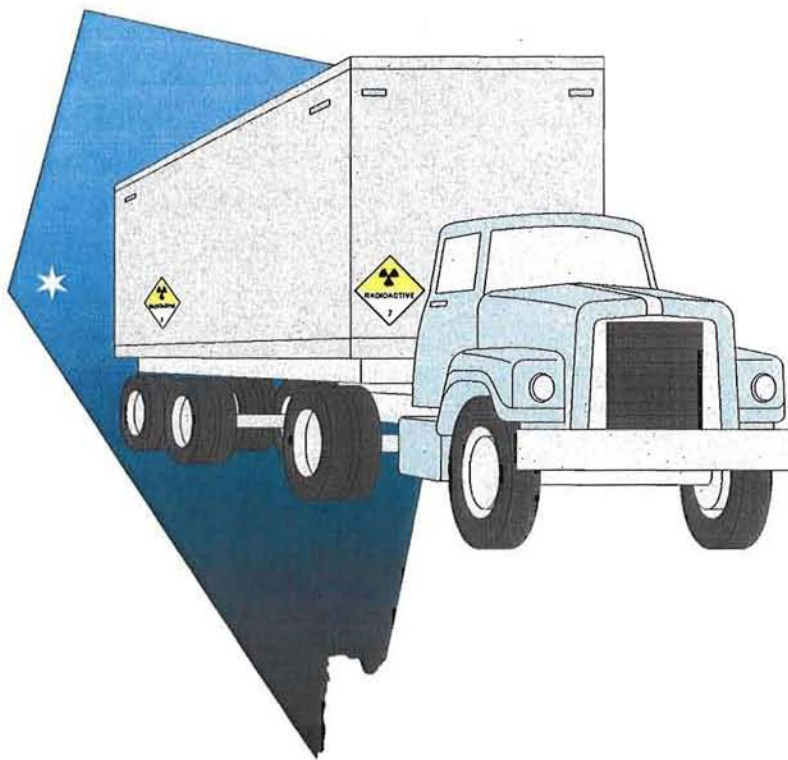


**CARSON CITY  
HAZARDOUS MATERIALS  
TRANSPORTATION  
COMMODITIES STUDY**

**CARSON CITY FIRE DEPARTMENT**

# CARSON CITY HAZARDOUS MATERIALS TRANSPORTATION COMMODITIES STUDY



**AUGUST 2005**

CARSON CITY FIRE DEPARTMENT  
Stacey Giomi, Fire Chief  
777 South Stewart Street  
Carson City, Nevada 89701  
(775) 887-2210

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# **C**arson City Fire Department: Hazardous Materials Transportation Commodities Study

## **HAZMAT TRANSPORTATION OVERVIEW**

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### ***NATIONAL***

The U.S. Department of Transportation (DOT) Office of Hazardous Materials Safety estimates that an average of over 800,000 shipments of hazardous materials (HAZMAT) are made each day in the United States. The DOT also reports that approximately 1.5 billion tons of hazardous materials are shipped each year. The majority of the hazardous material shipped is classified as flammable liquid (e.g. petroleum). Other types of hazardous material (in decreasing order of annual amount shipped) are corrosive materials, gases, flammable solids, toxics, and radioactive materials. The DOT also reports statistics on incidents involving hazardous materials shipping and their consequences. For 1999, the DOT reported five fatalities, 217 injured persons, and \$23 million in property damage associated with hazardous materials transportation on highways.<sup>1</sup>

### ***REGIONAL***

Carson City is dissected by two main transportation corridors, US Highway 50; the east-west route and US Highway 395; the north-south route. From the intersection of US 395 and US 50 near the south end of the city, both highways combine and run north for approximately 3.5 miles on what is known as Carson Street. At the intersection of N. Carson St. and E. Williams (US 50), the two highways diverge. As a result, all of the motor transport carriers traveling through Carson City must travel through the heart of the downtown business district. A two-phase freeway by-pass (the north phase is currently under construction) will relieve a majority of

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<sup>1</sup> Bureau of Transportation Statistics U.S. Department of Transportation and Census Bureau available at [www.bts.gov](http://www.bts.gov).

this traffic, but it is several years to completion. Both Highway 50 and Highway 395 are approved routes for the transportation of radioactive materials.

The Nevada Department of Transportation (NDOT) compiles statistics on accidents involving tractor trailer vehicles every year. Although the statistics do not differentiate by type of cargo, they are broken down county-by-county and street-by-street. For Carson City in 2002 (the most recent compilation), NDOT reported 20 tractor-trailer accidents resulting in 0 fatalities, 12 injuries, and 13 incidents of property damage. Twelve of the accidents occurred on U.S. Highway 395, five on U.S. Highway 50, and three on secondary roads or streets. Nine of the accidents occurred in what would be considered the central downtown area of Carson City. (See Appendix A.)

## **HAZARDOUS MATERIALS COMMODITIES SURVEY**

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### ***SURVEY METHODOLOGY***

To determine the amount of hazardous material commodities being transported into and through Carson City, two twenty-four hour visual surveys were conducted by the Carson City Fire Department. With some limitations, these “snapshot” surveys have provided insight to the flow of hazardous materials through Carson City. The first was done on Wednesday, February 24, 1999. The second was conducted on Thursday, June 16, 2005. The two surveys were conducted by placing fire department personnel at the three transportation entry points to Carson City. These locations were Highway 395 South at the Highway 50/Spooner Junction, Highway 395 North at the Eagle Valley Ranch Road/Lakeview Hill area, and Highway 50 East at Deer Run Road. (See Appendix B). In both surveys the personnel recorded the number of individual hazardous materials placards that passed their respective checkpoints. In the 1999 survey, vehicles both entering and leaving Carson City were recorded in two separate categories. In the 2005 survey, only vehicles entering Carson City were recorded. The 2005 survey also recorded the road trailer class type. (See Appendix C.)

### ***HAZARDOUS MATERIAL CLASSES***

For purposes of transportation, hazardous materials are designated into nine classes. Most of these classes utilize multiple placards. (See Appendix D.)

The nine hazardous material classes are:

CLASS 1	EXPLOSIVES
CLASS 2	GAS
CLASS 3	FLAMMABLE LIQUIDS
CLASS 4	OTHER FLAMMABLES
CLASS 5	OXIDIZING SUBSTANCES
CLASS 6	TOXIC
CLASS 7	RADIOACTIVE
CLASS 8	CORROSIVES
CLASS 9	MISCELLANEOUS

### ***SURVEY/STUDY OBJECTIVES***

To enable emergency response personnel to evaluate hazardous materials commodities transportation within Carson City thus facilitating emergency actions in order to save lives, reduce injuries, and prevent or minimize damage to property and the environment. These actions may include:

1. Providing rapid and effective warning, information, and instructions to threatened populations adjacent to the transportation corridors.
2. Providing means to access physical and technical resources to stabilize the affected area and return to normal conditions as quickly as possible, including the re-opening of the affected transportation route.
3. Training and equipping emergency response and allied medical personnel (hazmat team members as well as first responders) to efficiently, safely, and effectively mitigate hazardous materials transportation incidents.
4. Defining the overall emergency response organization for hazardous materials transportation incidents occurring within Carson City.
5. Training and planning for possible large scale evacuations and/or sheltering in place along the Highway 50 and Highway 395 corridors.
6. Establish possible mutual aid needs to supplement local resources.

