

Commodity Flow Study Final Report

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 SOUTH DAKOTA
DEPARTMENT OF PUBLIC SAFETY
Office of Emergency Management



Submitted to:
Bob Van Winsen
State of SD Office of Emergency Management
118 W Capitol Ave
Pierre, South Dakota 57501-2000
bob.vanwinsen@state.sd.us

Prepared by:
Project Solutions Inc.
3022 W. Saint Louis St.
Rapid City, South Dakota 57702-8168
sandy@projectsolutionsinc.com

FINAL

Acknowledgements

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1. Objective

The objective of this project is to develop and implement a commodity flow study for the South Dakota Dept. of Public Safety (DPS), Office of Emergency Management (OEM). The Request for Proposal stated that the study should “include all counties that have not been studied in the state over the last 2 years”. Funding for the project is provided through a US Dept. of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration grant that ends on September 30, 2012. At the June 19 project kick-off meeting it was decided to focus on highway transportation of hazardous materials in Western South Dakota counties without recent surveys. Lawrence and Pennington Counties were not included since studies had been conducted in these counties in 2011. 15 sites and 2 optional sites were identified to survey major roads entering Western South Dakota. The consulting contract with Project Solutions Inc. (PSI) was finalized on July 12 with a \$57,488.35 budget.

This commodity flow study does not quantify all of the hazardous materials that are transported on highways through Western South Dakota counties. It provides a representative sample of the types and traffic patterns of hazardous materials that are transported on major highways in this area. This study will be used by Local Emergency Planning Committees and emergency responders to train, equip, and respond to hazardous materials incidents. Study data may be used by community planners and elected officials to designate highway routes for the transportation of hazardous materials. According to the USDOT “Guidance for Conducting Hazardous Materials Flow Surveys”, January 1995 a commodity flow analysis is an important step in assessing transportation-related hazardous materials risks. Tribal transportation offices will also be provided with a copy of this report.

2. Work Plan

The project work plan included 15 proposed survey locations (plus 2 optional survey sites) and the process for conducting the study:

1. Obtain SD Dept. of Transportation (SDDOT) permits to occupy right-of-way (ROW).
2. Secure needed supplies and equipment.
3. Train a 2-person crew.
4. Deploy the crew to collect data for 8-10 hours for 2 days at each site beginning July 13.
5. Collect survey forms and update the Excel database weekly.
6. Submit monthly progress reports and invoices to the OEM on August and September 15.
7. Analyze data including comparison to Lawrence and Pennington County studies.
8. Submit a draft report and final invoice to OEM by September 28 and a final report by October 12.

3. Data Gathering

Applications for SDDOT permits to occupy ROW were submitted to the Rapid City (Belle Fourche, Rapid City, and Custer Areas), Pierre (Mobridge, Pierre, and Winner Areas), and Mitchell (Mitchell Area) Regions. SDDOT Area personnel processed our applications quickly and provided suggestions for survey sites. Permit requirements included:

- Notify Area Engineers prior to beginning surveys.
- Set 48" X 48" Survey Crew signs.
- Each surveyor shall wear a Type II safety vest.
- Safely park vehicle and trailer to not obscure the traveling public's sight distance.
- Contact tribal transportation offices prior to starting surveys.

Bob Van Winsen, OEM Project Manager, provided DPS contact information for the Tilford Weigh Station and Buffalo and Lemmon temporary weigh stations. DPS personnel were quick to respond to PSI's phone calls and e-mails. PSI conducted surveys from these sites but DPS personnel were not conducting inspections at Buffalo and Lemmon on our survey dates. PSI's Project Manager was responsible for making weekly SDDOT and tribal notifications, prepared a detailed schedule, and secured equipment and supplies including:

- Trailer (with generator) and pickup
- Chairs, safety vests, clipboards, pens, forms, binoculars, camera, and tripod
- Crew Manual including log sheet, survey schedule, survey locations, hotel information, State of SD contract, equipment and site checklist, DPS and SDDOT contacts, latitude/longitude information sheet, hazardous materials training materials, SDDOT permits to occupy ROW, equipment and site checklist, PSI phone list and travel policy, and local radio stations and hospitals
- Survey Crew signs
- Weather radio, crew cell phone, toolkit, bug spray, sunscreen, and first aid kit
- Water supply and bathroom supplies and generator fuel

PSI project team members were:

Sandy Burns	Senior Consultant
Lori Litzen	Technical Assistant
Frank Bowers	Engineering Technician
Les Smith	Engineering Technician
Zach Dosch	Engineering Technician
Jennifer Kirk	Administration
Donald (DJ) Kjar	Data Analyst

Field crew members included Frank Bowers, Les Smith, Lori Litzen, Jennifer Kirk, and Zach Dosch. They received training on hazardous materials transportation placarding and vehicle types, data collection using the Pennington County Data Collection Form

(copy on Page 9), equipment operation, and roadside safety. PSI also provided new employee and travel policy training. The crew observed vehicles for 7.5 to 12.5 hours (8 hours average) from July 13 to September 12 at the following locations:

Location	Description
Belle Fourche	US212/US85 intersection in Belle Fourche
Faith	US212/SD73 intersection west of Faith
Buffalo	US85/SD20 intersection south of Buffalo (temporary weigh station)
Lemmon	US12/SD73 intersection west of Lemmon (temporary weigh station)
Tilford	Tilford Weigh Station on I90 southeast of Sturgis I90 Rest Area southeast of Sturgis
Pine Ridge	US18/SD407 intersection in Pine Ridge
Martin	US18/SD73 intersection east of Martin
Mission	US83 truck stop south of Mission
Oelrichs	US385/US18 intersection in Oelrichs
Custer	US16/US385 intersection in Custer (Custer City Park)
Edgemont	US18 in Edgemont
Hayes	SD63/US14/SD34 intersection west of Hayes
Blunt	US83/US14 intersection west of Blunt
Herreid	US83/SD10 intersection south of Herreid
McLaughlin	SD63/US12 intersection in McLaughlin

Table 1 Study Locations

Location latitude/longitude is included in the Excel spreadsheet (see Appendix). A map with study sites is included on Page 5. These sites are located on SDDOT Principal Arterials (State Highway Functional Classification) including Interstate 90 and major highways. These routes have the highest Average Daily Traffic counts. The volume of truck traffic varies from 5-40% along these routes (SDDOT “2011 South Dakota Traffic Flow Map”).

