Staff Paper P97-3 **April 1997**

STAFF PAPER SERIES

MINNESOTA SHIPPERS AND STATE TRUCK SIZE/WEIGHT REGULATIONS:

A REPORT SUBMITTED TO THE MINNESOTA DEPARTMENT OF TRANSPORTATION

by

Al Mussell and Jerry E. Fruin

DEPARTMENT OF APPLIED ECONOMICS
COLLEGE OF AGRICULTURAL, FOOD, AND ENVIRONMENTAL SCIENCES
UNIVERSITY OF MINNESOTA

Staff Paper P97-3 **April 1997**

STAFF PAPER SERIES

MINNESOTA SHIPPERS AND STATE TRUCK SIZE/WEIGHT REGULATIONS:

A REPORT SUBMITTED TO THE MINNESOTA DEPARTMENT OF TRANSPORTATION

by

Al Mussell and Jerry E. Fruin

Research sponsored by the Minnesota Department of Transportation, University of Minnesota Center for Transportation Studies, and the University of Minnesota Agricultural Experiment Station.

The authors wish to thank Chuck Sanft and Don Kieffer of the Minnesota Department of Transportation's Office of Freight, Railroads and Waterways for their assistance.

Information on other titles in this series may be obtained from: Waite Library, University of Minnesota, Department of Applied Economics, 1994 Buford Avenue, 232 COB, St. Paul, MN 55108-6040, U.S.A.

MINNESOTA SHIPPERS AND STATE TRUCK SIZE/WEIGHT REGULATIONS:

A REPORT SUBMITTED TO THE MINNESOTA DEPARTMENT OF TRANSPORTATION

by

Allan Mussell and Jerry Fruin

Motor carriers face a number of regulations in carrying on their business. Trucks are typically regulated as to their length, width, height, load (in terms of gross vehicle weight), and axle weight. The purpose of these regulations is to promote public safety and protect the quality of road surfaces. Highway regulations affecting motor carriers are primarily a state-level responsibility in the United States. Minnesota has its own set of truck size and weight regulations as do neighboring states and Canadian provinces. Because states set their own regulations on truck size and weight, the commercial trucking industry measures the appropriateness of Minnesota regulations to a large extent based on their congruence with those in adjacent states. The object of this study is to determine the extent to which major shippers, the clients of commercial motor carriers, feel constrained by truck size and weight regulations in Minnesota and whether their needs are being met.

The Minnesota Department of Transportation (MNDOT) requested a study by the Department of Applied Economics and the Center for Transportation Studies at the University of Minnesota to help determine how highway regulations for commercial motor carriers affect Minnesota industries. Specifically, the object of the study was to solicit the ideas of major shippers in the state with a view toward determining their attitudes about size and weight regulations, and how current regulations address the needs of their businesses. This paper describes the study and reports its findings.

Background

Highway regulations are enacted both to promote safety and to protect road quality. These goals are intertwined in developing a policy for motor carriers on highways. Safety is maintained by establishing size and weight limits. Size regulations are used as a proxy for off-tracking and rollover threshold, which ensure that trucks can make turns safely on the highway without overturning or swerving into other vehicles (Nix et al., 1996). Weight regulations promote safety by helping to ensure that a vehicle's braking system is capable of providing adequate stopping power. The primary purpose of weight limits, however, is as a means to protect pavement quality and bridge structures. Weight per axle is the primary determinant of pavement performance, while both axle weight, gross vehicle weight, and axle spacing are important in meeting bridge standards (Nix et al., 1996). While safety and protection of roads is an important mandate of transportation regulation, it is not distinct from the infrastructure needs of business and industry. Businesses use roads to ship their products to markets both within and outside the state. These businesses wish to ship at low cost in order to remain competitive, particularly in far away markets. Thus, businesses are dependent on trucking regulations that allow them to ship their products on a cost-effective basis.

Public transportation regulators must fulfill multiple objectives in setting truck size and weight limits. Regulations are set both to ensure safety and protect road surfaces and bridges, and to provide Minnesota businesses with a cost-effective road system in which they can transport their products. These objectives are complicated by the fact that Minnesota is bordered by a number of jurisdictions with transportation regulations of their own. Consequently, the regulations of Wisconsin, Iowa, South Dakota, North Dakota, Manitoba, and Ontario may influence the actual and perceived effects of Minnesota's truck size and weight regulations.