### ***LIMITATIONS TO SURVEY***

**Several factors must be noted as limitations affecting the results of the survey. These limitations include:**

1. Each survey was conducted at a point on each of three highway corridors leading into Carson City. The surveys will not show inter-city transport and delivery of hazardous materials. These include, but are not limited to, medical oxygen and other compressed gasses, and the inter-area delivery of hazardous materials commodities in and around the industrial complexes.
2. Vehicles transporting hazardous material but not placarded due to the quantity of material being carried will not be shown in the survey. Unplacarded "mixed loads" of hazardous materials may pose a significant danger to first responders.
3. There also exists the possibility of vehicles being mis-placarded due to oversight or intentional deception to avoid special licensing fees or other regulations. It should be noted that mobile clandestine drug labs have been taken down in Carson City.
4. The two surveys were limited to twenty-four hours each, were conducted on different days of the week, and in different seasons.
5. Multiple placarded vehicles will be shown as multiple entries.

### ***STUDY CONCLUSIONS***

In trend with national statistics, the 1999 and the 2005 surveys both revealed that Class 3 (flammable liquids) commodities were the most common hazardous material moving through Carson City. From 1999 to 2005, Class 3 commodities increased by 23% percent. The second most common in both surveys were Class 2 (gas) commodities. The 2005 survey showed a 63% decline from the 1999 survey for this class. A possible explanation for this may be that the 1999 survey was conducted in February when propane use would be at its highest. 2005 saw decreases in both Class 4 (other flammables) and Class 5 (oxidizers), but substantial increases in Class 8 (corrosives) and Class 9 (miscellaneous).

The 2005 survey indicates that, by far, the most common placarded road trailer is shown as "empty". These empty trailers, depending upon the contents of their last load, may be as hazardous, or in some cases, more hazardous than when they were full. It should be noted that in the 1999 survey only one shift at one checkpoint recorded the number of "empty" road trailers. This resulted in the huge discrepancy seen between the 1999 and 2005 surveys in this category. For comparative purposes the empty trailer ratios must be discounted.

The following figures and tables show the complete results of the survey site by site. Figure 16 and 17 detail and compare both surveys by hazard class.

## Tables & Figures

Figure 1—Survey I Table

### SURVEY I

Placard Count 24-Feb-99

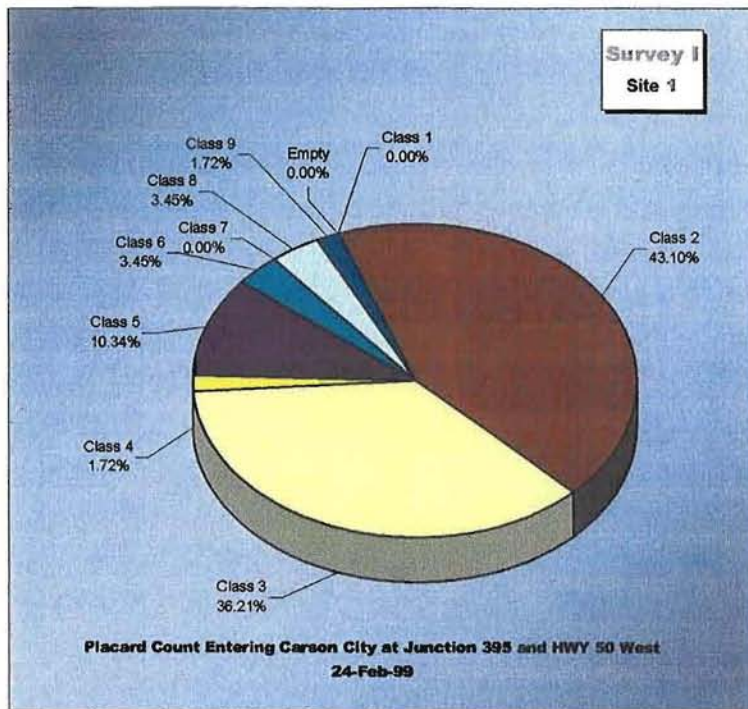
Location 1 Junction 395 and HWY 50 West											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>Entering</b>	0	25	21	1	6	2	0	2	1	0	58
<b>Leaving</b>	0	23	5	1	0	0	0	2	0	0	31
<b>Total</b>	0	48	26	2	6	2	0	4	1	0	89

Location 2 395 North at Lakeview Hill											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>Entering</b>	0	19	33	3	3	0	0	0	0	0	58
<b>Leaving</b>	0	17	32	1	5	1	0	1	0	0	57
<b>Total</b>	0	36	65	4	8	1	0	1	0	0	115

Location 3 HWY 50 East at Deer Run Road											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>Entering</b>	0	10	15	0	0	0	0	1	0	2	28
<b>Leaving</b>	0	12	10	0	1	0	0	2	2	1	28
<b>Total</b>	0	22	25	0	1	0	0	3	2	3	56

Totals											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>Entering</b>	0	54	69	4	9	2	0	3	1	2	144
<b>Leaving</b>	0	52	47	2	6	1	0	5	2	1	116
<b>Grand Total</b>	0	106	116	6	15	3	0	8	3	3	260

