
Western U.S.-Canada

Crossborder Case Study

U.S. DOT Comprehensive

Truck Size & Weight Study

Report No. 5

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Western-U.S.-Canada Crossborder Case Study

U.S. Department of Transportation Comprehensive Truck Size and Weight Study Report No. 5

Activity II: Task D Conduct Regional and Local Trucking Case Studies

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Prepared by



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The primary objectives of the U.S. Department of Transportation's Comprehensive Truck Size and Weight (TS&W) Study are to:

- assess the potential economic, safety, and environmental impacts of changing existing TS&W limits; and
- identify opportunities to increase the efficiency of freight transportation while preserving safety and highway infrastructure.

Reports which have been completed for the TS&W Study, to date, include the following:

- (1) Synthesis of Truck Size and Weight Studies and Issues
- (2) Analysis of the Truck Inventory and Use Survey from the Truck Size and Weight Perspective for Trucks with Five-Axles or More
- (3) Truck Size and Weight Modelling Workshop
- (4) Truck Size and Weight Performance-Based Workshop
- (5) Western U.S.-Canada Crossborder Case Study.

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This document was prepared for use in the U.S. Department of Transportation's Comprehensive Truck Size and Weight Study. The views expressed are those of the author(s) and are not necessarily those of the U.S. Department of Transportation.

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Executive Summary

This case study examines trucking across the western U.S.-Canada border and how it is influenced by truck size and weight (TS&W) regulations. Western border trucking differs from eastern border trucking in terms of the types of commodities being handled (high quantities of relatively low value, resource-based commodities), the density of truck volumes (many miles of roads with relatively low volumes of traffic), and the TS&W regulatory regimes arising from many grandfather exemptions and the resulting truck configurations. Also, the implications of a range of possible Federal TS&W policy initiatives on western border trucking are considered.

Highway Crossings on the Western Border

The western border reaches from the western end of Lake Superior to the West Coast. There are 54 highway crossings of the border. Twenty-eight involve: (1) an Interstate System (IS), National Network (NN), or National Highway System (NHS) highway; (2) a two-way commercial traffic flow of more than 12,000 trucks per year, or (3) both. The western border accounts for one-third of all trucking across the Canada-U.S. border.

Geographical Proximity of Western Canada and the United States

Truck travel times between western Canada and most of the United States west of the Ohio River and the southern section of the Mississippi River are less than travel times from western Canada to central Canada (Toronto) and east (Montreal and beyond). The proximity of western Canada to this area and its markets, the similarity in economic and industrial activities between western Canada and the north and mid-west United States, and the ease of crossborder trade have created strong trade and transportation linkages across the border.

Trade Across the Western Border

Most western border trucking is associated with local and regional trade. Economic sectors of particular importance in this trade are--agriculture (grains, livestock, seed, produce, peat moss); wood and paper (logs, lumber, shakes, newsprint, printed material); chemicals, metals, and minerals (potash, soda ash, petroleum); machines, vehicles, and farming and resource extraction equipment.

TS&W Regulations Governing Trucking Along the Western Border

There are a myriad of different TS&W regulations governing trucking across the western border. The laws and regulations governing western border trucking are promulgated and administered by twelve different entities: the States of Washington, Idaho, Montana, North Dakota, and Minnesota; the U.S. Federal Government; the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, and Ontario; and the Roads and Transportation Association of Canada (RTAC) interprovincial agreement on uniform vehicle weights and dimensions.

For longer distance crossborder trucking, such as between Winnipeg and Mexico, or Calgary and Los Angeles, or a triangular operation involving Wyoming, Idaho, and Saskatchewan, additional regulatory regimes influence fleet and loading characteristics. In total, at least 63 TS&W regulatory regimes can at some time or another influence North American trucking, including trucking across the western border.

Differences among the State gross vehicle weight (GVW) limits, for example Minnesota at 80,000 pounds, North Dakota at 105,500 pounds, and Montana at 131,060 pounds, can have as much or more of a role in designing the vehicles used in crossborder trucking as differences among Canadian Provinces and U.S. States where the GVW limit on Manitoba secondary highways is 124,300 pounds, which connect with North Dakota State highways with a limit of 105,500 pounds.

Weight Limits

- Axle weight limits of 20,000 and 34,000 pounds on single and tandem axles respectively govern the axle weights of most trucking crossing the western border under regular operation. These limits apply to IS, NN and all principal State highways in the five border States. They are equal to or more restrictive than the corresponding axle weight limits specified for most connecting highways in Canada.
- The de facto GVW limit is 105,500 pounds or more for most western border crossings, except for four crossings to and from Minnesota. A GVW limit of 131,060 pounds applies in Montana (except for the special ISTEA provision for a GVW of 137,500 pounds between Shelby, Montana and the Montana-Alberta border). Major highways in Minnesota are limited to 80,000 pounds GVW.
- For a given GVW limit, Bridge Formula B governs the number of axles and axle spacings required of most trucking across the western border under regular operation. The formula is, for the most part, more conservative than corresponding load distribution requirements specified for connecting highways in Canada.
- The combination of the requirements of Bridge Formula B, variations in its enforcement by different States (for example, North Dakota does not enforce the inner bridge requirements on non-IS highways), and the various GVW caps and length limits, now frozen by the ISTEA, and State laws has created a number of unintended consequences in

terms of vehicle characteristics operating across and along the western border. Examples are lift axles, wide-base tires, and excessively long drawbars between trailers and between trucks and trailers.

- Split tandems are used in semitrailers in the western border States. They allow, where permitted, operating five-axle tractor-semitrailers at a GVW of 86,000 pounds and more flexibility in loading at lower GVWs. The 10-foot spread of these axles is effectively prohibited by the Canadian RTAC regulations and by the western Canadian provinces. Ontario and Quebec permit the use of split tandems.
- Tridem- and quadrem-axle arrangements are used across and along the western border and often incorporate lift axles and wide-base tires. One major trailer manufacturer indicates that tridems are becoming the axle arrangement of choice for many carriers in the northwest region.
- Differences in tire load limits among the ten western jurisdictions have no significant effect on western border trucking. Canadian regulations generally discourage the use of wide-base tires by placing limits on the total allowable load per tire. In certain western border States, on the other hand, the tire load limit of 600 pounds per inch of width with no limit on the total allowable load per tire tend to encourage the use of wide-base tires.
- Canada's steering axle limit of 5,500 kilograms causes problems for U.S. trucks at certain crossings. U.S. vehicles entering Manitoba from I-29 can come in with a steering axle load of as much as 6,000 kilograms, and are required to move their fifth wheel to comply with the 5,500 kilograms requirement.

Dimensions

- Western border States (except Minnesota) permit 14-foot high vehicles. This is 6 inches more than allowed in the western Provinces. Fourteen-foot high vans are common throughout the western United States particularly with specialized truckload carriers. These vehicles are being permitted to operate into at least one western Province. Alberta has proposed 14 feet as the height limit for the Canamex Corridor (see Appendix C), an international trade corridor originally proposed by Alberta that extends from Alberta generally along I-15 to California and Mexico.
- RTAC regulations require the wheelbase of a tractor to be within the range of 3.0 to 6.2 meters (118 inches to 244 inches). Some U.S. carriers wish to operate tractors having shorter (2.7 meters--106 inches) or longer wheelbases (6.7 meters--265 inches) into the western Provinces. Some Provinces prohibit use of these non-RTAC tractors, others allow their use under special permits, while still others ignore their non-compliance.

Truck Combinations Used Along and Across the Western Border

The complex TS&W regulations applicable in the western border region allow and lead to the use of many different truck configurations along and across the western border. Several are unique to the region. Small trucks of four or less axles dominate the truck fleets in western border States (90 percent in North Dakota; 80 percent in Washington, Idaho and Minnesota; 75 percent in Montana). For the western border fleet of trucks that has five or more axles:

- Tractor-semitrailer combinations are most common--7 of 10 in Washington and Idaho, 8 of 10 in Montana, and 9 of 10 in North Dakota and Minnesota (86.6 percent nationwide). The tractor-semitrailer fleet in the western border States is complicated. It consists of conventional five-axle units, five-axle units with a split tandem axle on the semitrailer, six-axle tractor-semitrailers (some with wide-base rather than dual tires on the semitrailer), seven-axle tractor-semitrailers (with a lift axle on the tractor), eight-axle tractor-semitrailers (with lift axles on both the tractor and semitrailer).
- Truck-trailer combinations are the next most common--1 of 5 in Washington and Idaho; and 1 of 10 in Montana, North Dakota and Minnesota (7.5 percent nationwide). These include a variety of truck-trailer combinations with five, six, seven and eight-axles.
- Tractor-double trailer combinations follow--1.5 of 10 in Washington and Idaho, 1 of 10 in Montana, 1 of 20 in North Dakota, and 1 of 100 in Minnesota (5.9 percent nationwide). These include a variety of double-trailer A-trains, including western doubles and Rocky Mountain doubles, with from five to nine-axles; a few seven- or eight-axle double-trailer C-trains; and eight-axle double-trailer B-trains. The ISTEA freeze limits the cargo-carrying length of these units on the NN to 68 feet in Washington, 95 feet in Idaho, 93 feet in Montana, and 103 feet in North Dakota.
- Triple-trailer combinations are either non-existent as in Washington and Minnesota or infrequent (less than 0.1 percent nationwide).
- Containers are moved by truck between Seattle and Vancouver, often using a variety of vehicles specially-designed to comply with the combined effects of Bridge Formula B, the 105,500-pound Washington State GVW cap, Washington trailer length limits, and Canadian RTAC regulations.

Because of these varying TS&W regulations, depending on the jurisdictions being crossed and the highway classes used, trucks crossing both the international and State borders in the western region may: (1) be stretched or contracted using adjustable drawbars; (2) have axles raised, lowered, or re-positioned; (3) have fifth wheels re-positioned; (4) have tires removed or added; or (5) have loads modified or shifted.

Truck Usage in Western Border States

The importance of trade in local and regional commodities is reflected in truck usage in the five western border States. One-third of the 287,100 registered trucks in the five States are used for transporting farm products. An additional one-third are used for transporting building materials, processed foods, live animals, lumber and fabricated wood products, and transportation equipment.

Most trucks in the western border States operate within their base States (9 of 10 trucks drive less than 25 percent of their mileage outside of their home State) and within 200 miles of home (9 of 10 truck miles). About 1 of 20 trucks drive 75-100 percent of their mileage outside the base State. About 1 of 20 trucks operate in the 200-500 mile range, and another 1 of 20 with trip lengths of greater than 500 miles.

Most trucking in the western border States occurs at weight levels that are much lower than the governing GVW limits. Seven of 10 truck movements occur at an average GVW of up to 40,000 pounds, which generally requires no more than three-axles. Eighty-five percent occurs at average weight of up to 60,000 pounds, which requires no more than four-axles. About 97.5 percent occurs at average weight levels of up to 80,000 pounds, which requires no more than five-axles. About 1.5 percent occurs at an average GVW of up to 100,000 pounds, which requires six or seven-axles. About 1.0 percent occurs at weights up to 130,000 pounds, which requires eight or nine-axles.

Trucking Across the Western Border

The western border accounted for about 5,100 two-way truck movements per day in 1994. Ninety-five percent of all truck movements across the western border occur on highways where the governing GVW limit is either 105,500 pounds as in Washington, Idaho, and North Dakota or 131,060 pounds in Montana. Montana also has a 137,800-pound weight limit for the section of I-15 from the Canadian border to Shelby, Montana. This is allowed under a special provision in the ISTEA to allow vehicles meeting the RTAC limits access to an intermodal facility at Shelby. Only 5 percent of these movements directly cross the Minnesota-Manitoba border, which is controlled by the 80,000-pound limit.

Ten times as much truck traffic moves across the western border as moves between western and eastern Canada via the Trans-Canada Highway (5,100 per day versus 500 per day). Some western border movements travel through the United States between western and eastern Canada.

Trucking across the western border is growing. There has been a 25 percent increase in two years from 1992 to 1994. One major crossing has experienced a ten-fold increase in 20 years. Many factors have affected this. Among them are economic growth, deregulation of trucking, increased use of prorationing taxation systems, freeing-up of agricultural product trading, branchline abandonment on both sides of the border, increased fertilizer use, the U.S.-Canada Free Trade Agreement, the NAFTA, and most recently the low value of the Canadian dollar.

The six most heavily used crossings account for three-quarters of the western border truck movements. These are Blaine-Pacific on I-5 (1,820 crossings per day), Pembina-Emerson on I-29 (669 crossings per day), Sweetgrass-Coutts on I-15 (460 crossings per day), Sumas-Huntington on U.S. 9 (359 crossings per day), Portal-North Portal on U.S. 52 (301 crossings per day), and Eastport-Kingsgate on U.S. 95 (194 crossings per day). About 1 of 10 trucks moving southbound across the western border are empty. One-third of the northbound trucks are empty.

Many western Canadian carriers have established operating arms in the United States. In 1994, two of every three northbound trucks entering Canada across the western border were Canadian-registered. One-third were registered in the United States. A number of Canadian carriers have recently established associations with Mexican carriers. When employing U.S. drivers and equipment, the U.S. base allows them to operate both within the United States as well as between the United States and Canada, and in time, into Mexico.

Implications of Federal TS&W Policy Options

What would happen to western border trucking if there was no change in the current limits and scope of application of Federal TS&W provisions? Based on recent experience:

- More specialized western border vehicles would be introduced. These include increasing use of six-, seven-, and eight-axle tractor-semitrailer units and seven- and eight-axle truck-trailer units.
- A variety of (often undesirable) long-drawbar A-trains and truck-trailer combinations would remain and probably see increased use.
- U.S.-Canada crossborder traffic probably will grow at a rapid rate.
- Split tandems and wide-base tires will be increasingly employed.

What would happen to western border trucking if certain Federal TS&W regulation was devolved to the States?

Federal Length Limits (minimum): Since these limits are already equaled or exceeded in the five western border States, no effect is expected.

Federal Axle Weight Limits: The States could elect to increase single- and tandem-axle weight limits on the Interstates within their borders. None of these States have over the years elected to increase axle weights on non-IS highways under their respective authorities. Differences with Canadian tandem axle limits could effect some pressure.

The 80,000-Pound GVW Cap: In the five western border States, the only highways on which the Federal 80,000-pound GVW cap applies are in Minnesota. In the other four States, it is the GVW

limits imposed by the ISTEA freeze (and the ISTEA Shelby exemption) that are the Federal GVW limits of influence. What Minnesota would do with the authority to relax the 80,000-pound GVW limit on its Interstate highways is not known. To date, Minnesota has elected to maintain an 80,000-pound GVW limit (or less) on all highways in the State.

Bridge Formula B: Except for North Dakota, the five western border States apply Bridge Formula B on all highways. North Dakota applies the provisions of the formula on Interstate highways, but ignores inner bridge requirements and allows 48,000-pound tridem on non-Interstate highways. Given no Federally-imposed Bridge Formula B, North Dakota might choose to extend its bridge formula policy to Interstate highways. The other four States would probably proceed cautiously concerning liberalizing Bridge Formula B provisions, particularly given that they have these provisions on the rest of their road network without being obliged to do so by Federal law.

ISTEA Freeze on GVWs: The GVW freeze of ISTEA applies to the operation of combinations involving a truck tractor and two or more cargo-carrying units on Interstate highways. The GVW levels incorporated in the freeze in these five border States is the same as the GVW limits these States used for many years prior to the freeze.

From the western border crossing standpoint, only three of the 54 western border crossings are directly affected by the weight aspect of the ISTEA freeze. These are the crossings for Interstate Routes I-5, I-15, and I-29. In the case of I-15, the Canadian RTAC GVW limit of 137,800 pounds is already allowed by the ISTEA from the Canadian border to Shelby, Montana. The GVW limit on all but these three crossings are under State authority.

ISTEA Freeze on Lengths: The “box-length” freeze of ISTEA applies to the operation of combinations with two or more cargo units operating on the NN. The length limits incorporated in the freeze in these five border States is the same as the length limits these States used for many years prior to the freeze. From the Canadian perspective, none of these ISTEA cargo-carrying length limits would be viewed as particularly restrictive. From the western border crossing standpoint, twenty of the 28 western border crossings of interest are actually directly affected by the length aspect of the ISTEA freeze, including those for I-5, I-15, and I-29.

One potentially positive effect of eliminating the ISTEA freeze by devolution to the States would be facilitating WASHTO efforts to achieve improved uniformity in regional TS&W regulations as these relate to cargo-carrying length limits on NN highways.

What would happen to western border trucking if Federal size provisions were applied to non-NN highways on the NHS? This would have little or no effect. These size provisions, exclusive of the ISTEA freeze, are minimums and are already surpassed by the western States more or less throughout their networks.

What would happen to western border trucking if Federal weight provisions including grandfather authority was applied to non-IS highways on the NHS in conjunction with the above size provisions? The major impact of this would be associated with the application of the

weight limits of the ISTEA freeze to a significantly expanded highway network in each State. This could prohibit flexibility and rationalization within individual States, and cooperation among adjacent States.

What would happen to western border trucking if Federal weight provisions were modified to accommodate freight moving in interstate and international commerce particularly in containers on NHS highways? The crossborder movement of international containers along I-5 between the Ports of Seattle, Washington and Vancouver, British Columbia is estimated to involve about 135 truck trips per day each way, about 15 percent of the total truck movement. Many of these movements take place on vehicles specially designed to handle fully loaded 40-foot containers within the weight distribution provisions of Bridge Formula B. Others occur on five-axle tractor-semitrailers, often experiencing overloads on the drive tandem axle. Some containers are moved crossborder in double-trailer combinations (for example, with one 40-foot container plus one 20-foot container, or three 20-foot containers together).

The option of using a six-axle tractor-semitrailer for container movements across the United States and Canada, within Washington, and to and from adjoining States could be expected to have a substantial response by industry. It would reduce the use of the existing, specially designed equipment now used for these movements.

There is some, probably very limited, movement of international containers between Alberta and Shelby, Montana along I-15 for trans-shipment on the Burlington Northern (BN) Railway pursuant to the special weight provisions of ISTEA. Since these movements now occur in Canadian configurations at Canadian weights (for example, a six-axle tractor-semitrailer at 96,000 pounds) and Canadian axle spreads, little change would be expected here.

There are also limited movements of international containers between northern Minnesota and Winnipeg, Manitoba and between the BN mainline through North Dakota and Winnipeg. Providing for the effective employment of six-axle tractor-semitrailers for these movements could encourage these exchanges and support trade corridor proposals such as those along I-29 and I-35.

1.0 Introduction

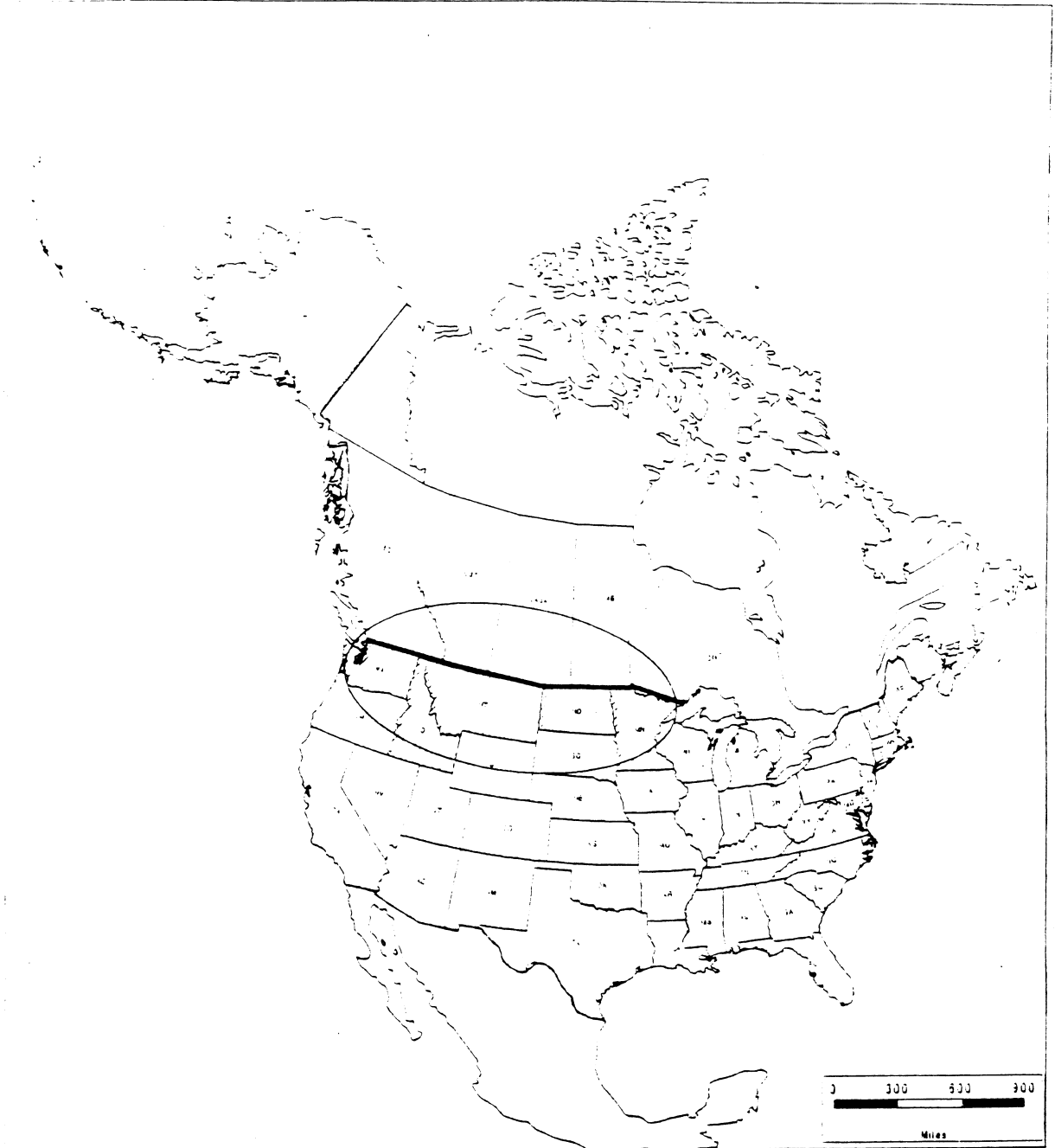
1.1 Purpose and Scope

This is a case study of trucking across the western U.S.-Canada border, and how it is influenced by TS&W regulations. Western border trucking differs from eastern border trucking in terms of the types of commodities being handled (high quantities of relatively low value, resource-based commodities), the density of truck volumes (many miles of roads with relatively low volumes of traffic), and the TS&W regulatory regimes arising from many grandfather exemptions and the resulting truck configurations. Figure 1-1 shows the area under consideration--the U.S.-Canada border region from the western end of Lake Superior to the West Coast. The western border accounts for one-third of all trucking between the United States and Canada. The implications of a range of possible Federal TS&W policy initiatives are also considered.

1.2 Report Organization

Chapter 2 characterizes the road network serving the western border region; details current TS&W provisions; illustrates how the regulations in combination work to affect vehicle characteristics; examines Truck Inventory and Use (TIUS) data regarding fleet make-up, commodity-handlings, operating range, and truck weight characteristics in the western border States. Chapter 3 summarizes readily-available information respecting cross border trade flows. Chapter 4 examines readily-available data regarding truck flows across and along the western border in terms of volumes and vehicle classification. Chapter 5 examines the implications of the above findings for TS&W policy. The appendices include detailed information on the border crossings and research related to TS&W issues specific to the western border region.

Figure 1-1: Western Border Study Area



Source: UMTIG, NHPN GIS data

2.0 Transportation System

This Chapter describes the road network, regulatory framework, and truck fleets operating along the western border.

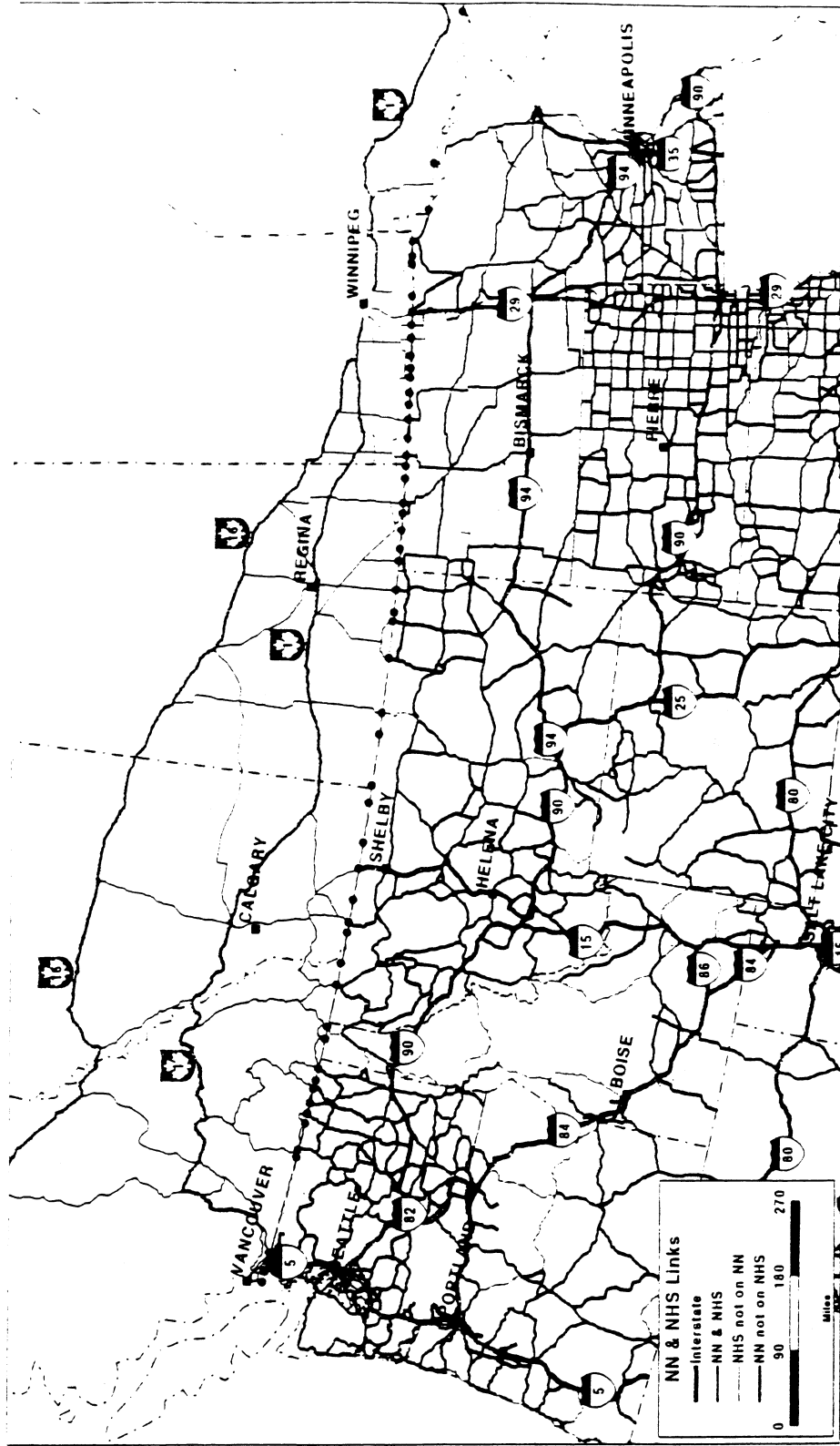
2.1 Road Network

The major components of the road network serving the western border region are shown in Figure 2-1a. For the United States, this network consists of all Interstate System (IS) highways, the National Highway System (NHS), and the National Network (NN) highways. For Canada, this network consists of all highways with RTAC weight limits south of Highway 16 and any other Canadian highways joining U.S. NHS and NN highways.

