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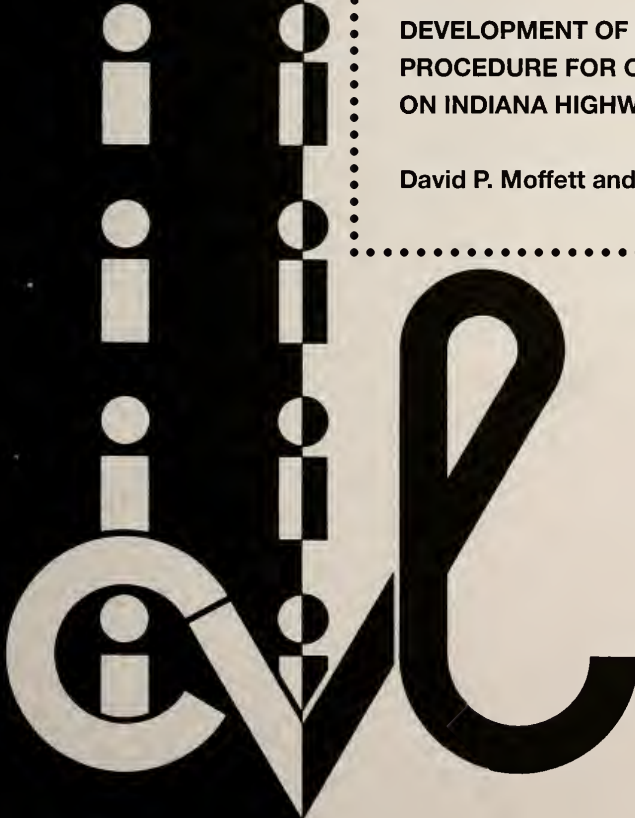
DEPARTMENT OF TRANSPORTATION

JOINT HIGHWAY RESEARCH PROJECT

FHWA/IN/JHRP-95/5  
Final Report

DEVELOPMENT OF ANNUAL PERMIT  
PROCEDURE FOR OVERWEIGHT TRUCKS  
ON INDIANA HIGHWAYS

David P. Moffett and Robert K. Whitford



PURDUE UNIVERSITY



FINAL REPORT

DEVELOPMENT OF ANNUAL PERMIT PROCEDURE FOR  
OVERWEIGHT TRUCKS ON INDIANA HIGHWAYS

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Joint Highway Research Project

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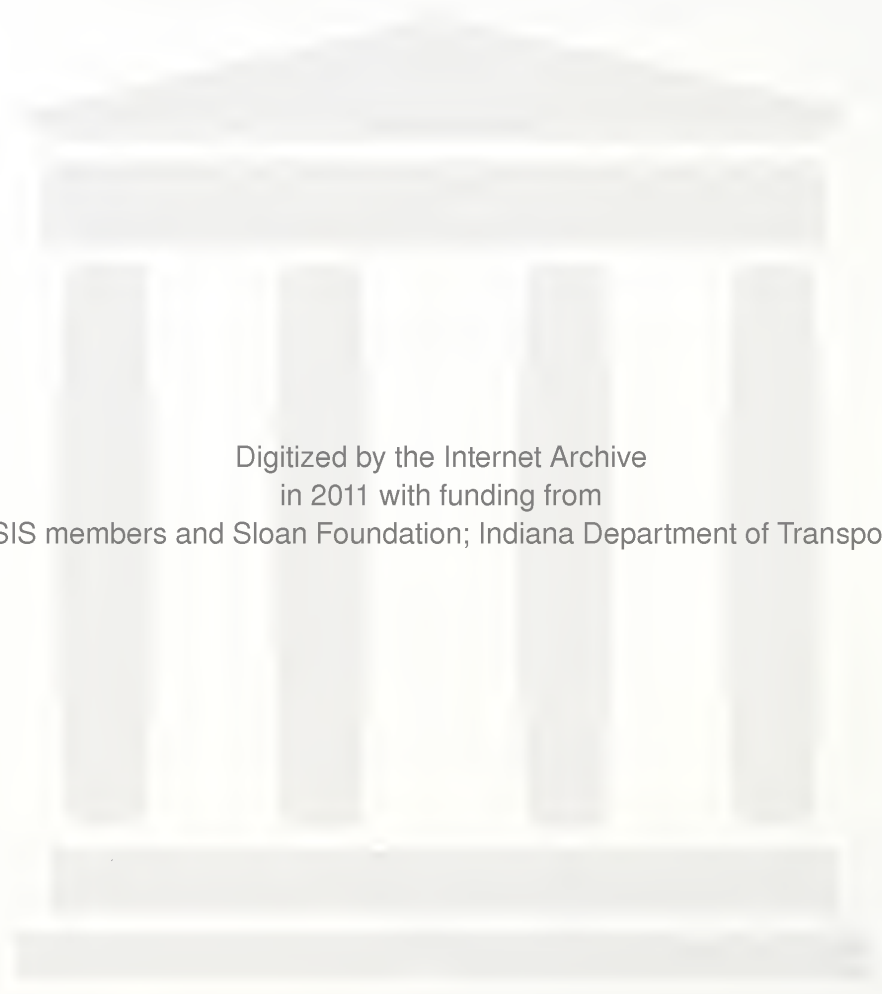
In cooperation with the  
Indiana Department of Transportation

and the

Federal Highway Administration

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

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16. Abstract Overweight truck permitting in Indiana is presently done on a per trip basis. This study evaluated alternatives to each trip having to make a call to the INDOT permit office to gain a permit. The study was originally requested by the Indiana State Legislature under P.L. 122-1993 section 7 in response to delays in getting permits.  The report's six chapters are:  1. Introduction and Summary 2. Review of Other State's Permitting Systems 3. Framework for Policy Evaluation 4. Permits for Michigan Truck-Trains 5. Overweight and Overweight/Oversized Trucks 6. Implementation Suggestions Plus 7 Appendices.  A Michigan Truck-Train is a special dual-trailer configuration permitted for only one short "Extra Heavy Duty Highway" in northern Indiana.  The report presents a methodology for evaluating various possible alternatives and then does that evaluation. It suggests that the per-call basis is fundamentally the correct mechanism, but that the present implementation of per-call permitting needs some improvements. Some suggestions are offered for those improvements.					
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## Table of Contents

- Chapter 1 - Introduction and Summary
- Chapter 2 - Overweight/Oversize Truck Permitting in Other States
- Chapter 3 - Framework for Policy Evaluation
- Chapter 4 - Permits for Michigan Truck-Trains
- Chapter 5 - Overweight and Overweight/Oversize Trucks
- Chapter 6 - Implementation Suggestions
  
- Appendix A - Other State Permitting -- State by State Details
- Appendix B - Extra Heavy Duty Highway Trip Report
- Appendix C - Data Analysis Methodology and Overview
- Appendix D - Voice Response Scenarios
- Appendix E - Abstract of Annual Permits for Overweight Trucks on Indiana Roads,  
Part 1. Annual Permits
- Appendix F - Abstract of Annual Permits for Overweight Trucks on Indiana Roads,  
Part 2. Permitting Alternatives
- Appendix G - Ideas for Computer Representation of the State Highway Network for  
Permitting

## Tables and Figures

Table 2.1	Annual overweight permit fees for those states who charge a flat-fee irrespective of vehicle configuration, distance traveled, or commodity shipped
Table 2.2	Annual overweight permit fees for those states who base fees upon vehicle configuration
Table 2.3	Annual overweight permit fees for those states who base their fees upon vehicle weight and distance traveled.
Table 2.4	Maximum weight that each state will issue an annual overweight permit
Table 2.5	States who issue a "blanket" annual overweight permit without any type of accompanying official route map.
Table 2.6	States who issue a "blanket" annual overweight permit with an accompanying official route map that must always be attached to the permit.
Table 2.7	States who issue annual overweight permits that restrict movements to either specific loads or specific routes.
Table 2.8	States who issue annual overweight permits and still require a company to call-in for a specific route authorization for each trip.
Table 2.9	States with PC-based electronic permitting systems that carriers can connect to with a modem.
Table 2.10	Additional notes from states that issue annual overweight permits.
Table 3.1	Descriptive Information About the Criteria to be Used in Policy Analysis
Table 3.2	Matrix of Criteria for Policy Evaluation
Table 4.1	Overweight/Oversize permits in Indiana for FY 1993 & FY 1994
Table 4.2	Industry breakdown of companies using Michigan Train permits FY 1994
Table 4.3	Data summary of Michigan truck-train permits in FY 1994
Table 4.4	Matrix of Criteria for Policy Evaluation - Michigan Train
Table 4.5	Michigan Train Annual Permit Fee by Company Using FY 1994 Data
Table 4.6	Annual Permit Available for Trucks Using the Extra Heavy Duty Highway
Table 5.1	Overweight & Oversize/Overweight permits in Indiana for FY 1993 & 94.
Table 5.2	Overweight Trucks Permit Data by Company for FY 1994.
Table 5.3	Company information related to type of haul in FY 1994.
Table 5.4	Location of Firms Purchasing Permits for Overweight/Oversize Trucks.
Table 5.5	Origin-Destination of Overweight/Oversized Loads in Indiana - FY 1994.
Table 5.6	Sample Individual Truck Volume of Travel Per Month for FY 1994.
Table 5.7	Average Truck Utilization for Overweight Loads by company ranked 10-20 in revenue.

**Tables and Figures (Continued)**

- Table 5.8 Examination of a sample of five companies with different average utilization.
- Table 5.9 Check of Revenue Neutrality for 1994.
- Table 5.10 Matrix of Criteria for Policy Evaluation - Overweight Trucks.
- 
- Figure 4.1 Map of Extra Heavy Duty Highway
- Figure 4.2 Typical Michigan Train
- 
- Figure 5.1 Axle Configurations for 108,000-120,000 GVW
- Figure 5.2 Pattern of travel by permit



## Chapter 1 Introduction and Summary

INDOT, in July of 1994, requested Purdue University to conduct a policy study on annual permits for overweight trucks in compliance with legislation passed by the Indiana State Legislature in 1993 [P.L. 122-1993 Section 7], which reads:

- (a) The Indiana Department of Transportation shall study the feasibility of issuing annual permits under IC 9-20-5 and IC 9-20-6<sup>1</sup> (Code chapters on Overweight and Oversize Trucks)
- (b) The study conducted under this SECTION must include an analysis of the potential benefits and detriments of annual permits. The study must establish a proposed fee schedule for annual permits.
- (c) Not later than December 1, 1993, the Indiana Department of Transportation shall report the results of the study conducted under this section to the commissioner of the Indiana Department of Transportation.
- (d) This SECTION expires December 31, 1993.

IC-9-20-5 and IC-9-20-6 includes permitting for: 1) overweight and oversize/overweight vehicles, 2) non-conforming vehicles used in emergencies or in restoration of utility service, 3) non-conforming vehicles using the "extra heavy duty highways" (referred to here as Michigan roads), 4) toll road gate permits, and 5) vehicles used with non-conforming semi-trailers. This study only considers uses 1 and 3.

Recently, the Indiana Department of Transportation has received an increasing number of requests for overweight permits, in part due to improved economic conditions in the State and to increases in pre-fabricated building materials. There has been a 40% increase in permit request over the last five years; 16% in FY 1994 over FY 1993. This has led to saturation of

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<sup>1</sup> The Indiana Code references are the chapters in the transportation section on the use of highways by trucks that exceed weight and size specifications for the majority of trucks. They refer mainly to loads which cannot be divided for purposes of transporting and to the hauling of steel into Michigan in load sizes more compatible with Michigan laws which allow 165,000 pound GVW.

the limited resources of the INDOT Permit Office. Permit seekers experience both long periods of time when all lines are busy in addition to long waits on hold. These numerous examples coupled with long periods of time when the permittee waits on "hold" characterize the difficulty that users experience when they attempt to request a permit. The recent addition of a fax line has alleviated this situation somewhat.

The following are the main recommendations from this study in order to meet the letter and spirit of P.L. 122-1993 Section 7.

**1. Recommendation for Annual Permits only**

There is no way to meet a major study objective of revenue neutrality by creating a pure/simple annual permit for either each truck or each company. In addition it appears that any form of annual permit will cause the trucking companies to alter their operations to reduce cost, potentially causing some industry dislocation. For example, the study found that an annual permit of \$10,000 for each company would be used by only 47 companies out of 1708 and lose at least 27% of revenue to the State. Likewise, a \$1000 annual permit would be used by 378 companies but cause a 70% loss in revenue. An annual permit by truck at \$1000 would show a loss of somewhere between 25% and 58% of the current system's revenue.

**2. Recommendation For An Improved System**

The study examined a whole range of policy options and recommends the following as a potential change to improve the system. The system includes the following elements:

1. A map delineating acceptable truck routes segregated by levels of acceptable weight limits.
2. An annual enrollment or permit that is a one time cost per year for each truck and company.

3. A fully automated 24-hour voice response system that can be easily used from any Touch-Tone™ phone.
4. An understanding by the truckers that they are using a self-policing system much as they are today, that requires them to correctly indicate which route map that they will use.
5. A data entry process in INDOT that would store and process data from the trucking companies requesting permits.

The following is one proposed rate structure that is revenue neutral and would work well within the above mentioned system:

- Company annual permit (good for 12 months from purchase) - \$25.00
- Per truck annual permit (good for 12 months from purchase) - \$15.00
- For travel between 80,000 lbs. GVW and 108,000 lbs. GVW - \$10 per every 30 miles traveled or part there of
- For travel between 108,000 lbs. GVW and 120,000 lbs. GVW - \$30 per every 30 miles traveled or part there of

### **3. Recommendation for Michigan trains**

Permitting of Michigan Trains is different from the above process. It is a simple and very repetitive process. It is simple because there is no route information collected. If a truck already had a record at the state which allowed the driver to call, dial his truck number, a PIN, and the starting date and time, then the computer could debit the driver's account and grant a permit. This would allow the employees in the permit office to spend more time working on more challenging problems. Further, with automation comes the ability to obtain a permit at any time of the day or night. This flexibility will lend itself to better compliance with the existing law.

Therefore we make no recommendation for a change in Michigan Trains except for the inclusion of automation of permit granting by a Touch Tone/Voice Response system.

The remainder of this report is a detailed analysis of the existing system and other alternatives that were evaluated before determining the preceding recommendations.

## Chapter 2

### Overweight/Oversize Truck Permitting in Other States

Through the assistance of the Specialized Carrier and Rigging Association, a summary list was obtained briefly itemizing which states offered at least one type of annual permit, though not necessarily an annual "overweight" or "special weight" permit. This list was then merged with a Federal emergency list which provided the name, address, phone, and fax number of each states' "designated official who grants permits for oversize, overweight, or other special military movements on public highways". Direct contact was then made with the appropriate high-level officials at each of the previously identified states in order to discuss those specific policy issues. In several instances, some of the states furnished copies of their permitting maps and other documents. States providing such information were: Ohio, Idaho, Michigan, New York, Minnesota, Iowa, and Kentucky.

A brief summary of the data obtained in the survey is follows. A report on the state-by-state conversations is provided in Appendix A.

**Finding 1:** There is no uniformity in the way states handle overweight permitting. Some have annual fees, some have annual fees plus a per overweight mile addition. Each of the states that issue "annual" overweight permits charge different fees than other states that issue these permits. No state's policy is exactly like any other state's policy.

**Finding 2:** Officials from states using a flat-fee approach to permitting indicated that significant revenue was lost when they switched from a single-trip permit system to an annual flat-fee permit system because they had no limit to the number of trips which could be taken in one year on an annual permit. They observed that many trucking companies consolidated their overweight operations from many vehicles that on occasion would obtain a single-trip

overweight permit, to a few vehicles with annual overweight permits that were dedicated to handle as many of a company's overweight movements as possible, in order to maximize the value of the company's investment in annual permits.

**Finding 3:** Weight-distance fees are expected and accepted by the high volume overweight haulers. In general, the trucking industry has voiced opposition about weight-distance taxation. However, some states which use annual weight-distance-based overweight permit fees noted that opposition to this type of fee was significantly less from companies who regularly deal with overweight movements. This is because most single trip overweight permit fees are already based on a movement's weight and the distance that it would be traveling. Therefore, this policy yields a type of permit fee that is similar to the policies which larger companies are accustomed.

**Finding 4:** Some states are providing permits through the use of electronic data transmission. During the survey process, it was determined that the amount of information entered in the agency's computer with electronic permitting was held to a minimum. The permit user fills out a form on a computer owned by the user, using software provided by the state, after which the software automatically dials the number and only the raw data is transmitted -- not the formatted data-entry screens. This off-line data-entry process, coupled with minimal data requiring transmission, helps limit the length of calls compared to those calls where data transmitted verbally via the telephone to a permit clerk. Service times were found to be shorter; subsequently the telephone lines were readily available for other companies wishing to contact the agency's computer system. This served to minimize prior problems of long phone queues and/or busy signals.

**Finding 5:** Officials in several states who have annual permits, have complained that their state could not adequately deal with the added road and bridge damage done by overweight trucks. After listening to a description of the Indiana's trip-by-trip, weight-distance approach to permit fee system, they indicated their interest in implementing a similar program. Presently, much of their permit fee structure is based on smaller amounts and often the amounts are not much more than an administrative fee.

**Finding 6:** Many states have developed a map that identifies routes in the state over which overweight trucks with certain gross weights and axle spacing are required to travel. The principal problem caused by used or over use of over weight vehicles is damage to. Colorado simply identifies each bridge and color codes it indicating what weight and axle spacing are permitted on that bridge.

The following tables 2.1-2.10 present in tabular form the information gained through conversations with state officials.

**Table 2.1: Annual overweight permit fees for those states who charge a flat-fee irrespective of vehicle configuration, distance traveled, or commodity shipped**

STATE	FEE
Alabama	\$ 100 / year
Arizona	\$ 640 / year if load-specific \$1,500 / year if "blanket"
California	\$ 90 / year
Colorado	\$ 400 / year
Florida	\$ 500 / year
Georgia	\$ 100 / year
Florida	\$ 500 / year
Georgia	\$ 100 / year
Massachusetts	\$ 300 / year
Nevada	\$ 50 / year
New Hampshire	\$ 100 / year
New York	\$ 360 / year
North Carolina	\$ 50 / year
Ohio	\$ 25 / quarter
Rhode Island	\$ 100 / year / trailer
Tennessee	\$ 500 / year for vehicles up to 120,000 GVW \$1,000 / year for vehicles over 120,000 GVW
Virginia	\$ 60 / two-years

(Note: permit availability may be limited to vehicles having certain configurations and/or carrying certain commodities)

**Table 2.2: Annual overweight permit fees for those states who base fees upon vehicle configuration )**

STATE	FEE
Alaska	\$ 40 - \$720 / yr. (30-day increments; 1-yr. max.)
Connecticut	\$ 7 / 1,000 lbs. / year
Kentucky	\$ 60 - \$160 / year
Minnesota	\$200 - \$800 / year
Pennsylvania	\$ 25 - \$300 / year
Rhode Island	\$ 50 / 1,000 lbs. / yr. (out-of-state power units)

(Note: permit availability may be limited to vehicles having certain configurations and/or carrying certain commodities)

**Table 2.3: Annual overweight permit fees for those states who base their fees upon vehicle weight and distance traveled**

STATE	FEE
Idaho	\$2.10 / mile / 2,000 lbs. excess weight + \$40 flat fee / year (all collected quarterly)
Montana	\$3.50 / 25-miles / 5,000 lbs. excess weight over 80,000 lbs. + \$200 flat fee / year
Ohio	In the process of switching from a flat-fee to a to-be-determined ton-mile rate

(Note: permit availability may be limited to vehicles having certain configurations and/or carrying certain commodities)



**Table 2.4: Maximum weight that each state will issue an annual overweight permit**

STATE	MAXIMUM WEIGHT
Alabama	150,000 lbs.
Alaska	125% of legal weight
Arizona	250,000 lbs.
California	"Numerous permits available"
Colorado	200,000 lbs.
Connecticut	200,000 lbs.
Florida	152,000 lbs.
Georgia	100,000 lbs.
Idaho	200,000 lbs.
Kentucky	?
Massachusetts	?
Minnesota	145,000 lbs.
Montana	5,000 lbs. total excess axle weight
Nevada	?
New Hampshire	?
New York	116,000 lbs.
North Carolina	122,000 lbs.
Ohio	?
Pennsylvania	Limited to quarrying operations moving up to 1/2-miles along a highway, and related trucks crossing a highway
Rhode Island	?
Tennessee	?
Virginia	90,000 lbs.

(Note: vehicle configurations and allowable routings can vary – see successive tables

**Table 2.5: States who issue a "blanket" annual overweight permit without any type of accompanying official route map.**

STATE	NOTES
Alabama	Only if movement weighs 100,000 lbs. or less
Alaska	N/A
Arizona	Only at the \$1,500 / year permit cost level
Georgia	N/A
Massachusetts	N/A
Montana	Available routes are posted at weight stations
Nevada	N/A
New Hampshire	N/A
New York	"Blanket" is restricted to routes within various air-mile radii from trip origin
Rhode Island	"No maps are issued because it is a small state and therefore no special map is needed. Special route exceptions are published in local newspapers."

**Table 2.6: States who issue a "blanket" annual overweight permit with an accompanying official route map that must always be attached to the permit.**

STATE	NOTES
California	Travel is allowed anywhere except "weak bridges" that are identified on a map.
Colorado	N/A
Florida	Must stay on "official map" routes
Idaho	Color-coded map with four weight-level categories
Kentucky	Travel is allowed on any state-maintained roads within the county the permit was issued for, and any neighboring counties. Multiple annual overweight permits to allow travel in other counties may be purchased.
Minnesota	Vehicles that are less than 12'6" in width and 8'6" in axle width may travel anywhere on the official map after first consulting a weekly construction map that is mailed by the Minnesota Department of Transportation to all holders of annual overweight permits.
Virginia	N/A

**Table 2.7: States who issue annual overweight permits that restrict movements to either specific loads or specific routes.**

STATE	NOTES
Arizona	Only at the \$640 / year permit cost level
Kentucky	For steel carriers only, they may travel on specific routes within a 35-mile radius from their base of operations
Massachusetts	Only issued for construction equipment, boat haulers, and self-propelled cranes
Minnesota	Permits are typically only issued for movements of construction commodities.
New Hampshire	Only issued for construction industry movements on pre-approved routes
New York	Various load-specific and route-specific permits
North Carolina	Depending on vehicle configuration, may travel from one to ten company-requested routes that are submitted for pre-approval when applying for an annual overweight permit.
Ohio	Annual overweight permits are both load-specific and route-specific.
Pennsylvania	Limited to quarrying operations up to 1/2-mile along a highway, and related overweight vehicles that need to cross a highway from one side of a quarry to another side of a quarry.

**Table 2.8: States who issue annual overweight permits and still require a company to call-in for a specific route authorization for each trip.**

STATE	NOTES
Alabama	If movement weighs greater than 100,000 lbs.
Connecticut	N/A
Minnesota	If movement is greater than 14'0" in width, greater than 14'0" in height, and greater than 85'0" in overall length

**Table 2.9: States with PC-based electronic permitting systems that carriers can connect to with a modem.**

Maine	Minnesota
Missouri	Oregon
Ohio --	(they are adding the ability to automatically handle special bridge analysis)

(Note: not all of the following states issue annual overweight permits).

**Table 2.10: Additional notes from states that issue annual overweight permits.**

STATE	NOTES
Arizona	<ul style="list-style-type: none"> <li>* "Points" against an annual permit are issued for violations to a permit's limitations. Excessive points result in the revocation of the annual permit.</li> <li>* The state is loosing money on their flat-fee envelope/blanket permit due to companies consolidating their overweight operations to certain vehicles.</li> </ul>
Georgia	<ul style="list-style-type: none"> <li>* Afraid their accident rates will rise as more trips are taken with annual permits (less oversight).</li> <li>* Since no trip authorization is required for their "blanket" permit, "Why even bother to issue an overweight permit?"</li> </ul>
Minnesota	* Suggests a "trip limit" on annual permits ("bulk purchase")
Missouri	<ul style="list-style-type: none"> <li>* Currently up to a 2-1/2 hour phone delay for their single-trip overweight permits (they have no annual overweight permits)</li> <li>* Feel it is their responsibility to route individual trips to limit carriers' exposure to bodily injury claims and other insurance issues.</li> </ul>
Nevada	* Just increased their flat-fee from \$25/year to \$50/year.
Ohio	* Previous annual overweight flat-fee of \$55/year has been eliminated and is being replaced by a ton-mile fee system.

### Chapter 3 Framework for Policy Evaluation

The policy evaluation task requires that a set of criteria be established against which each of the policy alternatives can be reviewed. The measures of performance while not weighted equally do indicate the best policies. For example the measure of revenue neutrality is a critical measure for the state. It also is a indication of the retention of equity between highway users.

Table 3.1 presents the important criteria, the reason(s) for its inclusion, and appropriate questions that may need answers before it can be weighted along with the other measures. Each of the policy approaches will be subjected to screening via the use of a chart similar to the one presented in Table 3.2.

**TABLE 3.1 Descriptive Information About the Criteria to be Used in Policy Analysis**

**A. Criteria that reflect the INDOT's effectiveness in permitting the overweight trucks.**

Road Utilization Data	With the implementation of some policies, the information base that INDOT now has available as to the use of some roads for overweight trucks may be lost.
Route Control	If there are no restrictions on the travel of certain trucks on some highways, bridge or road damage may become severe. Therefore route control is important in the evaluation of permit policies.
Ease of Implementing	Any new system will require some time and effort for implementation. The speed with which implementation can be accomplished becomes important. Potential side-effects must also be addressed, e.g. change in the skill level, number of personnel, or the manner in which permit fees are assessed or revenue is collected.

**TABLE 3.1 (Continued)**

<p>Cost of Implementation</p>	<p>Any new system will require some up-front costs and will have a continuing cost. e.g. new forms, working with firms on implementation, etc. Requirements for the involvement of other state personnel such as an increase in auditors or enforcement personnel, must also be assessed.</p>
<p>Reduction in Calls</p>	<p>Hopefully any system will reduce, if not the number of calls, at least the requirements for human processing of each call. It will be necessary to determine the total volume and peak periods for calls which can be expected in a new system.</p>
<p>Revenue Neutrality</p>	<p>The desire to maintain the present level of permit dollars coming into INDOT is a criterion that needs to be evaluated. Some loss in revenue may be offset by a corresponding reduction in the cost of processing calls that are still necessary.</p>
<p>Potential for subversion</p>	<p>Does the policy put INDOT at risk by enterprising truckers who might be interested in beating the system and thus reducing their costs? Will the penalty for subversion need to be increased to be sufficient for deterrence?</p>
<p>Ability to enforce</p>	<p>What are the limits on enforcement? Can the state legitimately and effectively enforce the law?</p>

**B. Criteria that reflect the Trucking Industry's needs for an improved permitting system.**

<p>Ease of understanding</p>	<p>If the policy is hard to describe and its approach can lead to misunderstanding then the policy may be inappropriate for implementation.</p>
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**TABLE 3.1 (Continued)**

Change in Operations	How will the trucking industry respond to policy alternatives in terms of organizational structure and operations?
Market Effects	Any policy other than one where users pay as they travel (per permit/per mile), will likely cause some effect in the industry. If the permit cost is of sufficient magnitude that a change will strongly favor large companies, what will the impact be on small companies? Likewise, will a policy that equally includes the small companies become cumbersome or unwieldy for the larger firms?
Cost to Operators	Will the policy increase or decrease the truckers cost of doing business and in what way?