**Figure 2—Survey I, Site 1 Chart**



**Figure 3—Survey I, Site 2 Chart**

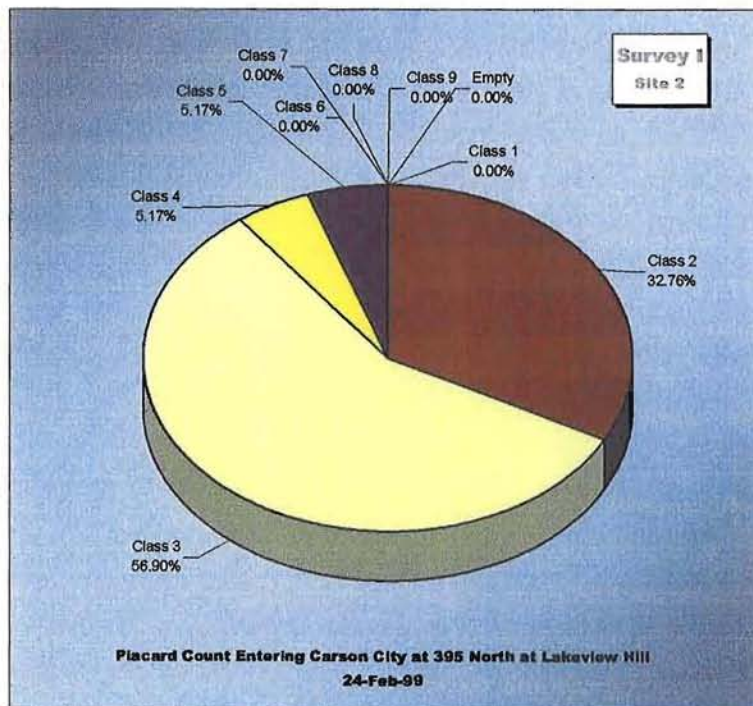


Figure 4—Survey I, Site 3 Chart

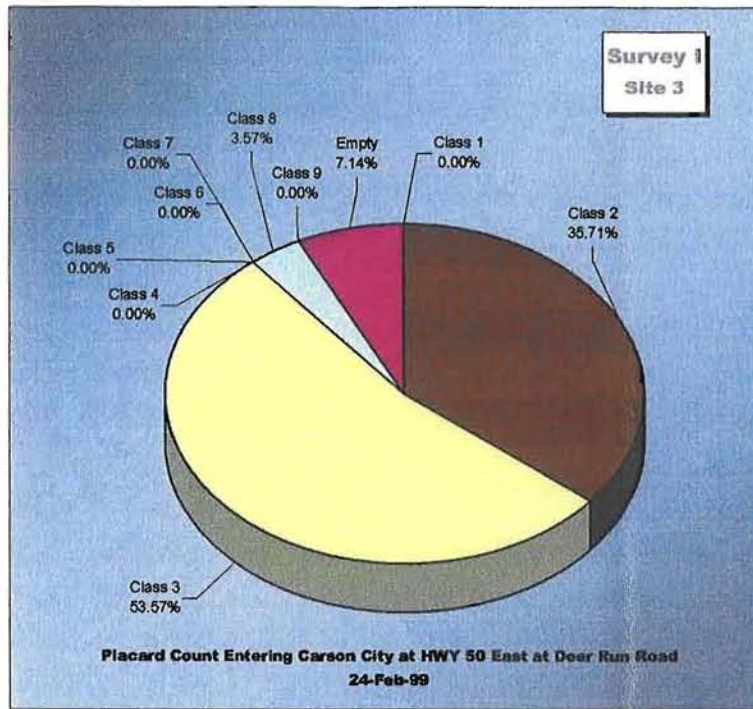
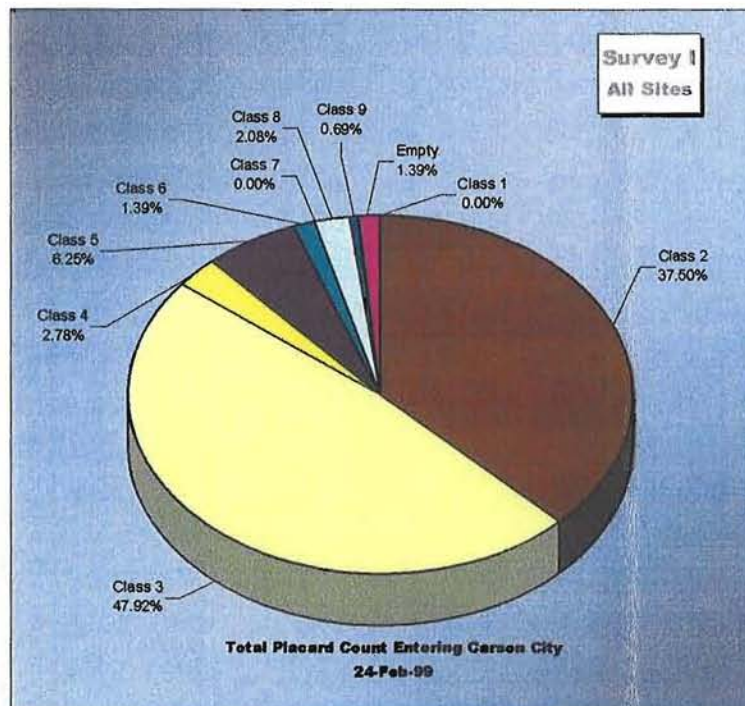


Figure 5—Survey I, All Sites Chart



**Figure 6-A—Survey II, Placard Count Table**

**SURVEY II**  
**Placard Count**  
**16-Jun-05**

<b>Site 1</b>											
<i>HWY 395 (South Carson Street) and Snyder Ave. (Northbound)</i>											
	<i>Class 1</i>	<i>Class 2</i>	<i>Class 3</i>	<i>Class 4</i>	<i>Class 5</i>	<i>Class 6</i>	<i>Class 7</i>	<i>Class 8</i>	<i>Class 9</i>	<i>Empty</i>	<i>Total</i>
<b>Entering</b>	0	12	27	1	2	4	0	5	5	140	196
<b>Total</b>	0	12	27	1	2	4	0	5	5	140	196

<b>Site 2</b>											
<i>HWY 395 North at Arrowhead Drive (Southbound)</i>											
	<i>Class 1</i>	<i>Class 2</i>	<i>Class 3</i>	<i>Class 4</i>	<i>Class 5</i>	<i>Class 6</i>	<i>Class 7</i>	<i>Class 8</i>	<i>Class 9</i>	<i>Empty</i>	<i>Total</i>
<b>Entering</b>	0	4	45	0	2	0	0	4	1	53	109
<b>Total</b>	0	4	45	0	2	0	0	4	1	53	109

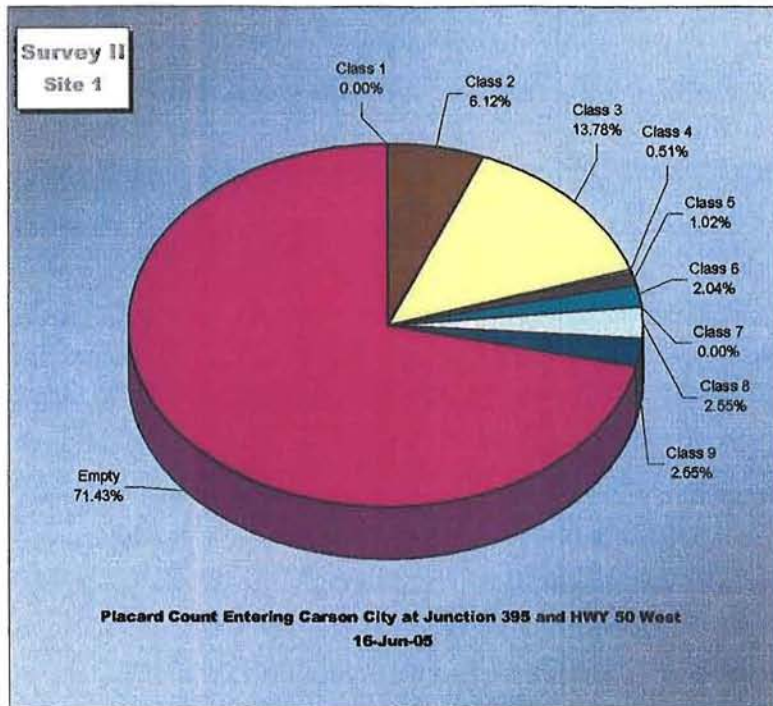
  

<b>Site 3</b>											
<i>HWY 50 East at Deer Run Road (Westbound)</i>											
	<i>Class 1</i>	<i>Class 2</i>	<i>Class 3</i>	<i>Class 4</i>	<i>Class 5</i>	<i>Class 6</i>	<i>Class 7</i>	<i>Class 8</i>	<i>Class 9</i>	<i>Empty</i>	<i>Total</i>
<b>Entering</b>	0	4	13	0	2	0	0	1	2	2	24
<b>Total</b>	0	4	13	0	2	0	0	1	2	2	24

<b>All Sites -- Totals</b>											
	<i>Class 1</i>	<i>Class 2</i>	<i>Class 3</i>	<i>Class 4</i>	<i>Class 5</i>	<i>Class 6</i>	<i>Class 7</i>	<i>Class 8</i>	<i>Class 9</i>	<i>Empty</i>	<i>Total</i>
<b>Entering</b>	0	20	85	1	6	4	0	10	8	195	329
<b>Grand Total</b>	0	20	85	1	6	4	0	10	8	195	329