The road networks of the western regions of both the United States and Canada, similar to the railways, were built to serve the historical dominant east-west linkages of the two countries. The U.S. - Canada Free Trade Agreement, and now the NAFTA, emphasize a north-south orientation. Transportation movements along and across the western border are influenced by changing competition: (1) among West Coast ports (Seattle, Vancouver, Prince Rupert), (2) between Canadian and U.S. railroads (Canadian Pacific/Canadian National versus BN), (3) between truck and rail, (4) between inland ports (Duluth and Thunder Bay), (5) among eastern terminals and gateways (Chicago, Toronto, Montreal), and (6) between Canadian and U.S. routings. Examples are:

- Some trucks move in-transit between eastern and western Canada via U.S. routes through Duluth, Minnesota to Sault Ste. Marie, Michigan or through Minneapolis and Chicago to Detroit or Port Huron, Michigan.
- Potash is moved by truck from Esterhazy, Saskatchewan to Northgate, North Dakota using a private road to cross the border for trans-shipment to the BN. This operation provides competition to Canadian railways regarding potash haul to the United States.
- Commodities are moved by truck between Alberta and Shelby, Montana for intermodal trans-shipment on the BN. These movements can benefit from utilizing Canadian vehicles and weight limits operating under special weight exemptions provided by ISTEPA and Montana for this section of I-15.
- International containers are moved by truck between Vancouver and Seattle. This operation often utilizes vehicles operating under indivisible load permits in Washington. These movements reflect a variety of competitive conditions between Canadian and U.S. ports and a

Figure 2-1a: Road Network in the Western Border Region



- Limited numbers of international containers are trucked from Winnipeg and southern Manitoba to the BN in North Dakota and Minnesota.
- Western Canadian grain is moved by truck to Plentywood, Montana for trans-shipment on the BN.

Figure 2-1b shows the IS highways, Figure 2-1c shows the NHS highways, and Figure 2-1d shows the NN highways in the western border region. The following table summarizes the mileage in each of the components of the U.S. road network under consideration in this case study.

Highway Mileage in the U.S. Road Network Under Consideration

(Data prepared by D. Finkner, Office of Policy Development, FHWA)

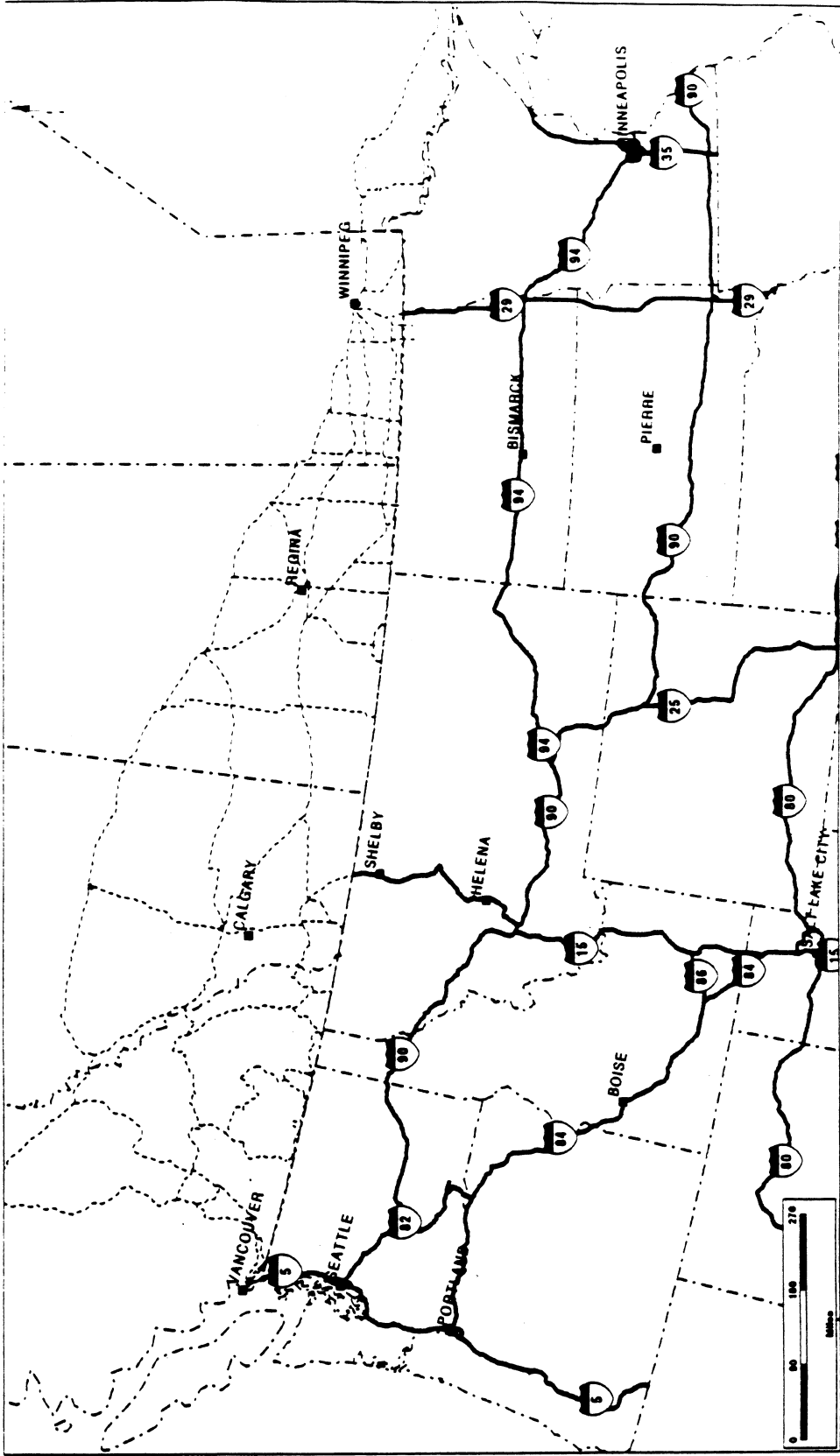
State	Intertstate Highways	Highways on both NN and NHS (which include IS)	Highways on NHS but not NN	Highways on NN but not NHS
Washington	762	3,178	180	2,478
Idaho	610	1,471	899	446
Montana	1,192	3,810	80	2,873
North Dakota	571	2,057	669	133
Minnesota	911	3,150	794	1,669
U.S.	45,074	111,644	49,629	65,478

2.2 Travel Time Comparisons

Figure 2-2 illustrates highway travel time contours from points in western Canada. It indicates that:

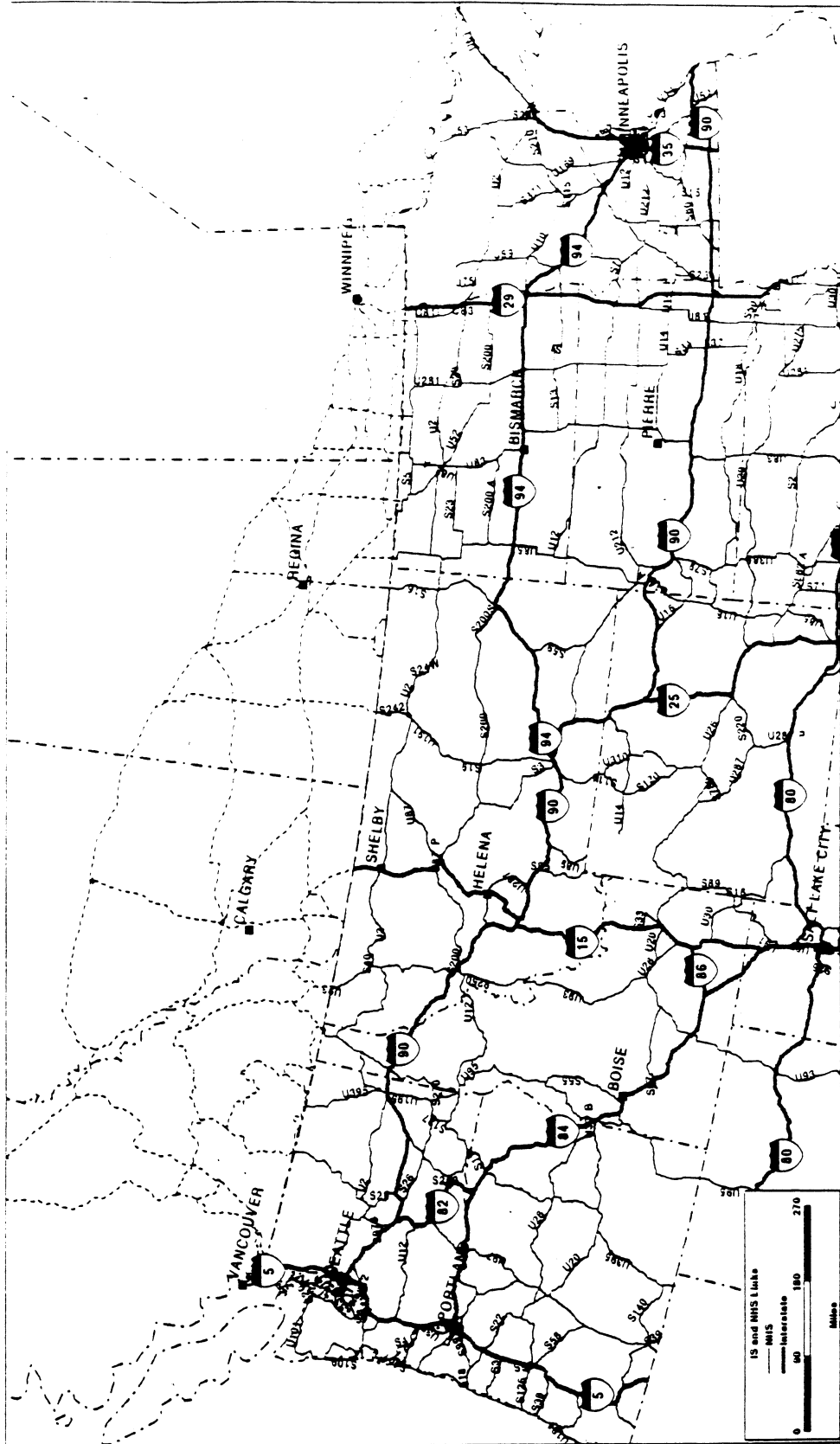
- Truck travel times between western Canada and most of the U.S. west of the Ohio River and the southern section of the Mississippi River are less than travel times from western Canada to central Canada (Toronto) and east (Montreal and beyond).
- Trucks leaving Winnipeg can be in Detroit, or Dallas, or Denver in less time than they can be in Toronto, Montreal or Vancouver. They can be at the Mexican border in an additional 7 hours of driving, and in Los Angeles or Monterey in an additional 12 to 15 hours.

Figure 2-1b: Interstate Highways in the Western Border Region



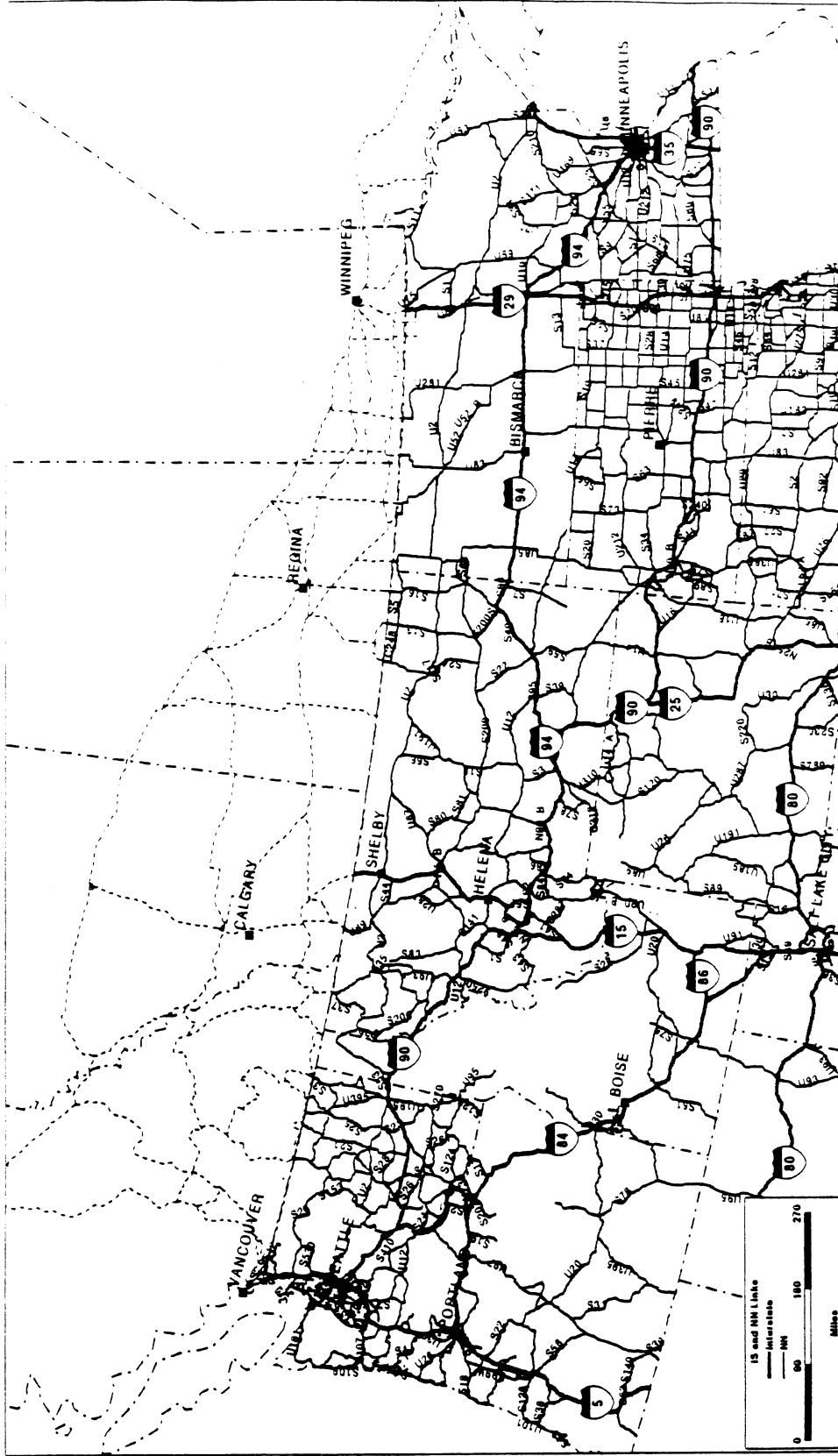
Source: NHPN GIS data, 1995

Figure 2-1c: NHS Highways in the Western Border Region



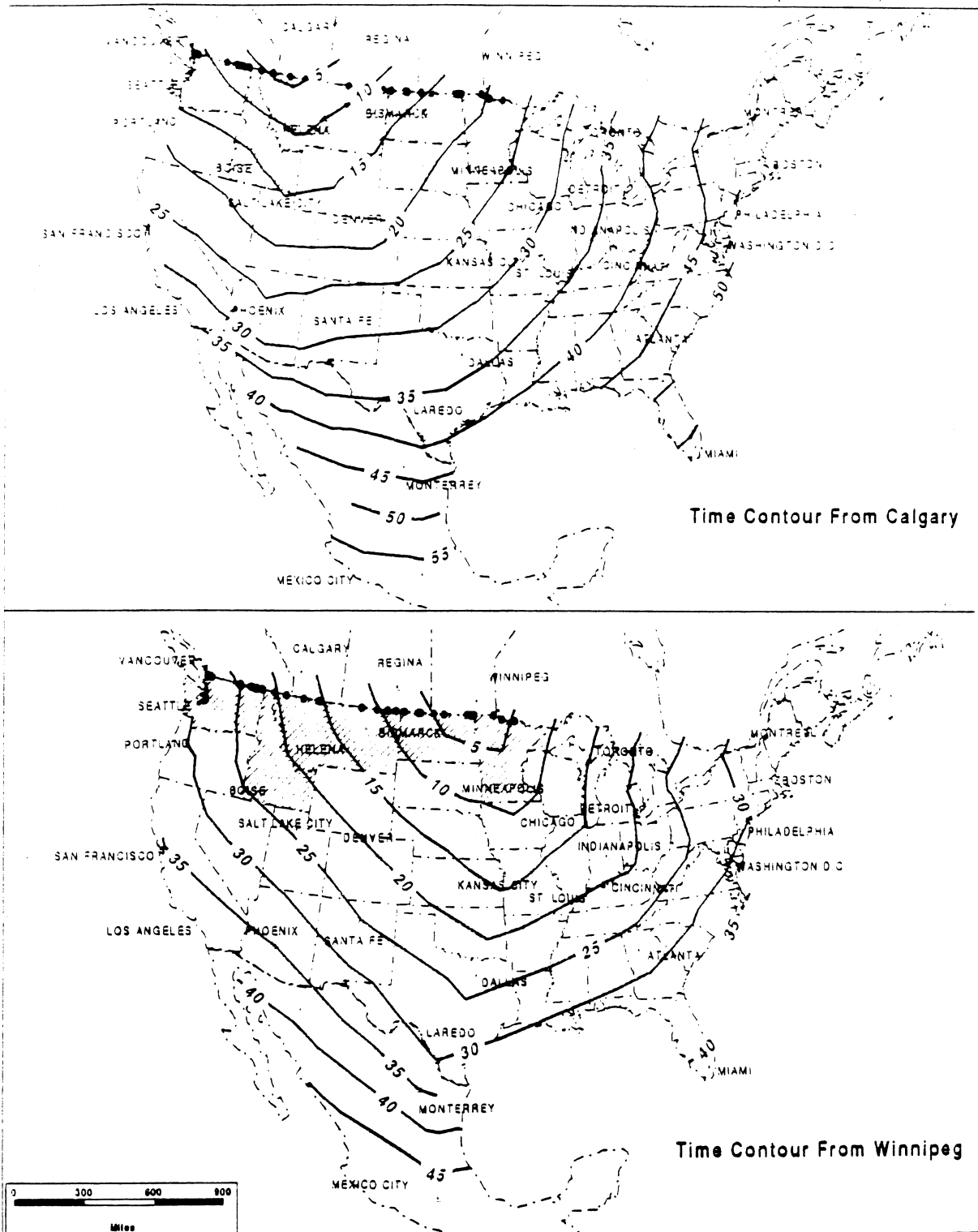
Source: NHPN GIS data, 1995

Figure 2-1d: NN Highways in the Western Border Region



Source: NHPN GIS data, 1995

Figure 2-2: Travel Time From Western Canada to the U.S. (in hours)



Source: Rand McNally Motor Carriers Road Atlas

- Trucks leaving Calgary can be in Los Angeles and the Mexican border in about 33 hours.
- Trucks leaving Vancouver can be in Los Angeles in 24 hours, which is about 4 hours less than the travel time from Winnipeg to Toronto.

The proximity of western Canada to this area and its markets, the similarity in economic and industrial activities across the western U.S. and Canada border, and the ease of crossborder trade have created strong trade and transportation linkages across the border.

2.3 Truck Border Crossings and Operations

There are 54 highway crossings (listed in Appendix A) on the western border. Table 2-3 lists and Figure 2-3 shows the 28 western border crossings of interest to this study. These crossings involve: (1) an Interstate (IS) highway, National Network (NN) highway, or National Highway System (NHS) highway; (2) a two-way commercial traffic flow of more than 12,000 trucks per year (about 30 trucks per day), or (3) both. The traffic criterion was based on data presented in pages A5 and A6 of “Descriptive Report on Cross-Border Traffic and Transportation in the Western U.S.-Canada Region,” FHWA-PL-009-041, “1992 Commercial Traffic by Border Crossing.” In subsequent references to Customs Service traffic data, this report uses the term “truck traffic” in place of commercial traffic, recognizing that a small portion of commercial traffic involves buses and light service trucks.

2.4 TS&W Regulations Governing Regular Operations

2.4.1 Legislative Framework

A combination of TS&W laws and regulations govern trucking operations across the western border. Three elements of this combination discussed here are: the ISTEA freeze, other U.S. TS&W provisions, and Canadian TS&W provisions.

The ISTEA Freeze

The ISTEA, as implemented through Federal regulation, restricts the weights of longer combination vehicles (LCVs) operating on the Interstate Highway System and the lengths of commercial motor vehicle (CMV) combinations with two or more cargo-carrying units on the NN. This “freeze” is subject to the State restrictions in effect on June 1, 1991. An LCV is defined in the ISTEA as any combination of a truck tractor and two or more trailers or semitrailers which operates on the IS at a gross vehicle weight greater than 80,000 pounds. A CMV is a vehicle combination with two or more cargo-carrying units operating on the NN.

Table 2-3. Western Border Crossings of Concern¹

State-Province	United States		Canada	
	Highway	GVW Limit (pounds)	Highway	GVW Limit (kilograms)
WASHINGTON-BRITISH COLUMBIA				
02b Blaine-Pacific Highway	I-5 NN, NHS	105,500	99 CNHS	63,500
03 Lynden-Aldergrove	539 NN, NHS	105,500	13	63,500
04 Sumas-Huntington	9 NN, NHS	105,500	11	63,500
06 Oroville-Osoyoos	97 NN, NHS	105,500	3	63,500
08 Danville-Carson	21 NN	105,500	41 CNHS	63,500
09 Laurier-Cascade	395 NN, CP	105,500	3	63,500
20 Frontier-Patterson	25 NN	105,500	3	63,500
12 Metaline Falls-Nelway	31 NN	105,500	6	63,500
IDAHO-BRITISH COLUMBIA				
14 Eastport-Kingsgate	95 NHS	105,500	95	63,500
MONTANA-BRITISH COLUMBIA				
15 Roosville-Grasmere	93 NN, NHS	131,060	93	63,500
MONTANA-ALBERTA				
17 Piegan-Carway	89 NN	131,060	2 MOU	62,500
19 Sweetgrass-coutts	I-15 NN, NHS	137,800	4 MOU, CNHS	62,500
MONTANA-SASKATCHEWAN				
24 Morgan-Monchy	242 NHS	131,060	4 Sec	54,500
25 Opheim-West Poplar	24 NN	131,060	2 Sec	54,500
26 Scobey-Coronach	13 NN	131,060	36 Sec	54,500
28 Raymond-Regway	16 NN, NHS	131,060	6 MOU	62,500
NORTH DAKOTA-SASKATCHEWAN				
29 Fortuna-Ourgre	85 NN, NHS	105,500	35 Sec	54,500
32 Portal-North Portal	52 NN, NHS	105,500	39 MOU, CNHS	62,500
33 Northgate	8	105,500	8 MOU	62,500
NORTH DAKOTA-MANITOBA				
36 West Hope-Coulter	83 NN, NHS	105,500	83 A1	56,500
38 Dunseith-Peace Garden	281 NN, NHS	105,500	10 MOU	62,500
44 Walhalla-winkler	32	105,500	32 A1	56,500
45 Neche-Gretna	18	105,500	30 A1	56,500
46 Pembina-Emerson	I-29 NN, NHS	105,500	29 MOU, CNHS	62,500
MINNESOTA-MANITOBA				
47 Noyes-Emerson East	75 NN	80,000	75 A1	56,500
50 WArroad-Sprague	313	80,000	12 MOU	62,500
MINNESOTA-ONTARIO				
51 Baudette-Rainy River	11 NN	80,000	11 Ont	63,500
52 Intern'l Falls-Ft. Frances	53 NHS	80,000	11 Ont, CNHS	63,500

NOTES: NN - National Network highway; NHS - National Highway System Highway; CNHS - Canadian National Highway System Highway; MOU - Canadian Memorandum of Understanding (RTAC); Sec - Saskatchewan Secondary Highway; A1 - Manitoba A1 Class Highway

¹ This list includes any of the 54 crossings identified in Appendix A which involve either or both: (A) an IS, NN, or NHS highway; (b) a two-way commercial traffic flow (in 1992) of more than 12,000 trucks per year (30 trucks per day).