Minnesota Highway Size and Weight Regulations

The state of Minnesota sets its own commercial truck regulations. The Minnesota weight regulations limit Gross Vehicle Weight (GVW) to 80,000 lbs. Single axles cannot bear a weight greater than 20,000 lbs., with tandem axles limited to a weight of 34,000 lbs. The state of Minnesota limits the length of a semi-trailer to 53 feet. Trailer combinations are limited to twin doubles, with each trailer not exceeding 28 feet, 6 inches in length. The width of vehicles is limited to 102 inches, with the total height not to exceed 13 feet, 6 inches. Figures 1, 2, and 3 along with Table 1 summarize the Minnesota size and weight regulations. Table 2 offers a summary of neighboring jurisdictions' regulations.

Study Design

To determine the concerns of Minnesota businesses about the transportation regulations, a sample of large businesses in the state was surveyed. The population from which the sample was drawn consisted of firms with greater than 1000 employees and a sales volume greater than $10 million. A sample of firms was drawn that would be geographically representative of business within the state. Although many of the firms came from within the Twin Cities metro area, others were distributed across the state, predominantly in the southern section. Firms in the sample were contacted by telephone and asked if they wished to participate. Fourteen of the contacted firms agreed to participate. Interviews were set up with transportation/logistics managers to elicit ideas and opinions on truck size and weight regulations. Table 3 identifies the surveyed firms by location and firm type.

The interviews were placed in context using a questionnaire. The questionnaire served multiple purposes in the study. First, it ensured that respondents were answering a common set of questions that could be compared. Secondly, it allowed partitioning of sample firms based on the responses to particular questions to key questions. The survey questionnaire is included on page 25.

Placards depicting the Minnesota regulations along with those in bordering jurisdictions were made available to assist respondents in responding to questions. These placards are presented in Figures 1, 2, and 3 and in Tables 1 and 2. The first question identifies firms as to their business type.

Question 2 identifies firms based on the distances they ship. Most respondents supplied information on outbound shipments, but some also dealt with inbound shipments. The 3rd question identifies firm shipments by mode, and identifies the extent to which truck transportation is of importance to them. Question 4 identifies the number of inbound and outbound shipments the firm receives/ships per day. The purpose of this question was to help determine if the firm was a higher or lower volume shipper/receiver. The 5th question identifies the loads a firm ships as either light and bulky (cube out) or heavy and dense (weight out). Question 6 helps partition the sample between firms that are in the motor carrier business implicitly themselves (private fleets) and those firms that hire commercial carriers for their transportation needs. Questions 7, 8 and 9 were designed to determine respondents' level of awareness of transportation issues. Questions 10, 11, and 12 were used to determine respondents' level of satisfaction with current Minnesota size and weight regulations.

Results

Useable responses were collected from all 14 respondents. The responses were collected and analyzed in database format on a microcomputer. A number of criteria were used in analyzing the data. Responses were sorted based on general responses truck ownership, fraction of outbound shipments shipped more than 500 miles, weight as a factor, and size as a factor.

General Responses

General responses supplied by respondents are presented in Table 4. Of the 14 respondents, 11, or 79%, felt their needs were being met by current Minnesota regulations. Of the firms that felt their needs were not met, all three expressed concerns about interstate consistency in regulations. Weight was an important factor constraining all but three respondents. Size was less of a constraining factor; it was identified by 9 of the respondents as a constraint. Only one shipper felt simultaneously constrained by both size and weight.

Truck Ownership

Questionnaire responses were sorted based on respondents' answers to question 6, truck ownership. The rationale was to distinguish any differences in attitudes toward regulation between firms that have significant internal trucking operations (are implicitly in the trucking business hauling their own freight) and firms that have small truck fleets and/or contract most of their transportation needs through a private carrier. Firms with 20 or more highway tractors and 20 or more semi-trailers were grouped as having significant internal trucking operations. Tables 5 and 6 compare selected responses with large and small trucking operations.

Table 6 indicates some definite trends among the firms with significant truck fleets. Four firms in the sample had greater than 20 tractors and 20 trailers. All these firms did most of their shipping in local (<100 miles) and regional (100-500 miles) areas. Of the firms with trucking operations, 50% (2) felt that their transportation needs were not being met under current size and weight regulations. Their responses identified both weight and size as problems in regulation, and expressed concern about a lack of uniformity in interstate regulations. One respondent identified driver availability and training as a transportation issue. The responses to questions on specialty equipment indicated the respondents were aware of equipment options, and that both size and weight were of concern to them.