**Figure 6-B—Survey II, Site 1**



**Figure 7—Survey II, Site 2**

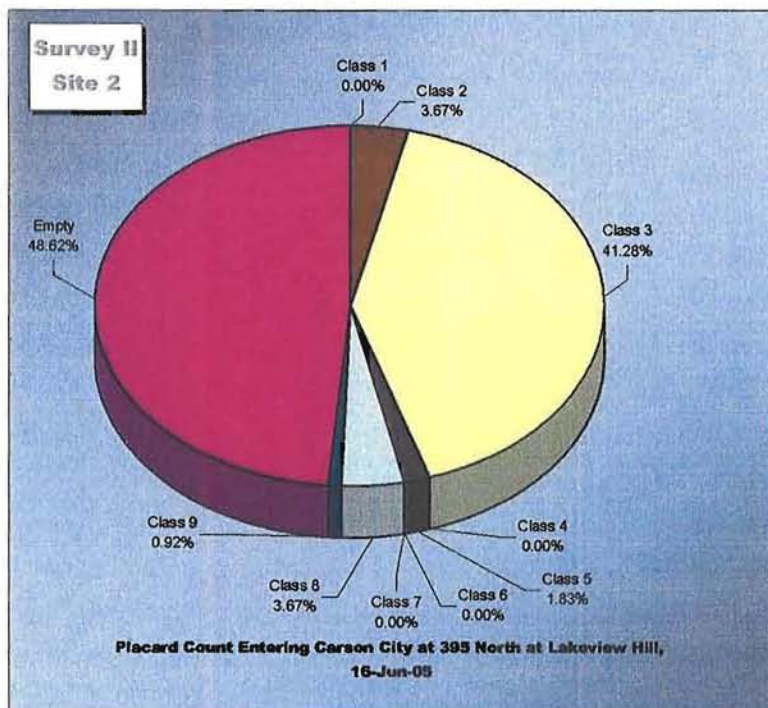


Figure 8—Survey II, Site 3

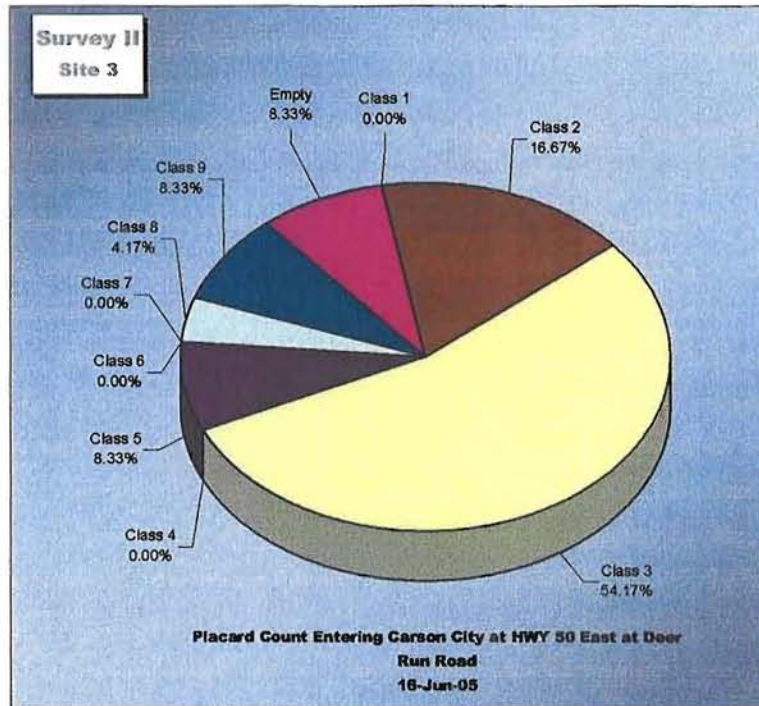
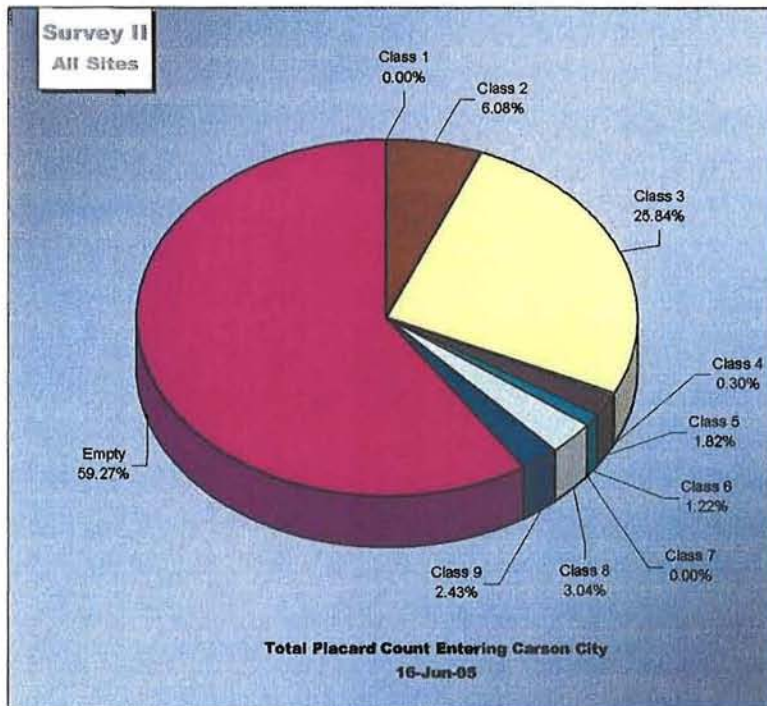


Figure 9—Survey II, All Sites



**Figure 10—Survey II, Road Trailer ID Count**

SURVEY II									
Road Trailer ID Count									
16-Jun-05									
Site 1									
HWY 395 (South Carson Street) and Snyder Ave. (Northbound)									
	MC 306 Pressure Chemical	MC 307 Low Pressure Chemical	MC 312 Corrosive	MC 331 High Pressure	MC 338 Cryogenic	Compressed Gas Tube	Dry Bulk	Mixed Cargo	Total
<b>Entering</b>	27	7	0	7	1	1	21	139	203
<b>Total</b>	27	7	0	7	1	1	21	139	203
Site 2									
HWY 395 North at Arrowhead Drive (Southbound)									
	MC 306	MC 307 Low Pressure Chemical	MC 312 Corrosive	MC 331 High Pressure	MC 338 Cryogenic	Compressed Gas Tube	Dry Bulk	Mixed Cargo	Total
<b>Entering</b>	43	0	2	3	1	0	17	152	218
<b>Total</b>	43	0	2	3	1	0	17	152	218
Site 3									
HWY 50 East at Deer Run Road (Westbound)									
	MC 306	MC 307 Low Pressure Chemical	MC 312 Corrosive	MC 331 High Pressure	MC 338 Cryogenic	Compressed Gas Tube	Dry Bulk	Mixed Cargo	Total
<b>Entering</b>	0	4	13	0	2	0	0	1	20
<b>Total</b>	0	4	13	0	2	0	0	1	20
All Sites Totals									
	MC 306	MC 307 Low Pressure Chemical	MC 312 Corrosive	MC 331 High Pressure	MC 338 Cryogenic	Compressed Gas Tube	Dry Bulk	Mixed Cargo	Total
<b>Entering</b>	2	0	0	4	0	1	0	10	17
<b>Grand Total</b>	2	0	0	4	0	1	0	10	17