Figure 2-3 : Western Border Highway Crossings

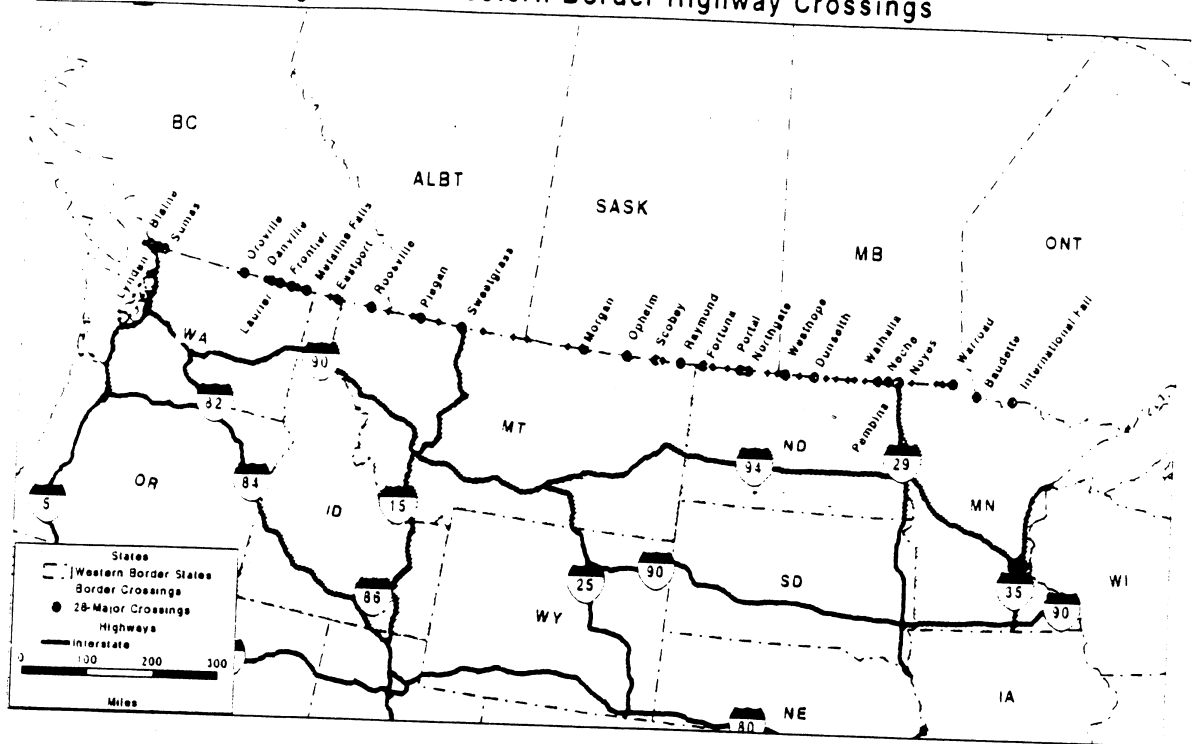
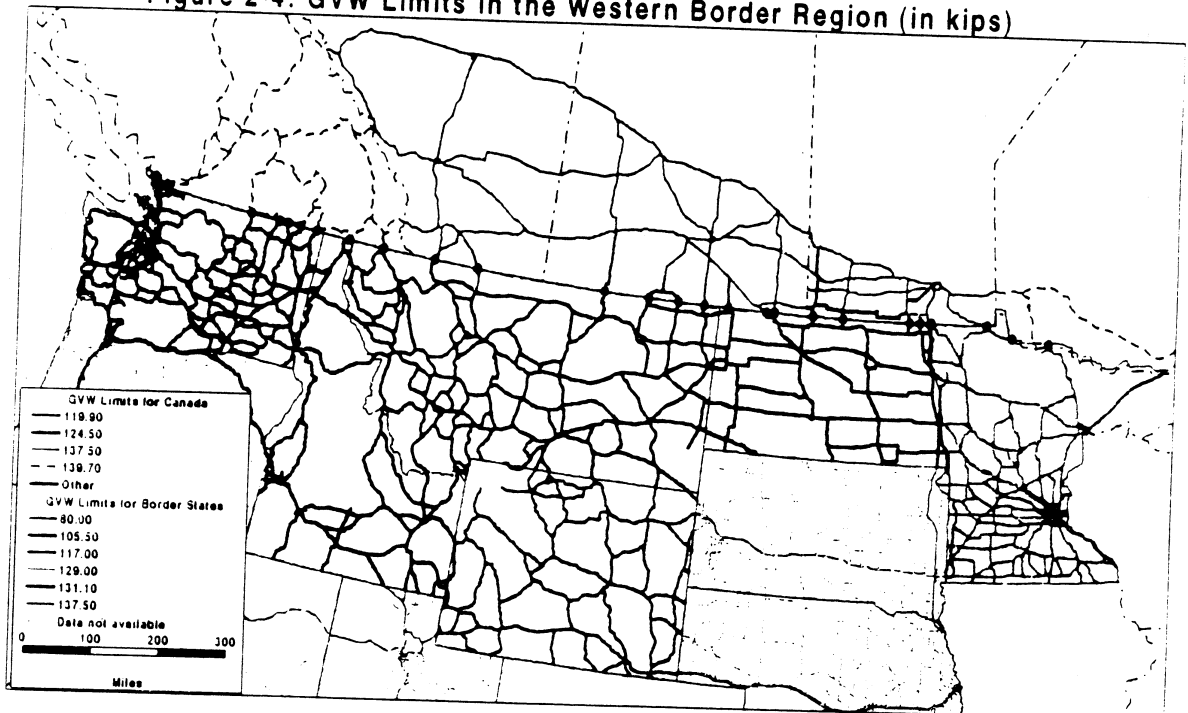


Figure 2-4: GVW Limits in the Western Border Region (in kips)



U.S. TS&W provisions in addition to the ISTEA freeze

Table 2-4-a presents selected aspects of the de facto TS&W provisions governing regular operations on highways in the five States on the western border. Regular operation is defined by WASHTO as “the movement over highways of motor vehicles with dimensions and weights specified by State codes”. These are a mixture of Federal and State laws and regulations. They are de facto in that they represent the regulatory limits within which trucks can and regularly do operate legally by simply registering the vehicle or obtaining necessary permits “across-the-counter,” usually subject to some fee. Some trucks, some of the time, operate beyond these de facto limits--either illegally, or under a special permit. There are other regulatory details over and above those shown in Table 2-4-a which govern and complicate trucking operations moving across the border.

Canadian TS&W provisions

Table 2-4-b presents selected aspects of the de facto TS&W provisions governing regular operations on major highways in the five Provinces on the western border. These are provincial laws and regulations. There is no Federal TS&W law in Canada.

Figure 2-4 shows the GVW limits governing the highways of interest in this case study.

2.4.2 Western Border State Regulation Details

This section presents details about TS&W regulations in the five western border States. They are necessary to understand how the regulations work to affect actual trucking operations in each State.

Washington [5]

As of 1995, all IS, NN and State highways have a specified GVW limit of 105,500 pounds. This was also the practical GVW limit in 1993 when registrations were sold to a maximum of 80,000 pounds, and then the permit office issued “across the counter” additional weight allowance up to 105,500 pounds, for a fee. The Washington law as of 1995 incorporates this extra permit allowance into the registration fee, and now a registrant receives the full 105,500 pounds GVW at the licensing office with no permit being required or issued. This registration allows operations on Interstate highways.

The limits specified by the ISTEA freeze for tractor twin-trailer combinations are 105,500 pounds GVW on Interstate highways and a box length (distance from the front of the first cargo unit to the back of the last unit) of 68 feet on NN highways. Washington does not allow triple-trailer combinations.

Table 2-4-a
TS&W Regulations in Western Border States
Governing Regular Operations
(dimensions in feet and weight in 1000s of pounds)

STATES	WASHTO	Washington			Idaho	Montana			North Dakota			Minnesota					
		IS	NN	Oth		IS	NN	Oth	IS	NN	Oth	IS	NN	Oth			
Divis. Load Permit		yes				yes			yes			no					
WIDTH	8.5	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*
HEIGHT	14	*	*	*		*	*	*	*	*	*	*	*	*	13.5	13.5	13.5
MAX LENGTH																	
Single Unit	45	40	40	40	*	*	*	*	*	*	50	50	50	40s	40s	40s	
Semi-Trailer	48	53s	53s	53s				53	53	*	53	53	53	53	53	53	
53 53 53																	
Trailer	NR	48	48	48	53o	53o	48o	28.5	28.5	28.5	53	53	53	45	45	45	
Doubles Box-length	61	*	*	*	68	68	61	NR	NR	NR	NR	NR	NR	*	*	*	
Truck-Trailer	70	75	75	75	75	75	75	75	75	75	75	75	75				
Trac-Semi	65	NR	NR	NR	NR	NR	65	NR	NR	NR	NR	NR	75	NR	NR		
Trac+Double	NR	*	*	*	*	*	75	*	*	*	*	*	75	NR	NR		
i ISTEAMCV(2)		68	68	na	95	95	na	93	93	na				103	103	na	
No No																	
i ISTEAMCV(3)		No	No		95	95	na	100	100	na	100	100	na	No	No		
TIRE WEIGHT (pounds/inch)																	
Steering	600	*	*	*	*	*	*	NR	NR	NR	550	550	550				
Other	500	*	*	*	600	600	600	600	600	600	550	550	550				
AXLE WEIGHT																	
Steering	20	*	*	*	*	*	*	*	*	*	12.1	12.1	12.1	*	*	*	
Single	20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Tandem	34	*	*	*	*	*	37.8				*	*	*	*	*	*	
* * *																	
Tridem	BFB	*	*	*	*	*	*	*	*	*	*	48o	48o				
* * *																	
GROSS WEIGHT																	
	80	105+o	105+o	105+o	105+	105+	105+	BFB	BFB	BFB	105+	105+	105+	*	*	*	
f FHWA-14 no permit		80	105+	105+	80	105+	105+	80	80	80	80	105+	105+	80	80	80	
f FHWA-14 r .permit 5-axle		103s	103s	103s				case-by-case			105+s	105+s	105+s	103s	103s	103s	
92s 92s FHWA-14 r .permit >5-axle					156s	156s	156s	case-by-case			126s	126s	126s	136s	136s	136s	
144s144s144s																	
i ISTEALCV(2)		105+	na	na	105+	na	na	131+	na	na	105+	na	na	No	Provisions		
i ISTEALCV(3)		No	na	na	105+	na	na	131+	na	na	105+	na	na	No	Provisions		
BRIDGE FORMULA B																	
		*	*	*	*	*	*	*	*	*	*	out	out	*	*	*	

SOURCES

Guide for Uniform Laws and Regulations Governing TS&W Among WASHTO States. June 1993, UNLESS NOTED OTHERWISE
f - FHWA Working Paper #14: GVWs by routine permit are from s and considered "approximate"
s - Specialized Carriers and Rigging Association Permit Manual
r - Rand-McNally Motor Carrier Atlas
o - Other source data corrected by State official
i - ISTEAMCV regulation--imply "divisible" load permits because LCVs and CMVs are by definition divisible operations

NOTES

* means same as WASHTO
NR means not regulated
na means not applicable
+ means number has been rounded down
IS means Interstate System highway
NN means National Network highway
Oth means highways other than IS or NN highways
BFB means Bridge Formula B
ISTEAMCV(2) means a combination with two cargo units
ISTEAMCV(3) means a combination with three cargo units
ISTEALCV(2) means a tractor with two trailing units
ISTEALCV(3) means a tractor with three trailing units

Table 2-4-b
TS&W Regulations in Western Border Provinces
Governing Regular Operations
(dimensions in meters and weight in metric tonnes)

PROVINCES	MOU	British Columbia	Alberta	Saskatchewan Pri Sec	Manitoba Pri Sec	Ontario	
WIDTH	2.6	*	*	*	*	*	
HEIGHT	4.15	*	*	*	*	*	
LENGTH							
Truck	12.5	*	*	*	*	*	
Semi-Trailer	16.2	*	*	*	*	*	
Tractor-Semi	23	*	*	*	*	*	
Doubles total	25	*	*	*	*	*	
A-double boxes	18.5	*	*	*	*	*	
TIRE WEIGHT (kgs/mm)							
Steering	10	*	*	*	*	11	
Other	10	*	*	*	*	11	
Tire limit	NR	3000 kg (MoU)	*	3000 kg	3000 kg	*	
AXLE WEIGHT							
Steering	5.5	*	*	*	*	9	
Single	9.1	*	*	*	8.2	10	
Tandem	17	*	*	*	14.6	*	
Tridem	23	*	*	*	*	*	
GROSS WEIGHT	62.5	63.5	*	*	54.5	56.5	63.5

BRIDGE FORMULA--The MOU specifies interaxle spacing limitations and requirements

NOTES

* means same as MoU

NR means not regulated

+ means number has been rounded

Pri means primary highways

Sec means secondary highways

MoU means Canadian RTAC Memorandum of Understanding

10 kg/mm = 550 lb/inch

The basic semitrailer limit is 53 feet. Yearly permits allowing the use of 56-foot chassis are available on an “automatic” basis, for the asking. Washington's basic box length is 61 feet, which allows the operation of two 28-foot trailers. A permit allowing a 68-foot box length is available across the counter for a fee of \$100. Anything greater than 68 feet requires an irreducible load permit.

An increasingly common combination involves a straight truck and trailer using a long drawbar designed to increase the allowable GVW in accordance with Bridge Formula B to the maximum of 105,500 pounds. One example is the “4-4” combination, a four-axle straight truck with a single lift axle coupled to a four-axle trailer with two lift axles.

The Stinson trailer is a specialized unit designed to transfer containers between Seattle and Vancouver. The unit is comprised of a three-axle tractor, a single axle jeep, and a tandem axle semitrailer with a rear booster axle. This vehicle is designed to meet the Bridge Formula B requirements hauling fully loaded 40-foot containers within the 105,500-pound GVW limit. There are about 25 of these units in regular operation.

Tridem axles in six-axle tractor-semitrailer combinations are increasing in popularity because of carriers requirements to practice “water level loading” (that is, to load their vans at a more or less constant level without having to worry about axle weight distributions). Such loading might lead to a weight distribution such as 11,000 pounds on the steering axle, 27,000 pounds on the drive tandem axle, and 42,000 pounds on a wide-base tire tridem axle, for a total of 80,000 pounds.

There have been requests to permit Canadian trucks to operate at RTAC weights from the Port of Bellingham to deliver logs and timber to the Socco plant in Sumas without requiring down-loading.

Idaho [6]

The limits specified for Idaho by the ISTEA freeze are 105,500 pounds on Intersate highways and a box length of 95 feet for NN highways for double- and triple-trailer combinations. In general, permits are required to operate at greater than 80,000 pounds GVW on IS highways, but these are obtained across the counter for a \$5 fee.

Seven-axle tractor-semitrailer and truck-trailer combinations are used in Idaho. The seven-axle tractor-semitrailer consists of a four-axle tractor with a (wide-base tire) lift axle between the steering axle and the drive tandem, and a tridem axle 53-foot semitrailer (using dual or wide-base tires). Typical maximum weights might be 12,000 pounds on the steering axle, 8,000 pounds on the lift axle, 34,000 pounds on the drive tandem axle, and 42,000 pounds on the tridem axle, for a total of 96,000 pounds GVW. Such units are used in chip haul and the trucking of hog fuel from forest to rail.

Idaho allows tandem loads of 37,800 pounds under a grandfather weight table up to a gross weight of 79,000 pounds, for trucks carrying raw products (lumber, farm, construction material) on both IS and non-IS highways.

There is growing use of wide-base tires in Idaho. With Idaho's 600 pounds per inch of tire width limit, some carriers are removing the inside of the dual sets on one axle in a tandem group. Using 11-inch tires, this leaves 66 inches of tire in a tandem axle. This is more than needed to operate at 34,000 pounds (that is, $66 \times 600 = 39,600$ pounds).

Montana [7]

The Montana limits specified for double-trailer combinations by the ISTEA freeze are 137,800 pounds GVW on I-15 between Shelby, Montana and the Montana/Alberta border and 131,060 pounds on the other Interstate highways and a box length of 93 feet on NN highways. For triple-trailer combinations the GVW limit is also 131,060 pounds, but the box length is longer at 100 feet on NN highways. Permits are required to operate at greater than 80,000 pounds GVW on IS highways. These are obtained across the counter for a fee. Once the permit is obtained, the carrier must at any time be able to demonstrate that the vehicle is in compliance with the axle weight limits and Bridge Formula B to on-road enforcement personnel.

The basis of the 131,060 pounds GVW ISTEA cap is that Montana limits all vehicles to a maximum of nine axles and limits total combination length. When combined with Montana's overall length limit of 105 feet (with cab over tractors) and 110 feet (with conventional tractors), and complying with both the inner and outer requirements of Bridge Formula B, 131,060 pounds was estimated by Montana to be the maximum practical GVW for a nine-axle unit at the time of the freeze.

Split tandems are used on five-axle tractor-semitrailers to achieve 86,000 pounds GVW. They are used in interstate weigh-out operations such as lumber haul and in local gravel haul.

Grain haul is often done in Rocky Mountain A-train doubles. These units use long drawbars (16 or more feet) to stretch the distance between axles to achieve a higher allowable GVW in accordance with Bridge Formula B. One recent development is the use of a cab-controlled air pressure device which can stretch or contract the drawbar while the vehicle is moving.

Large truck-trailer combinations are used in Montana. These combinations employ a long drawbar (up to 20 feet) designed to increase the allowable gross weight in accordance with Bridge Formula B. One example is a combination of a four-axle straight truck, with a single lift axle, coupled with an eighteen-foot drawbar to a four-axle trailer, having two sets of wide-base tires on tandem axles with a total length of as much as 110 feet.

North Dakota [8]

The North Dakota limits specified by the ISTEA freeze for double-trailer combinations are 105,500 pounds GVW and a box length of 103 feet. The triple-trailer combination limits are 105,500 pounds GVW, but a box length of 100 feet. Permits are required to operate at greater than 80,000 pounds GVW on IS highways. These are obtained across the counter for a fee.

Double-trailer combinations at up to 105,500 pounds GVW are common in North Dakota, and in cross border trucking. These combinations are typically used for truckload hauling of special commodities such as grain and fertilizer (using hopper bottom trailers), fuel (in tankers), dry bulk materials (such as cement), and flatdeck trailer operations.

North Dakota does not require trucks to comply with the inner bridge requirements of Bridge Formula B on non-IS highways. The inner bridge requirements are enforced on IS highways, however. In both cases, outer bridge requirements must be met.

North Dakota permits 48,000 pounds on three-axes or more, without reference to Bridge Formula B, on non-IS highways. Tridems on IS highways are limited by Bridge Formula B.

By axle weights, a six-axle tractor-semitrailer is theoretically permitted 94,000 pounds GVW on non-IS highways in North Dakota (12,000 pounds on the steering axle, 34,000 pounds on the drive tandem axle, and 48,000 pounds on the trailer tridem axle). In practice, such a combination would normally gross at about 90,000 pounds because of the Bridge Formula B limitations and the practical outer axle spacing. Six-axle tractor-semitrailers regularly operate on North Dakota IS highways at 88,000 to 89,500 pounds GVW using routine permits and in full compliance with Bridge Formula B.

Bridge Formula B limitations, however, encourage North Dakota trucking to utilize five-axle tractor-semitrailers with 10-foot split tandems, which creates two single axles, to operate at GVWs of 86,000 pounds rather than six-axle tractor-semitrailers at 88,000-90,000 pounds GVW. This is because the extra tare weight of the six-axle unit is about 3,000 pounds, leaving it a payload capacity more or less the same as a five-axle unit with a split tandem.

From an interview with officials at the Emerson Scale on May 30, 1995, it was learned that : (1) there is a growing use of split tandems on crossborder movements on I-29; and (2) Manitoba has grandfathered a limited number of North Dakota carriers to operate vehicles having a tandem axle spacing of 8 feet on the pup trailers in old seven-axle A-train doubles.

Minnesota

As Minnesota has not allowed LCVs or ISTEA CMVs, the freeze does not apply to that State.

2.4.3 Effect of Combined Regulations

This section summarizes the combined defacto effects of the TS&W regulations that govern trucking operations across the western border.

Weight

Axle weight limits of 20,000 and 34,000 pounds on single and tandem axles respectively govern most trucking crossing the western border under regular operation. These limits apply to IS, NN and all principal State highways in the five border States. They are equal to (in the case of single axles) or more restrictive than (in the case of tandem axles) the equivalent limits specified for most connecting highways in Canada. The exceptions are: (1) the ISTEA permits trucks to move on I-15 between the Alberta-Montana border and Shelby, Montana at Canadian RTAC weight limits, (2) certain connecting secondary highways in Saskatchewan are restricted to axle weight limits of 18,000 and 32,000 pounds versus 20,000 and 34,000 pounds respectively for single- and tandem-axle limits, (3) certain highways in North Dakota are restricted to lower axle weights, (4) Idaho permits 37,800 pounds tandem axle weights for agricultural and mining-related trucks on the interstate if the GVW is less than 79,000 pounds, and (5) spring restrictions on certain roads, particularly in North Dakota.

Bridge Formula B governs most trucking crossing the western border under regular operation. Bridge Formula B is for the most part more restrictive than equivalent load distribution requirements specified for connecting highways in Canada. The exceptions are: (1) in North Dakota, a unique tridem limit of 48,000 pounds irrespective of spread is permitted on all highways other than IS highways; (2) in North Dakota, while the outer and inner requirements of Bridge Formula B apply to IS highways, only the outer requirements apply to non-IS highways; (3) the ISTEA permits trucks to move on I-15 between the Alberta-Montana border and Shelby, Montana at Canadian RTAC axle and GVW weight limits and RTAC inter-axle spacing provisions notwithstanding Bridge Formula B; (4) certain connecting secondary highways in Saskatchewan are restricted to tandem axle weight limits of 32,000 pounds; and (5) States enforcing inner bridge requirements are normally concerned only with the “trailer (as opposed to “tractor”) inner bridge,” which applies to the axle group including those from the second axle to the last axle.

The de facto GVW limit is at least 105,500 pounds for effectively all western border crossings except to and from Minnesota. A 131,060-pound limit applies in Montana, except for the special Shelby exemption of 137,800 pounds. Major highways in Minnesota are limited to 80,000 pounds GVW.

Split tandems are increasingly used in the western border States. Two axles on a semitrailer are spread by 10 feet, and as such are permitted 40,000 pounds of load (two axles at 20,000 pounds each) pursuant to Bridge Formula B. This arrangement allows operating five-axle tractor-semitrailers at a GVW of as much as 86,000 pounds where allowed and flexibility in loading at

lower GVWs. Spreads of this nature are generally prohibited in the western Canadian Provinces. They do not classify as a tandem axle, and are not permitted to operate as two single axles. British Columbia has at times required the wheels to be removed from one of the axles, to render the semitrailer a single axle unit. Alberta allows only a single axle load on the two axle group. Manitoba prohibits their use, although from time to time allows them by permit for one trip.

Differences in tire load limits among the ten western jurisdictions have no significant effect on western border trucking. Most trucks are provided with enough tires and tire width to ensure that the applicable axle limit is reached before the tire limit. At the 500 pounds per inch limit, four 10-inch tires (two sets of dual tires) on a single axle can handle a load of 20,000 pounds, the limit for a non-steering single axle. Eight 10-inch tires on a tandem axle can handle 40,000 pounds based on tire load limits, but only 34,000 pounds based on the tandem axle load limit. The exceptions are: (1) Saskatchewan regulations prohibit the effective use of wide-base tires by limiting the load on an individual non-steering tire to 6,600 pounds, (2) British Columbia has the same restriction applicable to RTAC Memorandum of Understanding trucks, and (3) Alberta prohibits the use of wide-base tires on tridems.

Tridem axle load limits in Washington, Idaho, Montana, North Dakota (only on the IS), and Minnesota are governed by Bridge Formula B. On non-IS highways, North Dakota allows a tridem axle load of 48,000 pounds irrespective of spread. Canada's tridem limits are 23,000 kilograms (50,600 pounds) or 24,000 kilograms, depending on spread. Alberta prohibits the use of tridems with wide-base tires.

Canada's steering axle limit of 5,500 kilograms causes problems at certain crossings. U.S. vehicles entering Manitoba from I-29 can come in with a steering axle load of as much as 6,000 kilogram, and are required to move their fifth wheel to comply with the 5,500 kilogram requirement. Some of these vehicles have probably had their load shifted to the steering axle to remove weight from the drive tandem. In Manitoba, they then must shift weight back to the drive axle. Alberta seldom experiences a problem in this regard and generally does not require adjustment if it occurs.

Dimensions

Western border States, except Minnesota, limit vehicle height to 14 feet. This is 6 inches more than allowed in the western Canadian Provinces. Fourteen-foot vans are used throughout the western United States particularly by specialized truckload carriers (California can manufacturers and paper product manufacturers in Idaho and Oregon). Other areas benefitting from the 14-foot height limit include handling high cube 9-foot, 6-inch containers and stacking three flatdeck trailers. Some but not all Alberta enforcement officers allow 14-foot units to enter the Province under a grandfather right.

Canadian RTAC regulations require the wheelbase of a tractor to be within the range of 3.0 to 6.2 meters (118 to 244 inches). Some U.S. carriers (for example, Schneider and Watkins/Sheppard) wish to operate a series of tractors having a wheelbase of as low as 2.7 meters (106 inches) into the western Provinces. Different Provinces treat this matter differently. Manitoba deems these vehicles to be “non-RTAC” and thereby subject to the non-RTAC aspects of Manitoba's regulations. These regulations include a lower tandem axle weight (16,000 rather than 17,000 kilograms) and a shorter overall length (20 rather than 23 meters). This is no problem for Schneider since the 16,000-kilogram limit is greater than the U.S. 34,000-pound limit, and these short tractors can haul a 53-foot semitrailer just within the 20-meter Manitoba length limit. Alberta regulations do not permit the same response as Manitoba. Alberta specially-permits these units on the understanding that Schneider would phase them out of Alberta operations. British Columbia initially prohibited their use, although it is understood that this position has now been relaxed.