C. Criteria that reflect the "benefit" of the policy analysis .

Modeling certainty	Even the most analyzed policies can produce unpredictable or undesired side effects.. This item is simply an attempt to qualitatively assess the confidence in the analysis approach and techniques.
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D. Other possible considerations.

Evaluation Potential & Cost	Any policy needs to undergo continuing evaluation. Evaluation would include changing in the revenue stream, surveys of truckers, discussing with enforcement persons, etc. The analysis might consider evaluation techniques other than revenue.
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**TABLE 3.2**

**Matrix of Criteria for Policy Evaluation**

Criteria	Policies	Single Trip Permits				Permit by groups of trips or time					
		Present System	Voice response	E-mail permits	Bulk permits	Honor system	Single permit (90 or Ann)	Based on last year	Use on any truck	By specific truck	Specified Route
I	Road Utilization Data										
N	Route Control										
D	Ease of Implementing										
	Cost of Implementation										
O	Changes in Call Type & Volume										
T	Revenue										
	Neutrality										
	Ability to Enforce										
	Potential for subversion										
T	Ease of Understanding										
R	Change in Operations										
U	Market Effects										
C	Cost to Operators										
K	Modeling Certainty										

## Chapter 4 Permits for Michigan Truck-Trains

Michigan Truck-Trains are a specialized form of overweight truck operating in northern Indiana. This chapter describes what a Michigan Truck-Train is, what the route that the vehicles use is and how they are permitted. Then it describes possible improvements to how permitting is accomplished.

### 1. VEHICLE AND ROUTE DESCRIPTION

Michigan Truck-Trains get their name from being a tractor followed by two trailers to form what looks vaguely like a train. They are often just referred to as Michigan Trains. A typical Michigan Train is shown in Figure 4.2.

Title 9-20-5-5 of the Indiana code places the following maximum size and weight limits for special weight permit vehicles on extra heavy duty highways. The maximum size and weight limits for vehicles operated with a special weight permit on an extra heavy duty highway are as follows:

- (1) A vehicle may not have a maximum wheel weight, unladen or with load, in excess of eight hundred (800) pounds per inch width of tire, measured between the flanges of the rim.
- (2) A single axle combination may not exceed eighteen thousand (18,000) pounds.
- (3) An axle in an axle combination may not exceed thirteen thousand that may weigh sixteen thousand (16,000) pounds per axle or a total of thirty-two thousand (32,000) pounds.
- (4) The total gross weight, with load, of any vehicle or combination of vehicles may not exceed one hundred thirty-four thousand (134,000) pounds.
- (5) Axle spacing may not be less than three (3) feet, six (6) inches, between each axle in an axle combination.
- (6) Axle spacing may not be less than eight (8) feet between each axle or axle combination. [P.L.2-1991, § 8]



The aforementioned Extra Heavy Duty Highway is a section of U.S. 12 and U.S. 20 along with part of Indiana 39. See the map which is Figure 4.1 for the exact highway links. The highway was created to allow trucks to move from the Gary/East Chicago/Burns Harbor steel mills to the Michigan border. In Michigan the vehicles can operate at up to 164,000 pounds GVW.

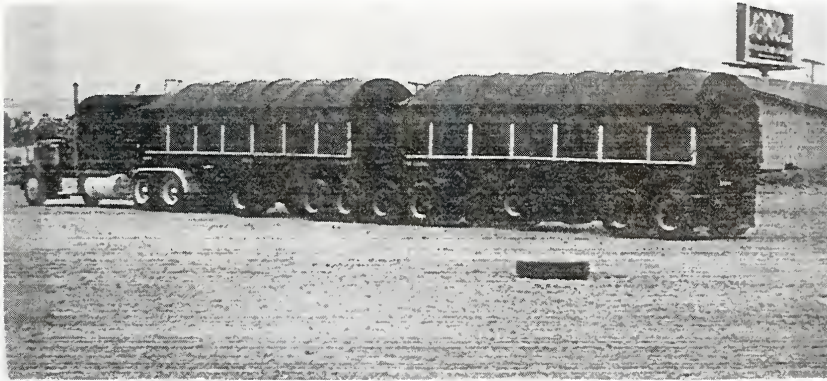
There is a considerable discrepancy between Indiana's maximum (134,000 GVW) and Michigan's (164,000 GVW). This has led to a two step process, where the trucker takes an overweight and thus permitted load up to a holding area in Michigan, then returns and picks up another 80,000 load which does not need a permit. After the trucker is in Michigan, the two trailers are mated and continue on to the auto plants in Detroit. Nearly all loads are covered to keep the steel clean and dry thus there is often the temptation to carry both trailers up from the outset saving time and often money by skipping getting the permit. For purposes of discussion later in this chapter, the process of moving trailers to Michigan is called *ferrying*. The current fee for using the Extra Heavy Duty Highway is \$43.50 per trip. The typical travel distance on the highway is less than 35 miles.

## **2. EXISTING CONDITIONS**

The Michigan trucks usually carrying steel goods (80% of the loads) into Michigan. Overweight backhauls from Michigan, often to Chicago, are 35% of the permits. Eighty-eight percent of the trips are across state line.

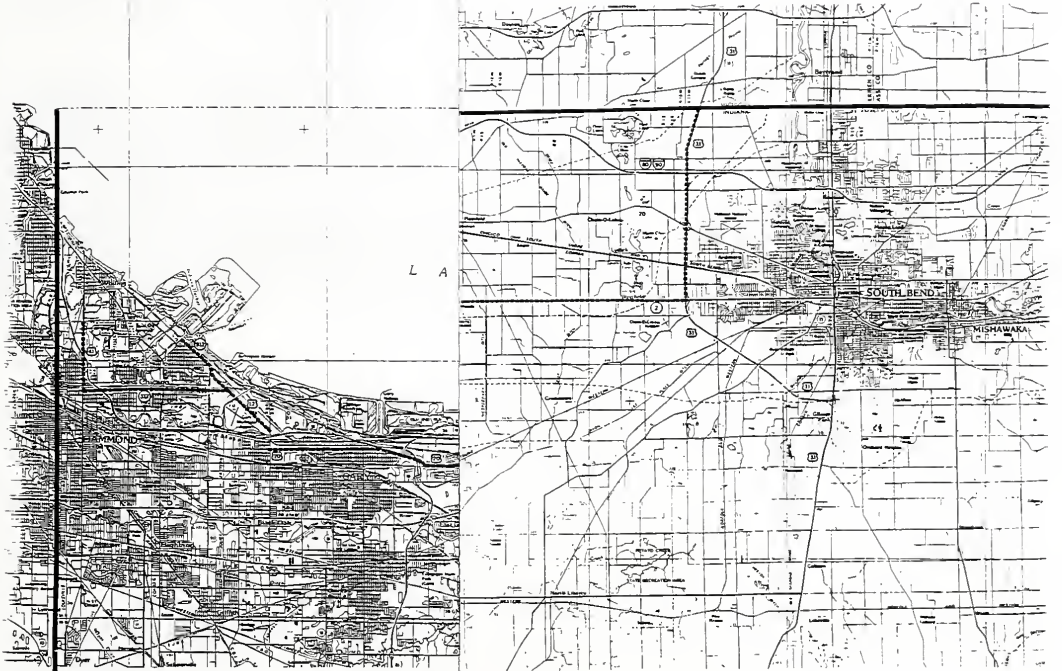
Enforcement of the permitting requirement is relatively easy since there is only two roads (Indiana 39 and US 31) crossing the state borders on the route. The trains are not allowed on the toll road or on Indiana portion of Interstate 94. Access is provided to the steel mills and other steel processing plants in Northern Indiana.

Many of the companies act as dispatchers for the large population of owner-operators who haul steel.



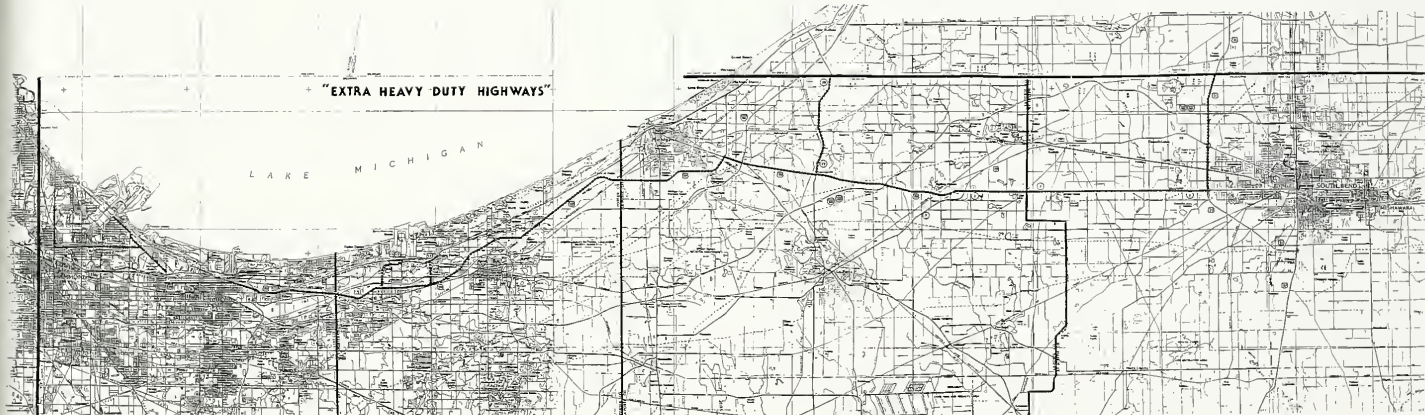
**Figure 4.2 Typical Michigan Train**

**Figure 4.1 Map of Extra Heavy Duty Highway (following page)**



+ "EXTRA HEAVY DUTY HIGHWAYS"

LAKE MICHIGAN



This section summarizes the information gleaned from analysis of the data on Overweight and Oversize/ Overweight trucks.

Permits and revenue

**TABLE 4.1 Overweight/Oversize permits in Indiana for FY 1993 & FY 1994 (Michigan Trains Highlighted)**

Truck Category	Gross Vehicle Weight (GVW) Limits	Number of Permits	FY 1993		FY 1994		
			Revenue [K= \$1000]	Avg. Cost	Revenue [K= \$1000]	Avg. Cost	
Oversize only	80,000# or less	61,382	\$1,829 K	\$29.81	69,937	\$2,083K	\$29.93
Overweight only	80,000# <GVW≤108,000#	3,854	\$23K	\$61.35	3,997	\$252K	\$63.13
Overweight only	108,000#<GVW≤120,000#	751	\$70K	\$92.62	995	\$88K	\$88.18
Oversize & Overweight	80,000# <GVW≤108,000#	17,645	\$950K	\$53.81	19,174	\$1,054K	\$54.95
Oversize & Overweight	108,000# <GVW≤120,000#	10,884	\$823K	\$75.61	12,796	\$994K	\$77.71
<b>TOTAL overweight</b>		33,134	<b>\$1,875K</b>	<b>\$56.59</b>	36,962	<b>\$2,388K</b>	<b>\$64.61</b>
Super Overloads	GVW>120,000#	2651	\$299K	\$112.89	3,448	\$411K	\$119.26
<b>Michigan Trains</b>	80,000# <GVW<134,000#	29,582	<b>\$1,28K</b>	<b>\$43.50</b>	39,958	<b>\$1,738K</b>	<b>\$43.50</b>
		126,480	\$5,497K	\$43.46	150,327	\$6,633K	\$44.12

Source: Permit Office Data

One principal finding is that the Michigan Trains, in spite of their limited travel and non-mileage based fee, bring in significant revenue for the State of Indiana. The growth in Michigan Train revenue has moved with the economy, the steel sales, and the level of enforcement. There has been considerable growth, in the last four years, from 14,462 permits with about \$630,000 in revenue in FY 1991 to 39,958 permits with revenue about \$1,740,000 in FY 1994. This corresponds to an annual growth rate of approximately 29% per year in numbers of permits and in revenue. The fees have not changed in that period.

### Industry Data

Since the detailed industry by industry data is confidential, only aggregate data is being presented. The first finding is that the number of companies who request permits for Michigan Trains is vastly less than for the overweight/oversize vehicles. 124 companies versus 1780. One might expect 124 to be higher considering the large number steel haulers who are independent-owners. However, many companies work with independents, by acting as dispatchers and purchasers of permits. The other noteworthy finding is that 42% of these companies are located in Michigan. Though largest company is headquartered else where.

**Table 4.2 Industry breakdown of companies using Michigan Train permits FY 1994**

Location of Company	Number/Percent of Companies	Number/Percent of Permits
Michigan	52 (42%)	13,878 (35%)
Indiana	28 (23%)	9,011 (23%)
Pennsylvania	7 ( 6%)	7,625 (19%)
Ohio	11 ( 9%)	4,337 (11%)
Canada	14 (11%)	2,499 ( 6%)
Other	11 ( 9%)	2,608 ( 7%)
Total	124	39,958

### Pattern of Permit Requests by Company

Table 4.3 presents data which reveals a heavy dominance in these permits by just two companies. These two companies account for almost 30% of the permits.

**TABLE 4.3 Data summary of Michigan truck train permits in FY 1994**

Number of Companies	Permit Range	Average number of permits	Average Number of Trucks	Total Revenue	Average Revenue
2	over 5000	5933	297	\$520K	\$260K
4	1500 to 2500	1921	103	\$340K	\$85K
8	900 to 1499	1232	78	\$430K	\$54K
9	400 to 650	500	47	\$200K	\$22K
7	200-300	273	40	\$85K	\$12K
19	100-199	137	19	\$113K	\$6K
10	50-99	69	17	\$30K	\$3K
13	25-49	38	8	\$21K	\$1K
52	<25	5	3	\$12K	\$231
124		40,000 Permits	3100 Total Trucks	\$1,740K	

### The Operational Situation and "Ferrying"

The operational pattern of the Michigan Trains reflects the short portion of the highway on which they must operate once they have picked up a load at the steel mill. These short highway trip lengths in Indiana of less than 30 miles provide opportunity for "ferrying" especially if an annual permit is used. One simply buys permits for the vehicles that are used for ferrying. The permitted truck would then be used several times in one day to carry loads just over the border into Michigan and then another truck permitted for Michigan, but not Indiana would transport the load the rest of the way to the destination. Often the haul can be as long as 200 miles once in Michigan. A "ferry" operation could conceivably carry as many as four loads per day.

The cost of the permit represents a significant part of the cost of a trip and any wholesale change in the permit process will probably have a significant impact on the industry. The Indiana permit costs represent from 5 to 10% of the trip revenue. Michigan, whose bridges have been designed to a different specification and can withstand the loads they are

being subjected to, charges a \$8 annual permit fee and the tractors must be registered (licensed) to pull the 165,000 loads. A tractor license costs in excess of \$2000.

## 2. POLICY ANALYSIS

### Considerations affecting policy analysis

There are several major factors to consider in establishing the policy regarding permits. They are:

1. The number of permits presently purchased by a given company.
2. The large range in the level of revenue from company to company.
3. The size of the fleet at the companies disposal.
4. How the permit is issued and who pays for the permit.
5. The use of owned trucks versus contract haulers.
6. The present level of truck utilization (e.g. one company makes 215 trips per year with one truck while another makes 201 trips using 69 trucks).
7. The percentage of each trip's costs that the permit consumes.
8. The home base of the companies requesting permits.
9. The difference between Michigan and Indiana in the permits and allowable weights.
10. While damage to the highway is estimated to be about equal to or slightly less than the equivalent amount of product carried on 80,000 pound GVW trucks, bridge damage could be significant. Because of the axle configuration of Michigan trucks, the routing selected has a minimum amount of bridge travel.
11. At 134,000 pound GVW, the Michigan Trucks carry twice the product that a standard 80,000 pound GVW truck does, resulting in 1/2 the truck drivers, a significant savings to the steel companies and their customers.

### Evaluating Policy Options

Ten policy options, including the "do nothing" option were reviewed for this single route, an almost uniform commodity movement situation. The options are divided into two



sets. The first are those options based on variations of the "per trip" permit approach and the second set are options based on the "time or groups of trips approach". An annual permit would be in the latter category.

**Group A: "Per trip permitting"**

1. The present system.
2. The present system with an automated voice response for normal permit requests.
3. The use of e-mail to provide permits.
4. Selling bundles of permits that will be used on a per trip basis.
5. An annual permit for administrative costs plus a reporting by the company on the number of trips or miles. (An honor system).

**Group B: "Time oriented permitting"**

1. One straight annual permit per company costing a single fee.
2. An annual permit based on the previous year's business.
3. An annual permit to a company with a limit on the number of trucks used at one time. A company can purchase multiple permits if they wish.
4. An annual permit per truck.
5. Annual permits for specific routes only. (A constraint already satisfied by the Michigan Train)

Michigan Trains would seem to lend themselves to consideration of an annual permit. Also on the surface, they are probably the easiest to implement a fair system since there are only 124 companies involved.

There is a high level of resentment in Northwest Indiana by the haulers, especially the small businessman who owns one or two trucks and serve as a contract hauler/owner-operator.

Resentment centers around the following three inequities:

- (1) The disparity between Michigan and Indiana on the cost of permitting especially when examined on a per mile basis. Michigan issues a permit license for \$2000 which permits the truck owner to carry 165,000 pounds provided a stipulated axle configuration is met. At 150 trips per year from Gary to the line (about 35 miles) amounts to about \$1.40 per mile while the Michigan permit from the Indiana-Michigan Line to Detroit (200 miles) amounts to about \$.07 per mile.
  
- (2) The logistics inefficiency that is required to set up trucks that carry the Michigan maximum which is 165,000 pounds GVW over most of their trip while still obeying the 134,000 pound maximum established for the Indiana highways. In order to achieve this, trucks carry partial loads just over the Michigan border and then go back and bring the rest of the load so they do not violate the Indiana requirement of 134,000 pound GVW.
  
- (3) Permits put in place to benefit the steel companies and their customers are being generally paid for by the truckers. Many, who are paying for these permits, are "little" guys, owner-operators who have no leverage to make sure that the permit cost is part of their haul cost. For them at 7 to 8 percent of the cost of hauling becomes an important issue as far as staying in business is concerned. The steel being carried probably has a value of \$80,000 to \$100,000, the cost of the haul is about 90 cents per cwt. or about \$750.00.

**TABLE 4.4 Matrix of Criteria for Policy Evaluation Michigan Train - Single Trip Permits**

		Single Trip Permits				
Criteria	Present System	Voice response	E-mail permits	Bulk permits	Honor system	
<b>I</b>	Road Use Data	The data is there but is not used	→	→	→	
<b>N</b>	Route Control	Not an issue for Michigan Trains	→	→	→	
<b>D</b>	Ease to Implement	Not an issue, already implemented	Easy to provide add-on to existing system	Will probably work for the larger carriers	Prepare permits that are sold in bundles of 50 or 100.	
<b>O</b>	Cost to Implement	Annual Cost is about \$400,000 to the state	Will accommodate more calls with same personnel & will accept calls on a 24 hour basis	Software & FAX machine. Software development	Printing of permit books; set up system to receive the permit	
<b>T</b>	Changes in Call Type & Volume	None	OK	Will eliminate 40 to 50% of the calls	All of the bundled permits will relieve the phone system	
<b>T</b>	Revenue Neutrality	OK	OK	Probably	Probably	
<b>T</b>	Ability to Enforce	Same as now	→	The permit when used most be used once and sent in. Will require unique design of form	→	
<b>T</b>	Potential for subversion	Depends on the enforcement in the field	→	Depends on the implementation and processing of the forms	→	
<b>R</b>	Ease of Understanding	They understand it	The same as bank by mail which most readily understand	Those with computers will consider - requires modem. Most companies have computers for dispatch. State will provide software.	Can be fairly simple	
<b>U</b>	Change in Operations	None	Simply to use a touch-tone phone		Probably none, promotes the maximum flexibility in the rig that is used.	
<b>U</b>	Market Effects	Pay by trip is fair for all companies	None	Will favor larger companies, free up the phone lines for the other companies	None	
<b>C</b>	Cost to Operators	Time loss in waiting for call is significant	Reduced - Flexibility of calling times. eliminates present burden.	Reduced cost if the operator has computer		
<b>K</b>	State with similar system		Ohio			
<b>K</b>	Modeling Certainty	N/A	N/A			

TABLE 4.4B Matrix of Criteria for Policy Evaluation Michigan Truck Train -

		Permit by groups of trips or time			
	Single Annual permit	Based on last year	Use on any truck	By specific truck	
<b>I</b>	Road Utilization Data	None from the permitting process	----->	----->	
<b>N</b>	Route Control	Keep the designated route map for overweight trucks	----->	----->	
<b>D</b>	Ease of Implementing	Not difficult to implement		Easy change to present system	
<b>D</b>	Cost to Implement	Should save the state money in the permitting office	Difficult - Increase in audit. (75% of companies out of state)	No increase in cost	No increase in cost
<b>O</b>	Recurring cost	Not high	Will increase the auditing	Not high	Part of licensing
<b>O</b>	Changes in Call Type & Volume	Considerably reduced calls - only for single permits	Not too great if a minimum number of permits is required for implementation	Reduced calls	Reduced calls
<b>T</b>	Revenue Neutrality	Not possible (see chart)	Will not continue. Companies will reduce permit cost in time by ferrying.	Impossible. The potential for ferrying will reduce the large company costs	Impossible. The potential for ferrying will reduce the large company costs
<b>T</b>	Ability to Enforce	Still open to violation for overloads	Still open to violation of overloads	Still open to violation for overloads.	Still open to violation for overloads.
<b>R</b>	Potential for subversion	No point in subversion unless the fee is very high	Very high - forming different companies long term ferrying	No need to subvert, ferrying is legal.	Will license only those trucks that will do the ferrying.
<b>T</b>	Ease of Understanding	No problem in developing understanding		Not difficult to understand	Not difficult to understand
<b>R</b>	Change in Operations	Should ease operations	Companies will begin to change to reduce future by ferrying	Companies with rescues will ferry.	Companies with rescues will ferry.
<b>U</b>	Market Effects	Depends on price of permit. Favors larger companies, negative to owner operators.	Will lead to some consolidation.	Will mitigate against the small companies and owner-operators who cannot ferry.	Will mitigate against the small companies and owner-operators who cannot ferry.
<b>C</b>	Cost to Operators	Depends on the level of the permit.	The cost of the audit may increase audits. Build up of ferry approach	Build up of ferrying operations	Build up of ferrying operations
<b>K</b>	State with similar system	many states have annual permits-often restricted administrative cost.	None that are known	Some states come close, but most permit by specific tractor.	A number of states specially license by tractor
<b>K</b>	Modeling Certainty	Probably OK		Ferrying well understood. Number of companies using may be difficult.	Depends on a company's owned resources

Table 4.4 presents a matrix of all the options with quantitative results where those are possible. Other quantitative results are supported with the discussion in each of the subsequent sections of the chapter which discuss the individual options. As seen from the matrix, there are 3 very acceptable options, each with positive and negative points.

The recommended policy for the Michigan trucks is to continue with the trip by trip permit, with changes to the period of validity. Instead of permits expiring at midnight, each permit should be valid for 24 hours. Also, in order to reduce the administrative waiting time an automated voice response system with specific numbers just for Michigan Trucks should be implemented.

#### Review of each option.

##### A-1. Make no policy changes to the system

It was clear from our contacts with trucking companies and truckers that those who must obtain permits are having a difficult time obtaining them. There were reports of both excessive waits on hold as well as the inability to reach a permitting clerk because the line was busy. Re-dialing for as long as three hours was cited and being on hold for another 30 minutes was also of concern. There were requests for telephone lines devoted especially to permits for the Michigan Trucks. A specialized line for Michigan Trucks would allow an operator to handle many short calls and save this class of users waiting in the same queue as the regular overweights.

The large haulers expressed little concern about the price of the permit, but were very concerned over the time being lost in obtaining permits. Because of the long waits, some potential business has been lost, and companies are tempted to disobey the law in order to fill

orders. This is especially difficult during the parts of the year when Indianapolis is one hour different than the area being permitted.

Operationally the Permitting office should find ways of making three changes even within the present system.

1. Give the Michigan trucks two or three priority lines.
2. Issue permits between the hours of 7:00 A.M. and 7:00 P.M. Gary time.
3. Extend the effective time of each permit to 7:00 A.M. or give an expiration time 24 hours from time of issuance.

Make sure that enforcement is maintained. There was considerable speculation that some drivers were in violation of either the weight limit or were not getting permits for all their hauls.

#### A-2 Voice Response System

The voice response system needs to query the caller as to the identification number of the truck, the ID number of the company, the destination and the commodity. After the first tom pieces of information the remainder can be a simple query like if your origin is Indiana press 1 and If Michigan press two. If the commodity you will be carrying is steel press 1, liquid asphalt press 2, other commodity press 3. The whole call would take less than a minute.

Since the route is always the same and since the fee is always the same an automated voice system without any human intervention would be a simple solution. The implementation

of the system would be a call to an 800 number with a possible interchange like one found in Appendix D.

PROS:

- It is a simple system, presently in major use in many industries and businesses.
- It relieves the system of the most repetitive calls.
- Reducing the number of operator processed calls by 25%.
- It maintains the revenue at the present level.
- It does not require any special paperwork or handling system.
- There is a tape record copy of the exchange in case of any disputes.
- The voice response system could be set up anywhere such as the LaPorte district office. Downloading could be done electronically from a remote location.
- Billing would continue as before.
- Clearly pays for the damage to the road as before.
- At 2 minutes per call, (1400 hours per year, it relieves almost one full time staff person i.e. about 40 weeks per year.)
- It is a system that can be available 24 hours per day, giving the trucking company more flexibility as to the time to request permits.

CONS:

- It does not provide the wished for annual fee.
- It has a recurring cost of the system.
- It has an implementation cost.

The approximate cost of implementing this system is approximately

- \$10,000 per line for hardware/software investment.
- \$1,500 per year per line for the operating cost (telephone fee, tape costs.)

- \$1,000 per line per year for on going maintenance of the system.

#### A-3: Computer Permitting System

Most of the companies contacted had computers, especially for their dispatching operation. Many of the truckers would be able to use computer granting of permits. In order to implement an effective system, software would have to be developed, training on its use given by the state, faxes would be mailed once the data were received, etc. The e-mail approach would not eliminate all of the calls as some of them are from smaller haulers who do not have the equipment to use such a sophisticated system.

