NDOT Permitting Fees

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16. Abstract

In this study, the objective of assessing the permit fees of overweight vehicles in Nebraska along with a review of surrounding Midwestern states was carried out in six stages. The first stage included a TAC meeting and a literature review. The second stage was the examination of the Nebraska permit process and structure utilizing the Nebraska Department of Transportation's (NDOT) website and consultation with NDOT staff. The purpose of documentation was to ensure the research team's understanding of the issues besides conducting a comparison with other states. The third stage consisted of a review of different state DOT's policies/procedures. A review of online information available from surrounding state DOTs was made to document their permit fee policies and procedures. To obtain more information and verify the online information on permits, state DOTs including Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Ohio, South Dakota, Wisconsin, Colorado, and Wyoming were contacted and asked to provide detailed information on their agency procedures via a telephone/mail questionnaire (no human subjects were involved). The outcome of the online and telephone/mail questionnaire was structured and presented in a set of tables for reference and comparison. The fourth stage was a comparison of permit data. Five hundred overweight vehicles were randomly simulated based on dimension and weight criteria, and the permit fees were calculated for these trucks, for Nebraska and all other states. Based on the average fee of each state for single-trip and annual permits, the states were sorted from expensive to cheap. Nebraska was found to be among the cheaper half of the studied states, both for single-trip and continuous permits. The fifth stage included examination of overweight vehicle costs to Nebraska. An estimate of damage to Nebraska highway infrastructure resulting from overweight vehicles was made based on published statistics for damage to pavements. The results, based on a number of assumptions, provided a table of pavement damage costs for different weight groups and mileages of overweight vehicles. These values may be used for policy-making regarding permit fees. The sixth stage was documentation and preparation of this final report. The main conclusion of the study was that Nebraska's current permit fees are relatively low, compared to other states and compared to the estimated damage costs to its pavements. While the approaches used for comparison in this study were based on reasonable assumptions, relaxing these assumptions by accessing/utilizing more detailed information may provide possibly different results. Nonetheless, a consideration of increase in the current permit fees for oversize/overweight trucks is warranted on the basis of analysis presented herein.

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Table of Contents

List of Tables

List of Figures

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Disclaimer

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Chapter 1 Introduction

1.1 Background

In Nebraska, the permit fees for oversized/overweight vehicles is set forth in statute however, the fees has not been updated in quite some time. As such, permit fees may not be sufficient to cover the current costs of damage that these vehicles inflict upon the pavements. Surrounding Midwestern states utilize different fee structures, such as fees based on ton-mile, to recoup costs associated with the transport of oversize/overweight vehicles. It is not clear how Nebraska compares with those states in terms of permit fee for oversized/overweight trucks. Therefore, there is a need to look at Nebraska's fee structure and assess its appropriateness in recouping the costs borne by the highways.

There is a perception that Nebraska attracts more oversized/overweight vehicles than surrounding states due to its relatively low fees. Therefore, there is a need to assess the validity of this perception by a case study comparing the cost of similar oversized/overweight loads passing through Nebraska and neighboring states to illustrate any disparities between Nebraska and its neighboring states.

1.2 Objective

The main purpose of this research is to assess overweight vehicle permit fees and the associated policies and procedures of Nebraska and neighboring/surrounding Midwestern states. The research will enable Nebraska Department of Transportation (NDOT) to assess if appropriate fees are recovered from overweight vehicles in a fair manner. In other words, vehicles that are causing more damage to public infrastructure (e.g., pavements) should pay their fair share. The results can be used by NDOT for policy-related decisions on overweight vehicle permit procedures.

1.3 Outline

This research project was conducted in six stages. The first stage included a TAC meeting and a literature review. An initial meeting with TAC members was arranged to discuss the research approach. Available research literature was reviewed, including research papers and state DOT project reports, with particular emphasis on permit fee structures and policies.

The second stage was the examination of Nebraska's permit process and structure. This was done using NDOT's website and in consultation with NDOT staff. The purpose of documentation was to ensure the research team's understanding of the issues besides acquisition of information for a comparison with other states.

The third stage consisted of a review of the state DOT's policies/procedures. A review of online information available from each state DOT was made to document their permit fee policies and procedures. To obtain more information and verify the online information on permits, state DOTs including Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Ohio, South Dakota, Wisconsin, Colorado, and Wyoming were contacted and asked to provide detailed information via a telephone/mail questionnaire. The focus was on soliciting information on agency procedures with respect to permits and not on human subjects.

The fourth stage involved a comparison of the acquired permit data. Five hundred oversized/overweight vehicles were randomly simulated based on dimension and weight criteria, and the permit fees were calculated for these trucks for Nebraska as well as the states considered in this study. Based on the average fee of each state for single-trip and annual permits, the states were sorted from expensive to cheap for truck travel. Inflation for Nebraska's fees was then considered and the comparison repeated with this consideration.

The fifth stage included the examination of overweight vehicle costs to Nebraska in terms of pavement degradation. An estimate of the damage to Nebraska's highway pavements resulting from overweight trucks was made based on published statistics for damage to pavements.

The sixth stage was documentation and preparation of the final report and presentation.

Chapter 2 Literature Review

2.1 Objective

The purpose of this chapter was finding and reviewing the existing literature on overweight and oversized vehicles' permits. Research papers and state Departments of Transportation (DOT) projects were reviewed and presented in this chapter.

2.2 U.S. DOT's Projects

An Arizona Department of Transportation (ADOT) project *(1)* tried to quantify state highway damage based on the impacts of overweight vehicles by identifying and evaluating the impacts of overweight vehicles on pavement. First, pavement design methods and available relevant pavement literature were reviewed in this project. Parts of this review is presented here, as it provides a good background for this project as well.

Among flexible and rigid pavements as two primary types of hard-surfaced pavements, flexible pavements were identified as the more common type, which covered 93% of all U.S. roads. The design of pavement structures are primarily dependent upon traffic data while it is possible to convert a mixed traffic stream of different axle loads and axle configurations into a design traffic volume. This can be achieved by converting each expected axle load into an equivalent number of 18 kip-single-axle loads, known as Equivalent Single-Axle Loads (ESALs). The AASHTO damage concept, however, has some limitations. It does not consider some significant forms of damage such as bleeding or flushing of asphalt pavements. Heavy loads on asphalt surfaces that have been designed for lighter loads may create this type of damage, and a loss of skid resistance may result. In order to reduce heavy truck damage, a seal coat may be applied with an adequate quantity of asphalt. Pavement costs depend on materials, thickness, quantity, and quality along with geographic and environmental conditions. Marginal

cost and incremental cost are two economic cost methods used for highway damage cost analysis. Different methods of traffic volume counting and overweight vehicle identifications were also reviewed in this project report. Weigh-in-motion sensors (WIM) devices are introduced as a commonly used tool as an alternative to static weigh stations. WIM sensors allow for the effective monitoring of gross vehicle and axle weight monitoring as trucks drive over a sensor.

Moreover, in this study, a survey was designed and performed to find out the current overweight vehicles' pavement-related information and in-use cost estimation procedures in all the 50 U.S. states and the ten provinces and three territories of Canada. The results are listed below.

- Data on overweight vehicles is sorely lacking.
- The range of estimates for the percentage of vehicles that are overweight ranges from less than 0.5% to a high of 30%.
- No state was able to produce a credible estimate of the amount of damage that might be attributed to overweight vehicles.
- Some enforcement personnel imagine they are weighing nearly every truck while the reality is that only a minority of trucks are likely weighed.
- Ports-of-entry are not consistently manned and operated as they are closed in the evenings or weekends and the highways are open for overweight violators.
- Some states' mobile units weigh millions of vehicles yearly. Others weigh only a few thousand.

- The damage done by overweight vehicles is gradual as roads are long-lived assets and the increment of damage from one overweight vehicle goes unseen. It is difficult to stimulate an effective response to counter the damage.

Finally, in this project, WIM data collected over several years across different Arizona ports was decided to be used for quantifying the pavement damages associated with overweight vehicles, but it quickly became clear that this data would be inadequate as a basis for this estimation. Based on estimates of the total cost of heavy vehicle use of the highways, the share of expenses due to heavy vehicles for roadways under the jurisdiction of local governments, the USDOT estimates of the nationwide costs to maintain pavements at the current level of service, the share of roadway costs attributable to the heaviest vehicles, and the percentage of overweight vehicles, their best guess was that overweight vehicles impose somewhere between $12 million and $53 million per year in uncompensated damages to Arizona roadways.

In a project *(2)* performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration, methodologies were developed to quantify pavement and bridge consumption rates per distance. The consumption rates were calculated for multiple axle loads and axle configuration and were considered independent of the commodity that was being transported. Fees for bridges, per distance travelled, were also calculated for non-routed loads. In this study, besides the consumption rates for bridges and pavements due to the effect of axle loads, the authors came up with a new fee schedule that considers costs associated with oversized vehicles that exceed legal width, height, or length for 34 rate categories. These new fee structures were also computed on the basis of vehicle miles traveled.

The highlights and recommendations of this study are listed below.