Certain U.S. tractors have wheelbases longer than the 6.2 meters permitted by RTAC. If the combination has operated in and out of the Province for several years, Manitoba allows these vehicles into the Province under special permit subject to the 23-meter RTAC overall length limit when in a tractor-semitrailer combination (or 25 meters in a double-trailer combination).

2.5 Extra-Legal Vehicles--Special Permitting

Many vehicles operating in the border States and Provinces are strictly speaking “extralegal vehicles,” defined by WASHTO as a “motor vehicle, laden or unladen which exceeds legal dimensions and/or weights and operates on highways by permit”. Many of these permits (for example, operating above the 80,000-pound GVW limit on Montana IS highways) are obtained more or less simply for the asking (sometimes accompanied by a nominal fee). In Washington's case, permits allowing 105,500 pounds GVW on IS highways are incorporated into the basic vehicle registration.

Where such permits are required but are obtained with ease and apply to day-to-day crossborder trucking operations, this report considers them part and parcel of regular TS&W limit provisions discussed in previous sections. Those aspects of crossborder trucking which are extra-legal in nature and which require non-routine permitting (for example, WASHTO's superloads, non-divisible loads, manufactured homes, and their equivalents in non-WASHTO jurisdictions) are beyond the scope of this report.

2.6 Effects of TS&W Regulations on Crossborder Truck Operations

Except for crossings between Manitoba and Minnesota, a variety of truck combinations having five or more axles routinely operate across the western border. While the five-axle tractor-semitrailer is the “work horse” of the crossborder fleet, other combinations include: six-axle tractor-semitrailers, seven-axle tractor-semitrailers (with a lift axle on the tractor), eight-axle tractor-semitrailers (with lift axles on both the tractor and semitrailer), A-trains with five to nine axles (including western doubles and Rocky Mountain doubles), a few seven- or eight-axle C-trains, eight-axle B trains, a variety of truck-trailer combinations having five to eight axles, specialized units (such as the Stinson trailers on the I-5), and specially-permitted vehicles (such as the Kleysen potash trucks at Northgate). The photographs on the following pages illustrate some of the more unique truck types operated in the western border States, and examples of how the de facto TS&W provisions on the western border affect selected trucks and trucking operations are discussed by carrier below.

Canadian Freightways [9]

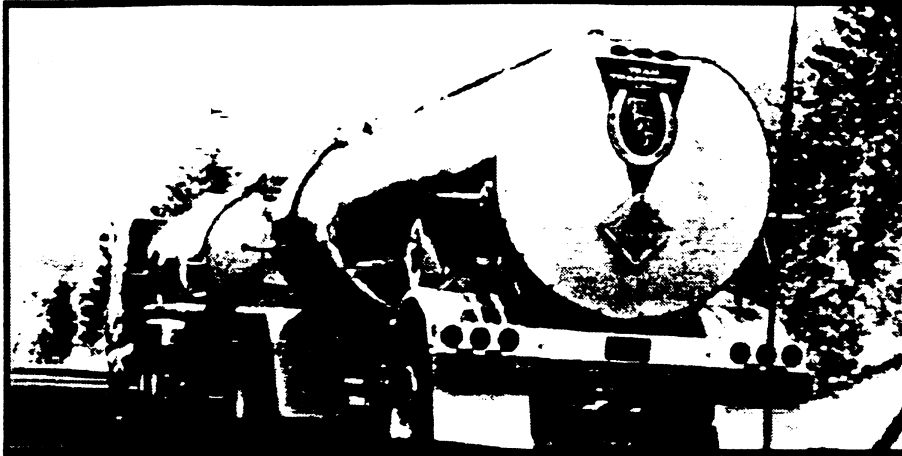
Alberta has recently permitted the operation of Rocky Mountain Doubles on selected undivided highways. These double-trailer combinations with either 48- and 28-foot trailers or 53- and 28-foot trailers can now operate freely along I-15 and Alberta on Highway No. 4, a two-lane undivided highway, to Calgary.

Most of Canadian Freightways' freight cubes out at roughly 10 pounds per cubic foot, with most vehicles being operated at substantially lower GVW than their size and number of axles would permit. Canadian Freightways does not use wide-base tires.

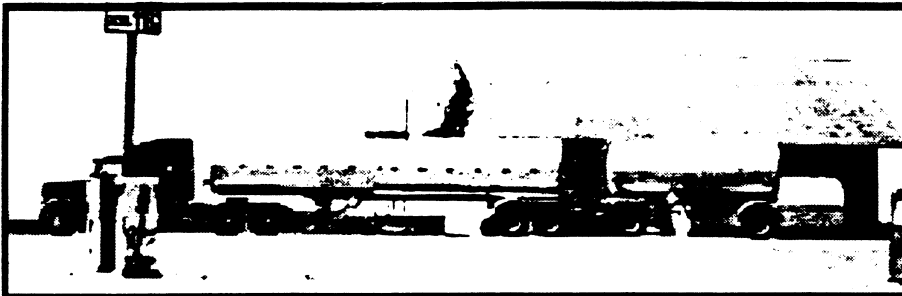
Paul's Hauling [10]

In the past, Paul's Hauling has used a seven-axle, A-train hopper-trailer operation from its terminal in Brandon, Manitoba on a four-leg route that involved: (1) a vehicle dead-heading from Brandon to Rocanville, Saskatchewan, (2) hauling potash from Rocanville to Idaho, (3) dead-heading from Idaho to Wyoming, and (4) hauling soda ash from Wyoming back to Brandon. In Brandon, the soda ash was re-loaded into pneumatic equipment for delivery to Thompson, Manitoba. The second and fourth legs were subject to a GVW limit of 105,500 pounds, the limit in Idaho and North Dakota.

The configuration's length is about 75 feet, with a 3.5 meter spread between the dolly axle and rear-most axle on the semitrailer. When the unit arrived at the U.S. border, its drawbar was stretched by 10 feet to comply with Bridge Formula B. On re-entering Canada, the unit was shortened by 10 feet for the movement into Brandon. Stretching and retracting drawbars is common on crossborder A-train operations.



**5-axle truck-trailer
tanker**
Blaine, ND



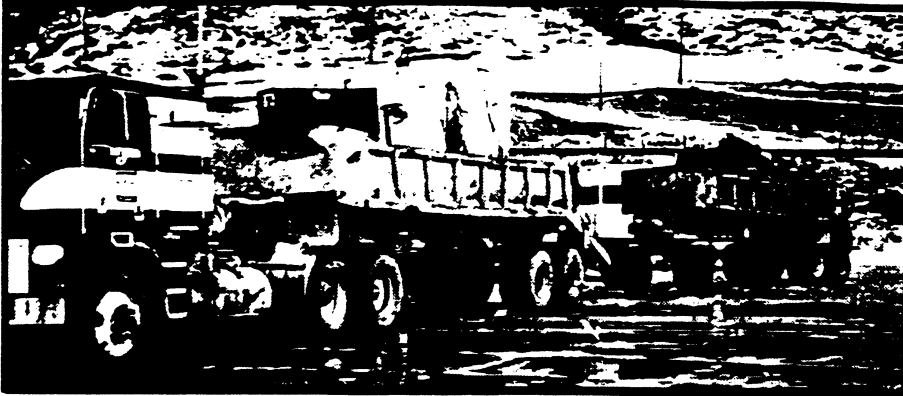
**7-axle A-train
tanker**
ND



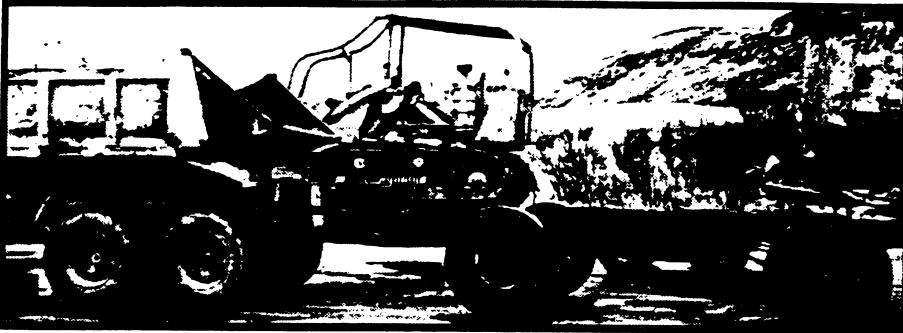
**8-axle A-train
dry bulk tanker**
Shelby, MT



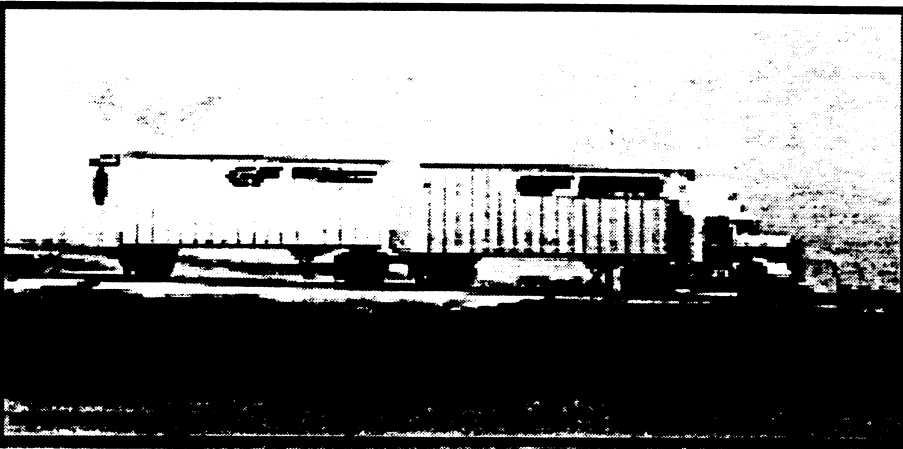
**8-axle B-train
tanker**
Portal, ND



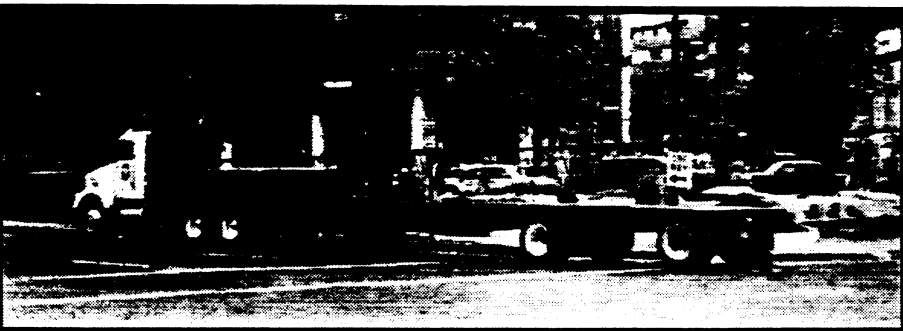
9-axle A-train
split tandem dolly
MN



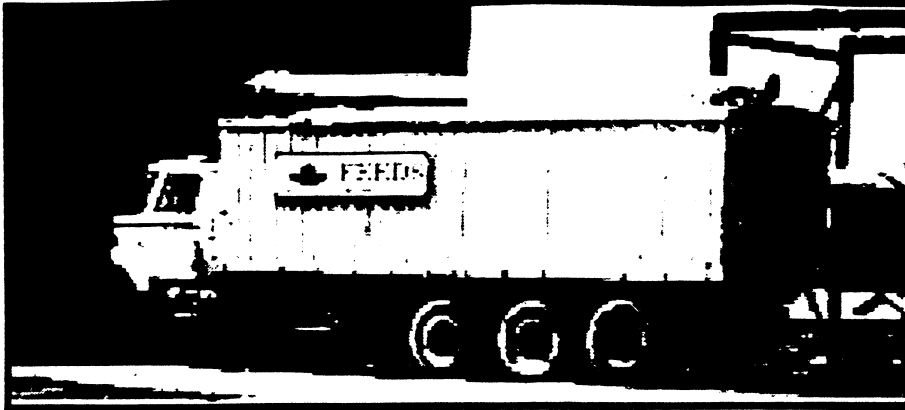
Dolly connection



5-axle A-train
Western Double
Shelby, MT

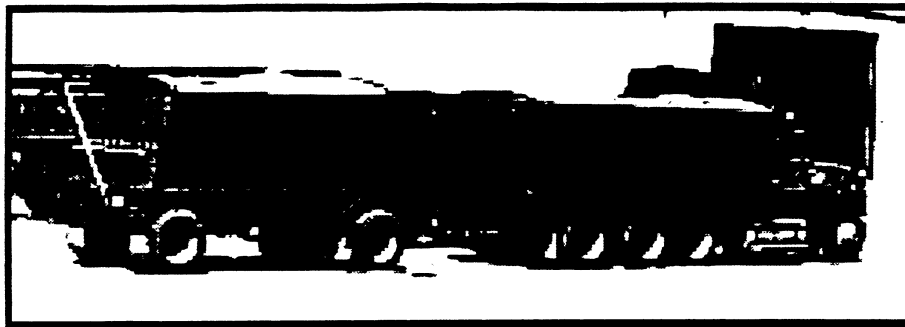


5-axle tractor semitrailer
with split tandem



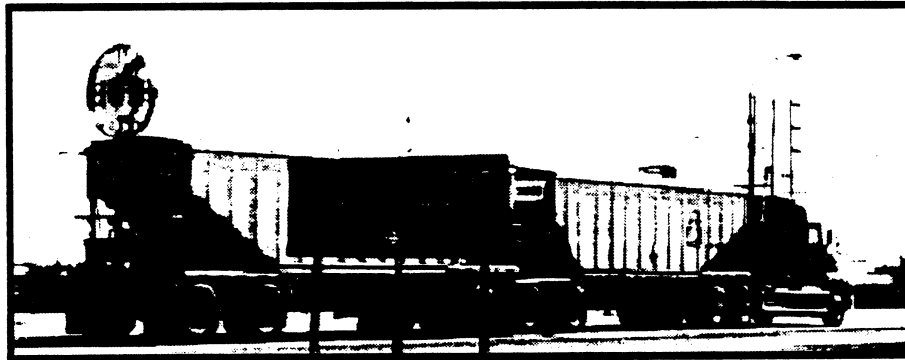
4-axle truck (grain)
with tag lift axle

MN



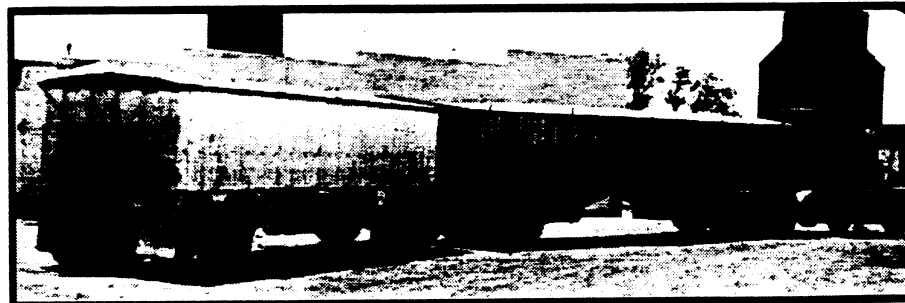
6-axle truck-trailer (grain)
with pusher lift axle

ND



8-axle B-train (hopper)

Devil's Lake, ND



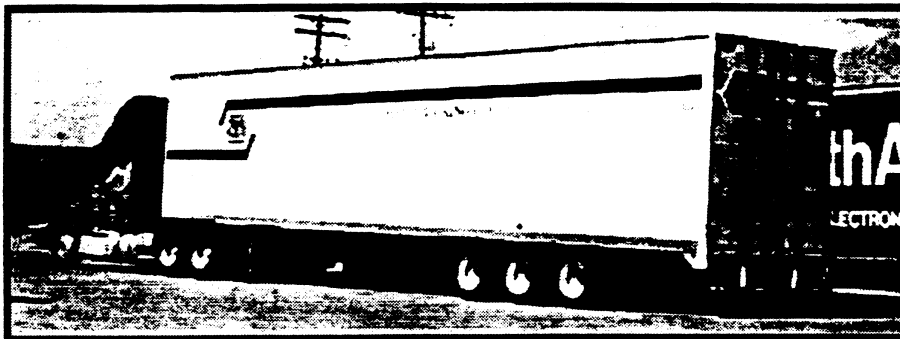
9-axle A-train (hopper)
Rocky Mountain Double
lift axle on tractor

ND



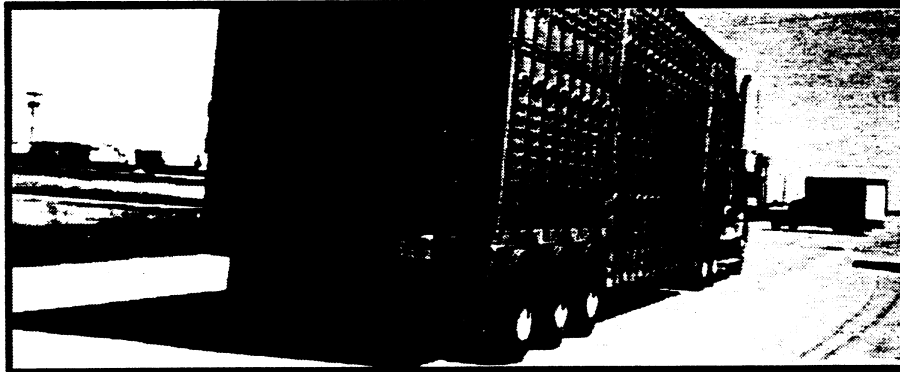
6-axle tractor semitrailer
tridem axle with dual tire

Blaine, WA



6-axle tractor semitrailer
dry van
tridem axle with dual tire

Shelby, MT



6-axle tractor semitrailer
live stock van
tridem axle with dual tire

Portal, ND



8/6-axle tractor semitrailer
lift axle on tractor
lift axle on semitrailer
hauling 40' container

Blaine, WA

Penner International [11]

Penner specializes in U.S.-Canada truckload movements in western Canada (Winnipeg to Vancouver) and the American Mid-West and to Toronto. They use five-axle tractor-semitrailer equipment that largely comply with U.S. Federal regulations, although they use heavier tractors than their U.S. competition, 20,000 pounds versus 17,500 pounds. They also use heavier trailers with I-beams at 18-inch versus 24-inch spacing. Their tractors are equipped with air-slide fifth wheels at an added weight of about 200 pounds. To further facilitate load distribution, all trailers are equipped with moveable tandems for an additional weight of 350 pounds per trailer. These devices provide added flexibility in loading. In practice, many drivers like to “stretch” their vehicles, sometimes leading to overweight axles. Penner believes that large U.S. fleets do not use slider equipment to the extent used in Canada to save tare weight and additional expense.

Penner is assessing its specifications which led to heavier tare weights because of increasing competition on payloads being offered to shippers by U.S. carriers. Penner's standard payload has been 44,000 pounds. At 80,000 pounds GVW, this allows a tare weight of up to 36,000 pounds. Certain competitors are offering payloads of 47,000 pounds with an 80,000-pound cap for the same mileage rate.

One-half of Penner's trailer fleet are 53-foot semitrailers, and the other half 48-foot. All new semitrailers in the past two years have been 53 footers. About two-thirds of Penner's activity cubes-out, while the remainder weighs-out.

Penner often routes traffic running between Winnipeg and Toronto across U.S. Route 2. This route is 40 miles shorter in distance and has lower fuel prices. Several other Canadian carriers also use this route.

Kindersley Transport [12]

Canadian truckload carriers operating into the United States typically use heavier power than their U.S. counterparts (for example, a Detroit Diesel engine at 380-400 horsepower versus a Cummins M-11 at 330-370 horsepower) and similarly heavier transmissions. One reason for this is that the equipment must also be employed in heavier Canadian haul operations. As such, Kindersley's typical Canadian tractor would have a tare weight of about 19,500 pounds versus its U.S. equivalent of 17,500-18,500 pounds. Because the Canadian tractor is heavier and often employs a steering axle set-back about 18 inches, most of this weight difference, 1,000 to 1,500 pounds, is applied through the front steering axle.

Kindersley reports increasing traffic from western Canada into southern California in terms of truckloads of paper and newsprint, chemicals, and peat moss. When in season, produce is returned northbound to destinations throughout western Canada, requiring the use of temperature-controlled equipment.

Kindersley uses standard five-axle, tractor-semitrailer equipment with 48- or 53-foot vans on its U.S. operations that are governed, for the most part, by U.S. Federal axle weight limits and Bridge Formula B. If the Canamex proposal were implemented, Kindersley would be interested in operating Rocky Mountain Doubles in this operation.

B & D Walters Trucking [13]

B & D Walters operates seven-axle semitrailer combinations for livestock hauls and and eight-axle semitrailer combinations for grain hauls between Alberta and the northwest States. The seven-axle combinations include four-axle tractors with the second being a lift axle and three-axle semitrailers. The eight-axle combinations include the same tractor configuration and four-axle semitrailers with the fourth axle, a lift axle. When crossing the border, the tractor lift axle is lowered in Montana and raised in Alberta. The seven axles are spread sufficiently to get a permissible GVW of 99,000 pounds under Bridge Formula B as allowed in Montana and the 46,500 kilogram GVW RTAC loading in Alberta. In addition to Montana, Washington and Idaho allow the use of four-axle tractors. B & D indicates that Oregon “frowns-on” their use.

With a 90-foot outer bridge length, A-train doubles can load to a GVW of 116,000 to 118,000 pounds for Montana. This is 4,000 to 6,000 pounds more than allowed on the nine-axle B-train. To achieve this GVW, the vehicle's drawbar must be stretched from 18 to 20 feet in length. (Comment: This is an example where Bridge Formula B works to create vehicles of potentially questionable stability performance relative to readily available alternatives, rewards them with greater payload, and does so in a way to inflict greater damage to a pavement per unit payload).

B & D operates eight-axle B-trains into Montana at 108,000 pounds GVW. With a four-axle tractor, a nine-axle B-train can operate at 114,000 pounds GVW. Because of the weight incentive to use B-trains in the RTAC regulations, Canadian carriers are abandoning the use of A-trains. U.S. carriers continue to use A-trains and where possible stretch them to maximize payloads under Bridge Formula B.

B & D trucks some grain into Sweetgrass, Montana on I-15 for trans-shipping to the BN for movement in the United States. This can be done at Canadian weights under the ISTEA provisions for this road.

2.7 Truck Inventory and Use Characteristics

This section presents truck fleet information developed from the 1992 Truck Inventory and Use Survey (TIUS) for the western border States. TIUS data are allocated to individual States by place of registration. The data on the truck fleet in each State excludes pickups, panels, vans, utilities and station wagons (that is, it includes only data from Column D in the TIUS reports).

2.7.1 Make-up of the fleet of trucks with 5 or more axles

The make-up of the truck fleet (TIUS Column D) with 5 or more axles for the five western border States and surrounding States is shown in Table 2-7-1. It also shows the truck fleet with four or less axles. For the five border States, there are significant differences in the percentages of the total truck fleets in western border States having five or more axles. Combination trucks having five or more axles account for 1 of 10 of the registered truck fleet in North Dakota, 1 of 5 in Washington, Idaho and Minnesota, and 1 of 4 in Montana. More specifically:

- Tractor-semitrailer combinations are most common--7 of 10 in Washington and Idaho, 8 of 10 in Montana, and 9 of 10 in North Dakota and Minnesota (86.6 percent nationwide).
- Truck-trailer combinations are the next most common--1 of 5 in Washington and Idaho; and 1 of 10 in Montana, North Dakota and Minnesota (7.5 percent nationwide).
- Tractor-double trailer combinations follow--1.5 of 10 in Washington and Idaho, 1 of 10 in Montana, 1 of 20 in North Dakota, 1 of 100 in Minnesota (5.9 percent nationwide).
- Tractor-triple trailer combinations are either non-existent (Washington and Minnesota) or infrequent (less than 0.1 percent nationwide).

Ninety percent of the truck fleet in North Dakota is made up of single unit trucks or combination units with four or less axles; 80 percent in Washington, Idaho and Minnesota; 75 percent in Montana. These compare to the nationwide figure of 80.6 percent.

2.7.2 Commodity Handlings

Table 2-7-2 lists the commodity handlings of (TIUS Column D) trucks in the western border States. Trucks identified in TIUS as personal transport, no load carried, not in use, other and craftsman's equipment are removed to establish the total of trucks of interest to this analysis. For the five border States combined:

- One-third of the 287,100 trucks of interest are used for transporting farm products.
- An additional one-third are used for transporting building materials (1 of every 8 trucks), processed foods (1 of every 12), live animals (1 of 17), lumber and fabricated wood products (1 of 25), and transportation equipment (1 of 28).
- Each of the other named commodities (machinery, animal feed, petroleum, refuse, mixed, chemical, logs) is handled by roughly 1 of every 30 trucks.

Table 2-7-1
1992 TIUS Column D Truck Fleet in Western States

(Data shows number of Column D trucks.
Column D trucks exclude pickups, panels, vans, utilities and station wagons.)