It is estimated that the software development alone could amount to as much as \$100,000. The equipment in Indianapolis would have to be upgraded and the clerks trained in a new way of doing business. The system could be automatic and once a bona fide permit request was received the computer would generate a report, the permit, and fax the permit back to the sender. This could happen especially quickly for the Michigan Train permits.

#### A-4: Bundle of Permits (Bulk sale of Permits)

The question was raised that why not sell a book of 10, 25 or 50 permits at a time. Since all permits are the same price the carrier could simply take one from his book for each trip and assign it to the truck filling in all the necessary information. Since the permit is only good for 24 hours or less then once the permit was extracted from the book and filled out in ink it could not be altered. A carbon copy of the permit would be mailed to INDOT for records and billing. In order to keep the same permit from being used multiple times there



would have to be agreement with the steel companies that they would stamp the permit at the time the truck was loaded or was leaving the plant.

The permits for backhaul would also be handled the same way except a border guard would stamp the permit. The company could even have the driver carry a blank permit for backhaul in case he were to bring back a load requiring an Indiana Permit. Companies needing an occasional permit would still be required to call in to get a permit in the same way that it is being done now.

The design of a permit would have to be different or numbers could be given in writing and charged to a company using the present design, provided there were provisions made for duplicates. The company would be under legal obligation to submit the permits issued at the end of each day. The books of permits would be good for a limited time such as 90 days. This permits color coding and a change in permit processing to keep the system from getting to staid.

The approach would rely on each company be willing to self police its permit use. The system would work much like the coupon system. A trucking company would buy a book of coupons which would serve as permits. Books of 10, 50 or 500 coupons would be sold. Each trip would call for the trucker to take one coupon, fill it in with the essential information and mail one copy to INDOT and carry the other in the cab as the permit. The coupons would be processed and once per quarter the trucking company would be billed.

The trucker would carry the carbon copy of the permit. How do we know that the company sent in the other copy of the coupon or that the same coupon isn't used for several trips? Since there is only one crossing points into Michigan on this route, it would be a simple

matter to ask each trucker to stop and deposit the coupon in an appropriately designed receptacle at the Indiana side of the border crossing. A person acting as border guard is another alternative.

The bundle or "bulk" purchase of permits would be incentivized by offering a discount for their purchase.

#### A-5: Honor system

One possible system could be classed as the honor system. It would involve a combination of an annual permit that is sold on the basis an administrative fee, say \$100.00. Then the company who purchased such a permit would receive each quarter an invoice in which they would tally the number of trips or miles that they had used the trucks, including an indication of the overweight amount.

The system would not require any extensive permitting but would call for an increased amount of auditing by the state. One audit mechanism already in place is the fuel tax. Unfortunately many of the companies have trucks that pull loads to Cleveland over the turnpike, and pull loads to other places where the weight limit is 80,000 # GVW. It would be hard to discern the amount of Michigan trucks for a company who wished to show less than they actually did.

The benefit to the state would be improved relations with the truckers. The cost would be a somewhat reduced level of income. The system would be set up for permits to be sold to those whose Michigan Train traffic was in excess of 50 or 100 trips This would eliminate some 26,000 calls but would require a new approach to billing the truckers.

B-1: One straight annual permit per company costing a single fee.

This is one of the two permitting techniques that the legislature asked be investigated. An annual fee charged to a company for all the trips they could take along the route. Companies not having enough trips would continue to pay the same permit fee as now paid and would call in as done presently. The level of the annual permit will be based on the following scenario. All companies with more business than the annual fee would be willing to pay the fee. All companies presently doing less business than the annual fee would call for would call in for single trip permits as is done now.

The following table reflect the analysis of the annual fee set at several levels. The annual fee surcharge is the amount of money that would have to be added to the annual fee to make the system revenue equal. If account is made for the trucking company's saving of the administrative saving likely for the trucking industry based on the present waiting time which can be as long as an hour.

The consolidation is hard to predict its magnitude with any certainty but it is clear that in a situation where there are several dominant players, they will become more dominant. The annual permit by company indeed favors the large trucking company. All truckers benefit somewhat because the heavily used phone system is relieved and the large trucker will utilize the ferrying approach suggested above.

**Table 4.5 Michigan Train Annual Permit Fee by Company Using FY 1994 Data**

Annual Permit Price to the Company	Companies purchasing based on 1994 data	Revenue Generated by the permit process	Revenue Lost
\$200	92	\$21,226	\$1,716,948 (99%)
\$1,000	72	\$84,004	\$1,654,169 (95%)
\$2,500	55	\$108,449	\$1,557,724 (90%)
\$5,000	45	\$306,976	\$1,431,197 (82%)
\$10,000	28	\$483,708	\$1,254,465 (72%)
\$40,000	14	\$1,014,116	\$ 724,057 (42%)
\$100,000	3	\$1,415,189	\$ 322,984 (19%)
No Annual Permit	None	\$1,738,173	

Table 4.5 shows that an annual permit will result in a severe loss of revenue. Further since the present permit represents 7 to 8 % of the cost of each trip this shift will clearly favor the larger company, who will aggregate the cost over many more trips. One might expect to see some aggregation of the trucking companies. Certainly it would behoove the small companies to work with a larger company who has a permit. Thus the number present for shortfall are probably underestimated.

B-2: One straight annual permit per company costing a single fee but limited in the number of trucks covered.

A fee would be set the same for all companies in the region. Those whose business would be less than the fee would still call in and get their permits as before. Each annual permit would give the company the right to use 4 trucks at a time through the simple mechanism of the company having placards in multiples of four, depending on the number of permits purchased. The cost of the 4 truck permit at a time would be based on 50 trips per year. Since any truck could carry the permit the company will have high flexibility to determine the logistics pattern of owned and contract tractors. Each placard would be good for one year and good for one trip at a time from origin to destination.

- Permit cost =  $\$50.00 * 4 * 50 = \$10,000$
- Companies with business in excess of 4 trucks at one time could buy more than one annual permit or simply call in as before when business fluctuates.
- Companies with business less than 4 trucks at one time or less than 200 trips per year would continue to purchase permits as is presently done.
- An analysis is needed assuming the above scenario to determine how a trucker might behave under such a permitting scheme. How many annual permits will be bought knowing that if there are peak business times that single trip permits can be bought as before.
- Until better data is available, one might make the following assumptions:
  - A given truck will make no more than 2.5 trips per week.
  - Each trip takes two days on the average.
  - A company who receive four placards can achieve a maximum of 300 trips per year but is more likely to average 200 trips per year.

Thus it would make sense for a company to purchase a \$8,000 per year permit good for four placards with a minimum business requiring 200 permits per year. The single permit might be escalated in price to \$45 in order to incentivize the annual purchase.

The placard would remain the truck for both the front haul and the back haul. This would avoid swapping placards once over the Michigan border, giving the larger carriers an advantage over the smaller carriers.

### B-3: An annual permit based on the previous year's business

This type of permit would cost the trucker some fraction, perhaps 80-90% of the revenue, that they would have paid had each trip cost the usual \$43.50. The permit would then be based on truck use data that is audited by the state to set the level based on the previous year's business. Information related to fuel tax will be, in part, used for establishing the annual base. The trucks log would also be used.

The permit will in, all cases, provides the trucker with total flexibility as to the truck that is used and when it is used. It would be for Michigan trucks with a GVW of 134,000 pounds or less as well as for operation only on the specified route.

The annual permit will be set to be \$1000 + 85% of the calculated annual revenue based on the number of trips undertaken by a given company between January 1 and December 31 annually. The trucker would be required to send to the permits section of INDOT by February 15th each year the data related to the number of trips taken in the previous calendar year together with the first quarter payment of his annual fee set at  $1000 + 0.85 * \$43.50 * \text{number of trips}$ .

A trucker wishing an occasional permit would still be able to call in and obtain the single permit. Any company with more than 120 permits annually would be required to purchase an annual permit.

#### B-4: An annual permit per truck

Michigan and many other states have annual permits for overweight trucks. The annual permit varies widely from state to state. In the case of Michigan, the permit is basically for the tractor and its price is based on whether or not it will be part of a truck that is 165,000 pounds GVW or 135,000 pounds GVW. The higher weight permit costs \$2000. It would seem that the only way to provide an annual permit for a truck in Indiana is to have such a licensing arrangement. There are several problems with it for the Michigan Trucks. First what cost can be charged. \$2000 for a 35 mile trip that represents only 15 percent of the trip seems like a tremendous burden on any of the carriers, but especially on the small trucker. The system will be prone to much "game playing" if a firm owned five trucks. It could easily simply get the

annual permit for one or two of the trucks and move the load just over the Michigan border and change tractors to pull the rest of the way on the basis of my Michigan permit. Since the distance is so short, the truck could be back with another load in less than two hours. If the authors of this report were operating a fleet of Michigan Trucks, this is certainly the tactic our operation would switch to.

The analysis thus treated not only the number of trucks but reduced the trucks getting Indiana permits according to a model which says only two trucks would be used. If a trucking company used only owner operators, then it would hire one or two to shuttle loads in Indiana and make the switch in Michigan.

From the data the vehicle usage patterns is very diverse, but if the ferrying takes place to any degree, the typical turn around of a truck and its load of two days will become one of two to four hours, with another tractor sitting on the other side of the state line to carry the load in Michigan. The large stable of owner-operators will find a way to use the system to their best advantage and as such will have to work with larger firms if this were to become policy.

Table 4.6 is based on examining truck usage, considering that a company with an average of two loads/week will need to obtain one annual permit. In that sense, the ferrying potential **is not included**.

**Table 4.6 Annual Permit Available for Trucks Using the Extra Heavy Duty Highway**

Annual Permit Price per truck	Truck usage model	Trucks expected to be permitted based on 1994 data	Individual Permits to be Purchased	Revenue Generated by the permit process	Revenue Lost
No Annual Permit			39,958	\$1,738,173	
\$ 100	2.5 trips/wk	369	100	\$44,425	\$1,694,183 (97%)
\$ 250	2.5 trips/wk	356	260	\$100,310	\$1,638,298 (94%)
\$ 500	2.5 trips/wk	344	449	\$191,532	\$1,547,076 (89%)
\$ 1,000	2.5 trips/wk	333	690	\$363,015	\$1,375,593 (79%)
\$ 2,500	2.5 trips/wk	305	2,105	\$854,068	\$ 884,541 (51%)
\$ 5,000	2.5 trips/wk	279	4,207	\$1,578,005	\$ 160,604 ( 9%)



## Chapter 5 Overweight and Overweight/Oversize Trucks

This chapter deals with some of the overweight and overweight/oversize trucks that request permits for travel on state highways within Indiana. A survey of the types of vehicles, the results from extensive analysis of existing conditions and a possible alternative permit system for these vehicles is provided.

### 1. VEHICLE DESCRIPTION

This chapter actually deals with two types of overweight vehicles. Those that are simply overweight and those which are overweight and also oversized (which throughout is noted as overweight/oversized). Outside the scope of this section are Michigan Truck-Trains as well as overweight and overweight/oversized vehicles beyond 120,000 gross vehicle weight (GVW) which are often called *super-overloads*. Michigan Trains are dealt with elsewhere in this document.

There are no general restrictions on the travel of these vehicles, though during permitting their route is checked against specific problem highway segments. The vehicles are permitted to a specific weight and to a specific route that is mutually agreed upon by the permit office and permittee. According to the permit regulations, the axle configurations of trucks whose GVW is between 80,000 and 108,000 pounds are not constrained. Trucks with GVW over 108,000 pounds but less than 120,000 pounds are to follow the configurations set aside in Figure 5.1.

**Figure 5.1 Axle Configurations for 108,000-120,000 GVW (following page)**

## 6.04 AXLE CONFIGURATIONS

120,000# GVW allowable on these axle configurations only, as routine issue by telephone. Any vehicle exceeding 108,000# with a load that cannot be divided, and not conforming to these configurations, must apply for a Super Load Permit.

FIG. I

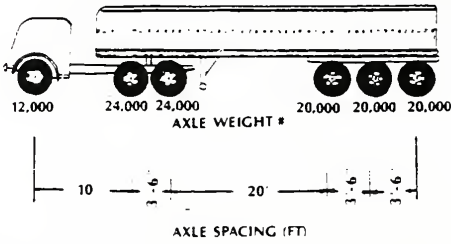


FIG. IV

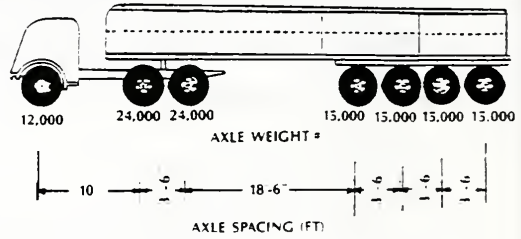


FIG. II

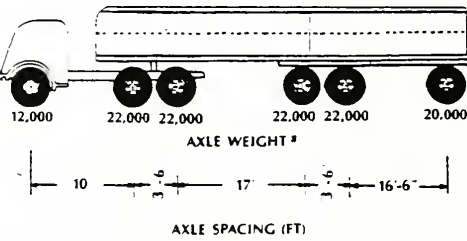


FIG. V

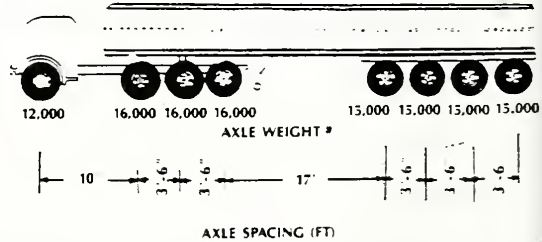


FIG. III

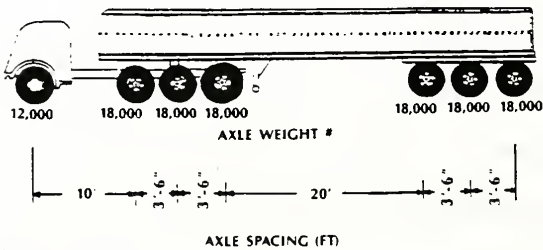
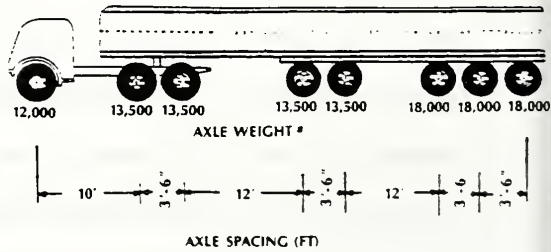


FIG. VI



### Please Note:

Weight distribution figured by using the bridge gross weight formula.

$$W = 500 \left[ \frac{LN}{N-1} + 12N + 36 \right]$$

Maximum 800 lbs. per lineal inch of tire measured between flanges of the rim.

Axle spacings can increase only.

Axle weights can decrease only.

**2. EXISTING CONDITIONS**

Permit records from the State permit office were analyzed for the five years from FY 1990 to FY 1994. An example fiscal year for Indiana is FY 1994 that ran from July 1, 1993 to June 30, 1994. This section summarizes the information gleaned from analysis of the data on Overweight and Oversize/Overweight trucks.

Permits and Revenue

**TABLE 5.1 Overweight & Oversize/Overweight permits in Indiana for FY 1993 & FY 1994**

Truck Category	Gross Vehicle Weight (GVW) Limits (1000's lbs)	FY 1993			FY 1994		
		# of Permits	Revenue (\$1000s)	Avg. Cost	Number of Permits	Revenue (\$1000s)	Avg. Cost
Oversize only	80 or less	61,382	\$1,829	\$29.81	69,93	\$2.08	\$29.93
Overweight only	80 < GVW ≤ 108	3,854	\$23	\$61.35	3,997	\$252	\$63.13
Overweight only	108 < GVW ≤ 120	751	\$70	\$92.62	995	\$88	\$88.18
Oversize & Overweight	80 < GVW ≤ 108	17,645	\$950	\$53.81	19,174	\$1,054	\$54.95
Oversize & Overweight	108 < GVW ≤ 120	10,884	\$823	\$75.61	12,796	\$994	\$77.71
<b>TOTAL overweight</b>		<b>33,134</b>	<b>\$1,875</b>	<b>\$56.59</b>	<b>36,962</b>	<b>\$2,388</b>	<b>\$64.61</b>
Super Overloads	GVW > 120	2,651	\$299	\$112.89	3,448	\$411	\$119.26
Michigan Trains	80 < GVW < 134	29,582	\$1,280	\$43.50	39,958	\$1,738	\$43.50
		126,480	\$5,497	\$43.46	150,327	\$6,633	\$44.12

Source: Permit Office Data

The majority of the permits for overweight vehicles also are oversized. This makes some sense, as the law requires the loads to be indivisible. The split at 108,000 pounds GVW accounts for the difference in single trip permit rates for the two weights from the Indiana State Law as indicated below.

*FEE: Overweight- \$20.00 Base Fee plus mileage charge of 35 cents per mile to 108,000 pounds, 60 cents per mile to 120,000 pounds.*

*FEE: Overweight & Oversize- \$20.00 Base Fee plus mileage charge of 35 cents per mile to 108,000 pounds, 60 cents per mile to 120,000 pounds or the Oversize Permit fee of \$30.00 whichever is greater.*

Overweight trucks are a significant source of revenue for the State of Indiana. The number of permits for trucks that are overweight but not oversize is only 13.5% of the total number of permits reflecting about 14.2% of the revenue.

Evaluating the five year span of data shows that there has been considerable growth in the last four years from 20,287 permits with about \$1.21 Million in revenue in FY 1990 to 36,962 permits with revenue rising to \$2.39 Million in FY 1994. This corresponds to an annual growth rate of about 16% per year in numbers of permits and close to 19% increase in revenue. The permit fees have not changed in that period.

#### Industry Data

The following data is presented in slightly modified, aggregate form because information about any specific vehicle or company is confidential.

A surprisingly large number of industries request permits for oversize/overweight vehicles. The data for FY 1994 showed a total of 1604 companies involved in overweight/oversize trucking. The vast majority of those companies (about 75%) purchased less than 12 permits per year. Less than 10% of the 1604 companies averaged more than one permit per week. Table 5.2 indicates how the companies purchased permits in FY 1994. There are only a few large transportation companies operating overweight/oversize trucks in Indiana. Nine companies secure about 21% of the permits and generate almost 25% of the revenue.

**Table 5.2 Overweight Trucks Permit Data by Company for FY 1994**

Permits Per Co.	Companies		Permits			Revenue		
	No.	%	No.	%	Amount	%	Avg./Co.	High
0 - 25	1,389	86.6%	7,162	22.4%	\$460	22.5%	\$331	\$ 3,700
26 - 50	85	5.3%	3,153	9.9%	\$191	9.3%	\$2,246	\$ 5,100
51 - 75	37	2.3%	2,329	7.3%	\$143	7.0%	\$3,867	\$ 6,200
76 - 150	54	3.4%	6,058	19.0%	\$341	16.6%	\$6,312	\$ 18,000
151 - 300	30	1.9%	6,590	20.6%	\$412	20.1%	\$13,749	\$ 38,000
> 300	9	0.6%	6,668	20.9%	\$502	24.5%	\$55,784	\$170,000
	1,604		31,970		\$2,050			

Patterns of Permit requests by Company

Table 5.3 presents how the companies provide service in one or more areas of hauling. For example, only 85 companies haul in all four weight or truck size categories. It was surprising that only 85 companies engaged in all the possible categories requiring a permit.

**Table 5.3 Company information related to type of haul in FY 1994**

	80,000<GVW≤108,000		108,000<GVW≤120,000	
	only overweight	oversize and overweight	only overweight	oversize and overweight
Only in one Category	125	11	597	163
Only in weight category	146		1027	
In all four categories	85			
Only in truck type category	874	190		

Location of Firms

The company headquarters are well spread through out the United States. At least one company is recorded in every state in the lower 48 and several are from Canadian or Mexican provinces. The largest represented states are indicated in Table 5.4.

**Table 5.4 Location of Firms Purchasing Permits for Overweight/Oversize Trucks**

State	# Companies		# Permits	
Indiana	486	30.3%	18,148	49.1%
Illinois	207	12.9%	2,989	8.1%
Ohio	167	10.4%	1,728	4.7%
Michigan	133	8.3%	1,173	3.2%
Kentucky	84	5.2%	2,017	5.5%
Pennsylvania	58	3.7%	3,547	9.6%
All Others	469	29.2%	7,360	20.0%

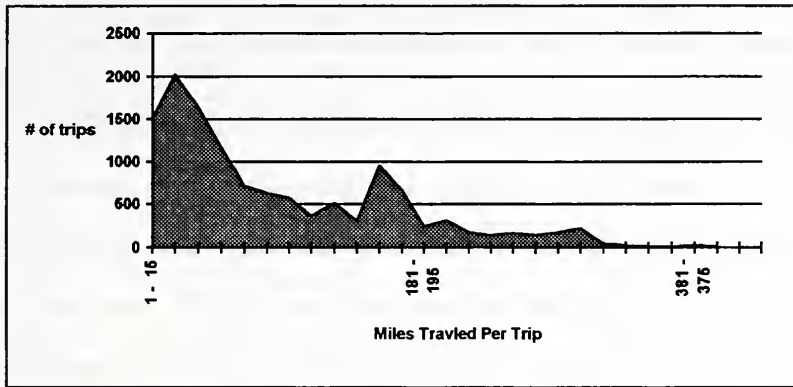
Travel Patterns of Oversize/Overweight Loads

The travel pattern of trucks becomes important as reasonable approaches to permitting are studied. The trips were broken down into 15 mile increments and plotted in a form shown in Figure 5.2. From this data, it was decided that the breakdown as indicated would provide an adequate measure for identifying the weight distance permit level. Table 5.5 shows the trips aggregated to this mileage element.

**Table 5.5 Origin - Destination of Overweight/Oversize Loads in Indiana -- FY 1994**

Distance Traveled (miles)	Trips	Trips In Indiana	Trips Thru Indiana	One Trip End in Indiana
0 to 60	17,839	59%	13%	28%
61 to 150	9,121	52%	11%	37%
151 to 240	7,683	9%	76%	15%
over 240	2,319	5%	79%	16%
Total permits	36,962	43%	30%	27%
Total Revenue	\$2,345,000	32%	44%	24%

**Figure 5.2 Pattern of travel by permit**



Truck Utilization

To evaluate annual permit policies it was necessary to understand how frequently trucks were used within a company for overweight trips. This is known as truck utilization. In other states, officials have frequently reported that with an annual permit, companies tend to reallocate their fleets to fewer vehicles that carry more overweight cargo. This consolidation directly changes the number of vehicles that would participate in any kind of annualized system. In order to better understand how this might occur, two data sets were examined.

First, the data in Table 5.6 examines a sample of the top 50 trucks for their utilization in FY 1994. One would have to examine the down time for each to see what approach a given company would take in reducing the number of trucks while performing the same amount of business. Further, without intimate knowledge of a company's business one can only look at use patterns across the year and try to see how a truck might be utilized better. During this analysis,

it was assumed that 280 trips is about a maximum for a year. However, if a trip is longer than one day there may be a lower maximum number of trips. Some business is seasonal and some numbers seem to be problematic, such as the 40+ trips in June for truck xxxx3 when the rest of the year the average is about 20. Truck xxx30 may be able to be better utilized for hauling overweight loads, but that is hard to say without interviews with each trucking company.

There was some surprise that the seasonality of trip making was not more pronounced. No discussion of vehicle utilization would be complete without acknowledging that the industry often has little or no control over when trips are made, since the shipper often lets a trucking firm know of a trip 24 to 48 hours before it is made. Thus there is some merit in an analysis assumption that the timing of trips will not appreciably change under any differing permit scheme.

**Table 5.6 Sample Individual Truck Volume of Travel Per Month for FY 1994**

Truck	Total Trips	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	Apr.	May	Jun.
xxxx1	288	20	24	21	23	20	19	14	6	21	35	40	45
xxxx2	283	21	24	21	23	20	19	14	5	19	36	38	43
xxxx5	204	18	24	21	23	13	10	14	5	21	10	2	43
xxx10	180	15	15	14	13	13	12	15	12	18	17	18	18
xxx20	147	14	5	12	10	14	9	13	10	11	15	16	18
xxx30	136	13	8	9	12	9	9	8	8	16	14	16	14
xxx50	122	9	7	10	12	6	9	8	10	15	11	14	11

Second was an attempt to examine how the companies who utilize several trucks would even consider annual trucks for all the trucks being used today. A report containing company trucks and permits would indicate that the company depending on a variety of factors could well consolidate the overweight loads to fewer trucks if doing such would enable him to earn more profit or gain some advantage. From Table 5.7 the range in truck utilization varies considerably



from slightly less than trips per truck per year average to slightly over 26 trips per year or once in two weeks.

**Table 5.7 Average Truck Utilization for Overweight Loads by company ranked 10-20 in revenue.**

Company Rank	Revenue	Permits	Trucks	Avg. Permits/ Truck/Yr.	See Table 5.8
10	\$21,539	243	118	2.06	
11	\$18,446	198	66	3.00	
12	\$18,381	220	110	2.00	X
13	\$18,318	148	28	5.29	
14	\$16,762	375	14	26.79	X
15	\$16,564	266	53	5.02	X
16	\$16,531	293	17	17.2	X
17	\$16,078	191	88	2.17	
18	\$15,071	339	35	9.68	X
19	\$14,461	183	7	26.14	
20	\$13,801	165	85	1.94	
Total	\$185,952	2621	621	4.22	

Recognizing that some trips take longer than one day and business may not be readily available on a continuous basis, an improved utilization may be only possible for those companies with utilization of less than ten to fifteen permits per truck per year. The major savings in permit fees will, of course, occur with those companies doing most of the haul, for the number of trucks in use.

**Table 5.8 Examination of a sample of five companies with different average utilization**

Company No	Maximum Month		Average Month		Minimum Month		Truck Trips Per Year				Est. Permits with Max Utilization
	Trips	Trucks Used	Trips	Trucks Used	Trips	Trucks Used	1-3	4-7	8-12	>12	
12	70	43	37	22	12	9	71	25	9	7	43
14	112	99	98	83	74	64	379	83	15	2	72
15	52	10	35	7	27	3	13	5	2	4	10
16	47	7	24	7	10	2	18	6	2	3	7
18	33	10	24	8	19	6	24	3	2	7	9

The results of this examination of five specific companies show the shift to an annual permit would allow even moderate sized firms to be able to reduce their fleet of vehicles in use carrying overweight loads. Further, the maximum utilization could shrink even further with relatively minor schedule changes. As a result, if annual permits were adopted as the only permitting scheme, the rate which would have to be charged for each permit would need to be quite (infeasibly) large if there was any hope of being revenue neutral.

