COMMODITY FLOW STUDY

MONITOR RURAL FIRE PROTECTION DISTRICT #58

SEPTEMBER, 2005

Monitor Fire District # 58 Hazardous Commodity Flow Study

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STATEMENT OF PURPOSE

This hazardous material transportation flow study was carried out within the Monitor Fire District boundaries (see "Study Area" next page). The data in this study will enhance Monitor Fire District's emergency planning abilities and enable the department to increase the effectiveness of their emergency response capabilities to hazardous material transportation events.

Monitor Fire District is an all volunteer department comprised of 36 members, located in Marion and Clackamas Counties about 23 miles northeast of the state capital, Salem, Oregon.

The purpose of this study is as follows:

1. Identify modes of shipment of hazardous materials that either originate in or are destined to pass through Monitor Fire District.

2. Identify the routes which involve the greatest flow.

3. Focus on roadway intersections that attributed to the highest occurrences of accidents within the district.

4. Get a general feel for the amount of hazardous materials that passes through the district over a defined period of time.

This study was conducted using the following information:

1. Marion County Public Works Emergency Resource Directory 2004;

2. Oregon State Fire Marshal HSIS 2005 Information;

3. Williams Gas Pipeline Emergency Response Manual 2005;

4. Traffic flow counts and information completed over a one month period of time (August, 2005);

5. Information supplied by Monitor Fire District #58;

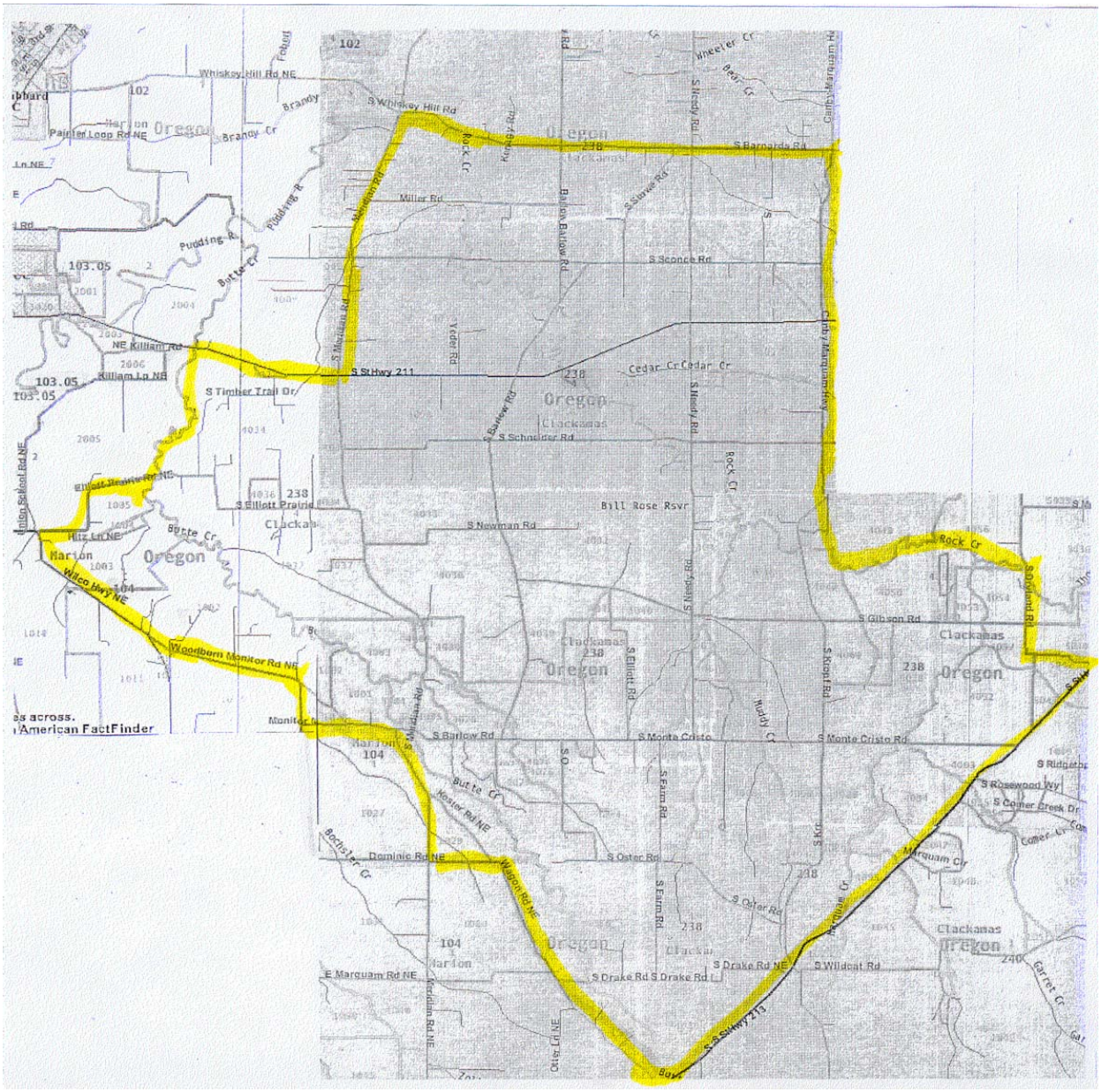
6. Northwest Natural safety personnel;