- The study concluded that the state's current OS/OW permit fee structure is inadequate to recover OS/OW truck-related infrastructure consumption costs.
- The research team used permit and trip data and rigorous engineering analysis to quantify infrastructure consumption costs associated with each type of OS/OW truck, including those that state law currently exempts from permit requirements.
- The research team proposes a model alternative fee structure that builds on the state's online permitting system; links OS/OW permit fees to the cost of infrastructure consumption; and generates additional revenue to address OS/OW vehicle-related administrative and enforcement costs as well as the cost of maintaining and preserving the state's transportation infrastructure.
- The research recommends streamlining the number of permit types and reducing exempt truck classes.
- The proposed model for an alternative fee structure uses vehicle miles travelled (VMT) and vehicle characteristics that exceed legal limits (i.e., weight, height, width, and length) to determine the permit fees. These proposed fees also include operational and safety cost components.
- Adopting the research's proposed model alternative fee structure could increase annual state OS/OW permit revenue to $521 million from $111 million collected in FY 2011, an increase of $410 million.
- Applying the research's proposed model fees to trucks exempt from permit requirements under current law—based on estimates of their numbers and adjusting for seasonal use and load types—could yield an additional $150 million in annual permit revenue

The Indiana Department of Transportation conducted a research project *(3)* to document the then current practice of truck weight permitting in Indiana vis-à-vis those of its neighboring states. This was done on the basis of the fee amounts, fee structure, and the ease of the permit acquisition process for the permit applicant. Parts of this study's results showed:

- While the upper thresholds (dimensions and weights) for legal trucking operations are generally the same across states, those for extra-legal operations vary considerably.
- There is great variability in overweight and oversize truck permitting criteria across the states.
- No state has adopted explicitly the weight-distance concept for its overweight trucks. However, in the states of Indiana, Ohio, and Illinois, the fee structures for overweight vehicles include weight levels and extents of travel, and thus operate in a manner similar to a weight-distance fee.
- A number of states such as Indiana appear to be generally more favorable to trucking because they have relatively higher upper thresholds for defining an overweight truck and/or relatively lower fees for overweight trucking operations.
- The differences in fees incurred by truckers across the states are significantly influenced by a variety of factors including the trip circumstances, permitting criteria, and trip frequency and distance.

This report also documented the streams of revenue from the permits issued for extra-legal trucking operations over the recent past, and it was approximately $12 million annually. On the subject of revenue neutrality, the study reported that highway agencies that had switched from a single-trip permit system to an annual flat fee permit system reported that they benefited

from cost savings due to reduced monitoring efforts of truck trips, but had lost significant revenue overall.

Using data from a national study, the report quantified the extent to which each additional payload increases pavement deterioration. The data also suggested that having more axles on a truck reduces pavement deterioration and consequently, damage repair cost, but could decrease the revenue to be derived from overweight permitting. In conclusion, the study recommended a cost allocation study to update these load-damage relationships as well as the overweight permit fee structures to address current (at the time of the study) conditions in Indiana.

2.3 Research Papers

In a research paper by Dey et al. *(4)*, a multi-objective analysis approach was utilized to consider conflicting objectives associated with overweight freight truck mobility and to identify proper overweight truck damage cost recovery fee options by considering detailed tradeoffs between these options. Bridge damage costs were estimated as fatigue damage using finite-element simulation models, and pavement damage costs were estimated using a method based on an equivalent single-axle load, similar to the AASHTO standard. These costs were used to develop the mathematical relationship between the objectives and constraints in the multi-objective model. Also, this paper presented a case study with two objectives, which were minimization of unpaid pavement and bridge damage by overweight freight trucks, and minimization of overweight damage cost recovery fees. A set of 10 overweight fee options and the associated tradeoffs were developed for four damage cost recovery fee types, including flat, axle-based, weight-based, and weight-distance-based fee types. The tradeoff analysis revealed that increasing the flat overweight damage cost recovery fee by $1 from $43 will reduce unpaid damages by $4.2 million annually in South Carolina with a high elasticity of demand. In the

axle-based damage cost recovery fee type, increasing the average axle-based overweight damage cost recovery fee by $1 from $43 will reduce unpaid damages of $3.8 million annually in South Carolina. According to the authors, these types of tradeoff analyses provide valuable information to decision-makers in terms of selecting types and levels of permits and fees for overweight trucks, and the tradeoff analysis framework and results of the tradeoff analysis depicted in the paper can contribute to assessing infrastructure damage due to overweight trucks and developing damage recovery fee policies regarding multiple conflicting objectives.

Ahmed et al. *(5)* presented a comprehensive framework to derive representative estimates of Pavement Damage Costs (PDC) and, according to the authors, addressed the limitations of past research and quantifying the resulting adverse consequences on their analysis outcomes. PDC estimation studies seek to charge vehicles on the basis of the marginal cost they incur to the pavement. Marginal Pavement Damage Cost (MPDC) is the MR&R (Maintenance, Rehabilitation, and Repair) cost that is directly attributable to an additional vehicle on a given roadway. The empirical approach is based on the statistical relationship between observed pavement MR&R costs and appropriate explanatory variables such as pavement age, surface type, traffic, and climate. In this study, the schedules for highway upkeep in the long term, defined as a key issue that influences the resulting marginal costs and user fees, were considered in the cost estimation process. In other words, along with maintenance and rehabilitation expenditures, reconstruction expenditures were also considered in this study. Also, pavements were clustered on the basis of their surface type, functional class, and traffic loading level, and the Indiana Department of Transportation's several databases were used as source of analysis datasets. Using the present worth concepts and equations, the equivalent uniform annual cost (EUAC) can be calculated, considering rehabilitation treatments, periodic maintenance, and

routine maintenance. Then, regression models were estimated using EUAC as a dependent variable and ESAL, the type of pavement and age of pavement, as independent variables, and the marginal cost of pavement damage was derived from the regression model. It was determined that in each highway functional class, the marginal cost of pavement damage was influenced significantly by the pavement material type, traffic levels, and age. Within any specific functional class, it was determined that the marginal cost increases with increasing traffic level and pavement age. The study also determined that non-consideration of at least one repair category such as reconstruction or routine maintenance leads to a relatively significant (27–45%) underestimation of the actual MPDC.

Zaghloul et al. *(6)* at Purdue University, funded by the Indiana Department of Transportation and FHWA, developed a procedure for permitting overloaded trucks in Indiana. The procedure considered damage effects of overloaded trucks for pavements and bridges. Both pavement and bridge analyses used statistical models (regression) developed especially for this study. The pavement statistical models were based on a three-dimensional, nonlinear dynamic finite-element analysis of rigid, flexible, and composite pavements. Repeated axle loads moving at different speeds were considered, and realistic material models, such as viscoelastic and elastic-plastic models, were used for pavement materials and subgrades. The bridge statistical models were based on analysis using the AASHTO Bridge Analysis and Rating System and selected samples of bridges and overloaded trucks. A computer software was developed to apply this procedure, which allows users to run damage analysis for overloaded trucks at the network level as well as at the project level for specific pavement or bridge structures. Three options were available to users: to check for pavements only, to check for bridges only, or to check for both.

Tirado et al. *(7)* developed a process based on a mechanistic-empirical (ME) analysis in which it is possible to estimate permit fees on the basis of truck-axle loading and configuration, as well as the predicted pavement deterioration that they cause. The process was implemented in a software package, Integrated Pavement Damage Analyzer (IntPave). IntPave is a finite element-based program that calculates pavement responses, uses ME distress models to predict performance under any type of traffic load, and is capable of comparing the level of distress caused by an overweight truck relative to a standard truck, and provides a permit fee based on this comparison, accordingly. Based on a parametric example study, it was found that, aside from the truck gross vehicle weight and axle configuration, pavement structure and the damage threshold to rehabilitation also significantly affect the permit fee.

Dey et al. *(8)* adopted a damage quantification framework to estimate bridge and pavement damage caused by overweight trucks. The framework was implemented to estimate unit overweight truck damage costs for the highway system maintained by the South Carolina Department of Transportation. The analysis showed that pavement and bridge damage increased significantly when trucks were above legal weight limits. In this research, representative truck models were developed, based on the truck population in South Carolina, to estimate the bridge and pavement damage costs caused by overweight trucks, and then detailed bridge and pavement deterioration costs were estimated. The annual bridge damage caused by a truck model was defined as the annual consumed fatigue life by a particular truck model divided by the bridge fatigue life of the truck. The bridge replacement costs were derived from the bridge replacement cost database in the HAZUS-MH program. The replacement costs for bridges were grouped by material type and structural type, and it was observed that the relationship between damage and truck weight was highly nonlinear. The total replacement cost for all bridges in South Carolina

was determined to be approximately $9.49 billion (in 2012 dollars). To estimate the pavement damage cost caused by overweight trucks, three design scenarios were developed: 8.3% of all trucks were overweight, no overweight trucks in the traffic flow, and 0% trucks in the traffic flow. The total South Carolina DOT highway network pavement replacement cost was calculated with per lane-mile costs and the total lane miles for each functional class in the South Carolina DOT network. Based on this analysis, considering 8.3% of overweight trucks in the normal truck traffic will result in an estimated increase in pavement replacement costs of more than $1.1 billion. Different fee types, based on the calculated costs, were finally proposed for South Carolina.

Hajek et al. *(9)* in a research study used a marginal cost method to allocate pavement damage due to trucks and developed a procedure for quantifying the pavement cost of proposed changes in regulations governing truck weights and dimensions. In this study, the marginal pavement cost of truck damage was defined as a unit cost of providing pavement structure for one additional passage of a unit truckload, expressed as ESAL. Marginal pavement costs for ESALs were calculated by developing a series of regression models relating the pavement cycle costs obtained for different sections to the number of ESALs the pavement sections were designed to accommodate, and differentiating these functions to obtain marginal costs of providing the pavement structure to service one additional ESAL. Pavement life cycle costs were calculated using a 60-year analysis period and the concepts and methods of present worth. The results showed that the highway type and truck volume associated with the highway type have a significant influence on marginal costs.

Chapter 3 NDOT Permit Process and Structure

3.1 Objective

In this chapter, the research team documented NDOT's permit process and structure using NDOT's website and in consultation with NDOT staff. The purpose of documentation was so that the research team and other involved parties look at the issue in the same way and agree on a course of action.

3.2 Legal Weights and Dimensions

The available information on NDOT's website regarding legal weights and dimensions of vehicles in Nebraska includes a standard from "RM-421b". This standard shows the legal weights and dimensions as shown in **Table *1***.