Truck Type and Axle Arrangement	Wash	Idaho	Mont	N Dak	Minn	Oregon	Wyom	S Dak	
<u>Having 5 or More Axles</u>									
Truck + Trailer with 5 or more axles		2,700	1,700	1,000	600	2,300	3,000	100	300
	%	18.2	18.3	10.7	8.6	10.9	14.8	2.4	4.8
Tractor + Semitrailer with 5 or more axles		10,100	6,200	7,300	6,100	18,600	14,200	3,600	5,700
	%	68.2	66.7	78.5	87.1	88.2	70.0	87.8	91.9
Tractor + Doubles with 5 or more axles		2,000	1,300	1,000	300	200	2,800	400	200
	%	13.5	14.0	10.8	4.3	0.9	13.8	9.8	3.2
5 Axles		200	(S)	(S)	(S)	100	800	(S)	(S)
6 Axles		500	200	(S)	100	100	500	(Z)	(Z)
7 Axles or more		1,300	900	900	200	(S)	1,400	300	200
Tractor + Triples with 5 or more axles		(S)	100	(S)	(Z)	(S)	300	(Z)	(Z)
	%		1.1				1.5		
7 Axles		(Z)	(S)	(Z)	(Z)	(Z)	100	(Z)	(S)
8 Axles		(S)	(Z)	(S)	(Z)	(S)	200	(S)	(S)
Trailer not specified		(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Total all trucks with 5 or more axles		14,800	9,300	9,300	7,000	21,100	20,300	4,100	6,200
Total all Column D trucks		72,000	44,900	37,000	66,000	120,300	70,100	14,000	40,500
Trucks with 5 or more axles as % of total		20.6	20.5	25.1	10.6	19.3	29.0	29.3	15.3
<u>Having Less Than 5 Axles</u>									
Single unit trucks with 4 or less axles	50,200	33,500	25,700	57,400	89,400	44,500	9,000	32,000	
	%	69.7	74.6	69.5	87.0	74.3	63.5	64.3	79.0
2 Axles		41,100	25,700	21,600	43,700	67,300	35,600	7,100	26,000
3 Axles		8,100	7,700	3,900	12,700	19,300	8,300	1,800	5,500
4 Axles		1,000	100	200	900	2,800	600	100	500
Truck + trailer with 4 or less axles		2,700	1,000	1,100	500	5,300	1,400	300	1,200
	%	3.8	2.2	3.0	0.1	4.4	2.0	2.1	3.0
3 Axles (utility trailer)		700	(S)	200	(Z)	1,300	(S)	(S)	300
4 Axles (utility trailer)		1,100	1,000	400	(S)	3,000	800	200	600
4 Axles (trailer)		900	(S)	500	500	1,000	600	100	300
Tractor + semitrailer @ 4 or less axles		4,300	900	1,000	900	4,200	3,600	500	1,000
	%	6.0	2.5	2.7	1.4	4.2	5.1	3.6	2.5
3 Axles		1,900	300	300	300	1,000	1,900	200	300
4 Axles		2,400	600	700	600	3,200	1,700	300	700
Total all trucks with 4 or less axles		57,200	35,400	27,800	58,800	98,900	49,500	9,800	34,200
Total all Column D trucks		72,000	44,900	37,000	66,000	120,300	70,100	14,000	40,500
Trucks with 4 or less axles as % of total		79.4	78.8	75.1	89.1	82.2	70.6	70.0	84.4

(S) Data withheld because estimate did not meet Bureau of Census publication standards

(Z) Reported data represents less than 50 trucks or .05 percent

Table 2-7-2
1992 Commodity Handlings of TIUS Column D Trucks in Western Border States

Data shows number of Column D trucks in thousands.
 (Numbers in [brackets] is the rank by frequency of observation in "Trucks of interest")

Commodity	Wash	Idaho	Mont	N Dak	Minn	Total
<u>Total Column D Trucks</u>	72.0	44.9	37.0	66.0	120.3	340.2
Less						
Craftsman equip	4.9	2.1	2.4	1.1	6.3	16.8
Personal transport	2.5	2.4	1.2	3.5	3.5	13.1
No load carried	2.4	2.2	1.4	2.6	3.9	12.5
Not in use	2.0	0.5	0.5	1.0	1.9	5.9
Other	0.9	0.5	0.5	1.0	1.9	4.8
<u>Trucks of interest</u>	59.3	37.2	31.0	56.8	102.8	287.1
Farm products	5.8 [3]	11.8 [1]	7.6 [1]	36.7 [1]	30.8 [1]	92.7
Building materials	9.6 [1]	4.3 [2]	3.5 [2]	4.3 [2]	15.0 [2]	36.7
Processed foods	7.5 [2]	2.6 [4]	2.3 [4]	2.1 [4]	8.7 [3]	23.2
Live animals	2.2	3.9 [3]	3.2 [3]	3.6 [3]	3.7	16.6
Lumber, fab wood	3.3 [5]	1.7	1.9	0.8	3.7	11.4
Transp equip	3.6 [4]	0.9	0.6	0.3	4.7 [4]	10.1
Machinery	2.1	0.9	1.2	1.1	4.2 [5]	9.5
Animal feed	1.7	1.7	1.2	1.4 [5]	3.4	9.4
Petroleum	2.3	1.0	1.2	1.1	3.7	9.3
Scrap, refuse	2.9	1.0	1.1	1.1	3.1	9.2
Mixed cargoes	2.9	0.2	2.0[5]	0.4	3.4	8.9
Chemicals	2.6	1.1	1.2	0.9	3.0	8.8
Logs, forest prod	2.5	2.1 [5]	1.3	(Z)	2.8	8.7
Other (12.3%)	10.3 (17.4%)		4.0 (10.8%)	2.7 (8.7%)	3.0 (5.3%)	12.6

(S) Data withheld because estimate did not meet Bureau of Census publication standards

(Z) Reported data represents less than 50 trucks or .05 percent

From the perspective of the individual border States, truck usage by the three major commodity groups in each State is:

- Washington: 1 of every 6 trucks is used to haul building materials, 1 of every 8 is used to haul processed foods, 1 of every 10 is used to haul farm products.
- Idaho: 1 of every 3 trucks is used to haul farm products, 1 of every 9 is used to haul building materials, 1 of every 10 is used to haul live animals.
- Montana: 1 of every 4 trucks is used to haul farm products, 1 of every 9 is used to haul building materials, 1 of every 10 is used to haul livestock.
- North Dakota: 2 of every 3 are used to haul farm products, 1 of every 13 is used to haul building materials, 1 of every 16 is used to haul livestock.
- Minnesota: 1 of every 3 trucks is used to haul farm products, 1 of every 7 is used to haul building materials, 1 of every 12 is used to haul processed foods.

2.7.3 Base and Range of Operation

Table 2-7-3a shows the percentage of mileage driven outside of the home base State by TIUS Column D trucks registered in each State. Table 2-7-3b shows the range of operation of TIUS Column D trucks registered in each State.

For the five border States combined, excluding the “not reported” category:

- Most trucking occurs within the base State. Nine of 10 trucks drive less than 25 percent of their mileage outside of the home State. About one of 20 trucks drive from 75 to 100 percent of their mileage outside the base State.
- Most trucking occurs within 200 miles of home. Nine of 10 truck miles are driven within this distance of home or off-the-road. About one of 20 trucks operate in the 200 to 500 mile range, and another one of 20 with trip lengths of greater than 500 miles.

From the perspective of the five border States, excluding the “not reported” category:

- Washington has the most concentrated localized trucking activity. About 19 of 20 trucks drive less than 25 percent of their mileage outside the home State, about 19 of 20 within 200 miles of home, and about 1 of 30 at greater than 500 miles.
- Montana has the least concentrated localized trucking activity. About 8 of 10 drive less than 25 percent, 8 of 10 within 200 miles, and more than 1 of 10 at greater than 500 miles.

2.7.4 Average Weight Characteristics

Table 2-7-4 shows the average gross vehicle weight (empty weight plus weight of cargo) of TIUS Column D trucks for each State. For the five border States combined, excluding the “not reported” category:

- Most trucking occurs at weight levels requiring five or less axles. About 7 of 10 truck movements occur at an average GVW of less than 40,000 pounds GVW, which generally require no more than three-axles; 85 percent occurs at average weight levels of less than 60,000 pounds GVW, which generally require no more than four-axles; 97.5 percent occurs at average weight levels of less than 80,000 pounds GVW, which generally require no more than five-axles.
- Little trucking occurs at weight levels requiring more than five axles. About 99 percent of the loads occur at an average GVW of less than 100,000 pounds and probably require six or seven-axles. About 1 percent of the loads weigh in the range from 100,000 to 130,000 pounds and probably require eight or nine-axles.

From the perspective of the five border States, excluding the “not reported” category:

- Roughly 1 of 20 trucks in Washington, Idaho and Montana operate at an average GVW of more than 80,000 pounds generally requiring more than five-axles.
- In North Dakota, 1 of 100 trucks operate at an average GVW requiring more than five-axles.
- Minnesota has the least amount of trucking, 3 in 1000, at an average GVW requiring more than five-axles.

Table 2-7-3a
1992 Base of Operation for TIUS Column D Trucks in Western Border States

(Data shows number of Column D trucks in thousands)

Miles Driven Outside Base State (in percent)	Washington	Idaho	Montana	North Dakota	Minnesota
Less than 25	63.1	35.2	27.5	52.6	95.7
25 to 49	1.1	1.8	0.7	1.2	2.9
50 to 74	1.4	1.7	1.4	1.5	4.8
75 to 100	1.9	2.1	2.4	2.1	5.7
No home base	(S)	0.4	1.8	0.9	1.6
Not reported	4.3	3.8	3.2	7.7	11.1
Total Column D Trucks	72.0	44.9	37.0	66.0	120.3

Table 2-7-3b
1992 Range of Operation for TIUS Column D Trucks in Western Border States

(Data shows number of Column D trucks in thousands.)

Typical Trip Length from Home Base (in miles)	Washington	Idaho	Montana	North Dakota	Minnesota
Local < 50 miles home	46.1	25.2	16.3	43.7	75.0
50-100 miles home	11.4	6.0	4.9	4.2	13.8
100-200 miles home	4.0	2.6	2.6	2.0	5.9
200-500 miles home	2.7	1.5	1.4	1.5	4.5
> 500 miles	2.1	2.2	4.9	2.5	6.7
off-the-road	4.1	6.6	6.9	10.8	11.3
not reported	1.7	0.8	(S)	1.2	3.1
Total Column D Trucks	72.0	44.9	37.0	66.0	120.3

Table 2-7-4

1992 Average Gross Vehicle Weight (GVW)
for
TIUS Column D Trucks in Western Border States

(Data shows number of Column D trucks in thousands.)

Average GVW (in pounds)	Washington	Idaho	Montana	North Dakota	Minnesota
40,000 lbs or less	51.7	30.0	25.6	48.9	83.5
40,001 - 60,000	7.4	6.8	3.5	10.7	18.9
60,001 - 80,000	9.6	6.2	6.1	5.1	17.4
80,001 - 100,000	2.4	0.8	0.8	0.4	0.3
100,001 - 130,000	0.9	1.0	0.9	0.2	0.1
130,001 or more	0.1	(S)	0.1	(Z)	(Z)
not reported	(Z)	(Z)	(Z)	(Z)	(Z)
Total Column D Trucks	72.0	44.9	37.0	66.0	120.3

(S) Data withheld because estimate did not meet Bureau of Census publication standards

(Z) Reported data represents less than 50 trucks or .05 percent

References For Chapter 2

TS&W Regulations

- [1] Comprehensive TS&W Study: Phase I Synthesis: Documentation of Truck Size and Weight Regulations, Working Paper 14, prepared for FHWA, February 1995.
- [2] “Guide for Uniform Laws and Regulations Governing Truck Size and Weight Among the WASHTO States,” Adopted by WASHTO Policy Committee, June 26, 1993.
- [3] Canadian Truck Weight and Dimension Regulations Chart, Fred Nix, February 1995.
- [4] North American Free Trade Agreement, Land Transportation Standards Subcommittee, Vehicle Weights and Dimension Working Group, “Comparison of Weight and Dimension Regulations, Canada-United States-Mexico,” Draft 1, February 1994.
- [5] State specific information was provided by Barry Diseth, Washington DOT, Olympia, Washington 206-664-9497, May 10, 1995.
- [6] State specific information was provided by Clayton Sullivan, Idaho DOT, 208-334-8405, May 12, 1995.
- [7] State specific information was provided by Dave Galt, Montana DOT Helena, 406-444-6130, May 10, 1995. Additional information was provided by Greg Hofman, Montana DOT, Culbertson Scale and Mike Areshenko, Alberta Transport, Joint Montana-Alberta Scale at Coutts.
- [8] State specific information was provided by Dennis Erikson, North Dakota DOT, Bismark, North Dakota, 701-338-4341, May 10, 1995, and Joliette Scale Master Don Jaster, 701-454-6544.

Carrier Information

- [9] This information was obtained from a phone interview with Darshan Kailly, Canadian Freightways, Calgary, Alberta, 403-287-4316, June 16, 1995.
- [10] This information was obtained from Transport Canada Report TP 8438E p131.
- [11] This information was obtained from Transport Canada TP 8438E p133 and phone interviews with Alan Penner, June 14, 1995.

[12] This information was obtained from a phone interview with Erwin Siemens, Kindersley Transport, Saskatoon, Saskatchewan.

[13] This information was obtained from a phone interview with B & D Walters, Lethbridge Alberta.

3.0 Trade Flows

This chapter presents selected characteristics about trade flows across the western border as reported in other documents that are of potential relevance to the consideration of TS&W policy options.

3.1 Value, Weight, Commodities and Origin-Destination Patterns

A number of studies have examined trade flow statistics related to the western border. This section summarizes points made in these studies of potential relevance to TS&W policymaking. It classifies the information in terms of value, weight, commodities and origin-destination patterns.

3.1.1 Value

Land trade across the western border--made up of the Upper Plains, Central Plains, Eastern Washington/Rocky Mountains, and Pacific Coast Gateways--was valued at \$26.6 billion in 1992. This is about one-sixth of the total of \$150.3 billion land trade across the U.S.-Canada border. [Ref 1, p. 35]. The land trade is roughly 80 percent of total trade across the western border [EN-1].

The value of the land trade across the western border is distributed among the western Provinces as follows:

- United States-British Columbia (40 percent)
- United States-Alberta (20 percent)
- United States-Saskatchewan (10 percent)
- United States-Manitoba (20 percent)
- United States-Western Ontario (10 percent). [EN-2].

The value of this trade is expected to increase over the next ten years by roughly 20 percent northbound and 30 percent southbound [EN-3]. (Comment: These numbers may require a revisit given the apparent 25 percent growth in actual trucking movements across the border between 1992 and 1994, as discussed in Chapter 4).

Five crossings account for about 85 percent of the value of Canada's exports and 67 percent of the value of U.S. exports moving south and north across the western border by motor carriers. The three largest are the I-5 Pacific Highway Corridor through Blaine, Washington; the Red River/Mid-Continent Corridor through Pembina, North Dakota; and the I-15 Rocky Mountain Corridor through Sweetgrass, Montana [Ref 2, p. 33].

Trucking accounts for two-thirds of the value of Canada-U.S. trade in terms of value. Rail accounts for 20 percent [EN-4].

Trade value statistics cannot be easily interpreted in terms of their implications for the effects of TS&W policy options. Much of the trade across the western border involves low-value commodities moving in large quantities. Most of these commodities weigh-out.

3.1.2 Weight

Canadian trucks moved roughly 32.5 million metric tonnes of freight across the U.S.-Canada border in 1988. This is roughly 2 tonnes moved southbound for every 1 tonne moved northbound. Ninety-five percent of the crossborder freight moving by truck was moved by for-hire carriers; 5 percent was moved by private carriers. [EN-5].

3.1.3 Commodities

As already noted, western border trade involves the movement of substantial quantities of low-value, resource-based commodities. Five trade sectors account for the major share of exports and imports across the western border [Ref 4, p 31]. These sectors and examples of some of the factors that influence them are [Ref 4, p 36]:

- Agriculture--U.S.-Canada exchange rate and subsidies
- Energy--Consumption and environmental regulations
- Wood and paper--Global markets, environmental regulation, and cutting restrictions
- Chemicals, metals, and minerals--Subsidies and environmental regulations
- Machines, vehicles, and equipment--Economic growth and auto industry

Twenty-two percent of the value of all Canadian exports to the United States originate in the four western border Provinces of which slightly more than half originates in Alberta. Forty percent of the value of Canada's western exports to the United States are energy-related (primarily crude oil, natural gas, and hydro-generated electricity). The Canadian energy trade places a heavy reliance on pipelines and transmission lines, which move 35 percent of the value of these export [Ref 3, p D-1.4]. More specifically:

- Wood and paper products make up 21 percent of Canada's exports in the West followed by industrial goods which account for 16 percent.
- Agricultural commodities and products account for 9 percent of western Canada's exports.
- U.S. export trade into western Canada is dominated by manufactured items which accounted for 64 percent of the total value of all U.S. exports to western Canada in 1990.
- The next largest category of trade is metals, minerals, and chemicals followed by agricultural products.

- Nearly 70 percent of the value of U.S. exports to western Canada were moved by motor carriers, compared to 36 percent of Canadian exports.
- Canadian traders transport a larger share of their exports by rail (19 percent versus 12 percent) [Ref 3, p D-1.4].

Rail movement involves primarily bulk and specialized commodities such as lumber, newsprint and automotive products [Ref 3, p 8].

3.1.4 Origin-Destination Patterns

Most trade flow patterns between the United States and Canada can best be described as intra-regional in nature. The communities on both sides have developed regional economies that are binational. There are high levels of crossborder commuting, shopping, and movement of goods and services to support these binational regional economies. [Ref 1, p 5].

The pattern of U.S.-Canadian trade in the west is organized into three crossborder trading subregions: the Pacific Northwest, the Rocky Mountains, and the Upper Plains. Trade flow is focused through a few major crossings. While some dominant interregional flows are associated with trade to and from these border gateways, trade flows beyond the border are diffuse with as many east-west as north-south flows to and from the border. [Ref 1, p 6].

3.2 Rail Captive versus Truck Captive versus Competitive Freight

Trucking accounts for about 80 percent of the value of U.S. exports to both eastern and western Canada. Both rail and air account for about 10 percent each. Air freight consists of largely high value, low volume goods. [Ref 1, p 55].

“Modal shares in the movement of commodities will remain largely unchanged from current values over the next ten years, with trucking capturing 92 percent of the market, rail 4 percent and air and water 4 percent. However, multimodal shipments ..., (which) accounts for an estimated four percent of all movements, is expected to increase its share to fully 15 percent by ... 2002”. [Ref 4, p 39].

3.3 Comments

Most western border trucking is associated with local and regional trade. Economic sectors of particular importance in this trade are: agriculture (grains, livestock, seed, produce, and peat moss); wood and paper (logs, lumber, shingle shakes, newsprint, and printed material); chemicals, metals, and minerals (potash, soda ash, and petroleum); machines, vehicles, and farming and resource extraction equipment.

Rail accounts for about 10 percent of the value of trade across the western border. Major western crossborder commodity movements by rail include lumber, potash, newsprint, and automotive products. Indications from interviews with customs officials suggest that crossborder rail traffic is holding steady, whereas truck traffic is growing rapidly. Intermodal movements crossing the western border include:

- Saskatchewan potash, which is trucked into North Dakota for trans-shipment on the BN.
- Western prairie grain is trucked to various elevators in North Dakota and Montana for trans-shipment on the BN.
- Containers are trucked between Seattle and Vancouver for trans-shipment with different water and rail services.
- Containers are trucked between U.S. rail services and Canadian origins and destinations, and Canadian rail services and U.S. origins and destinations.
- Containers and trailers are trucked between Alberta and Shelby, Montana pursuant to the special weight provisions of ISTEA allowing Canadian weights on I-15.

Many of these movements occur at GVW levels greater than 80,000 pounds. In some cases, container movements would not be possible at a GVW level less than 80,000 pounds. In other cases (grain), the movements are made economically (more) feasible because of the higher GVW limits provided.

References For Chapter 3

- [1] Intermodal Surface Transportation Efficiency Act: Section 1089 and Section 6015 “Assessment of Border Crossings and Transportation Corridors for North American Trade--Report to Congress,” FHWA-PL-94-009.
- [2] “Descriptive Report on Trade and Transportation in the Western U.S.-Canada Region,” L. Swanson and N. Moisey, FHWA-PL-94-009-040, September 1993.
- [3] “The Transborder Competitiveness of Canadian Trucking,” J. Heads et al, Transport Canada, June 1991.
- [4] Intermodal Surface Transportation Efficiency Act Section 6015 Study: Assessment of Border Crossings and Transportation Corridors for North American Trade (West): Section 6015 Study: Results of the Futures Assessment Process, FHWA-PL-94-009-32, p 31.

Endnotes For Chapter 3

[EN1] Merchandise trade across the western border was valued at \$32 to \$35 billion in recent years [Ref 2, p 3]. This compares with a total trade value of \$189 billion in 1992 [Ref 1, p 30].

[EN2] “Two-way trade across the U.S.-British Columbia border totalled approximately \$13 billion in 1990; U.S.-Alberta, \$5.7 billion (excluding \$8 billion via pipelines/transmissions); U.S.-Saskatchewan, \$2.7 billion; and U.S.-Manitoba, \$6.7 billion. If the \$2.7 billion in trade across Minnesota's border with western Ontario is added, the 1990 total U.S.-Canada trade for the western border is \$30 billion,” [Ref 3, p D-1.3].

[EN3] “U.S.-Canadian trade processed through border ports of entry in the western region is .. expected to increase. U.S. exports to Canada are projected to increase by 16 to 24 percent in the next ten years. Canada exports to the U.S. are projected to increase 24 to 34 percent over the same period” [Ref 1, p 7].

[EN4] From [Ref 3, “Value of Canadian-U.S. Trade 1989,” Table 2.1, p 6]:

	Canadian Exports to U.S. (\$ billions)	Canadian Imports from U.S. (\$ billions)	Total Trade with U.S. (\$ billions)	Percent of Total
Truck	55.7	66.7	122.4	65.6
Rail	26.7	9.7	36.4	19.5
Water	3.8	2.1	5.9	3.2
Air	3.7	5.2	8.9	4.8
Other	8.7	4.3	13.0	7.0
Total	98.6	88.0	186.6	100.0

[EN5] From [Ref 3, “Tonnage of Canadian-U.S. Trade carried by Canadian Carriers 1988,” Table 2.2, p 7]:

	SB to U.S.	NB from U.S.	Percent of Total
For hire truck	811,600-25t	441,400-25t	19.2
Private truck	39,640-25t	17,040-25t	0.9
Rail			28.5
Marine			51.4

4.0 Truck Flows

4.1 Trucking Movements To and From Western Border Jurisdictions

Total crossings of the western border average 4,307 trucks per day in 1992 (1,572,055 trucks for the year). In 1992, the 28 crossings of direct interest accounted for 96.4 percent of total truck traffic crossing the western border.

- For the United States, traffic to and from Washington accounted for slightly more than one-half of western border trucking activity to and from the United States. North Dakota accounted for 20 percent. Montana and Minnesota each accounted for about 10 percent. Idaho accounted for the less than 5 percent.
- For Canada, traffic to and from British Columbia accounted for more than half of western border trucking movements to and from Canada. Manitoba accounted for 20 percent. Alberta and Saskatchewan each accounted for about 10 percent. Ontario accounted for less than 5 percent.

Table 4-1 shows the total average daily trucking movements to and from each of the five States and five Provinces on the western border in 1992.

Based on data from U.S. Customs for southbound movements at most of the western border crossings for FY 1994, and recently acquired 1994 border crossing data from Statistics Canada, total crossings of the border have increased by 24.3 percent since 1992. Total crossings in 1994 are estimated to average about 5,100 trucks per day (1,881,940 for the year). In 1994, traffic to and from Washington is estimated to account for about one-half of western border trucking activity to and from the United States. North Dakota accounts for 25 percent. Montana accounts for 13 percent. Idaho and Minnesota each account for about 5 percent. The distribution among Provinces in 1994 is about the same as in 1992.

The western border accounted for roughly one-third of all truck movements between Canada and the United States in 1991. Total crossborder trucking is allocated with roughly one-sixth to each of the following areas in Canada: British Columbia, Prairie Provinces, Southwestern Ontario, other Ontario, Quebec, and Atlantic Provinces. [Transborder Trucking Survey: 1991. Statistics Canada. April 1991].

4.2 Trucking Activity at Major Western Border Crossings

The six largest crossings of the western border are discussed in this section in terms of specific TS&W-related matters. Table 4-2 ranks the 28 crossings selected for review in this study by the

number of truck crossings made in 1994. Additional information for each of the 28 crossings, obtained from a variety of sources, is shown in Appendix B.

Table 4-1
1992 Truck Crossings of the Western Border (in Both Directions)
(Average Daily Number of Trucks)

Jurisdiction	Study Crossings (28)	Other Crossings (26)	Total (54)
<u>United States</u>			
Washington	2313	67	2380 (54.0%)
Idaho	165	12	177 (4.0%)
Montana	473	21	494 (11.2%)
North Dakota	902	38	940 (21.4%)
Minnesota	<u>395</u>	<u>21</u>	<u>416</u> (9.4%)
	4148 (96.4%)	159 (3.6%)	4407
<u>Canada</u>			
British Columbia	2443	81	2524 (58.6%)
Alberta	356	13	369 (8.6%)
Saskatchewan	370	15	385 (8.9%)
Manitoba	822	50	872 (20.2%)
Ontario	<u>157</u>	<u>0</u>	<u>157</u> (3.6%)
	4148 (96.4%)	159 (3.6%)	4307

Source: Appendix B

These six crossings account for three-quarters of the western crossborder movement. Figure 4-2a shows truck flows across the six major border crossings. Also shown is the truck flow across the Manitoba-Ontario border, based on Manitoba Department of Highways and Transportation data. There is ten times as much truck traffic crossing the U.S.-Canada western border than moves between western and eastern Canada via the Trans-Canada Highway.