### 3. POLICY ANALYSIS

Table 5.10 (at the end of this chapter) provides a summary of the majority of the proposed permitting systems. This policy analysis follows a similar path of that done for permitting Michigan Trains. Commentary on each of the systems plus further recommendations follows in this section and the next.

#### A-1. Make no policy changes to the system

In discussions with many trucking firms there were problems getting permits because of telephone line congestion within the permit office. During those discussions, there were not complaints that the underlying permit system was unfair or excessively burdensome. The existing system is and has the appearance of being fair and equitable for both small and large overweight movement companies. Further, as noted elsewhere in this report, trucking companies and their shippers expect to be charged proportional to the damage they are doing to highway system.

In a review of the permitting systems in other states, clearly Indiana's system for permitting, at its core, is substantially better than most of the other systems in use. While INDOT and the trucking companies will continue to be at natural odds with each other about the absolute rates charged, the structure of the rate system does allow the state to recover costs at a rate proportional to the damage that is often an important missing feature of other state's systems.

Improvements to overweight permitting, as a result of this analysis, need to center on improvements in how the permits are granted and in simplifying the system, NOT TO FUNDAMENTAL CHANGES TO THE SYSTEM. Alternatives A-2 and A-3 both are attempts to improve the system will little change in the structure or the risks to the state's revenue stream.

## A-2. Voice Response System

Voice response is an automated system similar to that of bank-by-phone. A user calls a number, the computer answers and then the user responds to the computer by dialing digits on their phone. In the Michigan Trains case, TT/VR is a natural solution to the problem since little information need be entered and the information that is required is very regular. In the more general case of state-wide overweight permitting, the problem is more complex because route information needs to be captured and checked.

There are three potential solutions to the added complexity. Each way of handling route information has its pros and cons and deserves considerable discussion.

### *1) Introduce a map for the state of permitted routes and skip route data entry.*

By introducing a map, much like states like Colorado have done, of the routes permissible at each overweight level, (for example, red routes might be good up to 100,000 GVW, blue to 110,000 GVW etc...) then route data entry would cease to be a problem.

#### PROS:

- Full automation of overweight permits easy to accomplish. Only calls that are super overloads or are irregular, like for example expired insurance, would need to be handled by human operators.
- 24 hour availability possible. If the computer with the database is up, then the permitting system can be available.
- Known technology. Relatively low technological risk.

#### CONS:

- Route control lost. In the present system there is a detailed path of where the load will travel. That allows the operators to check on specific highway link problems like temporary clearance changes or temporary weight restrictions on bridges.
- Road use information is lost. The current system captures the route information and that then allows analysis of where loads are traveling. This information seemingly is used for enforcement while the load is traveling and can be later analyzed to determine which routes get the majority of the overweight loads. One of the things this study did was an analysis of origins and destinations based on this information. With a state-wide map this information is lost unless special forms are created, distributed, collected, and keyed into a system somewhere.

*2) Introduce some standard routes for automated entry, and keep less frequent ones manually entered.*

In the TT/VR appendix, is one version of how this might work. A menu of possible routes is available and the user selects which route from that menu. If the user knows the route number then they need not wade through the lengthy menus.

PROS:

- Operator handled calls reduced.
- Higher volume routes would then be fully automated. These are typically state line to state line.

CONS:

- Lessor volume routes either will need to talk to humans (and thus wait for service) or use alternative #3.
- Still need operators to process regular permit calls.

- 24 hour service only available on some routes, not all.
- Increasing complexity. While simple menus and routes are easy to select, what should be done about routes that have some kind of temporary restriction on them? Should those automated routes be removed during the restriction, and thus make the users call humans? There seems an ever changing problem with how to deal with such restrictions.

### *3) Introduce complete computer based route selection.*

The TT/VR appendix has as its final example, a whole route selection demonstration. It takes about five minutes to select a route from one state line to another enumerating each turn along the way. While it may be initially cumbersome for users to deal with, experienced users will have less difficulty doing very sophisticated trips without human interactions.

#### PROS:

- 24 hour service as long as the database server is available.
- The only operator calls are super-overloads or problems (like expired information).
- No special map required, nor much else other than a pre-selected route. Exceptions to the routes can be looked up during the call and feedback can be provided instantly.
- Route information is in a complete and easily machine processed form since it is machine generated in the first place.

#### CONS:

- Implementation is a serious matter, since the complexity of a whole route selection is quite a detailed problem. A high level of knowledge, by the computer, of the state highway system will be required to do even a passable job. See Appendix G for some notes on the subject.
- User phone times will be higher, even though they are not interacting with people. That time maybe considered a burden.

Updates to the system, while straight forward, will require state personnel that have a good understanding of how the system works.

### A-3. Computer Permitting System

A computer permitting system allows trucking companies, using their computers to build all the information needed to request a permit, then send it digitally to the state. During the same phone call, the state can validate that the firm is current with all its information, that the requested route is OK and provide a permit number. A variation on this idea is the state could FAX the requested permit back to the trucking firm if there were some delays in issuing a permit.

#### PROS:

- Could substantially reduce call volume to operators.
- Available up to 24 hours a day. Availability solely controlled by the uptime of the computer that holds the permit database.
- Captures all the data of the present system.
- Higher quality data, since better input validation is possible. The present system allows invalid data in some fields.
- Maintains the present system's economic fairness.

#### CONS:

- Requires a computer and software at trucking companies. This requires support, debugging and some level of recurring software development to keep up with ever changing PC technology. It also places smaller firms at some disadvantage as they may lack the technology.
- Requires software development for IBM host, since the interaction between the computer at the trucking company and the host will be new and reasonably sophisticated.

- Smaller firms will be at somewhat of a disadvantage, and thus some (though probably small) market consolidation is apt to occur.

#### A-4. Bundle of Permits (Bulk Sale of Permits)

Here permits are acquired in increments of 10, 25, 50 or perhaps even 100. The permit is filled out and sent in (perhaps by fax or U.S. Mail) before the trip is made. As the state receives the permits, they are entered into the computer and the trucking companies account is debited. Traditional single trip permitting would still be available, since the great majority of permit users are very infrequent trip makers.

#### PROS:

- Fewer calls
- No waiting for permits with GVW between 80,000 and 120,000 lbs.

#### CONS:

- Road use information will arrive on paper to the permit office. A new process will be required to key the data on those forms.
- Route control is lost. Clearance and weight limits that are out of the ordinary are dependent on either signage at the site, map reissue, or some recurring newsletter to those who are enrolled in the state's overweight program.
- Depending on implementation, either the permits are fixed rate and thus not proportional to the damage done. Or they are variable rate, which then may allow vehicles to travel without sufficient funds on deposit with the state.
- Enforcement is a problem. "The Permits in the Mail" precludes a load being stopped and having its validity accurately checked.



- Subversion. Since there is a delay between when the permit is written and the state receives it, enterprising truckers will not apply for a permit unless they are caught. Revenue will fall as a result of this reduced permitting.

#### A-5. Honor System

Users keep track of the travel that they make. Every month or quarter, they send in a report stating all the particulars for the loads they have moved along with a check for the amount required to cover those movements. The existing single trip permit system would be disbanded.

#### PROS:

- Seriously reduced call volume.
- 24 hour availability.

#### CONS:

- High potential for subversion. The probability that a subverter is caught is very low, since the entire system depends on a trucking company filling out a monthly or quarterly form to describe the trips that they have made. Potential trouble with Indiana State Constitution allowing use of roads before paying for them ("debt").
- Route control lost, unless a map is published.
- Enforcement becomes a problem. Even if a firm is in trouble with the state for incorrect information, it would be very difficult to determine if that information is in transit to the state and thus the firm really is current. The state's ability to stop any particular load and validate its movement is legal is substantially reduced.
- Road use information may be lost, depending on the system's implementation. Certainly a large volume of paper from the trucking companies will need to be processed in either a monthly or quarterly basis. The roads used may or may not be in that collected information.

### B-1. One Straight Annual/90 Day Permit per Company Costing a Single Fee

This is the much discussed annual permit. It, along with all the following 'group' permitting ideas, are not, nor can they be revenue neutral because a free market system will discover the way to minimize costs and thus 'overuse' whatever group is permitted.

Annual permits are common in other states. Those states cannot hope to recover the costs overweight loads do to roads on a basis proportional to the damage done. In this case, the existing single trip permit system would also be left in place.

#### PROS:

- Simple to end users.
- Reduced call volumes.
- Travel available at any time.

#### CONS:

- **Will not be revenue neutral.** Depending on implementation, will result in up to 75% of permitting revenue being lost. In FY 1994 that would amount to more than \$1.5 million in revenue to the state being lost.
- Road use data lost.
- Route control would only be on the basis of signage, maps and periodic travel advisories from the permit office.
- Will certainly cause market consolidation. This is anti-competitive and unfair to the owner/operator.
- Change in rate structure will also cause some companies to enter the market and others to exit.

### B-2. Annual Permit Based on Previous Years Business

The previous year's business was proposed by one of the trucking firms with whom the authors talked. The idea is that a trucking company will get a license this year based on last year's business. The obvious result would be that the state would always be running a year behind for income during good economic times and would be getting too much income during times of recession. Administratively this alternative works like a combination of Annual Permit and the quarterly honor system. The existing permit system would be disbanded under this scheme. This system has many problems.

PROS:

- Reduced call volume.
- Overweight travel possible at any time.

CONS:

- **Will not be revenue neutral.**
- Will be seriously subverted. If the authors were doing this, we would have two shell companies that leased their trucks from a third. Then during year 1, the first shell company would get permits. During year 2, the second shell company would get permits, and because they had no business in the previous year, they would pay only a token amount. Then during year 3, the first shell company would regain all the business, since it too had no business in year 2. This flip flop, while being perfectly legal, would cause income to collapse. If a five year moving average is used, then create 6 companies so that each shows no business over whatever period is needed. Very easy and perfectly legal.
- Road utilization data will be lost, unless special measures are taken.
- Route control lost unless a map is published.

- Extensive auditing is required to establish what the previous year's business would be, since specific permits would no longer be kept.

### B-3. Single Vehicle Permit Usable on Any Truck

This is the 'placard' approach. Much like many parking permit systems, the vehicle with the permit gets the privilege. Some odd things might happen under this scheme: Frantic drives from one part of the state to another with the placard so that yet another load could move legally.

Certainly, the placard would be worth considerably more than even an annual permit for a specific truck. With this alternative, the existing single trip permit system would be maintained for low volume users.

#### PROS:

- Reduced calls, since this is a form of annual permitting.
- Simple to explain, use and enforce. "Have the placard? Your free to travel!"
- Overweight travel available at any time for those with placards.

#### CONS:

- **Will not be revenue neutral.** Short of setting the placard's price at about 1.4 times a truck's maximum possible utilization (where no one would buy it) there is no price level where the state would not see some revenue lost. The lower the placard price, the more the revenue lost.
- Route control lost, unless maps are published.
- Road utilization information lost, unless a special system is created to capture such information.

- Market consolidation will occur favoring larger firms. One a placard is purchased, it is a sunk cost. As a result, firms with placards that are just sitting are losing money and will attempt to recoup that investment by underbidding firms that still need to purchase individual permits.

#### B-4. Single Vehicle Permit Usable on Only One Truck

This scheme permits a single tractor for a fixed time, probably a year from the start of the permit. Some accommodation will be required to take care of tractors that are sold, wrecked or otherwise irrevocably removed from service. Existing single trip permits would continue to be offered.

#### PROS:

- Reduced call volume depending on implementation.
- Overweight travel available at any time for those with vehicles so permitted.

#### CONS:

- **Will not be revenue neutral.** B-3's problems are about the same.
- Route control lost, unless maps are published.
- Road utilization information lost, unless a special system is created to capture such information.
- Market consolidation will occur favoring larger firms. Once a truck is permitted, it is a sunk cost. As a result, firms with permitted trucks will attempt to get loads that are suitable for those trucks.

#### B-5. Single Vehicle Permit Usable on Only One Origin/Destination Pair

This is an extension of the Michigan Train idea of a special route to carry overweight loads. In the analysis of Origin/Destination pairs, routes that went from one state line to another were common. If a particular truck tractor could make more of the trips, say from John Deere in

Iowa to Ohio is unclear. Certainly, since this is yet again a form of annual permitting, albeit however restricted, there will be market consolidation. Single trip permits would still be offered under this scheme.

#### PROS:

- **Reduced call volume.** How much reduced it is difficult to tell. If an eligible O/D pair was, for example, the Illinois State Line to the Ohio State Line on I-70, then a few hundred calls could be reduced. Overweight movements are widely scattered in their origins and destinations, such a permit would tend to cause more trips to be on fewer routes.
- **Easy for the truckers using the routes and annually permitted trucks.**
- **Route control is maintained, and enforceable except for restrictions that pop up over the life of the permit.**

#### CONS:

- **Will not be revenue neutral.** While this proposal is very restrictive, there will certainly be users who take advantage of the cost savings of such a permit unless it is very unreasonably priced.
- **Road utilization information is lost unless a special system is created to capture such information.**
- **Market consolidation will occur, since larger companies are more apt to get recurring loads.**

#### 4. RECOMMENDATIONS

Having spoken with dozens of people in all parts of permitting problem both within Indiana and outside, the best course of action is to stay very close to the existing system. It is fair to both small and large firms and offers the state the best underlying rate structure.

A hybrid system using the advantages of both maps and Touch Tone as well as simplified permitting seems the best alternative, though it is not radically better than the system already in place. Such a hybrid might be:

1. The introduction of state wide maps for route control. These will take time to develop, but will considerably ease planning on the part of the trucking firm. Further, they will eliminate the need to tell the state in an automated way what the route will be.

2. A fully automated permitting system. For those users who are current in their information, a permit should be generateable at any time without interacting with someone at the state. This will result in greater flexibility for shippers and cut considerably the number of calls the operators must handle. Cost savings will be had by all parties.

3. An annual enrollment fee that is a one time cost for each company and truck. This fee covers the cost of entering information into the automated permitting system as well as assuring that the required information is kept for vehicles carrying the loads. This fee should be around \$25/yr. for companies and \$15/year per each truck (tractor).

4. A form and data entry process that takes paper from the trucking companies to complete each permit after the permit number is issued. This will allow the state to continue to capture road use information.

5. A continuation of the understanding that the state has not the resources to heavily enforce whatever permitting system is in place.

6. Eliminate the per mileage fee, and replace it with one that takes into account ranges of distance traveled.

The complete rate table can be found in recommendation #2 of chapter 1. Table 5.9 is an evaluation of that rate table's revenue neutrality.

**Table 5.9 Check of Revenue Neutrality for 1994**

**Overweight less than 108,000 pounds GVW**

Mileage	Number of trips		1994 Revenue Comparison		Average difference
	Model	Actual	Model	Actual	
1 to 60	1,439	1,362	\$44,894		
61 to 150	1,039	1,077	\$57,157		
151 to 241	1,159	1,224	\$96,208		
over 241	360	334	\$42,448		
<b>Totals</b>	<b>3,997</b>	<b>3,997</b>	<b>\$240,707</b>	<b>\$252,322</b>	<b>-4.6%</b>

**Overweight between 108,000 and 120,000 pounds GVW**

Mileage	Number of trips		1994 Revenue Comparison		Average difference
	Model	Actual	Model	Actual	
1 to 60	398	407	\$15,602		
61 to 150	249	235	\$19,900		
151 to 241	249	244	\$31,840		
over 241	100	109	\$18,706		
<b>Totals</b>	<b>995</b>	<b>995</b>	<b>\$86,048</b>	<b>\$87,730</b>	<b>-1.9%</b>

**Oversize/Overweight less than 108,000 pounds GVW**

Mileage	Number of trips		1994 Revenue Comparison		Average difference
	Model	Actual	Model	Actual	
1 to 60	8,548	9,008	\$266,710		
61 to 150	5,033	1,077	\$276,825		
151 to 241	4,394	4,021	\$364,705		
over 241	1,198	1,149	\$141,408		
<b>Totals</b>	<b>19,174</b>	<b>19,174</b>	<b>\$1,049,649</b>	<b>\$1,053,693</b>	<b>-0.4%</b>

**Oversize/Overweight between 108,000 and 120,000 pounds GVW**

Mileage	Number of trips		1994 Revenue Comparison		Average difference
	Model	Actual	Model	Actual	
1 to 60	6,398	6,346	\$250,802		
61 to 150	3,099	3,108	\$247,923		
151 to 241	2,499	2,495	\$319,900		
over 241	800	847	\$150,353		
<b>Totals</b>	<b>12,796</b>	<b>12,796</b>	<b>\$968,977</b>	<b>\$994,397</b>	<b>-2.6%</b>



Summary

Mileage	Number of trips		1994 Revenue Comparison		
	Model	Actual	Model	Actual	Avg. diff.
Totals		36,962	\$2,345,381	\$2,338,133	-1.8%

TABLE 5.10 Matrix of Criteria for Policy Evaluation: Overweight Trucks — Single Trip Permits

Criteria	Single Trip Permits					Honor system
	Present System	Voice response	E-mail permits	Bulk permits		
<b>I</b> Road Use Data	Good	Very good-OK depending on implementation	Very good	OK, Depending on implementation	Fair - poor	
<b>N</b> Route Control	Very good	Very good-OK depending on implementation	Very good	None, except by map	None, except by map	
<b>E</b> Ease to Implement	Not an issue, already implemented	With contemporary technology + map-easy, w/o map-more complicated	Medium - considerable software development & user training	Prepare permits that are sold in bundles	Reporting requirements must be spelled out	
<b>D</b> Cost to Implement	None	Will add the cost of the automation, software develop. & some phone costs	Medium - Software & outbound FAX system. Software development	Printing of permit books; set up system to receive the permit	Low to medium	
<b>O</b> Changes in Call Type & Volume	None	Will accommodate more calls with same personnel & will accept calls on a 24 hour basis.	Medium. Voice calls drop and automated calls rise proportionally	Reduced	Sharply Reduced	
<b>T</b> Revenue Neutrality	Yes	Yes	Yes	Yes (depending on rate table)	Yes (depending on rate table)	
<b>A</b> Ability to Enforce	No change	No Change	No Change	Reduced	Greatly reduced	
<b>P</b> Potential for subversion	Little	Little	Little	Medium to high	High	
<b>E</b> Ease of Understanding	Well understood	The same as bank by phone which most users readily understand. Automated Route descriptions of varying difficulty	Need computer training	Easy	Reporting requirements may be more difficult	
<b>R</b> Change in Operations	None	None	Need computer training & use	Handling the permits will be different		
<b>U</b> Market Effects	System seems stable	None	Small - will favor companies with higher technology	None	None	
<b>C</b> Cost to Operators	Time loss in waiting for call is significant	Reduced-flexibility of calling times eliminates present burden	Reduced cost if the operator has computer Ohio	Less need to call	Less need to call	
<b>K</b> State with similar system	Very Good	Very Good	Very Good	Weak	Weak	
<b>M</b> Modeling Certainty						

TABLE 5.10B Matrix of Criteria for Policy Evaluation: Overweight Trucks — Trip/Time Permits

		Permit by groups of trips or time					
		Single period (90 day/annual)	Based on last year	Use on any truck	By specific truck	Specific Route	
	Road Utilization Data	All data will be lost	All data will be lost	All data will be lost	All data will be lost	All data will be lost	
I	Route Control	Can be controlled by map & enforced, but no data	Can be controlled by map & enforced, but no data	Can be controlled by map & enforced, but no data	Can be controlled by map & enforced, but no data	High and enforceable	
N	Ease of Implementing	Easy to implement	Difficult	Not difficult to implement - Movable placard	With truck's registration -- not difficult	Not difficult, movable placard	
D	Cost to Implement	Should save the state money in the permitting office	Will require work with the companies- Most out of state	Printing and document control.	No increase in cost	Maps perhaps as well as printing and document control	
	Recurring cost	Not high	Will increase the auditing cost	Not high	Part of licensing	Not high	
O	Changes in Call Type & Volume	Considerably reduced calls - only for single permits	Not too great if a minimum number of permits is required for implementation	Reduced calls	Reduced calls	Reduced calls	
T	Revenue Neutrality	Not possible	No. Legal subversion will certainly occur	Impossible. Suffers from all annual permit illnesses.	Impossible. Consolidation will certainly occur	Not likely. Routes that are often used will produce less revenue than at present	
	Ability to Enforce	Still open to violation for overloads	Still open to violation of overloads	Still open to violation for overloads.	Still open to violation for overloads.	Still open to violation for overloads	
	Potential for subversion	No point in subversion unless the fee is very high	Very high - forming different companies or alternate year truck use	No point in subversion unless fee set high to attempt to keep revenue neutrality	No point in subversion unless fee set high to attempt to keep revenue neutrality	Low	
T	Ease of Understanding	No problem in developing understanding	Difficult	Not difficult to understand	Not difficult to understand	Not difficult to understand	
R	Change in Operations	Should ease operations	Weird. All sorts of indeterminate changes depending on law specifics. Loopholes near certainty	Less schedule flexibility as permit will be passed around. Overall, operations eased for placard purchasers	A few trucks will carry all the loads.	Low until shippers change they operations then slowly higher. Secondary market effects unknown	
U	Market Effects	Depends on price of permit. Favors larger companies; very negative to owner operators.	Will lead to some consolidation.	Market consolidation favoring the companies with many trips per year	Market consolidation favoring the companies with many trips per year	Severe consolidation on routes that are selected. Favors larger firms	
C	Cost to Operators	Depends on the level of the permit.	Audits much more frequent and detailed, but day to day time saved	None	None	None	
K	State with similar system	Many states have annual permits- often restricted to administrative costs.	None that are known	Some states come close, but most permit by specific tractor.	A number of states specially license by tractor	Probably OK	
	Modeling Certainty	Probably OK	For revenue good. For operations quite poor	Good. Number of companies using may be difficult.	Uncertain - depends on a company's owned resources		

## **Chapter 6**

### **Implementation Suggestions**

The study covered the polices regarding the permit process for overweight, and overweight & oversize trucks. From the study their are good reasons not to change the present permit process to an annual permit. The study did, however, identify several problems in the permitting process.

The essence of the implementation plan should be threefold:

**GOAL 1.** To find ways to separate the permits needing longer operator time from the myriad of those which are routine and regular. Examples of the later are Michigan trains and those trucks traveling through Indiana from one state to another. Place the routine permit requests on an alternate system that can handle the volume which is expected to increase over the next few years.

**Step 1:** Set-up a voice response (TT/VR) system and begin by having all Michigan train permit requests be made through it. The specification for that automation will be generated under an INDOT JHRP contract to Purdue. Then begin to add other types of permits that are routine. Trucks that run from border to border of Indiana using the Interstate System lend themselves to such automation.

**Step 2:** INDOT transfers the permit granting function to the Indiana Department of Revenue under the Governor's one-stop-shopping initiative.

**Step 3:** Classify the trucks that traverse from border to border and automate them.

**Step 4:** Automate all other overweight and oversize-overweight trucks.

**GOAL 2.** Develop data that will simplify the work of the permit clerk.

**Step 1:** Complete a state-wide highway system plan that will indicate the routes that are acceptable for various truck weights, axle configurations and lengths.

**Step 2:** Place the responsibility for checking the road data and detours on the users wishing permits. One way of doing this would be to putting the detour information on the World Wide Web. This way the permit clerk would not have to check the routes for every overweight-oversize truck that wishes a permit.

**Step 3:** Examine the fee schedule in light of the automated system. For example, the fee schedule might be simplified that would make it more compatible with the automatic TT/VR. The box on page 1-3 of this report gives a fee schedule approach that is revenue neutral and that may be simpler to use on the Voice Response system than the present one.

**Step 4:** Use data from the equations in JHRP report 93-1 entitled, *Statistical Analysis of Overload Vehicle Effects on Indiana Highways* by Prasad, White, Ramirez, & Kuczek, dated August 19, 1994 to provide a summary of bridge effects

and how the weight/length characteristic of the truck that can then be used directly for permitting purposes.

**GOAL 3.** Rewrite the law so that it is clear and states more precisely, than it does now, exactly what permits are required by which vehicles. An alternative would be to change the Permit Guidelines published by INDOT.

The relevant material is found in Article 29, Chapter 9, Section 6-3 which is printed below and has suggested modifications as shown in the italics and crossouts.

**9-29-6-3. Permits issued under IC 9-20-6 to exceed legal weight limit - Permit for heavy vehicles or loads, or other objects, that exceed the legal length, width, or height limit and legal weight limit. -**

- (a) The fees for permits issued under IC 9-20-6 to exceed the legal weight limit are as follows:

(1) A trip permit, twenty dollars (\$20) *and*

(2) A mileage fee, which is in addition to the trip permit fee in subdivision (1), to be calculated for that part of the gross weight exceeding eighty thousand (80,000) pounds *or axle weight exceeding 18,000 pounds* as follows:

(A) For loads greater than eighty thousand (80,000) pounds but not more than one hundred eight thousand (108,000) pounds, thirty-five cents (\$0.35) per mile.

**(B) For loads greater than one hundred eight thousand (108,000) pounds but not more than one hundred fifty thousand (150,000) pounds, sixty cents (\$0.60) per mile.**

**(C) For loads greater than one hundred fifty thousand (150,000) pounds, one dollar (\$1) per mile.**

**(D) For loads less than 80,000 pounds but whose axle weights exceed**

- *any single axle of 20,000 pounds [9-20-4-1]*
- *any pair of tandem axles of 34,000 pounds [9-20-4-1]*

*thirty five cents (\$0.35) per mile or*

**(3) Trucks whose gross vehicle weight is less than or equal to 80,000 pounds, but whose axle weights exceed those in [(a)-(2)-(D)] above may purchase a ninety (90) day permit for two hundred dollars (\$200) for each truck traveling over specified routes.**

**(b) If an application for a permit involves transporting heavy vehicles or loads, or other objects, that exceed the legal length, width, or height limit applicant shall pay only the greater of the two (2) fees established in section 2 or 3 [IC 9-29-6-2 or 9-29-6-3] of this chapter and the issuing officer or body shall issue a single oversize-overweight permit. ~~The fee for a ninety (90) day permit described in IC 9-20-6-2(b)(3) is two hundred dollars (\$200). [P.L.2-1991, § 17.]~~**

The law, as it is, does not account for those trucks whose axles are overweight but the overall Gross Vehicle Weight is within the 80,000 pound legal limit. Frequently (over 2000 permits

per year) utility and drilling rigs have such vehicle configurations. One vehicle examined had 20,000 pounds on the single front axles and 46,000 pounds on the rear tandem axle with 10.5 feet between the front and forward-most rear axle.

As one can see how these trucks are covered is ambiguous. A first reading of the section b-2 would say that such trucks pay only the \$20.00 fee. However, when the question is referred to the INDOT council, they ruled that all overweight vehicles should pay an overweight charge. If that is the case, the law then needs to say that.



