

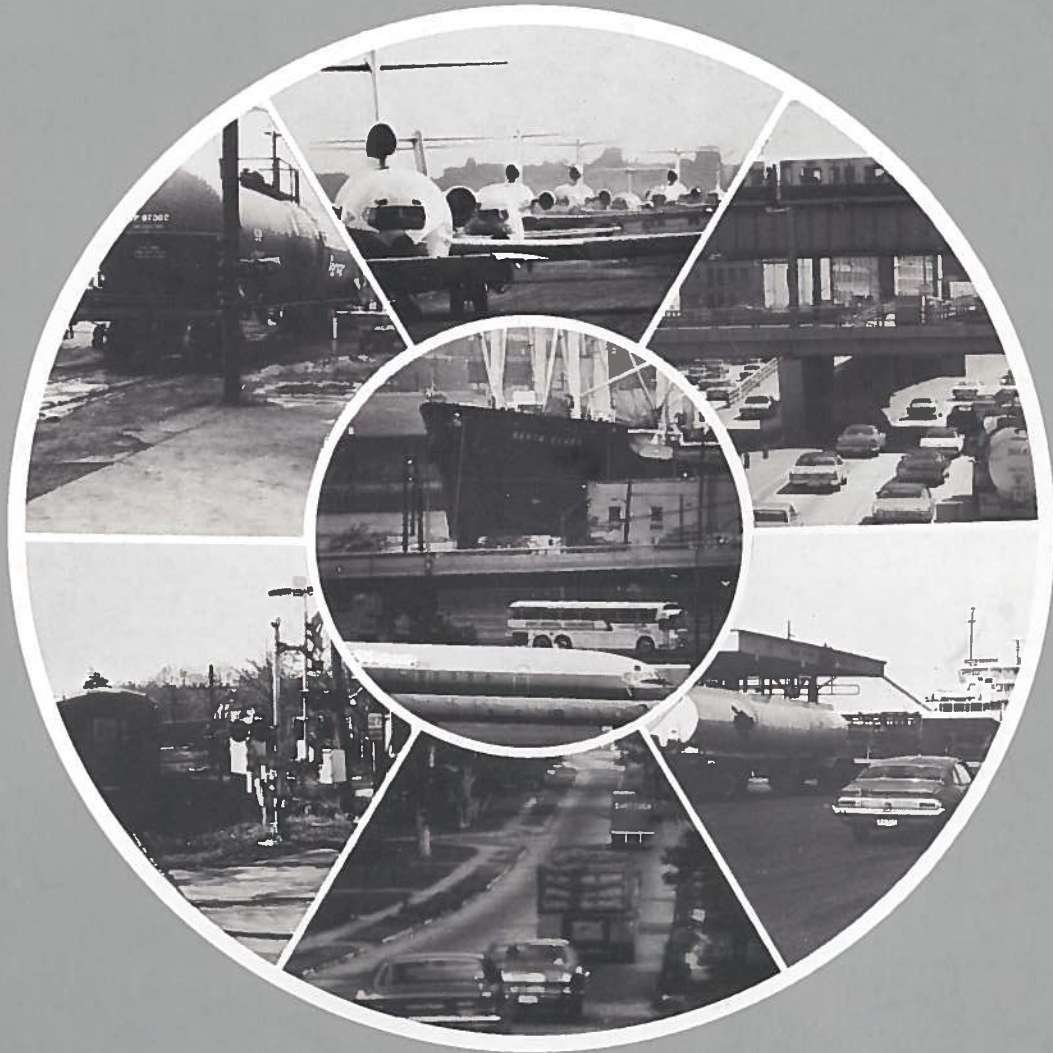
PA-88-3

DOT-TSC-RSPA-88-3



U.S. Department
of Transportation
**Research and
Special Programs
Administration**

Transportation Safety Information Report 1987 Annual Summary



Transportation Systems Center

Technical Report Documentation Page

1. Report No. DOT-TSC-RSPA-88-3		2. Government Accession No. PB-89-139-331		3. Recipient's Catalog No.	
4. Title and Subtitle TRANSPORTATION SAFETY INFORMATION REPORT 1987 ANNUAL SUMMARY				5. Report Date November 1988	
				6. Performing Organization Code DTS-32	
7. Author(s) James Kelley				8. Performing Organization Report No. DOT-TSC-RSPA-88-3	
9. Performing Organization Name and Address U.S. Department of Transportation Research and Special Programs Administration Transportation Systems Center, Center for Transportation Information, Cambridge, MA 02142				10. Work Unit No. (TRAIS) RS809/P8005	
				11. Contract or Grant No.	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Research and Special Programs Administration Office of Budget and Programs Washington, D.C. 20590				13. Type of Report and Period Covered Final Report 1987	
				14. Sponsoring Agency Code DMA-20	
15. Supplementary Notes					
16. Abstract <p>The "Transportation Safety Information Report" is a compendium of selected national-level transportation safety statistics for all modes of transportation. The report presents and compares data for transportation fatalities, accidents, and injuries for the current and preceding years. The report is based on data input to the Transportation Safety Information System (TRANSIS) by representatives in each of DOT's modal administrations and the National Transportation Safety Board.</p> <p>Featured in this annual report is the summary of modal safety hazards and safety program highlights for 1987, as well as summary charts detailing modal safety trends from 1977 to 1987.</p>					
17. Key Words Safety, Statistics, Transportation, Fatalities, Accidents, Injuries			18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Virginia 22161		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 120	22. Price

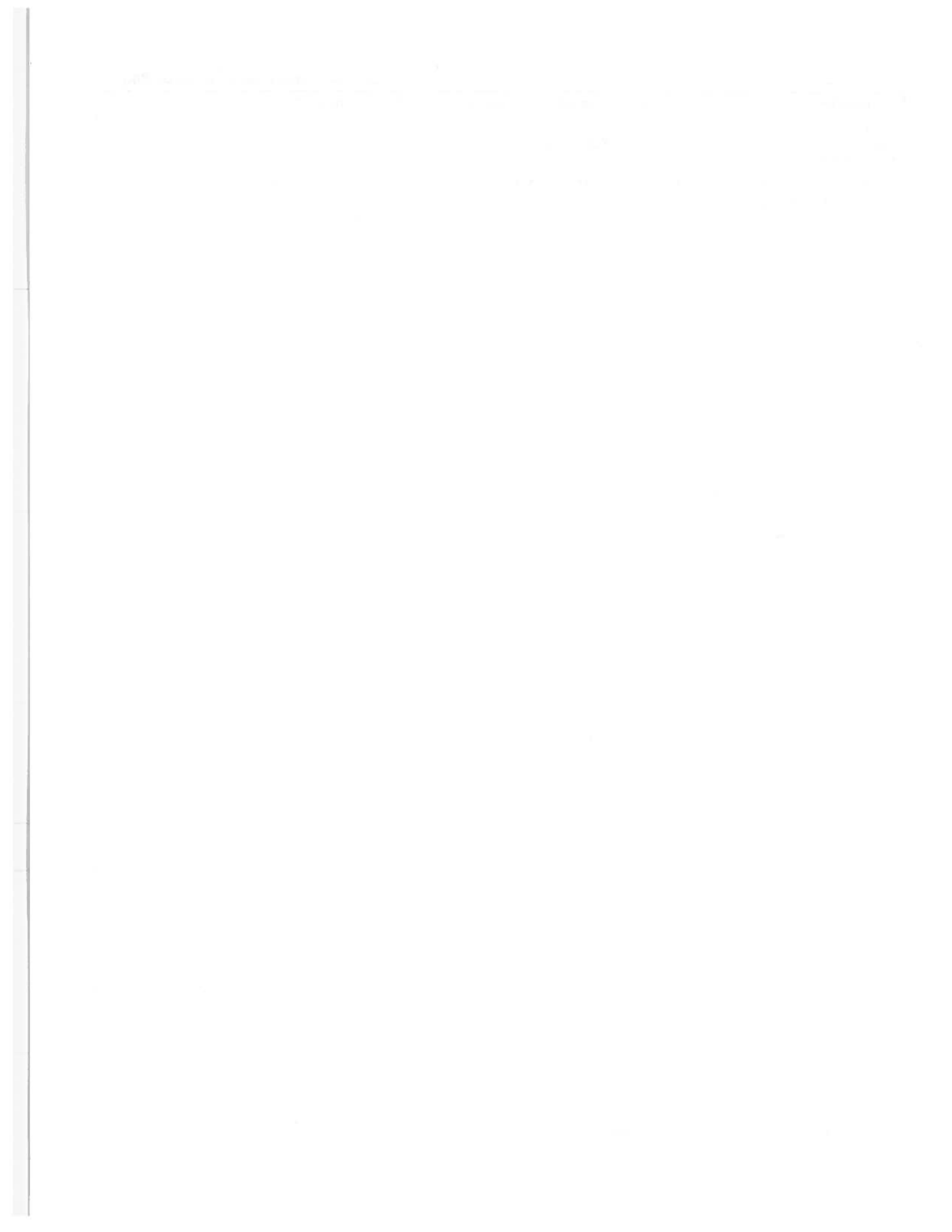


TABLE OF CONTENTS

	<u>Page No.</u>
SUMMARY STATISTICS OF TRANSPORTATION SAFETY	1
SAFETY PERFORMANCE BY MODE	
Highway	9
Railroad	27
Rail Rapid Transit	39
Aviation	
Air Carrier	45
General Aviation	58
Marine	
Waterborne Transport	70
Recreational Boating	79
Materials Transport	
Pipelines	87
Hazardous Materials	87
MAJOR DOT SAFETY REGULATIONS	100
GLOSSARY	106

LIST OF CHARTS

<u>Chart</u>	<u>Page No.</u>
1. Transportation Fatalities, 1987	1
2. Transportation Fatalities by Mode, 1986-1987	5
3. Transportation Accidents and Fatalities, 1977-1987	8
4. Motor Vehicle Traffic Fatalities, 1977, 1986 and 1987	11
5. Motor Vehicle Miles of Travel, 1986-1987	12
6. Motor Vehicle Accidents and Traffic Fatalities, 1977-1987	13
7. Motor Vehicle Traffic Fatality Rates, 1977-1987	14
8. Traffic Fatalities by Major Categories, 1977-1987	15
9. Motor Carrier Fatalities, Accidents and Injuries, 1976-1986	19
10. Fatality Rate Trends, 1973-1986	20
11. Fatality and Injury Trends, 1973-1987	21
12. Railroad Accidents and Fatalities and Rail-Highway Grade Crossing Fatalities, 1977-1987	28
13. Railroad Accident Rate Trends, 1977-1987	29
14. Train Accident Fatalities, Injuries and Accidents, 1986-1987	31
15. Train Incident Fatalities, Injuries and Accidents, 1986-1987	32
16. Nontrain Fatalities, Injuries and Incidents, 1986-1987	33
17. Grade Crossing Fatalities, Injuries and Incidents, 1986-1987	34
18. Train Accident Fatalities, Injuries and Accidents by Type, 1987	35
19. RRT Train and Non-Train Fatalities, Injuries and Accidents, 1986-1987	40
20. RRT Train Fatalities, Injuries and Incidents, 1986-1987	41
21. RRT Fire Reports, Fatalities and Injuries, 1986-1987	42
22. Fatalities, Accidents, and Fatal Accidents for U.S. Air Carriers, All Scheduled and Nonscheduled Service, 1977-1987	46
23. Accident Rates for U.S. Air Carriers, All Scheduled and Nonscheduled Service, 1977-1987	47
24. Fatal Accident Rates for U.S. Air Carriers, All Scheduled and Nonscheduled Service, 1977-1987	48
25. U.S. Air Carrier Accidents, 1986-1987	49
26. U.S. Air Carrier Fatal Accidents, 1986-1987	49
27. U.S. Air Carrier Fatalities, 1986-1987	50
28. U.S. Air Carrier Serious Injuries, 1986-1987	50

LIST OF CHARTS (Cont.)

<u>Chart</u>	<u>Page No.</u>
29. U.S. Air Carrier Fatalities and Fatal Accidents, All Scheduled Service, 1986-1987	51
30. U.S. Air Carrier Fatalities and Fatal Accidents, All Nonscheduled Service, 1986-1987	52
31. U.S. Air Carrier Passenger Fatality Rates, All Scheduled Revenue Passenger Service, 1977-1987	53
32. Accidents and Serious Injuries for U.S. Carriers, All Scheduled Service (Airlines), 1977-1987	54
33. General Aviation Accidents, Fatalities and Total Accidents, 1977-1987	58
34. General Aviation Accidents, and Serious Injuries, 1977-1987	59
35. General Aviation Accidents and Accident Rates, 1977-1987	60
36. General Aviation, Fatal Accidents and Rates, 1977-1987	61
37. General Aviation Fatalities and Fatality Rates, 1977-1987	62
38. General Aviation Accidents, 1986-1987	64
39. General Aviation Fatal Accidents, 1986-1987	64
40. General Aviation Fatalities, 1986-1987	65
41. General Aviation Serious Injuries, 1986-1987	65
42. General Aviation Fatalities by Aircraft Classification, 1987	66
43. Waterborne Accidents, Fatalities and Injuries Resulting from Vessel Casualties, 1977-1987	71
44. Waterborne Accidents by Month, 1986-1987	72
45. Vessels Involved in Waterborne Accidents, 1986-1987	73
46. Waterborne Fatalities Resulting from Vessel Casualties, 1986-1987	74
47. Waterborne Injuries Resulting from Vessel Casualties, 1986-1987	74
48. Waterborne Fatalities Not Related to Vessel Casualties, 1977-1987	75
49. U.S. Vessels Totally Lost in 1986	76
50. Fatalities Resulting from Total Loss of U.S. Vessels, 1986	77
51. Accidental Deaths Resulting from Falls Overboard, 1986	77
52. Recreational Boating Fatality Rates, 1977-1987	80
53. Recreational Boating Fatalities, Injuries and Accidents, 1977-1987	81
54. Reported Property Damage and Vessels Involved in Recreational Boating Accidents, 1977-1987	82

LIST OF CHARTS (Cont.)

<u>Chart</u>	<u>Page No.</u>
55. Recreational Boating Fatalities, 1986-1987	83
56. Recreational Boating Injuries, 1986-1987	83
57. Recreational Boating Reported Accidents, 1986-1987	84
58. Liquid and Gas Pipeline Leaks/Failures, 1977-1987	88
59. Liquid and Gas Pipeline Fatalities, 1977-1987	88
60. Gas Pipeline Fatalities, 1986-1987	90
61. Gas Pipeline Injuries, 1986-1987	90
62. Gas Pipeline Leaks/Failures, 1986-1987	90
63. Liquid Pipeline Fatalities, 1986-1987	91
64. Liquid Pipeline Injuries, 1986-1987	91
65. Liquid Pipeline Leaks/Failures, 1986-1987	91
66. Hazardous Materials Incidents, 1977-1987	92
67. Hazardous Materials Fatalities, 1977-1987	92
68. Hazardous Materials Injuries, 1977-1987	93
69. Hazardous Materials Fatalities, 1986-1987	93
70. Hazardous Materials Major Injuries, 1986-1987	94
71. Hazardous Materials Minor Injuries, 1986-1987	94
72. Hazardous Materials Incidents, 1986-1987	94
73. Hazardous Materials Incidents, Injuries, Deaths and Damages By Mode, 1987	95
74. Hazardous Materials Deaths by Top Six Commodities Involved, 1987	96
75. Hazardous Materials Injuries by Top 13 Commodities Involved, 1987	97
76. Hazardous Materials Incidents by Top 10 Commodities Involved, 1987	98
77. Hazardous Materials Damages by Top 10 Commodities Involved, 1987	99

LIST OF TABLES

<u>Table</u>	<u>Page No.</u>
1. Fatalities, Injuries, and Accidents by Transportation Mode, 1986-1987	4
2. Monthly Transportation Fatalities by Mode, 1986-1987	6
3. Motor Vehicle Traffic Data Comparisons, 1977, 1984-1987	10
4. Fatal Accidents by Posted Speed Limit, 1977, 1985-1987	16
5. Traffic Fatalities by Major Category, 1977, 1985-1987	17
6. Motor Carrier Fatalities, Accidents, and Injuries, by Type of Carrier, 1976-1986	18
7. Railroad Fatalities and Injuries, by Type of Person, 1985-1986	27
8. Railroad Fatalities by Month, 1986-1987	30
9. Commuter Carriers Accidents, Fatalities and Injuries, 1986-1987	55
10. On-Demand Air Taxis Accidents, Fatalities and Injuries, 1986-1987	56
11. Commuter Air Carriers Accidents, Fatalities and Accident Rates, 1977-1987	57
12. On-Demand Air Taxis Accidents, Fatalities and Accident Rates, 1977-1987	57
13. General Aviation Fatalities by Type of Flying, 1986-1987	63
14. Pipeline Fatalities by Month, 1986-1987	89

TRANSIS REPRESENTATIVES AND MANAGEMENT

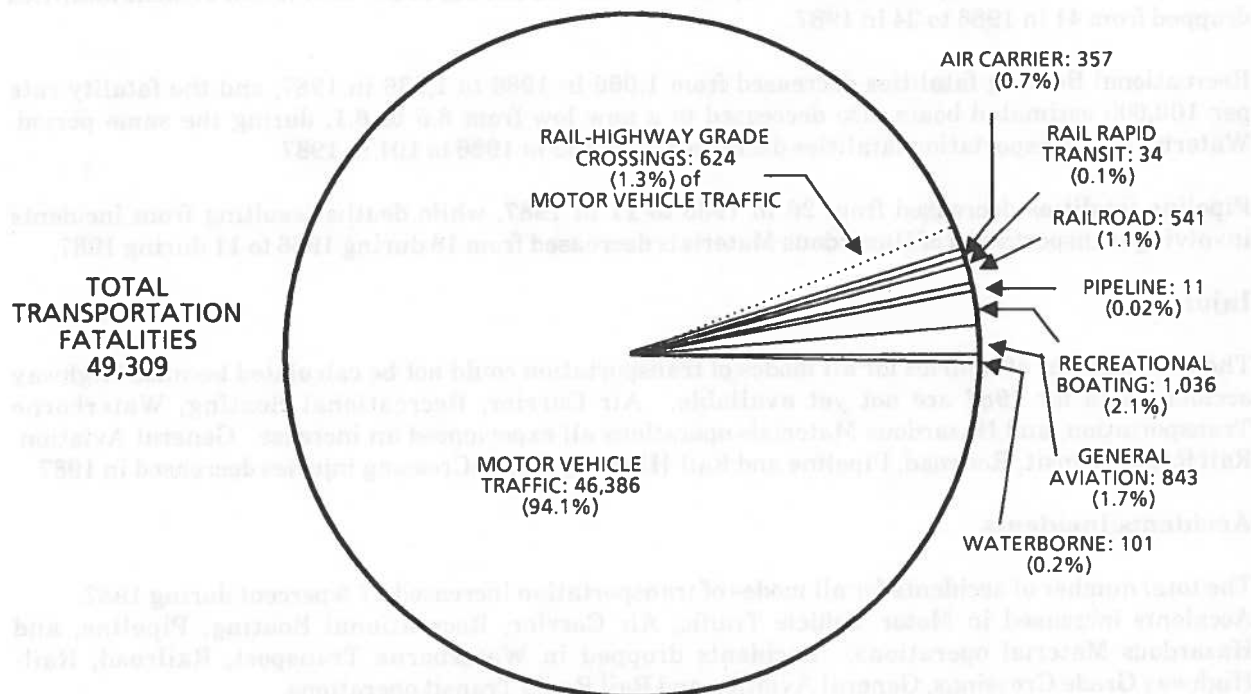
AGENCY	ROUTING SYMBOL	TELEPHONE	ROOM
RESEARCH & SPECIAL PROGRAMS ADMINISTRATION			
Richard C. Stevens	DMA-24	366-4348	8405
FEDERAL AVIATION ADMINISTRATION			
Charles J. Hoch	ASF-200	267-8256	330B(10A)
FEDERAL HIGHWAY ADMINISTRATION			
Phyllis Young	HHS-22	366-2159	3409
FEDERAL RAILROAD ADMINISTRATION			
Bruce Fine	RRS-20	366-0521	8314
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION			
Grace B. Hazzard	NRD-33	366-5820	6125H
NATIONAL TRANSPORTATION SAFETY BOARD			
J. Stanley Smith	SP-30	382-6672	834(10A)
URBAN MASS TRANSPORTATION ADMINISTRATION			
Steven Barsony	URT-6	366-0209	6428
UNITED STATES COAST GUARD			
Paul Ponce	G-MMI-3	267-1427	2406(TRPT)
Albert J. Marmo	G-NAB-2	267-1070	4220(TRPT)
TRANSIS MANAGEMENT			
SPONSOR-RSPA/MANAGEMENT INFORMATION SYSTEMS			
Richard C. Stevens	DMA-24	366-4348	8405
TASK MANAGER/PROGRAM COORDINATOR			
Michael A. Rossetti	DTS-32	837-2020	1161(TSC)
James Kelley	DTS-930	837-3439	854(TSC)

SUMMARY STATISTICS OF TRANSPORTATION SAFETY

- Total Transportation fatalities for 1987 rose to 49,309 from 48,920 in 1986, up nearly 1 percent.
- Motor Vehicle Traffic, Railroad, Air Carrier, and Rail-Highway Grade Crossings all experienced an increase in fatalities during 1987. Modes reporting a decrease in fatalities were General Aviation, Recreational Boating, Waterborne, Rail Rapid Transit, Pipeline operations, and Hazardous Materials operations.
- In 1987, injuries increased in Air Carrier, Waterborne Transportation, Recreational Boating, and Hazardous Materials operations. A decrease in injuries was reported for Railroad, General Aviation, Rail Rapid Transit, Rail-Highway Grade Crossings, and Pipeline.
- The total number of Motor Vehicle Traffic accidents increased in 1987, as did Air Carrier, Pipeline, Recreational Boating, and Hazardous Materials. General Aviation, Waterborne Transportation, Railroad, and Rail Rapid Transit operations experienced a decrease in accidents during 1987.

CHART 1.

TRANSPORTATION FATALITIES, 1987



1986 - 1987 STATISTICAL SUMMARY

Fatalities

The total number of transportation fatalities recorded in 1987 increased 0.7 percent when compared with 1986, as shown in Table 1. The following modes experienced an increase in reported fatalities in 1987: Motor Vehicle Traffic, Air Carrier, and Rail-Highway Grade Crossings. However, General Aviation, Recreational Boating, Pipeline, Waterborne Transportation, Hazardous Materials, and Rail Rapid Transit operations showed a decrease in 1987.

During 1987, an estimated 46,386 people died in Motor Vehicle Traffic accidents, up 0.7 percent from the 46,087 fatalities reported in 1986. The fatality rate per 100 million vehicle miles of travel was 2.43 in 1987, the lowest rate recorded in the past 11-year period. In addition, passenger car occupant fatalities rose, from 24,949 in 1986 to 25,114 in 1987. The total number of vehicles registered, number of licensed drivers and the total number of motor vehicle miles traveled all continued to rise in 1987.

U.S. Air Carrier fatalities, scheduled and nonscheduled, experienced a significant increase in 1987 when compared with 1986 -- from 4 to 232. Total Air Carrier fatalities, including Commuter Carriers and On-Demand Air Taxis, increased from 73 during 1986 to 357 during 1987. Both Commuter Carrier and On-Demand Air Taxi fatalities decreased in 1987. General Aviation fatalities fell to a 12-year low in 1987, from 1,019 to 843.

Railroad and Rail-Highway Grade Crossing fatalities experienced an increase during 1987 when compared with 1986. There were 541 Railroad fatalities in 1987 versus 475 in 1986, and 624 Rail-Highway Grade Crossing fatalities during 1987 versus 616 during 1986. Rail Rapid Transit fatalities dropped from 41 in 1986 to 34 in 1987.

Recreational Boating fatalities decreased from 1,066 in 1986 to 1,036 in 1987, and the fatality rate per 100,000 estimated boats also decreased to a new low from 6.5 to 6.1, during the same period. Waterborne Transportation fatalities decreased from 133 in 1986 to 101 in 1987.

Pipeline fatalities decreased from 26 in 1986 to 11 in 1987, while deaths resulting from incidents involving transportation of Hazardous Materials decreased from 16 during 1986 to 11 during 1987.

Injuries

The total number of injuries for all modes of transportation could not be calculated because Highway accident data for 1987 are not yet available. Air Carrier, Recreational Boating, Waterborne Transportation, and Hazardous Materials operations all experienced an increase. General Aviation, Rail Rapid Transit, Railroad, Pipeline and Rail-Highway Grade Crossing injuries decreased in 1987.

Accidents/Incidents

The total number of accidents for all modes of transportation increased 17.5 percent during 1987. Accidents increased in Motor Vehicle Traffic, Air Carrier, Recreational Boating, Pipeline, and Hazardous Material operations. Accidents dropped in Waterborne Transport, Railroad, Rail-Highway Grade Crossings, General Aviation and Rail Rapid Transit operations.

There were 20,800,000 estimated accidents involving Motor Vehicles in 1987 compared with 17,700,000 estimated for 1986. Air Carrier accidents also increased from 155 in 1986 to 169 in 1987. Recreational Boating accidents increased over 5 percent, from 6,407 in 1986 to 6,746 in 1987.

Hazardous Materials accidents/incidents rose 7.3 percent, from 5,758 in 1986 to 6,179 in 1987. Pipeline accidents/incidents also rose from 424 in 1986 to 467 in 1987.

Accidents decreased in Rail Rapid Transit operations by over 14 percent, from 3,686 in 1986 to 3,156 in 1987. General Aviation accidents dropped 4.5 percent; Railroad accidents dropped 1.9 percent, Waterborne Transport accidents dropped 2.2 percent and Rail-Highway Grade Crossing accidents were virtually unchanged.

MODE OF TRANSPORT	1986		1987		CHANGE %	REMARKS
	ACCIDENTS	INCIDENTS	ACCIDENTS	INCIDENTS		
Commercial Airplane	10	14	10	14	0%	
General Aviation	4,254	6,000	4,011	5,758	-4.5%	
Railroad	10	14	9	14	-10%	
Rail Rapid Transit	3,686	5,758	3,156	5,758	-14.1%	
Waterborne Transport	10	14	9	14	-22.2%	
Pipeline	424	600	467	600	10.9%	
Rail-Highway Grade Crossing	10	14	10	14	0%	
Motor Vehicle	10	14	10	14	0%	
Other	10	14	10	14	0%	
TOTAL	10,000	15,000	9,500	15,000	-5.0%	

TABLE 1.

FATALITIES, INJURIES, AND ACCIDENTS BY TRANSPORTATION MODE, 1986 - 1987

TRANSPORTATION MODE	FATALITIES		INJURIES		ACCIDENTS/INCIDENTS				
	1986	1987	% CHANGE	1986	1987	% CHANGE			
Motor Vehicle Traffic ¹	46,087	46,386	+ 0.7	1,700,000	N/A	-	17,700,000	20,800,000	+ 17.5
Railroad*	475	541	+ 13.9	24,465	23,604	-3.5	26,358	25,868	-1.9
Air Carrier**	73	357	+ 389.0	67	100	+ 49.3	155	169	+ 9.0
General Aviation***	1,019	843	-17.3	547	479	-12.4	2,583	2,467	-4.5
Recreational Boating	1,066	1,036	-2.8	2,847	3,501	+ 23.0	6,407	6,746	+ 5.3
Pipeline +	26	11	-57.7	138	113	-18.1	424	467	+ 10.1
Waterborne ²	133	101	-24.1	139	188	+ 35.3	3,366	3,292	-2.2
Rail Rapid Transit#	41	34	-17.1	3,642	3,122	-14.3	3,683	3,156	-14.3
Total Transportation ³	48,920	49,309	+ 0.8	1,731,845	N/A	-	17,742,976	20,842,165	+ 17.5
Hazardous Materials ⁴	16	11	-31.3	316	328	+ 3.8	5,758	6,179	+ 7.3
Rail-Highway Grade Crossings ⁴	616	624	+ 1.3	2,458	2,429	-1.2	6,396	6,392	-0.1

N/A Not available.

* Fatalities, injuries, and accidents resulting from train accidents, train incidents, and nontrain incidents.

** Air Carrier now includes Commuter Carriers and Air Taxis. Injuries are serious injuries only.

*** Injuries are serious injuries only.

Fatalities and injuries resulting from train and nontrain accidents.

+ Includes Gas and Liquid Pipeline.

¹ Fatality figures are NHTSA estimates for the 50 states and District of Columbia based on a 30-day definition (see Glossary).

² Accident data are obtained from National Safety Council estimates. 1987 injury data are preliminary.

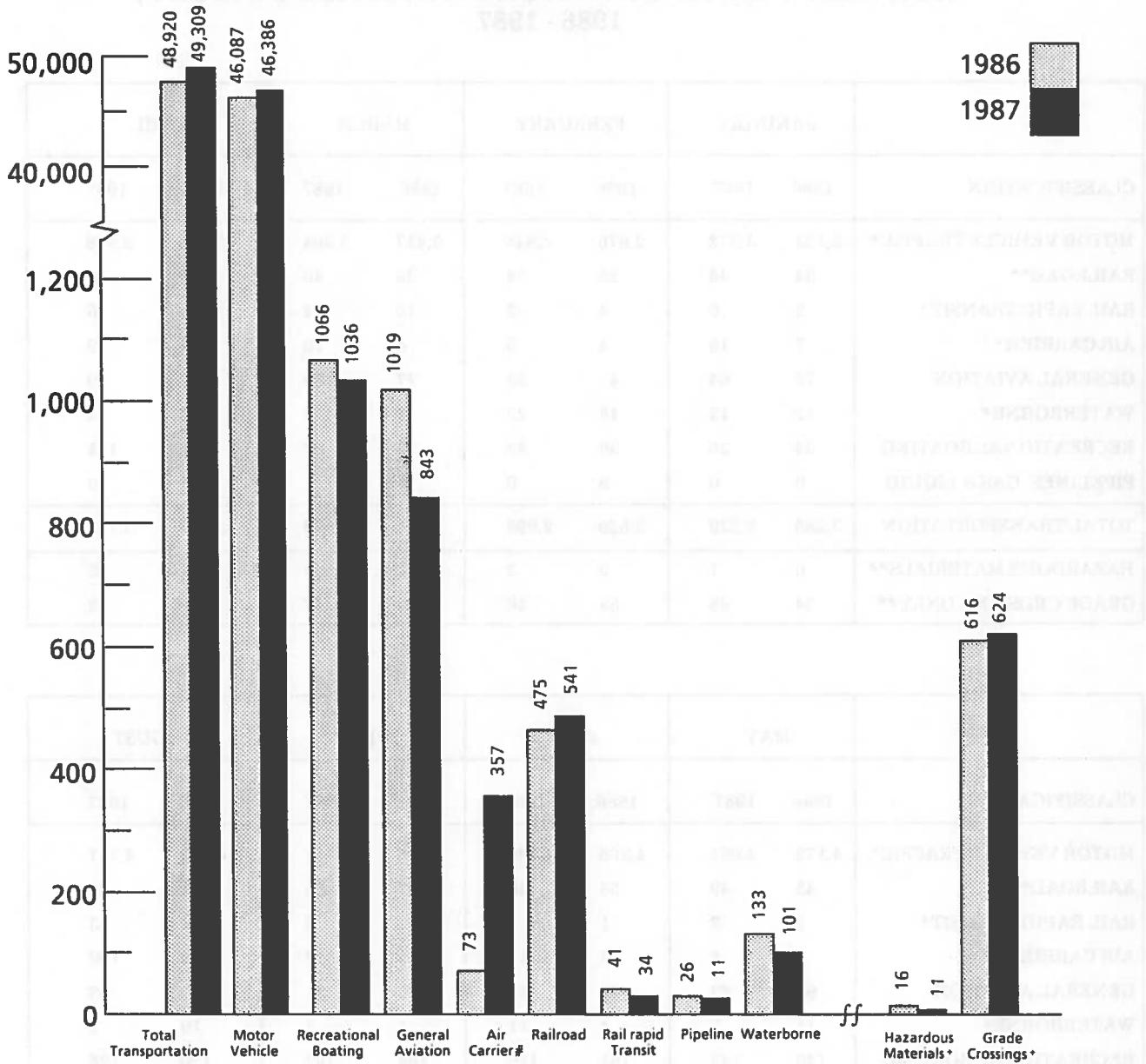
³ Waterborne data are for vessel casualties only. 1986 and 1987 data are incomplete.