Table 5 highlights some distinct trends among firms that do not maintain a significant truck fleet. Most of the firms in this group ship predominantly to national (>500 miles) locations. Of firms that gave information on inbound shipments, the majority received shipments from distances greater than 500 miles. A much greater proportion of firms that do not maintain truck fleets ship nationally than those with truck fleets. Most of the respondents in this group indicated that their transportation needs were being met by current regulations. Only one respondent indicated dissatisfaction with current size and weight regulations. Respondents in this group indicated concerns with both size and weight limits, with more emphasis on weight. The responses to questions on specialty equipment generally indicated a high degree of awareness with respect to what types of equipment were available and how they would be useful.

National Shippers

The sample was also partitioned into a group of firms that shipped more than 40% of output to destinations greater than 500 miles away, and firms that shipped to locations less than 500 miles away. The major results are presented in Tables 7 and 8.

Table 8 presents results for firms that ship a large percentage of output nationally. In practice, firms in this group shipped more than 50% of output nationally. Of the nine firms in this group, five shipped mostly by truck (truckload and less than truckload). Two of the firms in this group made extensive use of rail transport. Only one of the firms in this group said that its needs were not met.

Table 8 presents the responses for the firms that shipped mostly under 500 miles. Of the five firms in this group, four shipped mostly by truck. Two of the firms stated that their needs were not by current transportation regulations. The specific changes mentioned by the two groups were similar, both mentioned size, weight and rationalization of transportation regulations.

Effects of Weight Limits

Three of the firms in the sample indicated weight was not a source of concern in transportation regulations. Table 9 presents the responses of firms that explicitly stated that weight was not a factor of concern. None of the firms in this group owned any of their own trucks. They were all more national in terms of the shipping distances. One of the shippers in this group specified equipment that could be used that implied concern about weight; however, this was on the inbound side and emphasis was given here to the outbound side.

Effects of Size Limits

Five of the firms surveyed indicated that size regulation was not a concern. Results for firms that were not explicitly concerned about size regulations are given in Table 10. Of firms in this group, all but one was concerned about weight. Fewer trends were evident in this group. It contained both firms with significant truck ownership and firms that used contract carriers explicitly. There was also no evident trend with respect to distance shipped. One of the respondents indicated a desire for triple

trailer combinations; an implicit comment on size. It appears the major use of triple trailers would be for drops in specific locations rather than strictly to increase size capacity.

Conclusions

The analysis of responses to the questionnaire through the interview process yielded interesting results. A general result was that essentially all the respondents were aware of transportation issues and basic regulations. Very few of the respondents made use of the placards depicting transportation regulations that were supplied; most had adequate knowledge and awareness to answer the questions without them. This trend was also evident in the familiarity that both truck owners and non-owners had with specialty equipment.

Most (79%) of the respondents indicated that their needs were being met by current size and eight regulations; 21% said their needs were not being met. The characteristic concern of firms whose needs were not met was interstate consistency in regulations. Weight appears to be more of a constraint on shippers than size. Eleven, or 79%, of shippers said they were constrained by weight, while nine, or 64%, said they were constrained by size.

The most useful means of partitioning attitudes toward size and weight regulations was by grouping firms that operated a significant truck fleet. Firms that maintain a significant fleet of trucks tended to be more concerned about size and weight restrictions than firms that use mostly commercial carriers. This result was fairly robust across size and weight restrictions. There was a strong correlation in the sample between average shipping distance and fleet ownership. Shipment to far away locations appears to be correlated with the use of commercial carriers. The firms in the sample that operate their own fleets tend to ship largely to local and regional destinations.

A result that emerges from the analysis of responses is that fewer of the firms that are predominantly national shippers said their transportation requirements were not met by current regulations. In particular, national shippers were not as concerned about weight restrictions as were the predominantly regional and local group. Several respondents mentioned that interstate rationalization

of regulations was an issue, yet still felt their needs were being met. A possible explanation for this could be that the national shippers are moving freight predominantly to the south and east from Minnesota, through states with similar regulations. Moving westward, some states have size and weight limits that exceed those in Minnesota. However, firms that move most of their goods eastward cannot realize any advantage from regulations in western states, and as such are less concerned about Minnesota regulations. Minnesota regulations might only be a constraint to firms that ship substantial quantities west.