This is a picture of our equipment setup at the Faith location:



Figure 1 Faith Equipment Setup

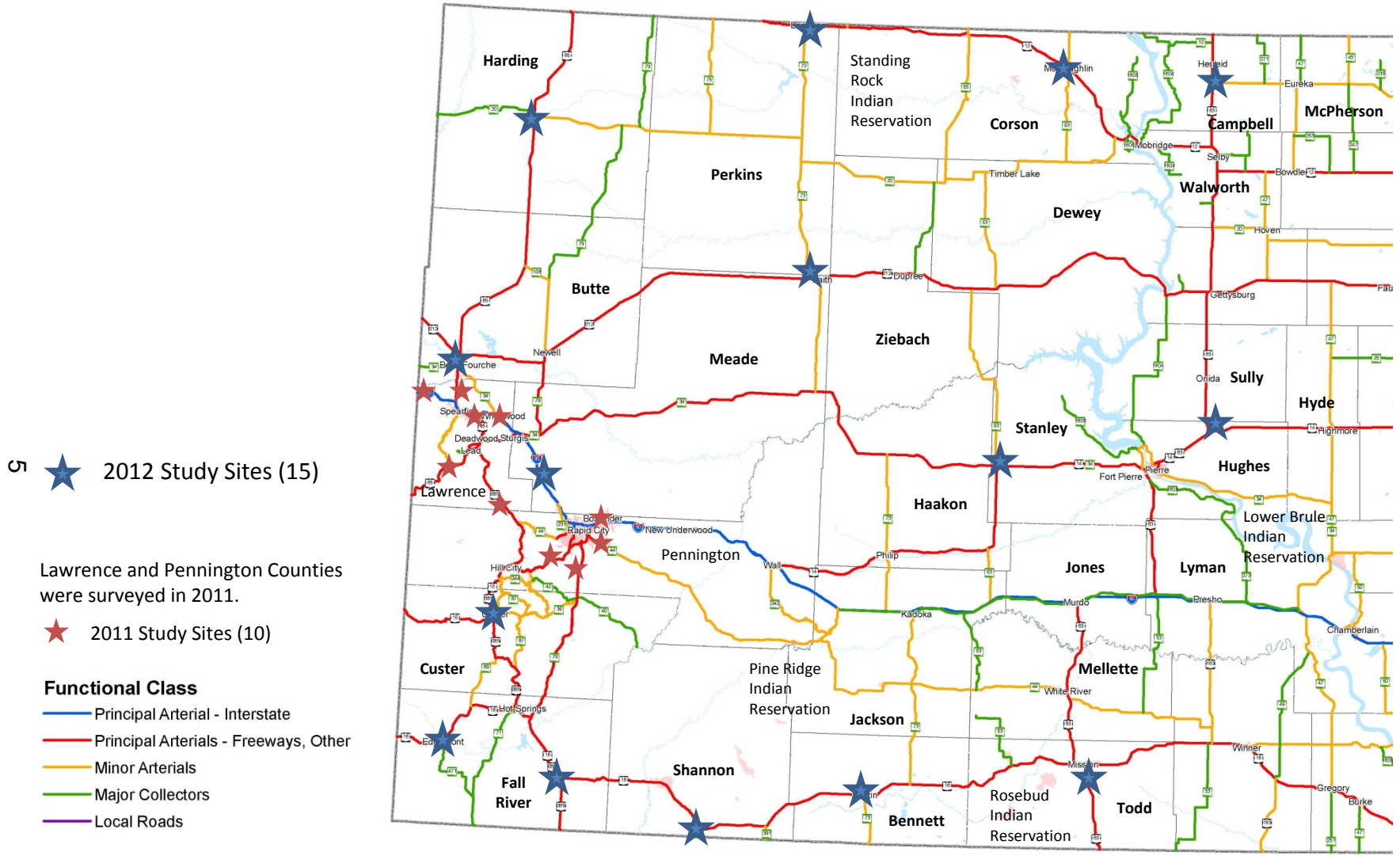


Figure 2 Western SD Commodity Flow Study Sites

A hazardous material is a substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce (49 Code of Federal Regulations (CFR) 171.8). It includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the criteria for hazard classes and divisions described in 49 CFR 173. The 9 hazard classes and divisions are:

Class 1 Explosives
Division 1.1 Mass explosion hazard (affects entire load instantaneously)
Division 1.2 Projection hazard
Division 1.3 Fire hazard and minor blast hazard or projection hazard or both
Division 1.4 Minor explosion hazard (confined to package)
Division 1.5 Very insensitive explosives with a mass explosion hazard
Division 1.6 Extremely insensitive articles
Class 2 Gases
Division 2.1 Flammable gas
Division 2.2 Non-flammable gas
Division 2.3 Gas poisonous by inhalation
Class 3 Flammable Liquids
Class 4
Division 4.1 Flammable solids
Division 4.2 Spontaneously combustible materials
Division 4.3 Dangerous when wet materials
Class 5
Division 5.1 Oxidizers
Division 5.2 Organic peroxides
Class 6
Division 6.1 Poisonous materials
Division 6.2 Infectious substances
Class 7 Radioactive Materials
Class 8 Corrosive Materials
Class 9 Miscellaneous Hazardous Materials

Table 2 Hazard Classes and Division

DANGEROUS, OXYGEN, and COMBUSTIBLE placards may also be displayed on vehicles as well as BIOHAZARD, HOT, and sour crude oil hazard markings and identification numbers. Many placards include the 4-digit North American (NA) or United Nations (UN) number on a white background.

A vehicle is required to display placards if transporting any quantity of the following hazardous materials:

Class/Division	Placard
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	POISON GAS
4.3	DANGEROUS WHEN WET
5.2	ORGANIC PEROXIDE
6.1	POISON INHALATION HAZARD
7	RADIOACTIVE

Table 3 49 CFR 172.504(e), Table 1 Requirements

Vehicles transporting 1001 pounds or more of the following hazardous materials must display placards (49 CFR 172.504(e), Table 2):

Class/Division	Placard
1.4	EXPLOSIVES 1.4
1.5	EXPLOSIVES 1.5
1.6	EXPLOSIVES 1.6
2.1	FLAMMABLE GAS
2.2	NON-FLAMMABLE GAS
3	FLAMMABLE
Combustible Liquid	COMBUSTIBLE
4.1	FLAMMABLE SOLID
4.2	SPONTANEOUSLY COMBUSTIBLE
5.1	OXIDIZER
5.2	ORGANIC PEROXIDE
6.1	POISON
8	CORROSIVE
9	Class 9

Table 4 49 CFR 172.504(e), Table 2 Requirements

DOT Chart 14 “Hazardous Materials Markings, Labeling and Placarding Guide” was included in the Crew Manual as a reference.

4. Data Analysis

Survey forms (see copy on Page 9) were turned in by the crew weekly and the data input into an Excel spreadsheet. The spreadsheet includes dropdown lists for Direction of Travel, Vehicle Type, Hazard Class, UN No., and Hazardous Material Name to eliminate spelling and improper data errors. Dropdown lists were revised as additional hazardous materials were observed. Table 5 on Page 10 summarizes the number of vehicles and the hazardous materials transported.