Figure 11—Survey II, Site 1

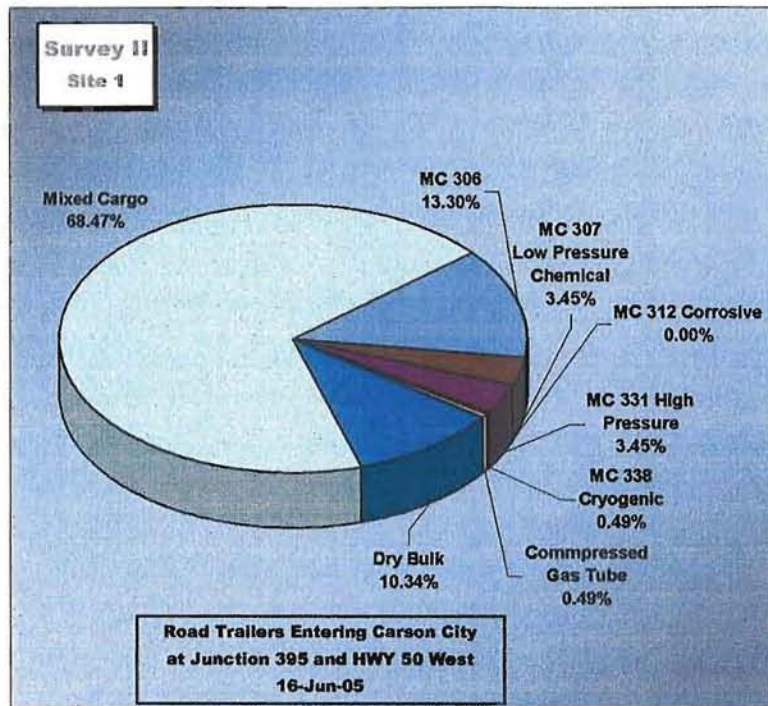


Figure 12—Survey II, Site 2

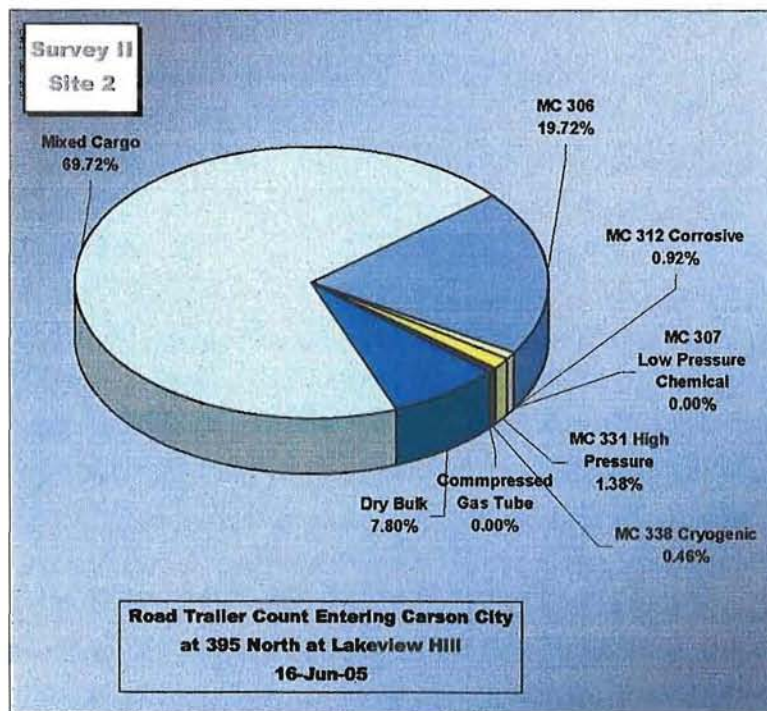


Figure 13—Survey II, Site 3

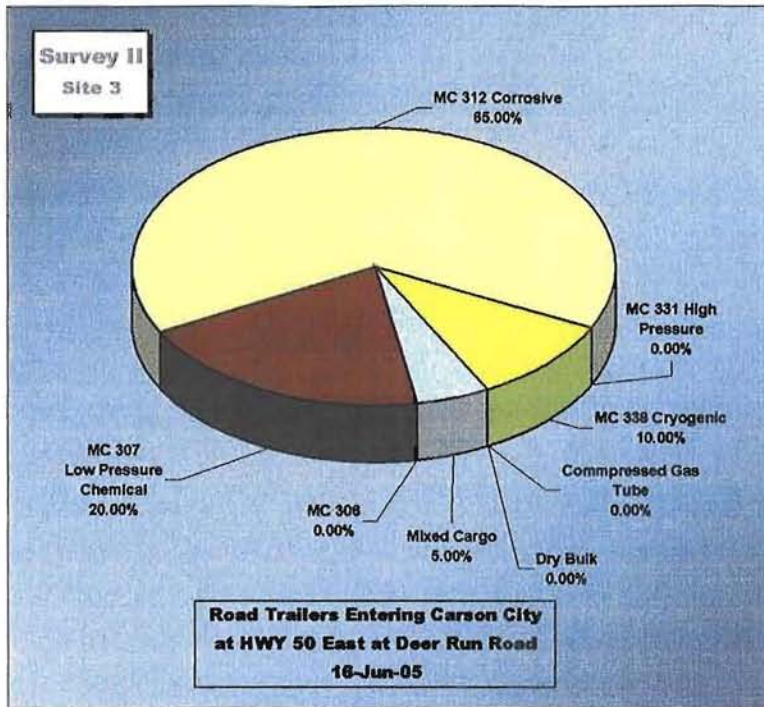


Figure 14—Survey II, All Sites

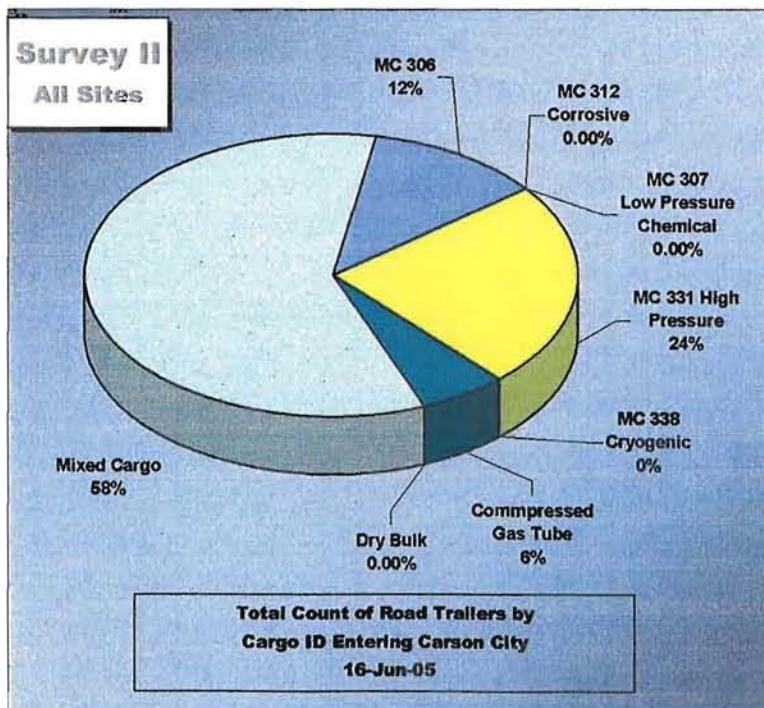


Figure 15—Survey I & II, Comparison Table

Comparison of Total Count by Hazard Class 1999 & 2005											
	Class 1	Class 2	Class 3	Class 4	Class 5	Totals Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>1999</b>	0	54	69	4	9	2	0	3	1	2	144
	Class 1	Class 2	Class 3	Class 4	Class 5	Totals Class 6	Class 7	Class 8	Class 9	Empty	Total
<b>2005</b>	0	20	85	1	6	4	0	10	8	195	329
Differences between 1999 & 2005 Classes											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	
<b>Amt</b>	0	-34	16	-3	-3	2	0	7	7	193	
Percentage of Change											
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Empty	
<b>%</b>	0%	-63%	23%	-75%	-33%	100%	0%	233%	700%	9650%	