4.2.1 Blaine-Pacific Highway

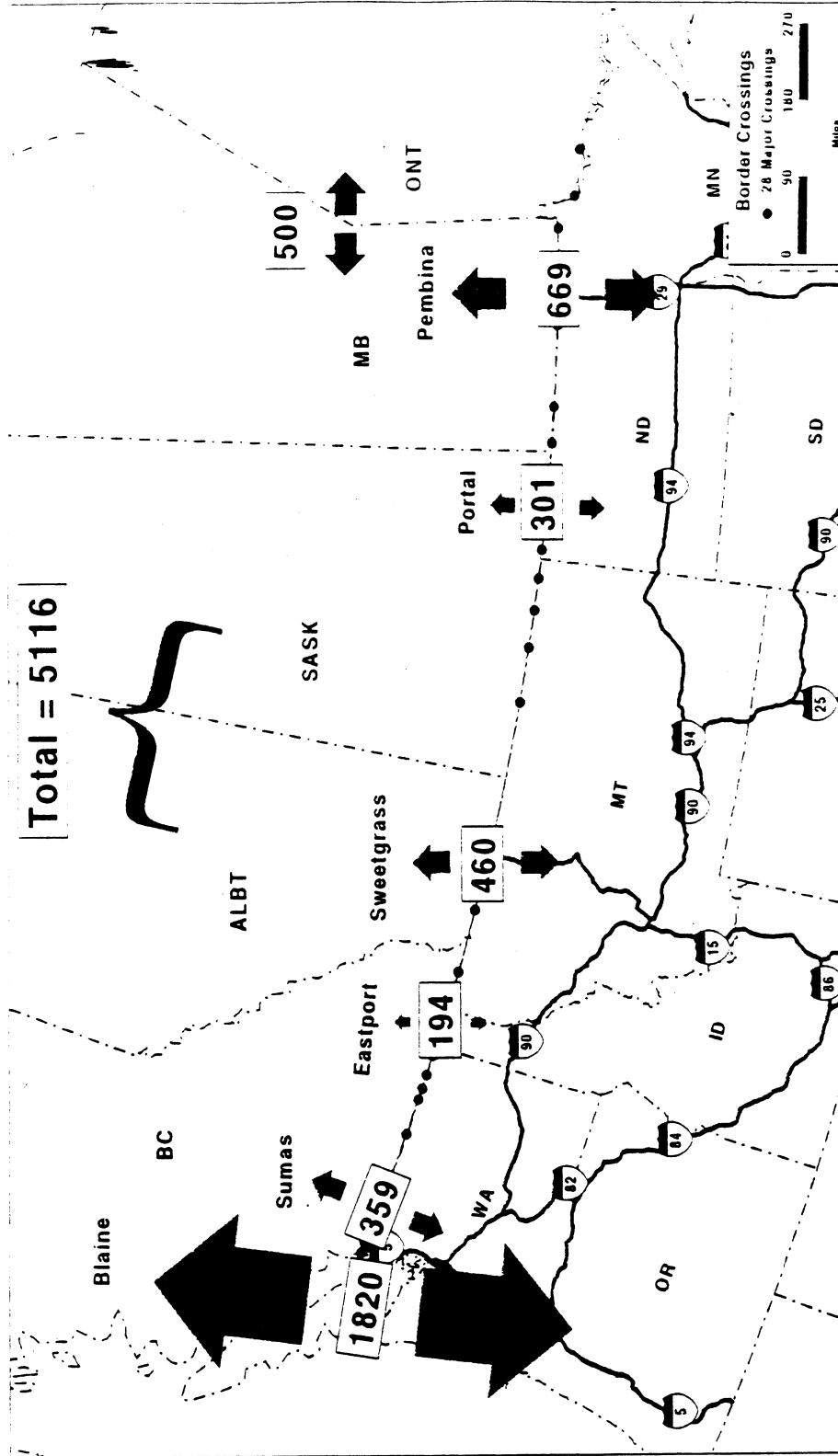
This is the highest volume crossing on the western border, averaging 1820 trucks per day in 1994 (two-way), which grew 23 percent since 1992. Trucking movements at this crossing are concentrated on traffic moving along the West Coast. Principal southbound movements are wood, lumber, paper and printed material, metals and metal products, and manufactured goods. Principal northbound movements include produce (particularly in winter), general freight and some lumber. Many of the northbound produce-haul trucks (principally five-axle, reefer-equipped, tractor-semitrailers) return empty to the south. About 15 percent of the trucks at this crossing handle containers moving between Seattle and Vancouver (between the respective ports, railroads, and shippers). Two-thirds of the northbound movements are conducted by Canadian-registered vehicles.

Table 4-2
Truck Crossings of the Western Border (in Both Directions)
(Average Daily Number of Trucks)

	U.S. Highway	Trucks/Day	
		1992	1994
<u>High Volume Crossings</u> (more than 5,000 per month)			
Blaine-Pacific	I-5	1482	1820
Pembina-Emerson	I-29	414	669
Sweetgrass-Coutts	I-15	351	460
Sumas-Huntington	US 9 NN, NHS	281	359
Portal-North Portal	US 52 NN, NHS	239	301
Eastport-Kingsgate	US 95 NHS	165	194
<u>Medium Volume Crossings</u> (1,000 - 5,000 per month)			
Lynden-Aldergrove	US 539 NN, NHS	169	165
Oroville-Osoyoos	US 97 NN, NHS	122	134*
International Falls	US 53 NHS		130*
Frontier-Paterson	US 25 NN	71	118*
Walhalla-Winkler	US 32	57	98
Dunseith-Peace Garden	US 281 NN, NHS	55	93
Warroad-Sprague	US 313	88	89
Rooseville-Grasmere	US 93 NN, NHS	65	85
Raymond-Regway	US 16 NN, NHS	47	69
Northgate	US 8	71	64
Neché-Gretna	US 18	42	56
Laurier-Cascade	US 395 NN, CP	59	51*
Metaline Falls-Nelway	US 31 NN	10	46*
Westhope-Coulter	US 83 NN, NHS	16	32
<u>Low Volume Crossings</u> (less than 1,000 per month)			
Baudette-Rainy River	US 11 NN	23	26
Fortuna-Oungre	US 85 NN, NHS	16*	18
Piegán-Carway	US 89 NN	10*	10
Morgan-Monchy	US 242 NHS	6*	8
Noyes-Emerson	US 75 NN	150	8
Danville-Carson	US 21 NN	8	8*
Opheim-West Poplar	US 24 NN	2*	3
Scobey-Coronach	US 13 NHS	2*	2

* estimated

Figure 4-2a: 1994 Crossborder Trucking Movements (Trucks/Day)



Sources: University of Manitoba Transport Information Group

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular those emanating from Washington, Oregon and California, and the Federal law. Being on I-5, this crossing is subject to the ISTEA freeze of 105,500 pounds GVW and 68-foot cargo-carrying unit length for tractor double-trailer combinations. Triple-trailer combinations are not permitted in Washington or British Columbia.

There are several relatively unique truck configurations operating on the crossing. These result from the combined effects of the governing TS&W regulations, commodity handlings and intermodal operations present in the region. Examples include: five-, six-, and seven-axle truck trailers, six-, seven-, and eight-axle tractor-semitrailers, and specialized container-hauling equipment.

The BN routes traffic through the same crossing. Substantial growth in southbound rail traffic through this crossing has occurred in recent years as the BN has accessed increasing amounts of British Columbia lumber traffic destined for the North Central U.S. Historically, this traffic tended to travel via Canadian railway routings, crossing into the United States in Minnesota.

4.2.2 Sumas-Huntington

This is the fourth highest volume crossing on the western border, averaging 359 trucks per day in 1994 (two-way flow)--28 percent higher than in 1992. There has been rapid growth of industrial activity in the vicinity of this crossing, particularly on the Canadian side of the border. Much of the traffic through this crossing moves between U.S. Route 9 and I-5 through relatively circuitous routing on two-lane State highways (particularly Highway 546). More than two-thirds of the northbound movements are conducted by Canadian-registered vehicles.

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular those of Washington, Oregon, and California, and the Federal law. Being on NN and NHS, the U.S. Route 9 crossing is subject to the ISTEA freeze of 68 feet for the box length of double cargo-carrying unit combinations.

There are several relatively unique truck configurations operating on the crossing. These result from the combined effects of the governing TS&W regulations, commodity handlings and intermodal operations present in the region. Examples include five-, six-, and seven-axle truck trailers and six-, seven-, and eight-axle tractor-semitrailers. The BN exchanges traffic with the Canadian National and Canadian Pacific Railways at this crossing.

4.2.3 Eastport-Kingsgate

This is the sixth highest volume crossing on the western border, averaging 194 trucks per day in 1994 (two-way flow)--18 percent higher than in 1992. Southbound traffic is dominated by truckload movements of building materials, peat moss, fertilizer, meat, and livestock (principally destined for Pasco, Washington). Most of these trucks would return empty to Canada or would

reposition themselves in the United States to capture a backhaul probably along some other routing. Northbound traffic is dominated by food and produce haul from the southern United States (principally California) destined for Calgary and Edmonton, Alberta. Eight-five percent of the northbound movements are conducted by Canadian-registered vehicles.

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular those of Idaho, Washington, Oregon, and California, and the Federal law. As the crossing highway is not on the IS, the ISTE A GVW freeze does not apply. Because U.S. Route 395 is an NN highway, the highway is subject to an ISTE A length freeze of 95 feet for double cargo-carrying unit combinations.

There are several relatively unique truck configurations operating on the crossing. These result from the combined effects of the governing TS&W regulations, commodity handlings and intermodal operations present in the region. Examples include five- to seven-axle truck-trailers, six- to eight-axle tractor-semitrailers, six- to eight-axle Rocky Mountain doubles, and eight-axle Canadian B-trains. The BN exchanges lumber traffic with Canadian Pacific Railway and trucks at this crossing.

4.2.4 Sweetgrass-Coutts

This is the third highest volume crossing on the western border, averaging 460 trucks per day in 1994 (two-way), which is 31 percent higher than in 1992. Southbound traffic is dominated by truckload movements of grain (30 percent of the southbound tonnage, and 22 percent of the southbound trucks), livestock, forest products, horticulture commodities, and perishable food. Western and northern States account for 80 to 90 percent of the southbound trucking movements from Alberta. About 8 percent of the southbound trucks are empty. Northbound traffic is dominated by perishable food (38 percent of the northbound tonnage and 32 percent of the northbound trucks), general freight, bulk dry chemicals, and equipment. Montana and California account for nearly one-half of the northbound traffic destined for Alberta. About 13 percent of the northbound trucks are empty. Two-thirds of the northbound movements are conducted by Canadian-registered vehicles.

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular those of Montana and States south, and the Federal law. Being on I-15, this crossing is subject to the ISTE A provision of 137,800 pounds GVW as far south as Shelby, 131,060 pounds GVW on the rest of I-15 in the State, and a 93-foot cargo-carrying unit length for double cargo unit combinations.

There are many unique truck configurations operating on the crossing. These result from the combined effects of the governing TS&W regulations (including the special provisions of ISTE A permitting Canadian RTAC weights between the border and Shelby, Montana), commodity handlings and intermodal operations present in the region. Examples include five- to seven-axle truck-trailers, five- to eight-axle tractor-semitrailers (75 percent of the southbound trucks and

85 percent of the northbound trucks), seven- to nine-axle Rocky Mountain doubles (roughly 10 percent of both the northbound and southbound trucks), and (primarily) eight-axle Canadian B-trains (6 percent of the northbound trucks and 16 percent of the southbound trucks).

Section 1023 of ISTEA and an associated Memorandum of Understanding between Alberta and Montana allow trucks to run on I-15 between the border and Shelby at Canadian RTAC axle weights and GVWs. Section 1023 also excludes these trucks from compliance with Bridge Formula B. The commodities which have most benefitted from this ISTEA provision are truckloads of fuel oil, sand, grains, potash, fertilizer, and agricultural products.

The BN exchanges with Canadian Pacific Railway and trucks at this crossing. Grain and other commodities are increasingly being trucked from southern Alberta into Montana for transshipment with Burlington Northern.

4.2.5 Portal-North Portal

This is the fifth highest volume crossing on the western border, averaging 301 trucks per day in 1994 (two-way), which is 26 percent higher than in 1992. Southbound traffic is dominated by truckload movements of wood, paper, printed material, chemicals, livestock, and other agricultural products. Seventy-five percent of the northbound movements through this crossing are conducted by Canadian-registered vehicles.

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular those emanating from North Dakota and States south, and the U.S. Federal law. Not being an IS route, there is no ISTEA GVW freeze applied to U.S. Route 52. Because U.S. Route 52 is an NN highway, it is subject to an ISTEA length freeze of 103-foot cargo-carrying unit length for double cargo unit combinations.

There are many unique truck configurations operating on the crossing. These result from the combined effects of the governing TS&W regulations, commodity handlings and intermodal operations present in the region. Examples include five- to seven-axle truck-trailers, six- to seven-axle tractor-semitrailers, seven- to nine-axle Rocky Mountain doubles, and (primarily) eight-axle Canadian B-trains. Due to the spring thaw, weight restrictions in North Dakota, southern Saskatchewan, and southern Manitoba lead to re-routing of heavy truck traffic through this region and across the border during the spring.

4.2.6 Pembina-Emerson

This is the second highest volume crossing on the western border, averaging 669 trucks per day in 1994 (two-way), which is 61 percent higher than in 1992. Deducting the effect of the virtual closure of the Noyes-Emerson crossing since 1992 on re-routing traffic to the Pembina-Emerson crossing, the real growth rate of the Pembina-Emerson crossing since 1992 is about 20 percent. Southbound traffic includes movements of lumber, peat moss (to Texas and Arizona), paper rolls,

potash (mainly to Minnesota), cement, livestock, clothing, furniture, grain, metal products, frozen french fries (to Mexico), and meat, much of which moves in truckload quantities. Southbound livestock movements are primarily destined for Dakota City, Sioux Falls, and Des Moines, Iowa. Roughly 10 percent of the southbound trucks are empty. Northbound commodities are dominated by fresh produce primarily originating in the southern United States, much of which is handled by North Dakota-based produce haulers. Roughly 30 to 40 percent of the northbound trucks are empty. Two-thirds of the northbound movements through this crossing are conducted by Canadian-registered vehicles. Roughly 50 percent of the northbound trucks are Manitoba carriers with the remainder primarily based in North Dakota, Minnesota, Wisconsin, and Ohio.

Truck characteristics at this crossing are primarily controlled by U.S. regulations, and in particular, those of North Dakota, Minnesota, States south, and the Federal law. Being on the I-29, this crossing is subject to the ISTEA freeze of 105,500 pounds GVW and 103-foot cargo-carrying unit length for tractor double-trailer combinations.

Roughly 90 percent of the trucks using this crossing are tractor-semitrailers, primarily with five-axles. These vehicles and their loadings are being primarily controlled by the U.S. Federal weight limits of 80,000 pounds GVW, 20,000 and 34,000 pounds on single and tandem axles respectively, and Bridge Formula B. This is because much of this traffic travels on the I-94 east of Fargo, North Dakota into Minnesota, and beyond. Other larger configurations moving through this crossing (for example, six axle tractor-semitrailers and seven-axle doubles) are routed to the South and West. Customs officers advise that rail traffic across the Manitoba-Minnesota border to the east has been relatively steady, whereas truck traffic has been growing rapidly.

4.3 Other Data on Western Border Trucking Movements

4.3.1 “Transborder Trucking Survey: 1991” Statistics Canada

Findings of interest from this report are: (1) Tractor-semitrailer combinations accounted for 85 percent of the vehicles surveyed, tractor-double trailers 7 percent, straight trucks 6 percent, truck trailers 1 percent, and deadhead tractors 1 percent; (2) 75 percent of trucks were for-hire and 25 percent were private; (3) 40 percent of the northbound and 35 percent of the southbound trucks were empty, and (4) origin-destination patterns for tractor-semitrailer combinations are shown in Table 4-3-a [derived from Tables A.2.3.d and A.2.3.e].

4.3.2 “Freight Transportation Trends and Forecasts to 2005,” TP 12237-E, November 1994 (Transport Canada)

This report predicts steady growth of total trucking activity by sector (shown in Table 4.3-b) in million of tons for Canadian Class I and Class II Carriers [Table 3.4.2.1, p84].

Table 4-3-a.
U.S. Origins and Destinations for Trucks Crossing Western Border
(in percent)

<u>Crossing Border with:</u>	<u>U.S. Regions</u>			
	Northeast	Northwest	Pacific	South
Prairie Provinces				
Originate in	19	52	12	16
Terminate in	20	53	15	13
British Columbia				
Originate in	2	5	90	4
Terminate in	1	3	95	1

Northeast Region: States east of Mississippi River but excluding the South Region

Northwest Region: Missouri, Iowa, Montana, North Dakota, South Dakota, Nebraska, Kansas, Wyoming, Colorado, Idaho, Utah, Nevada

Pacific Region: Washington, Oregon, California

South Region: North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, Arizona

Table 4-3-b.
Predicted Growth in International Trade for Canadian Class I and II Carriers
(in millions of tons)

	Prairie Provinces		British Columbia	
	<u>Exports</u>	<u>Imports</u>	<u>Exports</u>	<u>Imports</u>
1992	1.5	0.8	1.8	0.9
1993	1.7	0.8	2.0	0.9
1994	1.9	0.9	2.3	1.0
1995	2.0	0.9	2.4	1.1
1996	2.1	1.0	2.5	1.1
1997	2.2	1.0	2.6	1.2
1998	2.3	1.0	2.8	1.3
1999	2.4	1.1	2.9	1.3
2005	2.8	1.2	3.6	1.6

4.3.3 Truck Classification Data

On-road truck classification data is not readily available for most jurisdictions along the western border. Additional work is required to capture meaningful classification data from weigh-in-motion and automatic vehicle classification records and to expand it into flow data along particular road sections.

Selected classification observations are provided for some of the border crossings in the previous section. The following table provides the results of a limited classification survey of U.S. Route 2 and the Trans-Canada Highway in the region between May 30 and June 2, 1995 and I-29 on August 24 and 25, 1995.

Truck Class	North Dakota primarily US 2 EB	Montana primarily US 2 EB	Trans-Canada Highway between Medicine Hat and Winnipeg WB	North Dakota I-29 between Fargo and Pembina
2-S1, 2	0 (0%)	3 (4%)	0 (0%)	9 (3%)
3-S2	122 (72%)	32 (47%)	228 (58%)	255 (75%)
3-S3	14 (8%)	2 (3%)	58 (15%)	36 (11%)
A-train doubles	11 (7%)	8 (12%)	24 (6%)	8 (2%)
B-train doubles	7 (4%)	0 (0%)	66 (17%)	4 (1%)
Trucks	13 (8%)	14 (21%)	15 (4%)	26 (8%)
Truck-trailer	2 (1%)	9 (13%)	0 (0%)	3 (1%)
Total	169 (100%)	68 (100%)	391 (100%)	341 (100%)

NOTES: The A-trains are mainly 7-axle units (3-S2-2), with a few 8-axle units
The B-trains are mainly 8-axle units (3-S3-S2), with a few 7-axle units

4.4 Truck Flow Maps for the Western Border

Based on State-supplied data, Figure 4-4 shows the truck flow map for NN and NHS highways in Idaho, Montana and North Dakota. Most NHS highways in these States have volumes of less than 100 trucks per day (or about 2 trucks per hour in each direction). It is expected that subsequent work for this study, as possible, will address the following questions:

- Of this truck traffic, what portion can be classified as: (1) clearly governed by Federal TS&W regulations, (2) influenced by Federal TS&W regulations, or (3) unrelated to Federal TS&W regulations?
- What conclusions can be drawn about how changes in Federal TS&W regulations would affect the amount and types of truck traffic in individual States?

4.5 Truck Accidents in Western Border States

It is expected that subsequent work will assign both the TIFA and SAFETYNET truck accidents to the highway networks in each State and assess those accidents in terms of questions of importance to Federal TS&W policy considerations, including:

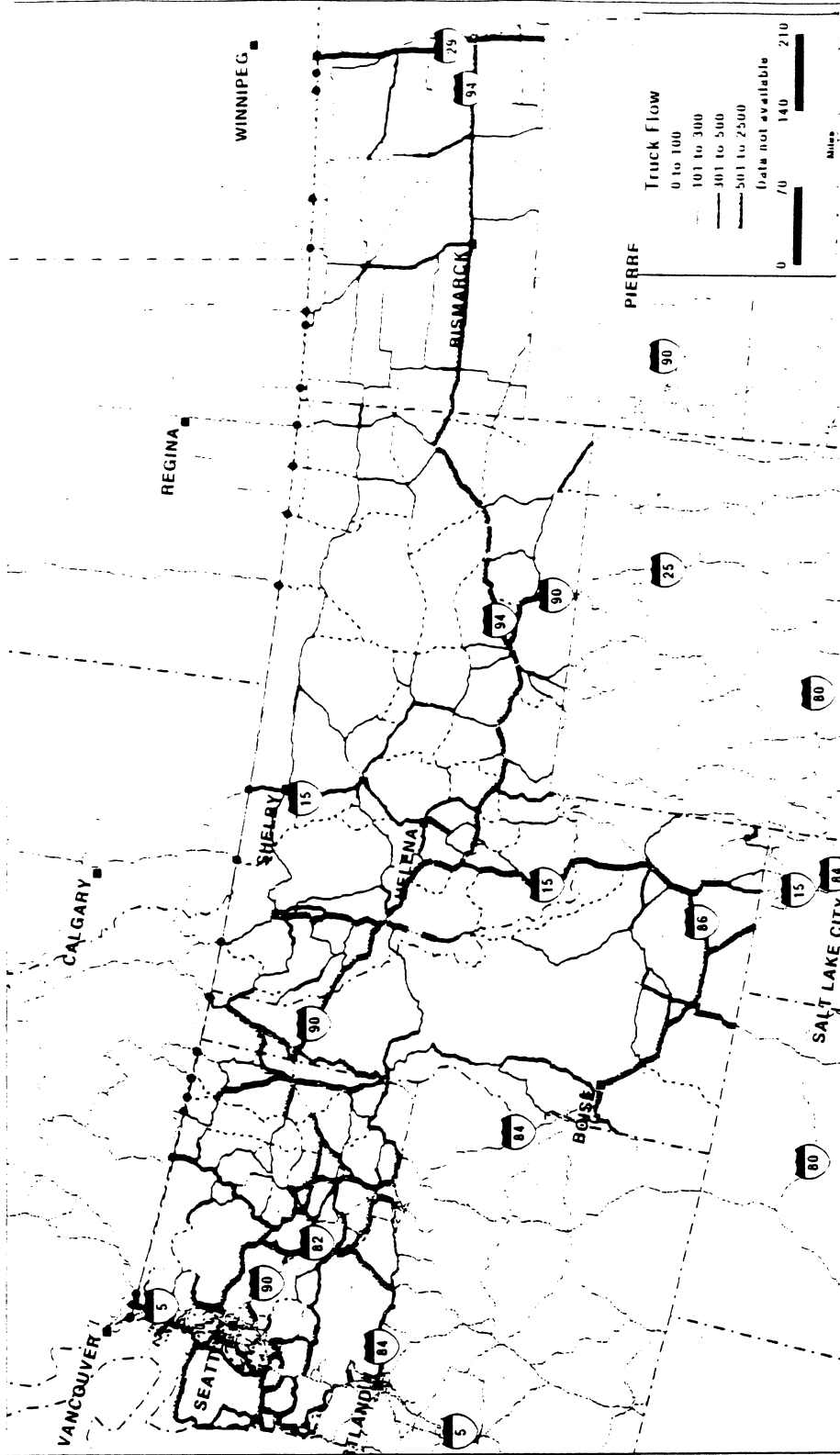
- To what extent are truck accidents occurring on highways which are governed by Federal TS&W regulations?

- Of these accidents, which ones can be classified as: (1) clearly related to a TS&W consideration?: (2) possibly related to a TS&W consideration?; (3) unrelated to a TS&W consideration?

- What conclusions can be drawn about how changes in Federal TS&W regulations could have affected those accidents which clearly or possibly were related to TS&W considerations?

Summary statistics of the number of fatal accidents involving trucks in the western border States, by configuration are shown in Table 4-5.

Figure 4-4: Truck Flows in the Western Border States (Trucks/Day)



Sources: ID DOT 1993, MT DOT 1993, ND DOT 1991, WA DOT 1992, OR DOT 1992, ALB DOT 1993, SASK DOT 1992, MB DOT 1994

Table 4-5
Fatal Accidents Involving Trucks by Configuration, Year and, State

	<u>Washington</u>	<u>Idaho</u>	<u>Montana</u>	<u>North Dakota</u>	<u>Minnesota</u>
Single Unit Truck					
1987	18	4	0	2	13
1988	16	5	2	3	18
1989	18	4	5	1	23
1990	18	10	1	1	17
Bobtail Tractor					
1987	3	0	0	0	1
1988	0	0	0	1	2
1989	1	0	0	2	1
1990	4	0	0	0	5
Single Unit Truck and Bobtail Tractor					
1992	11	6	4	6	13
Tractor Semitrailer					
1987	26	19	16	8	42
1988	30	21	12	7	43
1989	38	17	14	4	45
1990	34	11	13	6	46
Truck + Trailer					
1987	5	0	1	1	0
1988	14	1	1	0	2
1989	4	0	2	0	2
1990	11	2	2	0	0
Tractor Semitrailer and Truck Trailer					
1992	29	16	12	7	52
Multi-trailers					
1987	11	3	5	0	3
1988	9	4	2	0	1
1989	5	2	2	1	0
1990	7	2	3	0	1
1992	9	2	7	1	1
Other					
1987	0	0	0	0	0
1988	2	0	0	0	0
1989	4	1	1	0	0
1990	2	2	2	1	0
1992	0	0	0	0	0
Total					
1987	63	26	22	11	59
1988	71	31	17	11	66
1989	70	24	24	8	71
1990	76	27	21	8	69
1992	49	24	23	14	66

Sources 1987 Trucks Involved in Fatal Accidents Factbook 1987, UMTRI-91-6, June 1991, Table 3-1A
1988 Trucks Involved in Fatal Accidents Factbook 1988, UMTRI-92-9, April 1992, Table 3-1A
1989 Trucks Involved in Fatal Accidents Factbook 1989, UMTRI-92-19, October 1992, Table 3-1A
1990 Trucks Involved in Fatal Accidents Factbook 1990, UMTRI-93-1, April 1993, Table 3-1A
1992 Truck and Bus Accident Factbook 1992, UMTRI-94-44, December 1994, Table II-5

5.0 Implications of Federal TS&W Policy Options

This chapter considers the implications on western border trucking of a range of possible Federal TS&W policy options.