Date	Location	Number of Vehicles Surveyed	Flammable Gas (Division 2.1)	Flammable Liquid (Class 3)	Other*
7-13-12	Belle Fourche	11	2	5	4
7-16-12	Belle Fourche	29	7	18	4
7-23-12	Faith	2	0	2	0
7-24-12	Faith	3	0	3	0
7-25-12	Buffalo	12	7	2	3
7-26-12	Buffalo	10	4	5	1
7-30-12	Lemmon	8	2	6	0
7-31-12	Lemmon	10	2	7	1
8-1-12	Tilford EB	25	6	17	2
8-1-12	Tilford WB	24	2	20	2
8-2-12	Tilford EB	24	4	19	1
8-2-12	Tilford WB	30	2	24	4
8-6-12	Pine Ridge	7	0	7	0
8-7-12	Pine Ridge	4	0	4	0
8-8-12	Martin	6	2	2	2
8-9-12	Martin	7	1	6	0
8-13-12	Mission	5	0	3	2
8-14-12	Mission	6	0	2	4
8-16-12	Oelrichs	6	1	4	1
8-18-12	Oelrichs	6	0	6	0
8-20-12	Custer	30	7	23	0
8-21-12	Custer	22	6	15	1
8-22-12	Edgemont	17	5	9	3
8-23-12	Edgemont	10	3	7	0
8-26-12	Blunt	2	0	1	1
8-27-12	Blunt	11	1	6	4
8-28-12	Hayes	5	1	2	2
8-29-12	Hayes	2	0	2	0
9-4-12	Herreid	13	5	7	1
9-5-12	Herreid	18	9	6	3
9-6-12	McLaughlin	9	8	1	0
9-7-12	McLaughlin	12	3	8	1
9-11-12	Tilford EB	12	1	10	1
9-11-12	Tilford WB	16	2	10	4
9-12-12	Tilford EB	9	1	7	1
9-12-12	Tilford WB	20	4	11	5
	Totals	443	98	287	58

* Includes Hazard Class/Division 1 Explosives, 1.3C Explosives, 2.2 Non-Flammable Gas, 2.3 Poison Gas, 5.1 Oxidizer, 6 Poison, 8 Corrosive, and 9 Miscellaneous. Some vehicles display multiple placards. Detailed information is included in the Excel spreadsheet (see Appendix).

Table 5 Study Placarded Vehicle Counts

The majority of vehicles (426) displayed only 1 placard, 15 vehicles had 2 placards, and 2 vehicles displayed 3 placards. Hazard Class/Division for the 463 placards observed were:

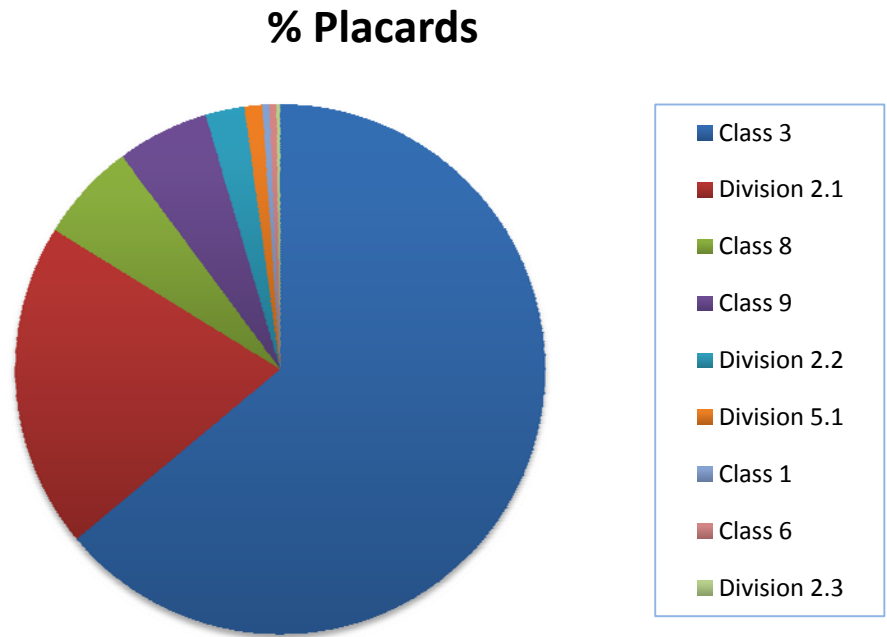


Figure 4 Placarded Vehicle Class/Division

Hazard Class/Division and Hazardous Material Name for the 463 placards observed were:

Hazard Class/Division	Hazardous Material Name	Number of Placards	% Placards
3	Gasoline Aviation fuel N.o.s. Crude oil Tars Alcohols	296	64%
2.1	Propane Trimethylamine Unknown Ethylene	92	20%
8	N.o.s. Unknown Acids Hypochlorite solutions Chloride compounds Batteries Sodium hydroxide Cyclohexyltrichlorosilane	28	6%
9	Elevated temperature Environmentally hazardous Unknown Ammonium nitrate fertilizer Benzaldehyde	26	6%
2.2	Oxygen Carbon dioxide Helium Unknown	11	2%
5.1	Ammonium nitrate	5	1%
1	1.3C Unknown	2	<1%
6	Unknown	2	<1%
2.3	Chlorine	1	<1%

N.o.s. = not otherwise specified

Table 6 Hazard Class/Division and Hazardous Material Name

The OXYGEN placard was observed on 4 vehicles and is included with the Division 2.2 placard count. The HOT placard was observed on 2 vehicles and the DANGEROUS placard on 1 vehicle. The HOT and DANGEROUS placards are included in the Class 9 placard count.

The USDOT “Guidance for Conducting Hazardous Materials Flow Surveys”, January 1995 found that hazard classes/divisions shipped from 1982-93 by decreasing volume (tons) and (ton-mile) were:

Tons	Ton-mile
Class 3	Class 3
Division 6.1	Division 6.1
Division 2.3	Division 4.1
Division 2.1	Class 8
Division 4.1	

Table 7 USDOT Hazard Class/Division 1982-93

Our study found that the majority of hazardous material shipments in Western South Dakota are Class 3 (flammable liquids). This is consistent with USDOT figures that 50% of 1982-93 hazardous material shipments were gasoline and petroleum products. The Division 2.1 (flammable gas) figure is higher (20%) because Western South Dakota is a rural area where propane is used for heating. PSI study results are comparable to the hazardous materials classes observed in the 2011 Lawrence and Pennington Counties studies:

Class	Lawrence County	Pennington County	Balance W SD Counties
3	59%	73%	64%
2	34%	16%	22%
8	2%	4%	6%
9	2%	6%	6%
5	--	<1%	1%
6	2%	<1%	<1%
1	3%	--	<1%

Table 8 County Studies Comparison

The Vehicle Types for the 443 vehicles observed in PSI’s study included:

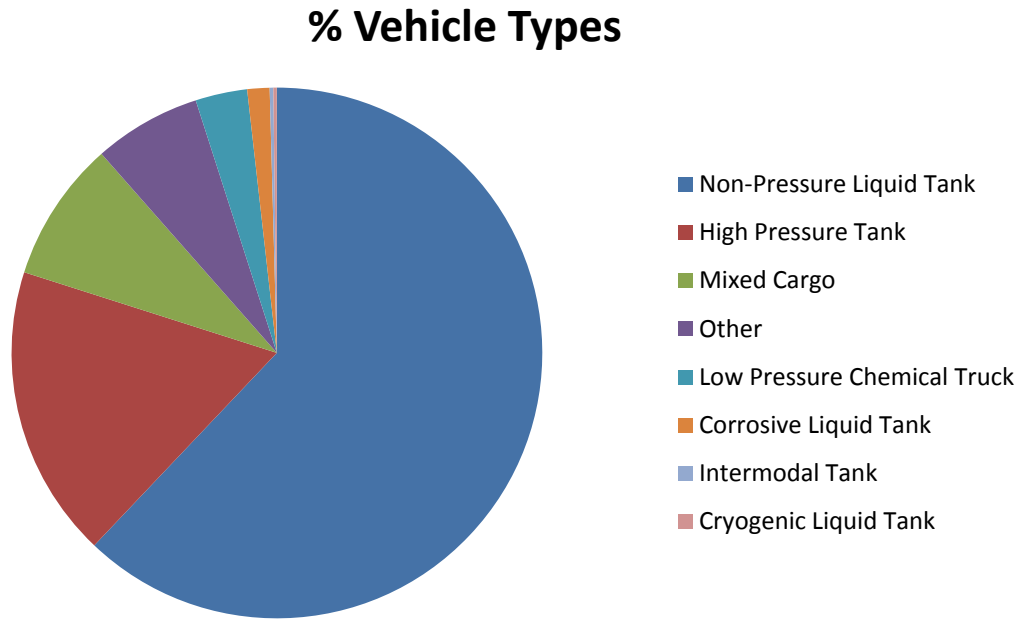


Figure 5 Placarded Vehicle Type

Vehicle Type	Number of Vehicles	% Vehicles
Non-Pressure Liquid Tank	275	62%
High Pressure Tank	79	18%
Mixed Cargo	38	9%
Other*	29	7%
Low Pressure Chemical Tank	14	3%
Corrosive Liquid Tanks	6	1%
Intermodal Tank	1	<1%
Cryogenic Liquid Tank	1	<1%

* Flatbed, truck, pickup, or van

Table 9 Placarded Vehicle Type

No placarded Dry Bulk Cargo Trailers, Compressed Gas/Tube Trailers, or Vacuum Loaded Trucks were observed. “Vehicle/Trailer Types Identified During Study” photos from the Rapid City/Pennington County Hazardous Materials Commodity Flow Study 2011 were included in the Crew Manual as a reference to assist PSI’s field crew in vehicle identification.

The largest number of placarded vehicles was observed on Interstate 90. Surveys were conducted from the Tilford Weigh Station in August and from the Tilford Rest Area in September. The figures were higher in August because the survey was conducted in advance of the Sturgis Motorcycle Rally:

Date	Number of Vehicles and Direction	Total
August 1-2	49 Eastbound	103
	54 Westbound	
September 11-12	21 Eastbound	57
	36 Westbound	

Table 10 Tilford Traffic Flow

These figures are consistent with Lawrence and Pennington County study results that noted slightly more Westbound traffic:

Location	Number of Vehicles and Direction	Total
WY/SD stateline	10 Eastbound	20
	10 Westbound	
Exit 17 (to Deadwood)	6 Eastbound	16
	10 Westbound	
Exit 26 (between Sturgis and Whitewood)	25 Eastbound	51
	26 Westbound	
Exit 61 (east of Rapid City)	52 Eastbound	154
	102 Westbound	

Table 11 I-90 Traffic Flow

DPS personnel conduct 3 levels of Hazardous Materials Inspections – Level 1 Under, Level 2 Walk Around, and Level 3 Paperwork. DPS performed one Hazardous Materials Inspection on August 1 at the Tilford Weigh Station (I-90). DPS inspected a vehicle transporting sulfuric acid (Class 8, corrosive material) in non-bulk containers from Washington to New Jersey. The DPS does not maintain an inspection database. PSI’s field crew also recorded information about this shipment. This is the only comparison we could make between PSI and DPS data.

The second highest location for placarded vehicles (52) was the US16/US385 intersection in Custer:

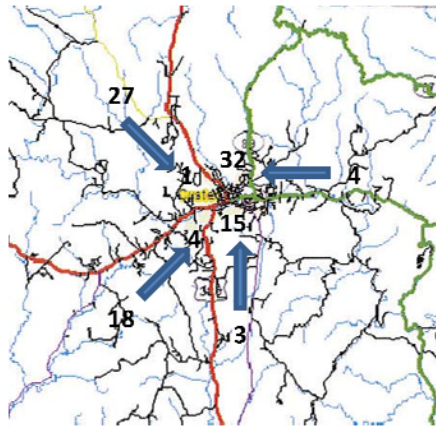


Figure 6 Custer Traffic Flow

The majority of placarded vehicles (27) traveling through Custer came from the northwest and were traveling west (32). A flammable liquid or flammable gas accident at this location could have a huge impact, especially during tourist season (May-September). Traffic flow at Edgemont (40 miles southwest of Custer) was also predominately northeast to west. Several loads of elevated temperature liquid were noted at the Edgemont location.

40 placarded vehicles were recorded at the US85/US212 intersection in Belle Fourche:



Figure 7 Belle Fourche Traffic Flow

21 placarded vehicles came from the south and most (16) were going north. Many of these vehicles were hauling hazardous materials associated with the oil industry in Western North Dakota. This includes chemicals (acids and oxidizers) that may be unfamiliar to emergency responders. A large number of unplacarded flatbed trailers loaded with pipe and cement trucks (Dry Bulk Cargo Trailers) were also observed traveling north. A busy truck stop is located on the southwest quadrant of this

intersection. This traffic flow is consistent with results of the Lawrence County study that observed more vehicles traveling north/northeast on US85 and SD34. The US85/SD20 intersection south of Buffalo (30 miles south of the South Dakota/North Dakota stateline) observed nearly an equal number of placarded vehicles traveling south (11) and north (10). Traffic flow at the US12/SD73 intersection in Lemmon (northeast of Buffalo) was predominately east/west. The US12/SD63 intersection in McLaughlin noted 7 northbound placarded vehicles, 6 southbound, 6 eastbound, and 2 westbound.

The field crew observed 31 placarded vehicles at the US83/SD10 intersection south of Herreid:

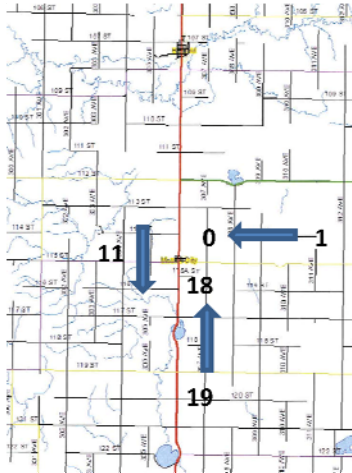


Figure 8 Herreid Traffic Flow

Most of the placarded vehicles (19) came from the south and were traveling north (18). Besides flammable liquids and flammables gases, acids and poison gas (chlorine) were being transported.

The remaining locations noted less than 30 placarded vehicles over a 2-day period:

Location	Vehicle Count	Location	Vehicle Count
Edgemont	27	Oelrichs	12
Buffalo	22	Mission	11
McLaughlin	21	Pine Ridge	11
Lemmon	18	Hayes	7
Blunt	13	Faith	5
Martin	13		

Table 12 Placarded Vehicle Counts <30

Because of continuing drought conditions, the greatest threat at any accident location is the ability of emergency responders to act quickly to control fire.