7. Wilco Farmers;

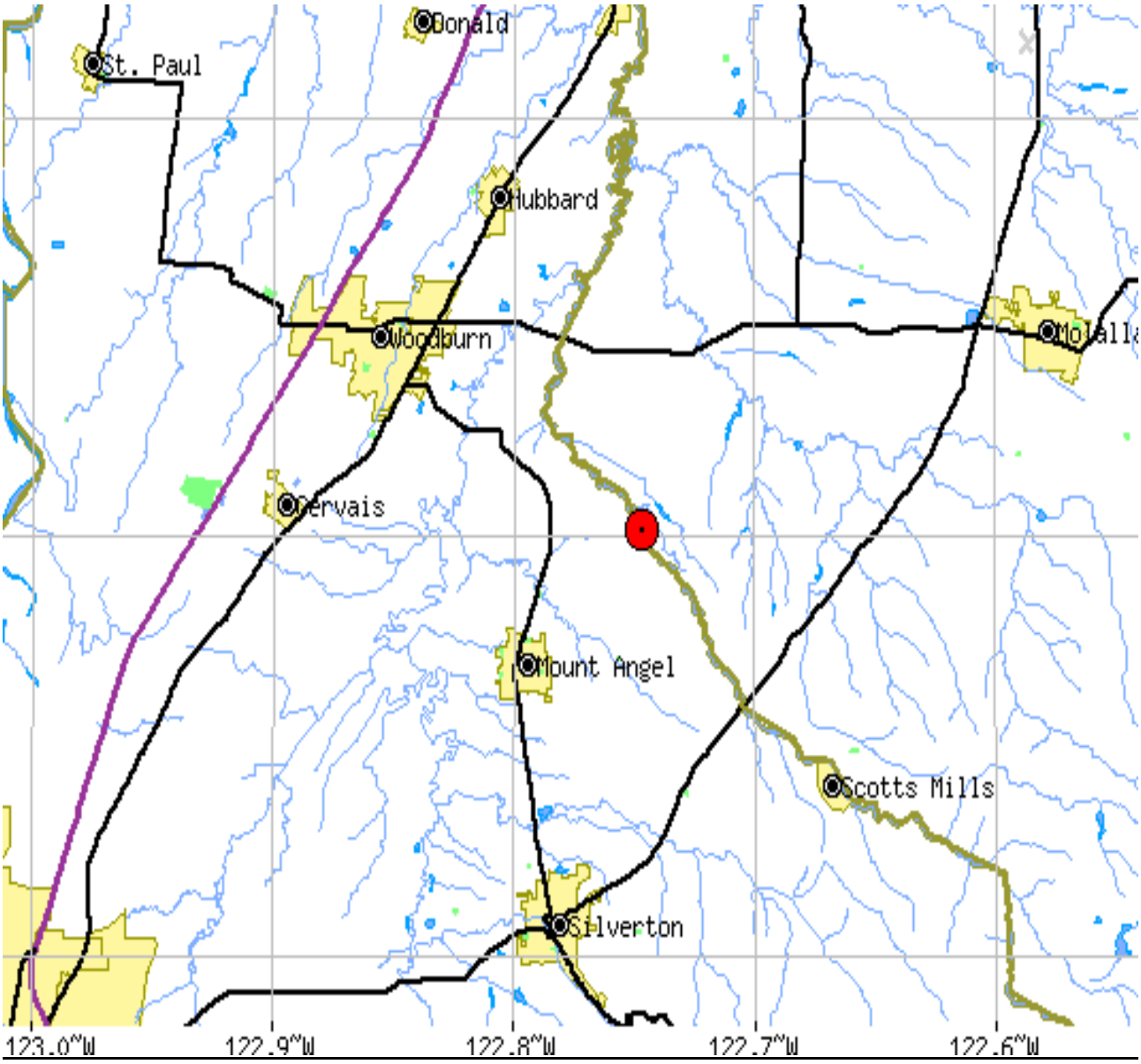
8. And finally, Federal Motor Carrier Safety Administration, "1998 Flow Study"

Study Area

The area of analysis for this commodity flow study was the Monitor Fire District (see map below and next page). The Monitor Fire District is comprised of 35 square miles. The community of Monitor with a population of 525 is in the approximate center of the District. The land use is mainly agriculture with small family farms and light-industrial. The unincorporated community of Monitor has several small mercantile type businesses. The total population of the Fire District is approximately 3000.



Surrounding Communities Map



Red highlight indicates Monitor Community

Transportation Summary

Highway

Transportation through Monitor Fire District takes place in several forms with the most common mode of transport of hazardous materials or materials in general being highway. Surprisingly most hazardous commodities either travel on or across State Highways 211 and 213. These highways are main arterials east-west and north-south respectively.

Rail

There is no current rail service in the Monitor Fire District. The exposure to rail would be in the event of a call for mutual or auto aid to assist another fire district (see map in Railroad Analysis section). Training for such emergencies would be a low priority but could be accomplished with annual hazmat refresher training conducted each year. Being familiar with the state hazmat team system and their response capabilities would be an important part of this training.