Table 1 Legal weights and dimensions for vehicles in Nebraska (source: Standard From RM-421b, Sep 93, Updated Oct 1999)

Maximum overall width	8'6"
Maximum overall height	14'6"
Maximum overall length, single vehicle	40'
Maximum overall length, combination of vehicles	65'
Maximum overall length, semi-trailer (excluding truck-tractor)	53'
Maximum overall length, semi-trailer and trailer (including connecting devices, excluding truck-tractor)	65'
Maximum single wheel load	10000 lb.
Maximum single axle load	20000 lb.
Maximum tandem axle load	34000 lb.
Maximum Gross Weight	80000 lb.

3.3 Permit for the Movement of Overweight and Oversized Vehicles

The research team encountered "TITLE 415, NEBRASKA ADMINISTRATIVE CODE, CHAPTER 3 (Statutory Authorities 60-6-288 to 60-6-302)" in its search for rules and regulations of oversized/overweight vehicle permit fees and procedures of Nebraska. A summary of this administrative code is provided here, which presents all the sections that are related to this

project. The permit types and their affiliated fees and restrictions are reported in the final part of this summary (**Table *2*** and **Table *3***).

3.3.1 Summary of Permits for Movement of Overweight and/or Overdimensional Vehicles and Loads in Nebraska

The terms that are used in this code are defined in **section 001**. The ones that need to be mentioned to avoid any confusion in this summary are:

Gross weight: The weight of a vehicle and/or vehicle combination with or without load.

Height: The total vertical dimension of any vehicle above the ground surface including any load and load-holding device thereon.

Length: The total longitudinal dimension of any vehicle or combination of vehicles, including any load or load-holding devices thereon.

Load: A weight or quantity or anything which cannot be readily reduced in size resting upon something else regarded as its support.

Long combination vehicle (LCV): Any combination of a truck-tractor and two or more trailers or semi-trailers.

Non-divisible load: A vehicle or load that cannot be dismantled, disassembled, or reduced in size or weight without great difficulty to meet the statutory size and/or weight limits.

Special permit: A written authorization to move or operate on a highway a vehicle, combination of vehicles, or vehicles with an indivisible load of size and/or weight exceeding the limits prescribed for vehicles in regular operation.

Single trip permit: A permit for the movement of a vehicle or vehicle combination, with or without load, from a point of origin to a destination point.

Continuous ("annual") permit: A permit issued for the frequent or repeated movement of a vehicle or a combination of vehicles, with or without loads, to several locations within an area or on designated highways approved by the Department and defined on the permit for a designated period of time not to exceed one year.

Conditional interstate use permit: A permit issued for vehicles weighing up to 95,000 pounds on the National System of Interstate and Defense Highways (Interstate). No vehicle can exceed 20,000 pounds on a single axle or 34,000 pounds on a tandem axle. The overall gross weight of a group of two or more consecutive axles must conform to the requirements of the Nebraska bridge formula.

Superload: A vehicle or vehicle combination transporting a non-divisible load that is in excess of any of the following dimensions or gross weight: 16 feet in width, 16 feet in height, 100 feet in length, and gross weight over 160,000 pounds.

Width: The total outside transverse dimension of a vehicle including any load or load-hold devices thereon, but excluding approved safety devices and tire bulge due to load.

In **Section 002** the vehicles or combination of vehicles that are considered oversized and/or overweight and need a permit to move in Nebraska are defined. These include overweight vehicles that are a vehicle or combination of vehicles, with or without load, which exceeds the gross load permitted by the statutes or any axle weight that exceeds the limit imposed by law for the axle spacing, and oversized vehicles which are a vehicle or combination of vehicles, with or without load, when the maximum width exceeds 8 feet 6 inches, the height exceeds 14 feet 6 inches, or the length exceeds 40 feet (65 feet for combination of vehicles).

Different types of available permits are introduced in **Section 003** as:

- Single Trip
  - Overdimensional Only
  - Overweight Only
  - Overdimensional and Overweight
  - Self-Propelled Equipment

- Manufactured Housing
  - New/Dealer
  - Pre-Owned

- Continuous
  - 3-Month
  - 6-Month
  - 1-Year

- Other
  - Conditional Interstate Use
  - Building/Slow Moving Large Object
  - Garbage/Refuse
  - Seasonally-Harvested Products
  - Annual Implement of Husbandry for I-80 (Only for Dealers)
  - Extra-Long Vehicle Combinations

Other details of the regulations including escort conditions, signs, and flags are mentioned in this section.

Provisions and details related to single trip permits are mentioned in **Section 004**. Single Trip Permits for special overweight and/or overdimensional movements (superloads) must be reviewed by and approved by the Lincoln Permit Office, and may require review and approval by the Bridge Division and/or District Engineer prior to issuance of a permit.

Section 005 includes provisions and details about continuous permits. Based on this section it should be noted that a continuous permit may not be transferred to any other vehicle. Five different types of continuous permits are introduced: statewide permits, local permits, local self-propelled permits, interstate self-propelled permits, and flotation permits. Statewide permits are issued for the movement of vehicles on all highways on the State and National system. Local permits are issued for the movement of vehicles on all highways on the State system within the

county in which the vehicle is licensed or the applicant maintains a headquarters or satellite office. Local permits are also issued for movement within an adjoining county and return to headquarters or a satellite office for a specific tractor, or tractor and semi-trailer hauling, or towing a specific overweight and/or overdimensional load or machine. Self-propelled permits are issued for the movement of vehicles that are self-propelled specialized mobile equipment. Lastly, flotation permits are issued for movement of vehicles on all highways on the State system within the county in which the vehicle is licensed or the applicant maintains a headquarters or satellite office and movement within an adjoining county and return to headquarters or satellite office for construction equipment or equipment used in agricultural land treatment, which is driven on the road provided it is equipped with flotation tires.

Sections 006, **007,** and **008** are mainly about the restrictions and permits for the movement of overdimensional and/or overweight manufactured housing, other overweight and/or overdimensional permits, and slow moving buildings/large objects on state highways, respectively.

Section 009 introduces the available permits structure and fees in Nebraska. This information is summarized in Table 2.

Table 2 Nebraska's oversized/overweight permit types and fees

	Fee			
Type of Permit	**Oversized**	**Overweight**	**Oversize/Overweight**	**Comments**
Single Trip	$15	$20	$25	-
Continuous Permit	$25/each quarter or part thereof			not to exceed $100 a year

Grain or other seasonally harvested products	$25/30 days or $50/60 days	less than 120 days per year
Movement of garbage or refuse	$10/ month	not to exceed $100 a year
Interstate Implement of Husbandry Permits	$25/each quarter or part thereof	not to exceed $100 a year
Conditional Interstate Use Permit	&10/ each ten-day increment	Max $90 for 90 days
Extra-Long Vehicle Combination	$250/year	-

It should be noted that there are other types of permits that are introduced in this statute, but the affiliated fees are not mentioned. The research team looked at the online permit system of Nebraska and the output spreadsheet file of this system and extracted the current fees of these permits. These permit types and fees are presented in **Table *3***.

Table 3 Nebraska's oversized/overweight special permit types and fees

Type of Permit	Fee	Comments
Single Trip-SPE (Self-Propelled Equipment)	$25	Single trip
Manufactured Housing (New/Dealer)	$15	Single trip
Manufactured Housing (Pre-Owned)	$15	Single trip
Single Trip-Two Axle Flotation	$25	Single trip
Building/Slow Moving Large Object	$10	Single trip
Statewide Envelope Vehicle	$25/each quarter or part thereof	Continuous
Statewide Empty Semi-Trailer	$25/each quarter or part thereof	Continuous
Interstate Self-Propelled	$25/each quarter or part thereof	Continuous

In **Sections 010** and **011**, specific provisions applicable to permits for the movement of extra-long vehicle combinations and conditional interstate use permits for divisible loads exceeding 80,000 pounds are presented.

Chapter 4 Review of State DOT's Policies and Procedures

4.1 Objective

In order to document permit fee policies and procedures of the Midwestern state Departments of Transportation (DOT) including Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Ohio, South Dakota, and Wisconsin as well as Colorado and Wyoming (as non-Midwestern neighbors of Nebraska), the research team conducted a review of online information available from each state DOT's website. Also, a questionnaire was designed and a telephone survey with all these DOTs was conducted to verify the collected information and gather extra information that was not available in their websites. No human subjects were involved in this effort. This chapter presents the gathered information.

4.2 Review of Available Online Information

The research team visited each DOT's website and gathered information related to oversized/overweight vehicle restrictions and permits. Along with these websites, the website of Specialized Carriers and Rigging Association (SC & RA) was also used for some of the states. The gathered information includes legal weight and dimensions of the vehicles, types of available permits, and their fees. This information is presented next.

4.2.1 Legal Weights and Dimensions

The legal weights and dimensions for Nebraska, other Midwestern states considered in this study are reported in **Table *4***. It should be noted that the maximum gross weight on Interstate highways is 80,000 lb., while in some states this value is 85,000 lb. on non-Interstate highways.

4.2.2 Permit Types and Fees

Each of the reviewed states have a unique set of permit types and fees based on different criteria and structures. As a result, the research team found it impossible to present these

structures and fees in a uniform table or figure for the various states considered in this study. Each state's permit fees and structure (in alphabetical order) is as follows.