⁴ Total includes Rail-Highway Grade Crossing fatalities which are not reported in Railroad figure.

These fatalities are included in the above modes and Total Transportation. Hazardous Materials operations injuries include major and minor injuries.

CHART 2.

TRANSPORTATION FATALITIES BY MODE 1986 - 1987



Note: Data for individual modes are shown in Table 1. 1986 Data are preliminary.
 * Total Transportation includes Rail-Highway Grade Crossing fatalities which are not reported in Railroad figure.
 ** Traffic fatalities are NHTSA's estimates based on a 30-day definition. (see Glossary).
 + These fatalities are included in other modes and Total Transportation.
 # Air Carrier includes Commuter Carriers and Air Taxes.

TABLE 2.
MONTHLY TRANSPORTATION FATALITIES BY MODE,
1986 - 1987

CLASSIFICATION	JANUARY		FEBRUARY		MARCH		APRIL	
	1986	1987	1986	1987	1986	1987	1986	1987
MOTOR VEHICLE TRAFFIC*	3,123	3,072	2,676	2,845	3,417	3,364	3,508	3,488
RAILROAD**	34	36	25	38	34	40	30	45
RAIL RAPID TRANSIT+	2	0	4	2	10	4	6	6
AIR CARRIER++	7	18	4	5	4	10	1	9
GENERAL AVIATION	73	64	47	53	77	59	72	69
WATERBORNE#	12	13	18	22	3	4	7	14
RECREATIONAL BOATING	34	36	38	33	78	97	95	131
PIPELINES, GAS & LIQUID	0	0	8	0	1	1	1	0
TOTAL TRANSPORTATION	3,285	3,239	2,820	2,998	3,624	3,579	3,720	3,762
HAZARDOUS MATERIALS##	0	1	0	2	1	0	1	2
GRADE CROSSING ONLY##	54	68	53	46	60	47	40	42

CLASSIFICATION	MAY		JUNE		JULY		AUGUST	
	1986	1987	1986	1987	1986	1987	1986	1987
MOTOR VEHICLE TRAFFIC*	4,173	4,081	4,305	4,130	4,495	4,241	4,730	4,711
RAILROAD**	45	49	58	46	67	65	49	45
RAIL RAPID TRANSIT+	1	2	1	1	3	6	4	3
AIR CARRIER++	6	6	5	10	4	2	16	162
GENERAL AVIATION	99	63	125	68	85	81	172	83
WATERBORNE#	11	7	4	11	1	7	19	2
RECREATIONAL BOATING	140	143	161	129	164	162	120	126
PIPELINES, GAS & LIQUID†	1	0	1	3	3	3	0	1
TOTAL TRANSPORTATION	4,476	4,351	4,660	4,398	4,822	4,567	5,110	5,133
HAZARDOUS MATERIALS##	2	0	3	1	0	0	4	0
GRADE CROSSING ONLY##	42	29	47	40	58	46	52	64

TABLE 2.
MONTHLY TRANSPORTATION FATALITIES BY MODE,
1986 - 1987 (Continued)

CLASSIFICATION	SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	1986	1987	1986	1987	1986	1987	1986	1987
MOTOR VEHICLE TRAFFIC*	4,003	4,145	4,114	4,380	3,787	4,021	3,756	3,908
RAILROAD**	36	53	37	42	26	36	34	46
RAIL RAPID TRANSIT+	3	2	3	2	0	2	4	4
AIR CARRIER++	4	6	9	3	5	50	8	76
GENERAL AVIATION	60	77	55	84	74	85	80	57
WATERBORNE#	25	2	12	2	7	14	14	3
RECREATIONAL BOATING	99	63	54	46	57	41	26	29
PIPELINES, GAS & LIQUID	3	0	2	0	1	2	5	1
TOTAL TRANSPORTATION	4,233	4,348	4,286	4,559	3,957	4,251	3,927	4,124
HAZARDOUS MATERIALS##	2	1	2	3	0	0	1	1
GRADE CROSSING ONLY##	54	54	52	70	54	57	50	61

CLASSIFICATION	12-MONTH TOTALS		
	1986	1987	% CHANGE
MOTOR VEHICLE TRAFFIC*	46,087	46,386	+0.7
RAILROAD**	475	541	+13.9
RAIL RAPID TRANSIT+	41	34	-17.1
AIR CARRIER++	73	357	+389.0
GENERAL AVIATION	1,019	843	-17.3
WATERBORNE#	133	101	-24.1
RECREATIONAL BOATING	1,066	1,036	-2.8
PIPELINES†	26	11	-57.7
TOTAL TRANSPORTATION	48,920	49,309	+0.8
HAZARDOUS MATERIALS##	16	11	-31.3
GRADE CROSSING ONLY##	616	624	+1.3

NOTE:

1987 data are preliminary.

* Traffic fatalities are NHTSA's estimates based on a 30-day definition.

** Fatalities resulting from train accidents, train incidents, and nontrain incidents. Train-related grade crossing fatalities are not included.

+ Fatalities resulting from train and nontrain incidents.

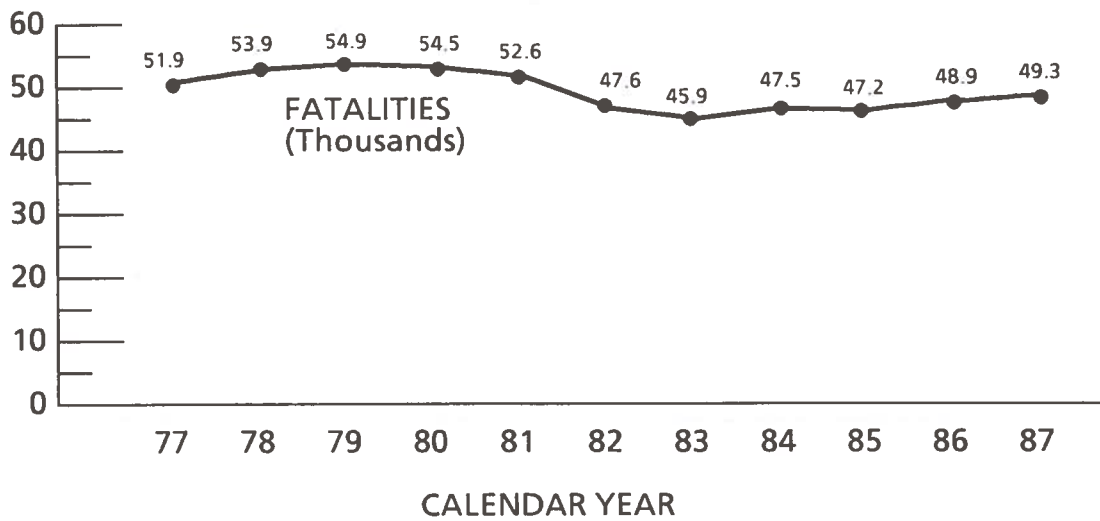
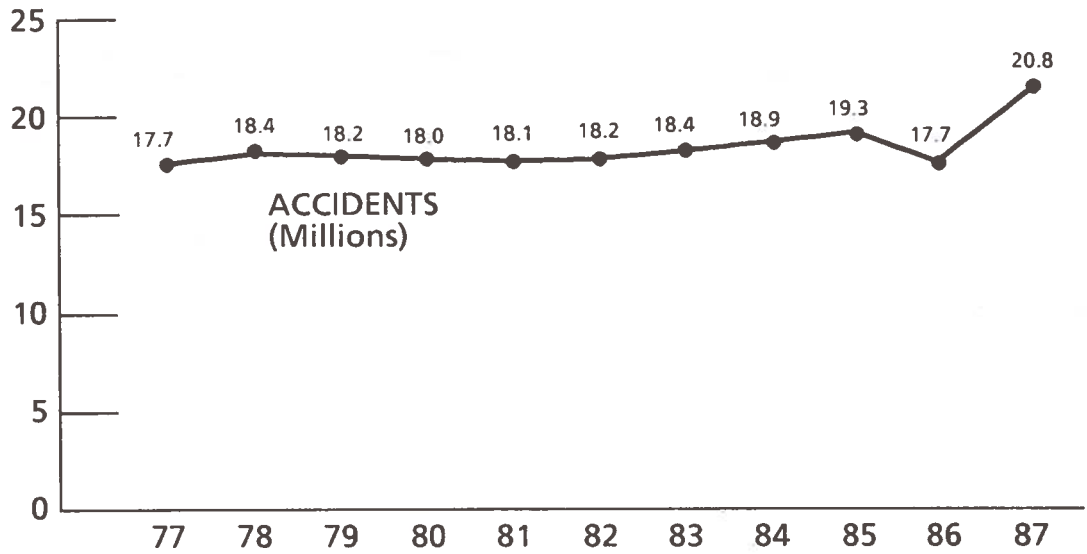
++ Air Carrier includes Commuter Carriers and Air Taxis (see Glossary).

Waterborne data are for vessel casualties only. Data for 1986 and 1987 are preliminary.

Highway related grade crossing and hazardous materials fatalities are included in Total Transportation. However, rail-related grade crossing fatalities are not included monthly. Twelve month total transportation figures include Rail-Highway Grade Crossing fatalities which are not reported in the Railroad figure.

CHART 3.

TRANSPORTATION ACCIDENTS AND FATALITIES*, 1977 - 1987



* Most accidents and fatalities are Motor Vehicle Traffic related.

HIGHWAY

- The death toll on the nation's highways, which dipped in 1983 to its lowest point in 20 years, is on the increase. An estimated 46,386 were killed in 1987, up 0.65 percent from the 46,087 highway fatalities of the year before and the highest total since 1981.
- An estimated 51 percent of the 46,386 fatalities in 1987 were alcohol-related; 40 percent of all fatal crashes involved a drunk driver or pedestrian (16,561 crashes out of a total of 41,435 fatal crashes); nearly 38 percent of all fatally-injured drivers were drunk; and close to 25 percent of all drivers in fatal crashes were drunk at the time of their crash.
- Preliminary estimates of travel show an increase of 3.9 percent in 1987. The fatality rate per 100 million vehicle miles of travel was 2.43 in 1987, a decrease of 3.2 percent over the rate in 1986.
- The number of licensed drivers increased 1.6 percent from 1986 to 1987, while the number of vehicles registered increased 2.7 percent during the same period. However, the increases are much more dramatic when 1977 through 1987 are compared. The number of licensed drivers rose over 17 percent and the number of registered vehicles nearly 22 percent in the 11-year period.
- When occupant fatalities by type of motor vehicle are compared for 1986 and 1987, passenger cars recorded a 0.7 percent increase while trucks increased 7.9 percent; motorcycles dropped 11.7 percent, and other vehicle types fell over 9 percent. Total non-occupant fatalities decreased 0.3 percent during the same period.
- Occupants of passenger cars accounted for more than half of the total highway fatalities in 1987. The largest proportion of these fatalities were occupants of subcompact and full size cars -- 35 and 24 percent, respectively.

TABLE 3.

MOTOR VEHICLE TRAFFIC DATA COMPARISONS*, 1977, 1984-1987^E

	1977	1984	1985	1986	1987 ^E	Average Annual % Change 1977-1987	% Change 1984-1985	% Change 1986-1987	% Change 1977-1987
Total Registered Motor Veh (000) [†]	148,765	171,729	177,098	176,191	180,989	+ 1.98	+ 3.13	+ 2.72	+ 21.66
Automobiles	113,696	128,271	131,864	135,431	139,041	+ 2.03	+ 2.80	+ 2.67	+ 22.29
Trucks	29,562	37,394	39,196	40,166	41,134	+ 3.36	+ 4.82	+ 2.41	+ 39.14
Buses	492	584	594	594	308	-4.58	+ 1.71	-48.15	-37.40
Motorcycles	5,015	5,480	5,444	5,262	5,148	+ 0.26	-0.66	-2.17	+ 2.65
Licensed Drivers (000)	138,121	155,391	156,868	159,487	161,975	+ 1.61	+ 0.95	+ 1.56	+ 17.27
Percent under 25 years old	22.1	19.0	18.3	17.4	17.4	-2.36	-3.68	0.0	-21.27
Percent over 64 years old	9.9	11.7	11.9	12.3	12.3	+ 2.19	+ 1.71	0.0	+ 24.24
Vehicle Mileage (Billions)	1,467	1,720	1,774	1,838	1,909	+ 2.67	+ 3.14	+ 3.86	+ 30.13
Traffic Fatalities	47,878	44,257	43,825	46,087	46,386	-0.32	-0.98	+ 0.65	-3.12
Traffic Fatality Rate***	3.26	2.57	2.47	2.51	2.43	-2.90	-3.89	-3.19	-25.46

E: Estimated.

* All data include the 50 States and the District of Columbia.

** Preliminary.

*** Per 100 Million Vehicle Miles.

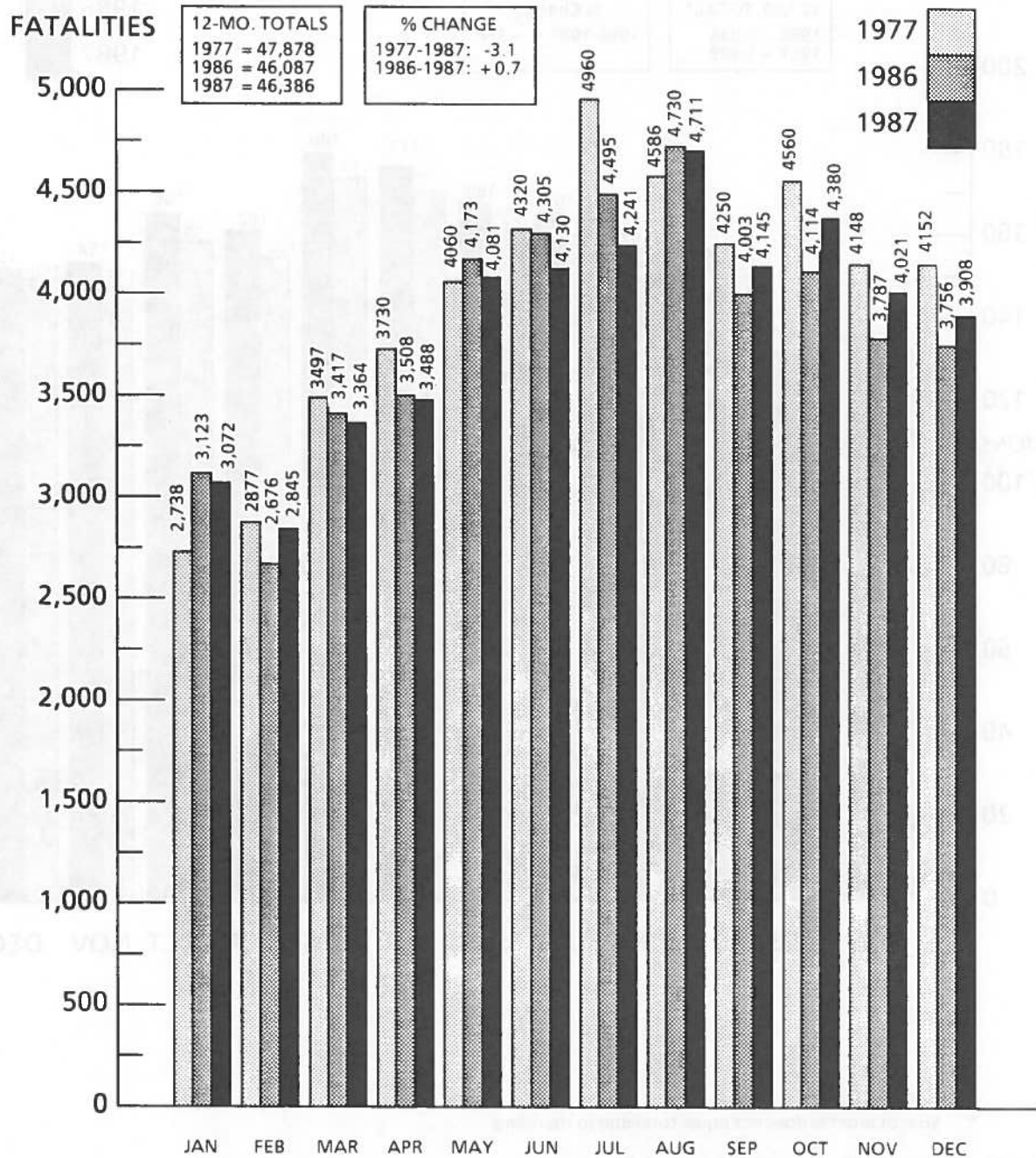
† Excludes motorcycles.

Note: Totals may not add due to rounding.

SOURCE: Registered Vehicles, Licensed Drivers and Vehicle Mileage, FHWA, Highway Statistics, 1977, 1984, 1985, 1986, Tables MV-1, DL-20, VM-1. Registered Vehicles, Licensed Drivers and Vehicle Mileage, 1987, FHWA, Office of Highway Planning. Fatalities - NHTSA, National Center for Statistics and Analysis, Fatal Accident Reporting System (FARS).

CHART 4.

MOTOR VEHICLE TRAFFIC FATALITIES BY MONTH, 1977, 1986 AND 1987

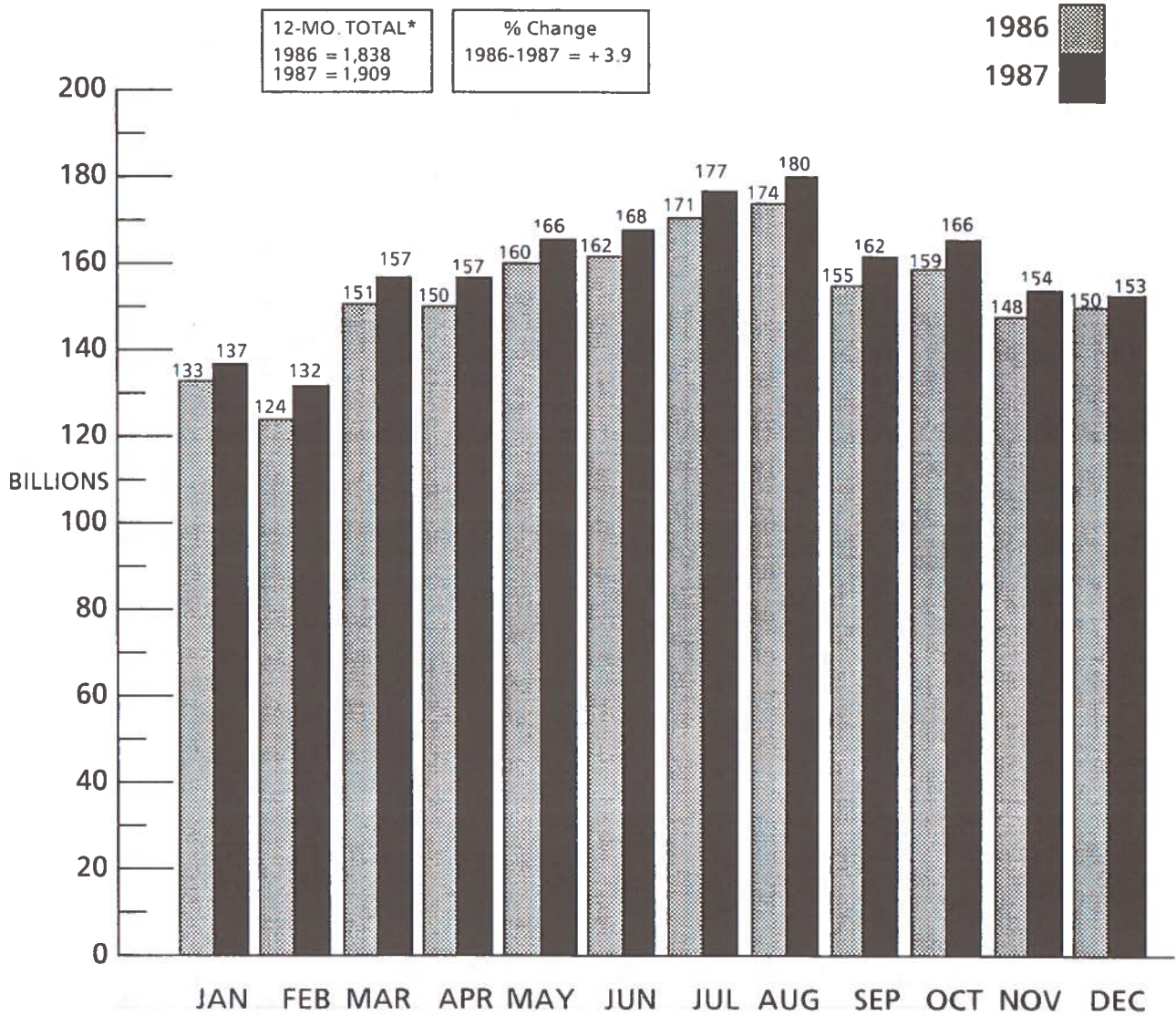


NOTE: Figures are based on 30-day fatality definition (see Glossary).
 1987 data are preliminary.

SOURCE: Fatal Accident Reporting System (FARS), NHTSA, NCSA, NRD-33.

CHART 5.

MOTOR VEHICLE MILES OF TRAVEL, 1986 - 1987^P



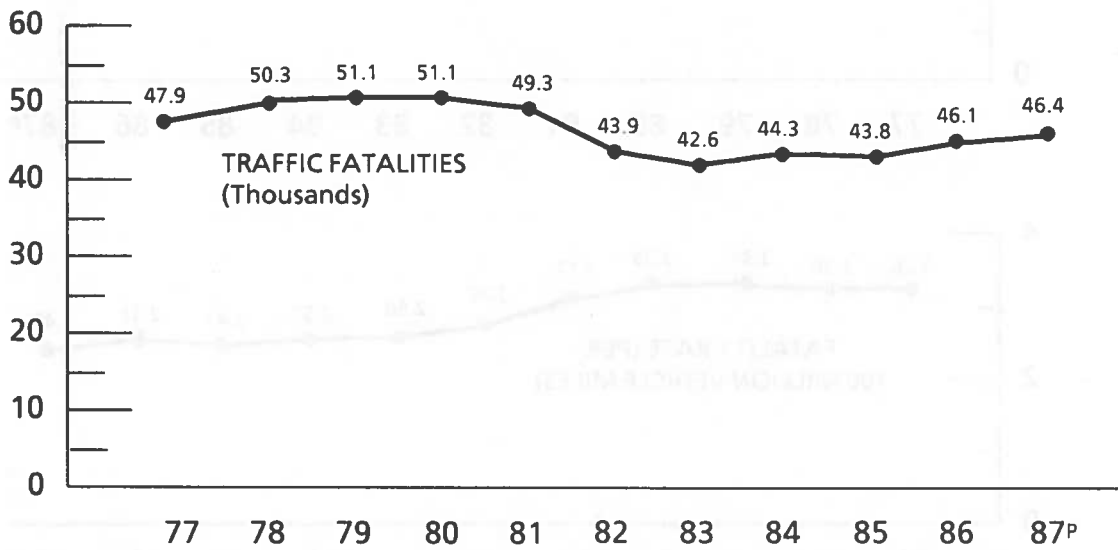
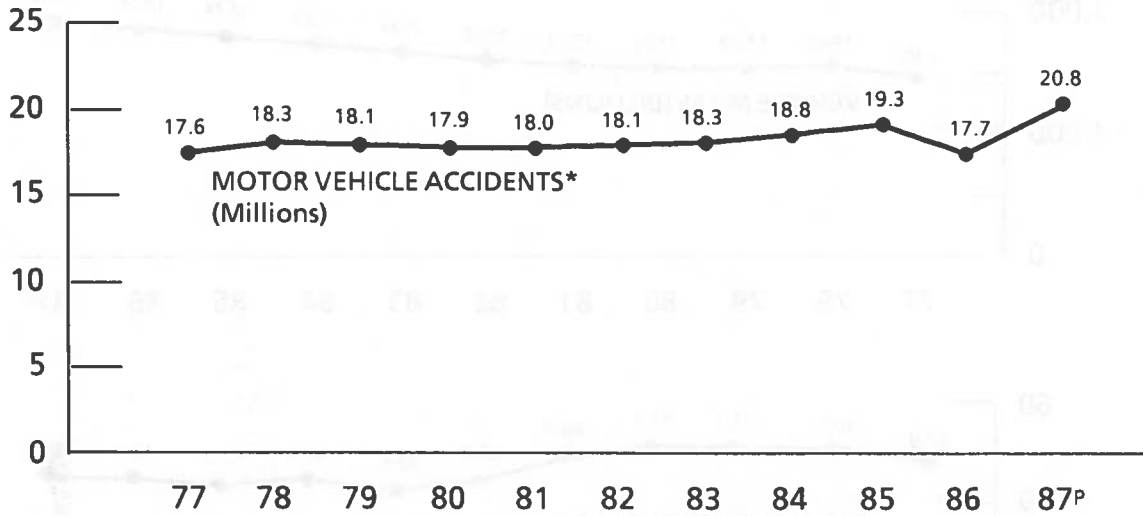
^P = Preliminary.

* Sum of months does not equal total due to rounding.

SOURCE: FHWA, Office of Highway Safety, HHS-22.

CHART 6.

MOTOR VEHICLE ACCIDENTS AND TRAFFIC FATALITIES 1977 - 1987



CALENDAR YEAR

P = Preliminary.

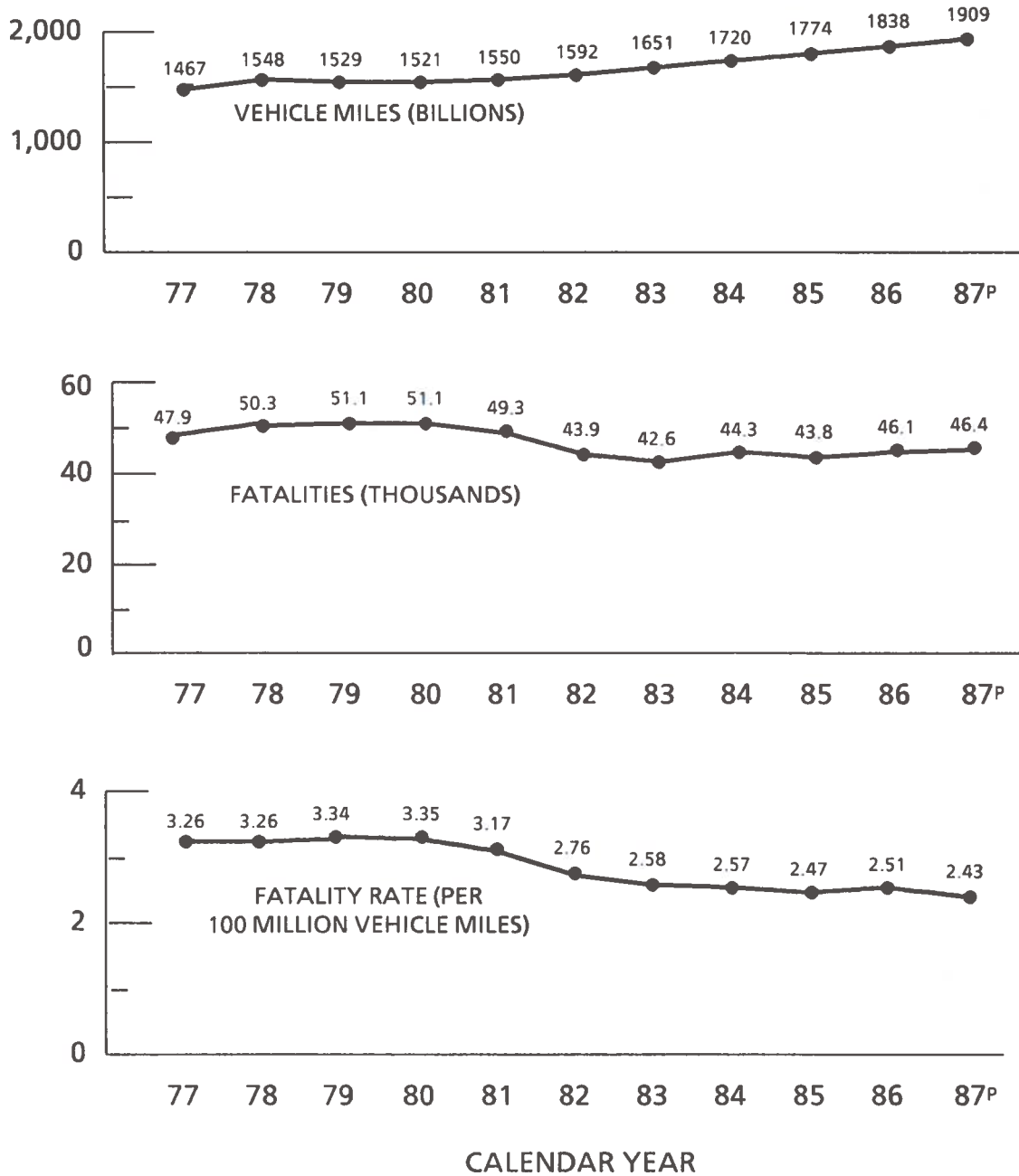
* The National Safety Council reports motor vehicle accidents rather than motor vehicle traffic accidents. The numbers shown are larger than the number of motor vehicle traffic accidents upon which the traffic fatalities are based.

NOTE: Fatalities in this chart are based on a 30-day definition, and include 50 states and the District of Columbia.

SOURCE: Fatality Data, NHTSA, Fatal Accident Reporting System (FARS).
Accident Data, National Safety Council, Accident Facts.

CHART 7.

**MOTOR VEHICLE TRAFFIC FATALITY RATES
1977 - 1987**



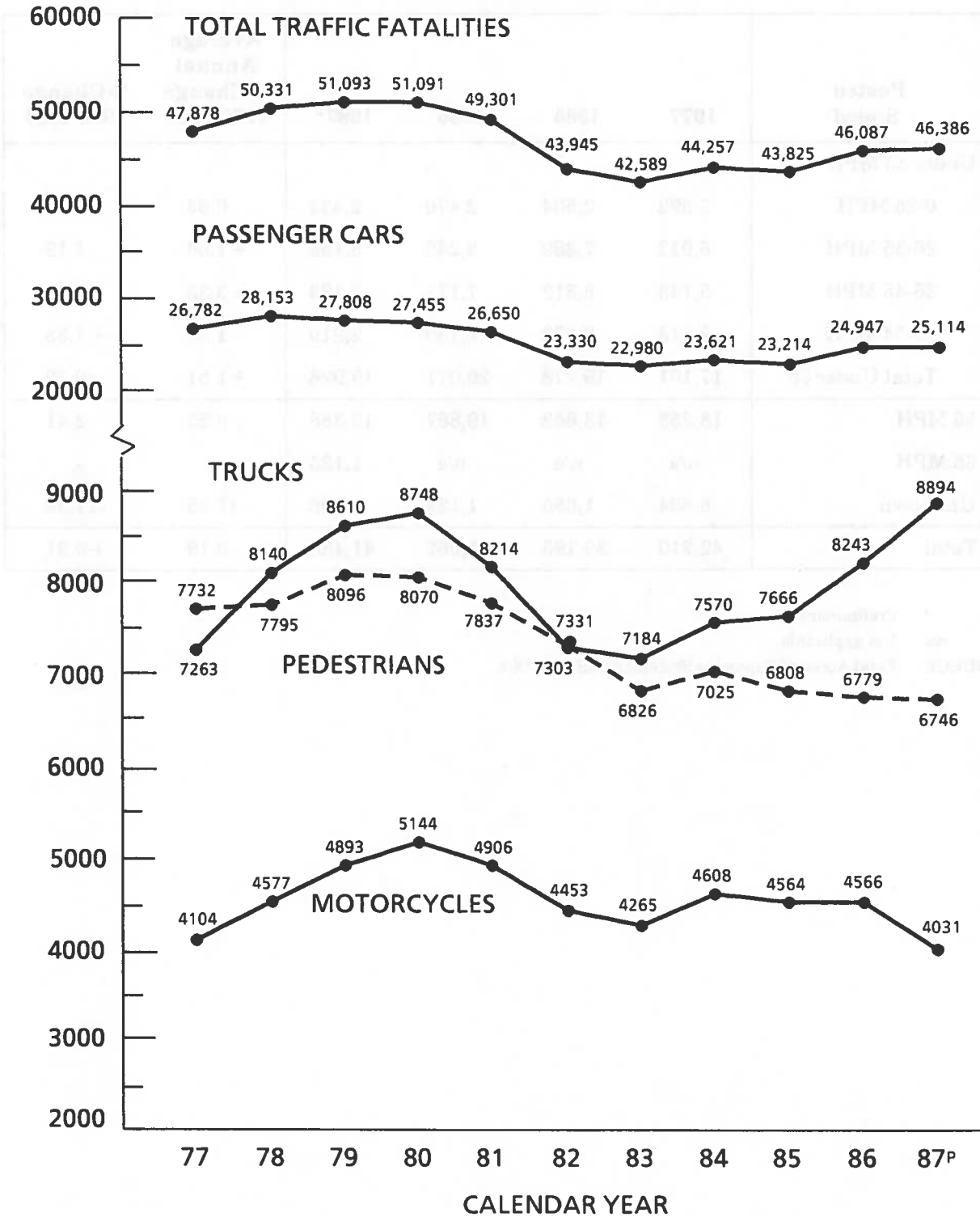
P = Preliminary

NOTE: Fatalities in this chart are based on a 30-day definition, and include 50 states and the District of Columbia.