Pipeline

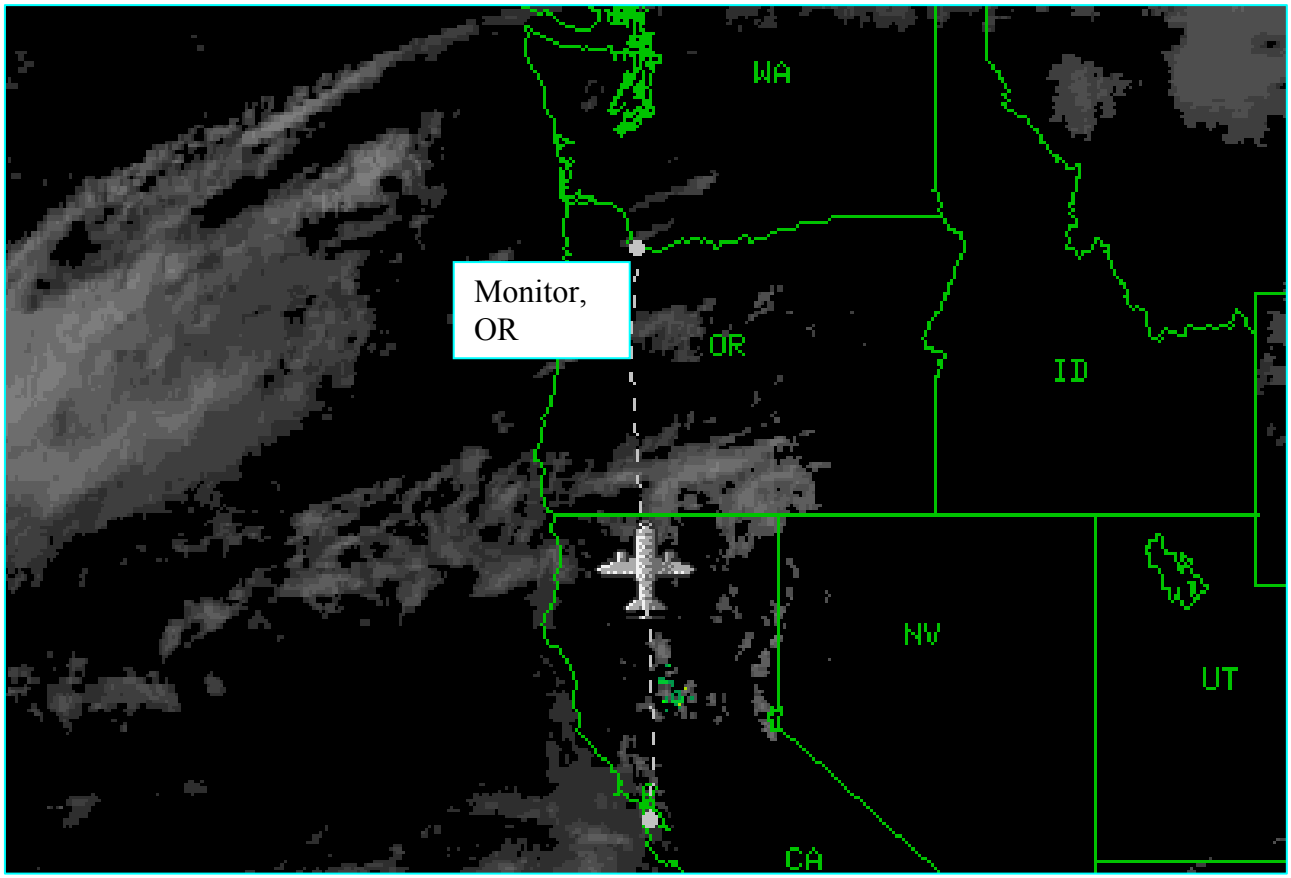
The Williams Company transports natural gas through a pipeline system that is located in the Monitor Fire District (see map in pipeline section). This is a 16" high pressure system that has been odorized. The maximum allowable operating pressure for this line is 896 psi (pound per square inch). Normal day to day operating pressure is 600 psi. This pipeline is a major north-south gas route and carries 200,000,000 cubic feet of gas per day! This pipeline supplies gas throughout the Monitor Fire District for Northwest Natural at pressures well below the main feed pressure (most is delivered at 40 psi to customers) Williams Company supplies an emergency response manual and training when requested (see Key Personnel page in the Natural Gas analysis section). Williams Company offers excellent courses and training at no cost to fire districts that have their pipeline in district. I would highly recommend contacting the Williams Company for ongoing training. This would be a high priority for Monitor Fire District.

Water

For the purposes of this hazardous flow study we will not include your waterways as supporting transportation. But with that being said, Butte Creek and the Pudding River are considered by the U.S. Coast Guard as navigable waterways, we know they are not, but this designation requires contact with the Coast Guard and others through the Oregon Emergency Response System (OERS) if there is a qualifying spill. Spills into these waterways will most likely be from farm related incidents or over the road forms of transportation. The Butte Creek and Pudding River (including small tributaries) are crossed by highways throughout the Monitor Fire District. If you have never conducted training to work to minimize spill impacts in these water ways I suggest you make it a medium priority. Drills to prevent spills from destroying these sensitive eco-systems can be fun and rewarding.

Air

The Monitor area is not served by a major airport but is in the main flight path for the Portland International Airport (see map below). This being the case, small planes and "crop dusters" would be the most likely to cause a transportation hazmat event by air. Training on how to handle an aircraft hazmat emergency is available but would be a low priority for planned training. A good resource would be a local pilot who has an aircraft in your district. His/her aircraft could be used for familiarization.



HIGHWAY ANALYSIS

Highway Transportation

The following section will study the flow of materials, both hazardous and non-hazardous, through the Monitor Fire District as it pertains to movement on roadways. Most materials that pose a significant statistical danger flow into and out of the Monitor Fire District over the highway system. Although, as we have discussed, hundreds of million cubic feet of natural gas moving through the district on a daily basis account for the most hazardous material as far a sheer volume. Nationally, highway vehicles carrying hazardous materials account for about an average of 6% of the multi-axle vehicles on the road and one (1) vehicle in eight (8) is a commercial multi-axle truck. Our study showed that 4.5% of the multi-axle vehicles counted were carrying hazardous materials and the multi-axle commercial vehicle to all the others on the road was 6:1 (1 multi-axle for every 6 other vehicles). But it must be stated here that Monitor Fire District (or any small volunteer department) would be challenged by an emergency involving an empty multi-axle commercial vehicle just because of the volume of hazardous materials used to power and lubricate one of these vehicles. Most of the multi-axle vehicles used for transport of commodities (including farm vehicles) have several hundred gallons of fuel and many tens of gallons of lubrication oil just to move the vehicle down the road. These alone would tax the hazardous materials capability of a department Monitor's size.

Spill history in the area indicates that fuel, as in all areas of the country, is the item most often spilled and the largest quantity. The last significant spill occurred in downtown Monitor right next to the fire station when a truck owned by Oil Products Incorporated from Mt. Angel, Oregon lost its brakes and overturned. The spill that resulted was confined to a few hundred gallons and Monitor Fire District did a good job limiting the extent of the emergency.

The quantities of chemicals that move through the Monitor Fire District are for the most part for use in agriculture. The top three (3) items as far as sheer amount are (in order of amount):

1. Fuels
2. Farm fertilizers (mostly nitrogen based oxidizers).
3. Other farm chemicals (Lime, other)

Due to the multitude of suppliers from all over the Willamette Valley it is hard to pin point exact amounts but we know they are in the millions (pounds/gallons) for each of the above listed items in the Monitor Fire District. We believe the vehicle count gives a clearer picture of the overall exposure to Monitor Fire District than pounds or gallons and we will focus on that information below.