Figure 16—Hazard Classes, Includes Empty

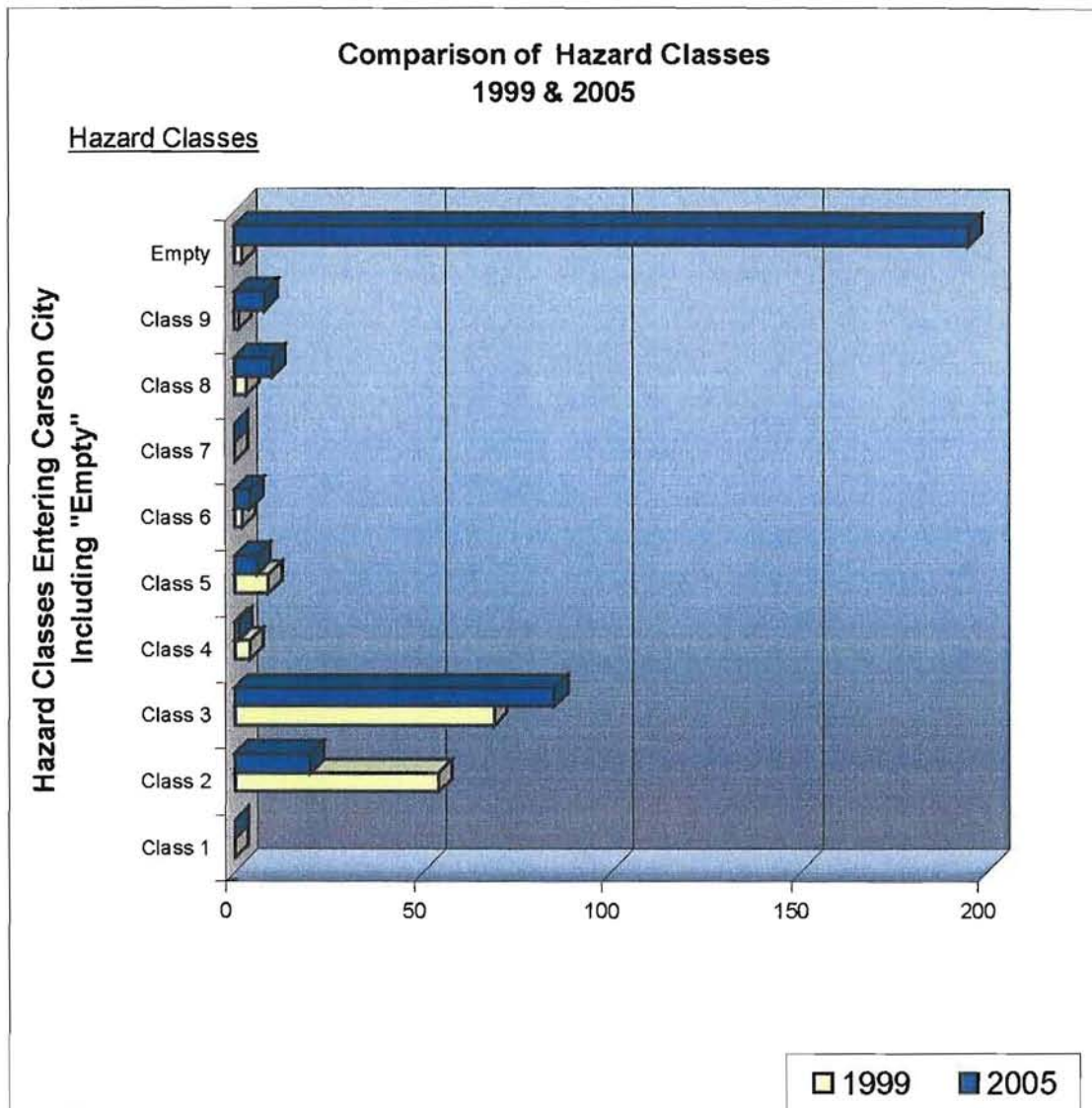
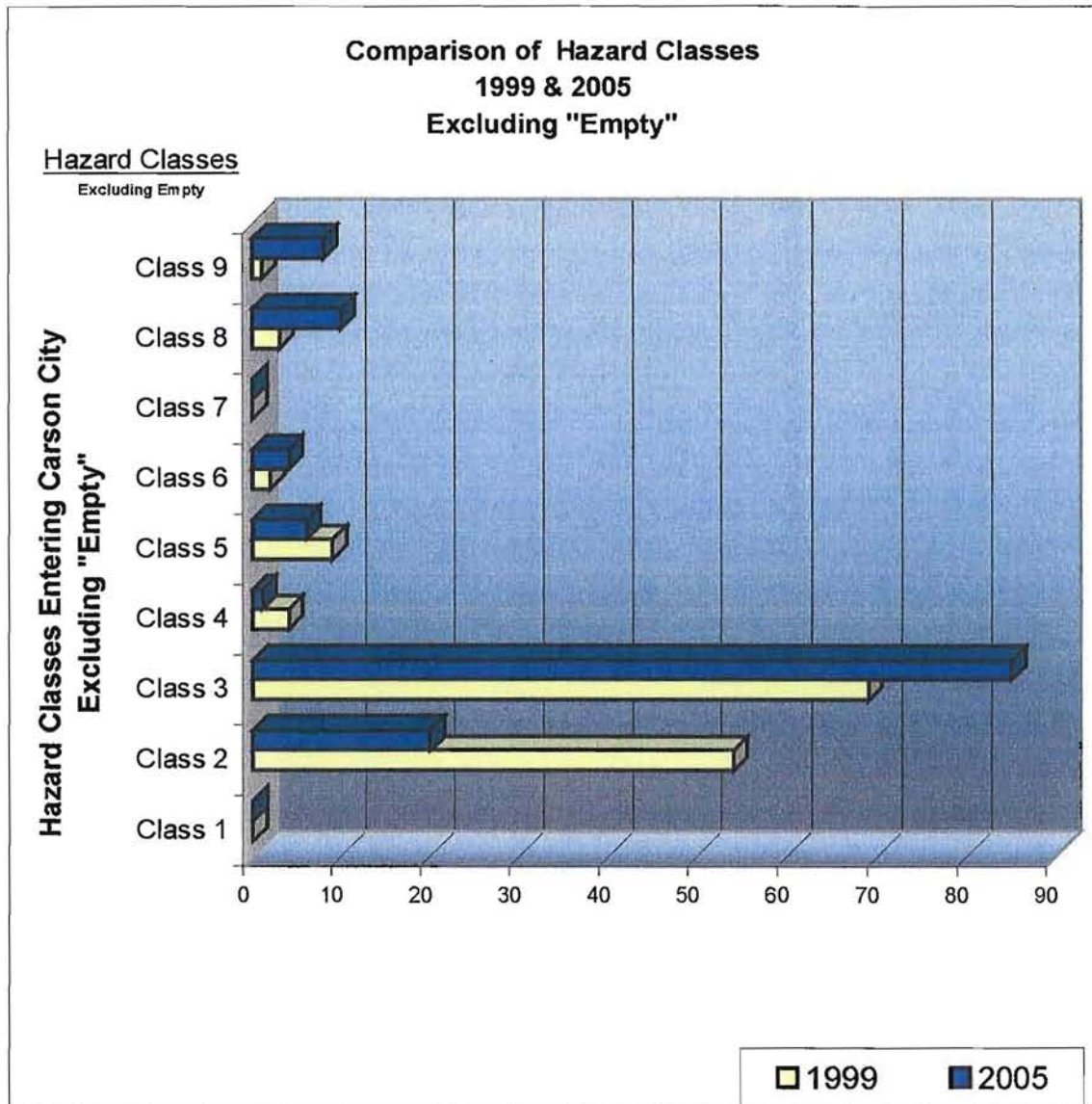
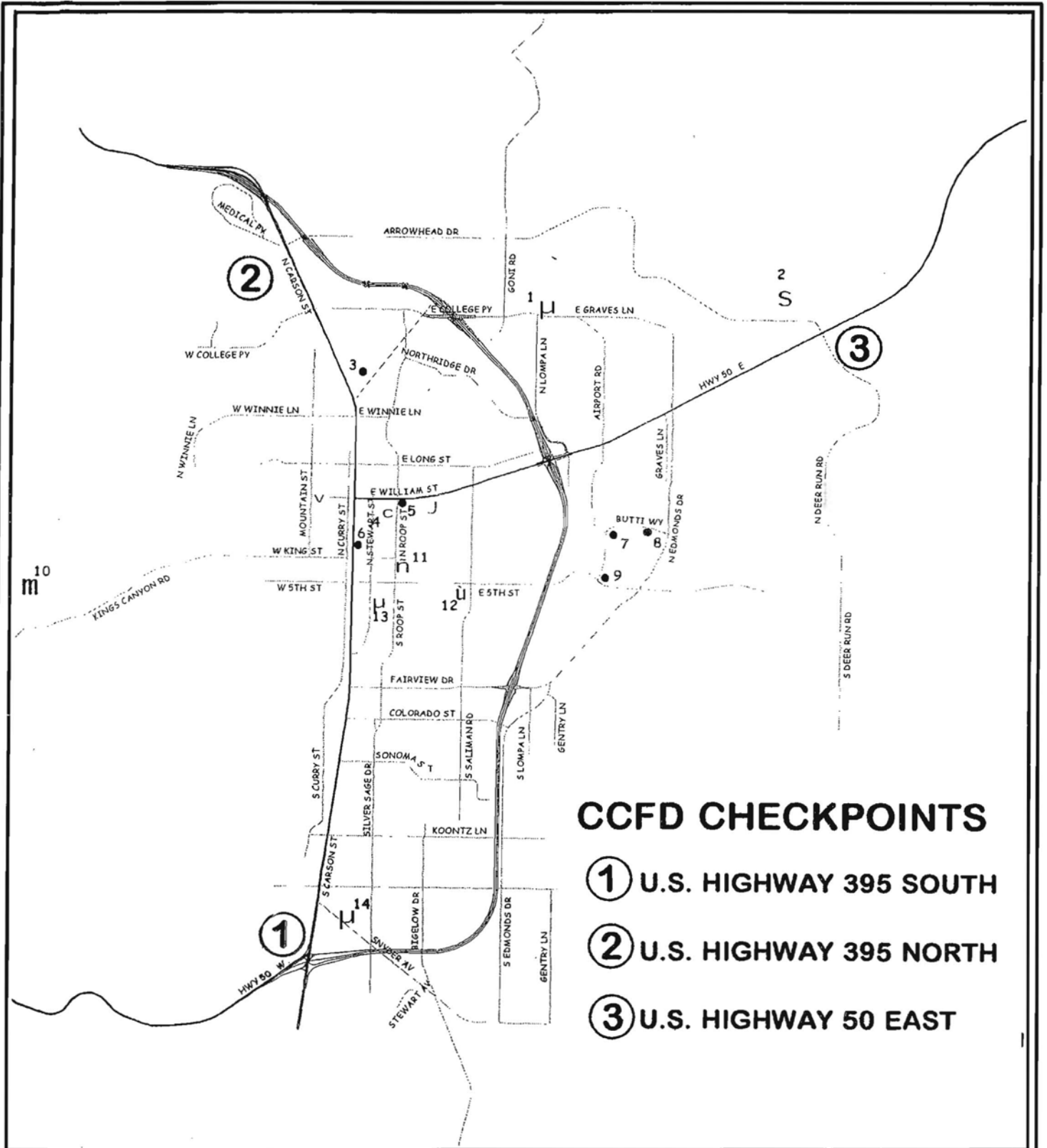