## APPENDIX A SUMMARY OF DISCUSSIONS WITH OFFICIALS OF OTHER STATES

DATA WERE GATHERED BY JAMES G. KAVALARIS

### ALABAMA

Mr. Randy Braden, Department of Transportation, Vehicle Permit Office, 1409 Coliseum Boulevard, Montgomery, AL 36130; (205) 242-6626; FAX: (205) 832-9084.

- They offer an annual overweight permit for loads up to 150,000 pounds that costs \$100. However, if a trip is going to be over 100,000 pounds, then the carrier has to get a routing authorization via a fax from the permit office. There is no extra charge for this authorization.
- Since the single-trip and the annual overweight permit programs were initiated at the same time, Alabama has no information as to revenue neutrality.
- They are faxing information regarding their rules/regulations and fees.

### ALASKA

Mr. Daniel J. Cooper, P.E., Permit Supervisor, Division of Measurement Standards, Department of Commerce and Economic Development, P.O. Box 111686, Anchorage, AK 99511; (907) 345-7750; FAX: (907) 345-6835.

NOTE: I talked to one of Mr. Cooper's assistants.

- They offer an "extended" overweight permit that can be purchased in increments of 30- days for a maximum of a one-year permit. It is only valid for tractor-trailers or truck-trailer type configurations that are no more than 125% of legal weight. There is no need to call in for special route authorizations since anyone over 125% of legal weight must purchase trip permits, which are only valid during a 3-day time period.
- Mr. Cooper would have information as to revenue neutrality, and I should give him a call when he gets back into the office on Wednesday. The permit assistant that I talked to did not have access to any financial information.
- They are faxing general information regarding their rules/regulations, fees, and type of vehicle configurations that this "extended" overweight permit is applicable towards.

### ARIZONA

Mr. Steve Abney, Manager, Central Ports, Motor Vehicle Division, AZ Department of Transportation 1801 West Jefferson Street, 524-M, Phoenix, AZ 85007; (602) 255-7346; FAX: (602) 269-5611.

- They offer two types of annual overweight permits, available for vehicles up to a maximum of 250,000 pounds. However, all vehicles must still be within the Federal Bridge Formula constraints for axle loadings except for some standard configurations (specifics are being faxed) that will allow for about a 25%-30% increase in allowable weight beyond the Bridge Formula. The first type of annual overweight permit is load specific and costs \$640 per year. The second type of annual overweight permit is called an "Envelope Permit" because it allows different types of loads to be hauled throughout the year. The "Envelope Permit" costs \$1500 per year. Neither permit requires any type of specific trip authorization. It is the responsibility of the carrier to maintain legal operations. All carriers are provided with a guidebook containing administrative rules, legal routes, and other information, and must sign a legal document stating that they will follow all of the rules. There are "considerable fines" for not following these rules. Like California, Arizona has adopted a point system where each violation causes a number of "points" to be assessed against the annual permit depending on the type and severity of the violation (i.e. number of pounds overweight on the axle, or use of a non-approved route, etc.). After a certain number of points are assessed, then the annual overweight permit in question is suspended.
- The load-specific annual overweight permit was essentially revenue neutral because it limited the vehicle to one specific type of load to be used during the year with that permit. A study of the revenue impacts of their "Envelope Permit" should be available sometime in August 1994 (since the first fiscal year that this type of overweight permit was available will be concluded at the end of July 1994). Early indications, though, are that the state is going to loose revenue with this permit. An example is that one of their companies was spending between \$40,000 to \$60,000 per year on overweight permits. With the "Envelope Permit" available, they will probably only be spending about \$15,000 this year on overweight permits. Also, carriers are consolidating their overweight movements to specific vehicles in their fleet that have been dedicated to overweight trips so as to maximize the potential value of an annual overweight permit. However, even though the state lost money on this permit, they feel that they are still in a better situation today than they were in previous to this "Envelope Permit" because they were not able to issue overweight trip permits fast enough to keep up with the demand for them. Consequently, many carriers were running without valid overweight permits. Currently, the state has much more confidence in their carriers' overweight movements because the carriers have made a substantial "up-front" investment to obtain an annual "Envelope Permit", and will therefore have much more incentive to do everything in their power to operate legally so as to continue the privilege of having an annual overweight permit.
- They are faxing general information regarding their annual overweight permitting program, a copy of the carrier agreement to abide by the permit rules and

regulations, etc., and a copy of the types of vehicle configurations that they will allow to exceed the Bridge Formula's axle-load limits (and by what amount).

### CALIFORNIA

Mr. Bob Shepard, Asst. Chief, Transportation Permits, Department of Transportation, 1120 "N" Street, Room 4104, PO Box 942874, Sacramento, CA 94274-0001; (916) 657-2284; FAX: (916) 654-3498.

- California offers multiple types of annual overweight permits. It is a "blanket" permits that is valid on all routes within either a 75-mile or 100-mile radius except for those "weak bridges" that are identified on a special map that must accompany the permit.
- By law they are only allowed to recover the administrative costs of issuing the permits, therefore all of their annual permits cost \$90. No highway damage costs are recovered.
- A copy of their permit handbook with full details will be mailed to Professor Whitford.

### COLORADO

Ms. Ina M. Anders, Highway Permit Officer, Department of Highways, 4201 East Arkansas Avenue, Denver, CO 80222; (303) 757-9539; FAX: (303) 757-9719.

- They issue an annual overweight permit for \$400. This is a blanket permit such that no special route authorization is required. All annual overweight permits are issued with a map and a rule book that details the "envelope"/limits of the permit. Vehicles can be up to 200,000 pounds, however there are certain configuration restrictions at various levels of increasing weight -- especially with regards to any excess axle weights.
- Due to time limitations of the telephone call, it has not yet been possible to discuss Colorado's experience with the revenue neutrality issue.
- They will be mailing Professor Whitford a copy of their annual overweight permit route map and rule book.

### CONNECTICUT

Mr. Rudolph Kamm, Jr., Department of Transportation, 24 Wolcott Hill Road, P.O. Box Drawer "A", Wethersfield, CT 06109-0801; (203) 594-2874; FAX: (203) 594-2866.

- They issue an annual overweight permit that still requires the carrier to call-in and get a route authorization for each trip that is taken. They can be purchased for up to 120,000 lbs if a 5-axle vehicle, for up to 130,000 lbs if a 6-axle vehicle, for up to 140,000 lbs if a 7-axle vehicle, for up to 16,000 lbs if an 8-axle vehicle, for up to

180,000 lbs if an 8-axle vehicle, and for up to 200,000 lbs if a 10-axle vehicle. Generally, a maximum of 20,000 lbs per axle is allowed.

- The cost of the annual overweight permit is \$7 per 1,000 lbs (beyond 80,000 lbs?). A vehicle can have more than one annual permit for different weights, or they can register for a lower annual permit weight and buy single-trip permits for any other trips that might happen to be over their registered weight if they are trying to save money.
- There was nothing additional that he felt that would be helpful to fax or mail, however, if there are any additional questions, he said that we should feel free to call him back for more information.

### FLORIDA

Mr. Billy R. Berry, Permit Engineer, Department of Transportation, 605 Suwannee St., Mail Station 62, Tallahassee, FL 32399; (904) 488-4961; FAX: (904) 487-3858.

- Their staff was not increasing, but their workload was increasing. Therefore, in 1982 they decided to issue a "Blanket Permit" for overweight movements. When this happened, they went from issuing 170,000 overweight and/or oversize single trip permits to issuing only 70,000 overweight and/or oversize single trip permits. They also felt that an annual permit enabled them to undertake a more detailed review of requests for overweight permits and routings than what they were able to do when they were only issuing single-trip overweight permits. To determine guidelines/parameters for this permit, they ran about fifty different vehicle combinations of 5-, 6-, 7-, 8-, and 9-axle vehicles through a computer program they had that tells them which Florida bridges can not be driven over. They then started to lower the amount of weight in each of these different combinations until there were only 300 restricted bridges throughout the state for each of the axle-types (Note: the 300 value was arbitrarily chosen). This resulted in "Blanket Permits" to be issued for 5-axle and 6-axle combinations up to 112,000 pounds, for 7-axle combinations up to 127,000 pounds if they have at least 62 feet between the first two axles, for 8-axle combinations up to 137,000 pounds if they have at least 72 feet between the first two axles, and for 9-axle combinations up to 152,000 pounds if they have at least 90 feet between the first two axles. In no case can a vehicle operating under an overweight "Blanket Permit" have more than 20,000 pounds per axle even though Florida law will allow up to 22,000 pounds per axle or 44,000 pounds per tandem if a single-trip overweight permit was purchased. Also, those with an overweight "Blanket Permit" may not have any more than two axles in a grouping. Continuing with how their program was put together: For each axle type, they then took a negative copy of a map of Florida and blacked-out all roadways, from interchange to interchange, that contained a restricted bridge from the above-mentioned computer program. This map was then printed and given to a carrier as part of their blanket permit. As long as a carrier stays on those roadways that are listed on their axle-specific map then they do not need to have any special routing

authorizations, etc. If they are stopped by the weight police and the road that they are on is not on the official map that they must always carry with their official original copy of their "Blanket Permit" (to prevent illegal use of multiple copies), then they are fined, must break-down the load, and must purchase a single-trip overweight permit before the load is released from the authorities (in order to collect damages from their illegal travels on non-authorized routes). If they want to legally travel a non-listed route, then they need to purchase a single-trip permit. In some limited instances, they will allow vehicles that are over the above weight limits for axle types to purchase a special restricted annual overweight permit that allows them to only travel on a specific route that is specially authorized for that vehicle only.

- Because Florida law does not allow for any commercial vehicle permit to cost more than \$500, this is the cost of an annual overweight permit. They are not recovering their damage to the roadway costs, and they have not been able to increase it to their desired \$2,000 per year rate due to heavy lobbying by the Florida Trucking Association. Under the single trip system they are recovering the cost of damage to the roadways and bridges because the fee for a single-trip overweight permit is 0.003 cents per 1,000 pounds per mile.
- The phone conversation was cut short by an emergency at their end so no request was able to be made for any special information to be faxed to Purdue. If necessary, though, Mr. Berry said that he can be called back at a later time to clarify information and to get other wanted details.

### GEORGIA

Mr. Jack Williams, Administrator, Office of Permits & Enforcement, GA Dept. of Transportation, 276 Memorial Drive, S.W., Atlanta, GA 30303; (404) 656-5435; FAX: (404) 656-9717.

- They offer an annual overweight permit for loads up to 100,000 pounds (with a maximum of 25,000 pounds on each axle). The cost is \$100. They feel the cost should be much higher, however, since it is written into the law, they have had no luck each time they have tried to increase it. No special routing authorization is required. Any load greater than 100,000 pounds requires a trip permit. Any single trip request greater than 135,000 pounds must be approved and routed by the Georgia Dept. of Transportation Bridge Department. No permits are issued for anything larger than 180,000 pounds. His first words regarding annual overweight permits were, "If you are not doing it now, then don't start doing it". He then went on to explain that it does help to reduce calls and manpower requirements, especially if you can't keep up with demand and truckers are running without valid permits (i.e. using a single-trip permit more than once in a 5-day time window, etc.), however, these type of annual permits allow the state to "loose control" of specific movements and "accident rates go up". He was of the opinion that the whole reason for having special permits for overweight movements was that they

tear-up the road and therefore must be handled with special trip authorizations. If annual permits are to be issued for these movements, then it doesn't seem to follow the logic of each trip being unique and needing the special authorization. Some other interesting items that were discussed: For single trip permits they have ten phone lines going to eight clerks who are taking information and keying-in particulars about a specific trip and making sure that they have all of their fuel taxes paid (checked via motor-fuel account number) and that they have enough money left in their state escrow accounts to pay for the permit (Note: less than 10% left in escrow account, then account is considered under-funded; bills are sent-out twice a month to replenish funds in the escrow account; all permits must be paid before they are issued). After the clerk takes the information, the call goes into four main queues (or another queue if the Bridge Dept. needs to route or if the account has insufficient funds and a CommCheck, etc. needs to be sent to the Permit Office). At these queues, two people handle all routings for mobile homes and other oversize/overweight movements -- and two other people handle all routings for overweight movements only. The initial eight permit clerks do not do any routing. They only take information. Finally, an original permit is printed, faxed to either a permit company on a special permit-service company machine that is kept in the permit office, or to an individual company that has set-up their own escrow account. Faxing charges for non-permit-service companies are \$2 per permit (a "good deal" because permit-service companies usually charge between \$6 to \$7 per permit). The original permit is kept on file for seven years at the permit office. For people using permit-service companies, a driver can have a single-trip permit in their hands in approximately thirty minutes. Within one year they will have an automatic faxing system. Also, they got the law changed so that they do not have to keep any originals at the main permit office. If the original is needed in the future for an accident report, etc., then they can generate one electronically from their old computer files.

- Since the annual overweight permit program has been in place for at least twenty years, they do not really have any details as to how it has affected revenues, however, the following information was given: First, because the permit office also has the responsibility of enforcing these overweight/oversize permits, they are a big money-maker for the state. In Georgia, operating overweight without the proper permit is a civil violation. The state takes in approximately \$500,000 per month on overweight citations alone. The total income for the permit office is about \$16 million per year. Since their annual budget costs are only about \$8 million to \$9 million per year, they make approximately \$8.5 million dollars per year for the general fund of the Georgia Department of Transportation to pay for highway maintenance. In 1993, they issued 941 overweight annual permits, and 4462 combined overweight/oversize annual permits. In 1993 they issued 51,163 overweight-only single-trip permits. They issue between 700 to 1200 single-trip permits per day (both oversize and overweight). In 1993, they issued approx.

110,000 overweight permits for movements greater than 100,000 pounds and up to 180,000 pounds (costing between \$10 and \$20 each). To help eliminate re-use of single-trip permits they also printed a four-digit code on the permit that was the sum of "a certain part of the permit number of the power-unit, a certain part of the permit number of the trailer, the day the permit was issued, and the day the permit was expired". This way, an enforcement officer could just add-up the proper numbers to see if it matches the "code" on the permit in order to check to see if it was being used for a second trip. When this was done, the number of single-trip permit requests jumped from about 400 per day to about 700 per day.

- They are faxing some information regarding the agreements that a carrier or permit-service company must sign in order to set-up an escrow account with the state's permit office. Mr. Williams also invited the InDOT permits people to visit them in Atlanta to see how their operation works.

### IDAHO

Ms. Regina Phipps, Size and Weight Specialist, Transportation Department, P.O. Box 7129, Boise, ID 83707-1129; (208) 334-8418; FAX: (217) 782-3572.

- They issue an annual overweight permit for vehicles up to 200,000 pounds (more weight, in some cases). This also includes the authority to travel at certain oversize dimensions under the same annual permit. There is a different permit for "reducible loads" and "non-reducible loads". They are valid for one-year from the date that they are purchased. The annual fee for these permits are \$40 plus 2.1 mills per mile per 2,000 pounds of permitted weight that is above the legal weight for the particular configuration that is being operated. This is collected quarterly via a "quarter card" form that requires each carrier to list how many miles they traveled on each of four different color-coded route systems -- each having a different permitted weight. This is based on established "factors" and the Bridge Formula. An example regarding axle weights: On interstates, up to 33,000 pounds are allowed for single axles, up to 56,000 pounds are allowed for double-axle combinations, and up to 70,500 pounds are allowed for triple-axle combinations. On their lowest category roads, up to 22,500 pounds are allowed for single axles, and up to 45,000 pounds are allowed for double-axle combinations. Special "posted bridges" are exceptions to all of the above rules. Weight limitations cannot be exceeded on "posted bridges" unless a single-trip overweight permit is obtained. Single-trip overweight permits can be faxed to the requestor and paid for via either a credit card, a "CommCheck", a "fee account"/escrow on deposit with the permit department, or in person at one of the state's ports-of-entry (note: the extra weight-distance fee is included in a single-trip permit fee so as to eliminate the necessity of "quarter cards" for these trips. Annual overweight permits can only be obtained at a port-of-entry because color-coded route maps and a rule book are also issued with the permit. Ports-of-entry are located just inside the state borders on all

interstates and some other major trunkline routes into the state. They include static enforcement scales for enforcement (annual overweight permits must be shown at ports-of entry). This enforcement is supplemented by roving enforcement officials who have portable scales with them.

- Since the annual overweight permit has been available for "many" years, they do not have any information regarding the revenue neutrality issue. It was mentioned, however, that the \$40 fee only covers "administrative costs" of issuing the annual overweight permit, and that the additional weight-distance fee does not recover the cost of the damage to the pavements and bridges that are being traversed. They are currently trying to increase this portion of the fee. In fact, their motor truck association "complained that the fees were too low". They contended that if the reason to have special permits and fees for overweight vehicles is to collect money to pay for excess damage to pavements and bridges, and that if the fees being charged to not recover for these damages, then the fees should be eliminated because they money is "being collected for reasons other than what has been claimed to be collected for" (i.e cost recovery from pavement and bridge damage).
- They will be mailing Professor Whitford a packet containing a rule book (including allowable configurations), a color-coded route map, a map of their ports-of-entry, a "quarter card", and any other information that they think might be pertinent to the study. Also, it was mentioned that we could call them back to ask more questions or to obtain additional details for anything in the packets that are being sent.

### KENTUCKY

Mr. Bill Debord, Asst. Director, KY Transportation Cabinet, Division of Motor Carriers, P.O. Box 2007, Frankfort, KY 40602; (502) 564-4109; FAX: (502) 654-4138.

- They offer two overweight annual permits. The first one is for travel only within the county one is based-in, and all adjacent counties. Travel must be on state-maintained highways. No special route authorization is needed, however, the state is not responsible for any damage caused by travel over posted bridges, etc. The second one is for steel carriers and is valid only within a 35-mile radius on routes that are specifically stated on the permit.
- Fees for the county-based permit are \$60 plus the following extra fees: \$30 if width is between 10'0" and 14'0", or \$50 if the width is greater than 14'0". Also, another additional fee is assessed for a 6-axle vehicle (\$40 extra), a 7-axle vehicle (\$50 extra), an 8-axle vehicle (\$60 extra), and for a 9 or more axle vehicle (\$70 extra).
- Note: Mr. Debord was not available, so this information came instead from Janice Stanley. Her number is (502) 564-7150. The fax number is the same. There is no information that will be mailed or faxed to us.

### MASSACHUSETTS



Mr. Robert Melions, Permit Engineer, Commercial Motor Vehicle Center, 525 Maple St., Marlboro, MA 02116-3969; (508) 624-0820; FAX: (508) 480-9629.

- Mr. Melions was not available, so I talked to a "Paul" in the same office. They currently issue three oversize/overweight annual permits for non-reducible loads. One is for construction equipment, a second is for boat haulers, and the third is for self-propelled cranes. They cost \$300 per year, valid for one-year from the time of purchase, and are required for any vehicles greater than 80'0" in length, 13'6" in height, and 13'0" in width. This is a "blanket" permit with no need to call-in for individual route-authorizations. There is no limit to the number of movements that may be made on an annual permit. However, permits are commodity specific -- i.e. a boat hauling permit cannot be used to haul construction equipment, and a construction equipment permit cannot be used to haul a steel beam to a construction site.
- If a vehicle is pulled-over by motor-carrier enforcement for inspection, the tractor, the trailer, the drive axles, and the load will be weighed and compared with the permit constraints for purposes of compliance. There was no information available regarding revenue neutrality.
- They will be mailing Professor Whitford a copy of their information booklet with more details and specific weight cut-off points, etc.

#### MINNESOTA

Mr. Dennis M. Lachowitz, MN Dept. of Transportation, Overweight and Overdimension Permits, MN Administrative Truck Ctr., 100 Stockyard Road, South St. Paul, MN 55075; (612) 296-6441; FAX: (612) 297-1908.

- They currently issue annual permits for limited commodities on non-divisible loads. They are construction machinery & related items, manufactured housing, commercial boat hauling, and farm machinery. Typically, only for the construction category have annual overweight permits been issued. Costs are as follows: \$200 for up to 90,000 lbs and/or exceeding any legal axle weight or axle group weight if gross weight is under 80,000 lbs; \$300 for up to 100,000 lbs; \$400 for up to 110,000 lbs; \$500 for up to 120,000 lbs; \$600 for up to 130,000 lbs; \$700 for up to 140,000 lbs; and \$800 for up to 145,000 lbs. Everyone else must purchase single-trip permits. Because an annual permit is inexpensive compared to a single-trip permit, there is much incentive to purchase an annual permit (single-trip overweight permits are charged based upon weight and distance traveled, and can cost between \$16 and \$200). These overweight annual permits are NOT blanket permits. Any loads over 14'6" of width, over 14'0" of height, over 85'0" of overall length, and over a given weight category (see fax) must call-in for a specific route authorization for each trip. If less than 12'6" in width and with less than 8'6" axle width, then a company can route themselves without having to call-in for a route authorization.

However, the permittee must only be on pre-approved routes that are known by reviewing a width of traveled roadway map, a bridge weight map, and a weekly construction bulletin (mailed weekly by MNDOT to all annual permit holders). In addition, all moves must be logged onto a certain form. However, this form is only used by field enforcement personnel. It is not audited. Therefore, there are some carriers who will log-in a size that allows self-routing, but actually be carrying a load that might exceed allowable dimensions, etc. When someone calls in for a route authorization, it is logged-into the MNDOT system by callers initials and commodity, and logged by the permittee also. In addition, size and weight information is given over the phone so that more route choices are available to the company. As size and weight increases, the available routes that can be traversed will decrease.

- They would suggest that a trip limit be placed on the "annual permits" in addition to the time limit of 1-year from the date of purchase. They have no idea how many self-routing trips are being made on an annual permit, however, some of the annual permits holders that require route authorization are making up to 400 trips on one of these permits. They were not able to put a limit on the number of trips (and really call it a "bulk permit purchase" since single-trip permits would still be relatively more expensive) because of the political difficulties that were encountered to try and get it passed through their legislature. Also, the annual permits have been around for such a long time that it was difficult to get people to change to something new.
- They are faxing Professor Whitford a copy of their weight limitation structure for self-routing vs. requiring route authorization, a copy of a movement log-form, and any other pertinent information that he feels might be useful for this study.

### MISSOURI

Mr. William R. Wilson, Special Permits Supervisor, MO State Highway & Transportation Department, P.O. Box 270, Jefferson City, MO 65102; (314) 751-2820; FAX: (314) 751-7408.

- They do not have an annual overweight permit, however, they do have an electronic single-trip permitting system that runs on a P.C. with a modem connected to an (800) telephone number whereby a company enters information to a computer screen, and then a permit is faxed back to them the first thing in the morning (if after hours), or the first thing on a Monday morning (if the call was during the weekend). They feel that it is their responsibility to provide safe routes so that the industry can limit their exposure from high insurance for bodily claims, etc. that could be large if the overweight trucks were able to drive without routing on a "blanket permit". Until early 1994 they were able to handle single-trip permits very efficiently with six agents working 11 (800#) phone lines. However, due to flood repair work/construction, and the general trend for more overweight

movements all over the country (including probably more enforcement), their issuance of overweight single-trip permits has doubled to 11,000 per month. Even though it takes only about 2 to 3 minutes to process a call (very automated with automated routing w/GIS coming soon), truckers have to wait on hold for up to two and 1/2 hours. They anticipate that their volume will double again in the next couple of years. By this fall they should have up to eight or nine agents to help reduce delay. Also, they are working on extending hours during peak times of the year and hiring temporary staff to work after hours and on weekends to handle the "electronic" permitting system. They suggest that staff increases are "inevitable" and that Indiana NOT go to an annual overweight permit system.

- The cost of the electronic system is about \$2,000 (not including 800 phone calls) for a computer and a fax machine.
- He will be sending Professor Whitford a packet describing how they handle their electronic single-trip permitting system. Also, Mr. William R. Wilson is friends with Dave Belford at INDOT oversize/overweight permits.

#### MONTANA

Mr. Dan Kiely, Special Permit Section, MT Department of Highways, P.O. Box 4639, Helena, MT 59604-4639; (406) 444-6130; FAX: (406) 444-7670.

- Since January 1, 1994 they have been issuing an annual overweight permit for non-reducible loads. No special route authorizations are required. Their current single-trip permit system that has been in effect for a long time is a "self-issuing system" whereby one must stay on certain special routes that are posted at various weight stations. Those who are issued annual permits do not get any special type of map. They also have not sold "that many" of these annual permits. They have issued about 5,000 single-trip permits for the first seven months of the year (an estimate). They probably average about 130 to 150 single-trip permits per day (not including the self-issuing permits).
- The cost of an annual permit that allows a maximum of 5,000 lbs in total excess axle weights costs \$200. The total allowable gross vehicle weight is then based upon charts in a "500 page book that their engineers use depending on the vehicle's configuration". Charges are then \$3.50 per 5,000 lbs excess over 80,000 lbs per 25 miles traveled. After this system has been in effect for a year they might decide to allow a greater total axle excess weight for an additional fee.
- Mr. Dan Kiely will be mailing Professor Whitford a copy of a study that Montana State University did for them when they were revising their fees before this change to an annual system. However, he thinks that there might not be that much information in the study about other states' experiences regarding annual overweight permitting.

## NEVADA

Mr. Wayne R. Teglia, Admin. Services Officer, Department of Transportation, 1263 South Stewart Street, Carson City, NV 89712; (702) 687-5412; FAX: (702) 687-4846.

- Mr. Teglia was not available, so discussions were instead conducted with Ms. Jen Christopherson. Nevada issues an overweight annual permit for \$50. It is valid for one year from the date of issuance. It is a "blanket" permit, therefore there is no need to call-in for any type of individual routing. However, all movements on annual permits are limited to vehicle configurations and axle weights that would be able to safely cross all of their "green-route" bridges. The "green route" bridges are their "lowest grade" (i.e. weakest) bridges. For vehicle configurations and axle weights that could not safely cross these "green route" bridges, annual permits would not be available and individual trip permits would have to be obtained.
- There was no discussion as to revenue neutrality, however, charges for the above described annual overweight permit have increased from \$25 to \$50. There are no limits on the number of movements that can be made on one of these annual overweight permits.
- They will be mailing their regulations manual for annual overweight permitting to Professor Whitford.

## NEW HAMPSHIRE

Mr. Robert A. Hogan, Administrator, Bureau of Highway Maintenance, Department of Transportation, P.O. Box 483, Concord, NH 03302-0483; (603) 271-2693; FAX: (603) 271-3914.

- They have an annual permit for \$100 that allows statewide travel for all vehicles that meet certain restrictions (see packet being mailed). It is mostly used by the construction industry and others who travel the same routes with the same commodities every day.
- The revenue neutrality issue was not discussed. Even though it is valid for one year from the date of purchase, most carriers renew and/or purchase them at the beginning of each year. Second type of permit is also issued for \$50, which allows 10 self-permitted \$5-each moves, however, a special route authorization must still be obtained for each trip.
- He will be mailing Professor Whitford a packet that describes all of the details of the New Hampshire annual overweight permit.