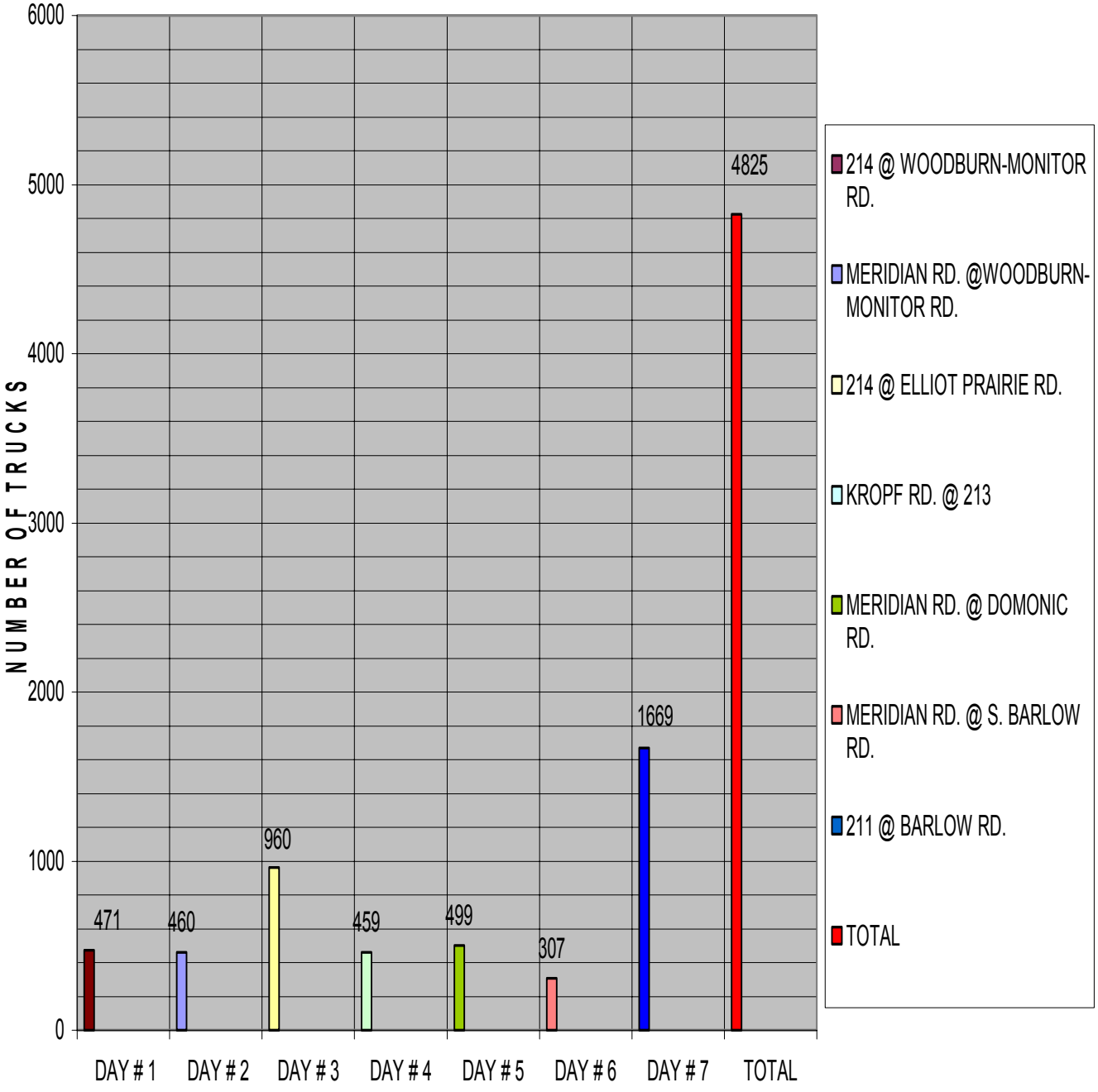
The final link in studying hazardous commodity flow in the Monitor Fire District is using "what has happened in the past" data to predict future emergencies. With data supplied by Monitor Fire District (call volume to location) we decided to look at specific intersections to get specific vehicle counts and the potential for a commodity transport event.

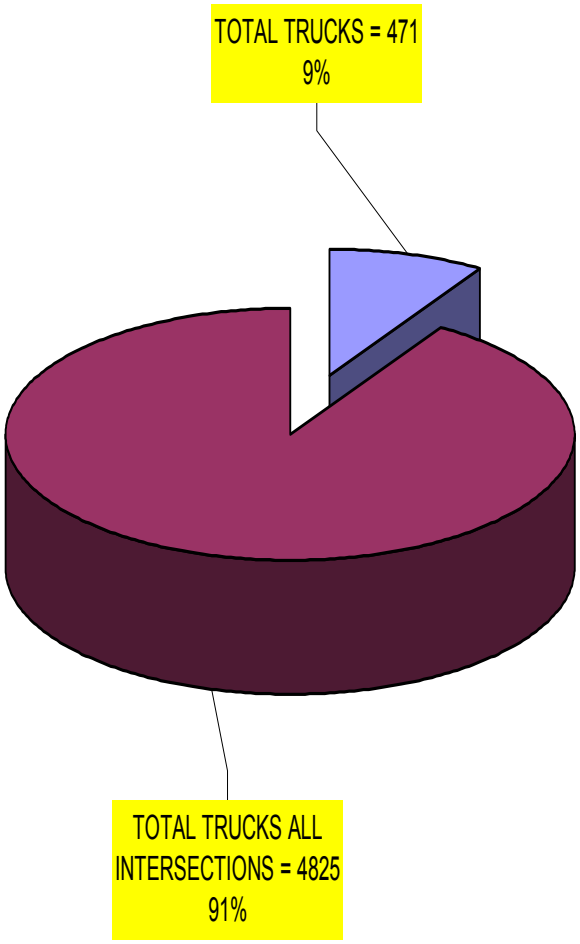
The intersections studied were:

1. Hwy 214 @ Woodburn Monitor Rd.
2. Meridian @ Woodburn Monitor Rd.
3. Hwy 214 @ Elliot Prairie Rd.
4. Kropf Rd. @ Hwy 213
5. Meridian Rd. @ Dominic Rd.
6. Meridian Rd. @ Barlow Rd.
7. Hwy 211 @ Barlow Rd