What would happen to western border trucking if certain Federal TS&W regulation was devolved to the States?

Federal length limits--48 feet for semitrailers and 28 feet for twin trailers--are minimums and apply to the NN. They are already equalled or exceeded by regulations in the five western border States for all highways in each State. Federal axle weight limits--20,000 pounds for a single axle and 34,000 pounds for a tandem axle--are maximums and apply to IS highways. They are the standard axle limits applicable on all major highways in each of the five States. The tandem-axle limit is exceeded in Idaho for selected situations. Washington, Idaho, Montana, and North Dakota have GVW limits governing all of their highways which nearly always exceed and are never less than the Federal 80,000-pound GVW limit. Minnesota applies the 80,000-pound GVW limit on all major highways. The provisions of Bridge Formula B are equalled or exceeded in each of the five States. North Dakota permits 48,000 pounds on tridems and does not apply inner bridge requirements on most non-Interstate highways. If Federal TS&W regulation was devolved to the States, the following effects could be expected:

Federal Length Limits (minimum): Since the Federal length limits are exceeded in the five western border States, no effects would be expected.

Federal Axle Weight Limits: The States could elect to increase single- and tandem-axle weight limits on the Interstates within their borders. There does not appear to be strong pressure to do so in this region. This is demonstrated by the fact that none of these States have over the years elected to increase axle weights on non-IS highways under their respective authorities. Differences with Canadian tandem-axle limits could effect some pressure.

The 80,000-Pound GVW Cap: In the five western border States, the only highways on which the Federal 80,000-pound GVW limit applies are Interstate highways in Minnesota. In the other four States, it is the GVW limits imposed by the ISTEA freeze (and the ISTEA Shelby exemption)--and not the 80,000 pound limit--that is the Federal GVW limit of influence. What Minnesota would do with the authority to relax the 80,000-pound GVW limit on its Interstate highways is not known. To date, Minnesota has elected to maintain an 80,000-pound GVW limit (or less) on all highways in the State.

Bridge Formula B: Except for North Dakota, the five western border States apply, for the most part, Bridge Formula B on all highways. North Dakota applies the formula on IS highways, but

ignores inner bridge requirements and allows 48,000-pound tridems on non-IS highways. Given no Federally-imposed bridge formula, the State might choose to extend its bridge formula policy to Interstate highways. The other four States would probably proceed cautiously on liberalizing their bridge formula for the rest of their road networks. The most obvious prospects that could encourage relaxation of bridge formula provisions in the western border States would be:

- A finding from Montana's current evaluation of Canadian RTAC weights that the formula is overly conservative, at least for certain bridge types and road classes.
- A finding that Bridge Formula B leads to the use of excessively long drawbars in truck-trailer and double A-train configurations.
- Pressure to relax Bridge Formula B weight limitation on tridem axles, and to allow effective use of tridems within a six-axle tractor-semitrailer combination. The seven- and eight-axle tractor-semitrailer combinations already operating in Washington, Idaho, Montana and North Dakota likely would be replaced with six-axle combinations given a more liberal bridge formula. These six-axle combinations should emerge as a popular unit for the farming industry (grain and fertilizer hopper bottoms), in livestock haul, in flat-deck operations (lumber haul), and for hauling fully-loaded 40-foot containers.

The Weight Aspects of the ISTEA Freeze: For the western border States, the ISTEA freeze prescribes the following State-specific GVW limits on the operation of “longer combination vehicles” (LCV). An LCV is a combination of a truck tractor towing two trailers which operates on the IS and weighs more than 80,000 pounds or three trailers at any GVW.

	Truck-tractor and 2 trailing units (in pounds)	Truck-tractor and 3 trailing units (in pounds)
Washington	105,000	Not Allowed
Idaho	105,500	105,500
Montana	137,800	131,060
North Dakota	105,500	105,500
Minnesota	80,000	Not Allowed

The GVW limits on all non-Interstate highways in these States, which is the case throughout the country, are determined by the individual States. The GVW limits for truck-trailer combinations and truck-trailer-trailer combinations, both on and off the Interstate highways in these States, is not controlled by the ISTEA freeze because truck plus trailer combinations are not “LCVs” as defined by ISTEA.

If Federal TS&W regulations were devolved to the States, and in so doing the ISTEA freeze were eliminated, the regulatory situation in these States would revert to what it was without the freeze.

This is for all intents and purposes the same regulatory situation as it is today and has been for many years.

From the western border crossing standpoint, only the three Interstate highway crossings of the 28 western border crossings being studied are directly affected by the weight limit aspect of the ISTEAs freeze. These are Interstate routes I-5, the I-15, and I-29. And in the case of I-15, the Canadian RTAC GVW limit of 137,800 pounds is already allowed by ISTEAs from the Canadian border to Shelby, Montana. The GVW limits on all but these three crossings are under State authority.

The Dimensional Aspects of the ISTEAs freeze: For the western border States, the ISTEAs freeze limits “box lengths” to the following for the cargo-carrying units of combinations with two or more cargo-carrying units:

	Two Cargo Units (in feet)	Three Cargo Units (in feet)
Washington	68	Not Allowed
Idaho	95	95
Montana	93	100
North Dakota	103	100
Minnesota	Not Allowed	Not Allowed

From the western border crossing standpoint, 21 of the 28 western border crossings under study are directly affected by the length aspect of the ISTEAs freeze. From the Canadian perspective, none of these ISTEAs cargo-carrying length limits would be considered particularly restrictive, even in Minnesota and Washington.

If Federal TS&W regulation were devolved to the States, including removal of the ISTEAs freeze, the regulatory situation in these States would revert to what it was without the freeze. This is for all intents and purposes the same as it is today and has been for many years. Whether or not the States would wish to alter the above cargo-carrying length limits is not known. Eliminating the ISTEAs freeze by devolution to the States could facilitate the efforts of the member States of the Western Association of State Transportation Officials to improve regional uniformity in TS&W regulations as these relate to GVW limits on Interstate highways.

What would happen to western border trucking if there was no change in the current limits and scope of application of Federal TS&W provisions?

- More specialized western border vehicles will be introduced. This would include increased use of: six-, seven-, and eight-axle tractor-semitrailer units, and; seven- and eight-axle truck-trailer units.

- A variety of (often undesirable) long-drawbar A-trains and truck-trailer combinations would probably see increased use.
- U.S.-Canada crossborder traffic probably will grow at a rapid rate. The rate was 25 percent between 1992 and 1994.
- Split tandems and wide-base tires will be increasingly employed, given the GVW limits of more than 80,000 pounds and the 600 pounds per inch of tire width limits in selected States.

What would happen to western border trucking if Federal size limits were applied to non-NN highways on the NHS?

This would have little or no effect. The length limits are minimums and are already surpassed by the western States more or less throughout their road networks.

What would happen to western border trucking if Federal and State grandfathered weight provisions were applied to non-IS highways on the NHS in conjunction with the above size provisions?

Based on the discussion on devolving Federal TS&W regulation authority to the States, this would seem to have little immediate impact. The grandfather authority would basically replicate the current situation.

What would happen to western border trucking if Federal weight provisions were modified to accommodate freight moving in interstate and international commerce, particularly in containers on NHS highways? This question is considered subject to the following assumptions:

- The modified limits would be applied to IS and other NHS highways.
- They would include: (1) lifting the 80,000-pound limit on gross vehicle weight to accommodate effective use of six-axle semitrailer combinations and their handling of interstate and international commerce particularly in containers, (2) establishing a weight limit for a tridem-axle group which would facilitate the effective use of six-axle semitrailers while not overstressing NHS bridges, and (3) revising the Federal bridge formula accordingly.
- They would include requirements needed to ensure that such vehicles: (1) would perform as well or better than existing vehicles in braking, handling, and stability; (2) can operate satisfactorily in prevailing highway and traffic conditions; and (3) provide full compensation for any additional cost responsibility for the use of NHS highways.

The crossborder movement of international containers along I-5 between the Ports of Seattle, Washington and Vancouver, British Columbia is estimated to involve about 135 truck trips per day each way, which is about 15 percent of the total truck movement. Many of these movements take place on vehicles specially designed to handle fully loaded 40-foot containers within the weight distribution provisions of Bridge Formula B. Others occur on five-axle tractor-semitrailers, often overweight (36,000 pounds) from the United States and Washington State perspectives on the drive tandem axle. Some containers are moved across the border in double-trailer combinations, for example, with one 40-foot container plus one 20-foot container, or three 20-foot containers.

The option of using a six-axle tractor-semitrailer for container movements across the U.S. and Canadian border, within Washington, and to and from adjoining States could elicit a substantial response by industry. It would reduce the use of the existing, specially-designed equipment now used for these movements.

There is also some, probably very limited, movement of international containers between Alberta and Shelby, Montana along I-15 for transshipment on the BN under the special RTAC weight provisions of ISTEA for Montana. Since these movements now occur in Canadian configurations, at Canadian weights (96,000 pounds is already feasible), and Canadian axle spreads, little change would be expected.

There are also limited movements of international containers between northern Minnesota and Winnipeg, Manitoba and the BN mainline through North Dakota and Winnipeg. Providing for the effective use of six-axle tractor-semitrailers for these movements could encourage these exchanges and enhance competition between the BN and the Canadian railways for the business to and from Winnipeg.

HIGHWAY CROSSINGS ON THE WESTERN BORDER

	State Town	Highway	Province Town	Highway	Weight Limit	24-Hour Operation
	<u>Washington</u>		<u>British Columbia</u>			
01	Point Roberts		Boundary Bay	17	63.5	No
02a	Blaine-Peace Arch	I-5 NN, NHS	Douglas	99 CNHS	63.5	Yes
02b	Blaine-Pacific Hwy	I-5 NN, NHS	Douglas	99 CNHS	63.5	Yes
03	Lynden	539 NN, NHS	Aldergrove	13	63.5	No
04	Sumas	9 NN, NHS	Huntington-Abbotsford		63.5	Yes
05	Nighthawk		Chopaka			
06	Oroville	97 NN, NHS	Osoyoos	3	63.5	Yes
07	Ferry	c	Midway			
08	Danville	21 NN	Carson	41 CNHS	63.5	No
09	Laurier	395 NN	Cascade	3	63.5	No
10	Frontier	25 NN	Paterson	22	63.5	No
11	Boundary	251 c	Waneta	22A	63.5	No
12	Metaline Falls	31 NN	Nelway	6	63.5	No
	<u>Idaho</u>		<u>British Columbia</u>			
13	Porthill	1	Rykerts			No
14	Eastport	95 NHS	Kingsgate	3/95	63.5	Yes
	<u>Montana</u>		<u>British Columbia</u>			
15	Roosville	93 NN, NHS	Grasmere		63.5	Yes
	<u>Montana</u>		<u>Alberta</u>			
16	Chief Mountain	17	Chief Mountain	6 NP	4.5	No
17	Piegan	89 NN	Carway	2 MoU	62.5	No
18	Port Del Bonita	213/444	Del Bonita	62 MoU	62.5	No
19	Sweetgrass	I-15 NN, NHS	Coutts	4 MoU	62.5	Yes
20	Whitlash	223 c	Aden	880 MoU	62.5	No
21	Wildhorse	232 c	Wildhorse	41 MoU	62.5 s	No
	<u>Montana</u>		<u>Saskatchewan</u>			
22	Willow Creek	233 c	Willow Creek	21 Sec	54.5	No
23	Turner	241 c	Climax	37 Sec	54.5	No
24	Morgan	242 NHS	Monchy	4 Sec	54.5	No
25	Opheim	24 NN	West Poplar River	2 Sec	54.5	No
26	Scobey	13 NN	Coronach	36 Sec	54.5	No
27	Whitetail	511 c	Big Beaver	34 Sec	54.5	No
28	Raymond	16 NN, NHS	Regway	6 MoU	62.5 s	Yes

HIGHWAY CROSSINGS ON THE WESTERN BORDER

(continued)

	State Town	Highway		Province Town	Highway	Weight Limit	24 hour Operation
	<u>North Dakota</u>			<u>Saskatchewan</u>			
29	Fortuna	85	NN, NHS, s	Oungre	35 Sec	54.5 s	No
30	Ambrose	42	s	Torquay	350 Sec	54.5	No
31	Noonan	40		Estevan	47 CNHS	62.5	No
32	Portal	52	NN, NHS	North Portal	39 CNHS	62.5	Yes
33	Northgate	8	s	Northgate	9 MoU	62.5	No
34	Sherwood	28	s	Carievale	8 Sec	54.5	No
	<u>North Dakota</u>			<u>Manitoba</u>			
35	Antler	256	s	Lyleton	256 B1	47.6 s	No
36	Westhope	83	NN, NHS	Coulter	83 A1	56.5	No
37	Carbury	14		Goodlands-Deloraine	21 A1	56.5	No
38	Dunseith	281	NN, NHS	Peace Garden	10 MoU	62.5	Yes
39	St. John	30		Lena-Killarney	18 A1	56.5	No
40	Hansboro	69		Cartwright	5 A1	56.5	No
41	Sarles	20		Crystal City	34 A1	56.5	No
42	Hannah			Snowflake	242 B1	47.6	No
43	Maida	1		Windygates	31 A1	56.5	No
44	Walhalla	32	s	Winkler	32 A1	56.5	No
45	Neche	18		Gretna	30 A1	56.5	No
46	Pembina	I-29	NN, NHS	Emerson	29 MoU	62.5	Yes
	<u>Minnesota</u>			<u>Manitoba</u>			
47a	Noyes	75	NN	Emerson East	75 A1	56.5	No
47a	Lancaster	59		Tolstoi	59 A1	56.5	No
48	Pinecreek	89		Piney	89 A1	56.5	No
49	Roseau	310		South Junction	310 B1	47.6	No
50	Warroad	313		Sprague	12 MoU	62.5	Yes
	<u>Minnesota</u>			<u>Ontario</u>			
51	Baudette	11	NN	Rainy River	11 Ont	63.5	Yes
52	International Falls	53	NHS	Fort Frances	11 CNHS	63.5	Yes

SOURCES: ISTE A 6015 Study, "Assessment of Border Crossings and Transportation Corridors for North American Trade (West);" "Making Things Work, Transportation and Trade Expansion in Western North America," Volume 4, "Profiles of Western US-Canada Border Crossings"

NOTES: c="county road;" s="subject to spring restrictions;" CNHS="Canadian NHS"

TRUCK TRAFFIC AT THE TWENTY-EIGHT MAJOR BORDER CROSSINGS

Trucking activity at the 28 border crossings of interest to this study is detailed in this appendix. Except where noted, the material is based on ISTEA 6015 Study: Assessment of Border Crossings and Transportation Corridors for North American Trade (West), Making Things Work: Transportation and Trade Expansion in Western North America, Volume 4: Profiles of Western U.S.-Canada Border Crossings. The statistics are for 1992.

02b: Blaine-Pacific Highway

- STAA-NHS/CNHS
- I-5 and BC 99
- Largest commercial crossing on western border
- Southbound Traffic:
 - FY 1992 = 745 trucks/day
 - + FY 1993 = 786 trucks/day
 - + FY 1994 = 867 trucks/day
 - Wood, lumber, paper and printed matter, metals and metal products, manufactured goods
- Northbound Traffic:
 - CY 1992 = 737 trucks/day
 - ^ CY 1994 = 953 trucks/day [339 U.S./614 Canadian]
 - * About 15% (100-125/day) handle containers
 - * Majority of containers are 40 ft
 - * Containers are handled on: 3-S2s (often heavy on the drive tandem (16,500 kg) carrying 40 ft); on the specialized "Stinson lowbed trailer" (25 in total); sometimes in trains (40 ft + 20 ft or 3-20 ft)
 - * 5-axle reefers carrying produce (particularly in winter)--many returning SB empty; also general freight; some lumber
 - * New combinations (4-axle tractors with a single center lift axle coupled to 4-axle semitrailers with a single rear lift tag axle--with the lift axles having to be lifted to enter BC) are being used by Puget Sound Trucks in Bellingham Washington; vans and flat decks; grossing at 101,500 lb
- BN Railroad moves through the same site; 5000 rail cars/mo (165/day).

Sources: * Supplied by Bruce Fuller, Pacific Scale Manager, 604-5381121 or Ron Oldridge, Manager Commercial Transport, 604-3876444, B.C. Ministry of Transportation and Highways.
 + Supplied by U.S. Customs, Blaine Washington, June 13, 1995.
 ^ Derived from Statistics Canada computer runs, June 19, 1995.

03: Lynden-Aldergrove

- STAA-NHS
- US 539 and BC 13
- Southbound Traffic:
 - FY 1992 = 60 trucks/day
 - + FY 1993 = 58 trucks/day
 - + FY 1994 = 61 trucks/day
 - Lumber, wood products, shakes and shingles, livestock and hog feed, bagged and bulk fertilizer, seed potatoes
- Northbound Traffic:
 - CY 1992 = 109 trucks/day
 - ^ CY 1994 = 104 trucks/day [31 U.S./73 Canadian]

Sources: + Supplied by U.S. Customs, Blaine Washington, June 13, 1995
 ^ Derived from Statistics Canada computer runs, June 19, 1995

04: Sumas-Huntington

- STAA-NHS
- US 9 and BC 11
- Southbound Traffic:
 - FY 1992 = 170 trucks/day
 - + FY 1993 = 204 trucks/day
 - + FY 1994 = 228 trucks/day
- Northbound Traffic:
 - CY 1992 = 111 trucks/day
 - ^ CY 1994 = 131 trucks/day [40 U.S./91 Canadian]
- Rapid growth in industrial activity particularly on Canadian side; growth is inhibited by circuitous connection to I-5 via a two-lane State highway; close proximity to Port of Bellingham Sumas International Cargo Terminal and Foreign-Trade Zone #131; Washington State University studied truck movements to and from Sumas--greatest share use Highway 546 (east-west) and Highway 539 (north-south Guide Meridien) all the way to I-5, or connected to I-5 via Lynden road off the Guide-Meridien
- BN line connects to east-west CN and CP; during the week, 15-40 loaded railcars per day carry machinery, forest products, fertilizers, propane/butane products SB

Sources: + Supplied by U.S. Customs, Blaine Washington, June 13, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

06: Oroville-Osoyoos

- STAA-NHS
- US 97 and BC 3
- Southbound Traffic:
 - FY 1992 = 68 trucks/day
 - Apples, lumber, woodchips, livestock, bottled water, whiskey, furniture, textiles, new trucks
- Northbound Traffic:
 - CY 1992 = 54 trucks/day
 - ^ CY 1994 = 60 trucks/day [18 U.S./42 Canadian]

Sources: ^ Derived from Statistics Canada computer runs, June 19, 1995.

08: Danville-Carson

- STAA/CNHS
- US 21 and BC 41
- Southbound Traffic:
 - FY 1992 = 5 trucks/day
 - Lumber and woodchips
- Northbound Traffic:
 - CY 1992 = 3 trucks/day
 - ^ CY 1994 = 3 trucks/day [1 U.S./2 Canadian]

Sources: ^ Derived from Statistics Canada computer runs, June 19, 1995.

09: Laurier-Cascade

- STAA-CP
- US 395 and BC 3
- Southbound Traffic:
 - FY 1992 = 24 trucks/day
 - Lumber, woodchips, particleboard, zinc and lead, paper and printed matter
 - * From a July 1993 16-hour survey of Canadian originating truck traffic (combining traffic through Laurier and Frontier):

<u>Commodities</u>	<u>Number of Trucks</u>
wood chips	31
lumber products	20
fertilizer	19
other freight	5
empty	8
Total	83

- * About one-half of the Canadian trucks enter at Laurier, and the other half at Frontier
- * Canadian originating traffic accounted for 44% of all trucks surveyed on US 395.
- * “About half of the wood products trucks originating in Canada were chip trucks with loads terminating at a wood generation power plant .. in Kettle Falls. Most of the remaining Canadian-origin trucks carrying wood cargo continued on S 395 to Spokane and .. beyond”.
- * Wood-related products are also the primary commodities hauled by trucks originating in Washington and travelling SB on US 395 towards Spokane. Sawmills located in Kettle Falls, Colville and Arden are the primary sources of wood traffic from NE Washington.
- Northbound Traffic:
 - CY 1992 = 35 trucks/day
 - ^ CY 1994 = 31 trucks/day [21 U.S./10 Canadian]
 - BN line through Laurier with 1 train/day, 5 days/week--same commodities as trucks
 - * “A critical link supporting both the northeastern Washington economy and international trade with Canada”

Sources: * Obtained from “Modeling Washington State Truck Freight Flows Using GIS-T: Data Collection and Design,” K. Casavant et. al., TRB Paper No. 95-0444, January 1995.
 ^ Derived from Statistics Canada computer runs, June 19, 1995.

10: Frontier-Paterson

- STAA
- US 25 and BC 3
- Southbound Traffic:
 - FY 1992 = 35 trucks/day
 - Chemicals (acids, fertilizer, other HAZMAT), wood, paper and printed matter, metal and metal products
- Northbound Traffic:
 - CY 1992 = 36 trucks/day
 - ^ CY 1994 = 59 trucks/day [37 U.S./22 Canadian]

Sources: ^ Derived from Statistics Canada computer runs, June 19, 1995.

12: Metaline Falls-Nelway

- STAA
- US 31 and BC 6
- Southbound Traffic:
 - FY 1992 = 5 trucks/day
 - Lumber, shakes and shingles, fertilizer

- Northbound Traffic:
 - CY 1992 = 5 trucks/day
 - ^ CY 1994 = 23 trucks/day [17 U.S./6 Canadian]

Sources: ^ Derived from Statistics Canada computer runs, June 19, 1995.

14: Eastport-Kingsgate

- NHS
- US 95 and BC 95
- Southbound Traffic:
 - FY 1992 = 80 trucks/day
 - + FY 1993 = 93 trucks/day
 - + FY 1994 = 107 trucks/day
 - building materials, peat moss, fertilizer, meat, livestock
- Northbound Traffic:
 - CY 1992 = 85 trucks/day
 - ^ CY 1994 = 87 trucks/day [13 U.S./74 Canadian]
 - Food and produce from Sallinas Valley to Calgary/Edmonton
- * The Yahk Weight Scale on B.C. Highway 3/95 handles 3,000 trucks per month--mainly U.S.-related. Cattle from Alberta (and Saskatchewan) moves to Pasco Washington (in the Spokane area--through Fernie to Yahk to US 95 in Idaho to Washington).
- Rail traffic is 1 train/day; has facility for transloading lumber between trucks and rail (BN and CP)

Sources: * Supplied by Bruce Fuller, Pacific Scale Manager, 604-5381121 or Ron Oldridge, Manager Commercial Transport, 604-3876444, B.C. Ministry of Transportation and Highways.
+ Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995

15: Roosevelt-Grasmere

- STAA-NHS
- US 93 and BC 93
- Southbound Traffic:
 - FY 1992 = 31 trucks/day
 - + FY 1993 = 38 trucks/day
 - + FY 1994 = 47 trucks/day
 - lumber and logs moving south to BN at Eureka; also woodchips and saw dust to pellet mill in Eureka
- Northbound traffic:
 - CY 1992 = 34 trucks/day
 - ^ CY 1994 = 38 trucks/day [9 U.S./29 Canadian]
 - Six of 10 northbound trucks are empty
- Roosevelt offers shortest distance between west coast and southwest and Calgary; but most truckers prefer I-15 through Sweetgrass (better highway, less mountainous); US-93 is occasionally congested by slow moving trucks.

Sources: + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

17: Piegan-Carway

- STAA
- US 89 and AL 2
- Southbound Traffic:
 - FY 1992 = 5 trucks/day
 - + FY 1994 = 6 trucks/day
 - o chemicals and related commodities

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- Northbound Traffic:
 - ^ CY 1994 = 4 trucks/day [2 U.S./2 Canadian]
- Most commercial traffic prefers I-15 at Sweetgrass.

Sources: + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June, 13 1995.
 ^ Derived from Statistics Canada computer runs, June 19, 1995.

19: Sweetgrass-Coutts

- STAA-NHS/CNHS
- I-15 and AL 4
- Southbound Traffic:
 - FY 1992 = 177 trucks/day
 - @ FY 1993 = 191 trucks/day
 - @ FY 1994 = 241 trucks/day
 - Lumber, paper, pulp, grain, feed, seed, chemical, petroleum products, fertilizers, ore, machinery, inspection facilities for live cattle and meat
 - * Alberta's 3-day survey of 510 southbound trucks had the following results:

Commodity	Tonnes	%	Trucks	%	Configuration			
					Single	A-double	B-double	C-double
Grains	3072	30	111	22	39	12	58	2
Live animals	1910	18	86	17	82	2	2	0
Forest products	1321	13	64	13	62	1	1	0
Horticulture commodities	814	8	37	7	26	8	3	0
Perishable food	801	8	40	8	38	2	0	0
Nitrate	458	4	17	3	4	6	7	0
General freight	371	4	28	5	21	5	2	0
Construction products	255	2	17	3	13	1	3	0
Other	1369	13	71	14				
Empty	nil		39	8	39	0	0	0
Above total	10371	100	510	100	380	46	82	2

* Of the 510 southbound trucks:

- * 60 had Montana overdimension permits, 103 had Montana weight permits, and 32 had Canadian weight permits to travel to Shelby.
- * destinations: Montana (37%), California (13%), Colorado (12%), Utah (9%), Idaho (7%), Wyoming (4%), Texas (3%), Other (15%).
- * 43% of the 510 trucks originated in Calgary, Edmonton and Lethbridge (57% from 53 other Alberta locations).
- * 75% were single trailer units (3-S2s and maybe some 3-S3s)--with doubles accounting for the remainder (2 B trains for every A or C train).