SOURCE: Fatality data is from NHTSA, Fatal Accident Reporting System (FARS).
Vehicle-mile data is from FHWA, Office of Highway Planning, HHP-44.
Fatality rate data is from NHTSA, NCSA, NRD-33

CHART 8.

TRAFFIC FATALITIES BY MAJOR CATEGORIES 1977 - 1987



P = Preliminary.
SOURCE: Fatal Accident Reporting System (FARS), NHTSA, NCSA, NRD-33.

TABLE 4.
FATAL ACCIDENTS BY POSTED SPEED LIMIT, 1977, 1985-1987*

Posted Speed					Average Annual	
	1977	1985	1986	1987*	% Change 1977-1987	% Change 1986-1987
Under 55 MPH						
0-25 MPH	2,592	2,504	2,470	2,433	-0.63	-1.50
26-35 MPH	6,913	7,889	8,248	8,150	+1.66	-1.19
36-45 MPH	5,143	6,813	7,173	7,133	+3.33	-0.56
46-54 MPH	2,513	2,072	2,180	2,210	-1.28	+1.38
Total Under 55	17,161	19,278	20,071	19,926	+1.51	-0.72
55 MPH	18,355	18,862	19,867	19,388	+0.55	-2.41
65 MPH	n/a	n/a	n/a	1,125	-	-
Unknown	6,694	1,055	1,124	996	-17.35	-11.39
Total	42,210	39,195	41,062	41,435	-0.19	+0.91

* Preliminary.

n/a Not applicable.

SOURCE: Fatal Accident Reporting System (FARS), NHTSA.

TABLE 5.

TRAFFIC FATALITIES BY MAJOR CATEGORY, 1977, 1985-1987*

Occupant Fatalities by Vehicle Type

	1977	1985	1986	1987*	Average Annual % Change 1977-1987	% Change 1986-1987
Passenger Cars	26,782	23,214	24,949	25,114	-0.64	+0.66
Subcompact	4,910	7,850	8,536	8,693	+5.88	+1.84
Compact	696	2,635	3,350	3,923	+18.88	+17.10
Intermediate	2,049	4,391	4,803	4,900	+9.11	+2.02
Full	11,642	6,586	6,903	6,067	-6.31	-12.11
Unknown	7,485	1,751	1,357	1,531	-14.67	+12.82
Trucks	7,263	7,666	8,243	8,894	+2.05	+7.90
Light Trucks	5,976	6,689	7,317	8,042	+3.01	+9.91
Heavy Trucks	990	820	781	728	-3.03	-6.79
Other Trucks	297	157	145	124	-8.36	-14.48
Motorcycles	4,104	4,564	4,566	4,031	-0.18	-11.72
Other and Unknown Vehicle Type	1,001	599	476	519	-6.36	-9.03
Total	39,150	36,043	38,234	38,558	-0.15	+0.85

Non-Occupant Fatalities

	1977	1985	1986	1987*	Average Annual % Change 1977-1987	% Change 1986-1987
Pedestrian	7,732	6,808	6,779	6,746	-1.35	-0.37
Pedalcyclist	922	890	941	949	+0.29	+0.85
Other	74	84	133	133	+0.64	0.0
Total	8,728	7,782	7,853	7,828	-1.08	-0.32

* Preliminary.

SOURCE: Fatal Accident Reporting System (FARS), NHTSA.

TABLE 6.
MOTOR CARRIER* FATALITIES, ACCIDENTS, AND
INJURIES, BY TYPE OF CARRIER,
1976-1986

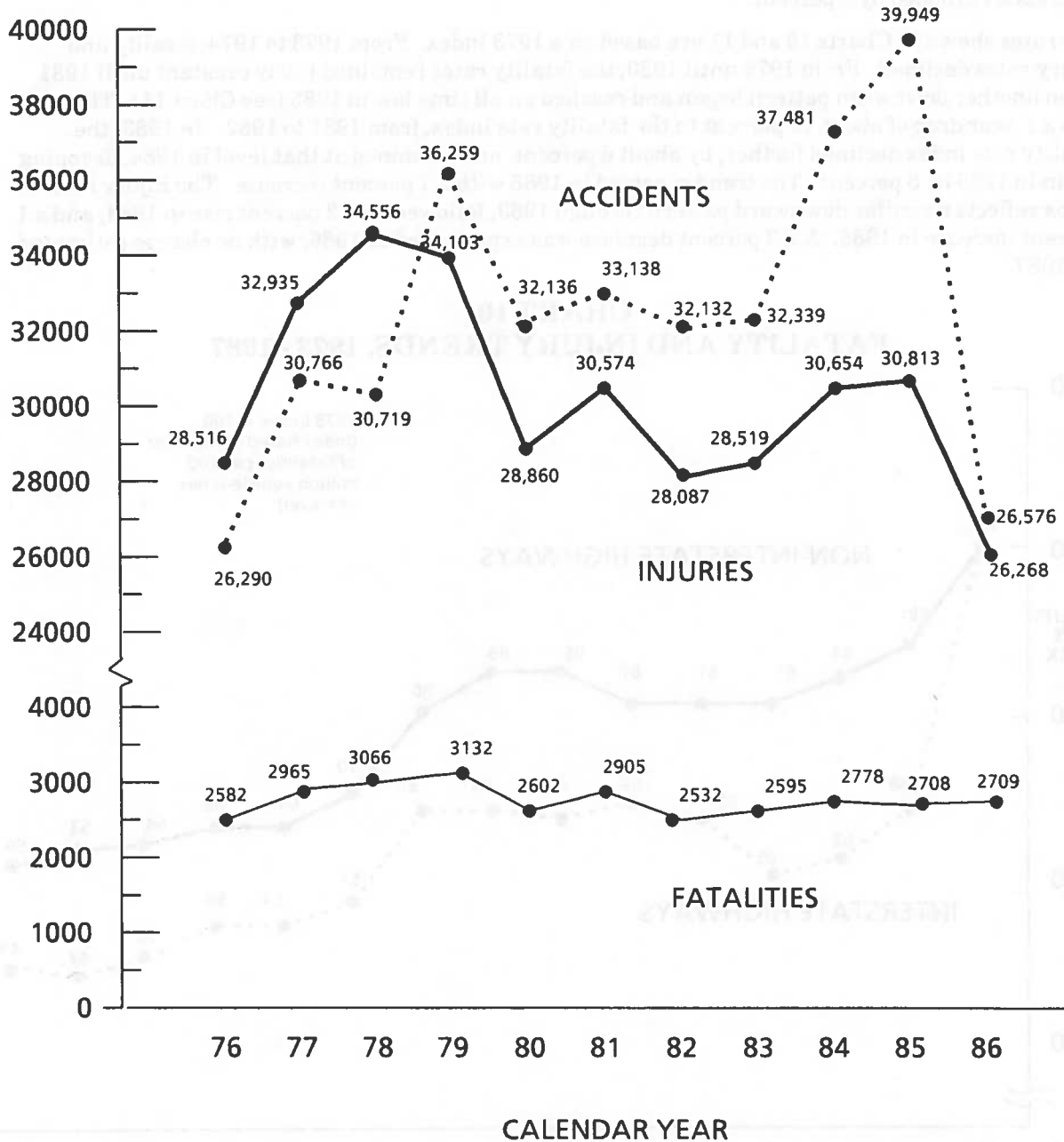
CLASSIFICATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Motor Carriers of Property											
Fatalities	2,520	2,878	2,998	3,072	2,528	2,810	2,456	2,528	2,721	2,646	2,609
Accidents	25,667	29,936	33,998	35,540	31,388	32,306	32,277	31,628	36,853	39,273	26,176
Injuries	26,794	31,006	32,757	32,126	27,149	28,533	26,117	26,692	29,149	28,988	25,092
Motor Carriers of Passengers											
Fatalities	62	87	68	60	74	95	76	67	57	62	100
Accidents	623	830	721	719	748	832	855	711	628	676	400
Injuries	1,722	1,929	1,799	1,977	1,711	2,041	1,970	1,827	1,505	1,825	1,176
Motor Carriers of Passengers											
Fatalities	2,582	2,965	3,066	3,132	2,602	2,905	2,532	2,595	2,778	2,708	2,709
Accidents	26,290	30,766	34,719	36,259	32,136	33,138	32,132	32,339	37,481	39,949	26,576
Injuries	28,516	32,935	34,556	34,103	28,860	30,574	28,087	28,519	30,654	30,813	26,268

* Includes only those motor carriers operating in interstate or foreign commerce.

SOURCE: FHWA, Office of Highway Safety, HHS-22.

CHART 9.

MOTOR CARRIER* FATALITIES, ACCIDENTS, AND INJURIES 1976 - 1986



* Includes only those Motor Carriers of Property and Passengers operating in Interstate or Foreign Commerce.

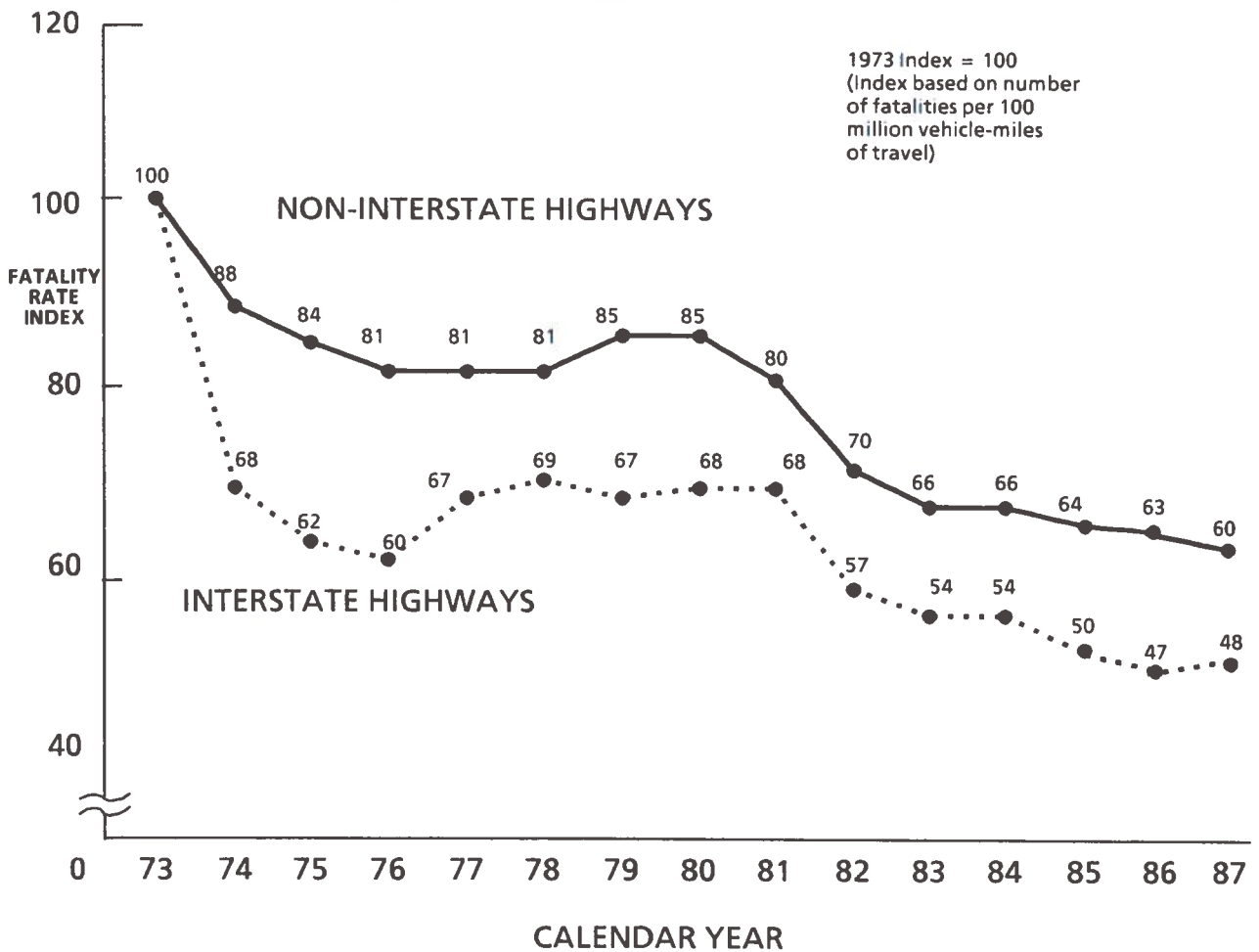
SOURCE: FHWA, Office of Highway Safety, HHS-22.

Fatality and Injury Rate Trends

Enforcement of the 55-mph speed limit has been more intensive on the Interstate highway system, where speeds and traffic volume tend to be highest. Except for 1982 to 1984, Chart 10 shows the fatality rate has dropped much more sharply on the Interstate highways than on the non-Interstate roads since 1973. A 65-mph speed maximum limit on rural Interstate roads was permitted in April 1987. The 1987 fatality rate index on Interstate roads rose by 2 percent while the index for non-Interstates dropped by 5 percent.

The rates shown in Charts 10 and 11 are based on a 1973 index. From 1973 to 1974, fatality and injury rates declined. From 1975 until 1980, the fatality rates remained fairly constant until 1981 when another downward pattern began and reached an all time low in 1985 (see Chart 11). There was a 1-year drop of about 18 percent in the fatality rate index, from 1981 to 1982. In 1983, the fatality rate index declined further, by about 6 percent, and remained at that level in 1984, dropping again in 1985 by 5 percent. The trend reversed in 1986 with a 7 percent increase. The injury rate index reflects a similar downward pattern through 1983, followed by a 2 percent rise in 1984, and a 1 percent increase in 1985. A 2.3 percent decrease was experienced in 1986, with no change estimated for 1987.

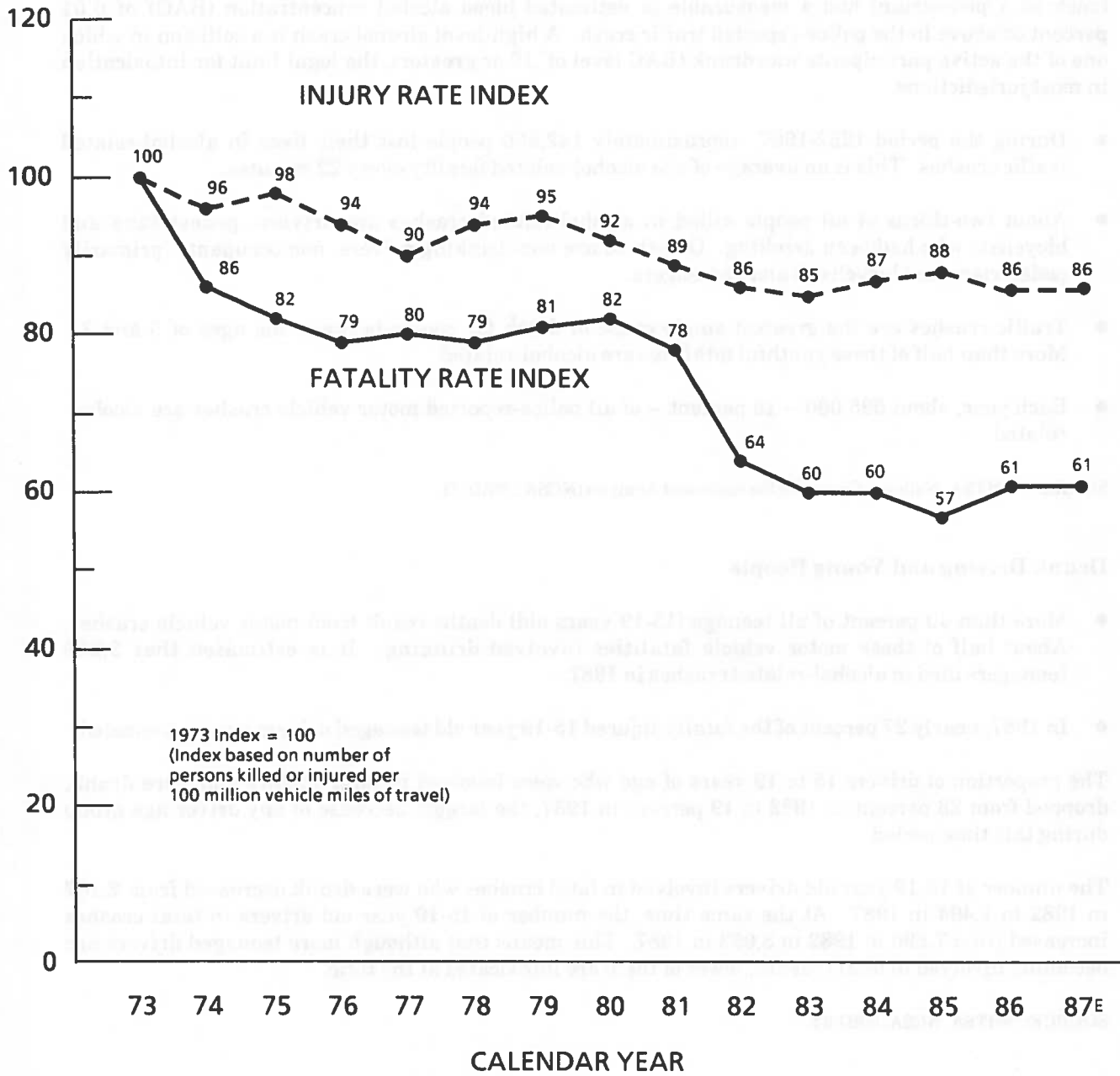
**CHART 10.
FATALITY AND INJURY TRENDS, 1973 - 1987**



SOURCE: FHWA, Office of Highway Safety, HHS-22.

CHART 11.

FATALITY AND INJURY TRENDS, 1973 - 1987^E



E: Estimated.

SOURCE: FHWA, Office of Highway Safety, HHS-22.

MODAL SAFETY HAZARDS

The Drunk Driving Problem

NHTSA defines a fatality or traffic crash as being alcohol related if either a driver or a non-occupant (such as a pedestrian) had a measurable or estimated blood alcohol concentration (BAC) of 0.01 percent or above in the police-reported traffic crash. A high-level alcohol crash is a collision in which one of the active participants was drunk (BAC level of .10 or greater), the legal limit for intoxication in most jurisdictions.

- During the period 1982-1987, approximately 142,550 people lost their lives in alcohol-related traffic crashes. This is an average of one alcohol-related fatality every 22 minutes.
- About two-thirds of all people killed in alcohol-related crashes are drivers, pedestrians and bicyclists who had been drinking. One-third are non-drinking drivers, non-occupants (primarily pedestrians and bicyclists) and passengers.
- Traffic crashes are the greatest single cause of death for people between the ages of 5 and 34. More than half of these youthful fatalities are alcohol-related.
- Each year, about 595,000 -- 10 percent -- of all police-reported motor vehicle crashes are alcohol-related.

SOURCE: NHTSA, National Center for Statistics and Analysis (NCSA), NRD-33.

Drunk Driving and Young People

- More than 40 percent of all teenage (15-19 years old) deaths result from motor vehicle crashes. About half of these motor vehicle fatalities involved drinking. It is estimated that 3,259 teenagers died in alcohol-related crashes in 1987.
- In 1987, nearly 27 percent of the fatally-injured 15-19 year old teenaged drivers were intoxicated.

The proportion of drivers 15 to 19 years of age who were involved in fatal crashes and were drunk, dropped from 28 percent in 1982 to 19 percent in 1987, the largest decrease of any driver age group during this time period.

The number of 15-19 year old drivers involved in fatal crashes who were drunk decreased from 2,187 in 1982 to 1,494 in 1987. At the same time, the number of 15-19 year old drivers in fatal crashes increased from 7,690 in 1982 to 8,052 in 1987. This means that although more teenaged drivers are becoming involved in fatal crashes, fewer of them are intoxicated at the time.

SOURCE: NHTSA, NCSA, NRD-33.

Safety Belts and Alcohol

Drivers who have been drinking use safety belts at a substantially lower rate than sober drivers. Of the passenger car drivers who were fatally injured in 1987 - safety belts were used by only about 8 percent of the drivers who were drunk (BAC of .10 percent or above), by 9 percent of the drivers who had some alcohol involvement (.01 - .09), but by more than 24 percent of the sober drivers.

SOURCE: NHTSA, NCSA, NRD-33.

Alcohol and Traffic Crashes

- About two in every five Americans will be involved in an alcohol-related crash at some time in their lives.
- Police report the presence of alcohol in 10 percent of the approximately 6 million crash reports filed each year.
- Each year, about 534,000 people suffer injuries in alcohol-related traffic crashes, an average of one person injured every minute. About 40,000 of these are serious injuries.
- The proportion of fatal crashes that are alcohol-related is about three times greater at night than during the day.
- More than half of all alcohol-related fatalities occur in single-vehicle crashes.
- In 1987, there were 41,435 fatal traffic crashes, compared to 41,090 in 1986, an increase of 0.8 percent. However, the percentage of fatal crashes which involved at least one driver or pedestrian with a BAC of .10 or above remained about the same as in 1986 (40 percent).
 - 61,434 drivers were involved in fatal traffic crashes. Of these, 25 percent (15,329) were drunk.
 - 26,831 drivers were killed in traffic crashes. Of these, nearly 38 percent (10,103) were drunk.
 - There were 17,058 single-vehicle crashes in which at least one occupant was killed. More than 53 percent of the fatally-injured drivers in these crashes were intoxicated.
- In single-vehicle fatal crashes on weekend nights in 1987, 78 percent of the fatally-injured drivers aged 25 or older were intoxicated, compared with 64 percent for drivers under age 25.

SOURCE: NHTSA, NCSA, NRD-33.

SAFETY PROGRAM HIGHLIGHTS

Tracking the Progress on Combating Drunk Driving

Drunk driving continues to be one of the nation's most serious public health and safety problems. There is evidence, however, that Federal, State, local and private efforts to reduce drinking and driving are having an impact.

Progress can be traced in the following comparisons. The information is estimated from NHTSA's Fatal Accident Reporting System (FARS).

- The number of intoxicated drivers (BAC = .10 or greater) killed in traffic crashes decreased from 13,110 in 1980 to 10,103 in 1987, a reduction of 23 percent.
- The proportion of drivers killed in traffic crashes who were intoxicated dropped from 46 percent in 1980 to approximately 38 percent in 1987.
- The number of fatalities in crashes in which at least one driver or pedestrian had a BAC of .10 percent or above, decreased from 20,356 in 1982 to 18,529 in 1987, a reduction of approximately 9 percent.
- The proportion of all people killed in crashes in which at least one driver or pedestrian had a BAC of .10 percent or above declined from 46 percent in 1982 to 45 percent in 1983, to 43 percent in 1984, 41 percent in 1985 and 1986, and dropped to 40 percent in 1987.
- In fatal crashes, the proportion of drivers with a BAC of .10 or above decreased from 30 percent in 1982 to 25 percent in 1987.
- From 1982 to 1987, the percentage of drivers with a BAC of .10 or above in fatal crashes decreased:
 - 7 percent at night
 - 13 percent on weekends
 - 7 percent at night on weekends

SOURCE: NHTSA, NCSA, NRD-33.

NHTSA Publishes Reports on Ride Service Programs to Discourage Drunk Driving

NHTSA has published a user's guide dealing with ride service programs. Such programs are designed to provide motorists who have been drinking with a safe ride home without injuring themselves or others. The guide contains information that should be useful to State and local planners, including types of ride service programs available, operating methods, resources required, and possible problems and recommended solutions.

A report was also published that should aid those readers who need more details about the study, including the methods used to identify ride service programs and to collect and analyze program information.

According to NHTSA, ride service programs, usually called "Dial-A-Ride" or "Safe Rides," can perform a valuable service to the community by providing a convenient alternative to driving while under the influence of alcohol.

The user's guide, entitled "A User's Guide to Ride Service Programs" (DOT HS 807 291) and the technical report, entitled "The Assessment of Ride Service Programs as an Alcohol Countermeasure" (DOT HS 807 290) can be obtained from NTIS, 5285 Port Royal Rd., Springfield, Va. 22161. "A Directory of Ride Service Programs" (DOT HS-807 146), which provides information on key features and program spokespersons for 325 programs from 44 States and the District of Columbia, is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SOURCE: NHTSA, Office of the Assistant Secretary for Public Affairs.

Safety Belt Use Laws

The Secretary of Transportation's July 1984 rulemaking on automatic occupant protection began a wave of legislative action that has resulted in the enactment of belt use laws in many States. Currently, 32 States and the District of Columbia have adopted belt laws. The goal of these laws is to reduce deaths and injuries in motor vehicle crashes.

- Numerous research studies indicate that lap and shoulder safety belts, when used, reduce the risk of fatal or serious occupant injury by between 40 and 55 percent.
- Currently, safety belt use in States that have passed seat belt laws averages about 50 percent. Use varies widely, however, reflecting the fact that laws, enforcement, and public information and education programs differ. Usage ranges from 65 percent in North Carolina to 22 percent in Utah.
- Safety belt use laws are 7 percent effective in reducing fatalities, i.e., States with belt laws have 7 percent fewer fatalities than would be expected without belt laws.

SOURCE: NHTSA, NCSA, NRD-33.

Safety Belt Use

NHTSA measures national belt use by conducting observational surveys each year in 19 cities. The data from these surveys found that belt use among car drivers in the 19-city survey was:

- 11 percent in 1982.
- 14 percent in 1983.
- 14 percent in 1984.
- 21 percent in 1985.
- 37 percent in 1986.
- 42 percent in 1987.
- 43 percent in the first half of 1988.

- Among cities without belt laws in effect in this survey, belt use was:
 - 30 percent in 1987 (7 cities) and
 - 31 percent in the first half of 1988 (6 cities).

- Among cities with belt laws in effect in this survey, belt use was:
 - 50 percent in 1987 (12 cities) and
 - 48 percent in the first half of 1988 (13 cities).
- In contrast to the 42 percent belt use observed in traffic in 1987, only 16 percent of front seat passenger vehicle fatalities in 1987 were belted. The difference between these two use rates reflects two factors. First, safety belts reduce the risk of fatality so the percent of fatalities that are belted is lower than the percent of occupants in potentially fatal crashes. Second, research has demonstrated that safety belt use in crashes is lower than safety belt use observed in the general population.

SOURCE: NHTSA, NCSA, NRD-33.

Safety Belt and Belt Law Benefits

- Among front seat passenger vehicle occupants over 4 years old, safety belts saved about 4,000 lives in 1987 - 3,100 in States with belt use laws.
- Among front seat passenger vehicle occupants, safety belts prevented about 48,000 moderate to critical injuries in 1987 - 37,000 in States with belt use laws.
- Since the first (New York) State safety belt use law became effective in December 1984, about 6,600 total lives have been saved and 79,000 moderate to critical injuries prevented by safety belt use laws and greater belt use in non-law States, through 1987.
- From 1983 through 1987, an estimated 10,900 lives were saved by safety belts - 6,900 due to belt use laws.
- During these same 5 years, belts prevented an estimated 130,000 moderate to critical injuries.
- At the current use level in belt law States (50 percent), belts would have saved 4,700 lives if all States had belt laws in 1987.
- At the high use levels achieved in some other countries (85 percent), belts could have saved 10,000 lives in 1987.
- If all front seat occupants wore safety belts, about 15,000 lives would have been saved in 1987.

SOURCE: NHTSA, NCSA, NRD-33.

RAILROAD

- The year 1987 saw railroad accidents and the train accident rate per million train miles drop to a 12-year low. Railroad accidents involving trains declined 75 percent since 1976, and the accident rate per million train miles dropped 67 percent in the 12-year period. When 1986 is compared with 1987, train accidents decreased 4 percent -- from 2,620 in 1986 to 2,512 in 1987.
- The total number of railroad and grade crossing fatalities increased from 1,091 in 1986 to 1,165 in 1987, representing a 6.8 percent increase. Of the total number of fatalities reported last year, 54 percent occurred in rail-highway grade crossing accidents. Railroad and rail-highway grade crossing accidents both experienced an increase in fatalities when 1986 is compared with 1987. There were 475 railroad fatalities in 1986 versus 541 in 1987, a 13.9 percent increase, and 616 grade crossing fatalities in 1986 versus 624 in 1987, a 1.3 percent increase.
- Injuries resulting from railroad accidents fell from 24,465 in 1986 to 23,604 in 1987. Rail-highway grade crossing injuries also dropped -- from 2,458 in 1986 to 2,429 in 1987.

TABLE 7.

RAILROAD FATALITIES AND INJURIES, BY TYPE OF PERSON, 1986-1987

CLASSIFICATION	FATALITIES		INJURIES**	
	1986	1987	1986	1987
Employees on Duty	57	55	22,387	21,982
Employees Not on Duty	2	1	384	396
Passengers on Trains	4	16	686	475
Nontrespassers	505	506	2,639	2,354
Trespassers	519	584	706	673
Contractor Employees	4	3	121	153
Total Railroad and Grade Crossing	1,091	1,165	26,923	26,033
Railroad Only*	475	541	24,465	23,604
Grade Crossing Only	616	624	2,458	2,429

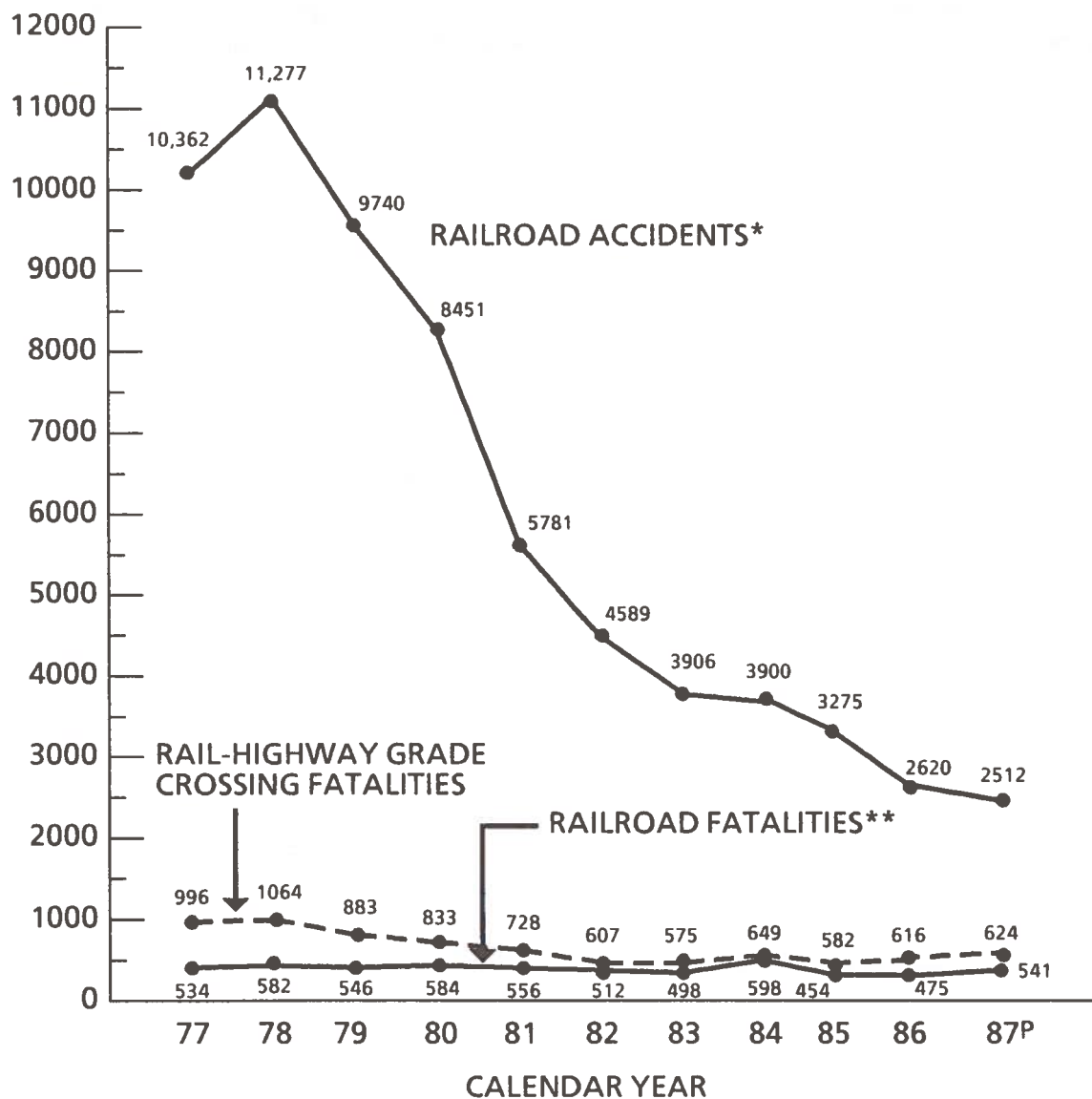
* Includes train and nontrain data.