Table 4 Legal weights and dimensions for Nebraska, other Midwestern states, and Nebraska's neighbors

Size or Weight Criteria	Nebraska	Colorado	Illinois	Indiana	Iowa	Kansas	Michigan	Minnesota	Missouri	North Dakota	Ohio	South Dakota	Wisconsin	Wyoming
Maximum overall width	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"	8'6"
Maximum overall height	14'6"	14'6"	13'6"	13'6"	13'6"	14'0"	13'6"	13'6"	14'	14'	13'6"	14'	13'6"	14'
Maximum overall length, single vehicle	40'	45'	42'	40'	41'	45'	40'	45'	45'	50'	40'	45'	45'	60'
Maximum overall length, combination of vehicles	65'	70'	60'	60'	-	65'	65'	75'	60'	75'	65'	80'	65'	60'
Maximum overall length, semi-trailer (excluding truck-tractor)	53'	57'4"	53'	53'	53'	59'6"	53'	45'-53'	53'	53'	53'	53'	-	48'
Maximum overall length, semi-trailer and trailer (including connecting devices, excluding truck-tractor)	65'	-	-	-	-	-	-	-	-	-	-	-	-	81'
Maximum single wheel load (lb)	10000	-	-	-	-	10000	-	10000	-	10000	-	-	11000	10000
Maximum single axle load (lb)	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
Maximum tandem axle load (lb)	34000	36000	34000	34000	34000	34000	34000	-	34000	34000	34000	34000	34000	36000
Maximum Gross Weight (lb)	-	80000	80000	-	80000	80000	80000	80000	80000	-	80000	80000	80000	80000

4.2.2.1 Colorado

In Colorado there are three main types of permits available for purchase that are single trip, annual, and special. The fees of these permits are dependent on weight, dimensions, and number of vehicle axels. These permits and their affiliated fees are provided in **Table *5***.

Table 5 Permit types and fees for Colorado

Vehicle	Single Trip*	Annual	Special**
OS	$15	$250	$125
OW	$15+$5 per axle	$400	$125
OSOW	$15+$5 per axle	$400	$125
Non-Interstate Quad	$30+$10 per axle	$500	NA (Not Available)
Non-Interstate Tandem/Triple	$15+$10 per axle	$250 for 6 months	NA

*A permit that is valid for a single move not to exceed a maximum of five days.

**A permit that is valid for only a single one-way trip over designated State Highways for an Extra-legal Vehicle or Load that exceeds the Maximum Limits.

4.2.2.2 Illinois

In Illinois the fees and criteria for oversized and overweight vehicles are different. For oversized vehicles, 5 group sizes are defined and different fees are attributed to the affiliated permits based on the size group, travelled distance, type of vehicle (house trailer and non-house trailer), and permit type. These are presented in **Table *6*** and **Table *7***.

Table 6 Oversized vehicles permit fees and structure for Illinois

	Group A: a house trailer, oversize storage building, modular home section, or a unit carrying roof or floor trusses in combination With a towing vehicle				Group B: overdimension vehicles, combinations, and loads, other than house trailer			
Permit Type	Single trip		90-day	Annual	Single trip		90-day	Annual
Size Group	Distance				Distance			
Size Group 1	<90	$12	$100	$400	<90	$12	$100	$400
	90< <180	$15			90< <180	$15		
	180< <270	$18			180< <270	$18		
	>270	$21			>270	$21		
Size Group 2	<90	$15	$150	$600	<90	$15	$150	$600
	90< <180	$20			90< <180	$20		
	180< <270	$25			180< <270	$25		
	>270	$30			>270	$30		
Size Group 3	<90	$25	$250	$1,000	<90	$25	NA	NA
	90< <180	$30			90< <180	$30		
	180< <270	$35			180< <270	$35		
	>270	$40			>270	$40		
Size Group 4	<90	$30	$250	$1,000	<90	$30	NA	NA
	90< <180	$40			90< <180	$40		
	180< <270	$50			180< <270	$50		
	>270	$60			>270	$60		
Size Group 5	<90	$30	$250	$1,000	<90	$50	NA	NA
	90< <180	$40			90< <180	$75		
	180< <270	$50			180< <270	$100		
	>270	$60			>270	$125		

Table 7 Vehicles' size groups in Illinois

Size Group	1	2	3	4	5
Maximum Width	10'	12'	14'	14'4"	16'
Maximum Height	14'6"	14'6"	15'	15'	15'
Maximum Length (Group A)	70'	115'	115'	115'	115'
Maximum Length (Group B)	70'	85'	100'	120'	120'

Two other sets of fees are considered for overweight vehicles. The first set belongs to overweight axle loads and is presented in **Table *8***. The other set is based on gross weight, number of axles, and the travelled distance (see **Table *9***). It should be noted that in the cases of both axle overweight and gross overweight, the one that results in higher fees should be applied.

Table 8 Fees for overweight axle loads

Axle weight in excess of legal weight (lb.)	2-Axle Single Axle	3-Axle Tandem	Tandem
1 - 6000	$5	$5	$5
6001 - 11000	8	7	6
11001-17000	NA	8	7
17001 - 22000	NA	NA	9
22001 - 29000	NA	NA	11

Table 9 Gross overweight vehicles permit in Illinois

Total Axles	6 or more	6 or more	6 or more	6 or more	5	5
Gross Weight (maximum)	88,000	100,000	110,000	120,000	88,000	100,000
Front tandem or axle (max)/axles	34000/2	44000/2	44000/2	48000/2	44000/2	48000/2
Rear tandem or axle (max)/axles	48000/3	54000/3	54000/3	60000/3	44000/2	48000/2
Distance (miles)						
0–45	$10.00	$15.00	$20.00	$30.00	$20.00	$30.00
46–90	12.50	25.00	32.50	55.00	32.50	55.00
91–135	15.00	35.00	45.00	80.00	45.00	80.00
136–180	17.50	45.00	57.5.0	105.00	57.50	105.00
181–225	20.00	55.00	70.00	130.00	70.00	130.00
226–270	22.50	65.00	82.50	155.00	82.50	155.00
271–315	25.00	75.00	95.00	180.00	95.00	180.00
316–360	27.50	85.00	107.50	205.00	107.50	205.00
361–405	30.00	95.00	120.00	230.00	120.00	230.00
406–450	32.50	105.00	132.50	255.00	132.50	255.00
451–495	35.00	115.00	145.00	280.00	145.00	280.00

4.2.2.3 Iowa

There are four types of permits available to purchase in Iowa: single trip, round trip annual oversized, and annual oversized/overweight. The affiliated fees of these permits are shown in **Table *10***.

Table 10 Permit types and fees for Iowa

Permit Type	Fee ($)
Single trip permit	35
Round trip permit	70
Annual oversize permit	50
Annual oversize/overweight permit	400

4.2.2.4 Indiana

Permit types and fees for Indiana are shown in **Table *11*** and **Table *12***.

Table 11 Permit fees and structure for Indiana

Permit Type	Single-trip Permit							90-day Permit	Annual Permit
	Oversized (OS)			Overweight (OW)			OS and OW	OS	OS
Fee	$20	$30	$40	$20 +$0.35/mile	$20 +$0.60/mile	$20 +$1.00/mile	The greater of the calculated OS or OW fees	$100	$405
Width	<12’4”	12’5”< <16’	Otherwise	Legal Size	Legal Size	Legal Size		<12’4”	<12’4”
Length	<95’	96’< <110’						<110’	<110’
Height	13’6”	13’7”< <15’						13’6”	13’6”
Weight (lb.)	<80000	<80000	<80000	<108000	108001 < <150000	>150000		<80000	<80000

Table 12 Mobile-home fees and structure for Indiana

Permit Type	Single-trip Permit			90-day Permit			Annual Permit		
Fee	$10	$18	$30	$250	$500	NA	$1,000	$2,000	NA
Width	<12’4”	<14’4”	<16’	<12’4”	<14’4”	<16’	<12’4”	<14’4”	<16’
Length	<110’	<110’	<110’	<110’	<110’	<110’	<110’	<110’	<110’
Height	<14’	<14’6”	<14’6”	<14’	<14’6”	<14’6”	<14’	<14’6”	<14’6”
Weight (lb.)	<80000	<80000	<80000	<80000	<80000	<80000	<80000	<80000	<80000

4.2.2.5 Kansas

Different permit types that are available to purchase in Kansas and their fees are reported in **Table *13***.

Table 13 Permit types and fees for Kansas

Single-trip Permit	Five-year permit for vehicles authorized to move bales of hay on non-interstate highways	Annual Permit	Annual permit for special vehicle combination for qualified companies
$20	$25	$150	$2000+$50 per year for each power unit operating under such annual permit

4.2.2.6 Michigan

Single-trip and annual permit fees in Michigan are also dependent on the size and weight of the vehicles. These fees are presented in **Table *14***.

Table 14 Permit types and fees for Michigan

Permit	Oversized	Overweight	Overweight and Oversized
Single-trip	$15	$50	
Annual	$30	$100	

4.2.2.7 Minnesota

In Minnesota, based on size and weight of the vehicle, single-trip and annual permits are available to purchase. The fee of single-trip permits for overweight vehicles is comprised of $15 and a mileage fee. Different permit types and their fees for Minnesota are presented in **Table *15*** while the mileage fees are reported in **Table *16***.

Table 15 Permit types and fees for Minnesota

Vehicle Type	Gross Weigh (1000 lb.)	Single-trip Permit	Annual Permit
Oversized	Not Restricted	$15	$120
Overweight and/or Oversized	< 90	$15 + mileage fee	$200
	90< <100		$300
	100< <110		$400
	110< <120		$500
	120< <130		$600
	130< <140		$700
	140< <145		$800
	145< <155		$900

Table 16 Mileage fees details for Minnesota

Total Axle Group Weights	Two Axles Spaced Within 8' or Less	Three Axles Spaced Within 9' or Less	Four Axles Spaced Within 14' or Less
0 - 34,000	0	0	0
34,000 - 36,000	0.12	0	0
36,001 - 38,000	0.14	0	0
38,001 - 40,000	0.18	0	0
40,001 - 42,000	0.21	0	0
42,001 - 44,000	0.26	0.05	0
44,001 - 46,000	0.3	0.06	0
46,001 - 48,000	NA	0.07	0
48,001 - 50,000	NA	0.09	0
50,001 - 52,000	NA	0.1	0.04
52,001 - 54,000	NA	0.12	0.05
54,001 - 56,000	NA	0.14	0.06
56,001 - 58,000	NA	0.17	0.07
58,001 - 60,000	NA	0.19	0.08
60,001 - 62,000	NA	NA	0.09
62,001 - 64,000	NA	NA	0.11
64,001 - 66,000	NA	NA	0.12
66,001 - 68,000	NA	NA	0.15
68,001 - 70,000	NA	NA	0.16
70,001 - 72,000	NA	NA	0.2
72,001 - 80,000	NA	NA	NA

4.2.2.8 Missouri

Table *17* shows the details and fees of the permit types that are available to purchase in Missouri, which are comprised of single-trip oversized and overweight permits and multi-stop oversized permits. Also, there are a number of special permits in Missouri that are dependent on type of vehicle and load. These are presented in **Table *18***.