In addition, we find that within the sample there was a very clear break between the national shippers and the local/regional group. The national group averaged over 50% of shipments over 500 miles. The local regional group averaged well under 33% of shipments over 500 miles. Thus, there were two "clusters" in terms of distances shipped. As noted, there was high correlation between the clusters and truck ownership.

Although some evident patterns emerge from the data collected in this study, there are some caveats that should be observed in interpreting its results. Although the study was designed to be representative of business activity across the state; it should not be confused with statistical significance. This is a small sample that was not randomly drawn, and its limits in exhaustively explaining the transportation attitudes of all shippers in the state should be recognized. Some respondents had difficulty answering some of the questions on the questionnaire due to the scale of their operations; some had multiple plants and/or warehousing facilities within and/or outside the state. Where this was a concern, respondents were asked to answer questions from the perspective of a single, representative, Minnesota facility. Thus the responses refer to a single facility, rather than firm-wide for all respondents. Some respondents had information on inbound as well as outbound shipments. For simplicity, the study concentrated predominantly on outbound shipments. However, there are some responses that deal partially with inbound transportation issues. These responses should be treated with caution, since we lack the context on the inbound side to fully interpret them.

The results presented here present a view of major shippers in the state that had not been described in a precise manner previously. Shippers are very aware of transportation issues and the way they affect their businesses, including size and weight restrictions. The more concerned shippers are those that own and operate their own trucking fleets. Shippers that transport goods to further destinations are less concerned about size and weight restrictions than the regional and local shippers.

Table 1. Minnesota Highway Regulations Summary

Box Dimensions	
Width	102 inches
Height	13 feet, 6 inches
Semi-trailer	53 feet
Twin Combination	28 feet, 6 inches
Weight	
GVW	80,000 lbs.
Steering Axle	20,000 lbs.
Single Axle	20,000 lbs.
Tandem Axle	34,000 lbs.
Tridem Axle	42,000 lbs.

Table 2. Bordering Jurisdictions' Size and Weight Regulations

Jurisdiction	Width (inches)	Height (feet)	Single Unit (ft)	Semi-Trailer (ft)	Twin Combin-ations (ft)	GVW (lbs)	Steering Axle (lbs)	Single Axle (lbs)	Tandem Axle (lbs)	Tridem Axle (lbs)
Wisconsin	102	13.5	40	53	28.5	80000	20000	20000	34000	42000
Iowa	102	13.5	40	53	28.5	80000	20000	20000	34000	42500
South Dakota	102	14	45	53	81.5[a]	129000[d]	20000	20000	34000	BFB
North Dakota	102	14	50	53	53[b]	105000	12100	20000	34000	42,500[h]
Manitoba	102	13.67	41.2	53.39	82.4[e]	137800[c]	12100	20,000[f]	37,500[g]	50700
Ontario	102	13.67	41.2	53.39	82.4[e]	140000	19800	22000	37500	50700

[a]Measured from front of first trailer to rear of last trailer, including hitching device, maximum trailer length 45 feet.
[b]Overall length 110 feet on interstate, state highways 88 feet, other roads 75 feet.
[c]Overall length, front of first trailer to rear of second.
[d]Weight limited to 80,000 lbs on interstate system.
[e]124,580 lbs. on secondary roads.
[f]18,080 on secondary roads.
[g]32,200 on secondary roads.
[h]Higher weight limits off Interstate system--48,000 lbs. on federal and state highways; 9 foot axle spacing.