** Includes occupational illness.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 12.

**RAILROAD ACCIDENTS AND FATALITIES AND
RAIL-HIGHWAY GRADE CROSSING FATALITIES
1977 - 1987**



P = Preliminary.

* Train accidents only--also includes those Rail-Highway Grade Crossing accidents which have been classified as Train accidents.

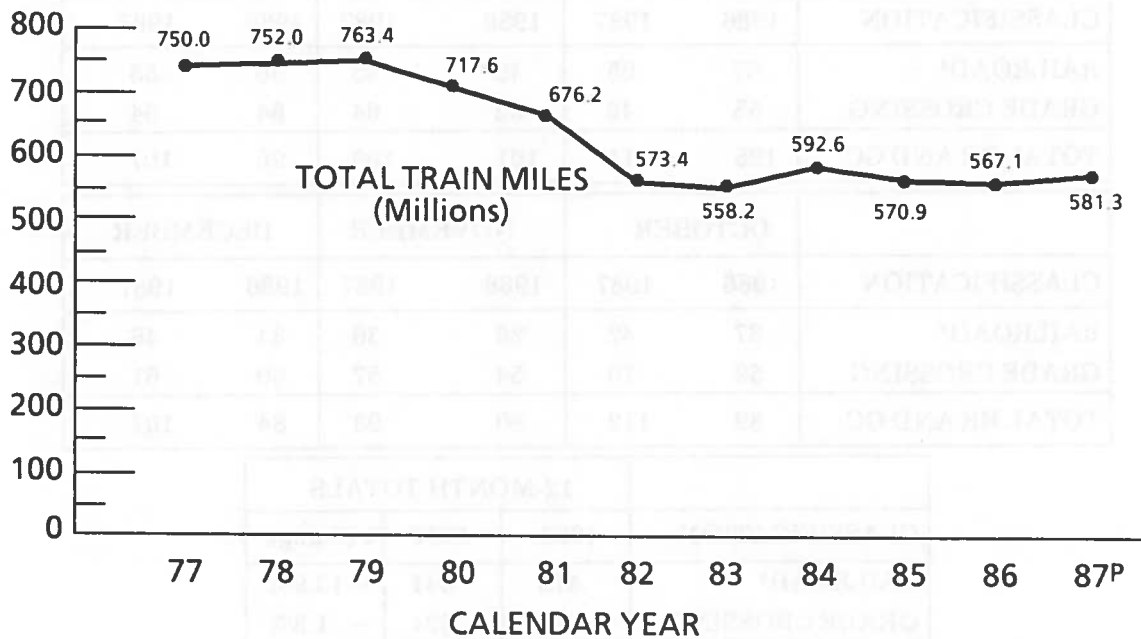
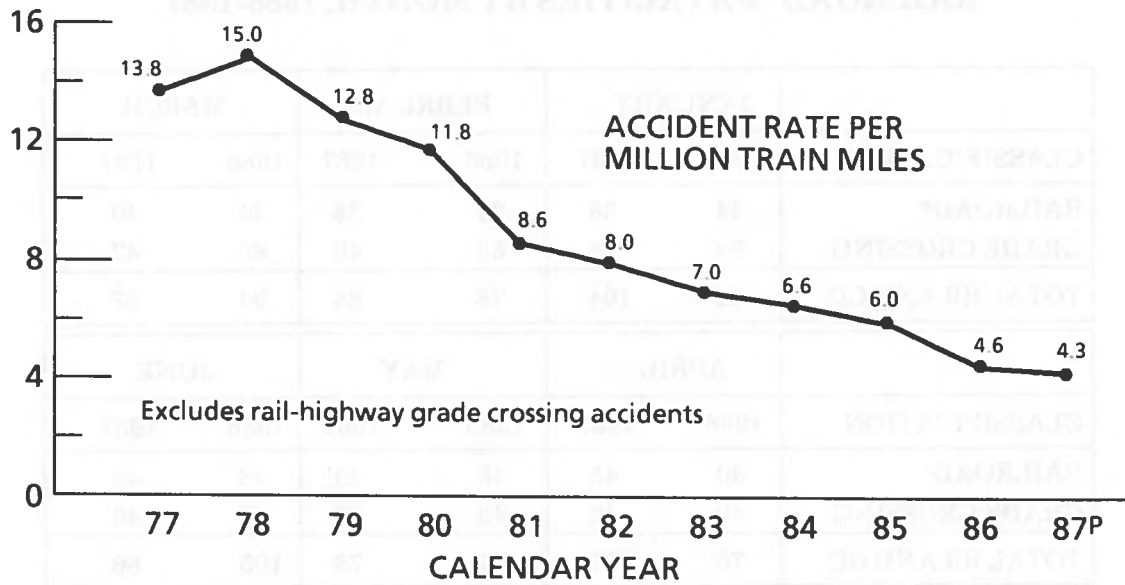
** Fatalities resulting from Train accidents, Train incidents and Nontrain incidents.

NOTE: Reporting threshold for Train accidents was raised to \$2,300 in 1977, to \$2,900 in 1979, to \$3,700 in 1981, to \$4,500 in 1983, to \$4,900 in 1985, and to \$5,200 in 1987.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 13.

RAILROAD ACCIDENT RATE TRENDS, 1977 - 1987



P = Preliminary.

* Train accidents only--also includes those Rail-Highway Grade Crossing accidents which have been classified as Train accidents.

NOTE: Reporting threshold for Train accidents was raised to \$2,300 in 1977, to \$2,900 in 1979, to \$3,700 in 1981, to \$4,500 in 1983, to \$4,900 in 1985, and to \$5,200 in 1987.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

TABLE 8.

RAILROAD* FATALITIES BY MONTH, 1986-1987

	JANUARY		FEBRUARY		MARCH	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
RAILROAD*	34	36	25	38	34	40
GRADE CROSSING	54	68	53	46	60	47
TOTAL RR AND GC	88	104	78	84	94	87

	APRIL		MAY		JUNE	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
RAILROAD*	30	45	45	49	58	46
GRADE CROSSING	40	42	42	29	47	40
TOTAL RR AND GC	70	87	87	78	105	86

	JULY		AUGUST		SEPTEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
RAILROAD*	67	65	49	45	36	53
GRADE CROSSING	58	46	52	64	54	54
TOTAL RR AND GC	125	111	101	109	90	107

	OCTOBER		NOVEMBER		DECEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
RAILROAD*	37	42	26	36	34	46
GRADE CROSSING	52	70	54	57	50	61
TOTAL RR AND GC	89	112	80	93	84	107

	12-MONTH TOTALS		
CLASSIFICATION	1986	1987	% Change
RAILROAD*	475	541	+ 13.9%
GRADE CROSSING	616	624	+ 1.3%
TOTAL RR AND GC	1,091	1,165	+ 6.8%

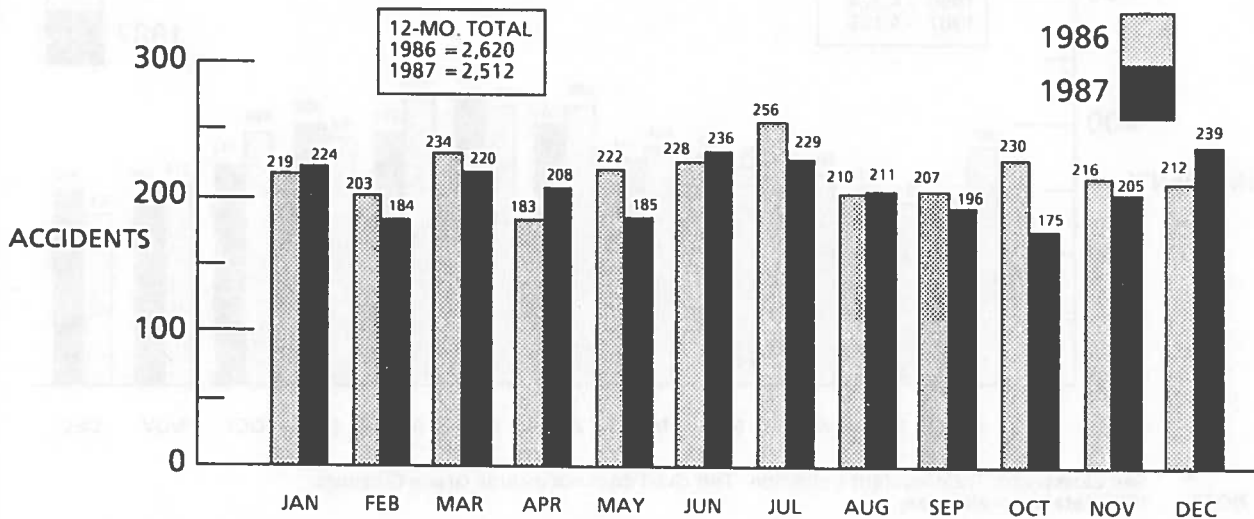
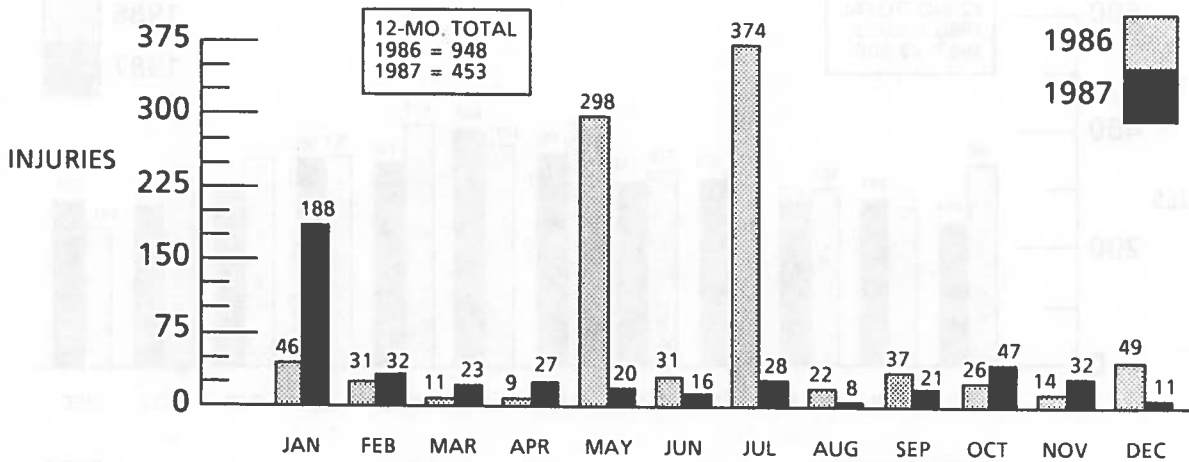
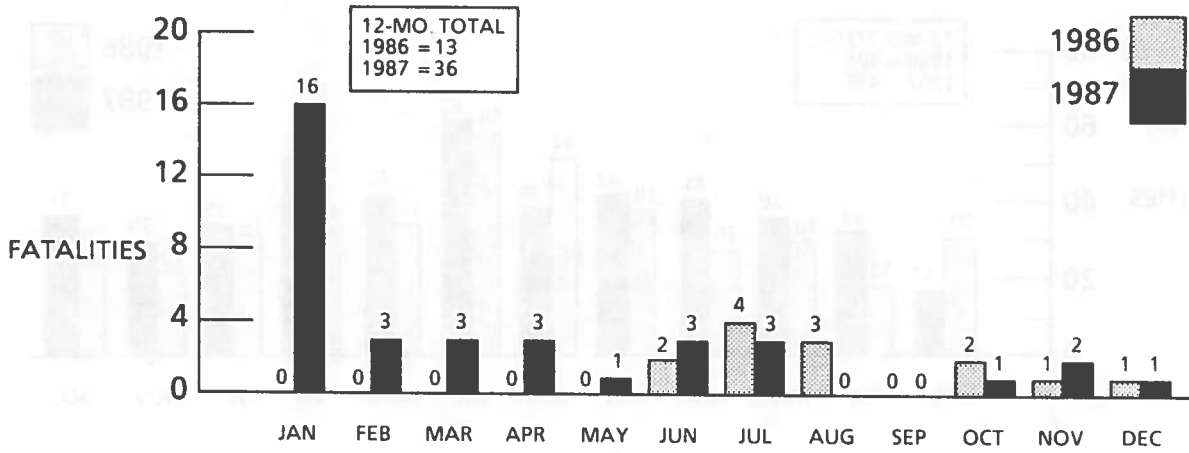
* Includes train accident, train incident, and nontrain incident data.

NOTE: 1987 data are preliminary.

SOURCE: FRA, Office of Safety Analysis, RRS-20

CHART 14.

TRAIN ACCIDENT* FATALITIES, INJURIES AND ACCIDENTS, 1986-1987

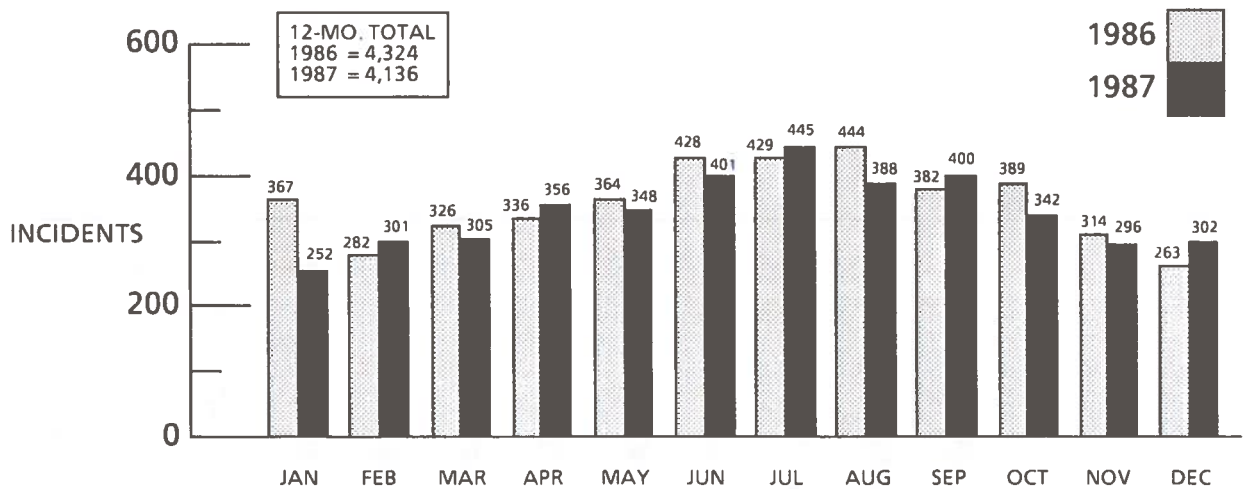
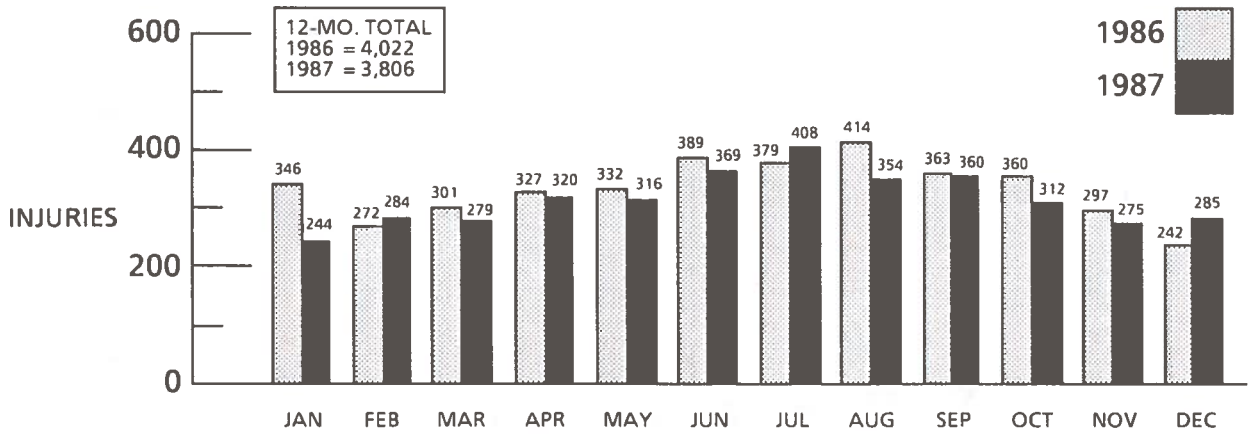
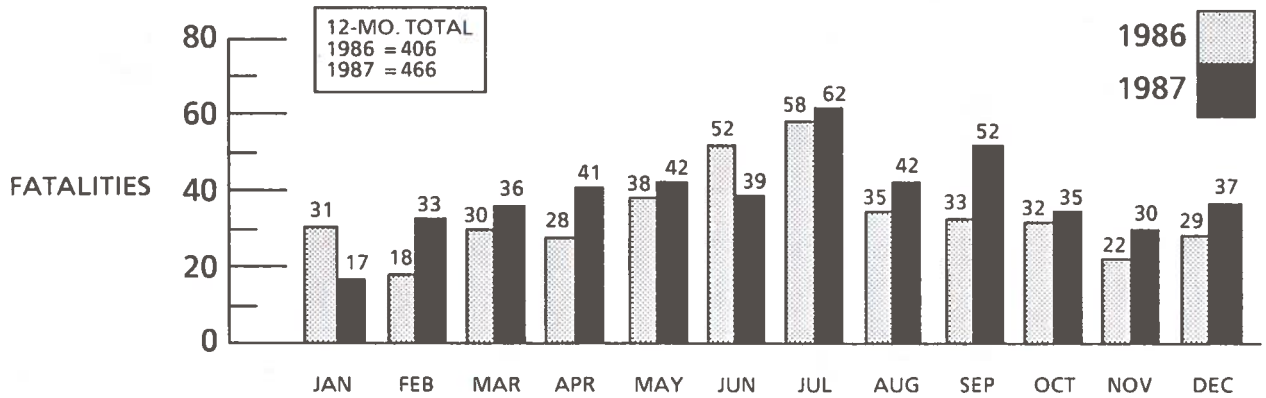


* See Glossary for Train Accident definition. This chart does not include Grade Crossings.
NOTE: 1987 data are preliminary.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 15.

TRAIN INCIDENT* FATALITIES, INJURIES AND INCIDENTS, 1986-1987

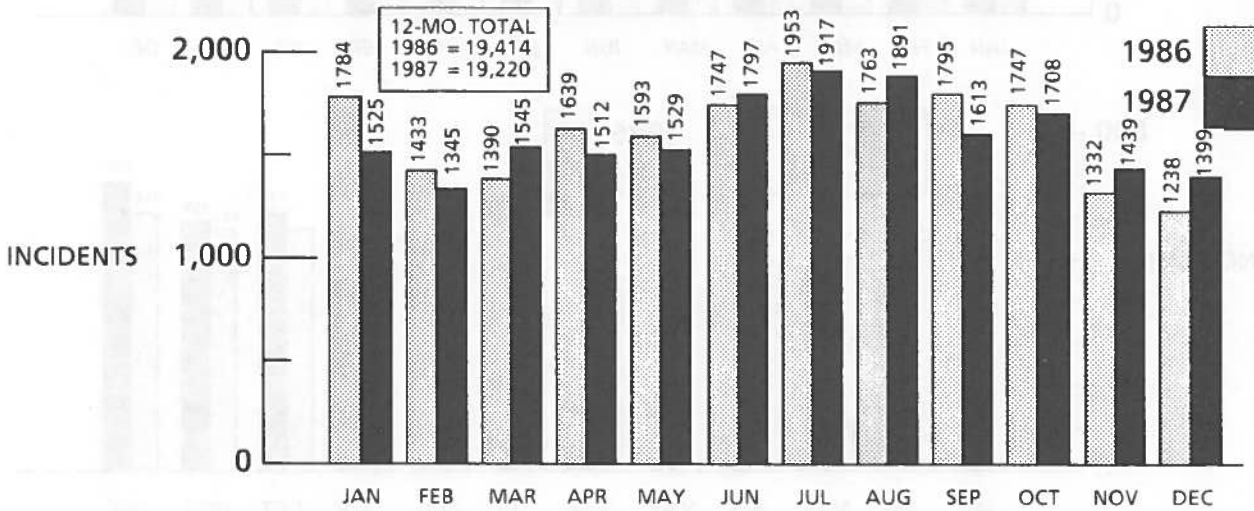
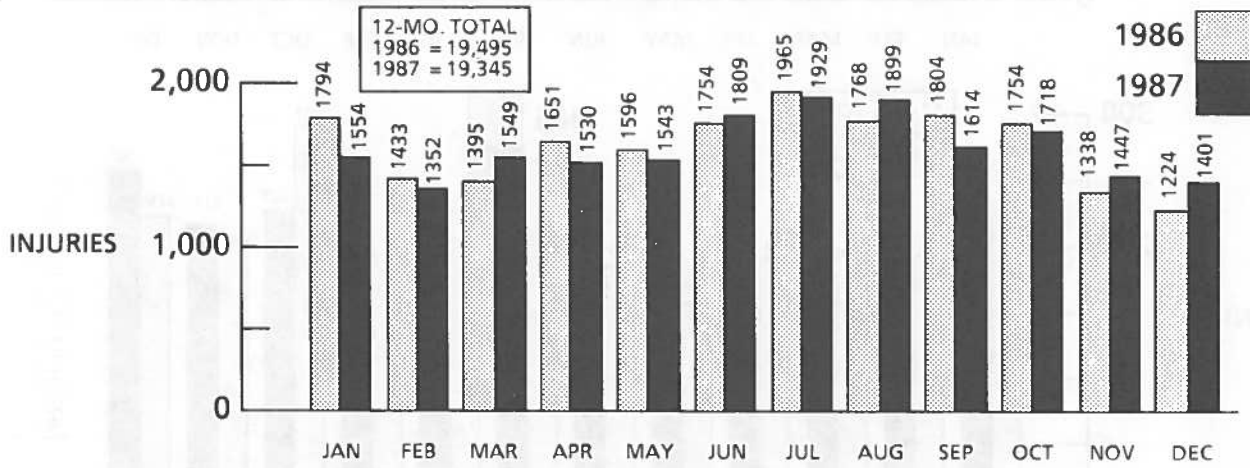
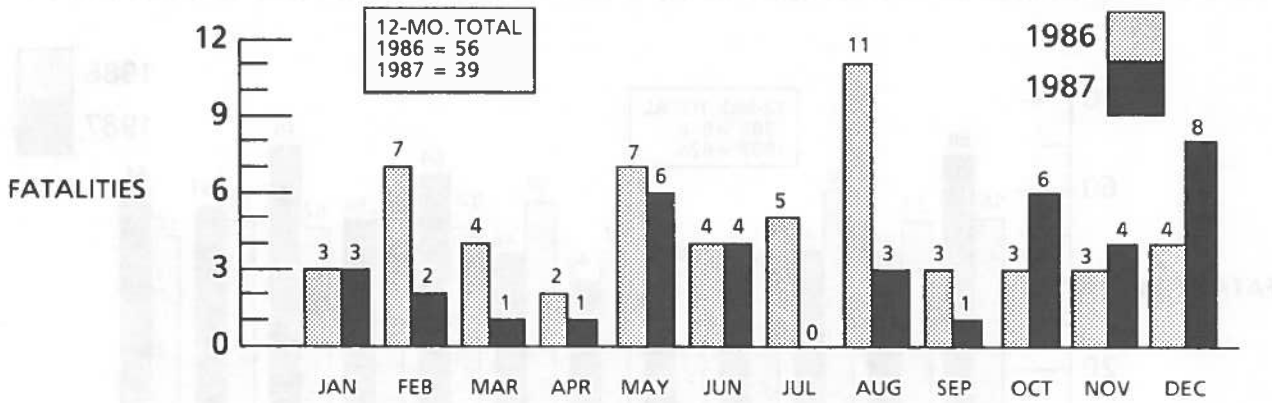


* See Glossary for Train Incident definition. This chart does not include Grade Crossings.
 NOTE: 1987 data are preliminary.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 16.

NONTRAIN* FATALITIES, INJURIES AND INCIDENTS, 1986-1987

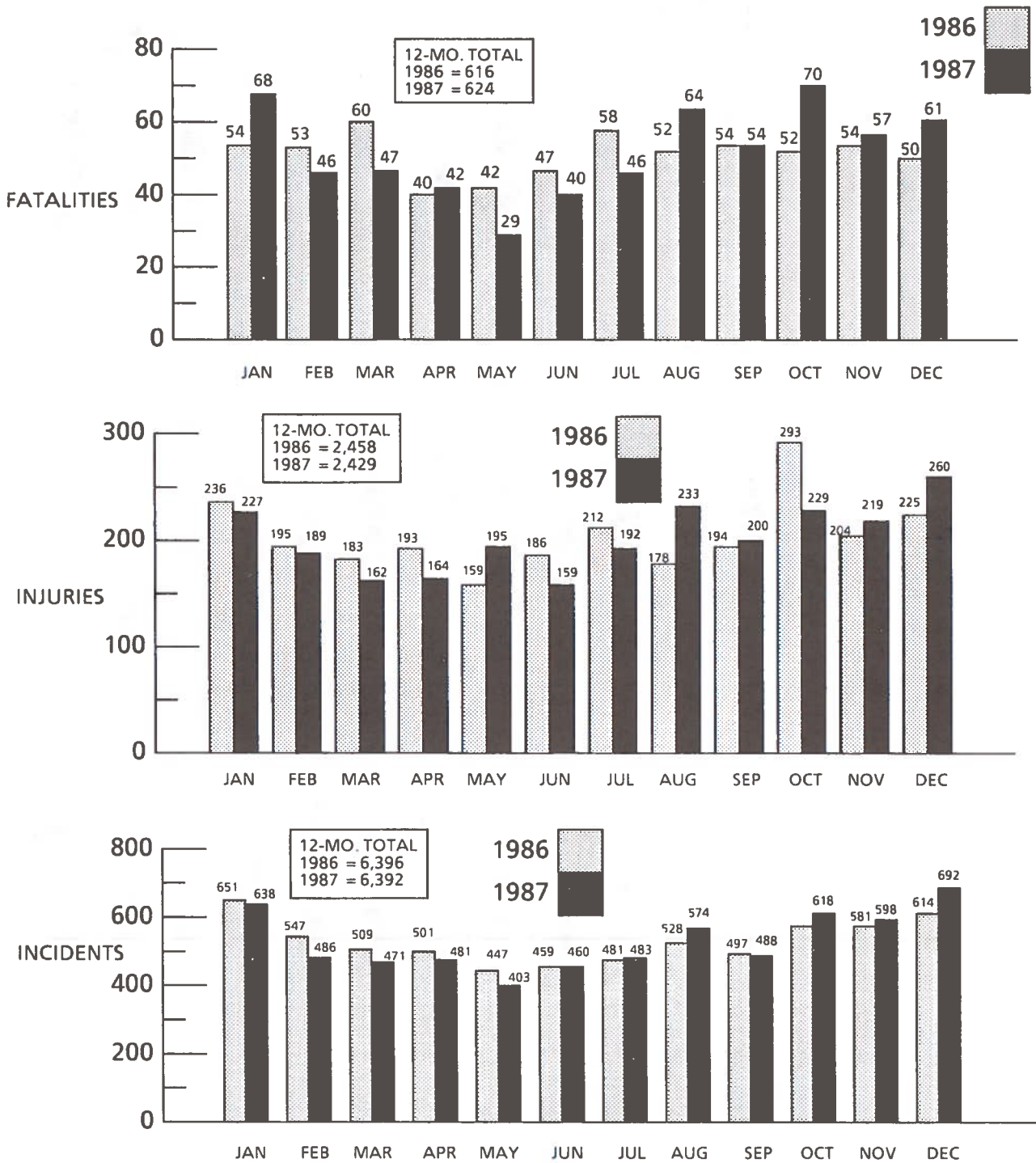


* See Glossary for definition. This chart does not include Grade Crossings.
 NOTE: 1987 data are preliminary.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 17.

GRADE CROSSING* FATALITIES, INJURIES AND INCIDENTS, 1986-1987



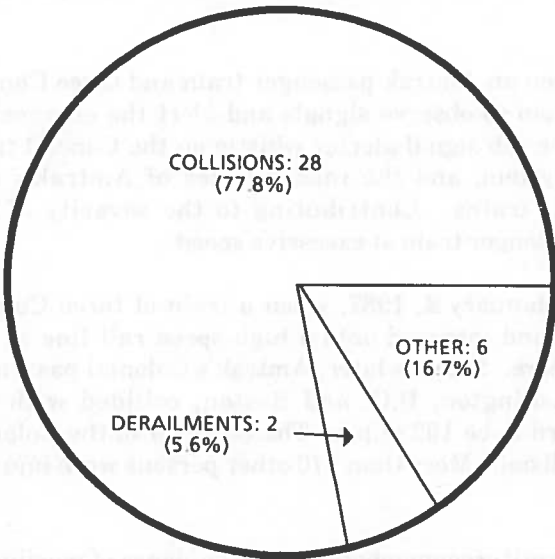
* See Glossary for definition.
NOTE: 1987 data are preliminary.

SOURCE: FRA, Office of Safety Analysis, RRS-20.

CHART 18.

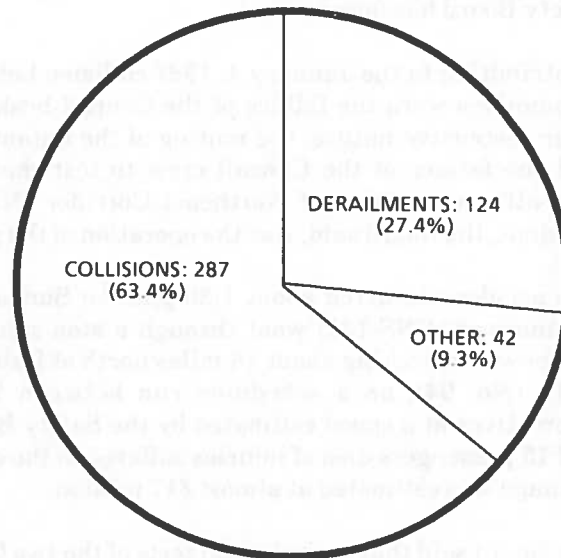
TRAIN ACCIDENT* FATALITIES, INJURIES, AND ACCIDENTS BY TYPE, 1987

Fatalities



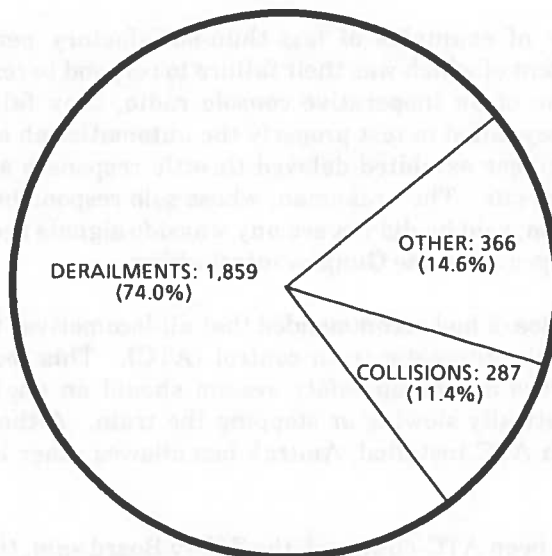
TOTAL FATALITIES: 36

Injuries



TOTAL INJURIES: 453

Accidents*



TOTAL ACCIDENTS: 2,512

* See Glossary for Train Accident Definition (does not include Train and Nontrain Incidents and Grade Crossing Accidents).

