968	78,079
1985	27,470	42,174	69,644
1986	17,015	38,271	55,286
1987	9,433	31,745	41,178

An attempt to quantify the total number of miles traveled during some time period by homes being transported is an approximation at best. For one company which moves houses both within the state and also interstate, the total loaded permit mileage for 1987 was 1,522,282 miles, which included some trips outside the state. For intrastate only, for the period of January to September of 1987, this company's loaded mileage was 873,912 miles. This mileage was covered during 5,496 moves, for an average intrastate trip length (loaded) of 159 miles. Many smaller movers may transport these homes a shorter distance than this average. A relatively small mover in the Houston area with 6 trucks moves an average of 100 miles (one way) per move. His range of distances is from a few blocks to 200 miles.

ENFORCEMENT CONCERNS EXPRESSED BY OILFIELD HAULERS

Legal and other concerns expressed by members of the Texas Oilfield Haulers Association (OFHA) in a recent survey have merit and should be considered by highway policy-makers. Oilfield haulers utilize vehicles and haul loads which may be somewhat unique. For example, they frequently use a long wheelbase, three axle single-unit truck which is usually illegal on the steer axle. These vehicles are not commonly found in other types of hauling. On the other hand, some of the concerns and needs of oilfield haulers are similar to those of other truckers. These are summarized below:

1. Drivers cannot know exactly how much weight they have on the truck until they can get to a public scale. Tanker measurement by sight glass can easily be off by five to ten barrels on a slight slope. If the mud weighed 20 pounds per gallon (ppg), a 5-barrel miscue would mean a difference of 4,200 pounds. Sometimes when the mud is picked up in the field, it is heavier than reported. If the weight happened to be 13 ppg instead of a reported 12 ppg, a difference of 3,570 pounds would be added to a 85 bbl tanker. One suggestion is to allow a 10 percent overgross tolerance on such loads.

2. Unlike some other industries and carriers, the oilfield industry involves hauling over irregular routes and irregular times during which many shipments have to be made. Quantities, weights, and time schedules are not routine. Laws should reflect the nature of this industry and allow some tolerance in order to accommodate those who attempt to haul legally while still making an honest living. If laws become too strict, more loads will be hauled by truckers who can find ways to get around the law.

3. The law currently allows a law enforcement officer "having reason to believe" that the gross weight or axle load of a vehicle is unlawful to require a driver to turn around and travel in a direction opposite his destination in order to drive to a scale for weighing. The driver should at least be allowed to continue traveling in the same direction so as not to be severely delayed.

4. Unloading part of a load beside the road creates a hazard to other motorists and to the driver. One suggestion is to allow the driver to proceed to the next nearest town or at least to the nearest level, safe place to unload.

5. The current practice is to void a permit which may be purchased for overwidth, overheight, and overlength if there is a violation on any of these. Oilfield haulers feel this is unfair. If only one part of the permit is invalid, then fines should be based on that discrepancy alone. One load was four inches higher than permitted; the officer issued a ticket for height, width, and weight.

6. There is a need to purchase permits from 5 a.m. to 8 p.m. 365 days

a year. State holidays are causing problems in acquiring permits.

7. For truck and trailer combinations with 12 or more axles hauling large and/or heavy loads which cannot be dismantled without major cost, the law should allow each axle group to be increased, while charging a fee in addition to the normal permit fee.

8. One company needed to purchase term permits for loads which were both overwidth and overlength.

9. Eliminate the discrepancy between truck-tractor and truck as now applied in the Texas length law.

10. There are different interpretations of the law by various DPS officers. Some officers accept a permit number, some accept the permit application, and some require the actual permit.

11. There are different requirements at different offices. Some require vehicle registration; others do not.

12. Oilfield haulers feel strongly that load zoned roads should be upgraded to allow movement of heavier loads frequently hauled in the "oil patch." The state's economy depends heavily on this industry and perhaps others which must use these thin pavements to carry on their work. It is unreasonable to expect truckers to unload part of their load when they reach a Farm-to-Market road or travel an inordinate distance to bypass the road.

On the subject of moving oversize/overweight loads without a permit, a spokesperson for the Oilfield Haulers Association (OFHA) noted that certificated haulers are required to charge the cost of the permit to the firm which hires them. Therefore, there should be relatively few who do not get permits. A fine for not having the proper permit is paid by the trucker. Therefore, there should be very little incentive to move these loads illegally. The only real obstacle is in getting the permit. Prior to the centralized operation, some truckers would have to make a special trip to a district or resident office of the SDHPT. For example, in west Texas a trucker was hired occasionally to move a bulldozer for the County Road Department. He might have to move from Mercer to San Angelo; he would first have to make a special trip into town to get the permit then go back and move the dozer. Now the process is much more convenient and there should be very few certificated truckers who operate without a proper permit. On the other hand, carriers without proper insurance or other requirements will probably take a chance, hoping they will not get caught.

A spokesperson for an oilfield hauling company seemed to think tariffs are set unreasonably low, causing truckers to exceed legal speed limits and/or overload in order to make a living. He also said there should be some margin of tolerance for loads which are moved from a remote site where there are no scales to weigh the truck.

CHAPTER 5. PERMIT FEES

Numerous pavement damage studies, notably those stemming from the AASHTO Road Test, indicate that pavement damage varies exponentially with axle weights under otherwise equal conditions. A loaded axle induces more than twice the damage of an axle half its weight. This effect is greatly accentuated at the upper end of the operating axle weight scale.

Overweight traffic is special traffic in the sense that highways are not originally designed to bear it. However, the state must have a provision for allowing overweight movements in the interest of the state's economy. One such reasonable provision is to permit overweight movements as long as those movements generate revenues to compensate for the cost of repairing additional damage that they impose on the roads. This cost is estimated, as described in Table 5-1, using recent weight and traffic data collected in the state.

Table 5-1. Vehicle Distribution

VEHICLE CLASS	PERCENT
Passenger Cars	50.28
Single Unit Trucks:	
2-Axle and Pickups	38.13
3-Axle	0.72
Combinations:	
2-S1	0.26
2-S2	1.09
3-S1	0.21
3-S2	8.85
2-S1-2	0.38
6-or-more Axles	0.08

Assumed ADT per lane: 8,000 vehicles

IMPACT OF OVERWEIGHT TRAFFIC ON THE HIGHWAY SYSTEM

Since most of the highway rehabilitation and maintenance cost in Texas is due to pavements and since pavement damage is directly related to axle loads, overweight damage is attributed to axles rather than vehicles in this study. Overweight traffic is defined as the number of single axles over 20 kips, tandem axles over 34 kips, triple axles over 42 kips, and quadruple axles over 50 kips in the traffic stream. The vehicle distribution and ADT in Table 5-1 were assumed *typical* for the state on the basis of available 1987 data.

Table 5-2. Axle Load Distributions

SINGLE AXLES

INTERVAL (KIPS)	EXPECTED NO. OF AXLES (MILLIONS)	ESALs (MILLIONS)
Under 5	87.265	0.188
5 to 10	18.884	2.266
10 to 15	4.456	1.404
15 to 20	1.246	1.246
20 to 25	0.217	0.570
Over 25	0.054	0.321

TANDEM AXLES

INTERVAL (KIPS)	EXPECTED NO. OF AXLES (MILLIONS)	ESALs (MILLIONS)
Under 9	0.948	0.003
9 to 18	3.600	0.144
18 to 27	3.039	0.821
27 to 33	2.480	1.972
33 to 36	0.709	0.883
36 to 45	0.729	1.657
Over 45	0.057	2.824

The performance of a sample of 12 pavements representing the various climatic regions and highway classifications in Texas were analyzed with RENU (11) over a simulated period of 20 years. The expected axle weight distributions and their corresponding ESAL distributions are shown in Table 5-2 (triple and quadruple axles were excluded in this part of the analysis since their population is so small that no useful traffic statistics could be obtained). Two traffic scenarios were used: an actual traffic scenario, using load and traffic distributions as measured in the field, and a *legal* traffic scenario, where all overweight traffic was eliminated. The latter traffic scenario was characterized by the axle load distributions shown in Table 5-2 after eliminating the last two rows of the single axle distribution and the last three rows of the tandem axle distribution. Table 5-3 summarizes the results of these runs, indicating the number of ESALs and the present value of maintenance and rehabilitation costs associated with legal and overweight traffic on the sample sections. According to the analysis, the marginal cost for overweight traffic is approximately 8 percent of the total maintenance and rehabilitation cost due to the actual traffic. Applying this percentage to total rehabilitation and maintenance expenditures of $785 million (1985 figures), the estimated marginal cost of the overweight traffic is $62.8 million.

Table 5-3. Loadings and Costs for the Sample Sections

SCENARIO	ESALs (MILLIONS)	COST (MILLIONS)
Legal	8.042	77.81
Actual	13.132	84.67
Overweight	5.089	6.86

PERMIT REVENUES AND ADMINISTRATIVE COSTS

The central permit office has incorporated all but seven districts to its system. According to Mr. Bert Lundell, the annual cost of the operation is estimated at $2.5 million. Centralized permit operations cost considerably less than the original 202 separate offices, which cost $4.6 million per year. If administrative costs are to be recovered from the approximately 290,000 permits issued this year, each permit would contribute $8.62.

Table 5-4 shows revenues from permits from 1984 to 1988. A net revenue of $5.5 million in 1988, obtained by subtracting operating costs from revenues, is what the highway department receives for highway use from overweight and oversize vehicles

under current regulations. This amount differs sharply from the estimated $62.8 million in highway damages calculated in the previous section.

Table 5-4. Permit Revenues

YEAR	REVENUE (MILLIONS)
1984	9.7
1985	9.6
1986	9.4
1987	7.9
1988	8.0

ALTERNATIVE FEE SCHEDULE

Current Texas oversize/overweight regulations prescribe a single trip fee of five, ten, or twenty dollars, depending on the type of load to be hauled. This fee schedule does not reflect the usage of or the damage imposed on the highway system by the permitted truck. Ostensibly, a fee structure is considered more equitable as it is more sensitive to these variables. An alternative fee schedule that reflects weight and trip distance is developed in this section. The objectives of the proposed fee schedule are (1) to raise sufficient revenue to pay for the additional damage caused by permitted overweight vehicles; (2) to assess permit fees so that the heavier the vehicle or the longer the haul, the higher the fee; and (3) to cover administrative costs of the permitting operation.

Since several pavement studies have concluded that pavement damage is directly attributable to axles, it is suggested in this study that weight be expressed in terms of 18-kip equivalent single axle loads (ESALs). It is relatively simple to obtain ESALs for a truck given its axle configuration, axle weights, and the type of road used on its trip. For a good quality U.S. or state highway (with a structural number of about 4), an 80,000-pound tractor-semitrailer combination loaded at 12,000 pounds on its steering axle and 34,000 pounds on each of two tandem axles is equivalent to 2.45 ESALs. This truck represents the heaviest legal truck-semitrailer allowed to travel on non-load-zoned Texas roads without a permit. Since such truck is the most common heavy truck on Texas roads, its ESAL equivalent will be considered the equivalent legal *ESAL limit* for the developments of this section.

Overweight traffic may be divided into *cells* according to weight (ESAL) and distance. A typical overweight distribution, $f_w(w)$, calculated from weigh-in-motion observations in early 1987, is shown in Table 5-5. Table 5-6 displays a trip distance

Table 5-5. Overweight Distribution

LOAD (ESAL)	PERCENT (%)
2.45-2.70	14.36
2.70-2.95	13.44
2.95-3.20	11.79
3.20-3.45	11.42
3.45-3.70	10.68
3.70-3.95	6.81
3.95-4.20	6.63
4.20-4.45	5.16
4.45-4.70	5.71
4.70-4.95	3.50
4.95-5.20	2.95
5.20-5.45	1.84
5.45-5.70	1.84
5.70-5.95	0.55
5.95-6.20	1.10
6.20-6.45	0.18
6.45-6.70	0.92
6.70-6.95	0.18
6.95-7.20	0.38
7.20-7.45	0.18
7.45-7.70	0
7.70-7.95	0.38
7.95-8.20	0

Table 5-6. Trip Distance Distribution

DISTANCE (MILES)	PERCENT (%)
0 - 50	6.45
50-100	35.88
100-150	17.74
150-200	9.68
200-250	10.08
250-300	4.84
300-350	2.82
350-400	2.02
400-450	2.42
450-500	0.81
500-550	0.81
550-600	0.40
600-650	0.81
650-700	0.81
700-750	1.61
750-800	0.40
800-850	0.40
850-900	1.21
900 +	0.81

distribution, $f_d(d)$, obtained from Central Permit Office sample of 250 records corresponding to FY 1987-88. It is reasonably assumed that the overweight distribution and the trip distance distribution are independent; therefore the expected portion of trips in weight category w and distance category d is $f_w(w) \cdot f_d(d)$. Let the number of overweight movements in a year be denoted by N and the permit fee contribution for additional pavement damage, a function of weight and trip distance, by C(w,d). The annual pavement damage contribution collected from all movements that fall in weight category w and distance category d is expressed by

$$C(w,d) \cdot f_w(w) \cdot f_d(d) \cdot N.$$

According to the objective (1) stated above, the total pavement damage contribution collected from all overweight-distance cells must equal the portion of rehabilitation and maintenance expenses attributable to overweight traffic T, which has been estimated at $62.8 million. This condition is established by the following equation:

$$\Sigma_{w>2.45,\,d}\, C(w,d) \bullet f_w(w) \bullet f_d(d) \bullet N = T \qquad (5.1)$$

In line with objective (2) above, the pavement damage contribution function C(w,d) is to be made proportional to the additional damage g(w) caused by the overweight and to trip distance. This is expressed by

$$C(w,d) = k \bullet g(w) \bullet d \qquad (5.2)$$

where k is a constant of proportionality. A basic result of the AASHO road test relates pavement damage g to the number of ESAL applications as follows:

$$g(w) = (w/\rho)^{\beta}, \qquad (5.3)$$

where ρ and β are performance parameters. Combining (5.1), (5.2), and (5.3) yields

$$\Sigma_{w>2.45,\,d}\, k(w/\rho)^{\beta} d \bullet f_w(w) \bullet f_d(d) \bullet N = T \qquad (5.4)$$

which may be solved for k using numerical methods. Once k is obtained, the pavement damage contribution function C(w,d) is completely specified. The proposed permit fee schedule is complete after adding the administrative cost contribution to C(w,d).