Table 3. Location of Firms Surveyed

Name	Type	Specific Type	Location
3M	Nondurable manufacturer	Consumer products	St. Paul
Alliant Techsystems	Durable manufacturer	Armaments	New Brighton
Cenex	Ag/Food	Farm supply	Cottage Grove
Ford Motor Co	Durable manufacturer	Automotive	St. Paul
Frigidaire	Durable manufacturer	Appliances	St. Cloud
Harvest States	Ag/Food	Grain	St. Paul
Jostens	Nondurable manufacturer	School memorabilia	Minneapolis
Land O'Lakes	Ag/Food	Dairy products	Arden Hills
LDI Fibres	Nondurable manufacturer	Paper/plastics	New Hope
Luigino's	Ag/Food	Frozen foods	Duluth
Red Wing Shoe	Nondurable manufacturer	Shoes	Red Wing
Swift & Co	Ag/Food	Pork packer	Worthington
Taylor Corp	Nondurable manufacturer	Stationery/printing	Mankato
Waldorf Corp	Nondurable manufacturer	Paper	St. Paul

Table 4. General Responses

Type	Needs Met	Weight Factor	Size Factor	Specific Changes
Nondurable manufacturer	Yes	Yes	No	Need consistency between state regulations, increased vehicle weight, reduce congestion, address driver shortage
Durable manufacturer	Yes	Yes	Yes	Longer trailers and higher weight limits
Ag/Food	No	Yes	Yes	Move to WASHTO standards
Durable manufacturer	Yes	No	Yes	Greater length and width to complement rail, double car carrier
Durable manufacturer	No	No	Yes	Interstate consistency in regulation, 57' trailers, Michigan trains[1]
Ag/Food	Yes	Yes	No	More weight
Nondurable manufacturer	Yes	No	No	Uniformity in regulations between states and Canada and Mexico
Ag/Food	Yes	Yes	No	2000 lbs more weight
Nondurable manufacturer	No	Yes	Yes	Need interstate consistency in regulations
Ag/Food	Yes	Yes	Yes	Need more weight to ship full loads in 53' equipment
Nondurable manufacturer	Yes	Yes	Yes	More weight-adhesive containers
Ag/Food	Yes	Yes	Yes	Longer trailer and higher weight limit
Nondurable manufacturer	Yes	Yes	No	Triple trailer, more weight
Nondurable manufacturer	Yes	Yes	Yes	110" height, lighter weight equipment

[1]Michigan trains refer to trailers which can carry more weight by adding additional axles.

Table 5. Shippers with Substantial Trucking Operations

Type	Tractors	Semi-Trailers	National Out	Regional Out	Local Out	Needs Met	How Needs Met	Specialty Equipment	Specific Changes
Nondurable manufacturer	40	400	30	50	20	Yes	Lack of uniformity in regulation, driver training	Drop frame equipment, logistics bars for double decking, ISO containers	Need consistency between state regulations, increased vehicle weight, reduce congestion, address driver shortage
Ag/Food	350	700	5	45	50	No	Mississippi River states are a bottleneck--need higher weights to conform with western states ASA	Trailer trains, ND-WASHTO equipment	Move to WASHTO standards
Nondurable manufacturer	55	150	33	33	33	No	Need greater size and weight	57' trailer, triple trailers to the Twin Cities	Need interstate consistency in regulations
Ag/Food	30	40	5	85	10	Yes	Could use 2000 lbs. more weight	Twin combinations reefer	2000 lbs. more weight

Table 6. Firms That Do Not Operate Substantial Truck Fleets

Type	Tractors	Semi-Trailers	National Out	National In	Regional Out	Regional In	Local Out	Local In	Needs Met	How Needs Met	Specialty Equipment	Specific Changes
Nondurbale manufacturer	3	12	100	65	0	20	0	15	Yes		Wider trailer to haul hides flat	More weight--adhesive containers
Ag/Food	0	0	100	0	0	0	0	0	Yes	Could use more weight		More weight
Ag/Food	0	0	60	0	35	0	5	0	Yes	Big improvement with 53' equipment		Need more weight to ship full loads in 53' equipment
Durable manufacturer	2	2	60	0	20	0	20	0	Yes		Expect to use more ocean containers	Longer trailers and higher weight limits
Nondurable manufacturer	0	0	50	0	50	0	0	0	Yes		Lift gates on trucks	Uniformity in regulations between states and Canada and Mexico
Durable manufacturer	0	0	90	0	8	0	2	0	Yes			Greater length and width to complement rail, double car carrier
Nondurable manufacturer	0	0	10	0	60	0	30	0	Yes		Lighter weight trailers, additional axles on trailers	110" interior height, lighter weight equipment
Nondurable manufacturer	1	0	80	0	15	0	5	0	Yes	Size no problem, would like more weight	Triple trailer trains, lighter weight trailers	Triple trailer, more weight
Ag/Food	0	0	80	0	15	0	5	0	Yes	Need interstate rationalization in regulations	Lighter trailers	Longer trailer and higher weight limit
Durable manufacturer	0	0	85	0	12	0	3	0	No	Need to be more liberal with transportation regulation--larger trailers, better driver training	57' trailer, Michigan trains	Interstate consistency in regulation, 57' trailers, Michigan trains