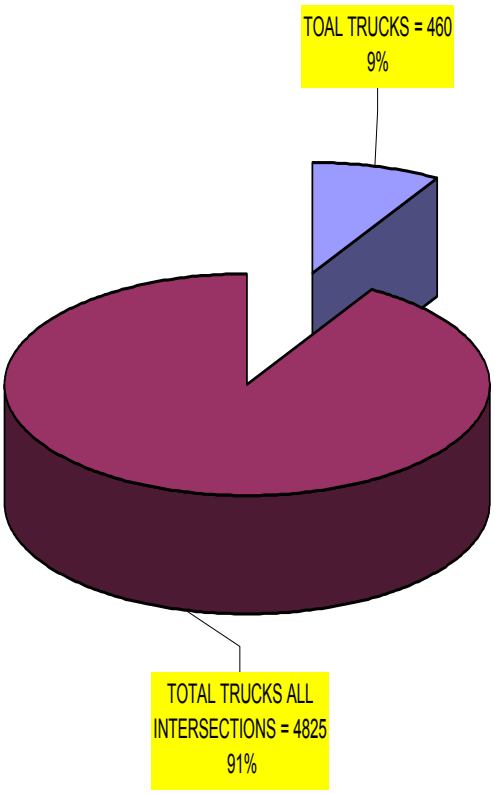
According to command staff at Monitor Fire District the above intersections are the "run producers". Most MVA's (motor vehicle accidents) that Monitor Fire District responds to occur at the above mentioned intersections. The flow data collected at these intersections in the month of August supports the fact that these intersections carry a very high volume of multi axle commercial as well as commuter traffic over two lane "country" roads. We believe this traffic load and road conditions attribute to the number and severity of MVA's in the Monitor Fire District. With projected increases in traffic due to population growth and other factors, these intersections will continue to be "run producers" for the Monitor Fire District. The potential for accidents involving a serious hazardous materials event is more likely now than ever before and the likely hood of a major event will only increase with time due to the amount of vehicles in the statistics below.

MULTI-AXLE TRUCK COUNT @ CRITICAL INTERSECTIONS



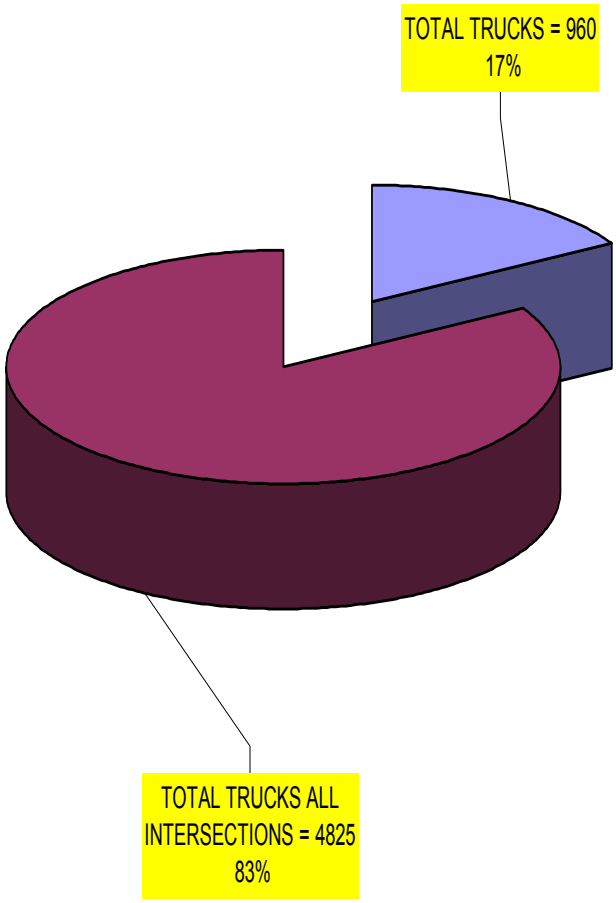


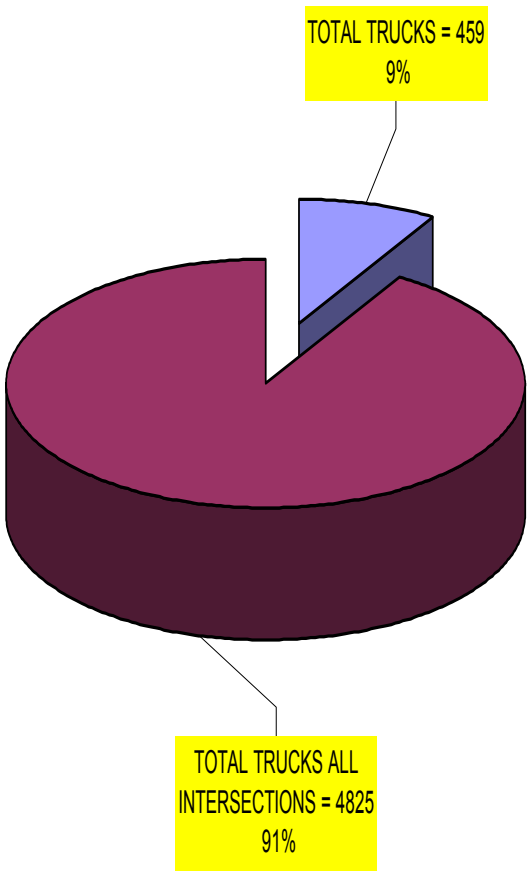
HWY 214 @ WOODBURN-MONITOR RD.



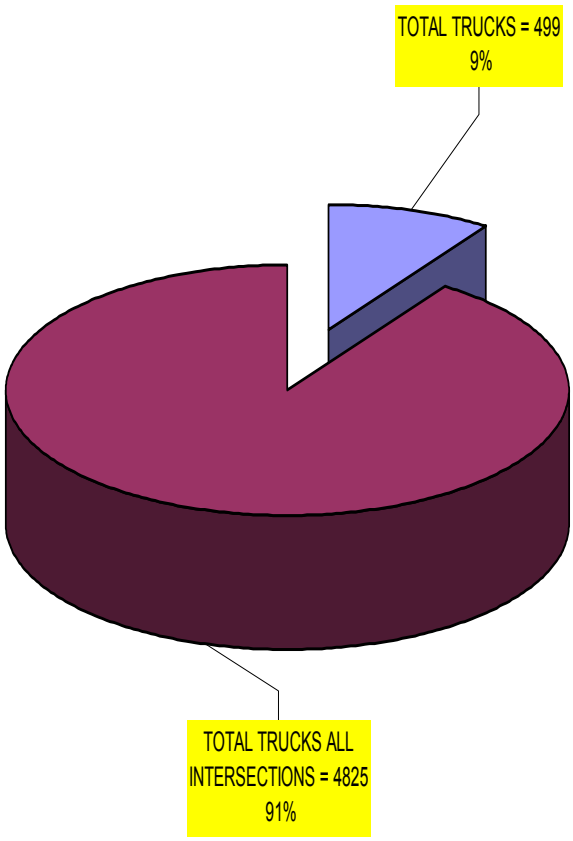
MERIDIAN RD. @ WOODBURN-MONITOR RD.