Figure 17--Hazard Classes, Excludes Empty



TRACTOR TRAILER CRASHES  
CARSON CITY  
2002

VEH TYPE	CRASH DATE	TIME OF CRASH	OCCURED ON STREET	DIST FROM REF STREET	REFERENCE STREET	CRASH TYPE	CONTRIBUTING FACTOR	SEVERITY	FATALITIE S	INJURIE S
TRUCK W/ONE TRAILER	9-May-02	8:00 AM	FAIRVIEW DRIVE	110	ROOP STREET	REAR-END COLLISION	IMPROPER BACKING	PROPERTY DAMAGE ONLY		
	15-Jun-02	9:24 AM	GRAVES LANE	187	GORDON STREET	JACKKNIFE IN ROADWAY	DEFECTIVE VEHICLE	PROPERTY DAMAGE ONLY		
	13-Aug-02	5:05 PM	US 395		COLORADO STREET	SIDESWIPE COLLISION-SAME DIRECTION	IMPROPER TURN	PROPERTY DAMAGE ONLY		
	8-Mar-02	3:50 PM	US 395	200	WINNIE LANE	REAR-END COLLISION	IMPROPER LANE CHANGE	PROPERTY DAMAGE ONLY		
	17-Jan-02	12:40 PM	US 395		BONANZA DRIVE	CHAIN REACTION COLLISION	FAILURE TO YIELD.	INJURY ACCIDENT		2
	1-Apr-02	11:50 AM	US 395		BONANZA DRIVE	SIDESWIPE COLLISION-SAME DIRECTION	IMPROPER TURN	PROPERTY DAMAGE ONLY		
	15-Jan-02	11:25 AM	US 395	700	SONOMA STREET	SIDESWIPE COLLISION-SAME DIRECTION	IMPROPER LANE CHANGE	PROPERTY DAMAGE ONLY		
	24-Sep-02	11:20 AM	US 395	275	ROBINSON STREET	REAR-END COLLISION	FOLLOWING TOO CLOSE	PROPERTY DAMAGE ONLY		
	31-Jan-02	10:50 AM	US 395	65	CLEARVIEW DRIVE	REAR-END COLLISION	FAILURE TO REDUCE SPEED	PROPERTY DAMAGE ONLY		
	5-Aug-02	9:20 AM	US 395	95	US 50	REAR-END COLLISION	FAILURE TO REDUCE SPEED	INJURY ACCIDENT		2
	12-Sep-02	9:05 AM	US 395		CORBETT STREET	REAR-END COLLISION	FOLLOWING TOO CLOSE	PROPERTY DAMAGE ONLY		
	23-May-02	7:35 AM	US 395	55	STEWART STREET	SIDESWIPE COLLISION-SAME DIRECTION	IMPROPER LANE CHANGE	PROPERTY DAMAGE ONLY		
	23-Apr-02	6:55 AM	US 395	20	BATH STREET	REAR-END COLLISION	FAILURE TO REDUCE SPEED	INJURY ACCIDENT		2
	23-Feb-02	10:00 AM	US 50	350	FLINT ROAD	REAR-END COLLISION	FAILURE TO REDUCE SPEED	INJURY ACCIDENT		1
	14-Mar-02	12:45 PM	US 50	30	GRAVES LANE	REAR-END COLLISION	IMPROPER BACKING	PROPERTY DAMAGE ONLY		
	24-Sep-02	1:15 PM	US 50	422	FLINT ROAD	REAR-END COLLISION	FAILURE TO REDUCE SPEED	PROPERTY DAMAGE ONLY		
	28-May-02	2:25 PM	US 50		FLINT ROAD	CHAIN REACTION COLLISION	FAILURE TO YIELD.	INJURY ACCIDENT		3
	3-Jan-02	8:26 AM	WASHINGTON STREET	75	CURRY STREET	PARKED VEHICLE	SPEED TOO FAST FOR CONDITION	INJURY ACCIDENT		1
TRUCK W/TWO TRAILERS	3-Jun-02	2:35 PM	US 395		CAROLINE STREET	REAR-END COLLISION	FAILURE TO REDUCE SPEED	PROPERTY DAMAGE ONLY		
	29-Aug-02	8:30 AM	US 50			RAN OFF ROAD AND STRUCK MEDIAN FIXED OBJECT	EXCESSIVE SPEED	INJURY ACCIDENT		1
TOTAL CRASHES : 20									Sum: 0	Sum: 12