Since very few placarded vehicles were noted at the Hayes, Martin, Mission, and Pine Ridge survey locations, emergency responders in Bennett, Dewey, Haakon, McPherson, Mellette, Shannon, Stanley, Sully, Todd, and Ziebach Counties and the Lower Brule, Pine Ridge and Rosebud Indian Reservations will rarely respond to hazardous materials highway incidents. Emergency responders in counties that I-90 passes through (Jackson, Jones, Lyman, and Meade) and locations where a larger number of placarded vehicles were observed (Butte, Campbell, Corson, Custer, Fall River, Harding, Hughes, Hyde, Perkins, and Walworth Counties and the Standing Rock Indian Reservation) should be prepared to respond to hazardous materials accidents. Maximum daily vehicle counts and estimated counts in surrounding counties are summarized in the following table:

County	Daily Vehicle Count	County	Daily Vehicle Count
Bennett	7	Martin	22*
Butte	29	Belle Fourche	22*
Campbell	18	Herreid	1*
Corson	12	McLaughlin	12 Tilford Eastbound 20 Tilford Westbound
Custer	30	Custer	6*
Dewey	0*	Perkins	3 Faith 10 Lemmon
Fall River	6	Oelrichs	7 Pine Ridge
	17	Edgemont	
Haakon	5*	Stanley	5 Hayes
Harding	12	Buffalo	1*
Hughes	11	Blunt	6 Mission
Hyde	10*	Walworth	17*
Jackson	20*	Ziebach	0*

* Estimated

Table 13 Daily Placarded Vehicle Counts and Estimates

The Appendix is a printout of the Excel spreadsheet. A CD with an electronic copy of this report is included in the report binder.

5. Recommendations

Flammable liquids and flammable gases make up the majority of hazardous materials transported on highways in Western South Dakota. Emergency response personnel should:

- Be trained to safely respond to highway accidents involving flammable materials.
- Have access to personal protective equipment and firefighting equipment, especially a sufficient quantity of foam.
- Be knowledgeable of the design and safety features of Non-Pressure Liquid Tanks (DOT 406) and High Pressure Tanks (MC 331).
- Know how to access Material Safety Data Sheets to obtain information for chemicals being transported.
- Understand unique material properties, for example, propane is heavier than air and chlorine is a poison gas.
- Have a working knowledge of drainage and storm sewer information to minimize environmental impacts of an accidental release of a hazardous material.

Lessons learned from the study include:

Hiring and retaining quality personnel for a 2-month project is challenging. PSI anticipated hiring college students to staff the field crew for this study. However, by the time the contract was approved (July 12), they were not available. Because PSI is familiar with providing specialty staffing, we quickly hired and trained a 2-person field crew. PSI staff members filled in when a crew member took a permanent job until a replacement crew person was hired and trained. PSI suggests that the OEM consider awarding contracts for future commodity flow studies by May 1 so college students looking for summer work can be employed.

Working with SDDOT and DPS personnel is essential. SDDOT permits to occupy ROW must be obtained in advance of conducting field work along state highways. SDDOT and DPS personnel responded quickly to our requests and were very cooperative and easy to work with concerning storage of our trailer at SDDOT yards and the Tilford Weigh Station. In addition, SDDOT personnel suggested the best survey locations and provided area construction information.

A 2-person field crew can collect additional vehicle information. Our field crew observed 10 or fewer placarded vehicles a day at several locations. A 2-person crew can easily record additional vehicle information. PSI proposes that OEM consider working with other agencies to determine if additional vehicle information should be gathered.

It is not necessary to survey weekend traffic. The crew observed traffic on a Saturday (Oelrichs) and a Sunday (Blunt). The number of placarded vehicles observed on Saturday was comparable to weekday figures. The number of placarded vehicles observed on Sunday was much lower than weekday numbers. It is especially not cost effective to pay crews overtime for weekend surveys.

It is not necessary to survey traffic into the evening. Traffic was observed past 5 PM at several locations (Belle Fourche, Blunt, Herreid, Lemmon, and Mission). Extending survey hours did not result in observation of a significant number of additional placarded vehicles. As previously stated, it is especially not cost effective to pay crews overtime for extended hour surveys.

Providing comfortable field crew accommodations is important. Many surveys were conducted at remote locations. A trailer with a canopy provided welcome shade. The crew utilized the air-conditioned trailer for breaks on hot days, they stored and prepared food in the kitchen, and had restroom facilities available on site.

Appendix

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments					
Buffalo	45°32'	103°33'	7/26/2012	Thursday	8:35 AM	North	South	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					9:10 AM	North	South	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					12:50 PM	South	North	Dixon Bros.	Non-Pressure Liquid Tank	5.1 Oxidizer	UN 1942	Ammonium nitrate	With pup					
					1:05 PM	South	South	Moyle Petroleum	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	Delivery to SDDOT yard					
					1:25 PM	South	North	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					1:25 PM	East	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:30 PM	South	North	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:45 PM	North	South	Brick Transport	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					2:25 PM	North	South	Land Star	Mixed Cargo	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
													3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
									2:55 PM	North	South	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline		
					Custer	43°46'	103°36'	8/20/2012	Monday	7:30 AM	South	West	WTT	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
										7:55 AM	South	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
										8:10 AM	South	West	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup
8:15 AM	North	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
8:50 AM	West	North	Harms Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
9:00 AM	West	South	Custer Gas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
9:05 AM	West	East	Custer Gas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
9:20 AM	North	West	Dixon Bros.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine						
9:45 AM	North	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
10:25 AM	West	North	Harms Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
10:45 AM	West	North	Dixon Bros.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	With pup					
11:05 AM	West	East	Custer Gas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
11:10 AM	North	East	Harms Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
11:20 AM	West	North	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup					
11:35 AM	West	North	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
11:45 AM	North	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
11:50 AM	North	East	Flying J	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
12:20 PM	West	North	Unknown	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
12:25 PM	East	West	Custer Gas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
12:30 PM	West	North	WTT	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
12:45 PM	West	North	Dixon Bros.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup					
1:20 PM	North	West	WTT	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
1:35 PM	North	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup					
2:00 PM	North	West	JBC Inc.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
2:20 PM	North	West	Stern Oil Company	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
2:45 PM	North	West	Dixon Bros.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine						
3:00 PM	West	North	Unknown	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
3:15 PM	North	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
3:45 PM	North	West	Custer Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas											
3:55 PM	West	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline											
Custer	43°46'	103°36'	8/21/2012	Tuesday	7:35 AM	North	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					7:45 AM	East	West	Custer Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					8:30 AM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					8:35 AM	North	West	WTT	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					8:35 AM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					9:05 AM	North	West	Dixon Bros.	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					9:05 AM	North	West	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	With pup					
					9:15 AM	West	North	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					9:50 AM	North	West	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine						
					10:00 AM	West	North	Custer Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					10:40 AM	North	West	McGas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					10:45 AM	North	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					10:55 AM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					11:20 AM	East	West	Country Pride	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					11:30 AM	West	North	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					12:15 PM	West	North	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	With pup					
					12:35 PM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					12:50 PM	East	West	McGas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					12:55 PM	North	West	Nelsons	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:05 PM	West	North	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	With pup					
1:40 PM	North	West	Custer Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas											
2:10 PM	North	West	Lincare	Other (describe in Comments)	2.2 Non-Flammable Gas	None	None	Van with OXYGEN placard										