The fee schedule proposed in this study was calculated using Equation (5.4). A good U. S. or State highway is assumed to have a structural number (SN) of 4.0, which corresponds to performance parameters of 6.34 for ρ and 0.66 for β. Overweight distribution $f_w(w)$ and trip distance distribution $f_d(d)$ are as specified in Table 5-5 and Table 5-6. The estimated annual number of overweight movements is 267,913, calculated as the sum of 187,913 weight permits issued in FY 1987-88 and approximately 80,000 illegal movements – based on nearly 24,000 weight citations issued by DPS in 1987 and assuming 30% enforcement. The estimated annual maintenance and rehabilitation budget is $62.8 million and the administrative cost per permit is $8.62. Equation (5.4) yields a value of 0.108 for the constant k; therefore, the permit fee formula is

$$\text{PERMIT FEE} = 8.62 + 0.108(w/6.34)^{0.66} d. \qquad (5.5)$$

The resulting fee schedule is tabulated in Table 5-7.

Table 5-7. Proposed Permit Fee Schedule

WEIGHT (ESAL)	TRIP DISTANCE (miles) 0 - 50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450
2.45-2.70	9.30	10.67	12.04	13.41	14.78	16.15	17.52	18.89	20.26
2.70-2.95	10.03	12.86	15.69	18.51	21.34	24.17	26.99	29.82	32.65
2.95-3.20	10.60	14.56	18.52	22.48	26.44	30.40	34.36	38.32	42.28
3.20-3.45	11.09	16.04	20.98	25.93	30.87	35.81	40.76	45.70	50.65
3.45-3.70	11.54	17.37	23.21	29.05	34.88	40.72	46.56	52.39	58.23
3.70-3.95	11.95	18.61	25.28	31.94	38.60	45.27	51.93	58.59	65.26
3.95-4.20	12.34	19.78	27.22	34.66	42.10	49.54	56.98	64.42	71.86
4.20-4.45	12.71	20.88	29.06	37.24	45.41	53.59	61.77	69.94	78.12
4.45-4.70	13.06	21.94	30.82	39.70	48.58	57.46	66.35	75.23	84.11
4.70-4.95	13.40	22.96	32.51	42.07	51.63	61.18	70.74	80.30	89.86
4.95-5.20	13.72	23.93	34.14	44.35	54.56	64.77	74.98	85.19	95.40
5.20-5.45	14.04	24.88	35.72	46.57	57.41	68.25	79.09	89.93	100.77
5.45-5.70	14.35	25.80	37.26	48.71	60.17	71.62	83.08	94.53	105.99
5.70-5.95	14.65	26.70	38.75	50.80	62.85	74.91	86.96	99.01	111.06
5.95-6.20	14.94	27.57	40.20	52.84	65.47	78.11	90.74	103.37	116.01
6.20-6.45	15.22	28.42	41.63	54.83	68.03	81.23	94.44	107.64	120.84
6.45-6.70	15.50	29.26	43.02	56.78	70.53	84.29	98.05	111.81	125.57
6.70-6.95	15.77	30.08	44.38	58.68	72.99	87.29	101.59	115.90	130.20
6.95-7.20	16.04	30.88	45.71	60.55	75.39	90.23	105.07	119.90	134.74
7.20-7.45	16.30	31.66	47.03	62.39	77.75	93.11	108.48	123.84	139.20
7.45-7.70	16.56	32.44	48.31	64.19	80.07	95.95	111.83	127.70	143.58
7.70-7.95	16.81	33.20	49.58	65.97	82.35	98.74	115.12	131.51	147.89
7.95-8.20	17.06	33.95	50.83	67.71	84.60	101.48	118.37	135.25	152.13

WEIGHT (ESAL)	TRIP DISTANCE (miles) 450-500	500-550	550-600	600-650	650-700	700-750	750-800	800-850	850-900
2.45-2.70	21.62	22.99	24.36	25.73	27.10	28.47	29.84	31.21	32.57
2.70-2.95	35.47	38.30	41.13	43.95	46.78	49.60	52.43	55.26	58.08
2.95-3.20	46.24	50.20	54.16	58.12	62.08	66.04	70.00	73.96	77.92
3.20-3.45	55.59	60.54	65.48	70.43	75.37	80.31	85.26	90.20	95.15
3.45-3.70	64.07	69.90	75.74	81.58	87.41	93.25	99.09	104.92	110.76
3.70-3.95	71.92	78.58	85.25	91.91	98.57	105.23	111.90	118.56	125.22
3.95-4.20	79.30	86.74	94.18	101.62	109.06	116.50	123.94	131.38	138.82
4.20-4.45	86.30	94.47	102.65	110.83	119.00	127.18	135.36	143.53	151.71
4.45-4.70	92.99	101.87	110.75	119.63	128.51	137.39	146.27	155.15	164.03
4.70-4.95	99.41	108.97	118.53	128.09	137.64	147.20	156.76	166.31	175.87
4.95-5.20	105.61	115.82	126.03	136.24	146.45	156.66	166.87	177.08	187.29
5.20-5.45	111.62	122.46	133.30	144.14	154.98	165.82	176.67	187.51	198.35
5.45-5.70	117.44	128.90	140.35	151.81	163.26	174.72	186.17	197.63	209.08
5.70-5.95	123.11	135.16	147.22	159.27	171.32	183.37	195.42	207.48	219.53
5.95-6.20	128.64	141.28	153.91	166.54	179.18	191.81	204.45	217.08	229.71
6.20-6.45	134.04	147.25	160.45	173.65	186.85	200.05	213.26	226.46	239.66
6.45-6.70	139.33	153.09	166.84	180.60	194.36	208.12	221.88	235.64	249.40
6.70-6.95	144.50	158.81	173.11	187.41	201.72	216.02	230.32	244.63	258.93
6.95-7.20	149.58	164.42	179.25	194.09	208.93	223.77	238.60	253.44	268.28
7.20-7.45	154.56	169.92	185.29	200.65	216.01	231.37	246.74	262.10	277.46
7.45-7.70	159.46	175.34	191.22	207.09	222.97	238.85	254.73	270.60	286.48
7.70-7.95	164.28	180.66	197.05	213.43	229.82	246.20	262.59	278.97	295.36
7.95-8.20	169.02	185.90	202.79	219.67	236.55				

SUPER-HEAVY VEHICLE PERMITS

Super-heavy vehicles, usually mobile cranes and special trucks used to haul extraordinarily heavy equipment, pose an additional problem to the highway system. Beyond the extra damage to pavements, these vehicles produce high stresses on highway structures. In some cases, it is necessary to evaluate structures on a super-heavy vehicle's route to insure that they are capable of sustaining the load. A fair permit fee policy should take into consideration the extra cost involved in performing these evaluations. Structure evaluation cost is primarily due to the time evaluators spent on assessing the structure's capacity. Total structure evaluation cost has increased from $1,532.58 in 1984 to $26,823.83 in 1987. The number of structures evaluated has also increased sharply from 79 in 1986 to 224 in 1987, resulting in evaluation costs per structure of $100.21 in 1986 and $119.75 in 1987. The variability of cost per structure is too high to make specific recommendations for including it in a general fee schedule. If this cost is to be recovered from the permit fee at this time, the permit recipient should be billed for the direct costs of evaluating the structures in his route. More detailed data -- number of spans, structure length -- are needed to build a more stable formula for structure evaluation costs into a general permit fee schedule.

Mobile cranes are subject to special legislation under the current oversize/overweight policy. Axle groups with axles weighing between 20,001 and 25,000 pounds are charged 4.5 cents per thousand pounds in excess of their legal weight limit; axle groups with axles weighing between 25,001 and 30,000 pounds pay 5.5 cents per thousand pounds above their legal limit; and axle groups with axles weighing between 30,001 and 35,000 pounds must contribute 8 cents per thousand pounds over their legal limit. Such legal weight limits are 20 kips for single axles, 34 kips for tandem axles, 42 kips for triple axles, and 50 kips for quadruple axles. Table 5-8 displays a comparison between current and proposed fees for the most typical super-heavy truck configurations found on Texas highways.

Table 5-8. Super-heavy Vehicle Permit Fee Comparison

VEHICLE	PROPOSED FEE	CURRENT FEE
100 kip, 6-axle comb.	$8.62 + 33.43¢/mile	$20.00
200 kip, 11-axle comb.	$8.62 + 44.52¢/mile	$20.00
300 kip, 16-axle comb.	$8.62 + 60.59¢/mile	$20.00
400 kip, 19-axle comb.	$8.62 + 92.80¢/mile	$20.00
150 kip, 6-axle crane	$8.62 + 54.04¢/mile	$1.78/mile
200 kip, 8-axle crane	$8.62 + 67.62¢/mile	$2.21/mile
250 kip, 10-axle crane	$8.62 + 79.92¢/mile	$3.13/mile
200 kip, 7-axle crane	$8.62 + 96.98¢/mile	$2.87/mile
250 kip, 9-axle crane	$8.62 + 112.02¢/mile	$4.06/mile

OVERWEIGHT FINES

A fine structure should include, in addition to the damage cost responsibility of the offending vehicle a penalty charge high enough to discourage potential offenders from overloading. A truck operator will be tempted to overload if the additional financial benefits from doing so exceed the amount of the fine to be paid. Current Texas policy establishes overweight fines that range from $100 to $150 at the discretion of a Justice of the Peace. Under this policy alone, a trucker would be better off running overweight by as little as 3,000 pounds (assuming a freight transport rate of $0.06 per pound) even if he is certain to be caught.

If an overweight fine structure is designed on the basis of cost recovery, the penalty charge must be specified to cover maintenance costs occasioned by illegal overweight vehicles. This charge may be applied as a factor of the additional damage imposed on the highway. Assuming an overweight enforcement level of 30 percent, the suggested fine for an illegal overweight vehicle would be an amount corresponding to a permit fee for such truck multiplied by a "recovery" factor of 1/0.3, or 3.333. Table 5-9 shows the suggested fine schedule.

Another possible deterrent is the enactment of an on-the-spot unloading policy, which has been in force in other states. Such policy has not been widely invoked, particularly when left to the discretion of the enforcing officer, since it may cause load handling, safety, and other problems.

Table 5-9. Proposed Fine Schedule

WEIGHT (ESAL)	TRIP DISTANCE (miles) 0 - 50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450
2.45-2.70	2.28	6.84	11.41	15.97	20.53	25.10	29.66	34.22	38.78
2.70-2.95	4.71	14.13	23.55	32.98	42.40	51.82	61.24	70.66	80.09
2.95-3.20	6.60	19.80	33.00	46.20	59.40	72.60	85.80	99.00	112.19
3.20-3.45	8.24	24.72	41.20	57.69	74.17	90.65	107.13	123.61	140.09
3.45-3.70	9.73	29.18	48.64	68.09	87.55	107.00	126.46	145.91	165.37
3.70-3.95	11.11	33.32	55.53	77.74	99.95	122.16	144.37	166.58	188.79
3.95-4.20	12.40	37.20	62.00	86.80	111.60	136.39	161.19	185.99	210.79
4.20-4.45	13.63	40.88	68.14	95.39	122.65	149.90	177.16	204.42	231.67
4.45-4.70	14.80	44.40	74.01	103.61	133.21	162.81	192.42	222.02	251.62
4.70-4.95	15.93	47.79	79.64	111.50	143.36	175.22	207.07	238.93	270.79
4.95-5.20	17.02	51.05	85.08	119.11	153.15	187.18	221.21	255.25	289.28
5.20-5.45	18.07	54.21	90.35	126.49	162.62	198.76	234.90	271.04	307.18
5.45-5.70	19.09	57.27	95.46	133.64	171.82	210.01	248.19	286.37	324.56
5.70-5.95	20.09	60.26	100.43	140.61	180.78	220.95	261.12	301.30	341.47
5.95-6.20	21.06	63.17	105.28	147.40	189.51	231.62	273.73	315.85	357.96
6.20-6.45	22.00	66.01	110.02	154.03	198.04	242.04	286.05	330.06	374.07
6.45-6.70	22.93	68.79	114.65	160.52	206.38	252.24	298.10	343.96	389.83
6.70-6.95	23.84	71.52	119.19	166.87	214.55	262.23	309.91	357.58	405.26
6.95-7.20	24.73	74.19	123.65	173.11	222.57	272.03	321.48	370.94	420.40
7.20-7.45	25.60	76.81	128.02	179.23	230.43	281.64	332.85	384.06	435.27
7.45-7.70	26.46	79.39	132.32	185.24	238.17	291.09	344.02	396.95	449.87
7.70-7.95	27.31	81.92	136.54	191.16	245.77	300.39	355.01	409.62	464.24
7.95-8.20	28.14	84.42	140.70	196.98	253.26	309.54	365.82	422.10	478.38

WEIGHT (ESAL)	TRIP DISTANCE (miles) 450-500	500-550	550-600	600-650	650-700	700-750	750-800	800-850	850-900
2.45-2.70	43.35	47.91	52.47	57.04	61.60	66.16	70.72	75.29	79.85
2.70-2.95	89.51	98.93	108.35	117.77	127.19	136.62	146.04	155.46	164.88
2.95-3.20	125.39	138.59	151.79	164.99	178.19	191.39	204.59	217.79	230.99
3.20-3.45	156.57	173.06	189.54	206.02	222.50	238.98	255.46	271.95	288.43
3.45-3.70	184.82	204.28	223.73	243.19	262.64	282.10	301.55	321.01	340.46
3.70-3.95	211.00	233.21	255.42	277.63	299.84	322.05	344.26	366.47	388.68
3.95-4.20	235.59	260.39	285.19	309.99	334.79	359.59	384.39	409.18	433.98
4.20-4.45	258.93	286.18	313.44	340.69	367.95	395.20	422.46	449.71	476.97
4.45-4.70	281.22	310.83	340.43	370.03	399.63	429.24	458.84	488.44	518.04
4.70-4.95	302.65	334.50	366.36	398.22	430.08	461.93	493.79	525.65	557.50
4.95-5.20	323.31	357.34	391.38	425.41	459.44	493.48	527.51	561.54	595.57
5.20-5.45	343.32	379.46	415.60	451.73	487.87	524.01	560.15	596.29	632.43
5.45-5.70	362.74	400.92	439.11	477.29	515.47	553.66	591.84	630.02	668.21
5.70-5.95	381.64	421.82	461.99	502.16	542.33	582.51	622.68	662.85	703.03
5.95-6.20	400.07	442.19	484.30	526.41	568.52	610.64	652.75	694.86	736.98
6.20-6.45	418.08	462.08	506.09	550.10	594.11	638.12	682.12	726.13	770.14
6.45-6.70	435.69	481.55	527.41	573.27	619.14	665.00	710.86	756.72	802.58
6.70-6.95	452.94	500.62	548.30	595.97	643.65	691.33	739.01	786.69	834.36
6.95-7.20	469.86	519.32	568.78	618.24	667.70	717.16	766.62	816.08	865.53
7.20-7.45	486.47	537.68	588.89	640.10	691.30	742.51	793.72	844.93	896.14
7.45-7.70	502.80	555.72	608.65	661.58	714.50	767.43	820.36	873.28	926.21
7.70-7.95	518.85	573.47	628.09	682.70	737.32	791.94	846.55	901.17	955.79
7.95-8.20	534.66	590.94	647.22	703.50	759.78	816.06	872.34	928.62	984.90

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The total sum of all permit load movements in the State of Texas is not totally accurate due to possible double counting in districts and the Central Permit Office (CPO), and due to differences in how types of permits are recorded. The CPO issued over 288,000 permits during fiscal year 1988, while the aggregate total for districts still issuing permits was about 119,000. The significant problem with counting errors is in trying to determine a permit compliance rate. It is desirable to compare the number of permits issued for a particular type of load and the number of loads which actually moved. Efforts to compare compliance rates of manufactured housing and concrete beams in this report were inconclusive for this very reason. When full implementation of the CPO is realized, more accurate evaluation will become possible.