Table 17 Permit types and fees for Missouri

Permit	Single-trip oversized permit		Multi-stop oversized permit (farm implements only)	Single trip overweight permits			
Fee	$15	$15+$250	$25	$15+$20 per each 10000 lb. in excess of legal gross weight	$15+$20 per each 10000 lb. in excess of legal gross weight+$425	$15+$20 per each 10000 lb. in excess of legal gross weight+$625	$15+$20 per each 10000 lb. in excess of legal gross weight+$925
Width	<16’	>16’	NA	NA	NA	NA	NA
Height	<16’	>16’	NA	NA	NA	NA	NA
Length	<150’	>150’	NA	NA	NA	NA	NA
Weight	NA	NA	NA	<160000 lb.	>160000 lb.	>160000 lb.	>160000 lb.
Mileage	NA	NA	NA	NA	0-50	51-200	>200

Table 18 Special permit types and fees for Missouri

Annual blanket emergency overweight permit (round trip)	Annual blanket oversize permit-single commodity	Annual blanket oversize permit-multiple commodity	Annual blanket overweight well drillers or concrete pump truck permit	Thirty-day blanket permit	Project permit	Highway crossing permit	Noncommercial building movement (in excess of routine dimensions)	Single trip commercial zone bridge analysis
$624	$128	$400	$300	$300	$125	$250	$265	$265

4.2.2.9 North Dakota

Single trip permits and annual overwidth permits for North Dakota are introduced in **Table *19*** and **Table *20***, respectively. It should be noted that in this state, all the permits are subject to an additional $15 service and routing fee.

Table 19 Single-trip permits types and fees for North Dakota

Fees	Weight (1000 lb.)	Comments
$20	<150	-
$30	150< <160	-
$40	160< <170	-
$50	170< <180	-
$60	180< <190	-
$70	>190	-
$25	<150	Self-propelled special mobile equipment
$100	NA	workover rigs
Permit fee+$.05 per ton per mile	>200	-

Table 20 Annual overwidth permits types and fees for North Dakota

Fees	Width	Noncommercial fishhouse trailer
$100	<14'6"	No
$20	<14'6"	Yes

4.2.2.10 Ohio

Ohio has single-trip and continuing permits available to purchase. The fees of these permits depend on size and weight of the vehicle, the type of trip, the travelled distance, and the duration of continuing permits. These details are shown in **Table *21***. Moreover, there are a number of special permits based on type of vehicle or load in Ohio that are presented in **Table *22***.

Table 21 Permit types and fees for Ohio

Permit	Weights and Size	Trip	Oversized	Overweight and/or Oversized
Single-trip permit	Routine Weights/Dimensions	One Way	$65	$135
		+Return	$100	$200
	Superload Weights/Dimensions	One Way	$135	135+$0.04 per miles travelled for each 1 ton excess of 120000 lb. (gross vehicle weight)
		+Return	$200	200+$0.04 per miles travelled for each 1 ton excess of 120000 lb. (gross vehicle weight)
Continuing (90 day) permit	Routine Weights/Dimensions	One Way	$250	$500
		+Return	$375	$750
	Superload Weights/Dimensions	One Way	NA	NA
		+Return	NA	NA
Continuing (Annual) permit	Routine Weights/Dimensions	One Way	$970	$1,970
		+Return	$1,170	$2,970
	Superload Weights/Dimensions	One Way	NA	NA
		+Return	NA	NA
Continuing (45 day) permit	Routine Weights/Dimensions	One Way	NA	NA
		+Return	NA	NA
	Superload Weights/Dimensions	One Way	NA	NA
		+Return	NA	NA

Table 22 Special permit types and fees for Ohio

Permit	Steel/Aluminum Coil	Multi-State Oversized Only	Multi-State Oversized and/or Overweight	Emergency	Michigan Legal	International Sealed Container
Single-trip permit	$65	$65	$135	$250	NA	NA
	NA	NA	NA	$365	NA	NA
	NA	NA	NA	NA	NA	NA
	NA	NA	NA	NA	NA	NA
Continuing (90 day) permit	$125	NA	NA	NA	$125	$500
	NA	NA	NA	NA	$125	NA
	NA	NA	NA	NA	$165	NA
	NA	NA	NA	NA	$165	NA
Continuing (Annual) permit	$470	NA	NA	NA	$470	NA
	NA	NA	NA	NA	$470	NA
	NA	NA	NA	NA	$630	NA
	NA	NA	NA	NA	$630	NA
Continuing (45 day) permit	NA	NA	NA	NA	NA	$250
	NA	NA	NA	NA	NA	NA
	NA	NA	NA	NA	NA	NA
	NA	NA	NA	NA	NA	NA

4.2.2.11 South Dakota

Table *23* shows the details and fees of the different permits that are available to purchase in South Dakota, which include single-trip and annual permits that are assigned to oversized and overweight vehicles. Also, there are a number of special permits in South Dakota that depend on the type of vehicle and load that are presented in **Table *24***.

Table 23 Permit types and fees for South Dakota

Permit	Number of axles	Weight (1000 lb.)	Single Trip	Annual
Oversized	-	-	$25	$60
Overweight or Overweight/Oversized	2	>40	$25+$0.02 per ton-mile	NA
	3	>60		
	4	>80		
	5	>85		
	6	>90		
	>7	>95		

Table 24 Special permit types and fees for South Dakota

Longer combination vehicle	Overweight Booster Axle	Annual Lift Axle or Variable Load Axle	Manufactured Home		Slow Movement on Interstate		Annual oversized trailer	Overlength Semitrailer	
			Single trip	Annual	Single trip	Annual		Single trip	Annual
$100 for book of 10 permits	$60	$60	$25	$60	$25	$60	$60	$25	$60

4.2.2.12 Wisconsin

In Wisconsin, there are single-trip, annual, consecutive months, and multiple-trip permits available to purchase. The fees and details of these permits are presented in **Table *25***.

Table 25 Permit types and fees for Wisconsin

Types of Permit	For vehicles or combination of vehicles which exceeds the limitation of						
	Length	Width or height	Width and height	Weight		Transportation of sealed loads in international trade	Transportation of certain agricultural products
Single-trip Permit	$15	$20	$25	10% of corresponding annual fee		$30	NA
Annual Permit	$60	$90	$90	>90000 lb.	$200	$300	$300
				90000< <100000 lb.	$350		
				>100000 lb.	$350+$100 for each extra 10000 lb.		
Consecutive Months Permit	One-twelfth of the annual fee multiplied by the number of months, plus $15 for each permit						
Multiple-trips Permit	$25 - $90 (varies by dimension)			$65 - $1,050 (varies by load type & weight)		-	-

4.2.2.13 Wyoming

In Wyoming there are overdimension and overweight permits. Overdimension permits have a flat fee of $25, plus $.03 per foot or fraction in excess of the legal dimensions for each mile traveled. Overweight permits are $.06 per ton or fraction in excess of statutory weights for each mile traveled with the minimum fee of $40.

4.3 Telephone Survey

As mentioned before, a questionnaire was designed for conducting a telephone survey with all the Midwestern and Nebraska's neighbor DOTs to verify the collected information and gather extra information that was not available in their websites. No human subjects were involved in this effort. The research team was not successful in getting a response from five state DOT's (Colorado, Indiana, Michigan, Minnesota, and Wisconsin) by telephone and therefore, decided to mail the questionnaire to these state DOT's. The Michigan and Minnesota DOT's responded to the mail

questionnaire. As a result, ten out of thirteen states were successfully surveyed. The results are reported in this section. The questionnaire that was designed and used in the telephone survey is shown in **Figure *1***. Results of the survey are summarized and presented in **Table *26*** and **Table *27***.

Telephone Survey for Oversized/Overweight Permitting Fees

Hello, my name is _____, and I am calling from University of Nebraska-Lincoln. We are conducting a survey of Nebraska's neighboring and Midwestern state DOTs about oversized/overweight vehicles permit fees. Its purpose is to find different types of oversized/overweight vehicles' permits that you have in your state, their affiliated fees and these fees determination procedures. The survey will help us get familiar with different approaches to determining permitting fees, in order to find a practical and appropriate approach for Nebraska. It will only take 10 minutes and you may elect to answer specific questions only and your cooperation is voluntary, but we'd greatly appreciate your help.

1- Responding Agency Information

1.1 State:

1.2 Agency name:

1.3 Division name:

1.4 Person's name and title:

1.5 Person's contact information:

2- Legal truck size and weight

2.1 Truck size and weight limitation that are already extracted from DOT's website will be presented here for the surveyor to check with the DOT.

- 2.2 Are there any other limitations on trucks' entrance into your state? Please mention them.

3- Oversized/overweight Vehicles Permits

3.1 Oversized/overweight vehicles permits procedures, types and fees that are already extracted from DOT's website will be presented here for the surveyor to check with the DOT.

4- Methods for Determining Permit Fees

- 4.1 How were the current fees determined (damage to pavement, damage to bridges and/or other structures, safety, etc.)?

- 4.2 When were the current fees last updated?