SOURCE: FRA, Office of Safety Analysis, RRS-20.

MODAL SAFETY HAZARDS

Marijuana Impairment, Lack of Safety Backup Devices Led to Worst Amtrak Accident

The failure of a Conrail engineer to stop his train in compliance with signals, as a result of impairment from marijuana, and the failure to require automatic back-up safety devices -- and of Conrail to use them -- led to the worst accident in Amtrak's history, the National Transportation Safety Board has found.

Contributing to the January 4, 1987 collision between an Amtrak passenger train and three Conrail locomotives were the failure of the Conrail brakeman to observe signals and alert the engineer to their restrictive nature, the muting of the automatic cab signal alerter whistle on the Conrail train and the failure of the Conrail crew to test that system, and the inadequacies of Amtrak's and Conrail's supervision of Northeast Corridor (NEC) trains. Contributing to the severity of the accident, the Board said, was the operation of the passenger train at excessive speed.

The accident occurred about 1:30 p.m. on Sunday, January 4, 1987, when a train of three Conrail locomotives (ENS-121) went through a stop signal and intruded onto a high-speed rail line at the Gunpow interlocking about 16 miles north of Baltimore. Seconds later, Amtrak's Colonial passenger train (No. 94), on a scheduled run between Washington, D.C. and Boston, collided with the locomotives at a speed estimated by the Safety Board to be 102 m.p.h. The engineer of the Colonial and 15 passengers died of injuries suffered in the collision. More than 170 other persons were injured. Damage was estimated at almost \$17 million.

The Board said that toxicological tests of the two Conrail crewmembers showed evidence of marijuana use at an undetermined time before the samples were collected. The brakeman also was positive for PCP in his urine. The Safety Board said it believes "that the [Conrail crewmembers] were impaired at the time of the accident from the effects of marijuana possibly combined with the effects of the use of alcohol the night before the accident."

The Board cited a number of examples of less-than-satisfactory performance by the Conrail crewmembers, the most evident of which was their failure to respond to restrictive signals. They also failed to resolve the problem of an inoperative console radio, they failed to make the required predeparture brake tests, they failed to test properly the automatic cab signal system including the alerter whistle, and the engineer exhibited delayed throttle responses along the 12-mile trip from Bayview Yard to the accident site. The brakeman, whose sole responsibility was to observe signals and alert the engineer to them, said he did not see any wayside signals because he was preparing his lunch as the Conrail train approached the Gunpow interlocking.

For many years, the Safety Board had recommended that all locomotives traveling on highspeed rail on the NEC be equipped with automatic train control (ATC). This technology, which has been available for decades, provides a back-up safety system should an engineer fail to respond to a restrictive signal by automatically slowing or stopping the train. Although all Amtrak passenger trains have locomotives with ATC installed, Amtrak has allowed other locomotives to use its track without such a system.

Had the Conrail locomotives been ATC-equipped, the Safety Board said, this accident would not have occurred. The Board said that it believes Amtrak should immediately discontinue the use of non-ATC-equipped locomotives on the NEC.

The Safety Board cited deficiencies in Amtrak's oversight of safety along with NEC: "The Safety Board's investigation left little doubt that Amtrak's safety department was primarily involved in preventing employee injuries and implementing emergency response... Amtrak's safety department should have also been concerned with promoting operational safety, even at the expense, if necessary, of on-time train performance."

Although all the Amtrak crewmembers aboard the Colonial were subject to the FRA's drug and alcohol testing regulations, most of them were not tested until four days after the accident. In addition, the samples taken from the Conrail crew were not properly supervised. The NTSB said that it "is deeply concerned about the failure of Amtrak and Conrail supervisors to comply with the intent of the FRA regulations for post-accident toxicological testing and about FRA's inability to achieve timely compliance with its regulations by these two railroads in this accident."

Amtrak's Colonial was restricted to 105 mph because one of its rail cars -- a Heritage car -- was of an older design, yet the train's speed recorder indicated that at times it reached 128 mph. When the Colonial's engineer threw his brakes into emergency application, the train was traveling at an estimated 120 mph, and was going approximately 102 mph when it hit the standing Conrail locomotives. The Board found that this excessive speed contributed to the severity of the accident.

The Board issued 14 safety recommendations as a result of its conclusion of this investigation. It had earlier issued three recommendations to Amtrak dealing with ATC. One of the new recommendations was that the FRA expand and intensify its oversight of Amtrak's operating practices, supervisory efficiency checks, and compliance with federal safety regulations and periodically provide the Safety Board with its assessment of Amtrak's performance in these areas.

Among the nine recommendations to Amtrak were that the railroad provide procedures and instructions to dispatchers to avoid operating trains not equipped with ATC in a manner that places them in potential conflict with passenger trains, that it revise the NEC timetable to eliminate the possibility of misinterpretation of maximum permissible speed rules, that it restructure its safety program to provide a greater role for safety considerations in its operations and that it modify the wayside signals it uses on the NEC so that horizontal aspects are displayed with the universally-recognized red lights, rather than the current use of amber.

The Board issued four recommendations to Conrail, including that it expedite the current program for installing automatic safety backup devices on its locomotives and that it improve the methods of identifying employees who abuse alcohol and/or drugs.

SOURCE: NTSB, News Digest, Vol. 7, No. 2.

NTSB Urges Expansion of Federal Rules on Alcohol/Drug Use by Rail Employees

The National Transportation Safety Board has recommended that the Federal Railroad Administration (FRA) expand the scope of its rules governing the use of alcohol and drugs by railroad employees. While calling the rules conceptually a "model approach for Federal regulation to reduce alcohol and/or drug use in the transportation industry," the Safety Board said that a number of changes would make it more effective.

Among the changes recommended by the NTSB are expanding the categories of employees tested after accidents and in reasonable cause testing programs, making testing for reasonable cause mandatory, lowering the threshold dollar amount of damage that triggers testing, and requiring for the first time Federal medical certificates for railroad employees having safety-related duties.

In early 1986, various aspects of the FRA's rules dealing with alcohol/drug use by railroad employees were phased into effect. Under the regulations, toxicological testing of "hours of service" employees is mandatory after:

- Accidents resulting in a fatality, release of hazardous materials leading to evacuation or injury from the product, or damage of at least \$500,000;
- Collisions resulting in damage of at least \$50,000 or in a reportable injury with damage in excess of \$5,200;
- Incidents resulting in an employee fatality.

There is no time limit within which the toxicological samples must be obtained.

The rules also require pre-employment drug screening and allow railroads to impose "reasonable cause" testing if they desire.

During 1987 alone, the FRA reported 37 accidents/incidents involving alcohol and/or drug use by railroad employees, resulting in 19 deaths, 220 injuries, the evacuation of more than 22,000 people, and approximately \$20 million in railroad-reported property damage. Of the 156 railroad accidents investigated by the Safety Board in 1987, 88 met the FRA criteria for toxicological testing. Of those, alcohol and/or drug use was found in 27 employees, or nearly 31 percent of the accidents in which tests were taken.

The Safety Board said it views the FRA rule, properly modified, "as the model approach for Federal regulation to reduce alcohol and/or drug use in the transportation industry. The Safety Board has identified several other specific areas where it believes constructive changes can be made to the FRA rule that will strengthen its effectiveness"

Specific changes recommended by the Board include;

- Expansion of reasonable cause testing.
- Expansion of testing to other railroad employees.
- Lower the damage threshold.

If the changes suggested by the Board are made, it is estimated that 600 accidents would qualify and an estimated 4,000 employees would be tested each year under mandatory provisions of the rule, compared to the 179 events and 770 employees tested in 1987.

SOURCE: NTSB, News Digest, Vol. 7, No. 2.

RAIL RAPID TRANSIT

Users of Rail Rapid Transit (RRT) statistics should use caution when comparing 1987 and 1986 data to data for years prior to 1986. In 1986, the Urban Mass Transportation Administration (UMTA) in conjunction with the transit operators, revised the reporting system categories and new thresholds were instituted. Fires, which prior to 1986 were reported as train accidents, are now reported separately. The figures shown in the following charts represent data received from all 13 Rail Rapid Transit systems as reported in the Safety Information Reporting and Analysis System (SIRAS). SIRAS is a voluntary reporting system, developed by UMTA in cooperation with the American Public Transit Association (APTA) and the heavy rail transit (RRT) systems operating in the United States. Since its implementation on January 1, 1983, the operating RRT systems have been reporting transit safety data to UMTA on a monthly basis. All transit systems submit a monthly Statistical Data Report containing the total number of car miles and number of passengers in the reporting month. A Train Accident Report, Casualty Report and Fire Report are submitted only during those months when reportable train accidents, fire or casualties occur.

- During calendar year 1987, there were 91 Rail Rapid Transit (RRT) revenue train accidents compared to 60 in 1986. These RRT accidents resulted in 146 injuries and 28 fatalities in 1987.

The following summarizes train accidents by type.

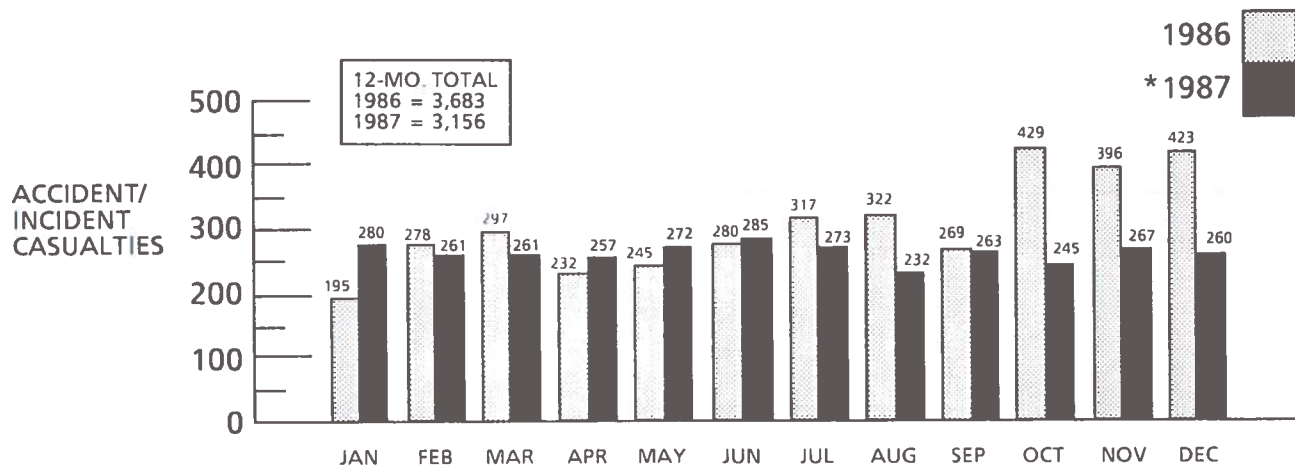
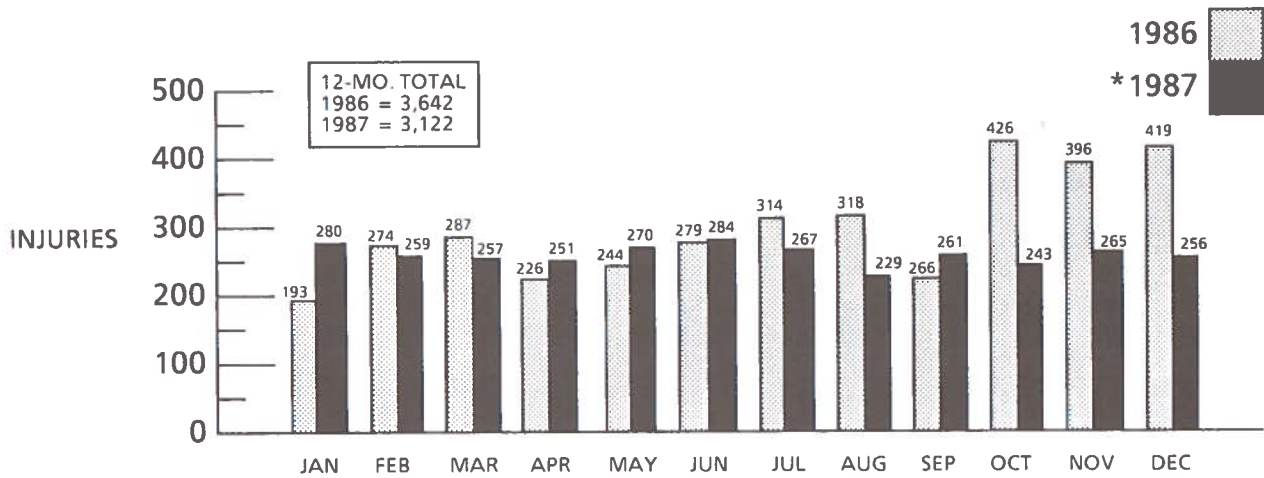
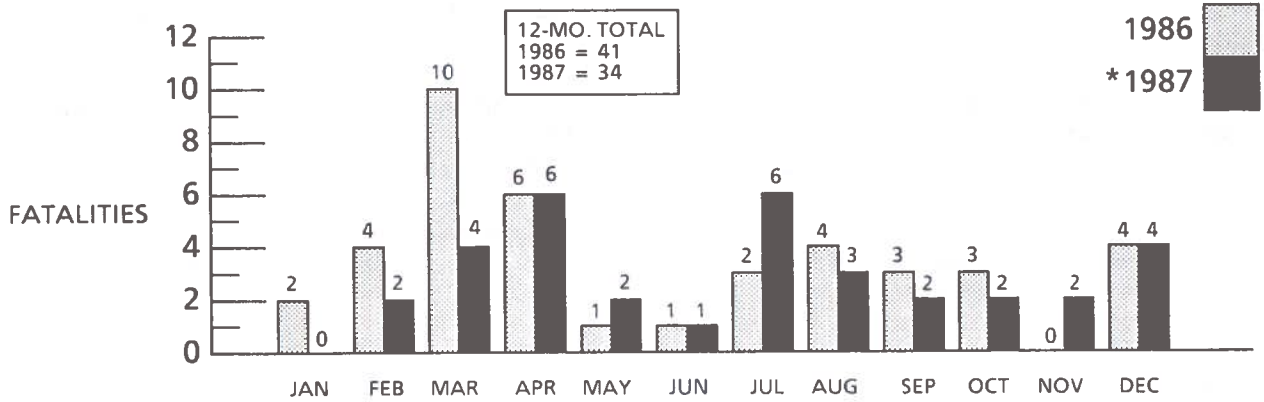
	CY 1986	CY 1987*
Collision with other train	1	7
Collision with obstacle	5	6
Collision with person	46	67
Derailment	3	5
Rail-Highway Crossing	5	6
TOTALS	60	91*

- Of the 3,683 train and non-train casualties (injuries and fatalities) reported in calendar year 1986, a total of 1,240 (34%) occurred on the platform.
- Of the 3,156 train and non-train casualties (injuries and fatalities) reported in calendar year 1987, a total of 1,112 (35.2%) occurred on the platform.
- Of the 6,140 reported train fires during 1986, a total of 1,963 (32%) were reported in the category of "other"
- Of the 4,524 reported train fires during 1987, a total of 1,271 (28%) were reported in the category of "other".

* Preliminary data prior to verification.
 Source: TSC, Safety and Security Division, DTS-43.

CHART 19.

RRT TRAIN AND NON-TRAIN** FATALITIES, INJURIES AND ACCIDENTS, 1986 - 1987*

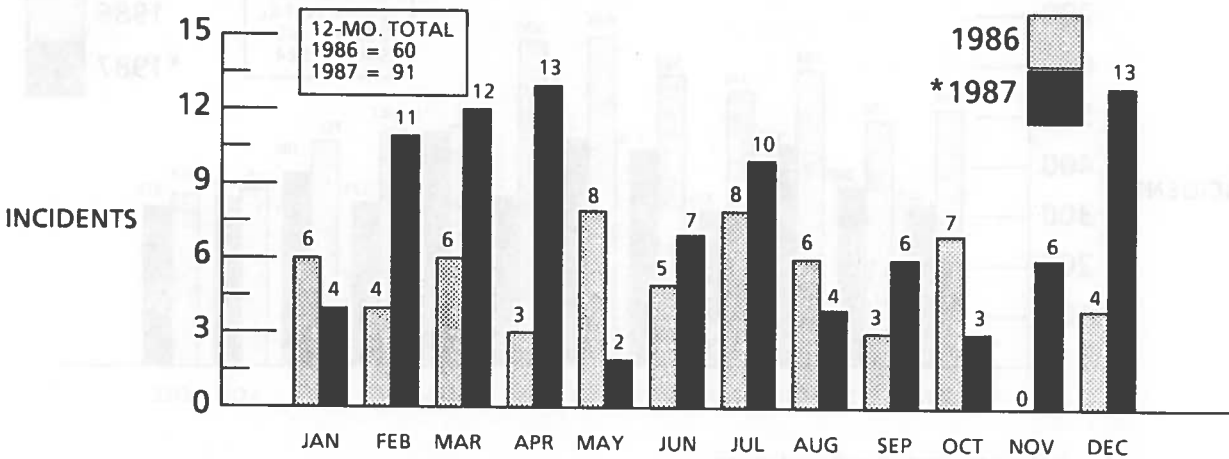
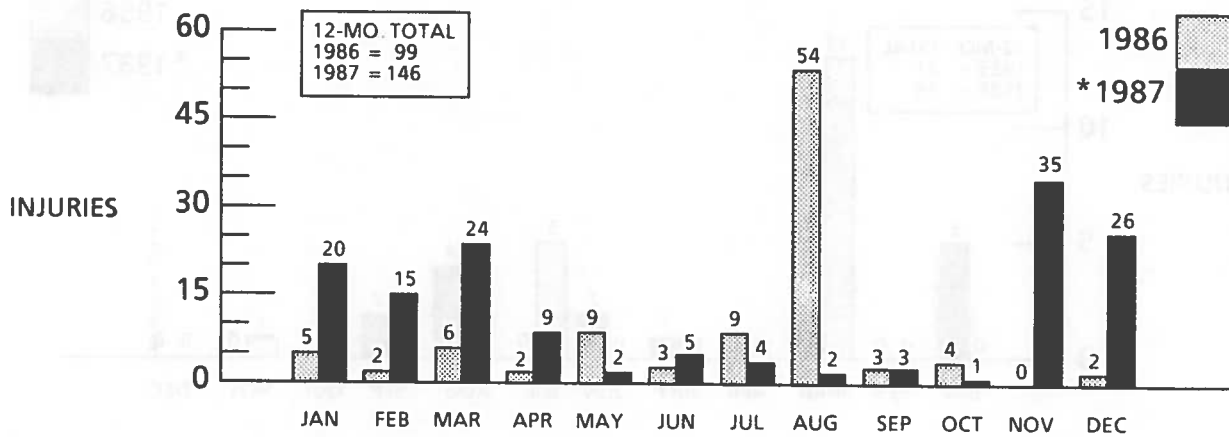
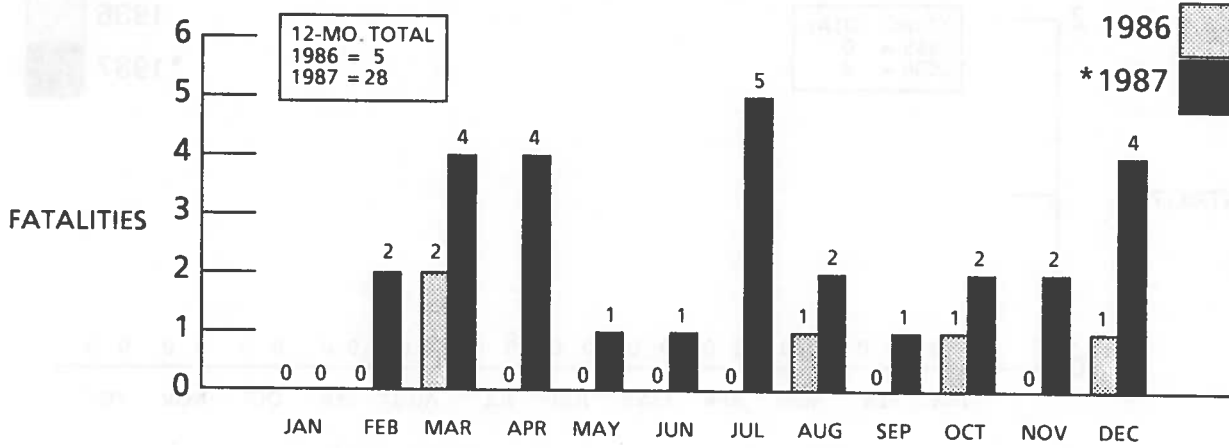


* Preliminary data prior to verification.
** See glossary for definition.

SOURCE: TSC, Safety and Security Systems Division, DTS-43.

CHART 20.

RRT TRAIN** FATALITIES, INJURIES AND INCIDENTS, 1986 - 1987*

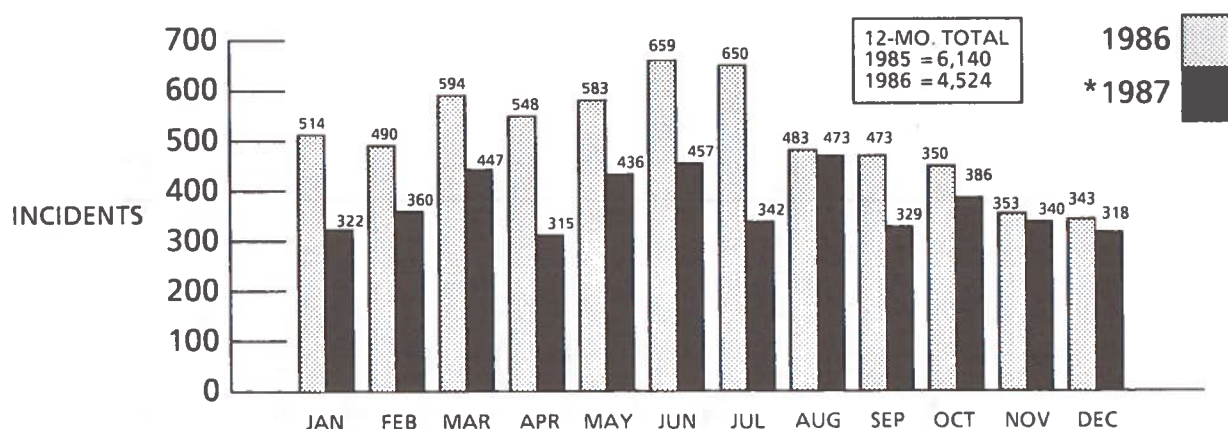
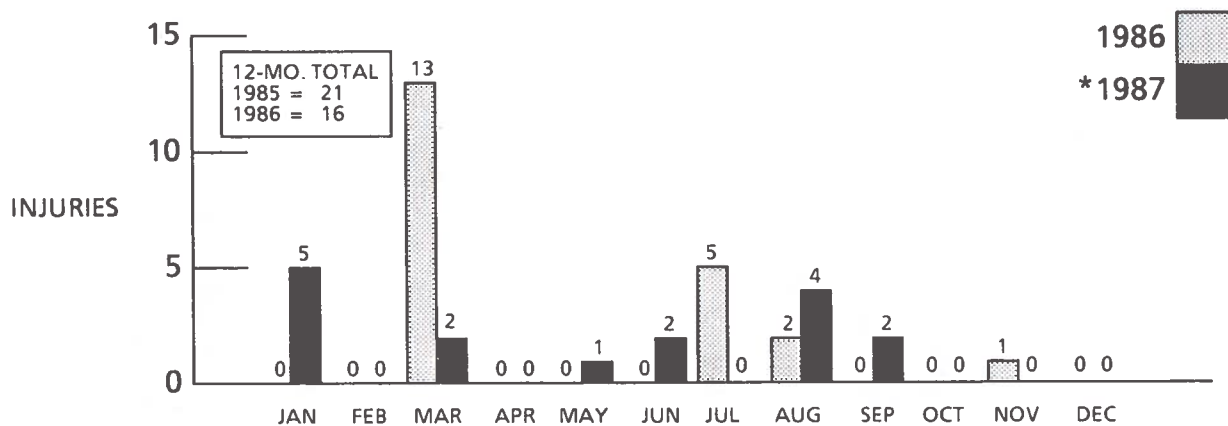
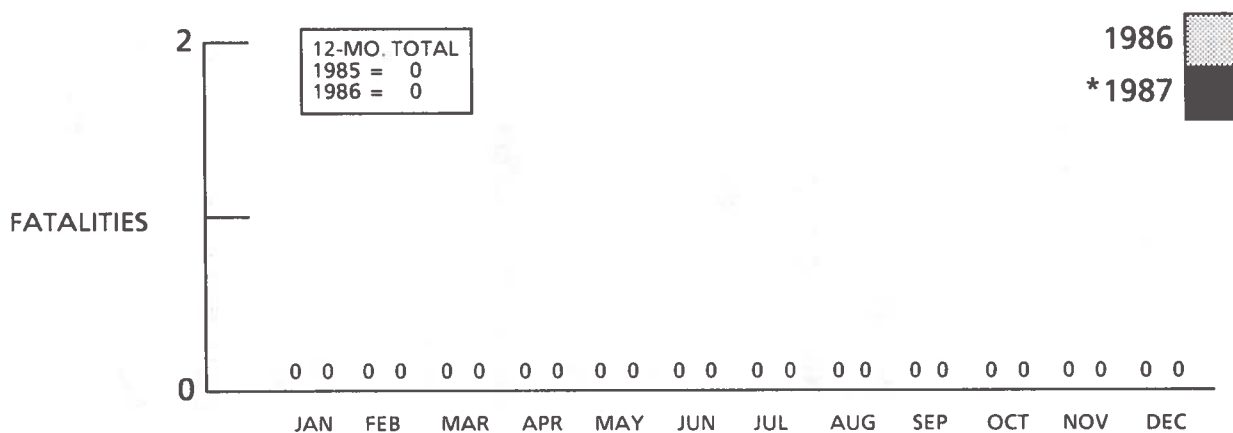


* Preliminary data prior to verification.
** See glossary for definition.

SOURCE: TSC, Safety and Security Division, DTS-43.

CHART 21.

RRT FIRE REPORTS** FATALITIES AND INJURIES, 1986 - 1987*



* Preliminary data prior to verification.
** See glossary for definition.

SOURCE: TSC, Safety and Security Division, DTS-43.

MODAL SAFETY HAZARDS

From the preliminary data reported, the major cause of Rail Rapid Transit (RRT) revenue train accidents in 1987 was from a train striking a person. Of the 91 accidents reported in 1987, a total of 67 were of this type.

The goal of any transit safety program should be to provide transit patrons with the highest practical level of safety. A safety program can and should minimize the risk associated with the use or operation of the system. Programs have been developed by UMTA's Office of Safety to promote a strong awareness of the need for safety in the transit industry and to provide the industry with the tools to accomplish the goal of providing all transit patrons with the highest practical safety level.

SAFETY PROGRAM HIGHLIGHTS

Fire Safety

UMTA has maintained an active fire safety program to assist bus and rail systems in the prevention, detection and suppression of the fire threat. One effort focuses on the selection of materials that have acceptable characteristics for flammability, smoke emission and toxicity. The "Recommended Fire Safety Practices for Rail Transit Materials Selection" specifically addresses the flammability and smoke emission characteristics of materials. The toxicity issue will be examined by an UMTA sponsored National Research Council study. Documenting fire safety countermeasures, evaluation of fire detection/suppression systems for rail systems and validating a fire model for use in subway ventilation design are projects in the program.

Emergency Preparedness

The concept of emergency preparedness focuses on enhancing a transit system's capability to respond to emergency situations and coordinate efforts with emergency response organizations. In order to respond effectively to and recover from emergency situations, transit systems must develop and implement emergency preparedness programs. Transit system preparedness will directly influence the effectiveness of the response to the emergency situation and thereby the resulting magnitude of the emergency situation. An emergency preparedness program should include:

- 1) planning the response
- 2) mobilizing the actual response, and
- 3) recovering from the emergency.

Previous efforts have been directed at the development of "Emergency Preparedness Guidelines for Rail Systems" and a computer-based decision-making aid called the "Automated Emergency Response System." Efforts are presently underway to address the emergency preparedness issue as it relates to urban bus operations and rural and specialized transit operations.

Elderly and disabled passengers, one segment of the population who may be at increased risk during a rail transit emergency situation, has not been specifically addressed. This increased risk may arise because of mobility limitations, difficulties in communication and health conditions. To address these concerns, UMTA has initiated the development of guidelines which are intended to assist rail transit systems in improving their specific capability for evacuation and rescue of elderly and disabled passengers from emergency situations.

Rail Safety Training

The primary objective of a transit safety program is accident prevention. To assist Rail Transit Systems in achieving this objective UMTA has sponsored the development of a training course entitled Mass Transit Rail System Safety. This week-long course focuses on accident prevention through the system safety process of hazard identification and hazard resolution. Recognizing that even with the implementation of the system safety process, accidents will happen. It is important to learn from each accident. The purpose of accident investigation is to identify the causes of a particular accident and eliminate or control those hazards that resulted in the occurrence of that accident. To assist rail transit operators in implementing an effective accident investigation capability, UMTA is sponsoring the development of a "Rail Accident Investigation" course. The course will focus on the development of an accident investigation plan, accident investigation process, tools, and documentation to be used. Students will be provided with working knowledge of accident investigation procedures used to analyze specific types of rail accidents, a methodology for the collection of accident data, and examples of how to prepare formal accident investigation reports.

Control of Drugs

To combat the substance abuse problem in transit systems, UMTA is preparing a drug rule for all safety critical transit personnel, and is developing supporting programs in the areas of education, awareness, testing and rehabilitation. The most effective approach to implementing the support programs necessary to address the deep rooted causes of substance abuse is through local and state action with the active involvement of the transit unions. As such, UMTA is providing financial assistance to several states in FY88 to develop demonstration programs to address substance abuse in transit. In addition, drug awareness and education conferences are scheduled for bus operators and for all rail operators. UMTA is also preparing guidelines for the implementation of the drug rule, developing techniques to assist local transit managers in identifying individuals who may be using illicit substances, and producing educational materials to assist transit agencies in promoting employee drug awareness. UMTA will also be monitoring the effectiveness of the drug rule and of local agency drug programs by collecting data on substance abuse in transit.

Source: TSC, Safety and Security Systems Division, DTS-43.

AVIATION

Beginning in January 1982, the National Transportation Safety Board began reporting aviation accident data according to the Federal Aviation Regulations under which the aircraft was operated at the time of an accident. Revenue operations of Air Carriers, Commercial Operators and deregulated All Cargo Carriers, using large aircraft, are conducted under 14 CFR 121, 125, and 127. Commuter Air Carriers' (scheduled) and On-Demand Air Taxi Operators (unscheduled) revenue operations (using small aircraft) are conducted under 14 CFR 135. Accidents involving flights not being conducted under either 14 CFR 121 or 14 CFR 135 are grouped by the Safety Board into the "General Aviation" category.