## NEW YORK

Ms. Linda Newton, Permits, New York State Department of Transportation, State Campus, Bldg. 5, Room 311, 1220 Washington Avenue, Albany, NY 12232; (518) 457-1155; FAX (518) 457-0367.

- The state of New York offers six different annual overweight permits that are either limited to a specific route, or allow travel within a given area without the need to call in for individual trip authorizations. The first annual overweight permit is available only to New York state businesses and those going to construction job sites. It is good for vehicles traveling within a 25-air-mile radius. Vehicles can be up to 116,000 lbs with 56,000 lbs on a tandem axle and 60,000 lbs on a tri-axle, up to 12'0" wide, up to 13'6" high, and up to 72'0" long. The second type of annual overweight permit is for vehicles traveling within a 50-air-mile radius. Vehicles can be up to 108,000 lbs, and up to 12'0" wide, 13'6" high, and 72'0" long. Allowable length can be increased to 85'0", however, the permit is then restricted to a specific route. The third type of annual overweight permit is good for vehicles traveling within a 100-air-mile radius. Vehicles can be up to 108,000 lbs, and up to 11'0" wide and 72'0" long. This permit is typically only given to mobile home contractors and trucking firms. Allowable length can be increased to 85'0", however, the permit is then restricted to a specific route. The fourth type of annual overweight permit is known as the "Bulk Milk Permit" and allows travel on any New York state road for vehicles that are up to 108,000 lbs (125% of legal weight?) and within legal dimensions. The fifth type of annual overweight permit is known as an "Emergency Blanket Permit" and is only for moving items for emergencies and public safety (like a train derailment, etc.). Vehicles can be up to 116,000 lbs with a maximum of 56,000 lbs on a tandem-axle and 60,000 lbs on a tri-axle, vehicle dimensions are limited to 13'0" width and 72'0" for length. Also, all travel must be on paved surfaces that are a minimum of 20'0" wide. The sixth type of annual overweight permit is a "blanket" permit that is available to any business that is doing work in New York state. Vehicles can travel on any paved state road that is at least 20'0" wide. Vehicles can be up to 100,000 lbs with 21,250 lbs on an individual axle, 42,500 lbs on a tandem-axle, and 52,500 lbs on a tri-axle (with a maximum of 17,250 lbs on any individual tri-axle). Dimensional restrictions are 10'0" of width, and 72'0" of length.
- All of the permits cost \$360 per year (they "wish it was more").
- She will be mailing an information packet to Professor Whitford. She also suggested that we contact the Civil Engineering? Department at Rensselaer Polytechnic Institute in Troy, NY (518) 276-6000 for information on a study they are doing to completely computerize the permitting process for Maine, Vermont, Massachusetts, New York, and Pennsylvania. The study might not be done yet, but they should have more information for us. Also, the Ohio Department of Transportation currently? has a computerized permitting system.

## NORTH CAROLINA

Ms. Tammy C. Denning, Assistant Director of Permit Unit, Division of Highways, Department of Transportation, P.O. Box 25201, Raleigh, NC 27611; (919) 733-7154; FAX: (919) 733-7828.

- An annual overweight permit is available (good for one-year from the date of purchase). Vehicles up to 94,500 lbs with five-axles may apply in writing for an annual overweight permit that is valid for up to ten specific pre-approved routes. Vehicles up to 108,000 lbs with 6-axles, or vehicles up to 122,000 lbs with either 7-axles or 8-axles may apply in writing for an annual permit that is valid for one specific route (just like a single-trip permit, but they do not have to pay extra or call in for routing approval for one year). Permit officers do the routing based upon "Green Line" routing maps that the engineers have approved for various weights and configurations. If any construction takes place on one of these routes, all posted detours must be able to handle vehicles up to 122,000 lbs. No special construction/detour maps are mailed to annual overweight permit holders.
- Each annual permit costs \$50. Advantages are for those companies who know that their origins and destinations will not be changing from trip to trip. Disadvantages are for those companies who are for-hire and need to take different routes for each trip (these carriers must still purchase single-trip overweight permits).
- There is no additional written information that will be mailed or faxed to us.

#### OHIO

Mr. Dennis M. Murphy, Supervisor, Bureau of Permits & Communications, OH Dept of Transportation, 1809 O'Brien Road, Columbus, OH 43228-3866; (614) 777-0224; FAX: (614) 777-0336.

- Ohio currently does not have an annual overweight permit. They had one in the past for \$55, and they will have one in the future (price to be determined on a ton-mile basis), but they stopped it during their current process to re-evaluate all of their fees (still trying to decide if ton-mile fees will be collected quarterly, based on average operations, previous years' activity, etc.). Currently, they offer a quarterly/"continuing" overweight permit for \$25. This is route-specific permit (not a "blanket permit"), and is based upon vehicle configuration and commodity, and is issued to the power-unit.
- The current system is very computerized. Most of their permits were issued through permit services who would courier forms from their Columbus offices to the main permit office. Now, many of their customers (for both quarterly and single-trip overweight permits) contact the permit office via a special communications package (provided free of charge and with a free class on how to use the system) that includes various formatted data screens (stored on each remote-users' PC to reduce data-transfer time) that need to be completed (this is done "off-line"). When finished, the permit office PC-compatible computer is

called and only the data is sent to the permit office on-line. This makes the call shorter and helps to free-up phone lines that would have been busy if a phone line had to be tied-up while people were typing all of the necessary information. A permit officer then approves the route for single-trip applications, and then a permit is automatically faxed-back to the applicant by a "fax-press" machine (i.e. a paper permit does not have to be printed and then physically put into a fax machine -- it is all electronically done). For quarterly permits, this only has to be done once each quarter (i.e. since the permit is for only one route, there is no need for any special authorization for each individual trip). Total turn-around time is currently a maximum of two-hours for single-trip permits (because of manual routing). They are currently installing equipment that will automatically check routes for bridge strength and other safety measures based upon data that the user enters via the modem-connected PC. A valid permit would then be automatically faxed-back. It should be noted that all who wish to use the computer/modem option must have previously set-up an escrow account with the state so for proper and timely receipt of fees by the permit office.

- Information will be mailed to Professor Whitford. If we would like a copy of the software that they give to companies wishing to connect via PC-compatible computers then a memo on Purdue letterhead should be faxed or mailed to Mr. Jeffrey E. Gelety, Administrator, Bureau of Permits & Communication (at the above address & phone number).

### PENNSYLVANIA

Mr. Walter Knerr, Permit Section Manager, Department of Transportation, Harrisburg, PA 17120; (717) 787-4680; FAX: (717) 787-9890.

- They have three very limited annual overweight permits. The first permit, costing \$25 allows a vehicle to cross a highway if they have their business operations on both sides of that highway. The second, costing \$50 is only for quarrying operations and allows a vehicle to travel up to 0.5 miles along a highway. The third permit, costing \$300 (approx.) is a temporary law that will sunset soon that allows construction trucks that were registered in Pennsylvania before October 1, 1980 to travel with overweight axles. It should be noted that none of these above movements are allowed on limited access highways, and they account for about 1/4 of one percent of their total permit volume. About 99% of all Pennsylvania permits are single-trip permits.
- Pennsylvania is avoiding the annual overweight permit philosophy because they feel that they would not be doing their job otherwise, which legally says that they must check each route that an overweight vehicle wants to travel. They feel that this control is consistent with their department's mission statement. They also don't want to have to post special detours and bridge signs whenever they need to do routine maintenance or special construction to inform those with annual permits

that a route that they might have annually permitted for can no longer be used. They are spending considerable dollars for a conversion to a PC-based system with electronic/automated permitting with a modem connection available for trucking company use for much quicker turnaround time. Presently their turn-around time is about 24-hours. This software was developed by "Peak Solutions" from Minnesota, and is about 50% "canned software" and about 50% state-specific software to replace their mainframe-based system. Their costs are extra-high vs. other states with this system because they want to still have the ability for permits to be issued from any of their eleven district offices. Also, the software is being modified to automatically handle special bridge analysis/checks that other states with the automated routing system must still do manually for certain special vehicle configurations.

- There is no other information to be mailed to us, however, it was suggested that we get in contact with a Mr. Larry Walker at "Peak Solutions" in Minnesota (612) 851-9997. They are the ones who are putting together Pennsylvania's automated routing system. This company also did the system for Minnesota, Oregon, and Ohio. "They probably have the best system available for automated routing".

#### RHODE ISLAND

Mr. Stanley M. Jendzejec, Chief, Permit Section, Division of Motor Vehicles, Department of Transportation, State Office Building, Rm. 106, Providence, RI 02903; (401) 277-2986; FAX: n/a.

- They have an annual overweight permit that allows travel anywhere except "posted bridges". No map is provided since "Rhode Island is a small state and posted bridges are usually put into the newspaper when they are first 'posted'". No special authorization is required for each trip.
- Charges are reflected in vehicle registration fees for Rhode Island -based vehicles. Charges for vehicles registered outside of Rhode Island are \$50 per 1,000 lbs over the Federal "Bridge Formula". Trailers are charged a flat fee of \$100. No charges are pro-rated. They use a three-part form. The applicant fills out the first part, the vehicle manufacturer fills out the second part, and the third part is used by the permit office to determine the maximum weight that will be allowed for that vehicle and its applied-for use configuration.
- There is no additional information that will be mailed to us.

#### TENNESSEE

Mr. Carlos Downey, Supervisor, Overweight & Overdimensional Permits, Suite 300, James K. Polk Bldg., 505 Deaderick Street, Nashville, TN 37243-0331; (615) 741-3821; FAX: (615) 256-5894. (We were never able to contact)



## VIRGINIA

Ms. Donna Dowdy, Transportation Data Analyst Supervisor, Dept. of Transportation, 1221 East Broad Street, Richmond, VA 23219; (804) 786-3495; FAX: (804) 225-4979.

- They issue a two-year "blanket-style" overweight permit for vehicles up to 90,000 lbs gross vehicle weight. No special route authorization is needed. All carriers must obey maps that describe bridge width and other route restrictions. They must also obey all posted bridge notices.
- The cost of this two-year overweight permit is \$60 for 24-months.
- There is no additional information that they will be mailing to us.

## Northern Indiana Trip Report

September 22, 1994

R. K. Whitford & D. P. Moffett

Purdue University

School of Civil Engineering

On September 22, 1994, David Moffett and Robert Whitford visited Northwest Indiana for the purpose of getting a better understanding of the Michigan Trucks operation. During the trip about fifty percent of the allowed Michigan Train route was driven. Further during the trip, two trucking companies and a few owner operators were contacted.

Steel Transport, an Indiana company, who operates both their own trucks and drivers as well as hiring some owner operators was the first stop. They have both Michigan Trucks that operate into Michigan at 134,000# GVW as well as "western" type doubles that operate to Cleveland over the Toll Road at 127,000# GVW. Since Toll Road permitting is not part of the study, most questions centered around Michigan Trucks.

From Steel Transport, the second stop was the local (Gary) dispatching office of Modular Trucking, a Michigan based company with a dispatcher in Indiana. Modular does not own any equipment or employ any drivers and thus is totally dependent on Owner/Operators. The dispatcher sets up trips and obtains ten to fifteen permits per day. The owner/operator pays

for the permit. For the privilege of getting a dispatch an owner/operator pays twenty-two percent of the rate charged the consignee.

It was interesting to note that four trucking companies operate from the same small pre-fabricated building. That would imply they had very similar costs and further that owner/operators could easily switch between companies with little operational change.

Finally, the third stop was with a few owner-operators at a truck stop. The owner/operator discussions were very productive in presenting a different perspective on the existing permitting system.

#### TRUCK CONFIGURATIONS

The Michigan trucks come in a variety of shapes and sizes. Most of them however consist of a special tractor design to pull a load usually of 165,000 pounds and two trailers, a main trailer & a "pup". The overall train has ten or eleven axles. The photographs on the following pages show some of the possible configurations.

See Figures now in Chapter 4.

Two configurations can operate over the Michigan Train Extra-Heavy Duty Highway at a maximum GVW of 134,000 pounds and in Michigan with 165,000 pounds. One owner-operator recounted that he recently sold his sled and now had an articulated rig with nine axles that could operate with a maximum of 148,000 pounds GVW. Its configuration is also shown.

## LOGISTICS

The company that needs the steel or the steel company when it has a customer calls the carrier or hauler and describes their need. Usually the trip is one-way to the auto companies in Michigan. The mills will usually place a load of 85,000 to 90,000 pounds on the truck, which with the tare weight of 42,000 pounds brings the load to about 130,000 pounds. This is pulled to the Michigan border. The driver unhooks his trailer and then returns to get the loaded pup, brings it to the Michigan border, where it is connected and travels the remaining distance at the 165,000 pounds permitted in Michigan. Not all trucks are loaded to the maximum. Some orders are held below 134,000 pounds. In discussions of why so much is hauled by truck rather than by rail, it is the just-in-time or low inventory approach used by the stamping plants that dictates reliable delivery at specified time. There is reasonable evidence that rail will become more competitive for roll steel in the near future. The coils (rolls of steel) are taken directly off the truck and placed on the production line.

## COMPARISON OF PERMITS

Indiana charges a flat fee of \$43.50 for the movement of the "Michigan Trains" and dictates that the truck with its load of steel may not exceed 134,000 GVW or 16,000 pounds on any axle. On the other hand Michigan charges \$2000 for a license plate through the LRP plus eight dollars for an annual permit (limited by law to administrative costs) which permits the

operator to move on state approved route with a GVW of 165,000 pounds. Thus the Michigan approach is basically an annual permit achieved by licenser of the tractor.

It was pointed out that Indiana charges amount to about \$1 per mile for the 40 to 60 mile trip into Michigan and while in Michigan the rate would vary according to the destination and the number of trips. In particular, a trip to Detroit from East Chicago would travel 38 miles in Indiana at one dollar per mile and 186 miles in Michigan at about 7 cents per mile. This is considered grossly unfair by the owner-operators who must pay for both permits.

The permit turns out to be a substantial portion of the total trip cost. For example, the haul to Detroit is priced at 90 to 98 cents per hundred weight depending on the competition. (An owner-operator indicated that J.B. Hunt was making a move in the area to force the little guys out by charging just 88 cents.) Thus the \$43.50 is a substantial fraction of the cost, especially considering it covers less than 20% of the distance. Initially the privilege of hauling the higher than regulation payload was established in conversation with the steel mills and their customers. The benefit is to the steel company because they use about one half the trucks (and drivers) to haul the same amount of product. However at this time only U.S. Steel does anything to pay for the permit cost. They pay half of it.

## VIOLATIONS/ENFORCEMENT

The general message from truckers was that many of the trucks operating on a given day were either overloaded or without a permit. One owner-operator indicated that he did so when he thought he could get away with it. When operating without a permit, the truck, if

stopped, is required to off-load to 80,000 pounds GVW and is given a ticket. The process of off-loading can be very expensive as the trucker must get a crane and move the steel coil, without damaging it, off to another vehicle. If the trucker were trying to meet a just-in-time operation this would create an intolerable delay. [This amongst other factors suggests that there should be some discussion with the enforcement officers.]

## PERMIT VALIDITY

The permits are valid from midnight to midnight. Even the permit that is purchased at 4:30 P.M. Indianapolis time for use the same day is only good until midnight. If a trucker is at the mills getting loaded at eleven P.M. and doesn't get on the road until after midnight he is essentially illegal. If there are weather delays or if there is a mechanical problem with the truck, such that he is still on Indiana highways after midnight his permit is not valid. This seems to be fairly arbitrary and should be examined. A twenty-four hour permit from the time of issue might be just as useful.

## BACKHAUL

The question of backhaul was raised. There are quite a number of backhauls available. The rate is about 50-60% of the fronthaul. Backhauls are often headed into Chicago. So the Michigan train, if it is overweight, must unhook in Gary and take the load into Chicago in two portions. If the backhaul for the Indiana portion of the trip is overweight a permit is also

required for the Indiana portion of the trip. The trucker may have to call in to get the permit. Waiting on the telephone line for a permit number creates a very irritating and costly delay.

## OBTAINING PERMITS

The persons interviewed described the difficulty in getting permits especially on Friday, Monday and near closing time any day. Further there is a major problem in the winter when northwest Indiana is on a different time that Indianapolis. Many calls come in for the movement of steel in the late afternoon. When that call comes in after 4:00 P.M. Chicago time then it is closing time in Indianapolis. Either the trucker has to be illegal or he does not move the freight. Most truck dispatch operations work from 6:00 A.M. to 8:00 P.M.

The dispatcher at Modular showed her log of permit requests and also indicated that she had to redial as many as 50 to 100 time just to get a telephone line and then was on hold often for up to 70 minutes or more. The manager of Steel Transport suggested that the Michigan trains should have their own telephone line(s). He felt that their request was so repetitive and frequent that they should not have to compete with the more complicated routing of other special loads for telephone time.

## CONCLUSIONS

The trip's initial purpose was to assure the researchers that they had a good grasp of the Michigan Truck problem and thus could make reasonable suggestions. It proved to point out that there was much yet to be learned.

At least the following topics merit further consideration.

1. The midnight expiration of permits needs to be examined. Many permit users reported being caught permitless by quirks of fate like a small delay in steel availability, being caught in traffic, minor equipment breakdown and the like. It would seem very sensible for a permit to have travel rights whenever, within reason, the trip was being made. It is clear that the current very short expiration of permits issued at midnight on the date of issue serves a useful purpose as it helps preclude the reuse of a permit for multiple runs to the state line. However, the arbitrary midnight expiration may not be fair to those who obtain their permits late in the day. Better mechanisms for enforcement of the single use of permits need to be studied and then established.

2. The differential in charges between Indiana and Michigan for permits is substantial, especially when viewed on a per-mile basis. Indiana has attempted to recover the costs of the special routes via the fees system, where clearly Michigan has taken a different path. At least a better education program of why Indiana fees are what they are would improve the user's understanding of the system.

3. In order to fully exploit the weight restrictions in Michigan (i.e., 164,000 GVW), legal Indiana users end up hauling two trips to the border if they are running a typical Michigan Train configuration. It would be more efficient if Indiana's route could withstand the 164,000



GVW configurations that Michigan already allows. A quick analysis leads to the impression that highway damage is about the same, so bridges could be the major impediment.

An argument can be made that if there is sufficient illegal traffic already that then the Michigan Truck route should be upgraded to 164,000 GVW anyway.

4. A substantial number of trips are being made either with no permit or with the wrong load configuration. An estimate from one trucker estimated that about half the trips were illegal on one basis or another. Since permits make up about eight percent of the trips cost, there is substantial incentive to skip permitting especially given the difficulty getting a permit and the lack of operational flexibility once one has it.

Further, since most of the loads are covered by tarpaulins, it is not immediately obvious if a load is legal or not. The Michigan Train (snake) configuration lends itself to being permitted to the Indiana weight limit while actually carrying 164,000 GVW. Steel companies are supposed to monitor loading, but they can load the truck and pup to Michigan limits and expect the trucker to make two trips to the Michigan boarder.

5. The introduction of an annual permit will lead to a collapse in revenue. Since most of the companies already have drop sites just on the other side of the Indiana-Michigan line in order to assemble a 164,000 GVW train, it would be very easy to just get an annual permit for a few tractors whose sole purpose would be to "ferry" loads to just the other side of the state line. If this occurs, vehicle utilization will rise for those few trucks to two or three hours per trip, instead of the present two days for a round trip to Detroit.

Annual permits could also cause market consolidation as the larger firms will have better resources to introduce the ferry service to the border versus the lone owner operator who lacks similar resources. This then gives a significant monetary advantage to the larger firms and allows them to under price smaller ones.

6. Everyone suggested getting a better means for obtaining permits. There were reports of drivers not getting permits simply because they could not get into the phone banks before they needed to make the pickup. It seems clear that the repetitive nature of the permit should allow for easier ways of obtaining permits.

Further, especially during the winter months when Indianapolis is an hour earlier than the northwest part of the state, the hours of the permitting office sometimes promote illegal traffic. If a steel pickup request comes in at 3:30 P.M. for pickup that night and the office is already closed then the driver either runs illegally or doesn't get the job and someone else runs the load illegally.

7. Who pays and who benefits for the permission to exceed the 80,000 GVW is a subject that needs further examination. The steel companies are the beneficiaries in the cost reduction of the haul. Where the trucking company pays for the permit, that is probably okay. It is the owner/operator, the little business guy, who is getting squeezed. One might call the permit a cost of doing business, and let the freight rates reflect those costs. Alas, it is not so straightforward when very large shippers are in the marketplace and can afford lower margins based on better economies of scale and regular availability of backhauls.

8. Would a fairly priced annual permit end violations? Yes. Everyone with whom permitting was discussed noted that it was much less hassle if they could just run legal to begin with. The

more critical point is what would happen to the revenue. There are a few obvious price mechanisms that merit consideration.

+ Extension of the existing permit price to cover reasonable vehicle utilization. Currently a truck makes about three trips a week and needs three permits a week. So  $3 * 43.50 * 52$  yields \$6786. However, at this price point the state line ferrying will begin in earnest and thus the real number of trips a truck with such a permit would make would be more like 3 per day \* 5 days a week \*  $43.50 * 52$  or \$33,930 worth of single use permits. A loss of around four fifths of the total permit revenue could be expected.

+ Setting an annual permit rate at the Michigan LRP license rate of roughly \$2000. This rate will let more owner/operators get permits. If current truck utilization continues, then the net effect is a single use permit price of  $\$2000 / (3 * 52)$  or \$12.82 per trip. Obviously this will not be revenue neutral since at  $\$2000 / \$43.50$  trips (46 trips) the remaining trips for the year are free. The relative cost for roughly 15% of the trip will still seem unfair but better.

If ferrying were introduced into the \$2000/year annual permit market place then 14/15ths of all the Michigan Truck revenue would be lost.

We know of no annual pricing mechanism for Michigan Trucks that will lend itself to revenue neutrality. Further, any reasonable annual permit system will result in market consolidation and certain revenue loss.

9. If there were time & money, a survey of owner/operators would be useful. A better grasp of the volume of illegal trips would make pricing either the per trip permit and/or an annual permit an easier process.

## **Appendix C**

### **Data Analysis Methodology and Overview**

This appendix provides an overview of the way the raw data was evaluated by Purdue. These tools on diskette, listings and sample data are available from the Joint Highway Research Office at Purdue, West Lafayette. All analysis was done Unix™ based systems and as a result the tools are very Unix specific.

Analysis for this study was done using data provided by the Permit Office of the State of Indiana. That office provided 9-track unlabeled tapes of both company records as well as permit records. Permits for overweight, overweight/oversized, and Michigan Trains were provided. A better study outcome would have been possible if the entire permit data set had been made available, as then workload on the permit office clerks could have been assessed. Data for 5 years of permits was provided. The study evaluated all the years, but worked extensively with the most recent two years of data. Data was on a fiscal year basis.

During analysis two paths were then followed. A reporting system and a scenario evaluation system were written. Most of the tools were written in AWK and the Borne shell. No explicit database manager was used, since AWK allowed for very large internal data structures, a whole years worth of permits were just held in memory. Some tools from a previous State study on traffic accident locations were reused and resulted in initial results being available earlier than otherwise possible.

First a large set of extraction and reporting tools were written. This allowed looking at the data sets in many different ways, many of which made it into the final report. A standardized tool was written to do extraction from the raw data set. The results from that tool were then fed to various sorts and reporting programs.

The second path was a set of scenario evaluation tools. These tools allowed the analysts to propose alternate permitting systems and then using real data from the most recent fiscal year simulate what would happen to the state's revenue under that scenario. It is

important to note that there was no modeling of new permit structure secondary effects such as the increased ferrying of loads into Michigan as that would have been difficult, if not impossible to accurately model. The scenario tools allowed many different alternatives to be proposed, evaluated and usually dismissed as infeasible. Average running times for the evaluation of one alternative on the school's Sun SPARC™ 1000 was 20 minutes. Reimplementation in C would have cut this time by 50%, but would have been less flexible in terms of the large number of changes done to evaluate alternatives.

**Data Quality.** During the data reduction portion of this study many errors were noted in the data provided from the Permit Office. Some of these errors should have been captured by the system accepting the data as they were sometimes mandatory fields that were left empty. Other errors, such as the dozen or more spellings of some cities were more a function of operator training. It would make future analysis of this data easier if there was more attention paid to the data sitting in the permit data base.

## **Appendix D**

### **Touch-Tone/Voice Response Scenarios**

David P. Moffett

December 1, 1994

In a Touch Tone/Voice Response system the user dials a telephone number with a computer on the other end. The computer then has a combination of synthetic and pre-recorded voices with which to speak to the user. The normal flow of the conversation is the computer presents a menu and the user presses the appropriate Touch Tone keys on his phone to navigate through the menus.

This paper presents a few scenarios of how such a system might work when the application is obtaining permits for oversize and/or overweight trucks in Indiana.

This technology was pioneered by the banking industry for the purpose of banking by phone. Touch Tone is a trademark of AT&T for their form of Dual Tone/Multiple Frequency (DTMF) signaling.

#### **Benefits:**

- 24 Hour Access. As long as the host computer is up, this system can be available. An increase in the number of available hours that users may call allows more flexibility for drivers and decreases the load during peak calling times.

- Little or no waiting. Since the sessions are typically very short, the delay to get connected to the system will be shorter than that presently being experienced when connecting to human operators.
- Easy scale up. As the state's economy expands, adding additional TT/VR hardware and related phone lines will keep recurring costs to a minimum while also minimizing delay to the users.
- Low risk. This technology is well understood from both the computer side and the human side. The banking industry has similar security needs and thus problems like lost transactions should not be a problem, given the lessons learned in banking are followed.
- Will reduce a moderate number of the calls per year. If only Michigan Trucks are removed, then roughly 30,000 calls might be diverted from the operators.

Costs:

- In comparison to other automation technologies (fax in-out, BBS systems, email, etc). This is a moderate cost solution. It has the lowest recurring cost of the group.
- Costs for hardware should be less than \$20k per line. Programming costs depend on how extensive a system is implemented.

Technology:

- Since the banking industry is mainly an IBM world, and since Indiana's core computing base is also IBM, there should be little trouble interconnecting a TT/VR system into the existing system.

- As with all applications some application development is needed from central services.

- Labor costs should be the same or reduced since many of the existing telephone calls could be handled by TT/VR. If the costs are the same, then the level of service to the users will improve.

- This system will either require separate telephone numbers or added complexity on the front of the existing numbers. The first raises the costs over the long term and the second will cause further concerns about the wait for services.

Examples:

In the following are three examples:

- A simple "Michigan Truck" example
- A less simple "standard route" example
- A complex "all routing" example



All the following examples are just proposed ways of dealing with the user. While the examples take into account what the analyst knows about TT/VR and the permitting system, they are certainly subject to change.

In each of the following examples the following notation is used. Words in italics are spoken by the computer. Numbers with brackets around them are pressed by the user.