HWY 214 @ ELLIOT PRAIRIE RD.

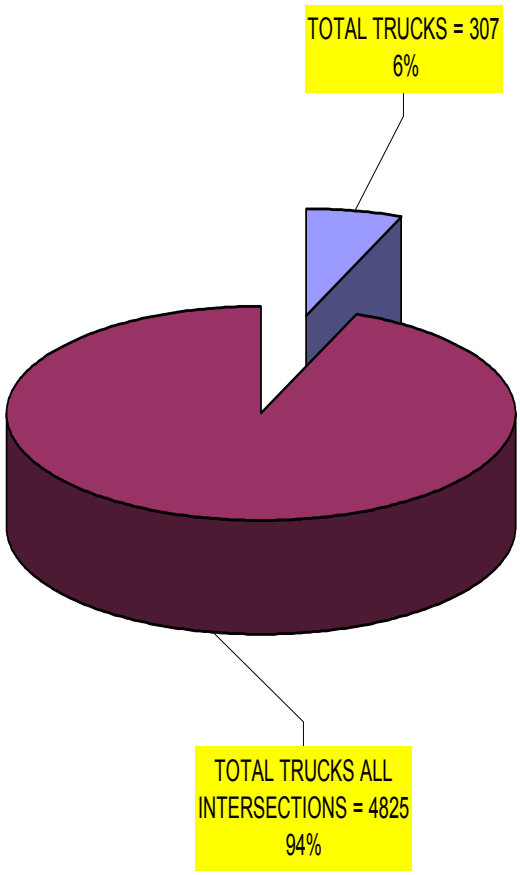




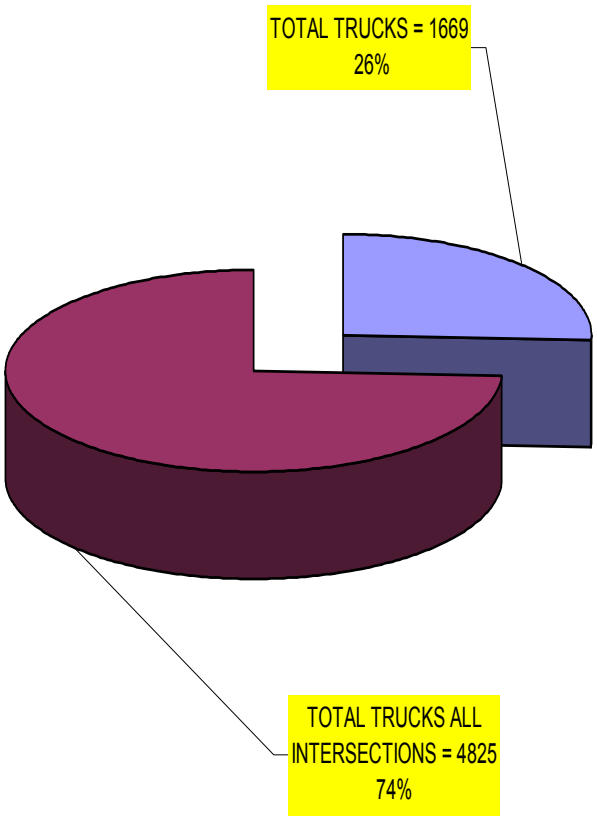
KROPF RD. @ HWY 213



MERDIAN RD. @ DOMONIC RD.

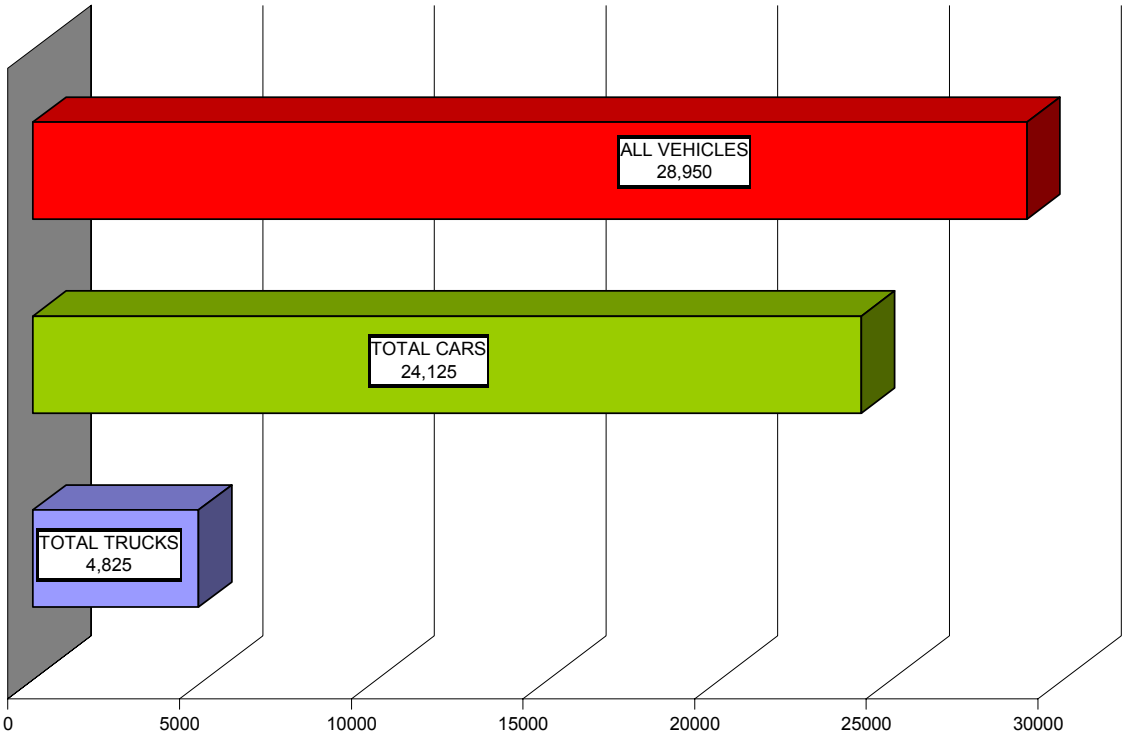


MERIDIAN RD. @ S. BARLOW RD.