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments					
Edgemont	43°18'	103°50'	8/22/2012	Wednesday	9:05 AM	North	West	JBC Inc.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					9:05 AM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					9:10 AM	North	South	DJ Petroleum	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					9:30 AM	North	East	Hi-D-Way Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					9:40 AM	North	West	Dixon Bros.	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					10:05 AM	North	South	Hi-D-Way Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					10:20 AM	North	West	Dixon Bros.	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.						
					10:20 AM	North	West	Dixon Bros.	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.						
					10:55 AM	West	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					12:00 PM	West	North	JBC Inc.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:35 PM	North	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:40 PM	North	West	Dixon Bros.	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.						
					1:50 PM	North	West	Hi-D-Way Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					2:00 PM	North	East	Flying J	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					3:15 PM	North	West	Flying J	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					4:00 PM	West	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					4:30 PM	West	North	Flying J	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
Edgemont	43°18'	103°50'	8/23/2012	Thursday	8:05 AM	North	West	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					10:10 AM	West	North	Hi-D-Way Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					10:30 AM	North	West	JBC Inc.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					11:25 AM	West	North	Hi-D-Way Gas	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					12:30 PM	West	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
					1:50 PM	West	North	Dixon Bros.	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					2:25 PM	North	West	Nelsons	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					2:40 PM	North	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
					3:50 PM	West	North	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
					4:00 PM	North	West	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
Faith	37°10'	95°58'	7/23/2012	Monday	12:30 PM	North	South	Locken Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					3:45 PM	North	South	Dana Leasing Systems	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
Faith	37°10'	95°58'	7/24/2012	Tuesday	11:10 AM	North	South	Unknown	Mixed Cargo	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
					11:25 AM	South	North	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
					2:15 PM	North	South	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
Hayes	44°22'	101°7'	8/28/2012	Tuesday	7:40 AM	South	East	Van Deist Supply Co	Mixed Cargo	2.1 Flammable Gas	None	None						
					8:00 AM	South	West	Unknown	Other (describe in Comments)	9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.	Flatbed with plastic containers					
					9:45 AM	South	West	Fitzgerald Petroleum	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					10:10 AM	West	South	Unknown	Other (describe in Comments)	9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.	Flatbed with small tanks					
					12:30 PM	South	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
Hayes	44°22'	101°7'	8/29/2012	Wednesday	10:50 AM	South	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					2:20 PM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
Herreid	45°46'	100°4'	9/4/2012	Tuesday	12:30 PM	North	South	Western Coop	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:10 PM	South	North	Western Coop	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					1:10 PM	South	North	Foster Trucking Co	Corrosive Liquid Tank	8 Corrosive	UN 1760	Corrosive liquids, n.o.s.						
					1:55 PM	South	North	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					2:20 PM	South	North	Northern Plains	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					2:25 PM	South	East	Ferrellgas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					2:40 PM	South	North	Service Transport Co	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
					2:50 PM	South	North	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					3:25 PM	North	South	Western Coop	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					3:50 PM	South	North	Wayne Transport	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					3:55 PM	North	South	Farmers Elevator	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
					6:20 PM	East	South	Ferrellgas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					6:35 PM	South	North	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
					Herreid	45°46'	100°4'	9/5/2012	Wednesday	8:10 AM	North	South	Dixon Bros.	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas	
										8:30 AM	South	North	Exide	Mixed Cargo	8 Corrosive	UN 2794	Batteries, wet, filed with acid, electric storage	Small truck
										9:50 AM	West	North	Western Coop	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
										10:50 AM	North	East	CHS Transport	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas	
10:55 AM	North	South	Western Coop	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
11:00 AM	South	North	Dixon Bros.	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
11:15 AM	South	North	Unknown	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
1:25 PM	North	South	Northern Plains	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
2:00 PM	South	North	Unknown	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
2:25 PM	South	North	Unknown	Cryogenic Liquid Tank						2.2 Non-Flammable Gas	UN 1963	Helium, refrigerated liquid (cryogenic liquid)						
2:25 PM	South	North	Farmers Elevator	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
2:40 PM	South	North	Unknown	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
2:50 PM	North	South	Western	Corrosive Liquid Tank						8 Corrosive	UN 1760	Corrosive liquids, n.o.s.						
3:05 PM	South	North	Farmers Elevator	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline						
3:10 PM	South	North	Northstar	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						
3:10 PM	South	North	Unknown	Mixed Cargo	2.3 Poison Gas	UN 1017	Chlorine	Small truck										
								8 Corrosive	UN 1778	Fluorosilicic acid								
								8 Corrosive	UN 1790	Hydrofluoric acid								
					3:40 PM	North	South	Western Coop	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
					3:45 PM	North	South	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments								
Lemmon	37°10'	96°59'	7/30/2012	Monday	12:55 PM	West	East	Landstar	Mixed Cargo	3 Flammable Liquid	UN 1992	Flammable liquids, toxic, n.o.s.									
					1:15 PM	East	West	Rockwater Energy Solutions	Mixed Cargo	2.1 Flammable Gas	UN 1962	Ethylene									
													8 Corrosive	UN 2920	Corrosive liquids, flammable, n.o.s.						
					1:55 PM	North	West	Unknown	Other (describe in Comments)	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas		Pickup							
					2:00 PM	West	South	Landstar	Mixed Cargo	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.									
													9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.						
					3:45 PM	West	South	Landstar	Mixed Cargo	3 Flammable Liquid	UN 1992	Flammable liquids, toxic, n.o.s.									
													6 Poison	None	None						
					3:50 PM	West	East	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline									
					5:20 PM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline									
					6:15 PM	East	South	Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline									
					Lemmon	37°10'	96°59'	7/31/2012	Tuesday	6:30 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline				
7:15 AM	South	West	Unknown	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
7:15 AM	South	West	Unknown	Mixed Cargo						3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.									
													9 Miscellaneous	None	None						
7:15 AM	South	East	Unknown	Mixed Cargo						8 Corrosive	UN 1763	Cyclohexyltrichlorosilane									
													8 Corrosive	UN 1765	Dichloroacetyl chloride						
7:15 AM	South	East	Cenex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
9:55 AM	East	West	Unknown	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
10:20 AM	East	West	Cenex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
12:50 PM	West	South	Unknown	Mixed Cargo						3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.									
1:50 PM	East	West	Unknown	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
2:20 PM	East	West	Cenex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.									
Martin	43°10'	101°44'	8/8/2012	Wednesday	9:30 AM	West	East	Bob's Gas	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline									
					9:45 AM	West	East	Matheson	Other (describe in Comments)	2.1 Flammable Gas	None	None		Welding truck							
													2.2 Non-Flammable Gas	None	None						
					10:05 AM	West	South	Matheson	Other (describe in Comments)	2.1 Flammable Gas	None	None		Welding truck							
													2.2 Non-Flammable Gas	None	None						
					11:20 AM	East	West	Country Pride	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline		Small non-pressure tanker							
					1:35 PM	South	West	Bob's Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas		Small high pressure tanker							
					3:15 PM	South	East	Bob's Gas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
					Martin	43°10'	101°44'	8/9/2012	Thursday	8:35 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup			
										8:40 AM	South	East	Unknown	Other (describe in Comments)	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.		Pickup with tank on trailer		
										9:05 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline		With pup		
										10:35 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline				
11:00 AM	South	East	Bob's Gas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
12:05 PM	East	West	Fresh Start Fuel	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
3:55 PM	South	East	Fresh Start Fuel	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
McLaughlin	45°49'	100°49'	9/6/2012	Thursday						9:05 AM	North	South	Cenex	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
										9:25 AM	West	East	Blue Rhino	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
										12:30 PM	West	East	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
										1:00 PM	West	North	Cenex	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
										2:00 PM	East	West	Brick Propane	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
					2:05 PM	North	South	Standing Rock Propane	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
					2:35 PM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.		With pup							
					2:45 PM	North	South	Cenex	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
					3:30 PM	South	North	Standing Rock Propane	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
					McLaughlin	45°49'	100°49'	9/7/2012	Friday	9:15 AM	North	South	Farmers Union	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline				
										9:25 AM	North	South	Cenex	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
										9:30 AM	South	North	Cenex	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas				
10:05 AM	East	North	Slater Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
10:50 AM	South	North	Cenex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
10:55 AM	North	East	Slater Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
11:25 AM	East	North	Lucky's Gas	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
11:40 AM	East	South	CFS	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
12:20 PM	North	East	Lucky's Gas	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
1:15 PM	West	North	Cenex	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas									
1:20 PM	North	East	CHS	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline									
2:10 PM	North	East	Landstar	Other (describe in Comments)						9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.		Flatbed with individual containers							
Mission	43°0'	100°34'	8/13/2012	Monday	12:10 PM	South	North	Unknown	Non-Pressure Liquid Tank	9 Miscellaneous	UN 2071	Ammonium nitrate based fertilizer									
					3:15 PM	South	North	Unknown	Mixed Cargo	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.									
													8 Corrosive	None	None						
					3:35 PM	North	South	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline									
					3:35 PM	South	North	Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline		Small non-pressure tanker							
					4:20 PM	North	South	Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline		Small non-pressure tanker							
					Mission	43°0'	100°34'	8/14/2012	Tuesday	9:05 AM	South	North	Sandhill Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	Small non-pressure tanker			
										9:50 AM	South	North	Unknown	Other (describe in Comments)	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.		Flatbed with totes		
																		9 Miscellaneous	None	None	
										10:35 AM	North	South	Unknown	Mixed Cargo	8 Corrosive	None	None				
										11:35 AM	South	North	Unknown	Other (describe in Comments)	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.		Flatbed with totes		
										11:55 AM	North	South	Unknown	Other (describe in Comments)	8 Corrosive	None	None		Flatbed truck with trailer		
2:05 PM	South	North	Unknown	Other (describe in Comments)						8 Corrosive	None	None		Flatbed with totes (greenish liquid)							