The most striking conclusion from comparing other state permit policies with that of Texas is the differences which exist, even with bordering states. Making these permit policies more similar would be desirable in some ways, but the different permitting conditions in the various states make totally uniform policies less than practical. Moving a 14-foot wide load over a 2-lane roadway with no shoulders in hilly terrain should be treated differently than the same load on a wide two-lane roadway with paved shoulders in flat open country. Additional escort vehicles in the former case might be sufficient to make the situation safer.

It is evident from comparing the Texas and California tandem and tridem axle weight maximums that Texas is more liberal for three axle groups. The Texas maximum for tandem axles is slightly less than California.

Some states are in the process of revising their permit policies; others do not have comprehensive information to disseminate permit requirements. California, for instance, is currently developing a more up-to-date brochure which will include several elements previously published separately.

SDHPT already realizes that its escort vehicle and driver policy is inadequate. Improvement in this area is needed immediately to include supportive fines to encourage compliance. There is currently no penalty in Texas for not providing an escort. Elements which must be included in the escort policy are: specific conditions which warrant escort vehicles, standard markings and safety devices (flashing lights, flags, and signs), communication equipment, and duties and responsibilities of escort drivers. In the current situation, haulers might bid on a job based on a required number of escorts, but when they actually make the move, they might provide fewer escorts in order to increase their profit margin. The law must be changed to provide for enforcement of the conditions required on a permit, to include escort requirements.

Lack of trucker cooperation was a big factor in being able to observe interaction of oversize loads with other traffic and thus evaluate capacity issues. Requests forwarded to truckers for notification when loads were scheduled to move were unheeded. Truckers are naturally apprehensive about cooperation when their livelihood might be at stake. On a few occasions when several moves were being made with common origins and

destinations, observation of a move was possible. Even then, notice was usually short, due to weather or demands at the job site.

The SDHPT should proceed as quickly as possible to implement automated routing capabilities. This should improve response time in issuance, but equally or even more important is the ability of improved pavement and bridge management strategies. Automated routing by a computer search routine will provide the ability to monitor the number of permit load applications on each link of the network and on each structure by vehicle class or axle load range. Also, the level of sophistication in assessing appropriate fees can be increased. A different fee might be assessed for a heavy load moving over a thin surfaced Farm-to-Market road as opposed to moving over a U.S. Highway which has thicker pavement. Response time required to incorporate changes in the highway network, such as in construction zones with width constrictions, should also be reduced.

The current fee structure for permits should change to incorporate a weight-distance factor. Fees should be sufficient to cover administrative costs plus the loss of pavement and structure life resulting from the move. This is especially important for vehicles which are heavier than the statutory weight limits. Fees assessed for super-heavy moves should be based on coverage of administrative time plus anticipated damage or use of the highway. Costs based on number of bridge spans appears to be the most equitable, as opposed to costs per structure or costs per permit. However, if the fee must be known in advance of structural evaluation, costs based on past experience might be applied.

RECOMMENDATIONS FOR IMPLEMENTATION

Practical application of the findings of this study should be considered at division level of SDHPT in order to pursue changes in current legislation. The basis currently used to assess permit fees should be changed so that a weight-distance factor is used. The most equitable cost will be based on axle loadings rather than gross vehicle loads. However, given current constraints of permit issuance procedures, gross vehicle weights might be used until a higher level of automation is achieved at the CPO. The cost of super-heavy permits should be increased immediately such that the total administrative and other costs are covered. The state of Texas is currently bearing most of the cost. A set of standards should be proposed for use of escort vehicles to include qualifications for the driver.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research needs relative to the investigation undertaken in this study are as follows: (1) determine permit compliance by monitoring several locations throughout the state, (2) develop an automated routing strategy, and (3) evaluate the current permit axle load maximums used in the state of Texas.

An expanded study to determine permit compliance rates would be based on a statistically sound sampling technique as well as on assistance from the Texas Department of Public Safety. Conclusions would be predictably reliable and a more

definitive answer to the compliance question could be given. The cost of such a study would be only a fraction of potential revenue loss due to noncompliance. The study should include rational ways to encourage compliance, including additional enforcement. Reasonable compliance rates should be sought. The field portion of this study could be automated, so that reduction of field data and evaluation would be much simpler than the method used in this study. Also, with regards to compliance, very little is known about the movement of manufactured housing.

An automated routing scheme holds promise from many perspectives. Permit issuance time could be reduced considerably. Intercity routing would be established as a link-node system with one-way links to account for differences by direction on the same roadway. The computer would search possible paths to find the shortest feasible path for a load. Weak structures or limited clearances would block the route from the search routine. The number of load applications on each link by direction would be stored by computer for later retrieval. Construction and maintenance activities would be reflected in the road network evaluated by the computer at the same time the restriction actually takes effect.

The current axle and gross load maximums allowed in Texas need to be fully evaluated based on the current pavement and structure conditions. This is especially critical in light of the increasing numbers of super-heavy loads. Of the super-heavy loads, mobile cranes have great potential for damage because of their extremely heavy weights and their short wheelbase. This is a very dangerous combination for some structures.

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APPENDIX

APPENDIX A

LOUISIANA PERMIT FEES

Department of Transportation and Development

P. O. BOX 94245
BATON ROUGE, LA. 70804-9245

Robert G. Graves
Secretary

Edwin W. Edwards
Governor

August 21, 1986

TO ALL OVERSIZE/OVERWEIGHT PERMIT USERS:

Due to economic reasons and budgetary constraints placed on the Department, it has become necessary to raise the prices of oversize and/or overweight permits from the level that has been used since 1955. Consequently, effective September 1, 1986, price increases for oversize and/or overweight permits passed during the 1986 Legislative Session will go into effect. The fees will be increased from $8.00 to $10.00 a day or a trip for oversize permits and from $0.03 per ton mile plus $8.00 to $0.07 per ton mile plus $10.00 for overweight permits.

As part of this legislation, a toll free telephone line is to be provided for calls made out of the Baton Rouge area, but within the state. This toll free number will be 1-800-654-1433. The telephone number for local and out-of-state calls will continue to be (504) 343-2345.

In addition, adjustments are being made in the operating hours of the Truck Permit Office in order to be more cost effective in its operation and to better accommodate the work load that it experiences on a daily basis. These new operating hours will be:

Monday through Friday: 6:00 a.m. - 5:00 p.m.

Saturday: Closed

Emergency type moves can still be handled by calling the regular permit number of (504) 343-2345

If any additional information is needed, please feel free to contact the Truck Permit Office at (504) 343/2345.

ROBERT G. GRAVES
SECRETARY

RGG:aht

FIRST OVERWEIGHT PERMIT FEE SCHEDULE

This schedule is for three types of vehicles:

+ Vehicles and combinations of vehicles which do not exceed their legal gross weight, but do exceed the legal axle weight on one to three axles or axle groups* (including steering axles).

+ Vehicles or combinations of vehicles which have two or three axles**total and which exceed both their legal gross weight and legal axle weight.

+ All two-to-four axle**off-road equipment.

EXCESS WEIGHT	DISTANCE (in miles)				
(in pounds)	0-50	51-100	101-150	151-200	Over 200
0-10,000	$20.00	30.00	35.00	45.00	55.00
10,001-20,000	35.00	65.00	90.00	115.00	140.00
20,001-30,000	55.00	100.00	140.00	185.00	230.00
30,001-40,000	70.00	135.00	195.00	255.00	315.00
40,001-50,000	90.00	170.00	245.00	325.00	405.00
50,001-60,000	105.00	205.00	300.00	395.00	490.00
Over 60,000	$10.00 plus $0.07 per ton-mile				

* Axle groups are tandem, tridum, and quadrum axles.
** "Axle" here refers to single or individual axles. Tandem axle groups will be counted as two axles and tridum axle groups as three axles.

SECOND OVERWEIGHT PERMIT FEE SCHEDULE

This schedule is for combinations of vehicles with four axles* (including the steering axle).

GROSS WEIGHT	DISTANCE (in miles)				
(in pounds)	0-50	51-100	101-150	151-200	Over 200
66,001-80,000	$20.00	35.00	45.00	60.00	70.00
80,001-90,000	45.00	75.00	110.00	145.00	175.00

* "Axle" here refers to single or individual axles. Tandem axle groups will be counted as two axles and tridum axle groups as three axles.

THIRD OVERWEIGHT PERMIT FEE SCHEDULE

This schedule is for combinations of vehicles with five or more axles* (including the steering axle) when the gross weight exceeds 80,000 pounds.

GROSS WEIGHT	DISTANCE (in miles)				
(in pounds)	0-50	51-100	101-150	151-200	Over 200
80,001-100,000	$30.00	45.00	65.00	80.00	100.00
100,001-108,000	50.00	95.00	135.00	180.00	220.00
108,001-120,000	70.00	130.00	190.00	250.00	310.00
120,001-132,000	90.00	170.00	250.00	330.00	415.00
132,001-152,000	120.00	225.00	335.00	445.00	555.00
152,001-172,000	155.00	295.00	440.00	585.00	730.00
172,001-192,000	190.00	365.00	545.00	725.00	905.00
192,001-212,000	225.00	435.00	650.00	865.00	1080.00
Over 212,000	$10.00 plus $0.50 per ton-mile of weight in excess of 80,000 pounds, plus a fee for structural evaluation based on the following schedule: $125.00 - for evaluation of treated timber, concrete slab, and precast concrete slab bridges $850.00 - for evaluation of truss, continuous span, and movable bridges and for all Mississippi River structures $500.00 - for all other structures				

* "Axle" here refers to single or individual axles. Tandem axle groups will be counted as two axles and tridum axle groups as three axles.

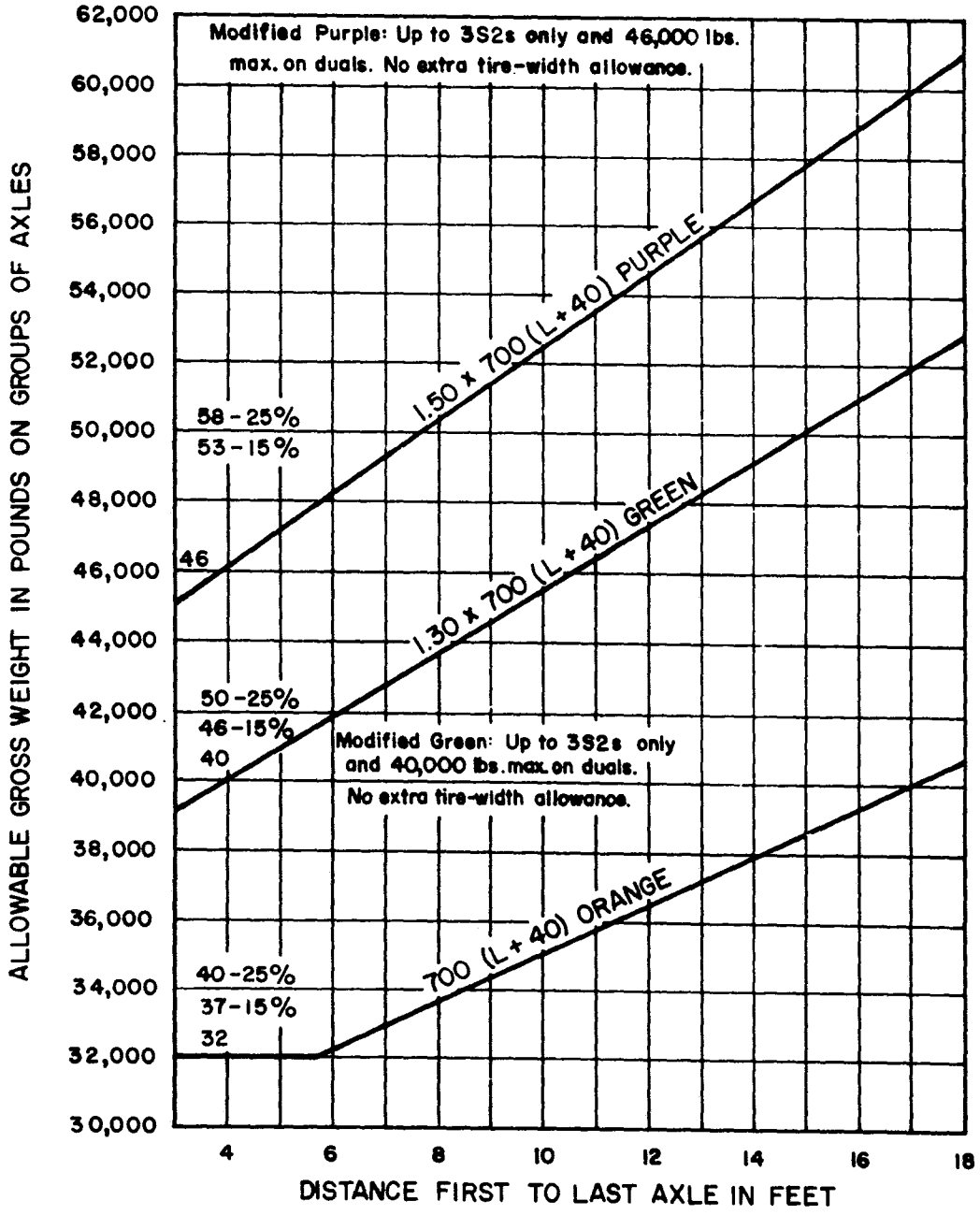
APPENDIX B

CALIFORNIA AXLE LOAD MAXIMUMS

PLATE 25-1

CHART FOR COMPUTING OVERLOAD PERMITS

The maximum weight permitted on a tire shall be 800 pounds per lineal inch of tread width. The width shall be the maximum inflated width as specified on the tire by the manufacturer, or as measured, if less.