- 4.3 Is there any documentation available that provides information on pavement and bridge damage and/or safety-related costs of overweight/oversized vehicles in your state?

5- Attracting Trips

- 5.1 Are you aware of any evidence that the permit fee in your state results in attracting oversized/overweight vehicles from/to the surrounding states?

6- Providing Data

- 6.1 What type of data do you maintain on oversized/overweight vehicles?

- 6.2 Would you be willing to share the data for research purposes with University of Nebraska?

Figure 1 Questionnaire for the oversized/overweight vehicles' permit telephone survey

Table 26 Results of the state DOT's survey - Part 1

State	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6
Illinois	1.1 Illinois 1.2 - 1.3 - 1.4 Bryon Williams 1.5 E-mail: bryon.williams@illinois.gov Tel: (217) 785-1477	2.1 Verified 2.2 None	3.1 Verified	4.1 The respondent does not know 4.2 "Approximately 40 years ago." 4.3 "Not that I am aware of."	5.1 "Yes, Illinois's permit is cheap and overweight/oversized vehicles are attracted to Illinois."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes, it may be possible."
Iowa	1.1 Iowa 1.2 Iowa DOT 1.3 Vehicle and Motor Carrier Services 1.4 Phoumine Baccam 1.5 E-mail: phoumine.baccam@dot.iowa.gov Tel: (515) 237-3270	2.1 Verified 2.2 None	3.1 Verified	4.1 The respondent does not know 4.2 "2015" 4.3 "Not that I am aware of."	5.1 "Yes, Iowa's permit is cheap and overweight/oversized vehicles are attracted to Iowa."	6.1 Five year information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes, it is not private."
Kansas	1.1 Kansas 1.2 Kansas DOT 1.3 Bureau of Transportation Planning 1.4 John W. Maddox, Program Manager 1.5 E-mail: johnm@ksdot.org Tel: (785) 296-3228	2.1 Verified 2.2 None	3.1 Verified	4.1 "We do not have any data about that. It must be related to infrastructures, crashes and fatality." 4.2 "2009" 4.3 "We do not have any right now."	5.1 "Yes."	6.1 Two and a half year information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes."
Michigan	1.1 Michigan 1.2 Michigan DOT 1.3 Development Services Division 1.4 Scott Greene, Manager 1.5 E-mail: greenes2@michigan.org	2.1 Verified 2.2 "Yes, there is a 700 lb. per inch of tread width limit."	3.1 Verified	4.1 "Legislation, to cover administrative costs and permit application." 4.2 "1998" 4.3 "No."	5.1 "No."	6.1 "three years' worth of permit applications" 6.2 "Possibly, but it may not be easy."
Minnesota	1.1 Minnesota 1.2 Minnesota DOT 1.3 Modal Planning, Program Management 1.4 Ted Coulianos, Permits Supervisor 1.5 E-mail: ted.coulianos@state.mn.org Tel: (651) 355-0250	2.1 Verified 2.2 None	3.1 Verified	4.1 The respondent does not know 4.2 Early 1980's 4.3 "Not that I would know"	5.1 "No."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes."

Table 27 Results of the state DOT's survey - Part 2

State	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6
Missouri	1.1 Missouri 1.2 Missouri DOT 1.3 Motor Carrier Services 1.4 Debra Bradshaw, OS/OW Supervisor 1.5 E-mail: debra.bradshaw@modot.mo.gov Tel: (573) 751-7410	2.1 Verified 2.2 None	3.1 Verified	4.1 "Damage of roadway and previous permit fees were considered." 4.2 "2009" 4.3 "Yes, it is stored by the DOT traffic division"	5.1 "No."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes."
North Dakota	1.1 North Dakota 1.2 North Dakota Highway Patrol 1.3 Permit Office 1.4 Jackie Darr, Supervisor 1.5 E-mail: jdarr@nd.gov Tel: (701) 328-4341	2.1 Verified 2.2 None	3.1 Verified	4.1 The respondent does not know 4.2 "1999" 4.3 "No."	5.1 "When the vehicles' weight is over 200000 lb. North Dakota attracts trips."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "It is very expensive and Large."
Ohio	1.1 Ohio 1.2 Ohio DOT 1.3 Special Hauling Permits 1.4 Mike Moreland, Supervisor 1.5 E-mail: mike.moreland2@dot.state.oh.us Tel: (614) 351-5530	2.1 Verified 2.2 None	3.1 Verified	4.1 *"Damage to pavement and bridges"* 4.2 "2009" 4.3 "There is a study done in 2008 that contains this information"	5.1 "No."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes, 2013 and later data."
South Dakota	1.1 South Dakota 1.2 South Dakota Highway Patrol 1.3 Motor Carrier Services 1.4 - 1.5 Tel: (800) 637-3255	2.1 Verified 2.2 None	3.1 Verified	4.1 "Damage to pavement and bridges" 4.2 The respondent does not know 4.3 "Yes. DOT keeps the data"	5.1 "Yes."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "Yes."
Wyoming	1.1 Wyoming 1.2 Wyoming DOT 1.3 - 1.4 - 1.5 Tel: (307) 777-4376	2.1 Verified 2.2 None	3.1 Verified	4.1 The respondent does not know 4.2 "Before 20 years ago" 4.3 The respondent does not know	5.1 "Wyoming's permits are relatively expensive."	6.1 Information on the vehicles' dimensions and weight and the purchased permits 6.2 "It is not her decision."

Chapter 5 Comparison of Permit Fees

5.1 Objective

This chapter presents a comparison of permit fees for Nebraska and the thirteen Midwestern/neighboring states. The purpose of this comparison was to investigate whether Nebraska's permit fees are cheap, relative to these states, which might be attracting oversized/overweight trucks to Nebraska.

5.2 Oversized/Overweight Vehicles Numerical Simulation

Due to the disparity in fee structures across the states considered in this study, the permit fee were not comparable by just looking at the extracted tables (shown in the previous chapter). The research team compared the average amount of money that a number of various oversized/overweight vehicles would have paid to purchase permits from all these states if they had to pass through all of them. In order to do this, a dataset of oversized/overweight vehicles was needed and a 2014-2016 permit dataset, including oversized/overweight vehicles and purchased permits information, was requested and received from the NDOT. Unfortunately, this dataset did not contain all of the information that was needed in all of the regarded states' permit structure to calculate the fees. Instead, the research team decided to simulate a dataset numerically to use for comparison.

In the numerical simulation, a number of vehicles were generated with random dimensions and weights. A numerical range was defined for each dimension and weight criteria along with the number and type of axles and distance travelled, and a random value in each affiliated range was generated from a uniform distribution. The dimension and weight criteria and number and type of axles and distance travelled, and also the ranges that were used, are presented in **Table *28***. For each randomly generated vehicle, the computer program determined whether the vehicle is oversized, overweight, or both in each state, and then permit fees were

calculated for each vehicle in each state. Five-hundred oversized/overweight vehicles were randomly generated, and permit fees for single permit and annual permit were calculated for all the states under consideration. The total revenue of these 500 vehicles in each state were calculated.

Table 28 The ranges used in oversized/overweight vehicles' numerical simulation

Criteria	Range
Overall Width (ft)	6 - 17
Overall Height (ft)	10 - 16
Overall Length, Single Vehicle (ft)	30 - 56
Overall Length, Combination of Vehicles (ft)	45 - 86
Overall Length, Semi-Trailer (Excluding Truck-Tractor) (ft)	40 - 65
Single Axle Load (lb.)	10000 - 30000
Tandem Axle Load (lb.)	20000 - 40000
Number of Axles	2 - 6
Distance (miles)	80 - 300

The number of randomly generated vehicles, as was mentioned, was chosen as 500. The reason was that the comparison results started to stabilize around 300 vehicles. The research team increased the number to 500 to ensure reliability of the results. Moreover, the ranges shown in **Table 28** were determined based on covering all the possible variations that existed in all the

states fees structures for each criteria. Using the simulated vehicles, the final average fees for single permit and annual permit are reported in **Table 29**. Also, **Table 30** and **Table 31** show the sorted states based on average single permit and annual permit fees, respectively (from expensive to cheap). It should be noted that Illinois and Wyoming were excluded from the simulation due to the complex nature of their permitting structures and dependence on other variables.

Table 29 Average permit fees based on numerical simulation

State	Average Single-trip Permit Fee, $	Average Annual Single Trip Permit Fee, $
Nebraska	21.28	100.00
Colorado	28.35	351.60
Indiana	78.39	NA
Iowa	10.00	203.01
Kansas	20.00	150.00
Michigan	37.66	75.31
Minnesota	15.00	240.48
Missouri	140.55	300.00
North Dakota	21.22	100.00
Ohio	110.31	1617.29
South Dakota	135.45	NA
Wisconsin	34.35	330.23

Table 30 States ranks from expensive to cheap permit fees (single permit)

Rank	State	Average Single-trip Permit Fee, $
1	Missouri	140.55
2	South Dakota	135.45

3	Ohio	110.31
4	Indiana	78.39
5	Michigan	37.66
6	Wisconsin	34.35
7	Colorado	28.35
8	**Nebraska**	**21.28**
9	North Dakota	21.22
10	Kansas	20.00
11	Minnesota	15.00
12	Iowa	10.00

Table 31 States ranks from expensive to cheap permit fees (annual permit)

Rank	State	Average Annual Permit Fee, $
1	Ohio	1617.29
2	Colorado	351.60
3	Wisconsin	330.23
4	Missouri	300.00
5	Minnesota	240.48
6	Iowa	203.01
7	Kansas	150.00
8	**Nebraska**	**100.00**
9	North Dakota	100.00
10	Michigan	75.31
-	Indiana	NA
-	South Dakota	NA

5.3 Consideration of Inflation

Based on the available institutional knowledge from NDOT/TAC members, the Nebraska permit fees were last updated sometime around the early 1990s. Considering inflation based on the Consumer Price Index (CPI) since 1992 (assuming 1992 as an approximation for the early

1990s), if the Nebraska permit fees are updated only based on inflation, the average single trip permit and average annual permit fees will be $36.64 and $172.17, respectively (this conversion was based on using the Bureau of Labor Statistics online inflation calculator). The use of these values will change Nebraska's position from rank 8 to ranks 6 and 7 for single and annual permits, respectively (in **Table 30** and

Table 31).