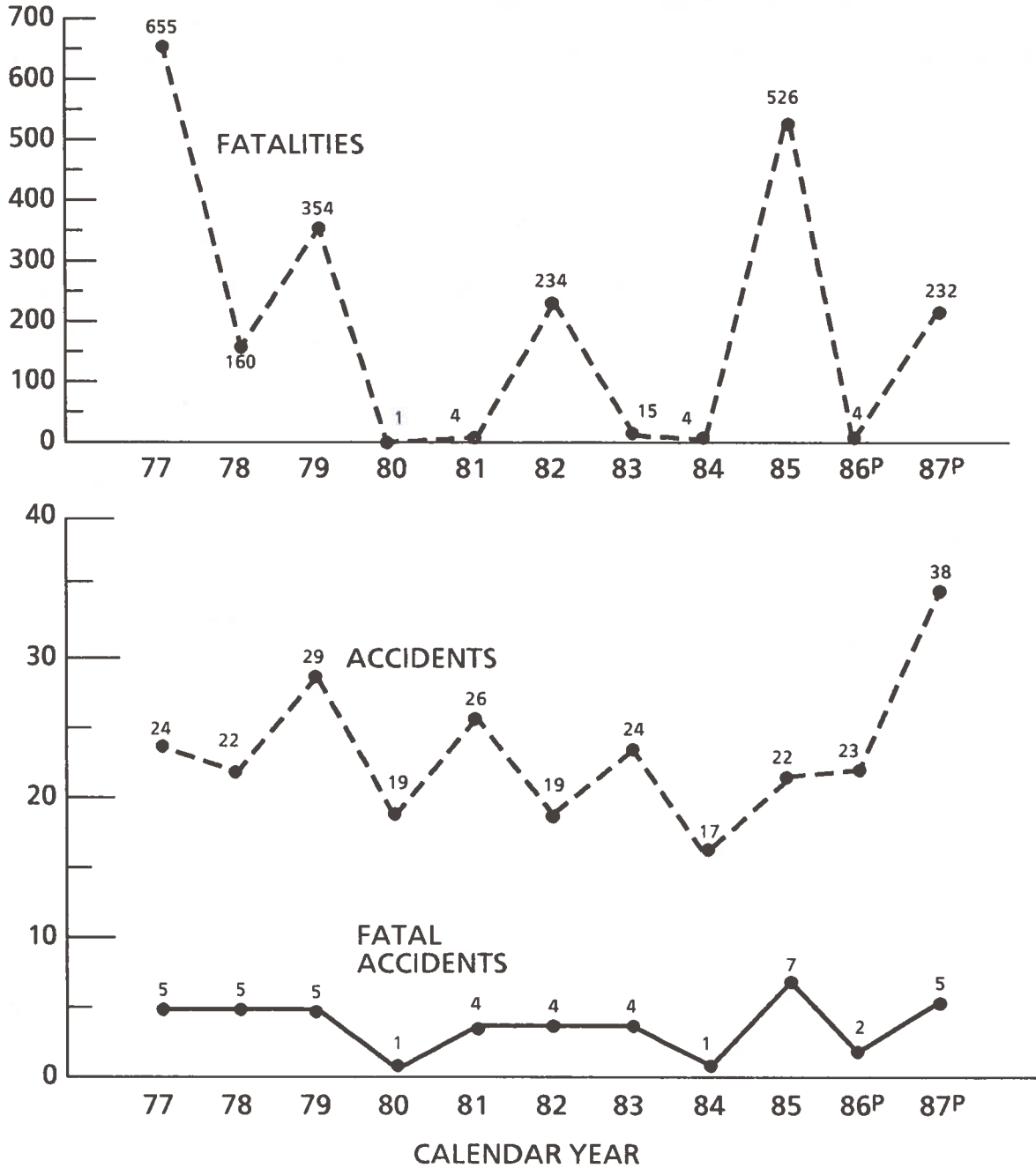
AIR CARRIER

- After reaching a record high of seven fatal accidents in 1985, U.S. air carriers flying large aircraft dropped to two fatal accidents in 1986 but increased to five in 1987. During the 1986-1987 period, total U.S. air carrier accidents rose from 23 to a high of 38.
- There were 232 fatalities in all U.S. air carrier operations during 1987 compared with 4 in 1986.
- Commuter carriers had 10 fatal accidents and 59 fatalities in 1987, compared with 2 fatal accidents and 4 fatalities in 1986. There were 0.45 fatal accidents for every 100,000 departures in 1987 versus 0.08 in 1986. A total of 32 accidents was recorded by commuter carriers in 1987 compared to 15 in 1986.
- The fatal accident rate for on-demand air taxis declined during 1987. On-demand air taxis recorded 31 fatal accidents and 66 fatalities in 1987 versus 31 fatal accidents and 65 fatalities in 1986. Total on-demand air taxi accidents decreased 11.2 percent in 1987 -- from 116 in 1986 to 103 in 1987.



CHART 22.

FATALITIES, ACCIDENTS, AND FATAL ACCIDENTS
FOR U.S. AIR CARRIERS,
ALL SCHEDULED AND NONSCHEDULED SERVICE,
1977 - 1987



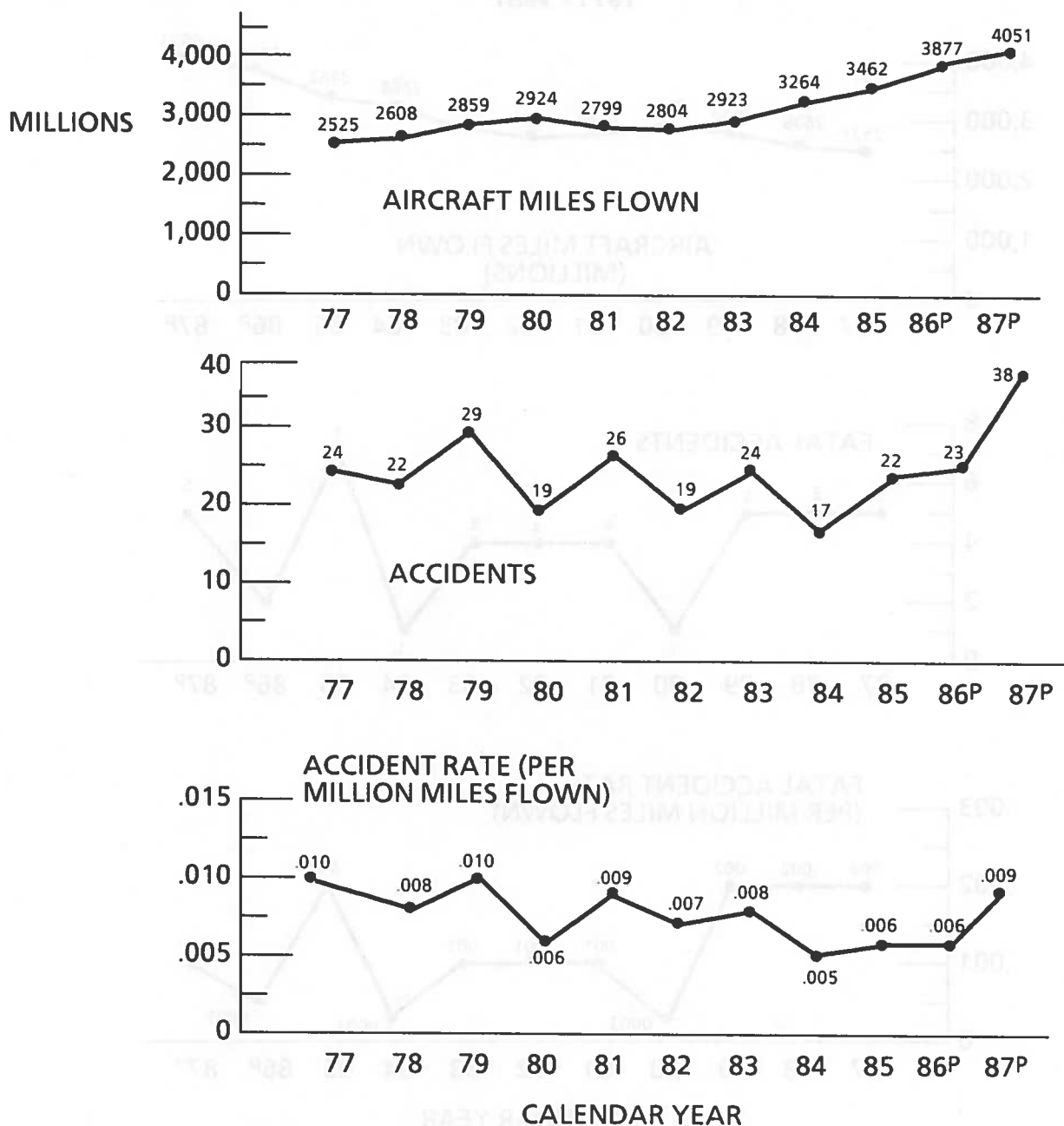
P = Preliminary.

* Includes accidents involving deregulated all cargo air carriers and commercial operators of large aircraft when those accidents occurred during scheduled 14 CFR 121, 125, and 127 operations.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 23.

**ACCIDENT RATES FOR U.S. AIR CARRIERS,
ALL SCHEDULED AND NONSCHEDULED SERVICE,*
1977 - 1987**



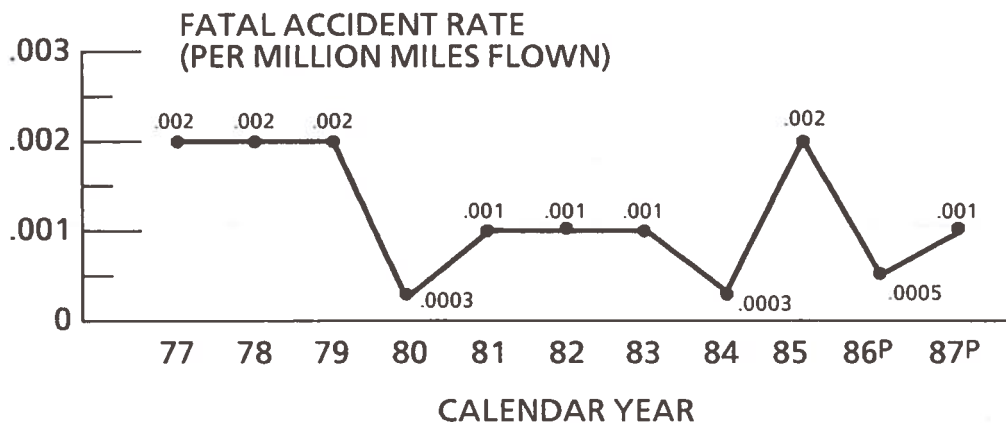
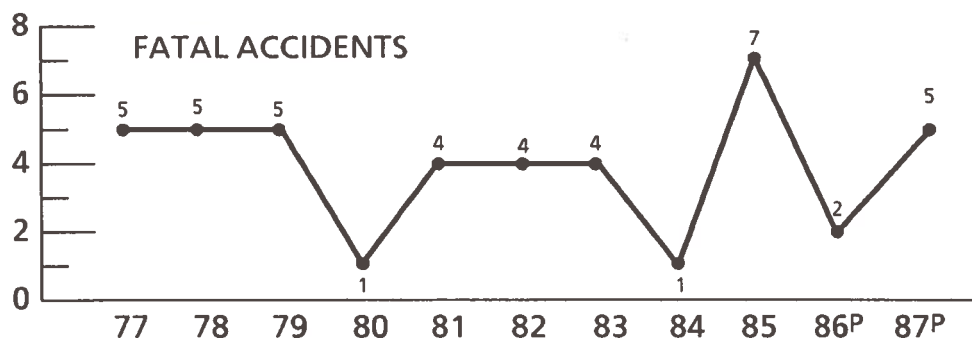
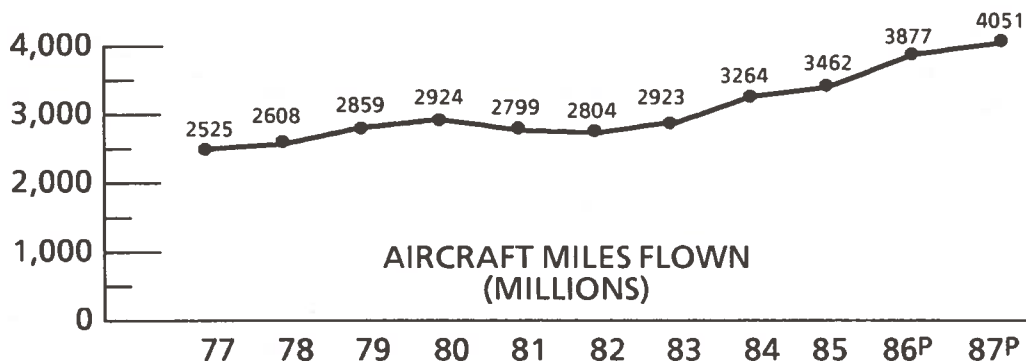
P = Preliminary.

* Includes accidents involving deregulated all cargo air carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121, 125, and 127 operations.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 24.

**FATAL ACCIDENT RATES FOR U.S. AIR CARRIERS,
ALL SCHEDULED AND NONSCHEDULED SERVICE,*
1977 - 1987**



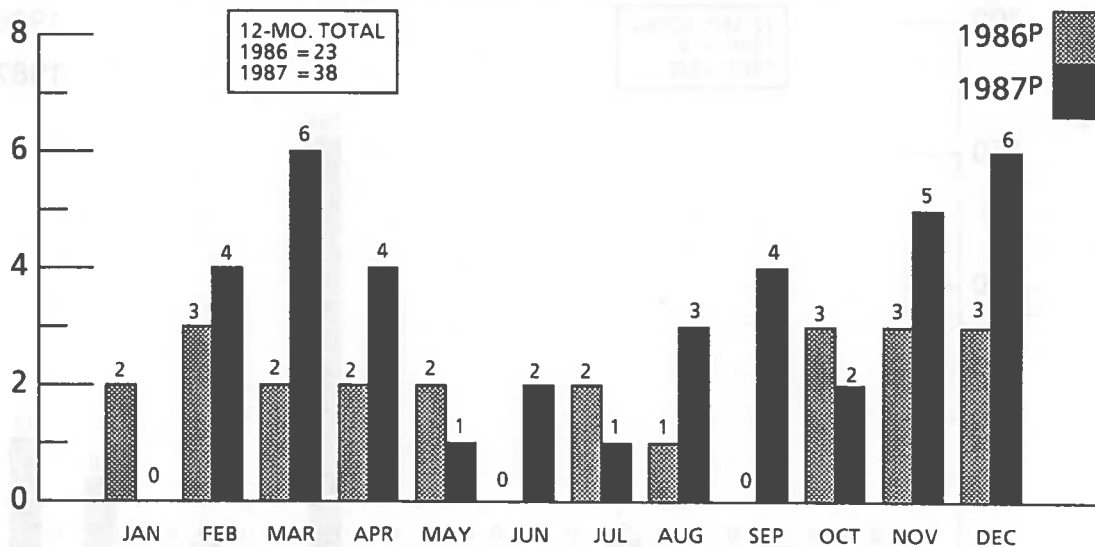
P = Preliminary.

* Includes accidents involving deregulated all cargo air carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121, 125, and 127 operations.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 25.

U.S. AIR CARRIER ACCIDENTS*, 1986 - 1987



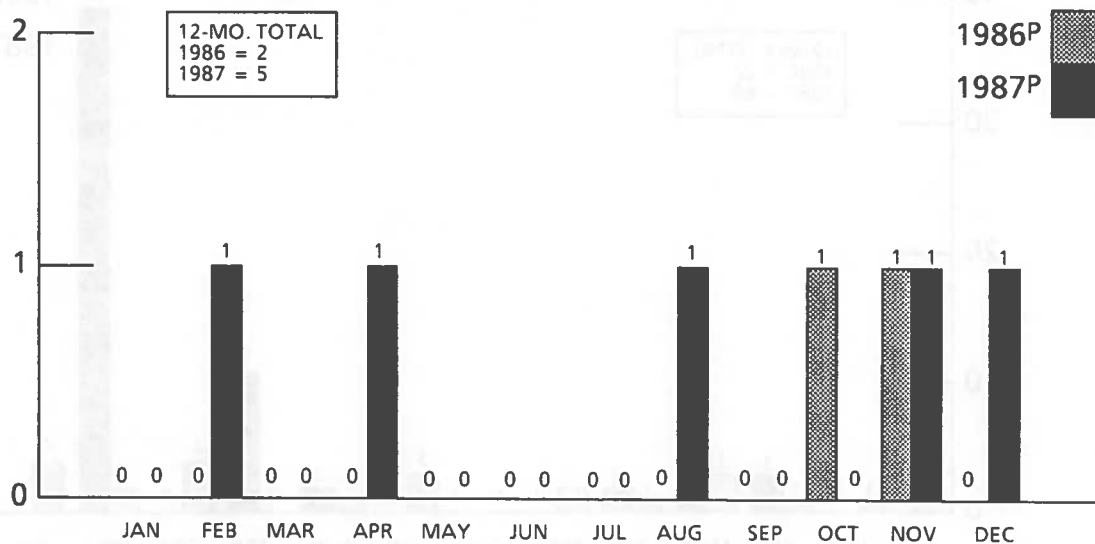
P = Preliminary.

* All large carriers operating under 14 CFR 121, 125, and 127

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 26.

U.S. AIR CARRIER* FATAL ACCIDENTS, 1986 - 1987



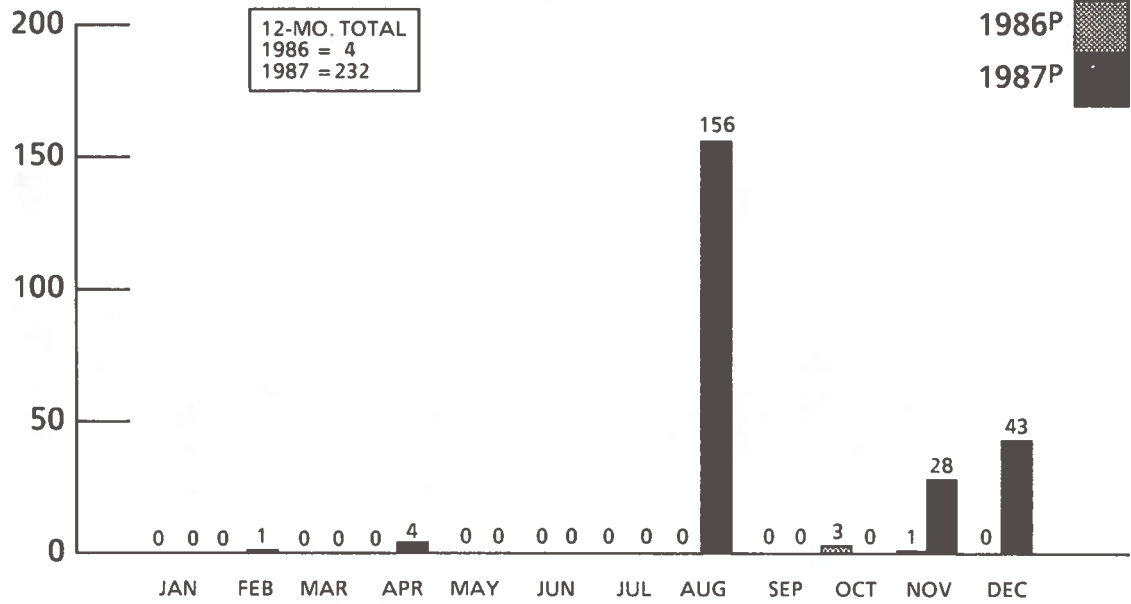
P = Preliminary.

* All large carriers operating under 14 CFR 121, 125, and 127.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 27.

U.S. AIR CARRIER* FATALITIES, 1986 - 1987



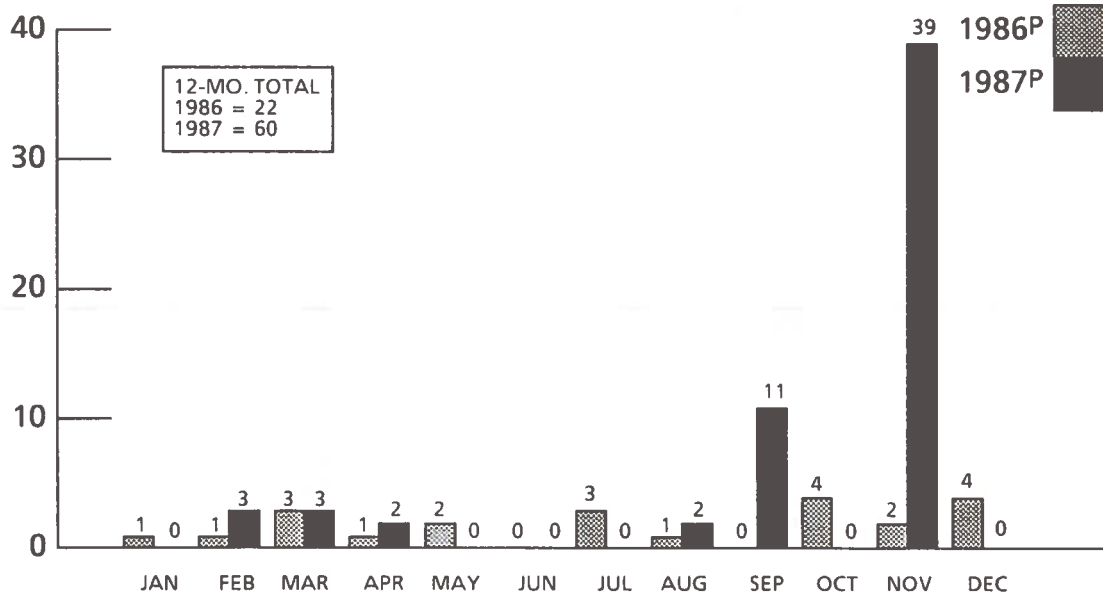
P = Preliminary

* All large carriers operating under 14 CFR 121, 125, and 127.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 28.

U.S. AIR CARRIER* SERIOUS INJURIES, 1986 - 1987



P = Preliminary.

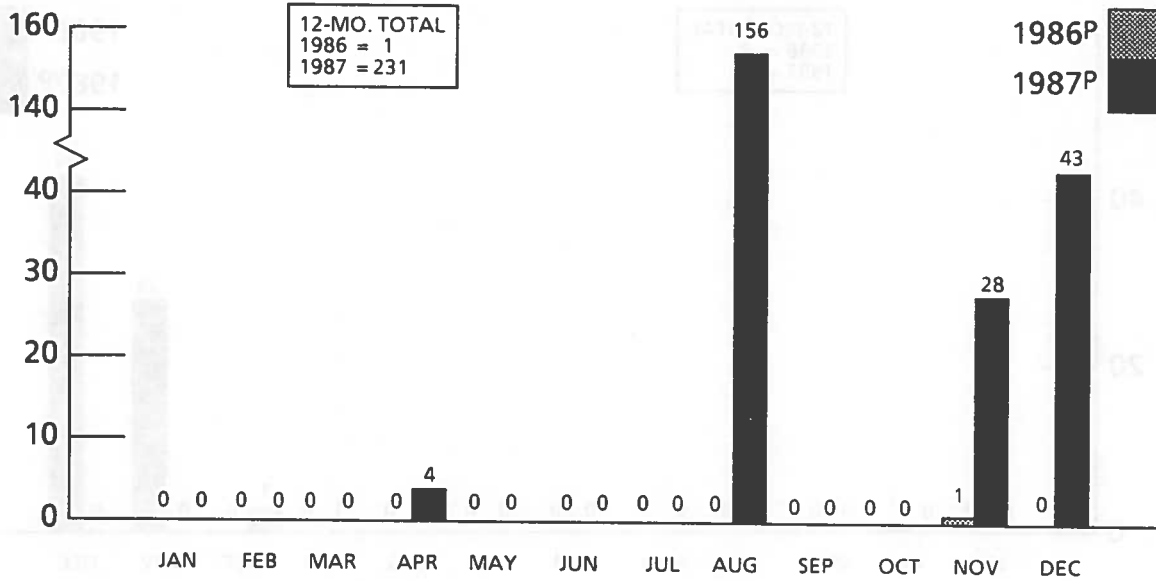
* All large carriers operating under 14 CFR 121, 125, and 127.

SOURCE: NTSB, Accident Data Division, SP-30

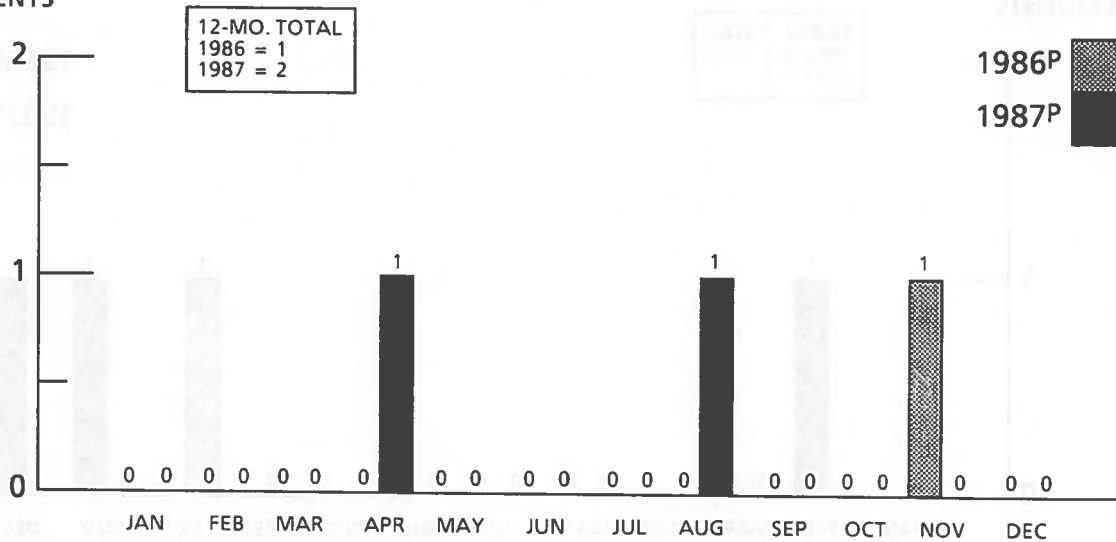
CHART 29.

U.S. AIR CARRIER FATALITIES AND FATAL ACCIDENTS,
ALL SCHEDULED SERVICE*, 1986 - 1987

FATALITIES



FATAL ACCIDENTS



P = Preliminary

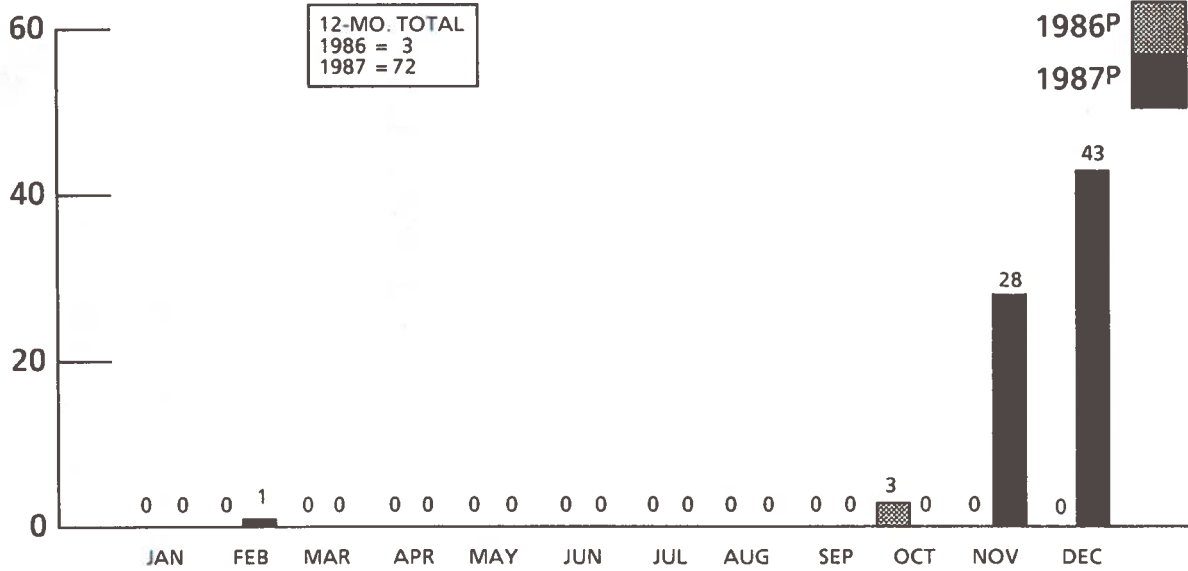
* All scheduled service operating under 14 CFR 121, 125, and 127.

SOURCE: NTSB, Accident Data Division, SP-30.

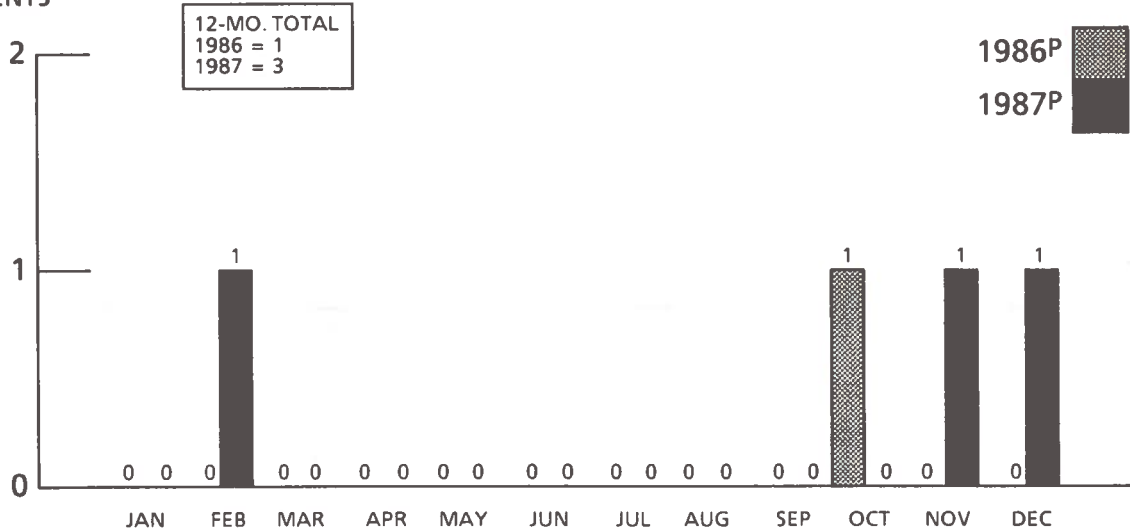
CHART 30.

**U.S. AIR CARRIER FATALITIES AND FATAL ACCIDENTS,
ALL NONSCHEDULED SERVICE*, 1986 - 1987**

FATALITIES



FATAL ACCIDENTS



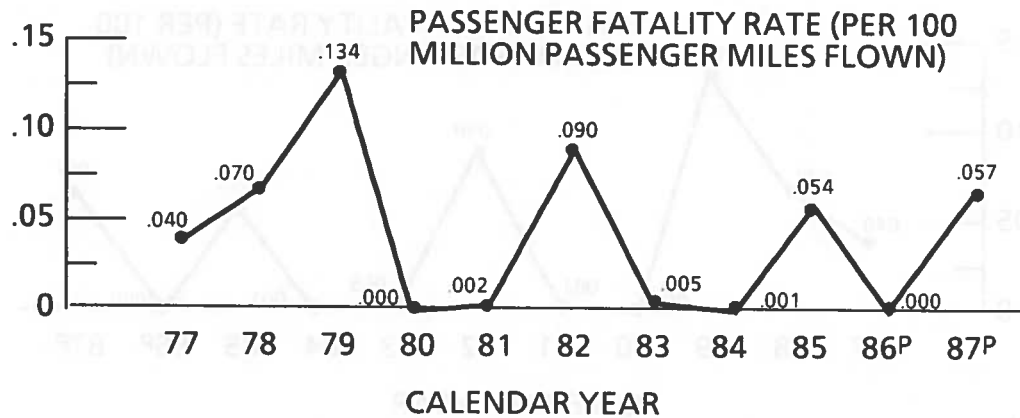
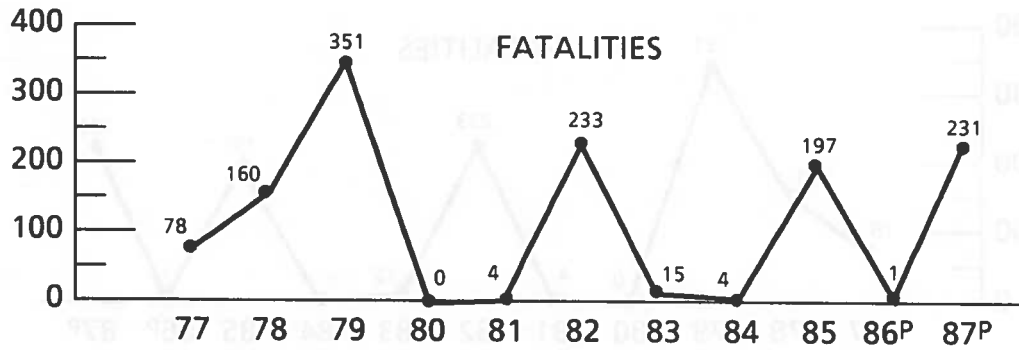
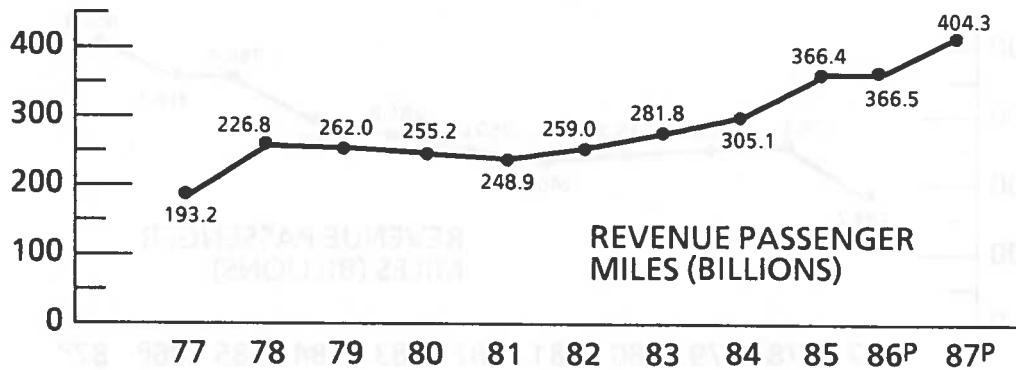
P = Preliminary.