#### Michigan Trucks Example

In this example, a Michigan Truck user calls the TT/VR system and acquires a permit for a single run. This presumes that only Michigan Train trucks will be using this number. In the example following Michigan trains are part of a broader permitting TT/VR system.

[1][8][0][0][5][5][1][2][1][2]

You have reached the State of Indiana's Automated Overweight/Oversized Permit system.

Please enter your truck number followed by a pound sign

[4][3][2][1][#]

Enter your personal identification number followed by a pound sign

[9][8][7][6][#]

Thank You.

Enter the starting date and time you wish the permit to start. Enter the year, month and day each of which need to be two digits long. Follow with a pound sign

[9][4][1][2][0][3][#]

Enter the time you wish the permit to become effective in military time. Some examples of military time are one p.m. becomes thirteen hundred, two p.m. becomes fourteen hundred, etcetera. Midnight is zero zero zero zero. After entering the time, follow with a pound sign

[1][3][3][0][#]

You wish to have the permit start on December third of ninety four at one thirty p.m. If this is correct press one, if incorrect press two

[1]

Enter the vehicles gross weight by axle starting with the front axle. Press zero pound for end. At every break between axle sets type a star. Finish each number with a pound.

Axle 1

[1][2][0][0][0][#]

Axle 2

[\*][1][4][0][0][0][#]

Axle 3

[1][4][0][0][0][#]

Axle 4

[\*][2][3][0][0][0][#]

Axle 5

[2][3][0][0][0][#]

Axle 6

[2][3][0][0][0][#]

Axle 7

[0][#]

Your gross vehicle weight is 109,000 pounds. Is the weight correct? press one to accept, two to revise

[1]

Your permit number is nine four dash one two three four dash five six. If you need the number repeated press one, otherwise press two

[1]

Your permit number is nine four dash one two three four dash five six. If you need the number repeated press one, otherwise press two

[2]

If you need another permit, press one otherwise press two

[2]

Thank you

<click>

Total time on the phone for this exchange is less than three minutes even given some delay from the host computer. The permitting for Michigan trucks has no routing specific to a particular route thus no route information needed to be provided. In the next example, the possibilities are widened to include some common routes.

Standard Route Example

In this example, a user calls the TT/VR system and acquires a permit for a single run from Ohio to Illinois over the I-70 west, I-465 South, I-70 west route..

[1][8][0][0][5][5][5][1][2][1][2]

You have reached the State of Indiana's Automated Overweight/Oversized Permit system.

Please enter your truck number followed by a pound sign

[4][3][2][1][#]

Enter your personal identification number followed by a pound sign

[9][8][7][6][#]

Thank You.

If you are requesting a Michigan train permit, press one. Otherwise press two

[2]

Enter the starting date you wish the permit to start. Enter the year, month and day each of which need to be two keys long. Follow with a pound sign

[9][4][1][2][0][3][#]

You wish to have the permit start on December third of ninety four. If this is correct press one, if incorrect press two

[1]

Enter the vehicles gross weight by axle starting with the front axle. Press zero pound for end. At every break between axle sets type a star. Finish each number with a pound sign

Axle 1

[1][2][0][0][0][#]

Axle 2

[\*][1][4][0][0][0][#]

Axle 3

[1][4][0][0][0][#]

Axle 4

[\*][2][3][0][0][0][#]

Axle 5

[2][3][0][0][0][#]

Axle 6

[2][3][0][0][0][#]

Axle 7

[0][#]

Your gross vehicle weight is 109,000 pounds. Is the weight correct? press one to accept, two to revise

[1]

Enter the route code for the route to be used. Press zero if you need a menu. Follow with a pound sign

[0][#]

The following are the standard routes presently in the system. If you need to use another route, please call 1 800 2xx xxxx for additional assistance.

Route 1: Indiana - Michigan special route trucks.

Route 2: I-70 east bound from the Illinois state line to I-465. I-465 south around the south side of Indianapolis to I-70. I-70 east bound from Indianapolis to the Ohio state line.

Route 3: I-70 west bound from the Ohio state line to I-465. I-465 south bound around the south side of Indianapolis to I-70. I-70 west bound from Indianapolis to the Illinois state line.

Route 4: [...] Other highly used routes would be listed here. An analysis of the previous permits should allow selection of the top dozen or so routes for presentation here.

Enter the route code for the route to be used. Press zero if you need a menu. Follow with a pound sign.

[3][#]

You have selected Route 3 which is I-70 west bound from the Ohio state line to I-465. I-465 south bound around the south side of Indianapolis to I-70. I-70 west bound from Indianapolis to the Illinois state line.

Is this correct? Press one to revise, two to accept this route

[2]

Your permit number is nine four dash one four three four dash five six. If you need the number repeated press one, otherwise press two

[2]

If you need another permit, press one otherwise press two

[2]

Thank you

<click>

After the users get familiar with this kind of system, they frequently will not need many menus. Most systems of this type will automatically advance to the next point if a key is pressed while a menu is being presented. Thus if a user knows that he wants route 2 and selects a menu getting all dozen or so standard options, he could press [2][#] as soon as he hears that option without waiting for all the other routes to be heard. Clearly a pamphlet explaining how the system works, shortcuts, and when the account is actually charged for the permit will be required in any TT/VR system.

## An All Routes Example

The all routes example is substantially more complicated than either of the preceding examples.

The general idea is walk the user through the construction of the route that will be used.

While slower than talking with a person, this eliminates much of the need for people and as with all the systems allows permits to be acquired any time the computers are up.

There are two major ways this can be implemented. The first, which is the example shown, assumes that the user has very little knowledge of the system and has only a state map for guidance. The second, which would be easier to use after initial training, puts a code book in the hands of the users to allow them to avoid the majority of the questions in the following example. In either case, the TT/VR system will require more programming to carefully allow consideration of all the possible route choices.

In this example, a user calls the TT/VR system and acquires a permit for a single run from Illinois to Ohio over the I-70 east, I-465 South, I-70 east route... to follow this example, it helps to be looking at an Indiana State Highway Map.

[1][8][0][0][5][5][1][2][1][2]

You have reached the State of Indiana's Automated Overweight/Oversized Permit system.

Please enter your truck number followed by a pound sign

[4][3][2][1][#]

Enter your personal identification number followed by a pound sign

[9][8][7][6][#]

Thank You.

Enter the starting date you wish the permit to start. Enter the year, month and day each of which need to be two keys long. Follow with a pound sign

[9][4][1][2][0][3][#]

You wish to have the permit start on December Third of ninety four. If this is correct press one, if incorrect press two

[1]

Enter the vehicles gross weight by axle starting with the front axle. Press zero pound for end. At every break between axle sets type a star. Finish each number with a pound.

Axle 1

[1][2][0][0][0][#]

Axle 2

[\*][1][4][0][0][0][#]

Axle 3

[1][4][0][0][0][#]

Axle 4

[\*][2][3][0][0][0][#]

Axle 5

[2][3][0][0][0][#]

Axle 6

[2][3][0][0][0][#]

Axle 7



[0][#]

Your gross vehicle weight is 109,000 pounds. Is that correct? press one to accept, two to revise

[1]

Starting route selection. At any time press zero to replay a menu or press star to get route so far.

Does the proposed route start at an external state border? Press one for yes, two for no

[1]

Which state will the route start from? Press one for Illinois, two for Kentucky, three for Michigan or four Ohio

[1]

What type of road will be used? Press one for interstate or two for other

[1]

Which interstate will be used? Press one for I-74, two for I-70 or three for I-64.

[2]

Where will the route then next change? Press one for at another interstate, two a US highway, three for a local road.

[1]

Which interstate will the trip change at? Press one for first I-465, two for I-65 or three for second I-465

[1]

What will the new direction be? Press one for northbound, two for southbound

[2]

Where will the route then next change? Press one for at another interstate, two a US highway, three for a local road.

[\*]

The route selected so far is entering east bound from Illinois on I-70. Exiting I-70 onto the first I-465 southbound.

Press one if correct, two if incorrect

[1]

Where will the route then next change? Press one for at another interstate, two a US highway, or three for a local road.

[1]

Which interstate will the trip change at? Press one for I-65 toward Louisville, two for I-74 toward Shelbyville, three for I-70 toward Richmond, four for I-69 toward Fort Wayne, five I-65 toward Chicago or six I-74 toward Danville

[3]

Where will the route then next change? Press one for at the Ohio state line, two a US highway, or three for a local road.

[1]

You have selected a route which is I-70 east bound from the Illinois state line to I-465. I-465 south bound around the south side of Indianapolis to I-70. I-70 east bound from Indianapolis to the Ohio state line.

Is this correct? Press one to accept this route, two to revise it.

[1]

Your permit number is nine four dash one four four four dash five six. If you need that repeated press one, otherwise press two

[2]

If you need another permit, press one otherwise press two

[2]

Thank you

<click>

As one can see, even a simple trip through the state can become reasonably involved. Further, programming such a system requires high attention to detail.

## Appendix E

### Abstract of Annual Permits for Overweight Trucks on Indiana Roads; Part 1. Annual Permits

**NOTE: THE DATA IN THIS APPENDIX IS CURRENT TO OCTOBER 26, 1994. FURTHER ANALYSIS (FOUND IN THE MAIN BODY OF THIS REPORT) MAY HAVE RENDERED SOME VALUES OBSOLETE.**

*Does this study only involve annual permits?*

As the Public Law requests, the study examines the annual permit. Since the permitting process is quite broad and complex, future examination of permit processes other than annual permits is warranted. Here, results of only the investigation of annual permits as requested is carried out. The Purdue analysis comes from in-depth data manipulation and analysis of the 569,000 permit records that have been generated over the last five years.

*What are the overweight/oversize loads involving calls for permits?*

Loads permitted are those loads that are not divisible, such as construction equipment, road building machinery, transformers, pre-formed building components and the like. The following table indicates the permit activity, excluding mobile homes, over the last two years. While there could be as many calls as permits, many request more than one permit on a given call, requesting up to ten is possible.

**TABLE E.1 Oversize, Overweight permits in Indiana for FY 1993 and FY 1994**

Truck Category	Gross Vehicle Weight (GVW) Limits (1000s of lb.)	FY 1993			FY 1994		
		Number of Permits	Revenue (1000s)	Average Cost	Number of Permits	Revenue (1000s)	Average Cost
Oversize only	80 or less	61,382	\$1,829	\$29.81	69,937	\$2,083	\$29.93
Overweight only	80 <GVW≤108	3,854	\$23	\$61.35	3,997	\$252	\$63.13
Overweight only	108 <GVW≤120	751	\$70	\$92.62	995	\$88	\$88.18
Oversize & Overweight	80 <GVW≤108	17,645	\$950	\$53.81	19,174	\$1,054	\$54.95
Oversize & Overweight	108 <GVW≤120	10,884	\$823	\$75.61	12,796	\$994	\$77.71
Super Overloads	GVW > 120	2651	\$299	\$112.89	3,448	\$411	\$119.26
Michigan Trains	80 <GVW < 134	29,582	\$1,28	\$43.50	39,958	\$1,738	\$43.50
		126,480	\$5,497	\$43.46	150,327	\$6,633	\$44.12

Source: Permit Office Data

*What are Michigan Trains and how are they permitted?*

The Michigan trains travel on a 40 mile stretch of highway, called the "Extra Heavy Duty Highway" in Northern Indiana. This highway is depicted in Figure E.1 These trucks, which mostly carry steel, have a set of unique requirements and should be considered separately.

**Figure E.1 Extra heavy duty highway**

See Figure 4.1 for an enlarged map previously found here.

**Figure E.2 Typical Michigan Train**

See Figure 4.2

*How are permits obtained today?*

Blank permit forms are available throughout the state for trucking company or individual trucker use. The form requires the user to fill-in company ID, truck registration number, date of travel, axle weights, axle spacing, oversize dimensions, commodity, route, mileage, etc. The information is then transmitted by voice (sometimes faxed) to a clerk in INDOT's permit office. As the data is entered in the computer, dimensions, weight, route are checked to make sure that the truck can physically pass and that it is not scheduled to travel on a bridge that cannot handle the load. When the check is complete and if it has been ascertained that there are no problems, the clerk gives the trucker a permit number. The trucker writes the number on the

permit form and proceeds to make the indicated trip. The data sent over the phone is on file and can be used for enforcement or for analysis (such as this report). The company pays through a procedure set-up by the permits office at the time of permit issuance.

*Is the present permit process unfair or inequitable?*

No! Indiana has what many officials in other states contacted during the study would like to see their state adopt. Namely, an economically fair, pay as you go, approach, for providing permits for overweight movements. This rate method is sometimes called "incremental marginal cost." Since each company pays the same per trip permit fee, there is no unfair discrimination between companies regardless of the amount they haul. The other portion would be to comment on the level of permit cost. The cost was originally established under the concept that permits for these loads would defray the marginally added road and bridge costs resulting from the overweight movement. (A truck with a GVW of 120,000 pounds causes about five times the road wear as a truck carrying the usual maximum load of 80,000 pounds GVW. Additional bridge damage will occur from the heavier weight; the extent depends on tire pressure, rim size, axle loads and axle spacing.) . The level of the fee was not part of this study.

*What is the industrial pattern for those applying for permits?*

There are over 1780 companies who request permits for one of the four overweight/oversize categories. Many (85%) are small users of the system requesting, on the average, less than 2 permits per month. Only 5% of the companies make, on the average, more than 2 trips per week. Company location is widespread with addresses in most of the 48 states and Canada. About 50% of the permits are requested by Indiana companies which comprise 27% of the 1780 companies in the FY 1994 database.

*What are the travel patterns for overweight vehicles?*

Overall about 44% of the trips (but only 30% of the revenue) come from trips entirely within Indiana. On the other hand 30% of the trucks pass through Indiana traveling from state border to state border. These trucks furnish about 44% of the revenue. See following table for FY 1994 results

**Table E.2. Origin - Destination of Overweight/Oversize Loads in Indiana - FY 1994**

Distance Traveled	Trips	Trip In Indiana	Trip Thru Indiana	One Trip End in Indiana
0 to 60 miles	17,839	59%	13%	28%
61 to 150 miles	9,121	52%	11%	37%
151 to 240 miles	7,683	9%	76%	15%
over 240 miles	2,319	5%	79%	16%
Total permits	36,962	43%	30%	27%
Total Revenue	\$2,345K	32%	44%	24%

Source: Permit Office Data

*What do all these data mean?*

Most of the trips are taken by companies which travel infrequently (no need for an annual permit) with a travel pattern that is very diverse. Most of the short trips are performed by Indiana based companies and most of the longer trips are from border to border where the trucking company is traversing Indiana Highways, usually the Interstate.

*If the permit process is to be changed to annual permits what are important constraints or study parameters?*

1. Maintain a system that provides a payment mechanism for the extra damage done to Indiana highways and bridges by these overweight trucks,
2. Avoid sizable dislocations in the trucking industry,
3. Provide an equitable system,
4. Ensure that any new structure is easily understandable and usable by all involved,
5. Have a system that can be implemented in a short time,
6. Allow continued enforcement,
7. Improve administrative efficiency for all parties, and
8. Maintain a constant revenue for the state. (revenue neutral).

*What were the key things learned from the survey of other states handling of overweight trucks?*

In summary no state handles permits for overweight trucks exactly like any other state. There were annual permits whose fee was usually set by law and did not cover the highway effects, there were weight-distance fees, distance fees and per trip fees. The persons interviewed had the following comments:

1. Officials from two states indicated that they thought that Indiana is doing it right and they wished they could do the same.
2. One state just replaced their annual overweight flat-fee of \$55 per year with a ton-mile system with individual permits issued largely electronically by e-mail.
3. Several officials from states indicated that in their experience the trucking industry opposition to a weight-distance permit for overweight trucks was not as great from companies who regularly deal with overweight movements. The overweight carriers understand that they will doing more than the usual damage to highways and bridges.
4. Many states have a map that is marked with the roads and/or bridges that overweight trucks can travel. One state has three color coded maps, each of which permits weights of different amounts.

*What is the likely effect of issuance of an annual permit on a company-wide basis?*

Only those companies that would benefit would purchase such a permit. If the annual rate is set at a rate of \$1000, about 380 companies would purchase them. Annual permits favor the large companies, whose per trip permit costs will become very small compared to companies who purchase less than about 25 permits per year. For example, under an annual fee by company, the 10th largest company would have a per trip permit cost of 5% of the equivalent per trip permit cost for the 380th (out of 1780) largest company's cost; \$3.00 compared with \$64.00. This fact could lead to considerable consolidation in the market place, especially when it is understood that permit costs represent from 5 to 10% of the trip revenue.



Table E.3 indicates what happens with a few possible annual permit price levels when an annual permit is sold not to an individual truck but to the company. The table presumes a fleet utilization of 2.5 trips per week. The routes would be controlled by a map issued by the state. The table makes no allowance for market consolidation, which will certainly take place. It is hard to predict its magnitude with any certainty and the benefits favor the large trucker. All truckers benefit somewhat because the heavily used phone system is relieved, as more annual permits are purchased. The higher the fee for the annual permit the lower the revenue impact on the state.

**Table E.3 Annual Permit Fee by Company Based on Analysis of FY 1994 Data**

Annual Permit Price to the Company	Companies purchasing based on 1994 data	Revenue Generated by the permit process	Revenue Lost
No Annual Permit	None	\$2,388,134	
\$200	954	\$ 267,024	\$2,121,111 (89%)
\$1,000	378	\$ 725,044	\$1,663,089 (70%)
\$2500	185	\$1,100,186	\$1,287,949 (54%)
\$5000	93	\$1,430,113	\$ 958,022 (40%)
\$10,000	47	\$1,733,597	\$ 654,538 (27%)
\$20,000	13	\$1,988,778	\$ 399,356 (17%)
\$40,000	4	\$2,145,314	\$ 242,820 (10%)
\$100,000	1	\$2,311,279	\$ 76,837 (3%)

*What is the likely effect of issuance of an annual permit on a truck by truck basis?*

In many states the permits are issued on a truck by truck basis. Issuing a permit on this basis is more in line with how oversize trucks are permitted. Trucking companies who have a large number of rigs would like to be able to move the permit from cab to cab to best utilize their fleet. That flexibility also exists under the current system. If permits for individual trucks are to be purchased the larger companies will buy permits only for the minimum number of trucks they feel they can use for overweight hauling. That is, they will change their operating logistics to maximize the usage of those specific trucks that are permitted. Further they will also buy more individual permits for those times when they are saturated and need to have some short-term relief.

The analysis by its very nature must be based on a truck usage model. Truck usage model is one that indicates how often a given truck is used to pull overweight/oversize loads. Some companies use their tractors with logistics that include more trips than just the overweight/oversize loads. In studying the patterns of truck use, it was determined that they are very diverse. Table E.4 is based on examining truck usage from the data base and considering that a company with an average of two loads/month will need to obtain 1 annual permit. The higher the value of the truck permit the more consolidation will occur. The permits above \$1000 per truck are based on a usage rate of twice per week. In the data there are some companies that have travel patterns as frequent as once a day, e.g. one truck obtains over 200 permits per year. It further presumes that the present company structure for carrying overweight loads will continue. For a "reasonable" added fee per truck of \$250 the state would lose 72% of its overweight/oversize revenue.

Please note that at \$1000 per permit there is a change in the assumption of the utilization. At an average truck movement of 2 trips per month there is a revenue loss of 25% trip, but at the higher utilization of 2 trips per week there will be a revenue loss of 58%. Also note that at an annual fee of 10,000 per truck the loss is zero because of the assumption that we have a utilization of 2 trips per week, when it would take an average of about three trips per week for the permit to be less expensive than the individual trip.

**Table E.4 Annual Permit Available for Trucks**

Annual Permit Price per truck	Truck usage model	Trucks expected to buy annual permits based on 1994 data	Individual permits to be purchased	Revenue Generated by the permit process	Revenue Lost
No Annual Permit	2/ month	0	36,965	\$2,388,134	none
\$ 100	2/ month	2,363	1,655	\$ 343,230	\$2,044,905 (86%)
\$ 250	2/ month	1,969	2,771	\$ 671,284	\$1,716,850 (72%)
\$ 500	2/ month	1,616	4,667	\$1,109,535	\$1,278,599 (54%)
\$ 1,000	2/ month	1,299	7,514	\$1,784,480	\$ 603,655 (25%)
\$ 1,000	2/ week	537	7,167	\$1,000,060	\$1,388,074 (58%)
\$ 2,500	2/ week	303	12,639	\$1,574,106	\$ 814,029 (34%)
\$ 5,000	2/ week	199	17,650	\$2,135,367	\$ 252,768 (11%)
\$10,000	2/ week	0	36,965	\$2,388,134	none

*Are Michigan trains permitted in the same way as other overweight trucks?*

No! Michigan trains call-in for each permit, as others do, but their permit is good only until midnight of the day for which the permit is requested. The cost of their permit is \$43.50 for any load over 80,000 pounds GVW and less than 134, 000 pounds GVW (the present limit) regardless of distance.

*Other than the permit, what significant differences exist between Michigan trains and other overweight/oversize vehicles*

As can be seen from Table E.1, Michigan trains generated about 25% of the overweight permit revenue in FY 1994. The number of companies involved in the Michigan trains is only 124. Most of the companies (42%) are in Michigan with only about 23% of the permits are issued to Indiana companies. Many of the companies act as dispatchers for the large population of owner-operators who haul steel. The original concept of the "extra heavy duty highway" was established to facilitate the movement of Indiana's steel product more in line with what was permissible under Michigan's law. Michigan permits trucks with sufficient number of axles to carry up to 165,000 pounds GVW. Indiana designated the short stretch of highway shown in Figure 1 and only permitted loads to 134,000 pounds GVW. This has helped the steel industry keep their prices down and helped Indiana steel be more competitive. The disparity in weights, however, has lead the industry to carry their loads to the Michigan border in one overweight

truck (less than 134,000 pounds) and one non-overweight truck (less than 80,000 pounds). Once in Michigan, the two parts of the load are assembled into a single "Michigan train" and finish the trip at 165,000 GVW. The larger companies have a staging places just inside Michigan for assembling trains.

**Table E.5 Industry breakdown of companies using Michigan train permits**

Co. Location	Number/Percent of Companies	Number/Percent of Permits
Michigan	52 (42%)	13,878 (35%)
Indiana	28 (23%)	9,011 (23%)
Pennsylvania	7 ( 6%)	7,625 (19%)
Ohio	11 ( 9%)	4,337 (11%)
Canada and Other	25 (20%)	5,107 (13%)
Total	124	39,958

Source: Permit Office Data

There is even more of a disparity in trucking company dominance between the heaviest user (over 30 permits per day) of the Michigan train permits and the occasional user than the data shown for the overweight trucks. There is also an operational difference in that Michigan trains operate on this short portion of Indiana highway (usual trip lengths in Indiana are less than 30 miles and annual permits provide a wonderful opportunity for "ferrying".) That is, the permitted truck would be used several times in one day to carry loads just over the border into Michigan and then another truck permitted for Michigan, but not Indiana would transport the load the rest of the way to the destination. (often the haul can be as long as 200 miles in Michigan). A "ferry" operation could conceivably carry as many as four loads per day. The cost level of the permit is significant and any wholesale change in the permit process can have a significant impact on the industry. The Indiana permit costs represent from 5 to 10% of the trip revenue. Michigan whose bridges have been designed to a different specification and can withstand the loads they are being subjected to charges a \$8 annual permit fee and the tractors must be registered (licensed) to pull the 165,000 loads. A tractor license costs in excess of \$2000.

*What is the likely effect of issuance of an annual permit for Michigan trains on a company wide basis?*

Table E.6 indicates what happens when an annual permit is sold not to an individual truck but to the company. The routes would still be controlled by a map issued by the state. The table makes no allowance for market consolidation, which will certainly take place. The consolidation is hard to predict its magnitude with any certainty but it is clear that in a situation where there are several dominant players, they will become more dominant. The annual permit by company indeed favors the large trucking company. All truckers benefit somewhat because the heavily used phone system is relieved.

**Table E.6 Michigan Train Annual Permit Fee by Company Using FY 1994 Data**

Annual Permit Price to the Company	Companies purchasing based on 1994 data	Revenue Generated by the permit process	Revenue Lost
\$200	92	\$21,226	\$1,716,948 (99%)
\$1,000	72	\$84,004	\$1,654,169 (95%)
\$2,500	55	\$108,449	\$1,557,724 (90%)
\$5,000	45	\$306,976	\$1,431,197 (82%)
\$10,000	28	\$483,708	\$1,254,465 (72%)
\$40,000	14	\$1,014,116	\$ 724,057 (42%)
\$100,000	3	\$1,415,189	\$ 322,984 (19%)
No Annual Permit	None	-\$1,738,173	

*What is the likely effect of issuance of an annual permit for Michigan trains on a truck by truck basis?*

As indicated previously this analysis must be based on a truck usage model. From the data the usage patterns are very diverse, but if the ferrying takes place to any degree, the typical turn around of a truck an its load of two days will become two to four hours. With another tractor sitting on the other side of the line to carry the load in Michigan. At least this will occur for the larger companies. As they see how the system works others may join with the larger companies to improve their cost basis. The large stable of owner-operators will find a way to use the system to their best advantage.

Table E.7 is based on examining truck usage from the data base, considering that a company with an average of two loads/week will need to obtain 1 annual permit. In that sense the ferrying potential is not included.

**Table E.7 Annual Permit Available for Trucks Using the Extra Heavy Duty Highway**

Annual Permit Price per truck	Truck usage model	Trucks expected to be permitted based on 1994 data	Individual Permits to be Purchased	Revenue Generated by the permit process	Revenue Lost
No Annual Permit			39,958	\$1,738,173	
\$ 100	2.5 trips/wk	369	100	\$44,425	\$1,694,183 (97%)
\$ 250	2.5 trips/wk	356	260	\$100,310	\$1,638,298 (94%)
\$ 500	2.5 trips/wk	344	449	\$191,532	\$1,547,076 (89%)
\$ 1,000	2.5 trips/wk	333	690	\$363,015	\$1,375,593 (79%)
\$ 2,500	2.5 trips/wk	305	2,105	\$854,068	\$ 884,541 (51%)
\$ 5,000	2.5 trips/wk	279	4,207	\$1,578,005	\$ 160,604 ( 9%)

*What are the advantages of the flat fee annual permit?*

1. It reduces the call-in load to better allow the permit clerks to handle the less routine calls.
2. It provides flexibility to the truckers for handling their fleet.
3. It should be easy to administer.
4. It will save the trucking industry money.
5. It meets the legislative mandate for a pure annual fee.

*What are the disadvantages for the flat fee annual permit?*

1. There are significant losses in revenue for any reasonable level of annual fee.
2. There will be market consolidation forcing the small trucking company to pay a higher percentage of the price of hauling for his permit, giving the large company economic advantage.
3. It does not charge heavier vehicles in proportion to their use of the highway.