For vehicles with 8 tires per axle:

1. If gage is 8' ------ Add 15%
2. If gage is 10' or more -- Add 25%

Single Axle

Purple	28,000
Green	24,000
Orange	20,000

PLATE - 25 - 3

ORANGE AND BONUS OVERLOADS*

Example: 8'-0" Distance Between First and Last Axle in Feet

33,600	4 tires, 8'-0" Wide	Orange Load = 700 (L + 40) (Min. = 32,000)
38,640	8 tires, 8'-0" Wide	Orange Load (+ 15%) = 1.15 x 700 (L + 40) (Min. = 36,800)
42,000	8 tires, 10'-0" Wide	Orange Load (+ 25%) = 1.25 x 700 (L + 40) (Min. = 40,000)

FT. \ IN.	0	1	2	3	4	5	6	7	8	9	10	11
2	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000
3	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	20,000 23,000 25,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000
4	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000
5	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,000 36,800 40,000	32,025 36,829 40,031	32,083 36,896 40,104	32,142 36,963 40,177
6	32,200 37,030 40,250	32,258 37,097 40,323	32,317 37,164 40,396	32,375 37,231 40,469	32,433 37,298 40,541	32,492 37,366 40,615	32,550 37,432 40,688	32,608 37,499 40,760	32,667 37,567 40,834	32,725 37,634 40,906	32,783 37,701 40,979	32,842 37,768 41,052
7	32,900 37,835 41,125	32,958 37,902 41,198	33,017 37,969 41,271	33,075 38,036 41,344	33,133 38,103 41,416	33,192 38,171 41,490	33,250 38,237 41,563	33,308 38,304 41,635	33,367 38,372 41,709	33,425 38,439 41,781	33,483 38,506 41,854	33,542 38,573 41,927
8	33,600 38,640 42,000	33,658 38,707 42,073	33,717 38,774 42,146	33,775 38,841 42,219	33,833 38,908 42,291	33,892 38,976 42,365	33,950 39,043 42,438	34,008 39,109 42,510	34,067 39,177 42,584	34,125 39,244 42,656	34,183 39,311 42,729	34,242 39,378 42,802
9	34,300 39,445 42,875	34,358 39,512 42,948	34,417 39,579 43,021	34,475 39,646 43,094	34,533 39,713 43,166	34,592 39,781 43,240	34,650 39,848 43,313	34,708 39,914 43,385	34,767 39,982 43,459	34,825 40,049 43,531	34,883 40,116 43,604	34,942 40,183 43,677
10	35,000 40,250 43,750	35,058 40,317 43,823	35,117 40,384 43,896	35,175 40,451 43,969	35,233 40,518 44,041	35,292 40,586 44,115	35,350 40,653 44,188	35,408 40,719 44,260	35,467 40,787 44,334	35,525 40,854 44,406	35,583 40,921 44,479	35,642 40,988 44,552
11	35,700 41,055 44,625	35,758 41,122 44,698	35,817 41,189 44,771	35,875 41,256 44,844	35,933 41,323 44,916	35,992 41,391 44,990	36,050 41,457 45,063	36,108 41,524 45,135	36,167 41,592 45,209	36,225 41,659 45,281	36,283 41,726 45,354	36,342 41,793 45,427
12	36,400 41,860 45,500	36,458 41,927 45,573	36,517 41,994 45,646	36,575 42,061 45,719	36,633 42,128 45,791	36,692 42,196 45,865	36,750 42,263 45,938	36,808 42,329 46,010	36,867 42,397 46,084	36,925 42,464 46,156	36,983 42,531 46,229	37,042 42,598 46,302
13	37,100 42,665 46,375	37,158 42,732 46,448	37,217 42,799 46,521	37,275 42,866 46,594	37,333 42,933 46,666	37,392 43,001 46,740	37,450 43,068 46,813	37,508 43,134 46,885	37,567 43,202 46,959	37,625 43,269 47,031	37,683 43,336 47,104	37,742 43,403 47,177
14	37,800 43,470 47,250	37,858 43,537 47,323	37,917 43,604 47,396	37,975 43,671 47,469	38,033 43,738 47,541	38,092 43,806 47,615	38,150 43,873 47,688	38,208 43,939 47,760	38,267 44,007 47,834	38,325 44,074 47,906	38,383 44,141 47,979	38,442 44,208 48,052
15	38,500 44,275 48,125	38,558 44,342 48,198	38,617 44,409 48,271	38,675 44,476 48,344	38,733 44,543 48,416	38,792 44,611 48,490	38,850 44,678 48,563	38,908 44,744 48,635	38,967 44,812 48,709	39,025 44,879 48,781	39,083 44,946 48,854	39,142 45,013 48,927
16	39,200 45,080 49,000	39,258 45,147 49,073	39,317 45,214 49,146	39,375 45,281 49,219	39,433 45,348 49,291	39,492 45,416 49,365	39,550 45,483 49,438	39,608 45,549 49,510	39,667 45,617 49,584	39,725 45,684 49,656	39,783 45,751 49,729	39,842 45,818 49,802
17	39,900 45,885 49,875	39,958 45,952 49,948	40,017 46,019 50,021	40,075 46,086 50,094	40,133 46,153 50,166	40,192 46,221 50,240	40,250 46,288 50,312	40,308 46,354 50,385	40,367 46,422 50,459	40,425 46,489 50,531	40,483 46,556 50,604	40,542 46,623 50,677
18	40,600 46,690 50,750											

* A set of tandem axles with spacing between axles of less than 3.5' is considered as a single axle.

PLATE 25-4
GREEN AND BONUS OVERLOADS*

Example: 8'-0" Distance Between First and Last Axle in Feet

43,680	4 tires, 8'-0" Wide	Green Load = 1.3 x 700 (L + 40)
50,232	8 tires, 8'-0" Wide	Green Load (+ 15%) = 1.15 x 1.3 x 700 (L + 40)
54,600	8 tires, 10'-0" Wide	Green Load (+ 25%) = 1.25 x 1.3 x 700 (L + 40)

FT. \ IN.	0	1	2	3	4	5	6	7	8	9	10	11
2	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000
3	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	24,000 27,600 30,000	39,585 45,523 49,481	39,661 45,610 49,576	39,737 45,698 49,671	39,812 45,784 49,766	39,888 45,871 49,860	39,964 45,959 49,956
4	40,040 46,046 50,050	40,116 46,133 50,144	40,192 46,221 50,240	40,267 46,308 50,334	40,343 46,394 50,429	40,419 46,482 50,524	40,495 46,569 50,619	40,571 46,656 50,713	40,647 46,744 50,809	40,722 46,831 50,903	40,798 46,918 50,998	40,874 47,006 51,093
5	40,950 47,092 51,187	41,026 47,179 51,282	41,102 47,267 51,377	41,177 47,354 51,472	41,253 47,441 51,566	41,329 47,529 51,662	41,405 47,616 51,756	41,481 47,703 51,851	41,557 47,791 51,946	41,632 47,877 52,041	41,708 47,964 52,135	41,784 48,052 52,231
6	41,860 48,139 52,325	41,936 48,226 52,419	42,012 48,314 52,515	42,087 48,401 52,609	42,163 48,487 52,704	42,239 48,575 52,799	42,315 48,662 52,894	42,391 48,749 52,988	42,467 48,837 53,084	42,542 48,924 53,178	42,618 49,011 53,273	42,694 49,099 53,368
7	42,770 49,185 53,462	42,846 49,272 53,557	42,922 49,360 53,652	42,997 49,447 53,747	43,073 49,534 53,841	43,149 49,622 53,937	43,225 49,709 54,031	43,301 49,796 54,126	43,377 49,884 54,221	43,452 49,970 54,316	43,528 50,057 54,410	43,604 50,145 54,506
8	43,680 50,232 54,600	43,756 50,319 54,694	43,382 50,407 54,790	43,907 50,494 54,884	43,983 50,580 54,979	44,059 50,669 55,074	44,135 50,755 55,169	44,211 50,842 55,263	44,287 50,930 55,359	44,362 51,017 55,453	44,438 51,104 55,548	44,514 51,192 55,643
9	44,590 51,278 55,737	44,666 51,365 55,832	44,742 51,453 55,927	44,817 51,540 56,022	44,893 51,627 56,116	44,969 51,715 56,212	45,045 51,802 56,306	45,121 51,889 56,401	45,197 51,977 56,496	45,272 52,063 56,591	45,348 52,150 56,685	45,424 52,238 56,781
10	45,500 52,325 56,875	45,576 52,412 56,969	45,652 52,500 57,065	45,727 52,587 57,159	45,803 52,673 57,254	45,879 52,761 57,349	45,955 52,848 57,444	46,031 52,935 57,538	46,107 53,028 57,639	46,182 53,110 57,728	46,258 53,197 57,823	46,334 53,285 57,918
11	46,410 53,371 58,012	46,486 53,458 58,107	46,562 53,546 58,202	46,638 53,634 58,298	46,713 53,715 58,386	46,789 53,808 58,487	46,865 53,895 58,581	46,941 53,982 58,676	47,017 54,070 58,771	47,092 54,156 58,866	47,168 54,243 58,960	47,244 54,331 59,056
12	47,320 54,418 59,150	47,396 54,505 59,244	47,472 54,593 59,340	47,547 54,680 59,434	47,623 54,766 59,529	47,699 54,854 59,624	47,775 54,941 59,719	47,851 55,028 59,813	47,927 55,116 59,909	48,002 55,203 60,003	48,078 55,290 60,098	48,154 55,378 60,193
13	48,230 55,464 60,287	48,306 55,551 60,382	48,382 55,639 60,477	48,457 55,726 60,572	48,533 55,813 60,666	48,609 55,901 60,762	48,685 55,988 60,856	48,761 56,075 60,951	48,837 56,163 61,046	48,912 56,249 61,141	48,988 56,336 61,235	49,064 56,424 61,331
14	49,140 56,511 61,425	49,216 56,598 61,519	49,292 56,686 61,615	49,367 56,773 61,709	49,443 56,859 61,804	49,519 56,947 61,899	49,595 57,034 61,994	49,671 57,121 62,088	49,747 57,209 62,184	49,822 57,296 62,278	49,898 57,383 62,373	49,974 57,471 62,468
15	50,050 57,557 62,562	50,126 57,644 62,657	59,202 57,732 62,752	50,277 57,819 62,847	50,353 57,906 62,941	50,429 57,994 63,037	50,505 58,081 63,131	50,581 58,168 63,226	50,657 58,256 63,321	50,732 58,342 63,416	50,808 58,429 63,510	50,884 58,517 63,606
16	50,960 58,604 63,700	51,036 58,691 63,794	51,112 58,779 63,890	51,187 58,866 63,984	51,263 58,952 64,079	51,339 59,040 64,174	51,415 59,127 64,269	51,491 59,214 64,363	51,567 59,302 64,459	51,642 59,389 64,553	51,718 59,476 64,648	51,794 59,564 64,743
17	51,870 59,650 64,837	51,946 59,737 64,932	52,022 59,825 65,027	52,097 59,912 65,122	52,173 59,999 65,216	52,249 60,087 65,312	52,325 60,174 65,406	52,401 60,261 65,501	52,477 60,349 65,596	52,552 60,435 65,691	52,628 60,522 65,785	52,704 60,610 55,681
18	52,780 60,697 65,975											

*A set of tandem axles with spacing between axles of less than 3.5' is considered as a single axle.

PLATE 25-5
PURPLE AND BONUS OVERLOADS*

Example: 8'-0" First to Last Axle in Feet

50,400	4 tires, 8'-0" Wide	Purple Load = 1.5 x 700 (L + 40)
57,960	8 tires, 8'-0" Wide	Purple Load (+15%) = 1.15 x 1.5 x 700 (L + 40)
63,000	8 tires, 10'-0" Wide	Purple Load (+25%) = 1.25 x 1.5 x 700 (L + 40)

IN. / FT.	0	1	2	3	4	5	6	7	8	9	10	11
2	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000
3	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	28,000 32,200 35,000	45,675 52,526 57,094	45,762 52,626 57,203	45,850 52,728 57,313	45,937 52,828 57,422	46,025 52,928 57,531	46,113 53,030 57,641
4	46,200 53,130 57,750	46,287 53,230 57,859	46,375 53,332 57,969	46,462 53,432 58,078	46,550 53,532 58,187	46,638 53,634 58,297	46,725 53,734 58,406	46,812 53,834 58,515	46,900 53,935 58,625	46,987 54,036 58,734	47,075 54,136 58,843	47,163 54,237 58,954
5	47,250 54,338 59,062	47,337 54,438 59,171	47,425 54,539 59,282	47,512 54,639 59,391	47,600 54,740 59,500	47,688 54,841 59,610	47,775 54,942 59,719	47,862 55,041 59,828	47,950 55,143 59,938	48,037 55,243 60,047	48,125 55,343 60,156	48,213 55,445 60,266
6	48,300 55,545 60,375	48,387 55,645 60,484	48,475 55,747 60,594	48,562 55,847 60,703	48,650 55,947 60,812	48,738 56,049 60,922	48,825 56,149 61,031	48,912 56,249 61,140	49,000 56,350 61,250	49,087 56,451 61,359	49,175 56,551 61,468	49,263 56,652 61,579
7	49,350 56,752 61,687	49,437 56,853 61,796	49,525 56,954 61,907	49,612 57,054 62,016	49,700 57,155 62,125	49,788 57,256 62,235	49,875 57,356 62,344	49,962 57,456 62,453	50,050 57,558 62,563	50,137 57,658 62,672	50,225 57,758 62,781	50,313 57,860 62,891
8	50,400 57,960 63,000	50,487 58,060 63,109	50,575 58,162 63,219	50,662 58,262 63,328	50,750 58,362 63,437	50,838 58,464 63,547	50,925 58,564 63,656	51,012 58,664 63,765	51,100 58,765 63,875	51,187 58,866 63,984	51,275 58,966 64,093	51,363 59,067 64,204
9	51,450 59,168 64,312	51,537 59,268 64,421	51,625 59,369 64,532	51,712 59,469 64,641	51,800 59,570 64,750	51,888 59,671 64,860	51,975 59,771 64,969	52,062 59,871 65,078	52,150 59,973 65,188	52,238 60,073 65,297	52,325 60,173 65,406	52,413 60,275 65,516
10	52,500 60,375 65,625	52,587 60,475 65,734	52,675 60,577 65,844	52,762 60,677 65,953	52,850 60,777 66,062	52,938 60,879 66,172	53,025 60,979 66,281	53,112 61,079 66,390	53,200 61,180 66,500	53,288 61,281 66,609	53,375 61,381 66,718	53,463 61,482 66,829
11	53,550 61,583 66,938	53,637 61,683 67,046	53,725 61,784 67,157	53,812 61,884 67,266	53,900 61,985 67,375	53,988 62,086 67,485	54,075 62,186 67,594	54,162 62,286 67,703	54,250 62,388 67,813	54,338 62,488 67,922	54,425 62,588 68,031	54,513 62,690 68,141
12	54,600 62,790 68,250	54,687 62,890 68,359	54,775 62,992 68,469	54,862 63,092 68,578	54,950 63,192 68,687	55,038 63,294 68,797	55,125 63,394 68,906	55,212 63,494 69,015	55,300 63,595 69,125	55,388 63,696 69,234	55,475 63,796 69,343	55,563 63,897 69,454
13	55,650 63,998 69,562	55,737 64,098 69,671	55,825 64,199 69,782	55,912 64,299 69,891	56,000 64,400 70,000	56,088 64,501 70,110	56,175 64,601 70,219	56,262 64,701 70,328	56,350 64,803 70,438	56,438 64,903 70,547	56,525 65,003 70,656	56,613 65,105 70,766
14	56,700 65,205 70,875	56,787 65,305 70,984	56,875 65,407 71,094	56,962 65,507 71,203	57,050 65,607 71,312	57,138 65,709 71,422	57,225 65,809 71,531	57,312 65,909 71,640	57,400 66,010 71,750	57,488 66,111 71,859	57,575 66,211 71,968	57,663 66,312 72,079
15	57,750 66,412 72,188	57,837 66,513 72,296	57,925 66,614 72,407	58,012 66,714 72,516	58,100 66,815 72,625	58,188 66,916 72,735	58,275 67,016 72,844	58,362 67,116 72,953	58,450 67,218 73,063	58,538 67,318 73,172	58,625 67,418 73,281	58,713 67,520 73,391
16	58,800 67,620 73,500	58,887 67,720 73,609	58,975 67,822 73,719	59,062 67,922 73,828	59,150 68,022 73,937	59,238 68,124 74,047	59,325 68,224 74,156	59,412 68,324 74,265	59,500 68,425 74,375	59,588 68,526 74,484	59,675 68,626 74,593	59,763 68,727 74,704
17	59,850 68,828 74,812	59,937 68,928 74,921	60,025 69,029 75,032	60,112 69,129 75,141	60,200 69,230 75,250	60,288 69,331 75,360	60,375 69,431 75,469	60,462 69,531 75,578	60,550 69,633 75,688	60,638 69,733 75,797	60,725 69,833 75,906	60,813 69,935 76,016
18	60,900 70,035 76,125											