* All nonscheduled service (charter) operating under 14 CFR 121, 125, and 127.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 31.

**U.S. AIR CARRIER PASSENGER FATALITY RATES,
ALL SCHEDULED REVENUE PASSENGER SERVICE,*
1977 - 1987**



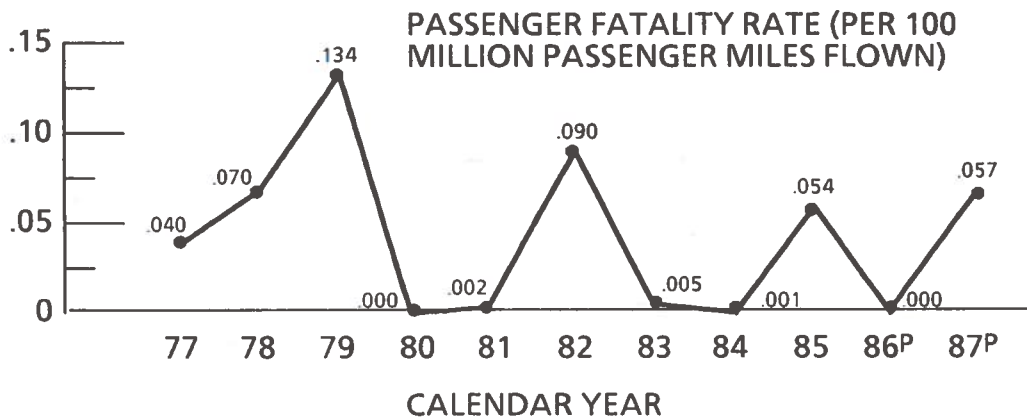
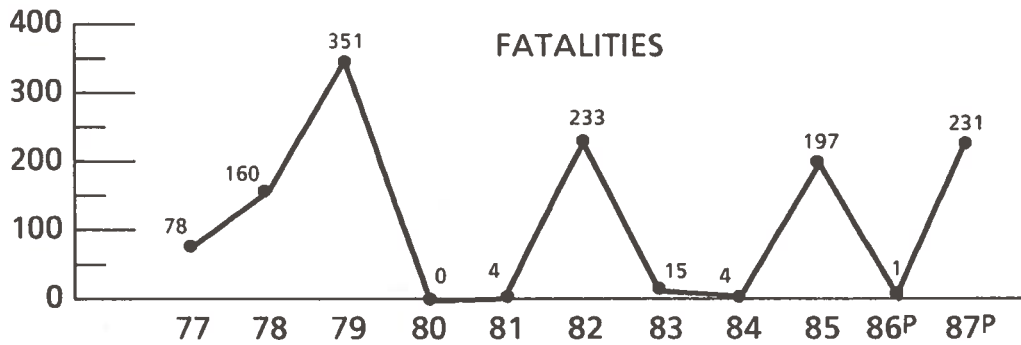
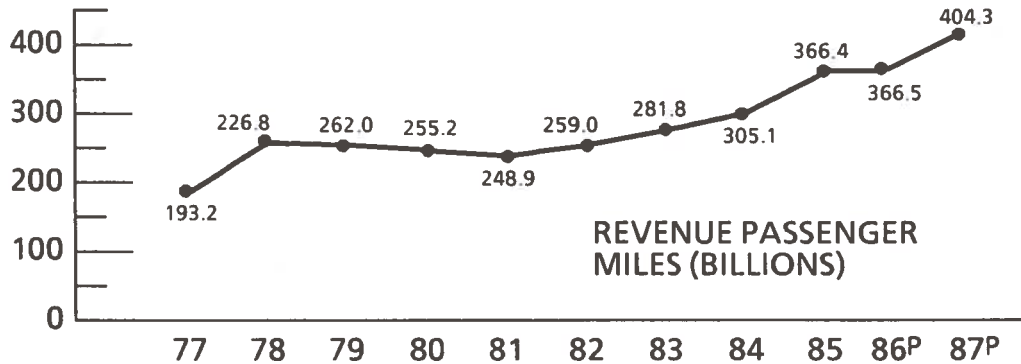
P = Preliminary.

* All scheduled service operating under 14 CFR 121, 125 and 127. Nonscheduled service not included.

SOURCE: NTSB, Accident Data Division, SP-30.
RSPA, TSC, DTS-32.

CHART 32.

**U.S. AIR CARRIER PASSENGER FATALITY RATES,
ALL SCHEDULED REVENUE PASSENGER SERVICE,*
1977 - 1987**



P = Preliminary.

* All scheduled service operating under 14 CFR 121, 125 and 127. Nonscheduled service not included.

SOURCE: NTSB, Accident Data Division, SP-30. RSPA, TSC, DTS-32.

TABLE 9.
COMMUTER CARRIERS* ACCIDENTS, FATALITIES AND INJURIES,
1986-1987

	JANUARY		FEBRUARY		MARCH	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	0	10	0	0	3	9
FATAL ACCIDENTS	0	1	0	0	1	1
TOTAL ACCIDENTS	1	3	2	2	1	4
SERIOUS INJURIES	0	0	0	0	5	3

	APRIL		MAY		JUNE	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	0	2	0	2	0	0
FATAL ACCIDENTS	0	1	0	1	0	0
TOTAL ACCIDENTS	2	4	3	2	0	1
SERIOUS INJURIES	0	1	1	6	0	0

	JULY		AUGUST		SEPTEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	0	0	0	1	0	1
FATAL ACCIDENTS	0	0	0	1	0	1
TOTAL ACCIDENTS	0	0	0	2	1	2
SERIOUS INJURIES	0	0	0	0	0	1

	OCTOBER		NOVEMBER		DECEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	1	0	0	18	0	16
FATAL ACCIDENTS	1	0	0	1	0	3
TOTAL ACCIDENTS	2	0	1	2	2	10
SERIOUS INJURIES	6	0	0	3	0	6

	12-MONTH TOTALS		
CLASSIFICATION	1986	1987	% Chg
FATALITIES	4	59	+1375.0
FATAL ACCIDENTS	2	10	+400.0
TOTAL ACCIDENTS	15	32	+113.3
SERIOUS INJURIES	12	20	+66.7

NOTE: 1986 and 1987 data are preliminary.

* All scheduled service operating under 14 CFR 135.

SOURCE: NTSB, Accident Data Division SP-30

TABLE 10.
ON-DEMAND AIR TAXIS* ACCIDENTS, FATALITIES AND INJURIES,
1986-1987

	JANUARY		FEBRUARY		MARCH	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	7	8	4	4	1	1
FATAL ACCIDENTS	3	5	2	2	1	1
TOTAL ACCIDENTS	10	10	16	5	11	7
SERIOUS INJURIES	8	5	3	1	0	3

	APRIL		MAY		JUNE	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	1	3	6	4	5	10
FATAL ACCIDENTS	1	2	4	3	3	5
TOTAL ACCIDENTS	5	5	6	4	10	8
SERIOUS INJURIES	0	2	1	1	1	0

	JULY		AUGUST		SEPTEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	4	2	16	5	4	5
FATAL ACCIDENTS	2	2	4	2	2	2
TOTAL ACCIDENTS	8	8	11	8	9	17
SERIOUS INJURIES	4	2	0	1	0	2

	OCTOBER		NOVEMBER		DECEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
FATALITIES	5	3	4	4	8	17
FATAL ACCIDENTS	3	3	3	1	3	3
TOTAL ACCIDENTS	8	15	14	8	8	8
SERIOUS INJURIES	6	1	9	0	1	2

	12-MONTH TOTALS		
CLASSIFICATION	1986	1987	% Chg
FATALITIES	65	66	+ 1.5
FATAL ACCIDENTS	31	31	0.0
TOTAL ACCIDENTS	116	103	-11.2
SERIOUS INJURIES	33	20	-39.4

NOTE: 1986 and 1987 data are preliminary.

* Nonscheduled service operating under 14 CFR 135.

SOURCE: NTSB, Accident Data Division, SP-30.

TABLE 11.

COMMUTER AIR CARRIERS* ACCIDENTS, FATALITIES AND ACCIDENT RATES, 1977 - 1987

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986 ^P	1987 ^P
Fatalities	32	48	66	37	34	14	11	48	37	4	59
Fatal Accidents	9	14	15	8	9	5	2	7	7	2	10
Total Accidents	44	61	52	38	31	26	17	22	21	15	32
Serious Injuries	15	32	45	14	24	28	12	23	16	12	20
Fatal Accident Rate ^{**+}	0.04	0.06	0.08	0.04	0.05	0.02	0.01	0.02	0.02	0.01	0.04
Total Accident Rate ^{**+}	0.22	0.27	0.27	0.20	0.16	0.12	0.07	0.08	0.07	0.06	0.13
Fatal Accident Rate ^{#+}	0.52	0.70	0.80	0.45	0.49	0.25	0.09	0.26	0.27	0.08	0.45
Total Accident Rate ^{#+}	2.53	3.06	2.76	2.14	1.69	1.28	0.73	0.82	0.82	0.64	1.39

P = Preliminary.

* All scheduled service operating under 14 CFR 135.

** Per million aircraft miles flown.

+ Rates are based on all accidents including some involving operators not reporting traffic data formerly to the CAB, now to DOT.

Per 100,000 departures.

SOURCE: NTSB, Accident Data Division, SP-30.

TABLE 12.

ON-DEMAND AIR TAXIS* ACCIDENTS, FATALITIES AND ACCIDENT RATES, 1977 - 1987

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986 ^P	1987 ^P
Fatalities	118	155	77	105	94	72	62	52	76	65	66
Fatal Accidents	31	54	30	46	40	31	27	23	35	31	31
Total Accidents	158	198	160	171	157	132	141	146	152	116	103
Serious Injuries	40	67	32	43	37	39	29	35	43	33	20
Fatal Accident Rate ^{**}	0.94	1.52	0.81	1.27	1.38	0.95	1.05	0.75	1.26	1.10	1.00
Total Accident Rate ^{**}	4.78	5.58	4.34	4.73	5.42	4.05	5.48	4.74	5.46	4.02	3.34

P = Preliminary.

* Nonscheduled service operating under 14 CFR 135.

** Per 100,000 aircraft hours

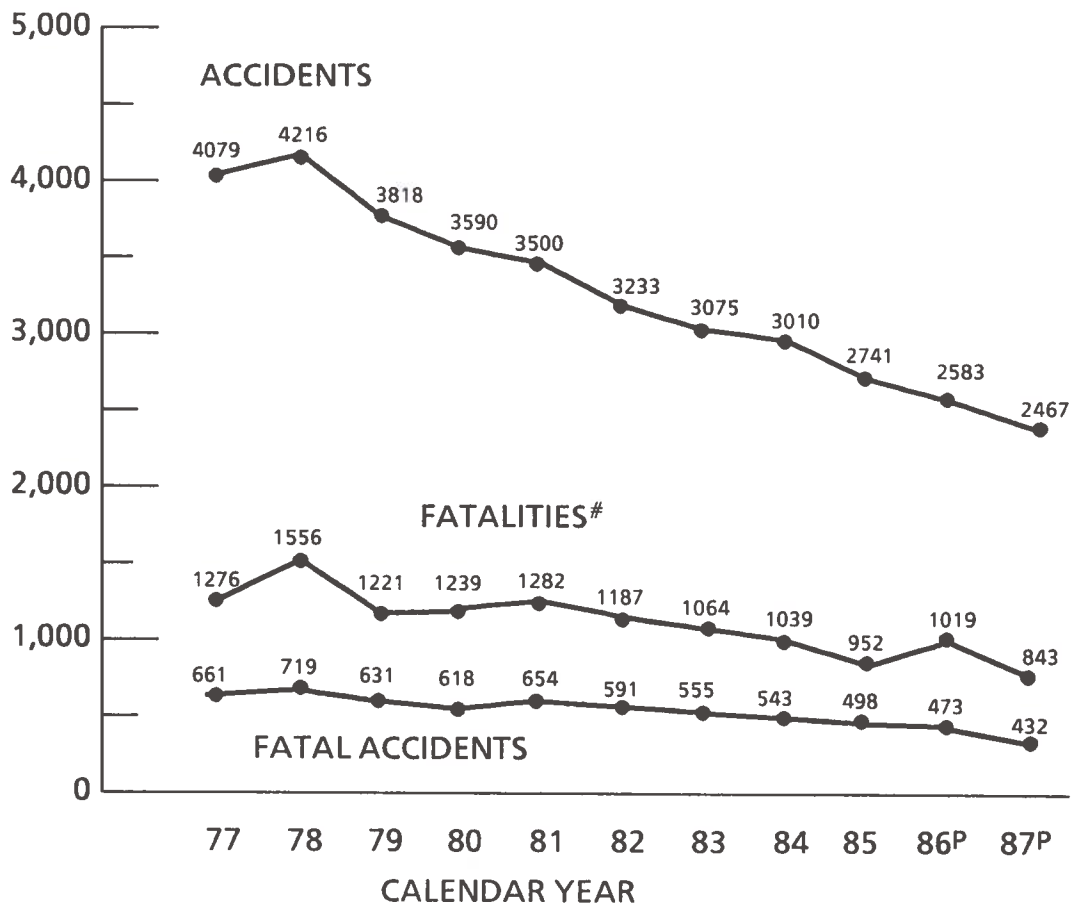
SOURCE: NTSB, Accident Data Division, SP-30.

GENERAL AVIATION

- U.S. General Aviation accidents, fatal accidents, and fatalities all decreased during 1987 as compared with 1986. There were 2,467 accidents, 432 fatal accidents and 843 fatalities in 1987 versus 2,583 accidents, 473 fatal accidents and 1,019 fatalities in 1986. Serious injuries also decreased during the same period with a total of 479 serious injuries in 1987 compared to 547 serious injuries in 1986.

CHART 33.

**GENERAL AVIATION* ACCIDENTS, FATALITIES,
AND FATAL ACCIDENTS, 1977 - 1987**



^P = Preliminary.

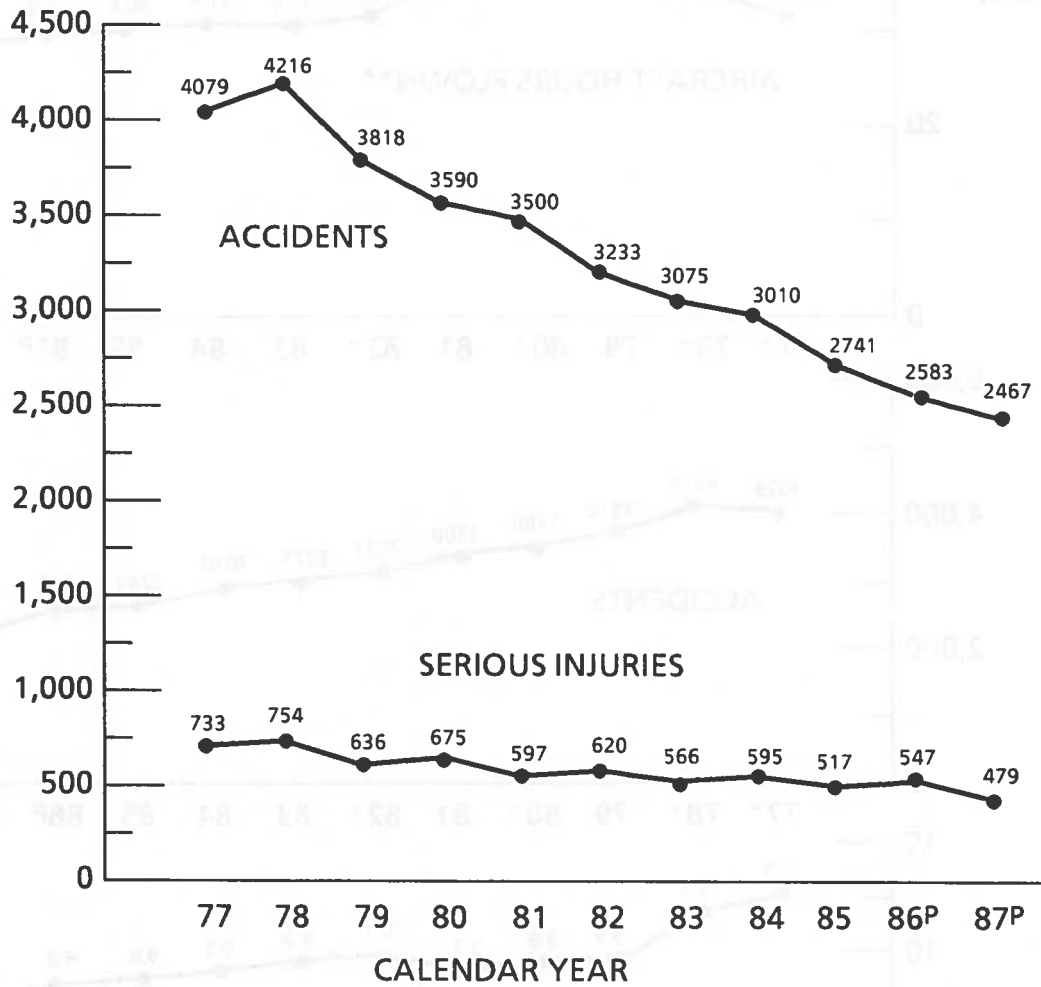
* All operations other than those operated under 14 CFR 121, 125, 127 and 14 CFR 135.

Includes air carrier fatalities when in collision with General Aviation aircraft.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 34.

**GENERAL AVIATION* ACCIDENTS AND SERIOUS INJURIES,
1977 - 1987**



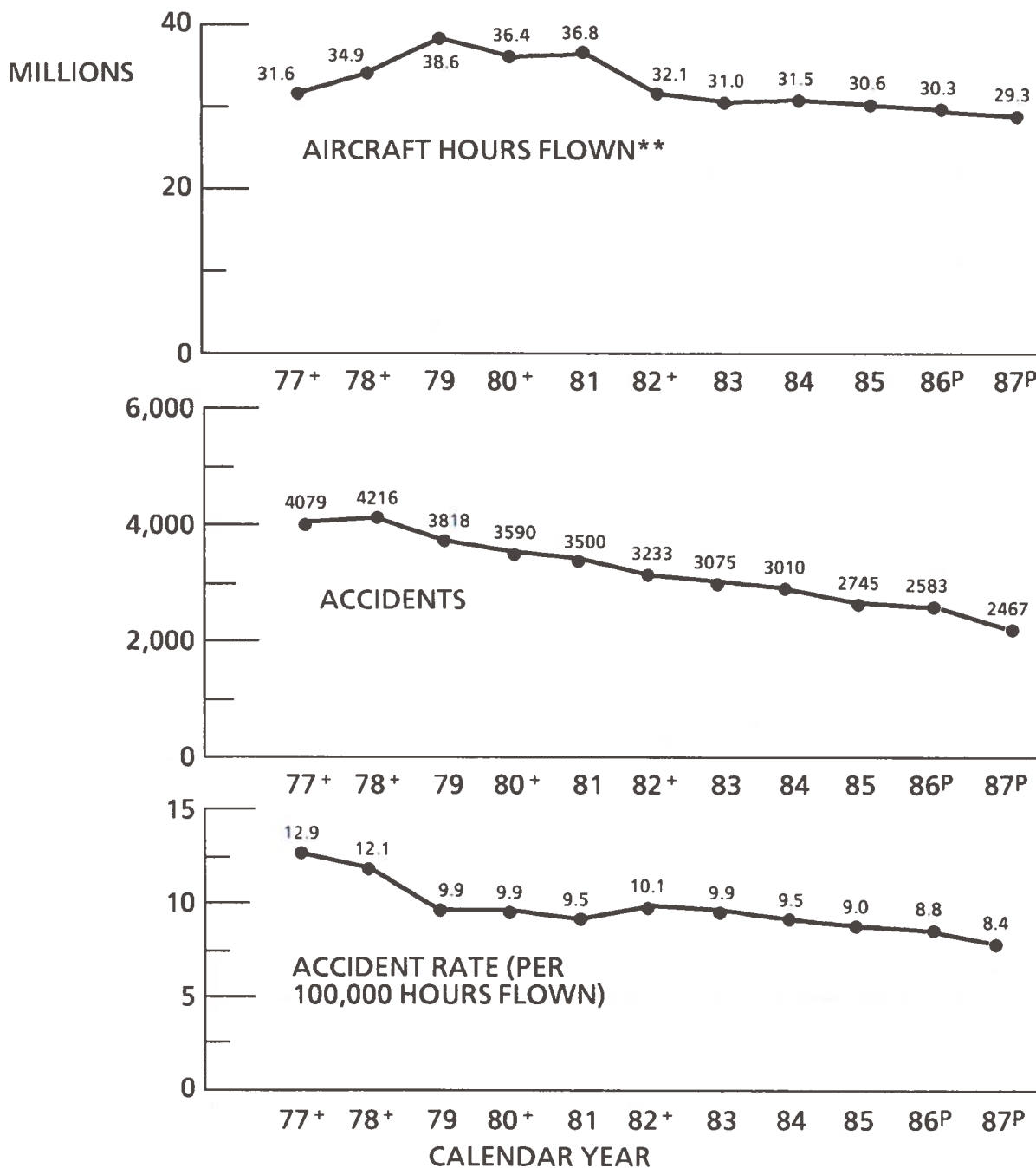
P = Preliminary.

* All operations other than those operated under 14 CFR 121, 125, 127 and 14 CFR 135.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 35.

GENERAL AVIATION* ACCIDENTS AND ACCIDENT RATES, 1977-1987



P = Preliminary.

* All operations other than those operated under 14 CFR 121, 125, 127, and 14 CFR 135.

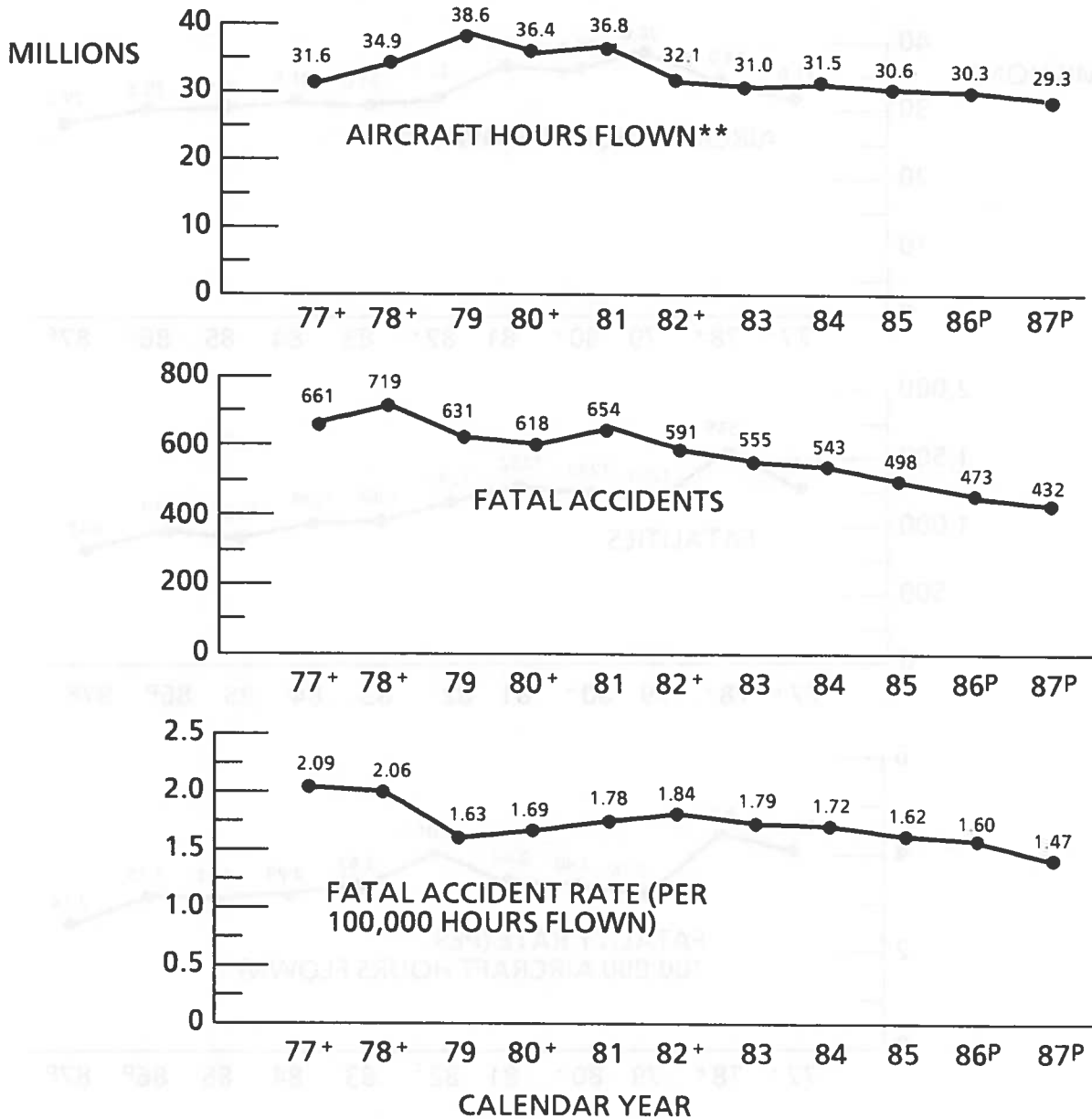
** Source of estimate: FAA.

+ Suicide/sabotage accidents included in all computations except rates (1977 - 1, 1978 - 2, 1980 - 1, 1982 - 3).

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 36.

**GENERAL AVIATION* FATAL ACCIDENTS AND RATES,
1977 - 1987**



P = Preliminary.

* All operations other than those operated under 14 CFR 121, 125, 127 and 14 CFR 135.

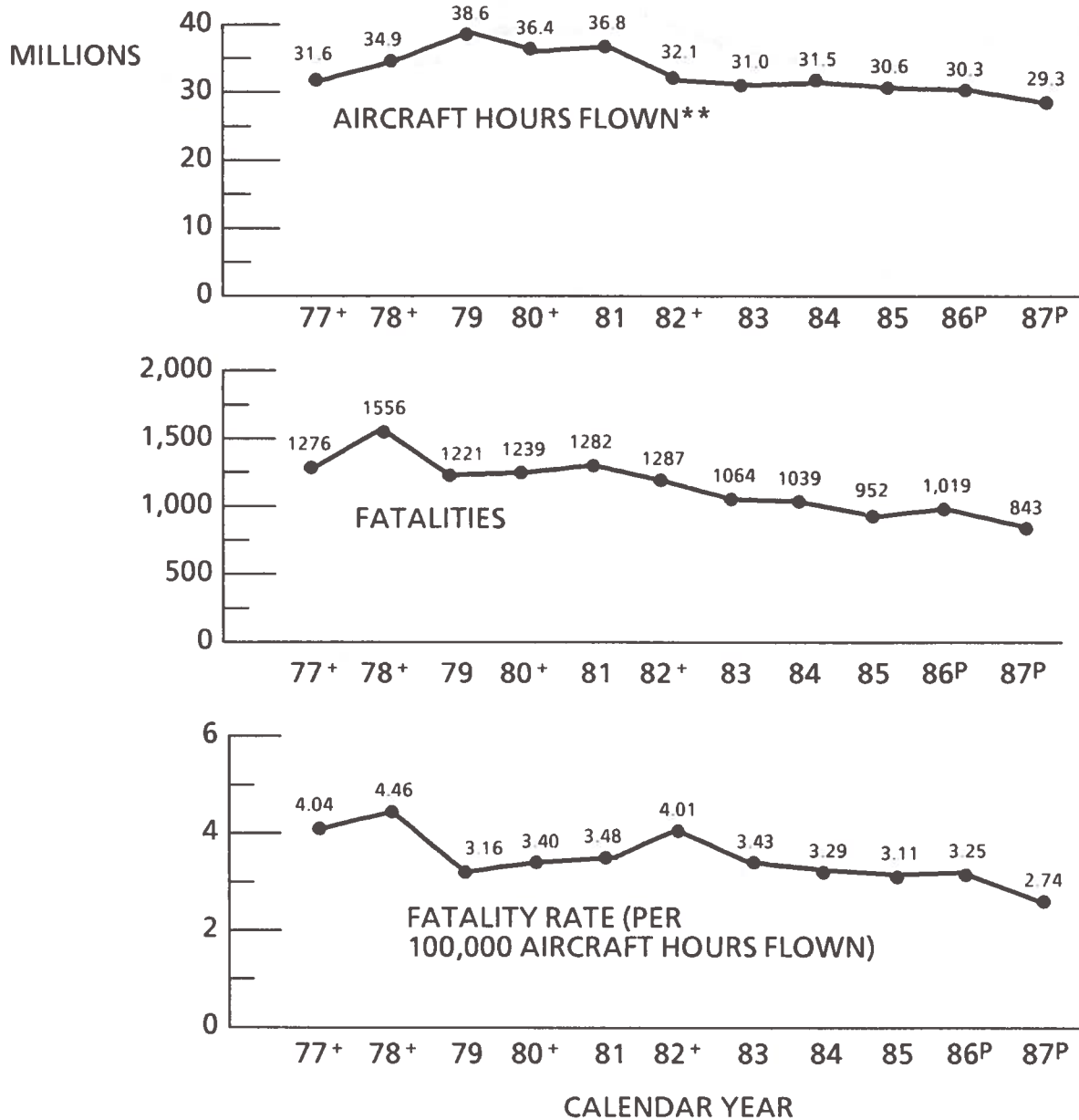
** Source of estimate: FAA.

+ Suicide/sabotage accidents included in all computations except rates (1977 - 1, 1978 - 2, 1980 - 1, 1982 - 3).

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 37.

**GENERAL AVIATION* FATALITIES AND FATALITY RATES,
1977 - 1987**



P = Preliminary.
 * All operations other than those operated under 14 CFR 121, 125, 127 and 14 CFR 135.
 ** Source of estimate: FAA.
 † Includes air carrier fatalities when in collision with General Aviation aircraft.

SOURCE: NTSB, Accident Data Division, SP-30.

TABLE 13.