4. There will be no possibility to capture data for adequate review and evaluation in the future.

*Should the state legislature implement a flat fee annual permit for overweight trucks or Michigan trains?*

Unequivocally, NO! There is no basis that can be developed from the data of Indiana's permitting process over the last five years that would indicate any reason for a change to an annual permit. If the Legislature was concerned about the length of time it takes to obtain a permit, then that can be reduced with improved phone service including better automation.

## Appendix F

### Abstract of Annual Permits for Overweight Trucks on Indiana Roads; Part 2. Permitting Alternatives

**NOTE: THE DATA IN THIS APPENDIX IS CURRENT TO DECEMBER 5, 1994. FURTHER ANALYSIS (FOUND IN THE MAIN BODY OF THIS REPORT) MAY HAVE RENDERED SOME VALUES OBSOLETE.**

In the initial report, an analysis was presented answering the request of the Indiana State Legislature for a study of feasibility and appropriate rates for annual permits for overweight and oversize/overweight permits. The report concluded that any form of constant or single value annual permit like \$500 per year per truck, would be counter productive to the present system which, presuming the permit fees are correct, clearly provides a fair and equitable system where the truck that does the excess damage pays for that excess damage to the bridges and highways in the state. The purpose of the study was not to assess the cost allocation for the overweight trucks, but rather, assuming it to be reasonable, was to examine the permitting policies.

This report responds to the request by the study advisory committee to examine alternatives to the present system that would simplify and expedite permitting, while still maintaining market fairness and relative revenue neutrality. A hybrid approach to simplify the overall permitting process was analyzed and the results follow this introduction. The authors note that the present system is economically fair and its deficiencies are mainly administrative. Before presenting a good alternative to the existing system, a few questions will be presented from the previous report.

As will be discussed in this report **the system being proposed includes an official overweight truck map, improved communications with the permit office and a new fee structure.** The fee structure (which is aimed at maintaining revenue neutrality) would do away with the \$20.00 administrative cost for each permit and request the carrier to purchase an annual license for each truck and company (\$15.00 per truck and \$25.00 per company). With



overweight hauling charged at \$10.00 for under 108,000 lbs GVW and \$30 for over 108,000 lbs GVW per 30 mile distance unit.

**For the heavy-duty highway on which "Michigan trains" GVW of 134,000 pounds or less travel no permit changes are proposed at this time, except the permit expiration period.** This study indicates considerable inefficiency in the present system due to the differences between the Michigan allowances for overweight of 165,000 pounds GVW and Indiana's maximum as well as the procedural permitting process. That short section of highway was originally established to improve the considerable amount of steel shipped into or through Michigan. For efficiency it is suggested that the INDOT study whether it is possible to allow 165,000 pounds GVW with the same axle configuration allowed by Michigan and then adjust the rate accordingly. The present system is also prone to many violations. If it can be made more efficient through improved phone permit requests and through change in weights so Michigan loads can be hauled directly out of the steel mills, the violations should be reduced and the revenue be more consistent.

*If the permit process is to be changed what are important constraints or study parameters?*

1. Maintain a system that provides a payment mechanism for the extra damage done to Indiana highways and bridges by these overweight trucks,
2. Avoid sizable dislocations in the trucking industry,
3. Provide an equitable system
4. Ensure that any new system is easily understandable and usable by all involved,
5. Have a system that can be implemented in a reasonable amount of time.
6. Allow for continued effective enforcement,
7. Improve administrative efficiency for all parties, and
8. Maintain a constant revenue for the state. (revenue neutrality)

*How are overweight and overweight/oversize permits obtained today?*

Blank permit forms are available throughout the state for trucking company or individual trucker to use. The form requires the user to fill-in company ID, truck registration number, date of travel, axle weights, axle spacing, oversize dimensions, commodity, route, mileage, etc. The information is then transmitted by voice (sometimes faxed) to a clerk in INDOT's permit office. As the data is entered in the computer while the clerk is talking to the permit seeker, the dimensions, weight, and route are checked to make sure that the truck can physically clear the proposed route and that it is not scheduled to travel on a bridge that cannot handle the load. When the check is complete and if it has been ascertained that there are no problems, the clerk gives the trucker a permit number. The trucker writes the number on the permit form and proceeds to make the indicated trip. The data sent over the phone is on file and can be used to support law enforcement or for analysis (such as this report). The company pays through a procedure set-up by the permits office at the time of permit issuance.

*Is the present permit process unfair or inequitable?*

No! Indiana has what officials in several other states, contacted during the study, would like to see their state adopt. Namely, an economically fair, pay as you go, approach, for providing permits for overweight movements. This rate method is sometimes called "incremental marginal cost." Since each company pays the same per trip permit fee, there is no unfair discrimination between companies regardless of the amount they haul. The other comment is on the level of permit cost. The cost was originally established under the concept that permits for these loads would defray the marginally added road and bridge costs resulting from the overweight movement. (e.g., a truck with a GVW of 120,000 pounds will cause about five times the road wear as a truck carrying the usual maximum load of 80,000 pounds GVW. Additional bridge damage will occur from the heavier weight and is primarily a function of the length of the truck. Tire pressure, rim size, axle loads and axle spacing are also important. The level of the fee was not part of this study.

*What were the key things learned from the survey of other states handling of overweight trucks?*

*(See above)*

*What permitting systems were considered?*

A broad variety of ideas, both from other states and other discussions were considered. Most of the proposed systems failed one of the preceding criteria. Often revenue neutrality was the sticking point in the programs from other states. Systems of note that were considered were:

Permits based on continuing single trip

- Present System
- Touch Tone/Voice Response
- e-mail Permits
- Bulk Permits
- Honor System (user reports trips after traveling)

Permits by groups of trips or by time

- Single Rate Annual Permit
  - By company
  - By truck
  - Based on Previous Year's usage
- Permit by Trip Purpose (Use on any truck)
- Annual Permit for Specified Route

In the end, a system which met the criteria was formulated.

*What does this system look like?*

The system has five parts all of which have been designed to work together to provide the INDOT with a technically viable, politically acceptable, more efficient, less INDOT labor intensive system for permitting overweight and overweight/oversize trucks.

1. A map delineating acceptable truck routes segregated by acceptable weight limits. i.e. A route for trucks 108,000 pounds GVW and under and a route for trucks up to 120,000 pounds GVW. The Idaho approach actually permits variable weights based on the number of axles and the distance between the

- second axle and the back or rear-most axle. Bridge capacity is very sensitive to the weight length relationship of the truck. [Passad NBR, et. al. 1994]
2. An annual enrollment or permit that is a one time cost per year for each truck and company. The fee for the annual permit would be established based on estimates of the administrative cost of issuing the permit itself. Presently the user pays a \$20 cost for each permit which presumably reflects their share of the cost for issuing the permit and for entering the data in the State's data file to support law enforcement and to do payment processing.
  3. A 24-hour voice response system that can be easily used from any Touch-Tone™ phone. The information sought through a simple voice menu will be the specific data needed for a trip. This system will be similar to many of the "bank-by-phone" systems presently being used. [Appendix D]
  4. An understanding by the truckers that they are using a self-policing system much as they are today, that requires them to correctly indicate which route map that they will use. They will be in violation if traveling on state roads not on the a map provided by the state or if they have embarked on a trip without obtaining a permit via the voice-response system or through the phone system with an INDOT permit office person.
  5. A data entry process in INDOT that would take data from the trucking companies requesting permits. The data may come to DOT by Fax, telephone, or electronic mail to be entered into a computer to allow the data for aid in law enforcement, billing and future analysis. The data to be stored would include more data than needed for a voice response permit, such as origin, destination, axle configuration and the like.

*Does the map mentioned in number 1 exist?*

No. Such a map will take some time and effort to develop. The principal concern is the capacity of many of the state's bridges. While permits are now given based on some data about the bridges along the permitted routes, it is clear that such data needs to be reviewed in the light of recent studies [Passad 93] of the effects of overweight trucks on a variety of bridge types. Once the bridge inventory has been studied then a Graphical Information System can be developed to help permitting and to indicate the capacity of each bridge on the state road network.

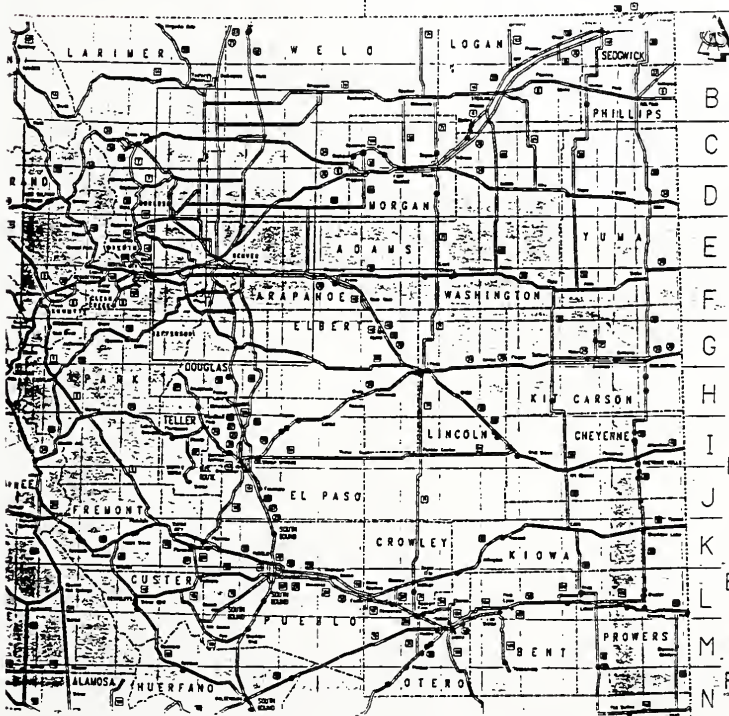
There are several possible forms the map may take. In all cases the map must be clear to the truckers in terms of which routes or which bridges are possible depending upon their load capacity.

1. One map would be similar to the part of one shown from Colorado as shown in Figure 1.2. On this map every bridge that has a problem with weight at certain weight levels, like 120,000 pounds is indicated by a colored dot and listed on the back with the following data:
  - Route number and Milepost,
  - Bridge number in the state inventory,
  - Allowable truck type,
  - Feature crossed (e.g. river, road, etc.), and
  - Color of bridge on the map
2. Another map is similar to the one shown is the one used by Idaho. Although Idaho has both an annual administrative fee plus a weight/mileage permit fee it saves administrative cost by publishing the map with the different routes being color coded according to the specific weight limit backed with a published listing of GVW, number of axles and distance from the second axle to the last axle.

# COLORADO BRIDGE WEIGHT LIMIT MAP

APRIL 1, 1992

SERVICE ROADS AND ACCESS ROADS ARE NOT SHOWN ON MAP



17	TRIPLE AXLE		AS PICTURED
18	TWO AXLE		TREAT AS SINGLE AXLES
19	THREE AXLE COMBINATION		AS PICTURED
20	FOUR AXLE COMBINATION		TREAT AS THREE AXLE COMBINATION PLUS SINGLE AXLE
21			TREAT AS TWO TRAILERS

IN ADDITION, 5,000 POUNDS WILL BE ADDED TO THE PRIMARY SINGLE AXLE GROUP ONLY  
 THESE AXLE WEIGHT LIMITS ARE FROM LEAFLET 10 AND INCLUDES 20,000 POUNDS ONLY

PREPARED BY  
 COLORADO DEPARTMENT OF TRANSPORTATION  
 DIVISION OF TRANSPORTATION DEVELOPMENT  
 GEOGRAPHIC INFORMATION SYSTEMS

BRIDGES FOR WHICH RESTRICTIONS ARE APPLIED PAYMENT TO (21-44-4002) OF  
 HIGLAND REVENUE STATUTES 1975  
 AUTHORIZED BY STATE HIGHWAY COMMISSION RESOLUTION NO. 26-1-88 DATED MARCH 7, 1974

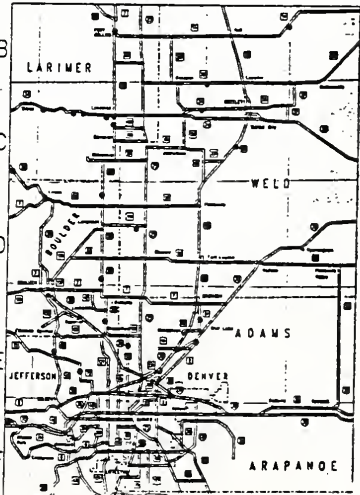


Figure 1. Colorado Bridge Map (partial)

*How does this annual permit differ from what the legislature requested?*

Our understanding of the request from the legislature was the request for an annual flat rate permit. That permit's feasibility was addressed in the previous report. This new plan involves an annual permit that only gives the requester the permission to enroll in the system and be able to receive the benefits of a simplified, more efficient process for obtaining permits.

*Is the voice response system too complicated?*

No, people from all walks of life have been successfully using such systems for nearly two decades. See *Some Alternative Touch Tone/Voice Response Scenarios for Indiana Truck Permitting* for some possible ways the actual implementation might be done. In Indianapolis, Indiana National Bank (now NBD-the National Bank of Detroit) has had substantial experience with such systems.

*Does the voice response system satisfy the States legal needs?*

Certainly. The banking industry is constrained by more severe requirements than those of the Permit Office. Early on, the problems with Touch-Tone/Voice Response were worked out inside the banking industry by a combination of tape recording each message for backup and journaling each transaction electronically in case the computer failed. These solutions to the Touch-Tone/Voice Response potential problems will be directly applicable to the State's legal needs.

*How does the self-policing idea work?*

At present, it is up to each trucker who wishes to haul an overweight or overweight/oversize, non-divisible load to call for a permit. If the trucker chooses not to call he is only punished if he happens to be stopped by a motor carrier enforcement officer. Those are the chances he takes if for whatever reason he chooses to violate the requirement for a permit. Under this system the same potential for evasion applies, except that when purchasing the annual permit,

the trucker could be asked to promise to obey the law. Likewise the data given for a permit could be falsified. That is true in either case.

*Why is it so important to have the data?*

Without the travel data, it is nearly impossible to make informed improvements in the current or any future system. The proposed revisions to the current system were made only after evaluating each of 569,000 permits over the previous five year span. By understanding the previous permit use, then it was possible to make a good estimate about how the proposed change would affect the state's income. It will also be possible to do analysis of the future system and understand how well it performs if the individual trip data continues to be captured.

*What are the important components of your analysis?*

The important components of the analysis include developing an understanding of the present permit process and analyzing the data from 569,000 permits to determine the make-up of companies involved and the travel patterns. To examine revenue neutrality, the distance model determined from the last years worth of data at each weight category was used and then the rate structure was varied until a good match was found with the present 1994 revenue and then checked it against previous years.

*What does your assessment of the present system indicate?*

The present system is very economically fair as it charges the people that cost the state the fees. On the other hand, it costs the users, the state, and industry within the state considerable unnecessary expense from delays getting permits and the related manpower costs. These delays result from the Permit Office telephone operators being swamped by calls. The proposed revisions to the system have targeted minimizing the number of calls, the duration of the calls, and the time frame when calls can be made



*How can you be sure that this proposed system is revenue neutral to the state?*

In reality, there are no guarantees that it is revenue neutral. The simulation studies suggest that it will be revenue neutral given the preceding years performance. Also tested, though not presented here, were 4 previous years of data and those seemed to bear out this plans revenue neutrality. The studies were performed in a manner to achieve the revenue shown in Table F.1 Note that the table includes only the overweight trucks less than 120,000 pounds GVW.

**TABLE F.1 Overweight and Oversize/Overweight permits in Indiana - FY 1994**

Truck Category	Gross Vehicle Weight (GVW) Limits	Permit Cat.	Actual FY 1994		
			Number of Permits	Revenue [K= \$1000]	Avg. Cost
Overweight only	80,000# <GVW≤108,000#	02	3,997	\$252K	\$63.13
Overweight only	108,000# <GVW≤120,000#	02	995	\$88K	\$88.18
Oversize & Overweight	80,000# <GVW≤108,000#	03	19,174	\$1,054K	\$54.95
Oversize & Overweight	108,000# <GVW≤120,000#	03	12,796	\$994K	\$77.71
			36,962	\$2,388K	\$44.12

Source: Permit Office Data

*What is the industrial pattern for those applying for permits?*

There are over 1780 companies who request permits for one of the four overweight/oversize categories. Many (85%) are small users of the system requesting, on the average, less than 2 permits per month. Only 5% of the companies make, on the average, more than 2 trips per week. Company location is widespread with addresses in most of the 48 states and Canada. About 50% of the permits are requested by Indiana companies which comprise 27% of the 1780 companies in the FY 1994 database.

*What are the travel patterns for overweight vehicles?*

Overall about 44% of the trips (but only 30% of the revenue) come from trips entirely within Indiana. On the other hand 30% of the trucks pass through Indiana traveling from state border to state border. These trucks furnish about 44% of the revenue. See Table F.2 for FY 1994 results.

**Table F.2 Origin - Destination of Overweight/Oversize Loads in Indiana - FY 1994**

Distance Traveled	Trips	Trip In Indiana	Trip Thru Indiana	One Trip End in Indiana
0 to 60 miles	17,839	59%	13%	28%
61 to 150 miles	9,121	52%	11%	37%
151 to 240 miles	7,683	9%	76%	15%
over 240 miles	2,319	5%	79%	16%
<b>Total Permits</b>	<b>36,962</b>	<b>43%</b>	<b>30%</b>	<b>27%</b>
<b>Total Revenue</b>	<b>\$2,388K</b>	<b>32%</b>	<b>44%</b>	<b>24%</b>

Source: Permit Office Data

*What do all these data mean?*

Most of the trips are taken by companies which travel infrequently (no need for an annual permit) with a travel pattern that is very diverse. Most of the short trips are performed by Indiana-based companies and most of the longer trips are from border to border where the trucking company is traversing Indiana Highways, usually the Interstate.

*What are the overweight/oversize loads involving calls for permits?*

Loads permitted are those loads that are not divisible, such as construction equipment, road building machinery, transformers, pre-formed building components and the like. The table below indicates the permit activity, excluding mobile homes, over the last two years. While there could be as many calls as permits, many request more than one permit on a given call; requesting up to ten is possible.

*Are Michigan trains permitted in the same way as other overweight trucks?*

No! Michigan trains call-in for each permit, as others do, but their permit is good only until midnight of the day for which the permit is requested. The cost of their permit is \$43.50 for any load over 80,000 pounds GVW and less than 134,000 pounds GVW (the present limit.) regardless of distance.

*Other than the permit, what significant differences exist between Michigan trains and other overweight/oversize vehicles?*

Michigan trains generated about 25% of the overweight permit revenue in FY 1994. The number of companies involved in the Michigan trains is only 124. Most of the companies (42%) are based in Michigan with only about 23% of the permits are issued to Indiana

companies. Many of the companies act as dispatchers for the large population of owner-operators who haul steel. The original concept of the "extra heavy duty highway" was established to facilitate the movement of Indiana's steel products more in line with what was permissible under Michigan's law. Michigan permits trucks with sufficient number of axles to carry up to 165,000 pounds GVW. Indiana designated the short stretch of highway shown in Figure 3 and only permitted loads to 134,000 pounds GVW. This has helped the steel industry keep their prices down and helped Indiana steel be more competitive. The disparity in weights, however, has lead the industry to carry their loads to the Michigan border in one overweight truck (less than 134,000 pounds) and one non-overweight truck (less than 80,000 pounds). Once in Michigan, the two parts of the load are assembled into a single "Michigan train" and finish the trip at 165,000 GVW. The larger companies have a staging places just inside Michigan for assembling trains.

**Table F.3 Industry breakdown of companies using Michigan train permits**

Location of Company	Number/Percent of Companies	Number/Percent of Permits
Michigan	52 (42%)	13,878 (35%)
Indiana	28 (23%)	9,011 (23%)
Pennsylvania	7 ( 6%)	7,625 (19%)
Ohio	11 ( 9%)	4,337 (11%)
Canada	14 (11%)	2,499 ( 6%)
Other	11 ( 9%)	2,608 ( 7%)
Total	124	39,958

Source: Permit Office Data

There is even more of a disparity in trucking company dominance between the heaviest user (over 30 permits per day) of the Michigan train permits and the occasional user than the data shown for the overweight trucks.

There is also an operational difference in that Michigan trains operate on this short portion of Indiana highway (usual trip lengths in Indiana are less than 30 miles and annual permits would provide a wonderful opportunity for "ferrying".) That is, the permitted truck would be used several times in one day to carry loads just over the border into Michigan and then another

truck permitted for Michigan, but not Indiana would transport the load the rest of the way to the destination. (often the haul can be as long as 200 miles in Michigan). A "ferry" operation could conceivably carry as many as four loads per day. The cost level of either the present or any proposed permit is significant and any wholesale change in the permit process can have a significant impact on the industry. The Indiana permit costs represent from 5 to 10% of the trip revenue. Michigan whose bridges have been designed to a different specification and can withstand the loads they are being subjected to charges a \$8 annual permit fee and the tractors must be registered (licensed) to pull the 165,000 loads. A tractor license costs in excess of \$2000.

*Since it looks like Michigan Trains are very different, should anything change in their permitting?*

Two issues would make the Michigan Train permitting more fair and efficient. First, automation of the permitting would be an easy and worthwhile process. Second a change in how the expiration of the Michigan Train permit would make the system more fair.

*How would automation help?*

Permitting of Michigan Trains is a simple and very repetitive process. What makes it very simple is there is no route information collected. If a truck already had a record at the state which allowed the driver to simply call, dial his truck number, a PIN, and the starting date and time, then the computer could debit the drivers account and give them a permit number. This, then, would allow the human operators in the permit office to spend their time working on harder problems. Further, with automation comes the ability to get a permit at any time of the day or night. This flexibility will lend itself to better compliance with the existing law.

*What would change in how a permit expires?*

At the moment the permits for using the heavy duty highway expire at midnight of the day they are granted. Thus, if a driver needs to pick up a load late in the day, there is often the possibility that the permit expires before the trip is completed through no fault of anyone. The very short expirations were established to preclude the gross abuse of reusing a permit to carry multiple loads

to Michigan (ferrying). The proposed change is to allow a permit to be valid for any 24 hour period. Then when the driver knows that the load will not be ready until 11 p.m., the permit can start then. This keeps the time limit small enough to preclude much abuse, but still allows better operational flexibility for both the driver and the Indiana steel company.

*How does the model compare on revenue neutrality?*

Table F.4 indicates the present permitting system while Table F.5 summarizes the proposed annual permit with a mileage/weight fee. Table F.6 gives the results comparing the revenue using actual data and the model used to evaluate the revenue.

**Table F.4 Characterization of the Four Overweight/Oversize Permitting Processes**

	80,000#<GVW≤108,000#	108,000#<GVW≤120,000#
Overweight Only Permit Category (02)	3997 Permits; \$20+.35cents/mi.: Revenue=\$252,321	995 Permits: \$20+\$.60/mi.: Revenue=\$87,740
Overweight/Oversize Permit Category (03)	19,174 Permits; \$20+\$0.35/mi. (minimum \$30.00); Revenue=\$1,053,693	12,796 Permits; \$20+\$0.35/mi. (minimum \$30.00); Revenue=\$994,376

**Table F.5 Proposed Rate Structure**

Company annual permit (good for 12 months form purchase) - \$25.00
Per truck annual permit (good for 12 months from purchase) - \$15.00
For travel between 80,000 lbs GVW and 108,000 lbs GVW - \$10 per every 30 miles traveled or part there of
For travel between 108,000 lbs GVW and 120,000 lbs GVW - \$30 per every 30 miles traveled or part there of

**Table F.6 Check of Revenue Neutrality for FY 1994**

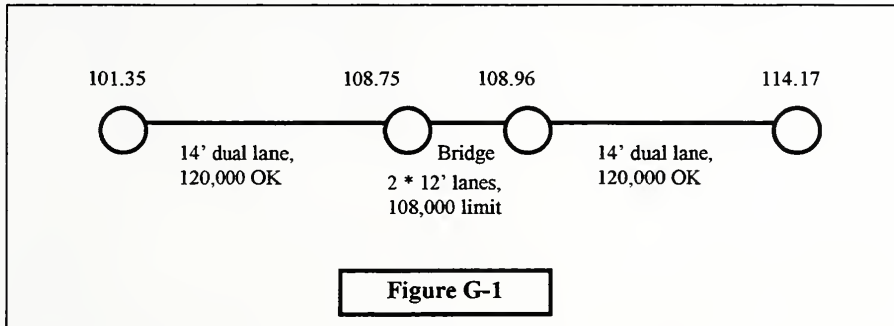
Overweight Category	Number of Permits	1994 Revenue Comparison			
		Model		Actual	
		Revenue from Mileage	Admin-istrative Revenue	Revenue from Mileage	Admin-istrative Revenue
Overweight less than 108,000 pounds GVW	3,997	\$160,418		\$158,645	\$93,677
Overweight between 108,000 and 120,000 pounds GVW	995	\$116,580		\$64,940	\$22,799
Oversize/Overweight less than 108,000 pounds GVW	19,174	\$655,070		\$614,277	\$439,416
Oversize/Overweight between 108,000 and 120,000 pounds GVW	12,796	\$1,286,130		\$692,533	\$301,846
<b>Sub-Total</b>		<b>\$2,218,198</b>	<b>\$182,922</b>	<b>\$1,530,395</b>	<b>\$857,738</b>
<b>Total</b>	<b>36,962</b>	<b>\$2,401,120</b>		<b>\$2,388,133</b>	

## Appendix G

### Ideas for Computer Representation of the State Highway Network for Permitting

This is a small application note about how to represent in a computer the highway network such that a tool such as a whole network permitter could quickly and easily help users route vehicles. While it is a bit odd that such an application specific note be in such a general report, one of the authors of the report has been working extensively with road networks and would like to save time for future developers.

A simple link and node representation should work fine. If every time there is a potential obstruction put another node. So a typical piece of Interstate will be represented as:



This representation scheme allows for the introduction or subtraction of new links easily within the existing structure. That allows new obstructions to be added or deleted as they appear or disappear. Mile markers are already on all highways, so the representation makes sense to those on the highway. If, for example, one must take the exit and the immediately re-enter the interstate because the bridge at 108.75-108.96 is too narrow because of redecking, then that information is already to be reported directly to the trucker.

Further, the state wide G.I.S. should be able to provide a good foundation for such a representation. It already knows mile markers and would just need a couple of additional layers for weight and size restrictions.

Internal to the computer, the nodes have a location but little else as attributes. The links contain width and weight restrictions (and could even keep a count of number of oversized loads scheduled over them). The length of each link is computed from the locations of the nodes. Routing then becomes a relatively simple problem of following the links, asking good questions to keep the number of questions to a minimum. Automatic routing would even be possible given the origin and destination, because path lengths and all the size restrictions are known so a simple shortest path could easily be computed that did not violate any of the restrictions for the pre-defined load size.





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