* A set of tandem axles with spacing between axles of less than 3.5' is considered as a single axle.

APPENDIX C

TEXAS MINUTE ORDER 85613

COMMISSION
ROBERT H. DEDMAN, CHAIRMAN
ROBERT C. LANIER
RAY STOKER, JR.

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
DEWITT C. GREER STATE HIGHWAY BLDG.
11TH & BRAZOS
AUSTIN, TEXAS 78701-2483

ENGINEER-DIRECTOR
R. E. STOTZER, JR.

May 12, 1987

IN REPLY REFER TO

D-18P

Mobile Crane Permits

To: All District Engineers

Attention: District Permit Coordinators

Gentlemen:

On April 30, 1987, the Commission passed Minute Order No. 85613, which amended the existing Texas Register rules for permits for mobile cranes. These amended rules have been filed with the Secretary of State, and will become effective on May 27, 1987.

We have attached a copy of Minute Order No. 85613 and the new modified rules. The primary features of the new modified rules are listed below:

1. Any mobile cranes requiring a fee calculation permit must obtain the permit from the Central Permit Operations office in Austin. Mobile cranes exceeding 650 pounds per inch of tire width or exceeding 25,000 pounds per axle must obtain a fee calculation permit. Fee calculation permits will be issued only in Austin effective May 27, 1987.

2. Mobile cranes that do not require a fee calculation permit may continue to obtain single-trip permits at the cost of $20.00.

3. All mobile cranes desiring a quarterly permit must have a hubometer to record the number of miles traveled during the time period of the permit.

4. If a permit applicant travels more than the mileage reported for the quarterly permit, the applicant will have to pay for the extra mileage before the next quarterly permit will be issued.

5. If a permit applicant travels less than the mileage reported for the quarterly permit, the applicant will receive a credit toward the purchase price of the next quarterly permit.

6. Failure by the permittee to maintain the hubometer in good working condition, or failure to advise the Central Permit Operations office of changing or replacing a hubometer, will be grounds for the Department to require the permittee to purchase only single-trip permits for all vehicles in the permittee's fleet for a period of one year.

7. The maximum permit axle weight for a mobile crane shall not exceed 35,000 pounds per axle.

If you have any questions concerning these rules, please contact either Mr. John Moorman (255-0249) or Mr. Stanley Wilson (255-0241).

Sincerely,

Edward A. Dan

for: William C. Garbade, Chief Engineer
of Safety & Maintenance Operations

JMM:gw
Attachment
cc: Engineer-Director
Deputy Engineer-Director
Deputy Directors
General Counsel
Internal Review and
Audit Section

MOBILE CRANE
FEE CALCULATION SHEET

A. Date _____. B. License Plate # _____.
C. Vehicle Serial # _____.

D. Width: -8'6" = X $0.06 = $ /mile

E. Height: -13'6" = X $0.04 = $ /mile

F. Axle Groups:

Weight per Axle	Single Grp Wt./1000 - 20	Tandem Grp Wt./1000 - 34	Triple Grp Wt./1000 - 42 or Quad Grp Wt./1000 - 50	
20,001 to 25,000	Total _____	Total _____	Total _____	Total _____ X $0.045= $ /mile
25,001 to 30,000	Total _____	Total _____	Total _____	Total _____ X $0.055= $ /mile
30,001 to 35,000	Total _____	Total _____	Total _____	Total _____ X $0.08 = $ /mile

Total Fee per mile = $ /mile

1) Present Hub Reading _____
2) - Previous Hub Reading _____
3) = Projected Mileage* _____
4) X Highway Use Factor (.6 Single Trip .3 Quarterly) _____
5) X Total Fee per Mile _____
6) = Unadjusted Fee (or $25 minimum) _____
7) + Fee adjustment _____
8) + $1 credit card fee (if applicable) _____
9) = Balance due _____

* If Hubometer mileage not available then operator must estimate projected mileage for quarter.

\\\\\\\\\\\\\\\\\\ Permit Fee Adjustment //////////////////

1. Previous Permit Number _____
2. Total Fee for Previous Permit _____
3. Beginning Hub Reading (Previous Permit) _____
4. Present Hub Reading _____
5. Elapsed Mileage (4-3) _____
6. Projected Mileage (Previous Permit) _____
7. Mileage Difference (5-6) _____
8. Rate Reduction Factor X Rate per mile (Previous Permit) _____
9. Fee Adjustment (7 X 8) _____

If fee adjustment is + then add to permit fee.
If fee adjustment is - then subtract from permit fee

MINUTE ORDER

WHEREAS, Article 6666, V.C.S., provides that the State Highway and Public Transportation Commission shall have the authority to establish rules for the conduct of work of the Department; and

WHEREAS, Article 6701d-19b, V.C.S., provides that the State Highway and Public Transportation Commission shall formulate fees and adopt rules for the issuance of oversize-overweight permits for certain unladen lift equipment motor vehicles (motor cranes); and

WHEREAS, pursuant to such authority the Commission has previously adopted such rules which are codified as 43 TAC Secs. 25.201 and 25.202; and

WHEREAS, the Commission passed Minute Order No. 85397, dated February 25, 1987, which proposed amendments to said rules to provide for more accurate methodology for permit fee calculation and for lower basic fee per mile rates; and

WHEREAS, said proposed amendments were published in the March 20, 1987 issue of the Texas Register (12 TexReg 947); and

WHEREAS, public comment was received from the Off Road Equipment Operators Association and Mica Corporation expressing disagreement with the proposed reduction of permittable axle weights in accordance with the scheduled dates of January 1, 1988 and January 1, 1989, and requesting that a single highway use factor be established for all permits, and requesting that all motor cranes up to 10 feet wide be permitted to travel on a 24-hour basis; and

WHEREAS, the Commission has determined that such amendments should now be permanently adopted with changes for clarity, and with certain changes in response to public comments as summarized and stated in Exhibit "B" to this Order; and

WHEREAS, the Commission finds that the changes do not affect new subject matters or different individuals; and

WHEREAS, said proposed amendments have been reviewed by legal counsel and found to be a valid exercise of the agency's legal authority;

NOW THEREFORE BE IT ORDERED THAT said amendments be and the same are hereby permanently adopted with changes, the amended rules to read as shown in Exhibit "A" attached hereto and fully incorporated herein; and

BE IT FURTHER ORDERED THAT the Engineer-Director is directed to take the necessary steps to implement the actions as ordered herein, pursuant to the requirements of the Administrative Procedure and Texas Register Act.

Submitted by:

(Title) Chief Engineer of Safety & Maintenance Operations

Examined and recommended by:

Deputy Director

Approved

Engineer-Director

Approved:

Commissioner

Commissioner

Commissioner

Minute Number 85613

Date Passed APR 30 87

MOBILE CRANE

Sec. 25.201 Permits for Unladen Lift Equipment Motor Vehicles.

Oversize and/or overweight permits may be issued to permit the movement of unladen lift equipment motor vehicles under the following:

(1) Only self propelled unladen mobile cranes constructed as a machine used solely for lifting purposes only, and consisting in general of a boom, an engine for power, and a chassis permanently constructed or assembled for the purpose of lifting shall be considered as unladen lift equipment motor vehicles.

(2) All vehicles described in paragraph (1) of this section that are registered with a machinery license plate may obtain the special oversize/overweight permits described in Texas Civil Statutes, Article 6701d-19b.

(3) When an applicant desires to move an unregistered mobile crane, such vehicle shall be issued a 72-hour temporary registration permit and a single-trip oversize/overweight permit issued under provisions of Texas Civil Statutes, Article 6701d-19b.

(4) A vehicle operating under provisions of a permit issued under authority of Texas Civil Statutes, Article 6701d-19b, must have the permit in the vehicle when the vehicle is being moved on the public highways.

(5) Vehicles that do not exceed nine-feet wide, legal height, and/or 65-feet long, shall be allowed 24-hour continuous movement. Vehicles exceeding these limits shall be restricted to movement during daylight hours only.

(6) Vehicles exceeding 12-feet wide, 14-feet 6-inches high, 95-feet long or 200,000 pounds gross weight shall not be eligible for quarterly permits, but may be permitted to move only on single-trip permits issued under the provisions of Texas Civil Statutes, Article 6701d-19b.

(7) The maximum weight for any single axle or any axle within an axle group shall not exceed 35,000 pounds or 850 pounds per inch of tire width, whichever is less; however, after January 1, 1990, the maximum axle weight shall be reduced to 30,000 pounds or 850 pounds per inch of tire width, whichever is less, and no permits will be issued after January 1, 1996, if any axle weight exceeds 25,000 pounds or 850 pounds per inch of tire width, whichever is less. The axle weight reductions specified herein will be applicable only to those vehicles with proof of Texas registration for the registration year of April 1, 1986 through March 31, 1987. Proof of registration will be the burden of the permit applicant. A copy of the vehicle's registration receipt will be proof of registration. Vehicles registered prior to or after the aforementioned dates will not be permitted if any axle weight exceeds 25,000 pounds.

(8) Vehicles that have axle weights in excess of 30,000 pounds but not exceeding 35,000 pounds will be issued only single-trip permits, under provisions of Texas Civil Statutes, Article 6701d-19b, until January 1, 1990. No permits will be issued for any vehicle with axle weights in excess of 30,000 pounds after January 1, 1990.

Sec. 25.202 Fees for Unladen Lift Equipment Motor Vehicles.

(a) Permit fees for these vehicles and equipment shall be calculated to provide for a basic rate per mile fee of $0.06 per mile for each foot (or fraction thereof) above legal width and $0.04 per mile for each foot (or fraction thereof) above legal height. The basic rate per mile fee for any axle or any axle in a group that exceeds legal weight but is less than or equal to 25,000 pounds will be $0.045 times (the axle or axle group weight minus legal weight for the axle or axle group) divided by 1000 pounds, and if any axle exceeds 25,000 pounds but is less than or equal to 30,000 pounds the fee will be $0.055 times (the axle or axle group weight minus legal weight for the axle or axle group) divided by 1000 pounds, and if any axle exceeds 30,000 pounds but is less than or equal to 35,000 pounds the fee will be $0.08 times (the axle or axle group weight minus legal weight for the axle or axle group) divided by 1000 pounds. Axles weighing greater than 35,000 pounds will not be permitted.

(b) The basic rate per mile fee calculated for exceeding legal width, exceeding legal height and the basic rate per mile fee calculated for each axle shall be added together to establish the total rate per mile fee.

(c) The highway use factor for single trip permits is 0.6 and for quarterly permits it is 0.3.

(d) Vehicles that apply for permits issued under Texas Civil Statutes, Article 6701d-19b, shall be equipped with a hubometer, supplied by the permittee and mounted on a drive axle for the purpose of calculating the mileage travelled during each quarter. The vehicle's hubometer serial number and the mileage travelled during the past quarter shall be reported to the Central Permit Office in Austin on the prescribed form, within 10 days of the permit expiration date if permitting is to be discontinued on the vehicle, or within 14 days of the permit expiration date when another quarterly permit is to be secured. The submission of hubometer readings prior to the permit's expiration date will be taken as a request for a new quarterly permit, unless the permittee specifically states in writing to the Department that a new permit is not to be issued. Mileage used for determining credit due or additional permit fee to be collected shall be the difference between the hubometer reading being reported and the previous hubometer reading that was reported for the prior permit.

(e) Actual mileage will be used to calculate the basic permit fee for single-trip permits, and shall be determined from the route to be travelled. Mileage for quarterly permits shall be determined by the permit officer from the vehicle's hubometer

reading from the previous quarter, which shall be supplied by the permittee to the permit officer each time that a quarterly permit is requested. The first quarterly permit issued for any vehicle shall have the permit fee based on a mileage amount estimated by the permit applicant. Subsequent quarterly permits will be calculated on the mileage traveled as indicated by the vehicle's hubometer. If a permitted vehicle travels in excess of the mileage reported for the prior permit, the permittee will be required to pay the State for the balance due for extra mileage traveled plus the projected permit fee for the next quarterly permit before a new quarterly permit will be issued. If a permitted vehicle travels less than the mileage reported on the prior permit, the Department will issue the permit applicant a credit toward the purchase price of the next quarterly permit obtained for the vehicle, or another vehicle in the permittee's fleet. In both cases, credit issuance or additional fee collection, the Department will make these calculations, based on the mileage reported from the hubometer readings, using the same rates that were used to calculate the fee for the previous permit. Refunds will be made to the permittee if the permittee stops the permitting process for a particular vehicle, provided the amount of the refund exceeds $25. Additional fee collections will be required of the permittee, if the permittee stops the permitting process for a particular vehicle, provided the additional fee collection exceeds $25.