**CCFD CHECKPOINTS**

- ① U.S. HIGHWAY 395 SOUTH
- ② U.S. HIGHWAY 395 NORTH
- ③ U.S. HIGHWAY 50 EAST

Carson City  
 GIS Division  
 3505 Butti Way  
 Carson City, NV 89701  
 (775) 887-2355 ex.1013

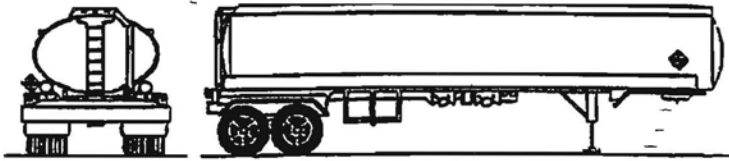
**CARSON CITY HAZARDOUS  
 MATERIALS TRANSPORTATION  
 COMMODITIES STUDY**

CARSON CITY, NEVADA  
 THIS MAP IS PREPARED FOR THE CITY OF CARSON CITY  
 FOR ILLUSTRATIVE PURPOSES ONLY. IT DOES NOT  
 REPRESENT A SURVEY. NO LIABILITY IS ASSUMED AS  
 TO THE SUFFICIENCY OR ACCURACY OF THE DATA  
 DELINEATED HEREON.

1 Inch equals 5,000 Feet

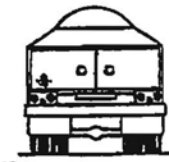


**ROAD TRAILER IDENTIFICATION CHART\***



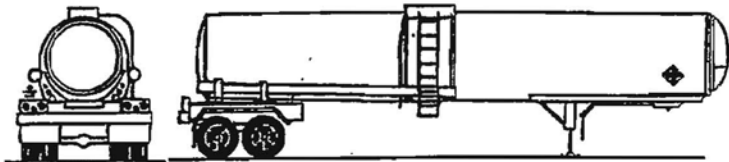
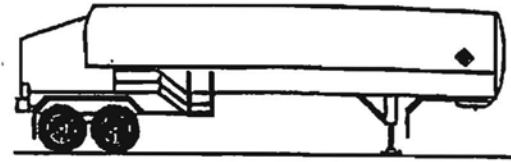
**MC306 Nonpressure  
Liquid Tank**

**131**



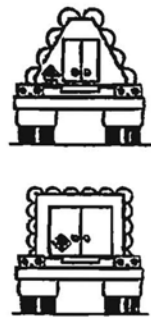
**MC-338 Cryogenic  
Liquid Tank**

**117**



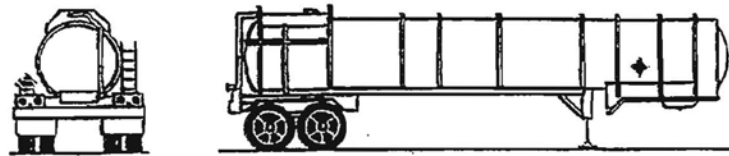
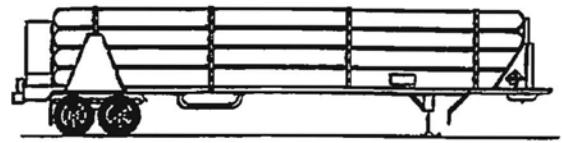
**MC307 Low Pressure  
Chemical Tank**

**137**



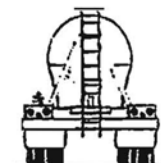
**Compressed Gas/  
Tube Trailer**

**117**



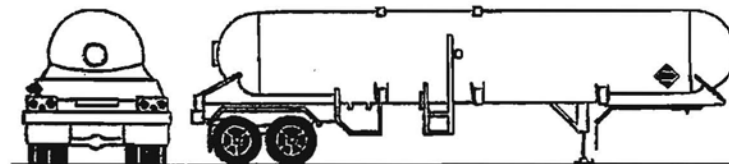
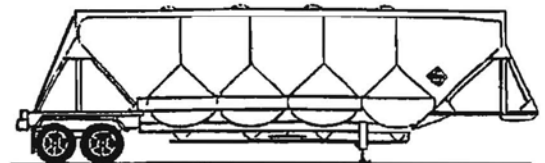
**MC-312 Corrosive  
Liquid Tank**

**137**



**Dry Bulk Cargo  
Tanker**

**134**



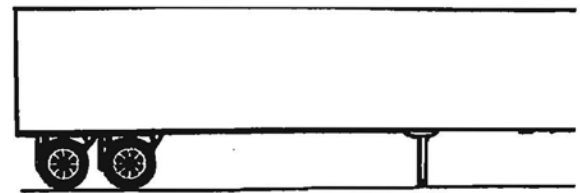
**MC-331 High Pressure  
Tank**

**117**



**Mixed Cargo**

**111**



# Appendix D—Placard Types

## CLASS I EXPLOSIVES



## CLASS 6 TOXIC



## CLASS 2 GAS



## CLASS 4 OTHER FLAMMABLE



## CLASS 7 RADIOACTIVE



## CLASS 3 FLAMMABLE LIQUIDS



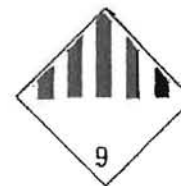
## CLASS 5 OXIDIZING SUBSTANCES



## CLASS 8 CORROSIVES



## CLASS 9 MISCELLANEOUS



CARSON CITY HAZARDOUS MATERIALS TRANSPORTATION COMMODITIES STUDY