HWY 211 @ BRLOW RD.

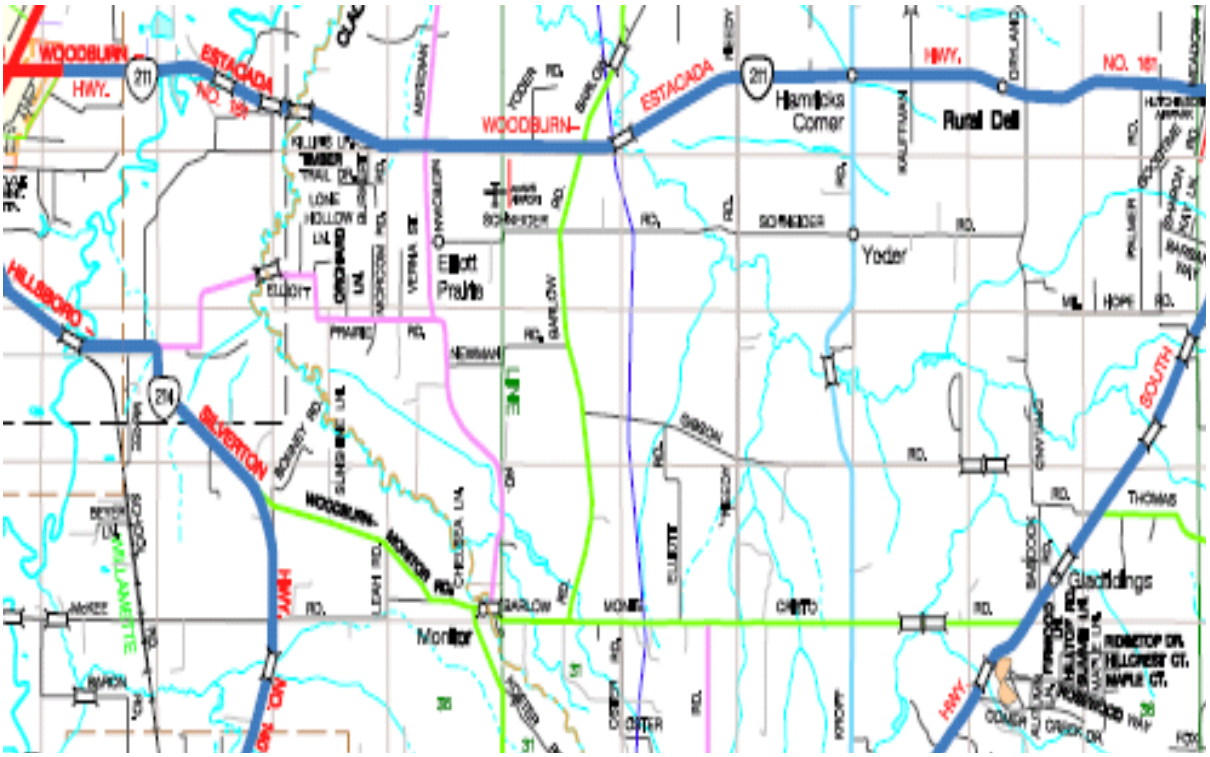
CAR TO TRUCK RATIO ALL INTERSECTIONS



RAILROAD ANALYSIS

Railroad Transportation Section

As was mentioned in the Transportation Summary section of this document, there is no current rail service in the Monitor Fire District and thus no hazardous materials transported by rail. The exposure to rail would be in the event of a call for mutual or auto aid to assist another fire district. Training for such emergencies would be a low priority but could be accomplished with annual hazmat refresher training conducted each year. Being familiar with the state hazmat team system and their response capabilities would be an important part of this training. A map has been attached to this page below to show the location of the nearest rail lines:



Nearest Rail Line in yellow

NATURAL GAS ANALYSIS

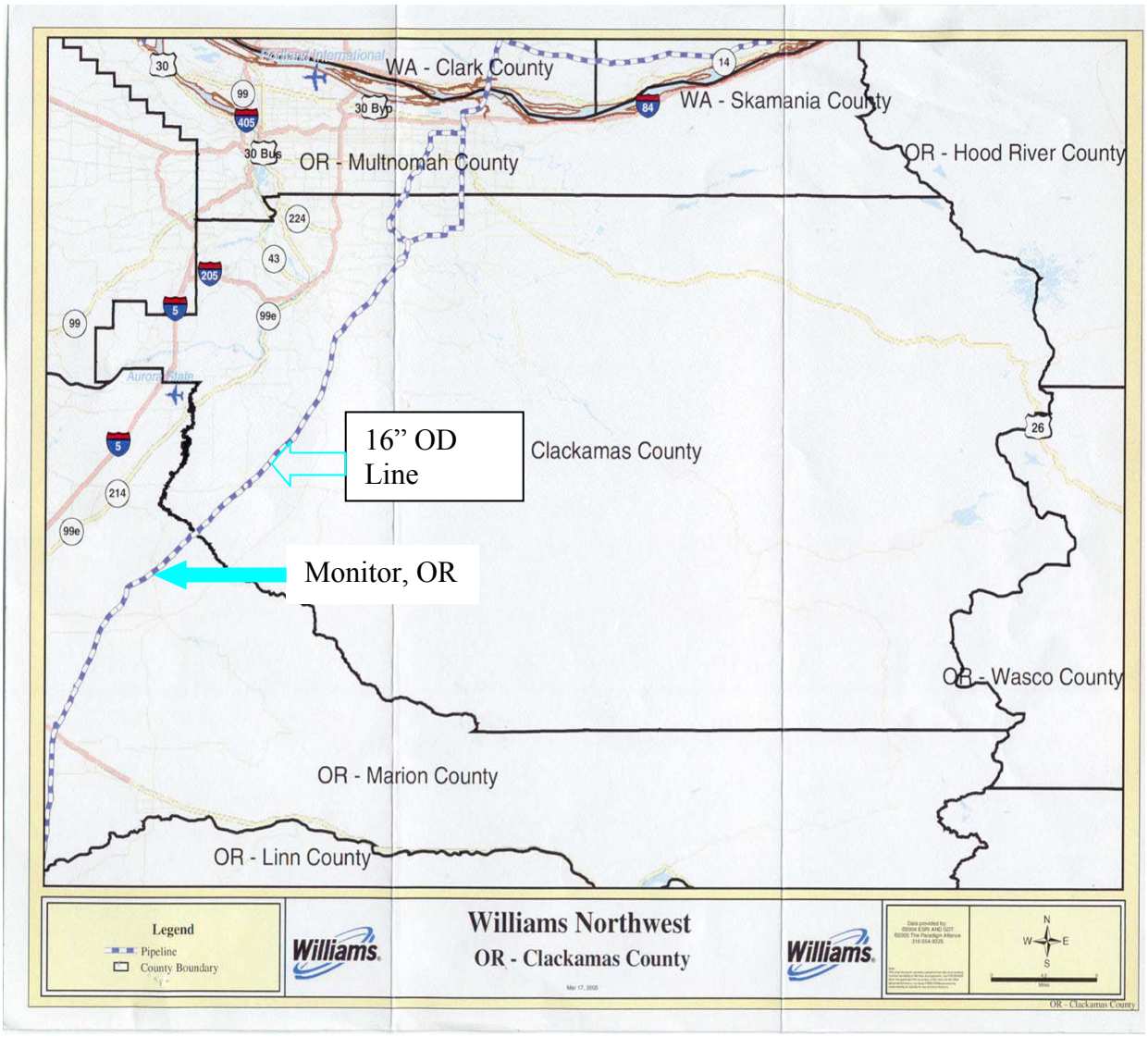
Pipeline Transportation Section

Monitor Fire District is crossed in several areas by Williams Company pipelines. The main feeder line traveling through the District is a 16" high pressure line with odorant added. The average pressure in the main delivery system is 600 psi, with a maximum allowable operating pressure of 896 psi. This system supplies gas to Northwest Natural customers at working pressure from ¼ psi up to several hundred psi. Monitor Fire District has only had two emergency events in the past 30 years, one in 1971 and one in 1986. Each event required no intervention from the Fire District and was controlled in several hours (high pressure burn off).
Hundreds of millions of cubic feet of natural gas run through this system on a daily basis. Northwest Natural estimates that during peak demand times this one 16" main supplies over 200,000,000 cubic feet of gas per day. This supply system has had little impact on Monitor Fire District due to a well run pipeline operation. Obviously, this does not mean there is no danger to the people protected by Monitor Fire District and our recommendation in this study is to work closely with the Williams Company and Northwest Natural to develop and keep the skills needed to handle a pipeline emergency well honed. I would recommend as a high priority annual training with both Williams Company and Northwest Natural. This training is free and very well presented. Both the Williams Company and Northwest Natural desire to keep their operations safe and realize that Monitor Fire District is an important part of that equation.

Northwest Natural training contact:
Michael Wall
503-226-4211
m2w@nwnatural.com

We have attached several documents to this section to show system components of the William's pipeline system and key personnel.

Williams Pipeline System map:



Revised March 15, 2005

KEY PERSONNEL

Williams Northwest Pipeline
Eugene District

EUGENE DISTRICT OPERATING OFFICE
89861 Game Farm Road
Eugene, Oregon 97408

PHONE NUMBERS
(541) 342-4434
(541) 344-3675 FAX

24 HOUR EMERGENCY NUMBERS

Gas Control		(800) 972-7733
Salt Lake City, UT		(801) 328-8252
(Call Collect)	(801) 584-6949 or	(800) 453-3810 x 6574

TELEPHONE NUMBERS OF THE EUGENE DISTRICT KEY PERSONNEL

Mike Haberkorn District Manager	Home Cellular	(541) 767-3781 (541) 953-0660
Larry Ferguson (Salem/Portland/Oregon City) Operations Technician	Home Pager Cellular	(503) 749-1104 (541) 710-0650 (541) 912-0617
Ebonie Johnson (Salem/Portland/Oregon City) Operations Technician	Home Pager Cellular	(503) 618-0514 (541) 710-0662 (503) 702-2817
Paul Andersen (Albany//Eugene/Creswell) Central District Leader Senior Operations Technician	Home Pager Cellular	(503) 873-7034 (541) 710-0658 (503) 791-4204
Larry West (Albany/Eugene/Creswell) Operations Technician	Home Pager Cellular	(541) 726-4344 (541) 710-0649 (541) 912-9079
Larry Davis Operations Technician	Home Pager Cellular	(541) 679-9731 (541) 814-0125 (541) 912-7928
Jim Larrabee (Roseburg/Klamath Falls) Operations Technician	Home Pager Cellular	(541) 726-0855 (541) 814-0120 (541) 912-1366

Discussion / Conclusion

Remember that each load of hazardous materials is bound for somewhere. Monitor for the most part does not have industrial fixed sites that are high volume end point users and this is backed up by the State Fire Marshal's HSIS (Hazardous Substance Information Survey) data base. The HSIS data base lists twelve (12) end users that have reportable hazmat quantities and of those most report common materials such as flammable liquids and plastics with the exception of Needy Brick & Tile who stores 250,000-499,999 pounds of high density polyethylene at their work site.

The conclusion that we come to by conducting this study is that Monitor Fire District faces interesting hazardous material challenges in their district. The fact is that most hazmat being shipped is not bound for the Monitor area but "just passing through". The reality that most hazardous materials in the district are moving through combined with the fact that the district experiences extremely high accident rates at critical intersections increases the likelihood of Monitor Fire District responding to a significant hazardous materials incident.

The call volume at the intersections studied in this document is amazing in that 33% of Monitor's total call volume comes from calls at these critical intersections.

As you can see Monitor Fire District has and will continue to face hazardous material challenges in transportation. It will be vital that Monitor Fire District train and equip to handle this special type of emergency.