Chapter 6 Examination of Overweight Vehicle Costs to Nebraska

6.1 Objective

In this chapter, the marginal pavement damage costs (MPDC) for each overweight truck is quantified. While oversized vehicles may have costs (e.g., possible crash over involvement or marginally greater traffic delays), they were not considered in this analysis. The estimation of MPDC is helpful in determining appropriate permit fees for overweight vehicles. The main approach used in this research is based on reference *(5)*, which considers pavement maintenance, rehabilitation, and reconstruction (MR&R) costs in an empirical manner to quantify MPDC. The empirical approach is based on the statistical relationship between observed pavement MR&R costs and appropriate explanatory variables such as pavement age, surface type, traffic, and climate. The derivative of the estimated cost function with respect to the road-use variable yields the MPDC *(5)*.

6.2 Methodology

The framework of the method proposed in *(5)* is illustrated in **Figure *2***. A description of each step is discussed herein.

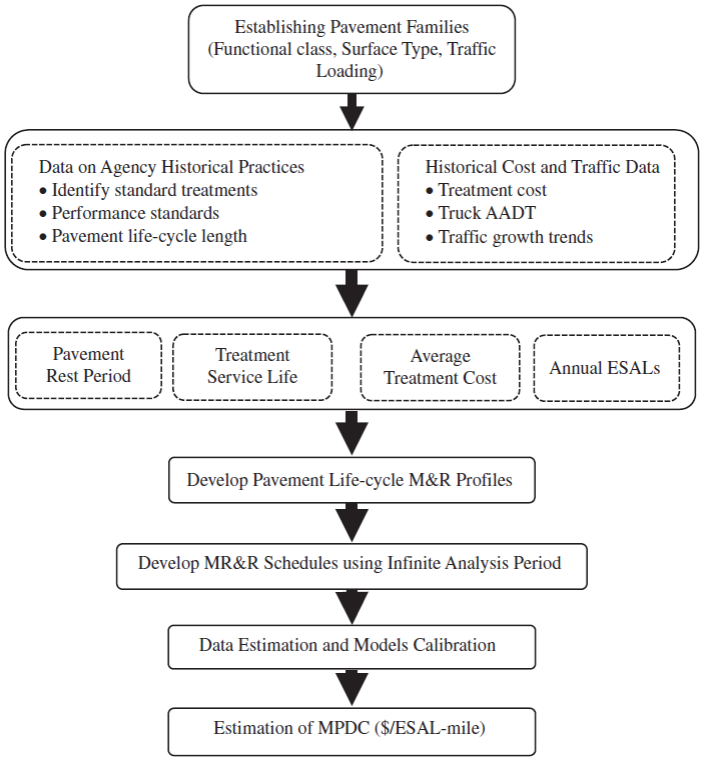

Figure 2 Framework for MPDC estimation (from (5))

6.2.1 Establishing pavement families

In this study, pavements were clustered on the basis of their surface type, functional class and traffic loading level. This was due to accounting for the heterogeneity of pavement in the transportation system in terms of attributes such as their design and material types *(5)*.

6.2.2 Scheduling parameters (treatment types and triggers)

The variety of treatments for pavements depend on the pavement surface type, functional class and age. For flexible pavements, these treatments include crack sealing, chip sealing, thin hot mix asphalt (HMA) overlay, micro-surfacing, functional HMA overlay, structural HMA overlay, mill full-depth and asphalt concrete overlay, and resurfacing over existing asphalt pavement. For rigid pavements, the treatments include crack sealing, cleaning and sealing of joints, concrete pavement restoration, repair Portland cement concrete (PCC) pavement and HMA overlay, PCC overlay of existing PCC pavement, crack-and-seat PCC and HMA overlay, and rubblized PCC and HMA overlay *(5)*.

6.2.3 Life-Cycle Length

The FHWA suggests that the analysis period should be long enough to accommodate all the rehabilitation and periodic maintenance treatments necessary to maintain the pavement at an acceptable level of service, and a period of 30-50 years is often suggested in the literature *(5)*.

6.2.4 Cost, Traffic, and Pavement Performance Data Collection

In this step, data regarding the costs of pavement reconstruction, routine and periodic maintenance, rehabilitation, traffic volume information (e.g. AADT or Truck AADT), and pavement performance data should be collected.

6.2.5 Pavement Rest Period and Treatment Service Life Estimation

A rest period is defined as the time between the pavement construction and first major treatment. Also, each maintenance and rehabilitation treatment implemented in the pavement life cycle has a service life *(5)*.

6.2.6 Average Treatment Cost and Average ESALs Estimation

Pavement repair expenditures were determined on the basis of the unit costs ($/lane-mile) of the treatments that comprise the schedule for each pavement family and repair schedule. In this approach, costs of past years were converted to the equivalent 2010 dollar values using FHWA's consumer price indices. Also, for a representative pavement section of each highway functional class, the average ESALs were calculated *(5)*.

6.2.7 Development of Pavement Life-Cycle M&R Profiles

An M&R profile is a combination of treatment types and their application timings during the life cycle of a pavement *(5)*. In the reference study, a pavement life-cycle M&R profile was established for each functional class. Five life-cycle M&R profiles for flexible pavements and four life-cycle M&R profiles for rigid pavements were established for each traffic loading level.

A total of 60 life-cycle M&R profiles were established for flexible pavements and 32 for rigid pavements. For a given pavement segment, different life-cycle M&R profiles represent a combination of different M&R treatments over one life cycle *(5)*.

6.2.8 Development of MR&R Schedules for Different Pavement Age Groups

It is necessary to consider variation in the age of the pavements under consideration (i..e., not all are new or of the same age) in damage cost estimation. In the reference study, MR&R schedules were developed for different pavement age groups. **Figure *3*** shows an example of a 10-year old pavement (R is the total cost) and how this was taken into account. It is assumed that the pavement is reconstructed every 50 years. The partial life-cycle length differs for the other pavement age groups: 40, 30, 20, and 10 years for the age groups 5–15, 15–25, and so forth.

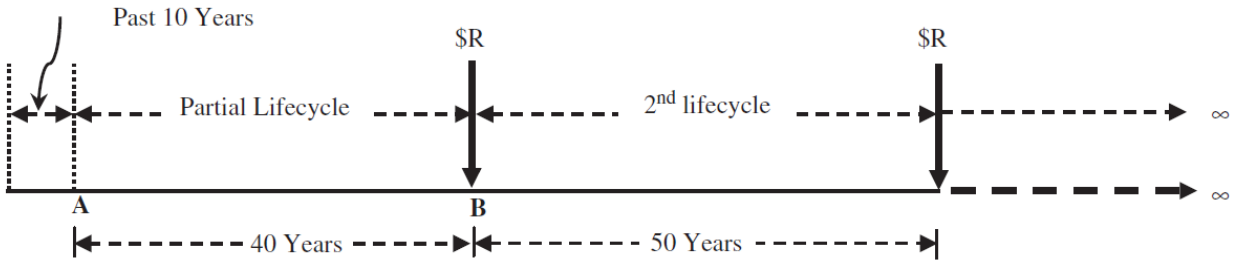

Figure 3 Example of MR&R schedules for a 10-year old pavement (from (5))

6.2.9 Estimating the Overall Cost for MR&R Schedules

The overall costs for MR&R schedules can be estimated as the summation of the present worth of partial cycle costs and the present worth of full cycle costs over an infinite analysis period. The present worth of partial cycle costs ($PW(PC)_{M\&R}$) is defined as equation 1. In this equation, *r* is the real discount rate, *t* is the year of application rehabilitation – periodic or route maintenance treatment – *m1* is the number of rehabilitation treatments applied to the pavement

during the partial life cycle, *m2* is the number of periodic maintenance treatments applied to the pavement during the partial life cycle, *m3* is the number of routine maintenance treatments applied to the pavement during the partial life cycle, *Rehab* is the rehabilitation treatment, *PM* is the periodic maintenance, and *RM* is the routine maintenance.

$$PW(PC)_{M\&R} = \sum_{i=1}^{m1} \frac{cost_i^{rehab}}{(1+r)^{t\_rehab_i}} + \sum_{i=1}^{m2} \frac{cost_i^{PM}}{(1+r)^{t\_PM_i}} + \sum_{i=1}^{m3} \frac{cost_i^{RM}}{(1+r)^{t\_RM_i}} \quad (1)$$

The present worth of the full cycles, $PW(FC)_{M\&RR(\infty)}$, is defined as equation 2. In this equation *N* is the length of one full life cycle of the pavement, *R* is the compounded life-cycle cost of one full life cycle (at the start of a full cycle) and m is the length of the partial life cycle.

$$PW(FC)_{M\&RR(\infty)} = \frac{R[(1+r)^N/(((1+r)^N - 1)]}{1/(1+r)^m} \quad (2)$$

Finally, the equivalent uniform annual cost (EUAC) to perpetuity is calculated using equation 3.

$$EUAC_{MR\&R(\infty)} = \left[PW(PC)_{M\&R} + PW(FC)_{MR\&R(\infty)}\right]^r \quad (3)$$

6.2.10 Estimating the Traffic Loading over the Pavement Life Cycle

The total ESALs over one full life cycle can be estimated as in equation 4. In this equation, *k* is the analysis period (50 years), *TruckAADT* is the annual average daily truck traffic, D_d is the directional distribution factor, G_f is the growth factor during the analysis period, L_d is

the lane distribution factor, LEF_i is the load equivalency factor contributed by a truck belonging to class *i*, $\%Class_i$ is the percentage of trucks in class *i*, and *m* is the number of truck classes.

$$\sum_{k=1}^{50} ESAL = TruckAADT \times 365 \times D_d \times G_f \times L_d \times \sum_{i=1}^{m} (LEF_i \times \%Class_i) \quad (4)$$

6.2.11 Estimating the Cost of Pavement Damage and Marginal Cost Estimation

Regression models are estimated with $EUAC_{MR\&R(\infty)}$ as the response variable and $\ln(ESALs)$ (ln = natural logarithm), type of pavement, pavement age, highway functional class, and other variables as explanatory variables. MPDC can be calculated by dividing the estimated coefficient of $\ln(ESALs)$ by the value of *ESALs*.