+ 1992 southbound weight at Coutts = 1,298,000 short tons/year (1,177,286 metric tonnes/year); truck count = 47091 25-ton trucks/year or 129 25-ton trucks/day [pA30]. This compares well with 1994 Alberta study of 138 25-ton trucks/day.

- = Most southbound trucks are loaded (grain, cattle, fuel); many northbound trucks are empty.
- = Sunday evening, Monday, Tuesday and half Wednesday are busy in both directions at the joint scale; weekend southbound traffic is light partly because U.S. permits are often not readily available at the Scale or otherwise
- = To utilize Canadian weights to Shelby, a carrier must buy an annual permit of \$200 and pay a per load charge of \$10. The per load permits are obtained at the Scale when U.S. officers are there. Certain carriers are authorized to self-issue the per load permits.

& Of the 99 southbound trucks: 6 of 10 were 3-S2s, 1 of 10 was a 3-S3, 1.5 of 10 were 8-axle B-trains, 1 of 8 was an A-trains (11 7-axes, 1 8-axle), and there was 1 each of a deadhead tractor, a 3-S4 (operating as a 3-S3 having its lift axle raised), and 1 2-S1.

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& GVWs (in pounds) of loaded southbound 3-S3single trailers, 8-axle B-doubles, and A-doubles:

<u>3-S3 singles</u>	<u>8-axle B-doubles</u>	<u>7/8-axle A-doubles</u>
89,640 (cattle)	122,060 (Cdn wts)	102,940 (dry bulk)
88,140 (cattle)	109,340	106,620 (hb-grain)
90,740 (cattle)	105,600 (hb-grain)	105,420
88,800 (cattle)	104,400 (hb-grain)	103,000 (hb-grain)
89,860 (cattle)	105,400 (hb-grain)	105,440 (hb-grain)
88,580 (cattle)	111,100 (hb-grain)	107,320 (hb-grain)
91,020 (cattle)	122,980 (hb-fertilizer-Cdn wts)	106,420
88,140 (grain)	107,440 (hb-grain)	105,600
	131,240 (hb-grain-Cdn wts)	67,840
	102,880 (hb-grain)	90,800
	105,460 (hb-grain)	
	119,840 (hb-grain-Cdn wts)	
	106,452 (Montana wts)	105,345 (weigh-out)
88,365 (average wt.)	124,030 (Cdn wts)	

& 1 of 8 trucks is a cattle hauler; 1 of 8 trucks is a grain hauler

- Northbound Traffic:

- CY 1992 = 174 trucks/day

^ CY 1994 = 219 trucks/day [75 U.S./144 Canadian]

* Alberta's 3-day survey of 389 northbound trucks had the following results:

Commodity	Tonnes	%	Trucks	%	Configurations			
					Single	A-double	B-double	C-double
Perishable food	2347	38	123	32	117	5	1	0
General freight	553	9	42	11	37	4	0	1
Bulk dry chemicals	581	9	21	5	8	9	4	0
Equipment	502	8	32	8	31	0	1	0
Grains	331	5	15	4	6	4	5	0
Construction materials	324	5	19	5	19	0	0	0
Bulk liquid chemicals	240	4	12	3	11	0	1	0
Metal products	193	3	10	3	10	0	0	0
Petroleum products	179	3	2	6	0	2	0	
Other	1025	16	54	14				
Empty	nil	0	52	13	40	6	6	0
Above total	6232	100	389	100	334	32	22	1

* Of the 389 northbound trucks:

* 28 had Montana overdimension permits, 46 had Montana weight permits, and 13 had Canadian weight permits to travel to Shelby.

* 36% carried perishable food (fruits, vegetables and meats)--mostly originating in California and southern U.S.--average payload of 19 tonnes.

* 70% destined for Calgary, Edmonton, and Lethbridge.

* Montana and California accounted for 47% of traffic destined for Alberta.

* 85% of the northbound trucks were single trailer units.

+ 1992 northbound weight at Coutts = 760,000 short tons/year (689,000 metric tonnes/year); Truck count = 27,560 25-ton trucks/year or 75 25-ton trucks/day [p A30]. This compares well with 1994 Alberta study of 83-25-ton trucks/day.

& Of 43 northbound trucks, 65% were 3-S2's; 12% 3-S3's; 9% 8-axle B-trains; 14% 7-axle A-trains.

1991 300 trucks/day through the Sweetgrass-Coutts [p 24].

- Pursuant to Section 1023 in ISTEPA, and an associated Memorandum of Understanding between Alberta and Montana, trucks are permitted to run on I-15 between the border and Shelby at axle weights of Canadian RTAC axle weights (12,100 lb steering, 37,500 lb tandem, 50,700 lb tridem) and gross vehicle weights, and are excluded from compliance with Bridge Formula B.

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- # 4,000 permits were issued pursuant to the MoU between 1991 and September 1993 [p19].
- # The commodities benefitting from the ISTEA provision are fuel oil, frac sand, grains, potash, fertilizer, agricultural products [p21].
- There are switching tracks between the BN and CP at the border crossing; Shelby is the only BN intermodal hub in Montana, operated by a trucking company.
- # The BN intermodal hub in Shelby was established in 1987: 30 lifts/month in 1987 to 1000 lifts/month in 1993
- # The western and northern States are the major destinations of Alberta exports to the U.S. (80% trucking revenue; 85% shipments; 90% tonnage) [p19].

- Sources:
- * Derived from the 1994 Coutts Commercial Vehicle Survey: Summary Report, Alberta Transportation and Utilities, October 18 1994--72 hour survey conducted June 7-9, 1994.
 - + Derived from "Descriptive Report on Cross-Border Traffic and Transportation in the Western U.S.-Canada Region" FHWA-PL-94-009- 041, August 1993.
 - # Derived from "Making Things Work: Transportation and Trade Expansion in North America: Volume 7: Commissioned Special Reports Number 4: The Sweetgrass Montana and Coutts Alberta Border Crossing" FHWA-PL-94-009-029, September 1993.
 - = Derived from an interview with Mike Areshenko, Scale Officer, Coutts Alberta, June 2, 1995.
 - @ Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
 - & Supplied by Jerry Stephens, Montana State University, May 17, 1995, based on a truck classification and weight survey conducted between September 12 and 16 inclusive during afternoon periods at the Coutts Scale.
 - ^ Derived from Statistics Canada computer runs, June 19, 1995.

24: Morgan-Monchy

- NHS
- US 242 and SK 4
- Southbound Traffic:
 - Primarily local traffic; potash, paper, fuel, wood posts, peat moss, egg cartons, paper from Prince Albert Saskatchewan.
 - + FY 1994 = 4 trucks/day
- Northbound Traffic:
 - CY 1992 = 3 trucks/day
 - ^ CY 1994 = 4 trucks/day [3 U.S./1 Canadian]

- Sources:
- + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
 - ^ Derived from Statistics Canada computer runs, June 19, 1995.

25: Opheim-West Poplar

- STAA
- US 24 and SK 2
- Southbound Traffic:
 - Salt cake and potash to Missoula, grain to Wolf Point, fence posts to Glasgow
 - + FY 1994 = 2 trucks/day
- Northbound Traffic:
 - CY 1992 = 1 truck/day
 - Primarily empty grain trucks

- Sources:
- + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13 1995)

26: Scobey-Coronach

- NHS
- US 13 and SK 36
- Southbound Traffic:

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- Farm to market; fuel, farm equipment from Regina, grain to General Mills elevator at Wolf Point, seed, hay and straw; Moose Jaw is the origin of most non-local traffic.
- + FY 1994 = 1 truck/day
- Northbound Traffic:
 - CY 1992 = 1 truck/day
 - ^ CY 1994 = 1 truck/day

Sources: + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

28: Raymond-Regway

- STAA-NHS
- US 16 and SK 6
- Southbound Traffic:
 - FY 1992 = 27 trucks/day
 - + FY 1993 = 31 trucks/day
 - + FY 1994 = 42 trucks/day
 - o 24 hour port; gateway between Regina and U.S.; fertilizers, potash, fuel, peat moss from Carrot River to California, pork (5-6 loads/week to Mexico via El Paso), lumber, cattle, seeds, lentils, canola, and steel.
- Northbound Traffic:
 - CY 1992 = 20 trucks/day
 - ^ CY 1994 = 27 trucks/day [14 U.S./13 Canadian]
- Route 16 is inadequate for any substantial growth in truck traffic.
- DMVW and BN branchlines on the U.S. side have a questionable future.

Sources: + Supplied by Tom Hoyme, Great Falls District, U.S. Customs, June 13, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

29: Fortuna-Oungre

- STAA-NHS
- US 85 and SK 35
- # Southbound Traffic:
 - # FY 1994 = 8 trucks/day
- Northbound Traffic:
 - CY 1992 = 8 trucks/day
 - ^ CY 1994 = 10 trucks/day [6 U.S./4 Canadian]
 - Local trade port

Sources: # Derived from an interview with Radley Austin, Area Port Director, United States Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

32: Portal-North Portal

- STAA-NHS/CNHS
- US 52 and SK 39
- Southbound Traffic:
 - FY 1992 = 112 trucks/day
 - # FY 1994 = 144 trucks/day
 - o Wood, paper, printed matter, chemicals, cattle, agriculture elements.

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- Northbound Traffic:
 - CY 1992 = 127 trucks/day
 - ^ CY 1994 = 157 trucks/day [42 U.S./115 Canadian]
- Gateway for CP/SOO; SB rail traffic consists of lumber, cement, fertilizer, zinc, pipe, grain, newsprint, wood pulp, sulphur, metal products.
- About 100 movements/day are in-transit or in-bond onto U.S. highways and rail, back into Canada at Detroit or Port Huron; also in-bond whiskey moves to U.S. distribution points.

Sources: # Derived from an interview with Radley Austin, Area Port Director, United States Customs Service, Pembina North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

33: Northgate

- US 8 and SK 8
- Southbound Traffic:
 - FY 1992 = 35 trucks/day (exclusive of Kleysen potash trucks)
 - # FY 1994 = 36 trucks/day
 - Potash, salt, sunflower seeds, waste oil, mustard, fertilizer, hay, farm equipment, urea, wood products, flax, oats, rye, heavy equipment, log homes, propane
 - Kleysen potash haul from Esterhazy Saskatchewan; in 3-S3-4 at about 200,000 pounds GVW, connecting via a private road in Saskatchewan to BN bulk transloading facility; when running, 1 truck every 5 minutes (192,200 pounds GVW--142,900 pounds payload)
- Northbound Traffic:
 - CY 1992 = 36 trucks/day
 - ^ CY 1994 = 28 trucks/day [3 U.S./25 Canadian]
- Considered a potential location for an intermodal facility for north-south TOFC and COFC movements (pvii).

Sources: # Derived from an interview with Radley Austin, Area Port Director, United States Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

36: Westhope-Coulter

- STAA-NHS
- US 83 and MA 83
- Southbound Traffic:
 - FY 1992 = 10 trucks/day
 - # FY 1994 = 18 trucks/day
 - Potash, farm commodities
- Northbound Traffic:
 - CY 1992 = 6 trucks/day
 - ^ CY 1994 = 14 trucks/day [7 U.S./7 Canadian]

Sources: # Derived from an interview with Radley Austin, Area Port Director, United States Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

38: Dunseith-Peace Garden

- STAA-NHS
- US 281 and MA 10
- Southbound Traffic:
 - FY 1992 = 31 trucks/day
 - # FY 1994 = 54 trucks/day
 - Potash, fertilizer, peat moss (Winnipeg to California), grain, cattle (prairies to SD, Nebraska, Iowa), diesel fuel, machinery
 - 99% SB trucks are loaded

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- Northbound Traffic:
 - CY 1992 = 24 trucks/day
 - ^ CY 1994 = 39 trucks/day [16 U.S./23 Canadian]
 - Reefers moving NB with produce return SB with peat moss.
- 5 percent of traffic moves in-bond to Blaine in the West and Windsor in the East.
- Principal carriers are: Pauls Hauling, Williams, Corchorane, Quintain, D&D, Styles & Kelly, TransX, Arnold, Hapag Lloyd, a marine carrier moving ISO marine containers.

Sources: # Derived from an interview with Radley Austin, Area Port Director, United States Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

44: Walhalla-Winkler

- US 32 and MA 32
- Southbound Traffic:
 - FY 1992 = 26 trucks/day
 - # FY 1994 = 49 trucks/day
 - Local trade
- Northbound Traffic:
 - CY 1992 = 31 trucks/day
 - ^ CY 1994 = 49 trucks/day [12 U.S./37 Canadian]
 - + Soya beans are trucked to Winkler Manitoba and usually return empty.
 - + Some of the Walhalla-Winkler traffic is attempting to avoid weigh scales.

Sources: # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
+ Derived from an interview with Willmer Scrumeda, Manitoba DHT, Emerson Scale Officer, May 30, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

45: Neche-Gretna

- US 18 and MA 30
- Southbound Traffic:
 - FY 1992 = 25 trucks/day
 - # FY 1994 = 35 trucks/day
 - Fuel, canola
 - Receives overflow traffic from Pembina.
- Northbound Traffic:
 - CY 1992 = 17 trucks/day
 - ^ CY 1994 = 21 trucks/day [16 U.S./5 Canadian]
 - + Seed grains are trucked to Canamera Seeds in Altona Manitoba and usually return empty.
 - + Some of the Neche-Gretna traffic is attempting to avoid weigh scales.

Sources: # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
+ Derived from an interview with Willmer Scrumeda, Manitoba DHT, Emerson Scale Officer, May 30, 1995.
^ Derived from Statistics Canada computer runs, June 19 1995.

46: Pembina-Emerson

- STAA-NHS/CNHS
- I-29 and MA 75
- # designated POE in the U.S.

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- Southbound Traffic:

- FY 1992 = 248 trucks/day
- # FY 1994 = 341 trucks/day
- Metal products, chemicals, agriculture machinery, lumber, cement, livestock, clothing, furniture, grain, meat
- # Traffic has grown from 30-50 trucks/day in 1977 to 300-500 trucks/day in 1995.
- # Major reason for recent growth is the devaluation of Canadian \$; southbound car traffic is down while southbound truck traffic is up.
- # Truck traffic is growing much faster than rail.
- # Lumber trucks and peat moss to Texas and Arizona; paper rolls, raw commodities, wood pulp in bails, potash mainly to Minnesota.
- # About 10 percent of southbound trucks are empty versus 40 percent empty northbound.
- + Southbound cattle movements through the Emerson Scale are destined for Dakota City and Sioux Falls and Des Moines, Iowa. Cattle is always moved southbound, with the cattle trucks returning empty.
- + Infrequently, loaded containers are moved southbound via Emerson (usually in-bond)

- Northbound Traffic:

- CY 1992 = 166 trucks/day
- * CY 1993 = 219 trucks/day
- * CY 1994 = 325 trucks/day
- ^ CY 1994 = 328 trucks/day [113 U.S./215 Canadian]
- Produce, consumer goods
- The difference between southbound and northbound movements in 1992 occurred because many of the empty northbound trucks utilize the Emerson East crossing to avoid processing time at this crossing. This practice has now stopped, with most traffic routing through this crossing.
- * Factors which have helped to create this large increase in northbound traffic are: (1) about January 1994, because of a bridge restriction at Emerson East, effectively all border brokerage services moved to the Emerson site; (2) at about the same time, U.S. Customs designated only selected locations as commercial Points of Entry (Emerson being one; Noyes not being), meaning fuller inspection services.
- * Canadian Customs conducted a special survey between April 3 and April 7, 1995 for northbound traffic through Emerson. 1942 commercial vehicles crossed the border during the study period. 264 of these were randomly selected, and showed the following:

Truck-load (TL) traffic	92
LTL traffic	11
Flatbed traffic	31
Bulk loads	18
Empty	104
Other	8
Total	264

- * 30-40 percent of northbound trucks are empty (roughly supported by the above special survey).
- * 50 percent of northbound trucks through Emerson are Manitoba carriers; the remainder are mainly from North Dakota, Minnesota, Wisconsin and Ohio.
- + Roughly 5 containers/day (usually 20-foot boxes) are moved northbound from Crookston, Minnesota, through Emerson, to Winnipeg, Manitoba for westbound shipment via the CN or CP.
- + Products originating in Mexico and destined for Manitoba are typically hauled by North Dakota carriers specializing in produce haul, such as Brysen, PRO.
- + Other northbound produce movement is estimated as three loads per week from California by California haulers, none are from New Mexico or Arizona, not many from Texas, and six loads per week from Florida.
- + Most of the produce haulers leave Manitoba empty.
- + Roughly 40 percent of Emerson scale traffic are U.S. trucks; 60 percent are Canadian.
- @ The truck traffic on I-29 through the Joliette Scale, which operates less than 24 hours per day, was

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122,070 weighed in 1992 and 114,762 weighed in 1993. For 1994, the breakdown (the Total column includes empty trucks not weighed) for each month is:

	<u>Weighed</u>	<u>Total</u>
January	6272	7963
February	7160	9027
March	10089	12708
April	10546	13143
May	11237	14234
June	9794	12539
July	8611	10977
August	9130	11314
September	9286	11479
October	11821	14243
November	11136	13510
December	9924	11811
Total	115006	142948 (392 trucks/day)

! Truck traffic through the Joliette Scale (on I-29 to and from Manitoba) is of the same quantity as traffic through the Beach Scale (on I-94 between North Dakota and Montana). The Fargo Scale (on I-94 between North Dakota and Minnesota) handles about twice the traffic as the Joliette and Beach Scales.

- Sources:
- * Derived from an interview with Larry Propp, Superintendent, Customs Operations, Emerson, May 30, 1995.
 - + Derived from an interview with Willber Scrumeda, Manitoba DHT, Emerson Scale Officer, May 30, 1995.
 - # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
 - @ Derived from an interview with Don Jaster, ND DOT, Joliette Scale Master, May 30, 1995.
 - ! Derived from information provided by Dennis Erikson, ND DOT, May 15, 1995.
 - ^ Derived from Statistics Canada computer runs, June 19, 1995.

47: Noyes-Emerson East

- STAA
- US 75 and MA 75
- Southbound Traffic:
 - FY 1992 = 24 trucks/day
 - # FY 1994 = 4 trucks/day
 - Due to a bridge restriction at Noyes, heavily loaded trucks that otherwise, would use this crossing are forced to use the I-29 crossing at Pembina. This skews the traffic in favor of the northbound direction as more of the southbound traffic is loaded and must generally use the I-29 crossing.
- Northbound Traffic:
 - CY 1992 = 126 trucks/day
 - CY 1994 = 4 trucks/day [2 U.S./2 Canadian]
 - + The combined effect of a bridge restriction problem in Emerson East and the movement of custom brokerage service to Emerson-Pembina has more or less eliminated the use of this crossing as of 1995. (The only reason to use this crossing is to avoid the Emerson Scale on Manitoba Route 200.)
- This crossing was considered “an excellent location for an intermodal hub facility” (pvii), but the recent movement of the brokerage business to Emerson challenges this. Rail traffic has remained stable in past 5 years;. The CN, CP, BN and SOO cross within 100 feet of each other. Southbound train traffic consists of lumber, fertilizer (urea and potash), propane, chemicals (sulphuric acid), furniture (piggyback), railcar axles (from Winnipeg), newsprint (Boise Cascade in Kenora to Fargo), grain (to Warren, Minnesota), wood pulp (to Grand Rapids, Michigan in box cars from British Columbia),

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Aspenite wafer board (from Saskatchewan to McMillan Bloedel in Springfield, Missouri), and malting barley (to the Busch Brewery in St. Louis). This traffic uses 49,340 railcars southbound (135/day).

Sources: # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
+ Derived from and interview with Willber Scrumeda, Manitoba DHT, Emerson Scale Officer, May 30, 1995.
^ Derived from Statistics Canada computer runs, June 19, 1995.

50: Warroad-Sprague

- US 313 and MA 12
- Southbound Traffic:
 - FY 1992 = 50 trucks/day
 - # FY 1994 = 46 trucks/day
 - Fuel, agricultural products, grain, mustard seed, hay
- Northbound Traffic:
 - CY 1992 = 38 trucks/day
 - ^ CY 1994 = 43 trucks/day [10 U.S./33 Canadian]
- Being a short-cut for Canadian east-west traffic, much of the truck movement (24/day in each direction) is in-transit between eastern and western Canada.
- There is considerable in-transit rail traffic via CN between Ontario and Manitoba (9 trains/day, 15,000 cars/month).

Sources: # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

51: Baudette-Rainy River

- STAA
- US 11 and ON 11
- Southbound Traffic:
 - FY 1992 = 13 trucks/day
 - # FY 1994 = 14 trucks/day
 - Limited truck traffic; mainly in-transit between east and west; pulpwood moved SB to local area
- Northbound Traffic:
 - CY 1992 = 10 trucks/day
 - ^ CY 1994 = 12 trucks/day [2 U.S./10 Canadian]

Sources: # Derived from an interview with Radley Austin, Area Port Director, U.S. Customs Service, Pembina, North Dakota.
^ Derived from Statistics Canada computer runs, June 19, 1995.

52: International Falls-Fort Frances

- NHS/CNHS
- US 53 and ON 11
- Northbound Traffic:
 - ^ CY 1994 = 71 trucks/day [26 U.S./45 Canadian]
- Most of the crossborder traffic is Boise-Cascade, and it fluctuates with Boise Cascade activity. Ninety percent of the southbound trucking is on line-release. It consists of paper products, machinery, wood products. The rail traffic consists of chemicals, wood products, lumber, potash, and sulphur.

Sources: ^ Derived from Statistics Canada computer runs, June 19, 1995.

**TS&W REGULATION RESEARCH AND DEVELOPMENT
ON
THE WESTERN BORDER**

Over and above the on-going activities of WASHTO, AASHTO, and NAFTA Land Transportation Standards Subcommittee consultations, there are a number of specific TS&W development and research projects underway of importance to trucking across the western border.

Canamex (Rocky Mountain Trade Corridor)

Alberta is promoting development of the Canamex trucking corridor involving Arizona, California, Idaho, Montana, Nevada, Utah, and the Federal Governments of Mexico and the United States. The latest version of the proposal is outlined in a "Memorandum of Understanding regarding the Canamex Trucking Corridor" circulated at an AASHTO Meeting in Phoenix in early June 1995. The proposal envisions undertaking a pilot project permitting the operation of A- and C-train Rocky Mountain Double trailer combinations along I-15 connecting to Highway 4 in Alberta and extending south to the U.S.-Mexico border at higher than current weights in order to enhance industry productivity. The TS&W details of the proposals are:

Weight Limits

Tire	560 pounds per inch of tread width	
Steering axle	12,000 pounds	
Single axle	20,000 pounds	
Tandem axle	34,000 pounds	
Gross vehicle:		
	<u>A-train</u>	<u>C-train</u>
5-axle	92,000 pounds	92,000 pounds
6-axle	106,000 pounds	106,000 pounds
7-axle	118,000 pounds	120,000 pounds
8-axle	118,000 pounds	128,000 pounds

Axle group weights as a function of interaxle spacing--See the proposal for details.
Limits are higher than permitted by Bridge Formula B.

Size Limits (maximums)

Total length	98 feet, 5 inches
Semitrailer length	53 feet
Second trailer length	29 feet
Height	14 feet

The following table compares the above limits with those of the ISTEA freeze for long double-trailer combinations tractors in the six affected States.

State	Maximum Cargo-Carrying Length (feet)	Maximum GVW (pounds)	Conditions
Arizona	95	111,000	Comply with Bridge Formula B
California	--	--	--
Idaho	95	105,500	Comply with Idaho Bridge Formula
Montana	93	137,800	Comply with Bridge Formula B and MoU
Nevada	95	129,000	Comply with Bridge Formula B
Utah	95	129,000	Comply with Bridge Formula B

The proposal complies with all length limits except California, but the 118,000/128,000-pound limits exceeds current GVW limits in Arizona, California, and Idaho. As it is being proposed as a demonstration project, the proposal recommends an evaluation procedure and criteria. However, there are no data on the amount and type of truck traffic now operating on this corridor nor its expected impact.

State TS&W Studies

The **Montana** DOT has commissioned a project on “Assessing the Impact on Montana's Highways of Adopting Canadian Truck Weight and Size Limits,” with Dr. J. Stephens, Montana State University. The completion date is estimated to be Spring 1996.

The first report produced from this work is, “The Impact on Montana's Interstate Bridges of Adopting Canadian Interprovincial Weight Limits,” by S. Patterson, May 4, 1995. Paraphrasing a May 17, 1995 letter from Dr. Stephens, this is a “single load event” study involving the bridge superstructure. Fatigue and accelerated deterioration effects are not considered. Paraphrasing the abstract from the report (referencing Canadian B-train loads) of the 845 bridges on the Montana interstate system, 88 percent “have the required capacity to carry the increased demands of the Canadian configurations. Simple span structures made of reinforced concrete, steel, and prestressed concrete all possess the required capacity to carry the increased load. Notably,

continuous reinforced concrete structures displayed poor abilities to accommodate the ... B train and nearly all the bridges of this type would be insufficient to carry the heavier vehicles. Some steel continuous structures also require additional capacity ..." Dr. Stephens advises that the findings of this work are undergoing additional review and assessment.

The **Minnesota** DOT has commissioned a project entitled, "Truck Size and Weight: Minnesota Perspective," with Dr. Jerry Fruin and Dan Halbach, Agricultural and Applied Economics. The completion date is estimated to be Spring 1996.

APPENDIX B

TRUCK TRAFFIC AT THE TWENTY-EIGHT MAJOR BORDER CROSSINGS