Table 7. Firms Shipping More Than 50% of Shipments Nationally

Type	National Out	National In	TL	LTL	Parcel Service	Rail	Inter modal	Ocean Vessel/ Container	Air	Other	Needs Met	How Needs Met	Specific Changes
Nondurable manufacturer	100	65	60	35	5	0	0	0	0	0	Yes		More weight--adhesive containers
Ag/Food	100	0	30	0	0	70	0	0	0	0	Yes	Could use more weight	More weight
Ag/Food	60	0	100	0	0	0	0	0	0	0	Yes	Big improvement with 53' equipment	Need more weight to ship full loads in 53' equipment
Durable manufacturer	60	0	50	30	10	0	0	0	10	0	Yes		Longer trailers and higher weight limits
Nondurable manufacturer	50	0	5	35	60	0	0	0	0	0	Yes		Uniformity in regulations between states and Canada and Mexico
Durable manufacturer	90	0	10	0	0	90	0	0	0	0	Yes		Greater length and width to complement rail, double car carrier
Nondurable manufacturer	80	0	15	15	70	0	0	0	0	0	Yes	Size no problem, would like more weight	Triple trailer, more weight
Ag/Food	80	0	98	0	0	0	0	0	0	0	Yes	Need interstate rationalization in regulations	Longer trailer and higher weight limit
Durable manufacturer	85	0	79	1	0	20	0	0	0	0	No	Need to be more liberal with transportation regulation--larger trailer, better driver training	Interstate consistency in regulation, 57' trailers, Michigan trains

Table 8. Firms Shipping Predominantly Local and Regional

Type	National Out	TL	LTL	Parcel Service	Rail	Inter modal	Ocean Vessel/ Container	Barge	Air	Other	Needs Met	How Needs Met	Specific Changes
Nondurable manufacturer	30	25	30	5.5	6	2.5	13	0	18	0	Yes	Lack of uniformity in regulation, driver training	Need consistency between state regulations, increased vehicle weight, reduce congestion, address driv
Ag/Food	5	100	0	0	0	0	0	0	0	0	No	Mississippi River states are a bottleneck--need higher weights to conform with western states ASA	Move to WASHTO standards
Nondurable manufacturer	10	80	5	0	10	1	0	0	0	4	Yes		110" interior height, lighter weight equipment
Nondurable manufacturer	33	10	60	30	0	0	0	0	0	0	No	Need greater size and weight	Need interstate consistency in regulations
Ag/Food	5	40	59	1	0	0	0	0	0	0	Yes	Could use 2000 lbs. more weight	2000 lbs. more weight

Table 9. Firms for Which Weight Was Not a Factor

Type	National Out	Tractors	Semi-Trailers	Specific Changes
Nondurable manufacturer	50	0	0	Uniformity in regulations between states and Canada and Mexico
Durable manufacturer	90	0	0	Greater length and width to complement rail, double car carrier
Durable manufacturer	85	0	0	Interstate consistency in regulation, 57' trailers, Michigan trains

Table 10. Firms for Which Size Was Not a Factor

Type	National Out	Tractors	Semi-Trailers	Specific Changes
Ag/Food	100	0	0	More weight
Nondurable manufacturer	30	40	400	Need consistency between state regulations, increased vehicle weight, reduce congestion, address driver shortage
Nondurable manufacturer	50	0	0	Uniformity in regulations between states and Canada and Mexico
Nondurable manufacturer	80	1	0	Triple trailer, more weight
Ag/Food	5	30	40	2000 lbs. more weight