(f) It shall be the responsibility of the permittee to maintain the hubometer in good working condition at all times while the vehicle is operating under provisions of a permit. Failure to properly maintain a vehicle's hubometer in good working condition or failure to report changing of hubometers on a permitted vehicle, before the permit time period has expired, will be grounds for the Department to deny the issuance of additional quarterly permits for all vehicles belonging to permittee for a period of one year from the date of the offense. If a permittee is denied the issuance of quarterly permits, the permittee will be required to purchase single trip permits for all vehicles in the permittee's fleet for one year.

(g) The basic Permit fee shall be determined by the following formulas:

(1) Quarterly Permits:

Hubometer Mileage	X	Highway Use Factor	X	Total Rate Per Mile	X	Registration Reduction	=	Basic Permit Fee

(2) Single-Trip Permits:

Mileage To Be Traveled	X	Highway Use Factor	X	Total Rate Per Mile	X	Registration Reduction	=	Basic Permit Fee

(h) The total permit fee for single-trip permits and quarterly permits shall be the basic permit fee or a minimum fee of $25, whichever is the greater amount.

(i) Mobile cranes, registered with machinery license plates, that do not exceed legal size limitations or legal weight limitations, for axle or gross load, but do exceed the maximum legal tire load limit of 650 pounds per inch of tire width, must obtain an annual permit; provided the tire load limit does not exceed 850 pounds per inch of tire width. The fee for these annual permits shall be based on a rate of $0.99 per 100 pounds of gross weight. These annual permits will be valid for one year from date of issuance.

EXHIBIT "B"

The Commission received comments from the Off Road Equipment Operators Association and Mica Corporation, copies attached hereto, generally requesting that the Department not implement the automatic reduction in axle weights scheduled for January 1, 1988 and January 1, 1989 because of the great expense necessary to modify certain motor cranes to bring them within the limits of Departmental permit rules concerning the maximum weight limits for axles. The commentators state the great expense, necessary to modify the cranes to bring their axle weights within the limits stated in the amendment, cannot be justified from a financial standpoint because any modification made now would have to be made again one year later.

The Commission has reviewed the comments concerning the scheduled automatic reduction in axle weights and has determined that the reduction in axle weights is very necessary to protect the public's investment in the State highway system. The Commission has determined, that in an effort to cooperate with the commentators request, the Department will extend the axle weight reduction time period for any single axle or any axle within an axle group weighing in excess of 30,000 pounds but not exceeding 35,000 pounds to January 1, 1990, and for any single axle or any axle within an axle group weighing in excess of 25,000

pounds but not exceeding 30,000 pounds to January 1, 1996. The axle weight reductions specified herein will be applicable only to those vehicles with proof of Texas registration for the registration year of April 1, 1986 through March 31, 1987. Proof of registration will be the burden of the permit applicant. A copy of the vehicle's registration receipt will be proof of registration. Vehicles registered prior to or after the aforementioned dates will not be permitted if any axle weight exceeds 25,000 pounds.

The Commission has determined that extending the axle weight reduction time period will provide the motor crane industry sufficient time to either modify the equipment to the required axle weight limits, or will allow the industry to remove certain cranes from their fleets, that have never been within the long established Departmental permit weight limits for axles and axle groups.

The commentators expressed a desire that the highway use factor for all permits be set at the rate of 0.3. The Commission has reviewed this comment and finds that the proposed rates of 0.6 for single-trip permits and 0.3 for quarterly permits are based on the reasoning that quarterly permits will have a certain amount of travel that is not on the State highway system, while single-trip permits are based on actual mileage travelled on the system. The highway use factor for a quarterly permit should be at a lower rate than a single trip permit because the single-trip permit fee is based on the actual mileage travelled on the

State highway system; therefore, the Commission does not agree to change the highway use factor to 0.3 for both permits.

The Mica Corporation expressed the desire that all motor cranes not exceeding 10 feet wide be permitted to travel, under permit, on a 24-hour basis. The Commission has reviewed this comment, and finds that the proposed rule stating that vehicles not exceeding nine feet wide may be permitted to travel on a 24-hour basis is in the best interest for the safety of the general travelling public; therefore, the Commission does not agree to change the width limit for 24-hour continuous movement.

WOOD, LUCKSINGER & EPSTEIN
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS
ATTORNEYS AT LAW

CHICAGO, ILLINOIS
DALLAS, TEXAS
HOUSTON, TEXAS
LOS ANGELES, CALIFORNIA
MIAMI, FLORIDA

SUITE 1400 SAN JACINTO CENTER
98 SAN JACINTO BOULEVARD
AUSTIN, TEXAS 78701

512/320-5600

NEW YORK, NEW YORK
PALM BEACH, FLORIDA
PALM SPRINGS, CALIFORNIA
SANTA ANA, CALIFORNIA
WASHINGTON, D.C.

April 24, 1987

BY HAND DELIVERY

Mr. William C. Garbade
Chief Engineer of Safety and
Maintenance Operations
State Department of Highways
and Public Transportation
11th and Brazos Streets
Austin, TX 78701

2261.17-203
WDD/PBS

Re: Proposed Amendments to
Rule §§25.201 and 25.202

Dear Mr. Garbade:

The Off Road Equipment Operators Association has requested that I submit the following comments on the amendments to 43 T.A.C. §§25.201 and 25.202 which were published on March 20, 1987, at 12 Tex. Reg. 947-950. The rules to be amended relate to the permitting of motor cranes which exceed the maximum weight allowable for motor vehicles.

The Off Road Equipment Operators Association is comprised of persons in the business of owning, operating, and supplying motor cranes. These cranes are used primarily for heavy lifting in building construction. In 1985 the Legislature authorized the Department to promulgate a procedure for the issuance of permits controlling the movement of heavy motor cranes. TEX. REV. CIV. STAT. ANN. art. 6701d-19b. The Legislature authorized the Department to collect fees for such permits in amounts which recognize the added highway wear imposed by the movement of motor cranes.

Since passage of the new law, the Department has worked to formulate and implement an equitable and workable system of permits and fees. The Department's staff is to be complimented for much of what is currently proposed. The new procedure will improve control over movements of heavy cranes and will, to some extent, minimize the administrative difficulty of complying. However, the Association would

request that certain modifications be made to the rule as proposed.

First, the automatic reductions in permissible axle weights, scheduled for January 1, 1988, and January 1, 1989, should not be adopted. Equipment on the road today was lawful when purchased and should not be made unlawful on a short time schedule, during its useful life. Some of the equipment can be modified to meet the requirements of the rule, but only at great expense. This expense cannot be justified, because, under the proposed system of automatic annual weight reductions, modifications made this year will become obsolete next year. Particularly given the depressed state of Texas' construction industry, the motor crane owners cannot afford to lose expensive equipment or make expensive modifications this year only to repeat them next year.

In addition, the single-trip permit fee should not be increased by 50 percent as proposed. The formula for determining fees includes a "rate reduction" or "highway use" factor. Currently, the factor for determining quarterly permit fees is 0.8, and, for determining single-trip permit fees, it is 0.4. §25.202(d). The proposed amendment would turn that relationship on its head. Under the proposal, the quarterly permit factor would be 0.3, and the single-trip permit factor would be 0.6. Proposed §25.202(c). There is no justification for charging so much more for a single-trip permit. The 0.3 factor should be used for all permits.

The changes requested by the Association can be made very simply. The references to automatic reductions would be deleted from proposed §25.201(7) and (8), and an equal highway use factor would be stated for all permits in §25.202(c). A copy of proposed rules §§25.201(7) and (8) and §25.202(c) with the requested changes shown is attached. Adoption of the rules with the modifications suggested would result in a regulatory system which recompenses the public for the crane operators' use of the highways, satisfies the Department's need for an administratively workable system, and permits the continued use of valuable equipment.

Please advise me if anything further is needed to apprise the Commissioners of the Association's comments. Thank you for your assistance.

Yours truly,

Phyllis B. Schunck

Phyllis B. Schunck

PBSaa/j.1
Enclosure
cc: Bob Guinn

Proposal of Off Road Equipment Operators Association

Section 25.201(1) - (6) (no comment)

(7) The maximum weight for any single axle or any axle within an axle group shall not exceed 35,000 pounds or 850 pounds per inch of tire width, whichever is less. [~~,-however,-after-January-1,-1988,-the-maximum-axle weight-shall-be-reduced-to-30,000-pounds-or 850-pounds-per-inch-of-tire-width,-whichever is-less,-and-no-permits-will-be-issued-after January-1,-1989,-if-any-axle-weight-exceeds 25,000-pounds-or-850-pounds-per-inch-of-tire width,-whichever-is-less.~~]

(8) Vehicles that have axle weights in excess of 30,000 pounds but not exceeding 35,000 pounds will be issued only single-trip permits, under provisions of Texas Civil Statutes, Article 6701d-19b. [~~,-until January-1,-1988.--No-permits-will-be-issued for-any-vehicle-with-axle-weights-in-excess of-30,000-pounds-after-January-1,-1988.~~]

Section 25.202(a) - (b) (no comment)

(c) The highway use factor for all [~~single-trip~~] permits is 0.3 [~~0.6~~]. [~~and-for quarterly-permits-it-is-0.3.~~]

(d) - (i) (no comment)

PBSzA-a.2

Exhibit B
Page 6 of 7

MC CORPORATION

P.O. Box 14350
Fort Worth, Texas 76117
(817) 838-6738
Metro 429-3862

"Signs That Tell You Where
To Get Off"

1951 Probandt Street
San Antonio, Texas 78214
(512) 532-3270

April 21, 1987

State Department of Highways
11th and Brazos Streets
Austin, Texas 78701

Attn: William C. Garbade
Chief Engineer of Safety &
Maintenance Operations

Re: HB 2496, passed early June, 1985
Unladen Lift Equipment

Gentlemen:

For two years members of the A G C have been working with the State Department of Highways to achieve implementation of the above referenced law. There has been much discussion with a lot of give and take.

However, the proposed regulations you have published in the March 20, 1987 Texas Register miss the mark in several instances:

(1) The economic loss of the regulations is not the $100 per vehicle as advertised, but conceivably $300,000 to $400,000 per machine when in 1988 per section (8) there will be no permits issued for machines with axle weight over 30,000 pounds.

(2) In the meetings we attended, it was agreed that machines up to ten (10) feet in width would be allowed 24 hour usage.

People who own cranes are like every other business in Texas, they are not in good economic shape at this time. To mandate the mothballing of fleets of cranes makes no economic sense and was not the intent of the bill that was to "enable the Highway Department to write more than single trip permits".

We would appreciate your review of this regulation and the abolishment of Sections 7 and 8, along with the revision of Section (5)[(6)] to ten (10) feet in width.

Sincerely,

L. C. Tubb, Jr.
President

Reply To:
FORT WORTH

APPENDIX D

DEPARTMENT OF PUBLIC SAFETY
COMMERCIAL VEHICLE FORM

ST-3C (1/88) COMMERCIAL MOTOR VEHICLE SUPPLEMENT TO THE TEXAS PEACE OFFICER'S ACCIDENT REPORT

ACCIDENT INFORMATION

LOC NO. _____

DO NOT WRITE IN THIS SPACE

(1) COUNTY _____ (2) CITY OR TOWN _____

(3) ROAD ON WHICH ACCIDENT OCCURRED _____
BLOCK NO. STREET OR ROAD NAME ROUTE NUMBER

(4) DATE OF ACCIDENT _____ 19__ (5) DAY OF WEEK _____ (6) HOUR _____ ☐AM ☐PM (IF EXACTLY NOON OR MIDNIGHT, SO STATE)

MCS NO. _____

DRIVER INFORMATION

(7) NAME _____ (8) DRIVER'S LICENSE _____
LAST FIRST MIDDLE STATE NUMBER

(9) DRIVER'S LICENSE CLASS/TYPE _____ (10) RESTRICTIONS OR ENDORSEMENTS _____ (11) DRIVER'S DOB _____
MONTH DAY YEAR

CARRIER INFORMATION

(12) TYPE OF CARRIER: ☐ INTERSTATE ☐ INTRASTATE

(13) CARRIER'S CORPORATE NAME _____

(14) CARRIER'S PRIMARY ADDRESS _____
NUMBER STREET CITY STATE ZIP

(15) CARRIER ID TYPE: ☐ ICC ☐ RRC ☐ NONE (16) CARRIER ID NO. _____

MOTOR VEHICLE INFORMATION

☐ (17) UNIT NUMBER ON ST-3 (18) LICENSE PLATE _____ (19) REGISTERED GROSS VEHICLE WEIGHT _____
YEAR STATE NUMBER

(20) VEHICLE TYPE ☐
1-TRUCK
2-TRUCK TRACTOR
3-TANK TRUCK
4-DUMP TRUCK
5-VAN
6-BUS
7-SPECIALIZED
8-CEMENT MIXER
9-OTHER (SPECIFY)_____

(21) CARGO CLASS ☐
1-HAZARDOUS CORROSIVE
2-HAZARDOUS FLAMMABLE
3-HAZARDOUS COMBUSTIBLE
4-HAZARDOUS POISON
5-HAZARDOUS RADIOACTIVE
6-NON-HAZARDOUS
7-NOT APPLICABLE
8-UNKNOWN

(22) CARGO TYPE ☐
1-GENERAL FREIGHT
2-GAS IN BULK
3-LIQUID IN BULK
4-SOLIDS IN BULK
5-PRODUCE
6-AGRICULTURAL PRODUCTS
7-LIVESTOCK
8-ROCK, DIRT, SAND, GRAVEL, ETC.
9-MACHINERY
10-CONSTRUCTION MATERIAL
11-DAIRY PRODUCTS
12-OTHER (SPECIFY) _____
13-EMPTY
14-NOT APPLICABLE (UNIT NOT EQUIPPED FOR CARGO)

(23) ☐ IF THIS VEHICLE TYPE IS A BUS, SHOW THE NUMBER OF PASSENGERS THE BUS IS EQUIPPED TO CARRY (INCLUDING THE DRIVER).

(24) ☐ SHOW THE NUMBER OF TRAILER(S)/SEMI-TRAILER(S) THIS MOTOR VEHICLE IS TOWING. COMPLETE TRAILER INFORMATION BELOW AS APPLICABLE.