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments		
Oelrichs	43°11'	103°14'	8/16/2012	Thursday	9:00 AM	South	North	Landstar	Mixed Cargo	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
					10:20 AM	South	North	Lone Wolf Trucking	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1987	Alcohols, n.o.s.			
					12:50 PM	North	South	Unknown	Mixed Cargo	8 Corrosive	UN 1730	Antimony pentachloride, liquid	Short cargo truck		
												8 Corrosive	UN 1791	Hypochlorite solutions	
												9 Miscellaneous	UN 1990	Benzaldehyde	
Oelrichs	43°11'	103°14'	8/18/2012	Saturday	12:55 PM	South	North	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					2:15 PM	North	East	Unknown	Other (describe in Comments)	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas	Truck towing a trailer		
					4:25 PM	North	South	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					7:55 AM	South	North	J&L	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:00 AM	North	South	Unknown	Other (describe in Comments)	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	Pickup with container in bed		
Pine Ridge	43°1'	102°34'	8/6/2012	Monday	11:35 AM	East	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:40 AM	North	South	Petroleum Distribution	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					12:10 PM	North	South	WTT	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					2:05 PM	South	North	WTT	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					8:10 AM	North	South	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
Pine Ridge	43°1'	102°34'	8/7/2012	Tuesday	10:00 AM	East	South	Pine Ridge Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	Small non-pressure tanker		
					10:00 AM	North	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:30 AM	South	East	Pine Ridge Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	Small non-pressure tanker		
					11:30 AM	South	North	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					12:30 PM	East	South	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
Pine Ridge	43°1'	102°34'	8/7/2012	Tuesday	12:35 PM	East	North	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:00 AM	East	South	Pine Ridge Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	Small non-pressure tanker		
					11:35 AM	North	South	Pine Ridge Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:45 AM	North	South	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					2:40 PM	North	South	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
Tillford East	44°14'	103°23'	8/1/2012	Wednesday	8:00 AM	West	East	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					8:25 AM	West	East	Dupont	High Pressure Tank	2.1 Flammable Gas	UN 1083	Trimethylamine, anhydrous			
					8:30 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					8:35 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					9:35 AM	West	East	Western Powders	Other (describe in Comments)	1.3C Explosives	None	None	Pickup with flatbed container		
					10:00 AM	West	East	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
					10:00 AM	West	East	Black Hills CO2	Other (describe in Comments)	2.2 Non-Flammable Gas	UN 2187	Carbon dioxide, refrigerated liquid	Small truck with tank		
					11:10 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:20 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:20 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:55 AM	West	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					12:50 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:05 PM	West	East	CGL	Mixed Cargo	8 Corrosive	UN 3264	Corrosive liquid, acidic, inorganic, n.o.s.			
					1:15 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:15 PM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:35 PM	West	East	Brick Transport	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas			
					1:40 PM	West	East	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					2:20 PM	West	East	Lincare	Other (describe in Comments)	2.2 Non-Flammable Gas	None	None	Van with OXYGEN placard		
					2:35 PM	West	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
					2:45 PM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
2:45 PM	West	East	Cory Richards Trucking	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas								
2:50 PM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline								
3:50 PM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline								
4:00 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline								
4:30 PM	West	East	Welding Supply	Non-Pressure Liquid Tank	2.1 Flammable Gas	None	None								
Tillford East	44°14'	103°23'	8/2/2012	Thursday	7:35 AM	West	East	Schneider Trucking	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
					7:50 AM	West	East	Dupont	High Pressure Tank	2.1 Flammable Gas	UN 1083	Trimethylamine, anhydrous			
					8:10 AM	West	East	Moyle Petroleum	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					9:50 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:05 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:20 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:30 AM	West	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					10:55 AM	West	East	Amerigas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas			
					11:00 AM	West	East	NWE	Mixed Cargo	6 Poison	None	None			
					11:05 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:10 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:40 AM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					11:55 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					12:35 PM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					12:40 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:25 PM	West	East	McGas	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas			
					1:35 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup		
					1:45 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
					1:55 PM	West	East	Wayne Transport	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.			
					2:00 PM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline			
2:05 PM	West	East	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.								
2:55 PM	West	East	Henderson	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup							
3:05 PM	West	East	Lincare	Other (describe in Comments)	2.2 Non-Flammable Gas	None	None	Van with OXYGEN placard							
3:55 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup							