Figure 1 Single Trailer

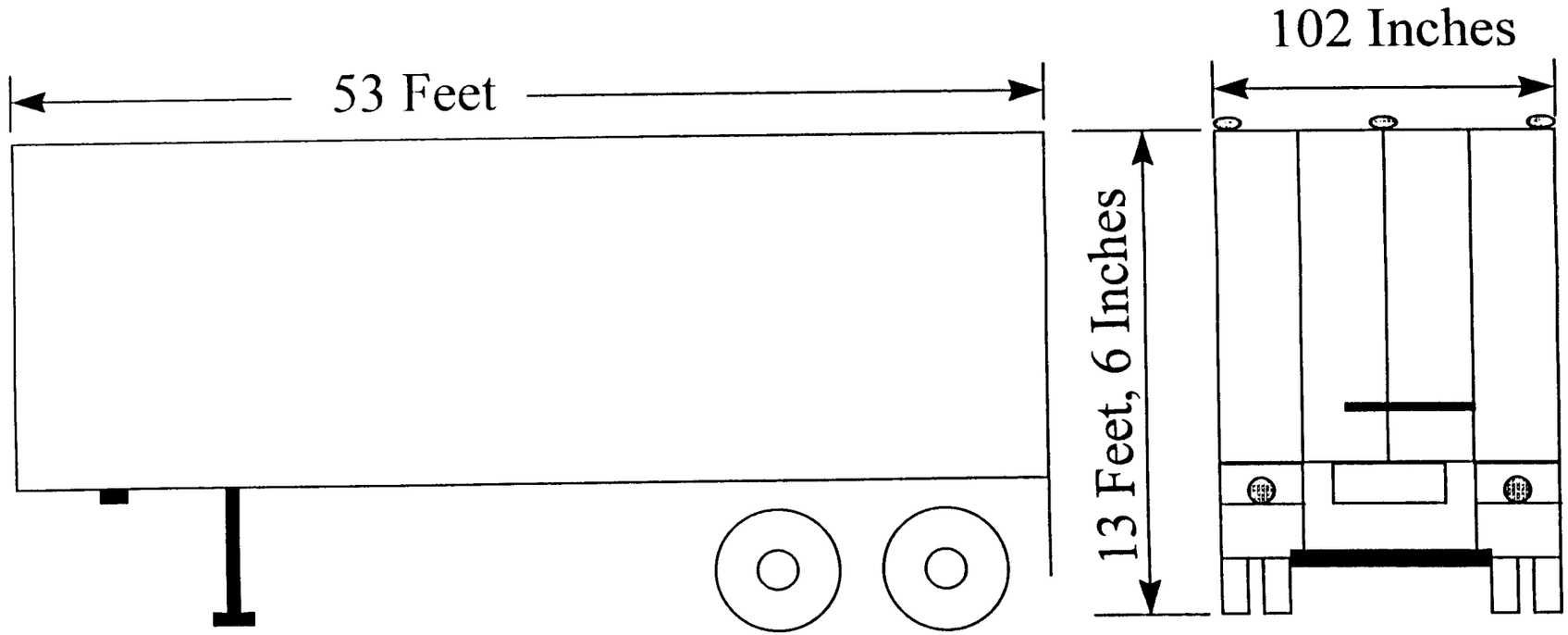


Figure 2 Twin Double Trailers

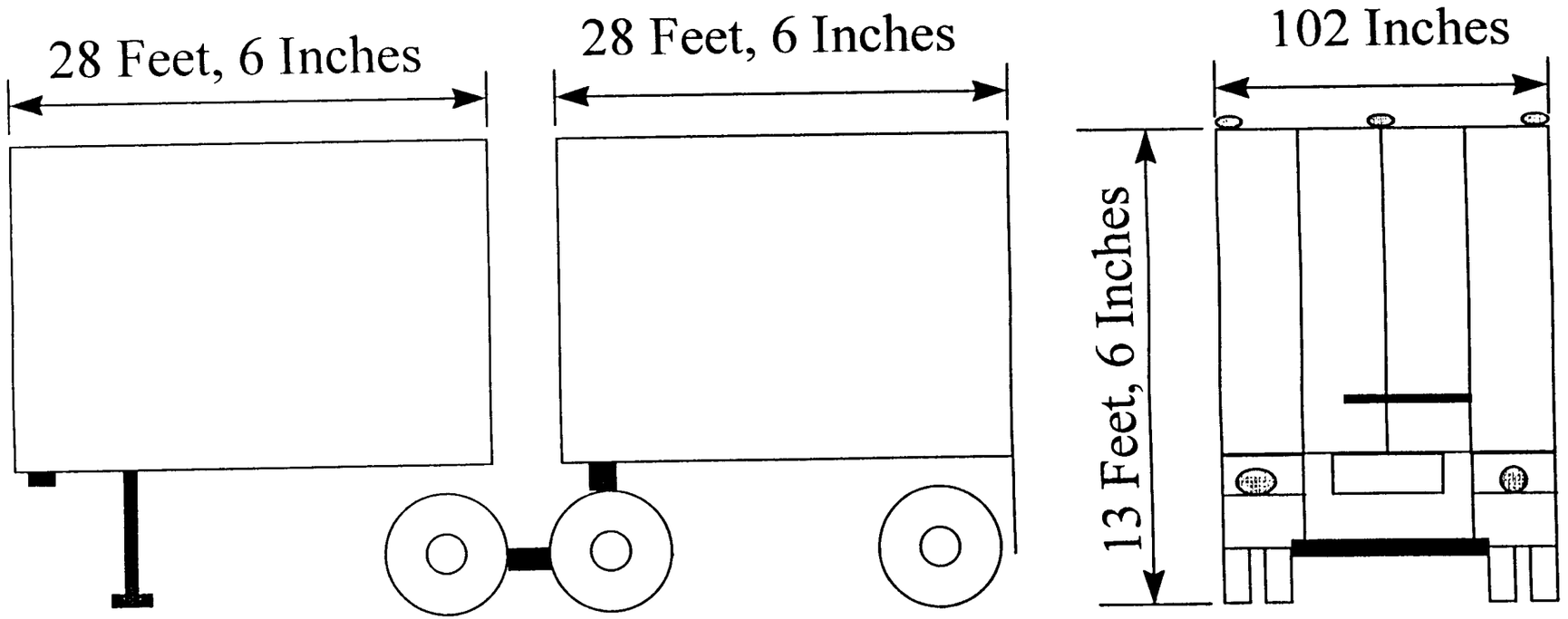
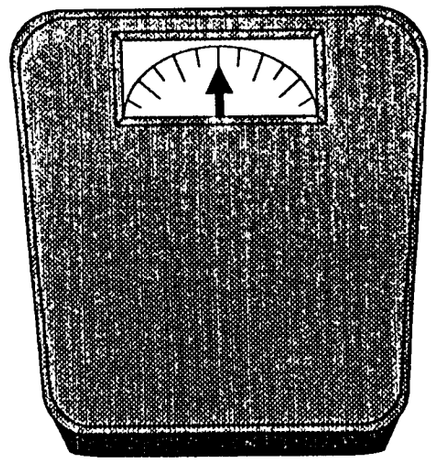


Figure 3 Vehicle Weight Limits

Gross Vehicle Weight	80,000 lbs
Single Axle Weight	20,000 lbs
Tandem Axle Weight	34,000 lbs



QUESTIONNAIRE

MINNESOTA TRUCK REGULATIONS

1. Classify your business, by percentage of sales
   a. Retail _____ %
   b. Wholesale _____ %
   c. Service _____ %
   d. Other _____ %

2. What distances do you ship, by percentage of volume?
   a. Local (<100 mile) _____ %
   b. Regional (100-500 miles) _____ %
   c. National (> 500 miles) _____ %

3. Classify your shipments, by percentage
   a. Parcel service or express _____ %
   b. Less than truckload _____ %
   c. Truckload _____ %
   d. Container _____ %
   e. Other _____ %

4. How many shipment/truckloads do you ship and/or receive per day?

5. Is the size of your shipments constrained by volume before weight (i.e., do your shipments tend to cube out before they weight out)?

6. Do you own your own trucks? If so, how many, and of which type?
   a. Highway tractors
   b. Semi trailers
   c. Straight trucks
   d. Vans
   e. Containers

7. Have you considered ways in which your shipping process could be improved, in terms of the size and shape of containers and package protection? If so, how?

8. Do you work with carriers or customers in determining ways in which your delivery service could be improved? If so, how?

9. Are your shipping decisions affected by seasonal climate changes, such as spring weight restrictions?

10. If it were available, could your business make use of any specialty transportation equipment for shipping your products? If so, what types of equipment?

11. In terms of vehicle weights and dimensions, are your transportation needs being met at this time?

12. Are there specific changes in truck size and weight limits which you feel would better serve your business' freight transportation needs? If so, what are they?