TRAILER NUMBER 1 INFORMATION

(25) LICENSE PLATE _____ (26) REGISTERED GROSS WEIGHT _____
YEAR STATE NUMBER

(27) TRAILER TYPE ☐
1-TANK TRAILER
2-DUMP TRAILER
3-LIVESTOCK TRAILER
4-FLATBED TRAILER
5-SPECIALIZED TRAILER
6-VAN TRAILER
7-POLE TRAILER
8-OTHER TRAILER (SPECIFY) _____
9-TANK SEMI-TRAILER
10-DUMP SEMI-TRAILER
11-LIVESTOCK SEMI-TRAILER
12-FLATBED/FLOAT SEMI-TRAILER
13-VAN SEMI-TRAILER
14-OTHER SEMI-TRAILER (SPECIFY) _____

(28) CARGO CLASS ☐
1-HAZARDOUS CORROSIVE
2-HAZARDOUS FLAMMABLE
3-HAZARDOUS COMBUSTIBLE
4-HAZARDOUS POISON
5-HAZARDOUS RADIOACTIVE
6-NON-HAZARDOUS
7-NOT APPLICABLE
8-UNKNOWN

(29) CARGO TYPE ☐
1-GENERAL FREIGHT
2-GAS IN BULK
3-LIQUID IN BULK
4-SOLIDS IN BULK
5-PRODUCE
6-AGRICULTURAL PRODUCTS
7-LIVESTOCK
8-ROCK, DIRT, SAND, GRAVEL, ETC.
9-MACHINERY
10-CONSTRUCTION MATERIAL
11-DAIRY PRODUCTS
12-OTHER (SPECIFY) _____
13-EMPTY
14-NOT APPLICABLE (UNIT NOT EQUIPPED FOR CARGO)

TRAILER NUMBER 2 INFORMATION

(30) LICENSE PLATE _____ (31) REGISTERED GROSS WEIGHT _____
YEAR STATE NUMBER

(32) TRAILER TYPE ☐
1-TANK TRAILER
2-DUMP TRAILER
3-LIVESTOCK TRAILER
4-FLATBED TRAILER
5-SPECIALIZED TRAILER
6-VAN TRAILER
7-POLE TRAILER
8-OTHER TRAILER (SPECIFY) _____
9-TANK SEMI-TRAILER
10-DUMP SEMI-TRAILER
11-LIVESTOCK SEMI-TRAILER
12-FLATBED/FLOAT SEMI-TRAILER
13-VAN SEMI-TRAILER
14-OTHER SEMI-TRAILER (SPECIFY) _____

(33) CARGO CLASS ☐
1-HAZARDOUS CORROSIVE
2-HAZARDOUS FLAMMABLE
3-HAZARDOUS COMBUSTIBLE
4-HAZARDOUS POISON
5-HAZARDOUS RADIOACTIVE
6-NON-HAZARDOUS
7-NOT APPLICABLE
8-UNKNOWN

(34) CARGO TYPE ☐
1-GENERAL FREIGHT
2-GAS IN BULK
3-LIQUID IN BULK
4-SOLIDS IN BULK
5-PRODUCE
6-AGRICULTURAL PRODUCTS
7-LIVESTOCK
8-ROCK, DIRT, SAND, GRAVEL, ETC.
9-MACHINERY
10-CONSTRUCTION MATERIAL
11-DAIRY PRODUCTS
12-OTHER (SPECIFY) _____
13-EMPTY
14-NOT APPLICABLE (UNIT NOT EQUIPPED FOR CARGO)

(35) SIGNATURE _____ DATE THIS SUPPLEMENT MADE _____
PERSON COMPLETING SUPPLEMENT DEPARTMENT

APPENDIX E

FIELD STUDY SUMMARY TABLES

VEHICLES ROUTED THROUGH STUDY SITE
ACCORDING TO CPO RECORDS

Table E-1. Field Data Results
IH-10, Date: 6/29/88

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS.	DESCRIPTION
1	751	ZD3991TX		8		2-2	BACKHOE ON 2-AXLE TRAILER
2	755	R48273TX		9.5	11.5	3-S2	"BOX" LOAD
3	809	5B38KI				2-2	CRATES
4	820			9		3-S3	TRACKHOE
5	844			8.5		3-S3	4-TIRE CRANE
6	930	G426PG		8		2-2	SMALL TRACKHOE: 2 AXLE TRAILER
7	936	01371JTX		14			MOBILE HOME
8	936	5146KITX		14			MOBILE HOME
9	936	OX184TX		14			MOBILE HOME
10	943					3-S2	FLOAT TRAILER
11	946			8	14	3-S2	MIL. SU ON TRAILER
12	957			8	12	3-S3	LARGE GRAY ENGINE
13	958	ZAG689		10.5		3-S3	SIDE BOOM CRAWLER
14	1004			12		3-S2	REC. METAL
15	1031			12	12.5	3-S2	ROOF TRUSSES
16	1031			12	12.5	3-S2	ROOF TRUSSES
17	1031			12	12.5	3-S2	ROOF TRUSSES
18	1059			12	12.5	3-S2	ROOF TRUSSES
19	1106					3-S3	DRESSER GRADER
20	1117					3-S3	CAT GRADER
21	1144		24	12		2-2	PORT. BLDG.

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS.	DESCRIPTION
22	1144			12		2-2	PORT. BLDG.
23	1157					3-S3	OILFIELD EQUIP.
24	1216			12		3-S3	OILFIELD EQUIP.
25	1216			11		SU	GROVE CRANE
26	1222		30	12			BOAT
27	1242			8	13.5	3-S3	GRAY MACHINE
28	1253			12		3-S2	REC. METAL
29	1300		70	14			MOBILE HOME
30	1302			11		SU	4 AXLE CRANE ON FR. RD.
31	1310	K5B-_56		12		3-S2	LARGE MACHINE
32	1316	R46665TX	65TR	11		8 AX.	TARPED LOAD
33	1330	01371JTX	80	16			MOBILE HOME REAR ESCORT
34	1330			10		3-S2	STEEL
35	1347					SU	ROLLER OR COMPRESSOR
36	1419	36276SNM		14			MOBILE HOME
37	1421						HALF TRAILER
38	1421		38	12.5	15	2-S2	CYL. TANK
39	1423	___7__TX	40		14	3-S2	CYL. TANK
40	1428	5146NXTX	70	14			MOBILE HOME
41	1442		44	10			MOBILE HOME
42	1442		44	10			MOBILE HOME
43	1501	R49043TX		8		SU	ROLLER OR COMPRESSOR
44	1533	R45264TX	17	13	15	3-S2	CYL. TANK

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS.	DESCRIPTION
45	1540			10	12	2-S2	CYL. TANK
46	1557			8.5	12	3-S3	UNKNOWN
47	1620			8		3-S2	TARPED LOAD
48	1620	7365HZTN				3-S2	UNKNOWN
49	1749			10		3-S2	FLAT STEEL
50	1830			10		3-S2	FLAT STEEL
51	1914		20LD	12	14	2-S2	CYL. TANK
52	1925		18LD	8.5		3-S2	WHITE BLDG.
53	1942					3-S3	EQUIPMENT
54	2003						EQUIPMENT
55	2011						EQUIPMENT
56	2028					9 AX.	CAT SCRAPER

Table E-2. Field Data Results
IH-10, Date: 6/30/88

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS	DESCRIPTION
1	700			8.5		3-S2	FLAT BED W/PED. TUNNEL
2	700			10		SU-5	5 AX. CRANE TO SHELDON RD.
3	832			8.5		SU-4	4 AX. CRANE
4	844	PR_ ___TX	40	10			MOBILE HOME
5	855	241 ___TX		10		3-S3	BULLDOZER
6	904			8.5			4 AX. CRANE
7	918			10			MOBILE CRANE
8	928			8.5			ROOF TRUSSES
9	942	2AH-419TX		9			CRANE ON LOWBOY
10	1001	514-6NXTX	50	12			MOBILE HOME
11	1002	_88009TX		8.5		3-S3	CRANE ON LOWBOY
12	1002			9			CURVED PIPE
13	1003			11			STEEL PLATE
14	1012	PO46582 Red/Wh.		8			3 COMPRESSORS
15	1024	2AN-666TX	64LD	16+	14		MOBILE HOME
16	1024		64LD	16+	13.5		MOBILE HOME
17	1028	42291F Red/Wh.		8			ROOF TRUSSES
18	1037			--			UNKNOWN
19	1035	849OLN		10		2-2	METAL FRAME
20	1037			10	14	3-S3	BOILER
21	1044	PO50061 Red/Wh.	6 OH	--	12	3-S3	BUNK HOUSE OVER REAR AX.

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS	DESCRIPTION
22	1044			12	14.5		LARGE DUMPSTER
23	1044			12	14.5		LARGE DUMPSTER
24	1045	0137NJTX	36	12			MOBILE HOME
25	1129			14			MOBILE HOME
26	1132						
27	1149		54				MOBILE HOME
28	1151	14_ ___TX					ROOF TRUSSES
29	1210	R69 638TX				3-S2	TALL MACHINE
30	1212	R47 258TX				3-S3	SMALL SCRAPER
31	1216	R41 809TX				3-S2	FLAT STEEL
32	1219	NONE	60	14			MOBILE HOME
33	1240	R48 710TX				3-S3	OIL WELL SERV. RIG
34	1243	QX 184 (OR 104)	70	14			MOBILE HOME
35	1252	R34 ___				SU-4	OIL WELL SERV. RIG
36	1253			12			STEEL PLATE
37	1255	2BP 694		12		2-S1	CYL. TANK
38	1317	432 5MVTX ?		14			CYL. TANK
39	1317	329 4FBTX		14			CYL. TANK
40	1319			14		9 AX.	UNKNOWN
41	1336	2AB 396	50' TRL	12			3 PORT. BLDGS.
42	1349	COVERED	60' TRL	12		4-S5	UNKNOWN
43	1448			11			TRUSSES
44	1452	R27 948TX		9.5	12		METAL DUCTS

VEH. NO.	TIME	TAG/STATE	L(FT)	W(FT)	HT	CLASS	DESCRIPTION
45	1454		36LD	12			MOBILE HOME
46	1501	0137NJTX		14			MOBILE HOME
47	1525	2AB756TX		10			TRACKHOE (MTCY. ESC.)
48	1537	2AG515		8		3-S3	SMALL GRADER
49	1557		28	9			MOBILE HOME
50	1608	2591HA N.MEX.				3-S1	CYL. COMPONENT OF SYSTEM
51	1615		56LD			3-S2	2D COMPONENT
52	1615	16055C N.MEX.	54LD			3-S2	3D COMPONENT
53	1625	COVERED		10		3-S3	TRACKHOE
54	1702	HINGED	42	9		3-S1	4TH COMPONENT
55	1751	R40 328TX		8.5		3-S2	4 TIRE CRANE
56	1813			12		3-S4	SIDE BOOM CRAWLER
57	1827	R44 942TX		8.5		3-S2	MED. SIZE GRADER
58	1837	COVERED		8.5	14		HELICOPTER
59	1923			14		9 AX.	ROUNDED SHAPE (TARP)
60	1923	DF5498 Y./BLA.		14		9 AX.	ROUNDED SHAPE (TARP)
61	2005	2836 WYO.				3-S1	5TH COMPONENT

15:31 TUESDAY, JULY 5, 1988
Texas Department of Highways and Public Transportation
Safety and Maintenance Operations Division
Central Permit Operations
Trucks Permitted on I-10E on June 29 and 30, 1988

Start Date: WED, JUN 29, 1988 Start Time: 8:52:18
Truck Make: 81 INLT
Truck Lic: QX184
Load Description: MOBILE HOME
Route: $PORTER$ JCT FM1314 & US 59-US59S,IH610E&S,IH10E,TO JCT SHORE LANDER RD,SH146N,1 MILE.$BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON
PERMITS NOT TO BE AMENDED TO EXTEND DATE

Start Date: WED, JUN 29, 1988 Start Time: 8:53:43
Truck Make: 81 INLT
Truck Lic: 0A37NJ
Load Description: MOBILE HOME
Route: $PORTER$ JCT FM1314 & US 59-US59S,IH610E&S,IH10E,TO JCT SHORE LANDER RD,SH146N,1 MILE.$BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON
PERMITS NOT TO BE AMENDED TO EXTEND DATE

Start Date: WED, JUN 29, 1988 Start Time: 8:54:55
Truck Make: 79 INLT
Truck Lic: 5146NX
Load Description: MOBILE HOME
Route: $PORTER$ JCT FM1314 & US 59-US59S,IH610E&S,IH10E,TO JCT SHORE LANDER RD,SH146N,1 MILE.$BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON
PERMITS NOT TO BE AMENDED TO EXTEND DATE

Start Date: WED, JUN 29, 1988 Start Time: 11:18:14
Truck Make: 85 FORD
Truck Lic: R49135
Load Description: BOAT
Route: $HOUSTON$ WEST MONT RD. JCT. FM149S,IH45S,IH610E&S,IH10E,US96N, FM105S,IH10W TO JCT.2 MILES TO SPINDLETOP TRUCK STOP $VIDOR$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON & BEAUMONT

Start Date: WED, JUN 29, 1988 Start Time: 17:26:19
Truck Make: 79 GMCE
Truck Lic: 140089 TEMP
Load Description: ARMY WRECKER
Route: $KILLEEN$ SH195 JCT. US190E,IH35N,SH36S,FM2095E,US190W,SH36S,
SH36B/RT/S,FM577E&S,US290E,IH610N,E&S,IH10E,US96N,FM105S,IH10E
TO JCT. $LA.LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON & BEAUMONT

Start Date: WED, JUN 29, 1988 Start Time: 16:06:16
Truck Make: 84 PETERBILT
Truck Lic: R45928
Load Description: DUST COLLECTOR
Route: $SAN ANTONIO$ JCT IH410 & IH35N,LP1604S,IH10E,IH610N,E&S,IH10E,
US96N,FM2246E,SH62S,IH10E $LA STATE LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
SAN ANTONIO,HOUSTON,BEAUMONT.

Start Date: WED, JUN 29, 1988 Start Time: 16:08:39
Truck Make: 84 PETERBILT
Truck Lic: R45929
Load Description: DUST COLLECTOR
Route: $SAN ANTONIO$ JCT IH410 & IH35N,LP1604S,IH10E,IH610N,E&S,IH10E,
US96N,FM2246E,SH62S,IH10E $LA STATE LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
SAN ANTONIO,HOUSTON,BEAUMONT.