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments				
Tillford East	44°14'	103°23'	9/11/2012	Tuesday	7:55 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					8:25 AM	West	East	Unknown	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.					
					8:45 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					9:35 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					9:50 AM	West	East	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					11:10 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					1:00 PM	West	East	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					1:05 PM	West	East	Matheson	Other (describe in Comments)	2.1 Flammable Gas	None	None	Flatbed with tanks				
										2:15 PM	West	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline
					2:40 PM	West	East	Stern	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					3:00 PM	West	East	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					3:55 PM	West	East	Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
Tillford East	44°14'	103°23'	9/12/2012	Wednesday	9:05 AM	West	East	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					11:10 AM	West	East	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					11:35 AM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					12:05 PM	West	East	Unknown	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.					
					12:05 PM	West	East	CBH	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					12:30 PM	West	East	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					1:20 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					1:25 PM	East	West	Unknown	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas					
					3:25 PM	West	East	CBH/Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					Tilford West	44°14'	103°23'	8/1/2012	Wednesday	7:40 AM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline
7:45 AM	East	West	CHS	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.					
7:50 AM	East	West	Unknown	Other (describe in Comments)						3 Flammable Liquid	UN 1999	Tars, liquid including road oils and cutback bitumens	Tar truck				
7:55 AM	East	West	Amerigas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas					
8:45 AM	East	West	Unknown	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline					
8:50 AM	East	West	ADM Trucking Inc.	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 3065	Alcoholic beverages					
9:00 AM	East	West	Conway Freight	Non-Pressure Liquid Tank						3 Flammable Liquid	None	None					
9:25 AM	East	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline					
9:25 AM	East	West	Cross Country Transit	Mixed Cargo						8 Corrosive	None	None					
9:50 AM	East	West	Quinn	Other (describe in Comments)						3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.	Small truck with tank				
				9:55 AM	East	West	American Road Liners	Mixed Cargo	9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.						
				10:00 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				10:05 AM	East	West	Dupont	High Pressure Tank	2.1 Flammable Gas	UN 1083	Trimethylamine, anhydrous						
				10:30 AM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				10:50 AM	East	West	Charleston & Sons	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
				11:15 AM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				11:30 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				12:10 PM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				1:15 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				1:35 PM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				3:25 PM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				3:05 PM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				4:00 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				4:25 PM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
Tilford West	44°14'	103°23'	8/2/2012	Thursday	7:55 AM	East	West	Water Treatment Group	Mixed Cargo	8 Corrosive	UN 1791	Hypochlorite solutions					
					8:15 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					8:35 AM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					8:55 AM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					9:15 AM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					9:20 AM	East	West	Dupont	High Pressure Tank	2.1 Flammable Gas	UN 1083	Trimethylamine, anhydrous					
					9:55 AM	East	West	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline					
					10:05 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup				
					10:05 AM	East	West	R&R Trucking	Mixed Cargo	1 Explosives	None	None					
					10:05 AM	East	West	US Army	Other (describe in Comments)	3 Flammable Liquid	UN 1863	Fuel, aviation, turbine engine	Military truck with tanker				
				10:10 AM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				10:15 AM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				10:45 AM	East	West	Landstar	Mixed Cargo	8 Corrosive	UN 1760	Corrosive liquids, n.o.s.						
				11:05 AM	East	West	NUCQ	Other (describe in Comments)	2.2 Non-Flammable Gas	UN 2187	Carbon dioxide, refrigerated liquid	Truck with tank on flatbed					
				11:10 AM	East	West	Moyle Petroleum	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
				11:10 AM	East	West	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.						
				11:15 AM	East	West	Rude	Mixed Cargo	8 Corrosive	None	None						
				11:15 AM	East	West	Dixon	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				11:20 AM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				12:20 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				12:25 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				12:35 PM	East	West	Cenex	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				1:00 PM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				2:00 PM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
				2:05 PM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				2:55 PM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup					
				3:10 PM	East	West	Henderson	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				3:35 PM	East	West	Harms Oil	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				3:45 PM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline						
				3:55 PM	East	West	Meade County	Other (describe in Comments)	3 Flammable Liquid	UN 1999	Tars, liquid including road oils and cutback bitumens	Small truck with tank					

Commodity Flow Study Data

Site	Latitude (* & min)	Longitude (* & min)	Date	Day of the Week	Time	Direction of Travel (From)	Direction of Travel (To)	Company Name	Vehicle Type	Hazard Class/Division	UN No.	Hazardous Material Name	Comments
Tilford West	44°14'	103°23'	9/11/2012	Tuesday	7:55 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					8:05 AM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.	
					8:50 AM	East	West	Unknown	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					8:50 AM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					10:00 AM	East	West	MME	Mixed Cargo	8 Corrosive	None	None	
					10:10 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					10:25 AM	East	West	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					12:15 PM	East	West	Unknown	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.	
					12:50 PM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					1:20 PM	East	West	Heartland	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	
					1:50 PM	East	West	Turner Gas Company	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas	
					2:05 PM	East	West	Growendike	Corrosive Liquid Tank	8 Corrosive	UN 1824	Sodium hydroxide solution	
					2:30 PM	East	West	Unknown	Mixed Cargo	8 Corrosive	UN 1760	Corrosive liquids, n.o.s.	
					2:35 PM	East	West	Stern Oil Company	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1993	Flammable liquids, n.o.s.	
					3:00 PM	East	West	CHS	Non-Pressure Liquid Tank	3 Flammable Liquid	UN 1203	Gasoline	With pup
					3:50 PM	East	West	WSE	Mixed Cargo	3 Flammable Liquid	None	None	
					Tilford West	44°14'	103°23'	9/12/2012	Wednesday	7:45 AM	East	West	CHS
7:50 AM	East	West	Unknown	Low Pressure Chemical Tank						9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.	With pup
8:10 AM	East	West	AmeriGas	High Pressure Tank						2.1 Flammable Gas	UN 1075	Liquefied petroleum gas	
8:30 AM	East	West	Dupont	High Pressure Tank						2.1 Flammable Gas	UN 1083	Trimethylamine, anhydrous	
8:55 AM	East	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
9:10 AM	East	West	Stern Oil Company	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1999	Tars, liquid including road oils and cutback bitumens	
9:15 AM	East	West	Unknown	Low Pressure Chemical Tank						9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.	
9:25 AM	East	West	Genex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
9:30 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup
10:25 AM	East	West	Harms Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
10:50 AM	East	West	Dixon Bros	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
11:30 AM	East	West	Unknown	Low Pressure Chemical Tank						9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.	
11:35 AM	East	West	Harms Oil	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup
1:00 PM	East	West	Unknown	Low Pressure Chemical Tank						9 Miscellaneous	UN 3082	Environmentally hazardous substances, liquid, n.o.s.	
1:10 PM	East	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
1:40 PM	East	West	Heartland	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	
1:40 PM	East	West	Genex	Non-Pressure Liquid Tank						3 Flammable Liquid	UN 1203	Gasoline	With pup
3:00 PM	East	West	Unknown	Low Pressure Chemical Tank	9 Miscellaneous	UN 3257	Elevated temperature liquid, n.o.s.	With pup					
3:30 PM	East	West	Unknown	Mixed Cargo	2.2 Non-Flammable Gas	UN 2187	Carbon dioxide, refrigerated liquid						
3:55 PM	East	West	Brick Propane	High Pressure Tank	2.1 Flammable Gas	UN 1075	Liquefied petroleum gas						