6.3 Results

The final calculated MPDCs by reference *(5)*, using the method introduced and based on Indiana data is:

Interstate = $0.0032/ESAL-mile

National Highways = $0.0287/ESAL-mile

Non-National Highways = $0.1124/ESAL-mile

Average = $0.0481/ESAL-mile

Weighted Average (assuming a route with 50% interstate, 40% national highways and 10% non-national highways) = $0.0243/ ESAL-mile

Calculation of the ESAL factor for each OW vehicle depends on many factors, including the Annual Average Daily Traffic (AADT) and its vehicle composition, directional distribution factor, growth factor, lane distribution factor, load equivalency factor, type of pavement, vehicle

characteristics, etc. Based on a 2-year Nebraska permit data (July 2014 – July 2016) obtained from NDOT, the 1st quantile, median, 3rd quantile, and number of axles for different gross weight groups of OW vehicles were extracted, and an approximate ESAL was calculated for each gross weight group-number of axles combination. In these calculations, flexible pavement with SN=2 and single axles was assumed (except where the axle loads were over 30,000 lbs., where tandem axle was assumed). The approximate ESALs and their averages for weight groups and different number of axels are reported in **Table *32***. ESAL factors are extracted from *(10)*.

Table 32 Approximate ESAL Factors

Gross Weight	Characteristics	Number of Axles			Average
		1st Qu.	Median	3rd Qu.	
80000-99999	**Number of Axles**	5	5	6	5.33
	ESAL Factor	5	5	2.88	**4.29**
100000-119999	**Number of Axles**	6	6	7	6.33
	ESAL Factor	6.6	6.6	3.5	**5.57**
120000-139999	**Number of Axles**	6	7	7	6.67
	ESAL Factor	13.2	7.7	7.7	**9.53**
140000-159999	**Number of Axles**	7	7	8	7.33
	ESAL Factor	15.4	15.4	8.8	**13.20**
160000-179999	**Number of Axles**	8	8	8	8.00
	ESAL Factor	17.6	17.6	16	**17.07**
180000-199999	**Number of Axles**	9	10	11	10.00
	ESAL Factor	18.9	12	8.8	**13.23**
200000-219999	**Number of Axles**	10	11	11	10.67
	ESAL Factor	21	13.2	14.3	**16.17**
220000-239999	**Number of Axles**	12	13	13	12.67
	ESAL Factor	14.4	11.7	11.7	**12.60**
240000-259999	**Number of Axles**	12	13	13	12.67
	ESAL Factor	25.2	15.6	16.9	**19.23**
260000-279999	**Number of Axles**	13	13	13	13.00
	ESAL Factor	27.3	20.8	20.8	**22.97**
280000<	**Number of Axles**	14	19	19	17.33
	ESAL Factor	30.8	9.5	9.5	**16.60**

Finally, **Table 33** and

Table 34 present the damage costs based on average MPDCs and weighted average MPDCs, respectively, categorized on gross weight groups and the different travel distances in Nebraska. The means of such values are also presented in these tables. For example, an OW vehicle in the 160000-179999 lb. weight group that travelled for 200 miles in Nebraska, caused $164.18 in pavement damage costs (2010 dollars) based on the average MPDC, while it caused $83.01 in pavement damage costs based on the weighted average MPDC. The values of these two tables are based on numerous assumptions while having access to data and information may make some of the outcomes more realistic.

Table 33 Damage Costs Based on Average MPDCs (2010 dollars)

Gross Weight	Average ESALS	Damage Cost/mile (Average)	Damage Costs (Average, 2010 $)						
			Distance (mile)						Mean Cost
			50	100	200	300	400	500	
80000-99999	4.2933	0.2065	10.33	20.65	41.30	61.95	82.60	103.25	**53.35**
100000-119999	5.5667	0.2678	13.39	26.78	53.55	80.33	107.10	133.88	**69.17**
120000-139999	9.5333	0.4586	22.93	45.86	91.71	137.57	183.42	229.28	**118.46**
140000-159999	13.2000	0.6349	31.75	63.49	126.98	190.48	253.97	317.46	**164.02**
160000-179999	17.0667	0.8209	41.05	82.09	**164.18**	246.27	328.36	410.45	**212.07**
180000-199999	13.2333	0.6365	31.83	63.65	127.30	190.96	254.61	318.26	**164.44**
200000-219999	16.1667	0.7776	38.88	77.76	155.52	233.29	311.05	388.81	**200.88**
220000-239999	12.6000	0.6061	30.30	60.61	121.21	181.82	242.42	303.03	**156.57**
240000-259999	19.2333	0.9251	46.26	92.51	185.02	277.54	370.05	462.56	**238.99**
260000-279999	22.9667	1.1047	55.23	110.47	220.94	331.41	441.88	552.35	**285.38**
280000<	16.6000	0.7985	39.92	79.85	159.69	239.54	319.38	399.23	**206.27**

Mean Cost	32.90	65.79	131.58	197.38	263.17	328.96	169.96

Table 34 Damage Costs Based on Weighted Average MPDCs (2010 dollars)

Gross Weight	Average ESALS	Damage Costs/Mile (Weighted Average)	Damage Costs (Average, 2010 $)						
			Distance (Mile)						Mean
			50	100	200	300	400	500	
80000-99999	4.2933	0.1044	5.22	10.44	20.88	31.32	41.77	52.21	**26.97**
100000-119999	5.5667	0.1354	6.77	13.54	27.08	40.61	54.15	67.69	**34.97**
120000-139999	9.5333	0.2319	11.59	23.19	46.37	69.56	92.74	115.93	**59.89**
140000-159999	13.2000	0.3210	16.05	32.10	64.20	96.31	128.41	160.51	**82.93**
160000-179999	17.0667	0.4151	20.75	41.51	**83.01**	124.52	166.02	207.53	**107.22**
180000-199999	13.2333	0.3218	16.09	32.18	64.37	96.55	128.73	160.92	**83.14**
200000-219999	16.1667	0.3932	19.66	39.32	78.63	117.95	157.27	196.59	**101.57**
220000-239999	12.6000	0.3064	15.32	30.64	61.29	91.93	122.57	153.22	**79.16**
240000-259999	19.2333	0.4678	23.39	46.78	93.55	140.33	187.10	233.88	**120.84**
260000-279999	22.9667	0.5585	27.93	55.85	111.71	167.56	223.42	279.27	**144.29**
280000<	16.6000	0.4037	20.19	40.37	80.74	121.11	161.48	201.86	**104.29**
Mean			**16.63**	**33.27**	**66.53**	**99.80**	**133.06**	**166.33**	**85.94**

Chapter 7 Conclusions

This research assessed the oversized/overweight vehicle permit fees policies and procedures of Nebraska and other Midwestern/neighboring states. The results may be used by NDOT for policy-related decisions on oversize/overweight vehicle permitting procedures. This research project was conducted in six stages, with results and conclusions reported for each stage. The first stage included a TAC meeting and a literature review. An initial meeting with TAC members was arranged to discuss the research approach. Available research literature was reviewed, including research papers and state DOT project reports, with particular emphasis on permit fee structures and policies. The second stage was the examination of the Nebraska permit process and structure. This was done using NDOT's website and in consultation with NDOT representatives.

The third stage consisted of a review of state DOTs' policies/procedures. A review of online information available from each state DOT was made to document their permit fee policies and procedures. To obtain more information and verify the online information on permits, state DOTs including Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Ohio, South Dakota, Wisconsin, Colorado, and Wyoming were contacted and asked to provide detailed information via a telephone/mail survey. The outcome of the online and telephone survey was structured and presented in a set of tables for reference and comparison. The fourth stage involved a comparison of permit data. Five-hundred oversized/overweight vehicles were randomly simulated based on dimension and weight criteria, and the permit fees were calculated for these trucks for Nebraska and all the states that were considered in this study. Based on the average fee of each state for single-trip and annual permits, the states were sorted from expensive to cheap. Nebraska was among the cheaper half of the studied states, both for single-trip and continuous permits. Inflation for

Nebraska's fees was considered then; results showed that Nebraska will still stay in the cheaper half of the states considering a fee adjustment for inflation.

The fifth stage included the examination of overweight vehicle costs to Nebraska. An estimate of damage to Nebraska highway infrastructure resulting from oversized/overweight vehicles was made based on published statistics for damage to pavements. The results, based on a number of assumptions, provided a table of pavement damage costs for different weight groups and mileages of overweight vehicles. These values exceed current permit fee charged from overweight trucks. The sixth stage was documentation and preparation of the final report and presentation.

Besides providing a comprehensive reference for a number of US state's oversized/overweight vehicle permit fees and procedures, including Nebraska, its neighbors, and other Midwestern states, the main conclusion of the study is that Nebraska's current permit fees are relatively low compared to other states considered in this study and compared to the damage cost to Nebraska pavements from overweight trucks. While the approaches used for comparison in this study were based on reasonable assumptions, relaxing these assumptions by having access to more detailed information may provide possibly different results. Nonetheless, a consideration of increase in the current permit fees for oversize/overweight trucks is warranted on the basis of analysis presented herein.

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