Start Date: WED, JUN 29, 1988 Start Time: 14:35:39
Truck Make: 81 INTL
Truck Lic: X897998 TA
Load Description: TRUSSES
Route: $SAN ANTONIO$ IH10E @ FM1516, TO COLUMBUS,FM2434N,US90E,IH10N
FRONTAGE RD,E,FM102 CROSSOVER IH10E,HOUSTON,IH610N/E,IH10E
BEAUMONT US96N,FM2246E,SH62S,IH10E,LA/SL
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
SAN ANTONIO,HOUSTON,BEAUMONT

Start Date: WED, JUN 29, 1988 Start Time: 17:27:07
Truck Make: 74 GMC
Truck Lic: PR1926
Load Description: MOBILE OFFICE
Route: $HOUSTON$ JCT. GELLHORN & IH610E&S, IH10E, US96N, FM2246E, SH62S,
IH10E $LOUISIANA LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON & BEAUMONT

Start Date: THU, JUN 30, 1988 Start Time: 16:44:59
Truck Make: 79 FORD
Truck Lic: R44564
Load Description: STEEL PLATE
Route: $HOUSTON$JCT.FAIRBANKS
RD.&US290E,IH610E&S,IH10E,BEAUMONT,US96S,
SH347S,FM366E,JCT.FM365$NEDERLAND$
NO MOVEMENT BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON & BEAUMONT

Start Date: WED, JUN 29, 1988 Start Time: 8:18:34
Truck Make: 82 WHITE
Truck Lic: 801464M
Load Description: STEEL PLATE
Route:HOUSTON,F529EFROM300F529,U290E,IH610E/S,IH10E,U96N,F2246E,S62S ,IH10E,ORANGE,LA.ST.LINE.
NO MOVEMENT IN HOUSTON & BEAUMONT 7-9AM & 4-6PM.

Start Date: WED, JUN 29, 1988 Start Time: 13:32:30
Truck Make: 84 FRTLINER
Truck Lic: 801495H TA
Load Description: STEEL PLATES
Route: HOUSTON,JCT FM529,US290E,IH610NE&S,IH10E,BEAUMONT US96N,EVADALE FM2246E,SH62S,IH10E,LASL ORANGE.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON & BEAUMONT.

Start Date: WED, JUN 29, 1988 Start Time: 7:37:36
Truck Make: 73 FORD
Truck Lic: R33882
Load Description: OFFICE UNIT
Route: BURLESON.JCT
SH174/IH35WS,IH35S,SH171S,US84E,FM553S,SH179E,IH45S,
IH610E,S,IH10E,US96N,FM2246E,SH62S,IH10E,LASL.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUST
ON,BEAMONT.

Start Date: WED, JUN 29, 1988 Start Time: 8:38:04
Truck Make: 81 GMC
Truck Lic: 4707LP TA
Load Description: TANKS
Route: COLUMBUS.JCT IH10/FM949N,FM1049S,SH36S,LP350S,SH36S,IH10E,IH610N,
E,S,IH10E,US96N,JCT SH62.BUNA.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON.
DETOUR STRUCTURE AT MAGNOLIA.

Start Date: THU, JUN 30, 1988 Start Time: 13:33:14
Truck Make: 84PB
Truck Lic: 2AH434
Load Description: POOL
Route: $HOUSTON$US290E,FROM JCT. GESSNER
RD.,IH610E&S,IH10E,US96N,FM2246
E,SH62S,SH12NE TO TX LA S/L$DEWEYVILLE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON & BEAUMONT
1ST AMD: CHANGE TRAILER DUE TO VEH. BK/DN. CDH/LL 6-29-88 3:15

Start Date: WED, JUN 29, 1988 Start Time: 10:53:38
Truck Make: 1985 W/STAR
Truck Lic: 19246 TEMP.
Load Description: HEAT EXCHANGER
Route: $BEASLEY$:US-59N@540,LP-610N,E,S,I-10E,US-96N,FM-2246E,SH-62S,I-1
0E, TO $LOUISIANA STATE LINE$.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON,BEAUMONT

Start Date: WED, JUN 29, 1988 Start Time: 10:46:38
Truck Make: 79 GMC
Truck Lic: R10523
Load Description: FIBERGLASS TANK
Route: $VICTORIA$US59S,FROM 1 MILES N OF SLP175,TO LP175E,US87S,FM616E,S
172N,US59N,I-610N&E&S,I-10E,FM1406N,TO JCT US90$NOME$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON

Start Date: WED, JUN 29, 1988 Start Time: 10:03:25
Truck Make: 88 FORD
Truck Lic: R69799
Load Description: BOAT LANDING
Route: $INGLESIDE$JCT FM2725 & SH361E,SH35N,SH172N,SP522N,US59N,LP610S,
E&N,IH10E,US96N,FM2246E,SH62S,IH10E,TO$LA.LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON & BEAUMONT.

Start Date: WED, JUN 29, 1988 Start Time: 7:29:37
Truck Make: '86 FORD
Truck Lic: 8248KH
Load Description: PORTABLE BUILDINGS
Route: $CLEVELAND$ JCT. FM2025 ON US59S,IH610E&S,IH10E,SP330SE,TO BAY WAY DR. $BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON

Start Date: WED, JUN 29, 1988 Start Time: 7:31:21
Truck Make: '87 FORD
Truck Lic: 5321NK
Load Description: PORTABLE BUILDINGS
Route: $CLEVELAND$ JCT. FM2025 ON US59S,IH610E&S,IH10E,SP330SE,TO BAY WAY DR. $BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON

????Start Date: WED, JUN 29, 1988 Start Time: 10:32:49
Truck Make: '78 KENWORTH
Truck Lic: R47378
Load Description: STEEL BEAM **5'ROH
Route: $HOUSTON$ JCT. ALMEDA-GENOA RD. ON IH45N,IH610E&N,IH10E,US96N&E,FM105S,IH10E,LA ST LINE LA
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON

Start Date: WED, JUN 29, 1988 Start Time: 7:40:08
Truck Make: 78 INTL
Truck Lic: R38762
Load Description: OFFICE BUILDING
Route:BURLESON,IH35WS,JCTLP50,IH35S,SH22E,SH171S,US84E,FM553S,SH179E, IH45S,LP610E,S,IH10E,US96N,FM2246E,SH62S,IH10E,TO LA/TX STATE LINE

Start Date: WED, JUN 29, 1988 Start Time: 7:17:37
Truck Make: 80 PETERBILT
Truck Lic: P13508 TA
Load Description: CONTROL BUILDING
Route: $HOUSTON$ JCT AIRPORT BLVD ON IH45N,IH610E & N,IH10E,SH146S,FM1405SE JCT SP55$BAYTOWN$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON

Start Date: WED, JUN 29, 1988 Start Time: 10:16:26
Truck Make: 79 KW
Truck Lic: R41331
Load Description: SCRAPER
Route: AUSTIN EMPTY O/L 97' JCT W. CANNON AT IH35,IH35S,JCT LP337,SOUTH NW BRAUNFELS,LOAD AT JCT LP337 & IH35,IH35N,SH46E,IH10E,FM2434N,GLIDDEN,US90E,IH10NSR,E,FM102,X OVER,IH10E,IH610N,E,S,IH10E,US96N, FM2246E,SH62S,IH10W,JCT FM1136,XOVER,IH10E TO LA LINE. APP 15.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUST

Start Date: WED, JUN 29, 1988 Start Time: 10:53:22
Truck Make: 80 GROVE
Truck Lic: 66M706
Load Description: S/P CRANE
Route: HOUSTON JCT SH35 AT IH610,IH610E,N,IH10E,SH146S FOR 5 MILES BEACH CITY.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON CITY LIMITS.

Start Date: THU, JUN 30, 1988 Start Time: 9:15:48
Truck Make: 79 INLT
Truck Lic: 5146NX
Load Description: MOBILE HOME
Route: $PASEDENA$ JCT PINE ST & BELT WAY 8 -B.W.8 N,SH225W,IH610N,IH10E, TO JCT CROSBY/LYNCHBURG RD.$HIGHLAND$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON
PERMITS NOT TO BE AMENDED TO EXTEND DATE

Start Date: THU, JUN 30, 1988 Start Time: 15:26:21
Truck Make: 84 MACK
Truck Lic: R43161
Load Description: LIGHT POLES
Route: $BRENAM$JCT SH36 &
US290-US290E,IH610E&S,IH10E,US96N,FM2246E,SH62
S,IH10E,LA LINE.$ORANGE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON,BEAUMONT

Start Date: THU, JUN 30, 1988 Start Time: 5:38:02
Truck Make: 76 MACK
Truck Lic: R37154
Load Description: MOBILE HOME
Route: PORTER, JCT FM1485/US59S,IH610E/S,IH10E,SH146S,JCT FM565,
BAYTOWN
PERMITS NOT TO BE AMENDED TO EXTEND DATE
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 5:38:48
Truck Make: 76 MACK
Truck Lic: R37154
Load Description: MOBILE HOME
Route: PORTER, JCT FM1485/US59S,IH610E/S,IH10E,SH146S,JCT FM565,
BAYTOWN
PERMITS NOT TO BE AMENDED TO EXTEND DATE
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 8:06:42
Truck Make: 79 CHEVY
Truck Lic: 2AV396
Load Description: PORTABLE BUILDINGS
Route: $HALLETSVILLE$ FM 318 3 MILES WEST OF US 77 E, US 77N,US90AE,FM30
13N,SH36N,IH10E,IH610N&E,IH10E,US96N,TO JCT. SH105$BEAUMONT$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON AND BEAUMONT

Start Date: THU, JUN 30, 1988 Start Time: 8:48:19
Truck Make: 81 KW
Truck Lic: 80241 TA
Load Description: PRESS MACHINE
Route: NM/SLIH10E US85S,SANTA FE ST.S,LP375E/N,IH10E SAN ANTONIO,IH410
S,E,N,IH10E,HOUSTON,IH610N/E/S,IH10E BEAUMONT,US96N,FM2246E,EVADA
LE,SH62S,IH10E,LA/SL
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
SAN ANTONIO,HOUSTON,BEAUMONT

Start Date: THU, JUN 30, 1988 Start Time: 9:18:36
Truck Make: 'WHITE
Truck Lic: P70488 TA
Load Description: DUMP BODY
Route: MCALLEN JCT.F1924&F1926S,U83E,U281N, FALFURRIAS S285NE,U77N, TIV
OLI S239E,S35N,S172N, GANADO U59N,I610N/E/S,I10E, TO JCT.S124 @ W
INNIE. NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6
PM IN:HOUSTON.

Start Date: THU, JUN 30, 1988 Start Time: 7:24:07
Truck Make: 81 MACK
Truck Lic: 2AM666
Load Description: MOBILE HOME
Route: SPRING,IH45S,JCT.FM2920,IH610ES,IH10E,FM565N,FM1409N,9MILES,DAY-
TON
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:
HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 12:23:29
Truck Make: 85 WESTERN
Truck Lic: R26180
Load Description: HELICOPTER
Route: CORPUS CHRISTI,S358N FROM NAVAL AIR STATION TO LEOPARD ST,
IH37 E SERV RD N FROM LEOPARD ST & F1694 TO UPRIVER RD,U77N
FROM UPRIVER RD & F624,S239E,S35N,S172N,F710N,U59N,IH610N/E/S,
IH10E,U96N,F2246E,S62S,IH10E,ORANGE,LA.ST.LINE. 6'REAR OVERHANG.

Start Date: THU, JUN 30, 1988 Start Time: 8:59:12
Truck Make: 78 WHITE
Truck Lic: 2AD081
Load Description: MOBILE HOME
Route: LA PORTE UNDERWOOD/SH225W,IH610W,N,E,S,IH10E,US96N,FM105S,JCT
IH10.VIDOR.
PERMITS NOT TO BE AMENDED TO EXTEND DATE
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON.

Start Date: THU, JUN 30, 1988 Start Time: 8:25:56
Truck Make: 1981 GROVE
Truck Lic: 66M724
Load Description: S/P MOTOR CRANE
Route: $HOUSTON$:SH-35@LP-610E,N,I-10E,TO JCT. SH-146,$MONT BELVIEW$.
RETURN TRIP GRANTED,VIA REVERSE ROUTE,TIME OF PERMIT.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:

Start Date: THU, JUN 30, 1988 Start Time: 7:26:26
Truck Make: 73 GMC
Truck Lic: 7960KS
Load Description: MOBILE HOME
Route: $LEPORT$S225W,FROM MCCABE RD,TO
I-610W&N&E&S,I-10E,FM3180S,FM565W
,FOR 2 MILES$MONT BELVIEU$
PERMITS NOT TO BE AMENDED TO EXTEND DATE
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM
IN:HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 8:08:58
Truck Make: 81 KW
Truck Lic: R41421
Load Description: CONTROL SKID
Route: $HOUSTON$I-45N,FROM MONROE ST,TO I-610N,I-10E,S73E,TO JCT FM823$PORT ARTHUR$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON ROUTE APROVED BY ROY

Start Date: THU, JUN 30, 1988 Start Time: 12:25:19
Truck Make: 82 PETE
Truck Lic: P056487 TA
Load Description: STEEL PLATES
Route: $INGLESIDE$ FROM GULF MARINE FABRICATORS ON FM2725N,SH361E,SH35N,
SH172N,LP522N,US59N,LP610N,E&S,IH10E,US96N,FM2246E,SH62S,IH10E,TO $LA.LINE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON & BEAUMONT.

Start Date: THU, JUN 30, 1988 Start Time: 6:07:43
Truck Make: 77 GMC
Truck Lic: 2507HM
Load Description: MOBILE HOME
Route: $PORTER$ U59S AT FM1485, I610ES,I10E,S146S TO JCT. FM565 $BAY TOWN$
***NO MOVEMENT ON JULY 4, 88
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN: HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 8:46:44
Truck Make: '75 KENWORTH
Truck Lic: R41809
Load Description: STEEL PLATE
Route: $HOUSTON$ JCT. MESA DR. ON US90W,IH610S,IH10E,US96N,FM105S,TO JCT. IH10 $VIDOR$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON

Start Date: THU, JUN 30, 1988 Start Time: 9:16:01
Truck Make: 81 FRTLINER
Truck Lic: P050061 TA
Load Description: METAL BUILDING
Route: $TOMBALL$ FM2920E FROM JCT FM2978, IH45S, IH610E,S, IH10E, US96N, FM2246E, SH62S, IH10E TO LA.ST.LINE $ORANGE$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON.

Start Date: THU, JUN 30, 1988 Start Time: 10:19:29
Truck Make: 81 INTL
Truck Lic: QX184
Load Description: MOBILE HOME
Route: $HUMBLE$ US59S FROM JCT BELTWAY 8, IH610E,S, IH10E, SP330S 1 MILE $BAYTOWN$
PERMITS NOT TO BE AMENDED TO EXTEND DATE.
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON. NO MOVEMENT ON JULY 4TH.

Start Date: THU, JUN 30, 1988 Start Time: 8:50:19
Truck Make: 81 GMC
Truck Lic: 9057EB
Load Description: MOBILE HOME
Route: $SPRING$FM2920 JCT IH45S,MAIN ST TURNAROUND,IH45N,IH610E&S,IH10E, FM565N,FM1409N,7 MILES$DAYTON$
NO MOVEMENT ALLOWED BETWEEN THE HOURS OF 7-9 AM & 4-6 PM IN:HOUSTON