GENERAL AVIATION FATALITIES BY TYPE OF FLYING, 1986-1987

CLASSIFICATION	JANUARY		FEBRUARY		MARCH		APRIL	
	1986	1987	1986	1987	1986	1987	1986	1987
PERSONAL	51	37	29	40	49	27	40	47
BUSINESS	19	7	9	3	14	8	18	1
CORPORATE/EXECUTIVE	0	6	0	0	0	1	4	0
AERIAL APPLICATION	1	0	0	0	0	6	4	2
INSTRUCTIONAL	0	13	3	2	7	12	5	11
OTHER	2	1	6	8	7	11	1	8
TOTAL GENERAL AVIATION	73	64	47	53	77	59	72	69

CLASSIFICATION	MAY		JUNE		JULY		AUGUST	
	1986	1987	1986	1987	1986	1987	1986	1987
PERSONAL	66	42	50	52	61	66	160	59
BUSINESS	19	14	10	8	6	1	7	9
CORPORATE/EXECUTIVE	0	0	0	0	0	2	1	0
AERIAL APPLICATION	1	3	10	0	5	3	0	2
INSTRUCTIONAL	2	2	0	4	6	3	3	4
OTHER	11	2	55	4	7	6	1	9
TOTAL GENERAL AVIATION	99	63	125	68	85	81	172	83

CLASSIFICATION	SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	1986	1987	1986	1987	1986	1987	1986	1987
PERSONAL	37	46	35	64	52	53	60	48
BUSINESS	12	14	11	14	6	11	6	3
CORPORATE/EXECUTIVE	0	1	0	0	0	8	6	0
AERIAL APPLICATION	3	1	0	0	0	1	0	0
INSTRUCTIONAL	0	7	7	0	5	11	3	2
OTHER	8	8	2	6	11	1	5	4
TOTAL GENERAL AVIATION	60	77	55	84	74	85	80	57

CLASSIFICATION	12- MONTH TOTAL		
	1986	1987	% Chg
PERSONAL	690	581	-15.8
BUSINESS	137	93	-32.1
CORPORATE/EXECUTIVE	11	18	+63.6
AERIAL APPLICATION	24	12	-50.0
INSTRUCTIONAL	41	71	+73.2
OTHER	116	68	-41.4
TOTAL GENERAL AVIATION	1019	843	-17.3

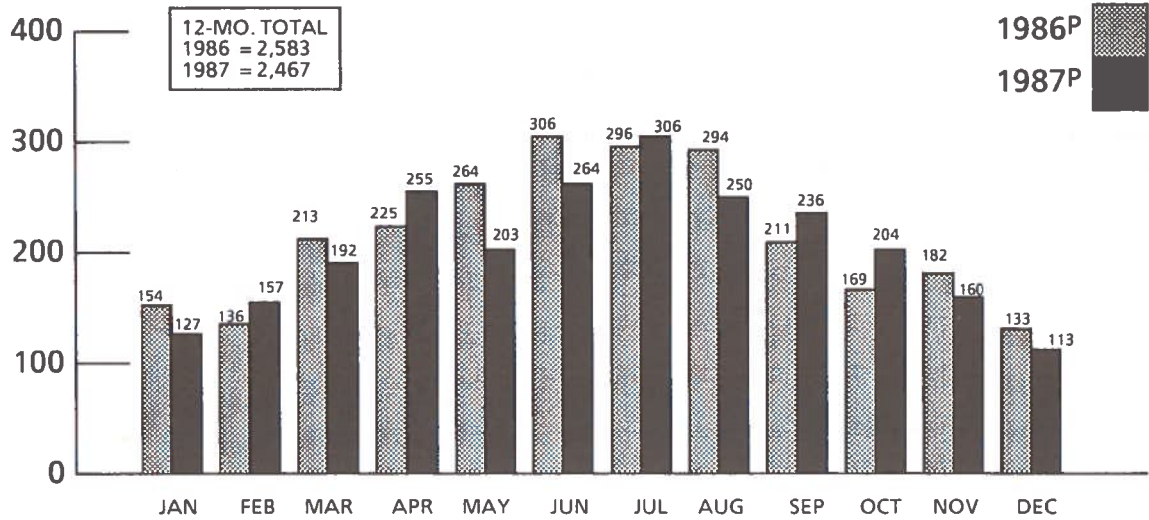
[1] Not calculable

NOTE: 1986 and 1987 data are preliminary.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 38.

GENERAL AVIATION* ACCIDENTS, 1986 - 1987



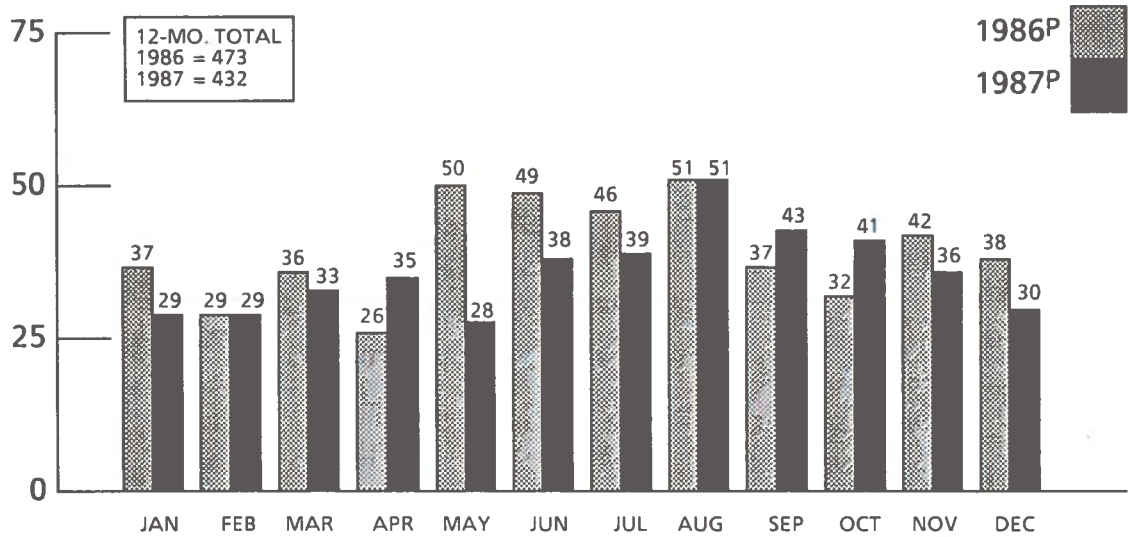
P = Preliminary.

* All operations other than those operations under 14 CFR 121, 125, 127, and 135.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 39.

GENERAL AVIATION* FATAL ACCIDENTS, 1986 - 1987



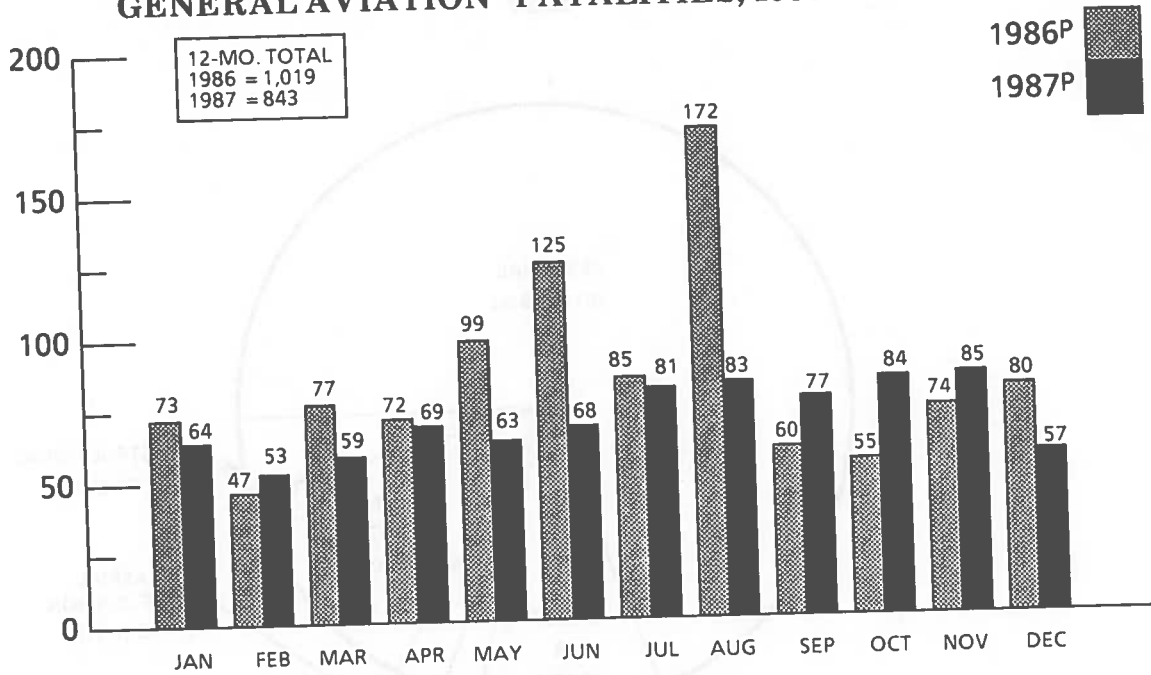
P = Preliminary.

* All operations other than those operations under 14 CFR 121, 125, 127, and 14 CFR 135.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 40.

GENERAL AVIATION* FATALITIES, 1986 - 1987



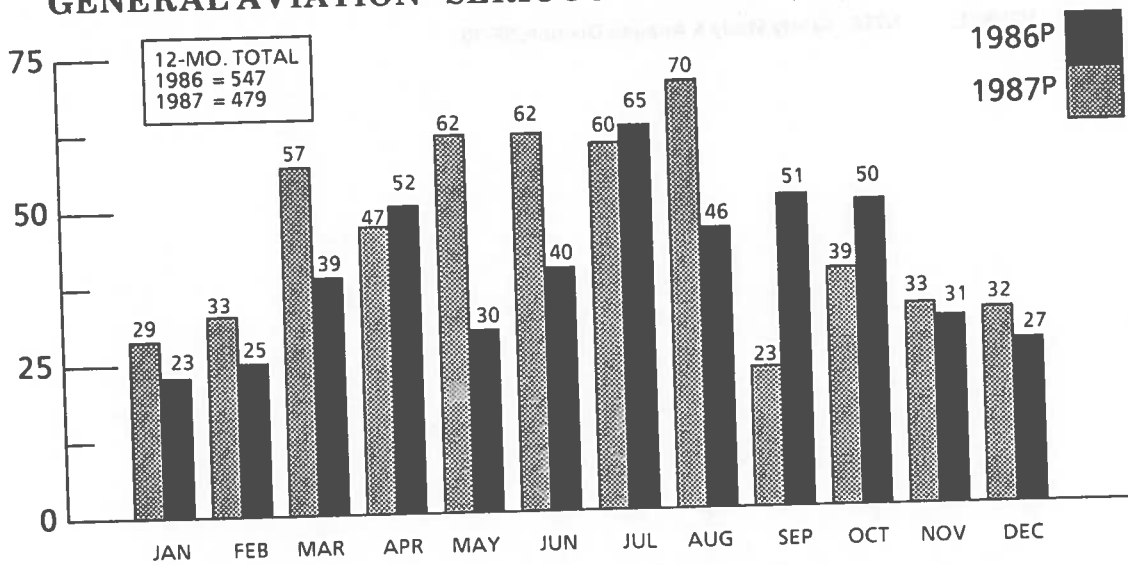
P = Preliminary.

* All operations other than those operations under 14 CFR 121, 125, 127, and 135.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 41.

GENERAL AVIATION* SERIOUS INJURIES, 1986 - 1987

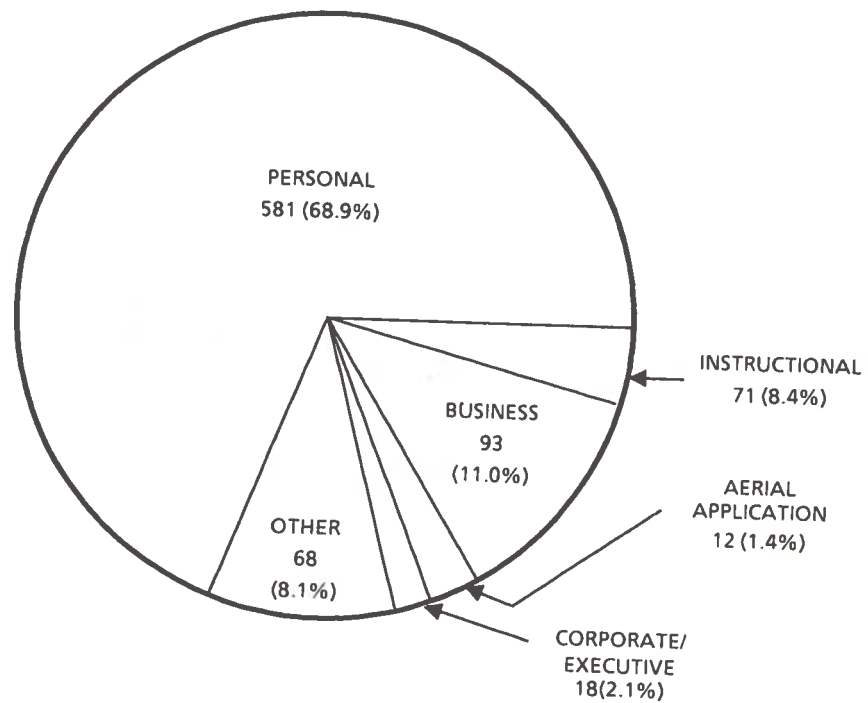


P = Preliminary.

* All operations other than those operations under 14 CFR 121, 125, 127, and 135.

SOURCE: NTSB, Accident Data Division, SP-30.

CHART 42.
GENERAL AVIATION FATALITIES BY AIRCRAFT CLASSIFICATION,
1987



TOTAL FATALITIES: 843

Note: 1987 data are preliminary

SOURCE: NTSB, Safety Study & Analysis Division, SP-30.

MODAL SAFETY HAZARDS

Failure to Deploy Flaps and Slats Cited in Detroit Crash

The probable cause of the August 16, 1987 crash of Northwest Airlines Flight 255 was the flightcrew's failure to use the taxi checklist to ensure that the flaps and slats were extended for takeoff, the National Transportation Safety Board (NTSB) has concluded. Contributing to the accident was the absence of electrical power to the airplane takeoff warning system which thus did not warn the flightcrew that the airplane was improperly configured for takeoff. The reason for the absence of electrical power could not be determined.

The flight crashed shortly after taking off from Detroit Metro Wayne County International Airport. Flight 255, a McDonnell Douglas DC-9-82, was en route to Phoenix, Arizona with 149 passengers and 6 crewmembers.

On board flight 255, 148 passengers and 6 crewmembers were killed; 1 passenger, a 4-year-old child, was injured seriously. On the ground, two persons were killed, one person was injured seriously, and four suffered minor injuries.

The airplane's maintenance records disclosed that it had been maintained and operated in accordance with applicable regulations, rules and procedures. Except for the possible failure of the takeoff warning system to provide an aural warning for an improper takeoff configuration, there was no evidence of any preexisting malfunctions or failures of any airplane structures or systems which could have been a causal factor to the accident, the Board found.

The investigation revealed no evidence of a windshear encounter; thus the investigation centered on the configuration of the airplane for takeoff, flightcrew performance of duties, and the absence of a warning from the takeoff warning system.

Examination of the recovered flap sensors, the Digital Flight Guidance Computer memories, and the fact that airplane systems that would have been adversely affected by a malfunctioning slat position sensor(s) performed within prescribed limits, showed that the information received by the DFDR accurately reflected the positions of the wing flaps and slats.

The Safety Board's airplane performance study of the liftoff speed and climb profile also indicated that flight 255 was not configured for takeoff and corroborated the DFDR data that the takeoff was made with the flaps and slats retracted.

"An examination," the Board said, "of the flightcrew's performance patterns during the flight into Detroit and during their departure from the terminal and taxi to the takeoff runway showed numerous examples of less than standard performance including:

- leaving the weather radar turned off well past the AFTER LANDING check list;
- missing an assigned gate upon arrival at Detroit-Metro Airport;
- missing a radio frequency change during the taxi-out to runway 3-C; and
- the captain's inability to locate the taxi way to the take-off runway."

The NTSB believes that "the absence of dynamic leadership and coordination demonstrated by the accident crew suggests there is strong evidence to support that the cockpit resourced management training they did receive was deficient and that future programs must go beyond the scope of a limited and traditional classroom forum."

As a result of its investigation, the National Transportation Safety Board made recommendations to the FAA which include modifying the DC-9-80 series airplanes to illuminate the existing CAWS FAIL flight on the overhead annunciator panel; investigate circuit breaker reliability and their ability to disable operating systems; require part 121 and 135 carriers and operation inspectors to emphasize rigorous adherence to checklist procedures; and implement line-oriented flightcrew training techniques. The last recommendation was also directed to the airline industry.

SOURCE: NTSB, News Digest, Vol. 7, No. 4.

SAFETY PROGRAM HIGHLIGHTS

Effect of Airline Deregulation on Air Safety

Airline deregulation has been in effect for 9 years. Safety rates have improved during this time even though air carrier activity has shown great increases in all categories. Deregulation has also been a boon to consumers in the form of lower costs to fly.

- The number of flights in 1987 increased for all segments of commercial aviation, setting a new high.
- While air traffic continued to increase, accident and fatality rates for Part 121 air carriers in scheduled service have continued their long-term trend of levels below pre-deregulation years. A total of five Part 121 accidents occurred during 1987.
- Total accident and fatality rates for commuter carriers are much lower than those recorded for 1978, the last year of airline regulation. However, the rates for commuter air carriers for 1987 represent a statistical high point since 1981. The accident rate for air taxis, on the other hand, was the lowest since deregulation in 1979.
- Due to the increasing number of passengers and air carriers in the system, up to 1,000 safety inspectors are expected to be added to the FAA workforce over the next four fiscal years. Adjustments will be made within the normal budgetary process.
- As in past years, the FAA's primary emphasis remained on safety in 1987. The FAA Administrator initiated "Impact '88," which includes the development of a system-wide safety index. This will enable the FAA to identify potential trouble spots within the National Airspace System and correct any shortcomings; the Safety Activity Functional Evaluation (SAFE) and National Aviation Safety Inspection Program play integral roles in this effort.

SOURCE: FAA, Annual Report on the Effect of the Airline Deregulation Act on the Level of Air Safety.

Back-to-Basics Program

The Back-to-Basics Program to reacquaint all segments of the aviation industry with basic operational procedures completed its second year of operation. A Pilot Deviation Task Group was formed in June 1987 to study the types of pilot deviations that occur and to propose ways to reduce or eliminate them. The Office of Aviation Safety convened the Operational Error Task Group in May 1987 to identify air traffic control system deficiencies and trends that affect air traffic control operational errors. The task group generated more than 100 recommendations.

SOURCE: FAA, National Airway System, Annual Report - FY 1987.

Airport Security Programs

The FAA continued its airport security programs in passenger screening, foreign airport assessments, inspections, and detection of explosives. Civil Aviation Security Specialists were deployed to selected European and Middle Eastern airports in February and March of 1987 to monitor the safety of U.S. air carrier flights during a time of heightened international tensions. Federal Air Marshals provide inflight security coverage to U.S. air carriers of the world. The FAA continued its support of research to identify technologies to detect ceramic and plastic weapons.

SOURCE: FAA, National Airway System, Annual Report - FY 1987.

Air Traffic Controller Work Force

As of September 30, 1987, the FAA had exceeded the goal of 15,255 for the controller work force (CWF), with 15,433 on board. At the end of the fiscal year, 70 percent of the FAA's CWF was full-performance-level grade, with centers at 53 percent and terminals at 83 percent.

SOURCE: FAA, National Airway System, Annual Report - FY 1987.

MARINE

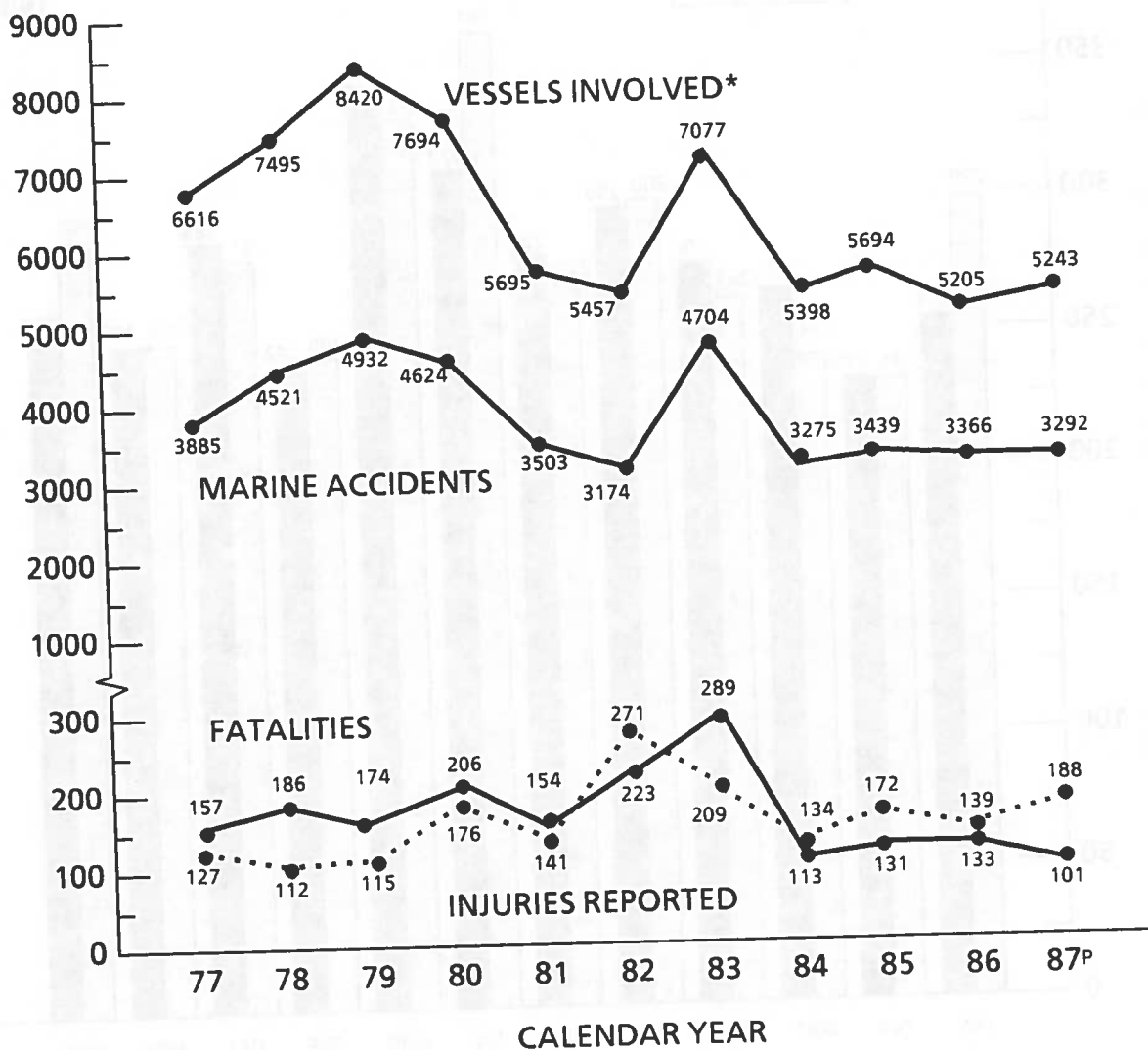
WATERBORNE TRANSPORT

Users of Waterborne Transport statistics should exercise caution when comparing accident, fatality, and injury data for 1986 and 1987. Data for 1987 are incomplete at this time since many of the marine casualties are still being investigated or are in various stages of completion.

- As of September 14, 1988, a total of 3,292 marine accidents involving 5,243 vessels occurred for 1987. As a result of these marine accidents, 101 fatalities and 188 injuries have been reported.
- In 1986, 93 percent of all U.S. vessel losses were uninspected vessels. Fishing vessels accounted for 66 percent of the total number of losses. There were 5,205 vessels involved in 3,366 marine accidents resulting in 133 fatalities and 139 injuries during 1986. Also, in 1986, 119 fatalities were reported as a result of non-vessel-related accidents. Of this number, 39 (33 percent) resulted from falls overboard.
- The injury total for June 1987 includes one accident with 53 injuries to produce a June injury total much higher than for previous years.

CHART 43.

**WATERBORNE ACCIDENTS, FATALITIES AND INJURIES
RESULTING FROM VESSEL CASUALTIES,
1977 - 1987^P**

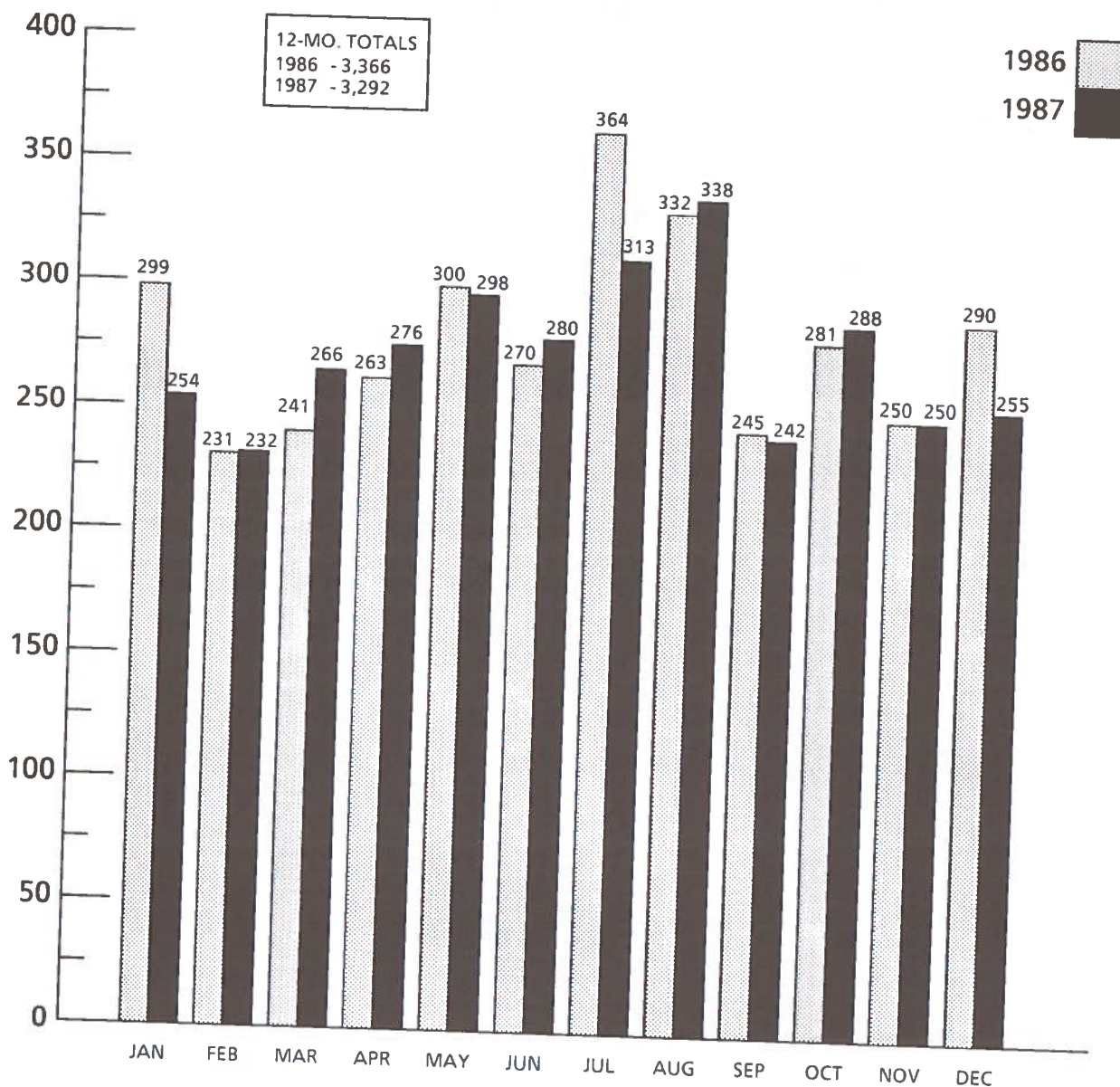


p preliminary
 * More than one vessel may be involved in a marine accident.
 NOTE: Data for 1986 and 1987 are incomplete.
 All deaths and injuries cited result from vessel casualties.

SOURCE: USCG, Marine Investigation Division, G-MMI.

CHART 44.

WATERBORNE ACCIDENTS BY MONTH, 1986-1987^P



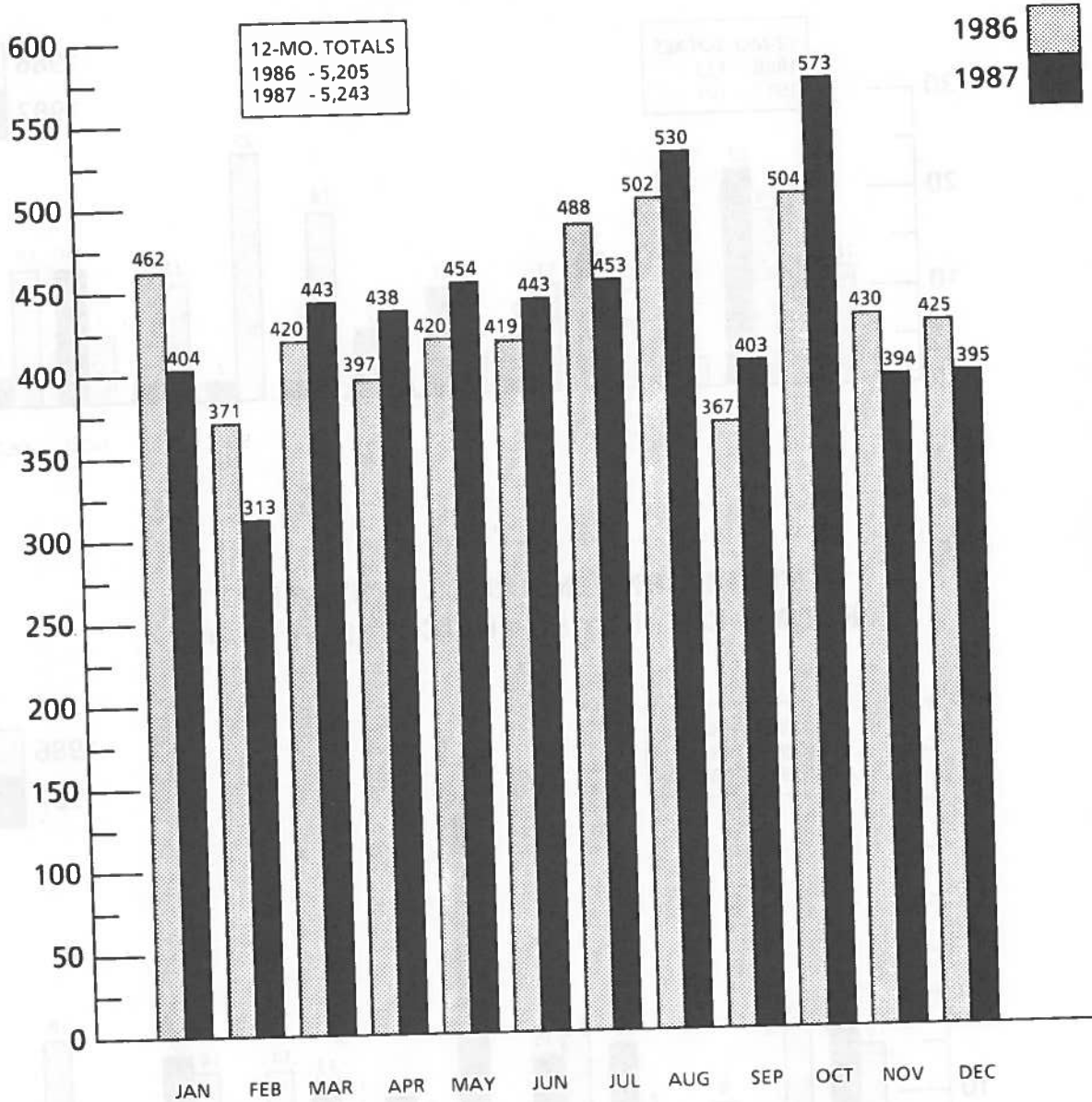
^P preliminary

NOTE: More than one vessel may be involved in a marine accident.
Data for 1986 and 1987 are incomplete.

SOURCE: USCG, Marine Investigation Division, G-MMI.

CHART 45.

VESSELS* INVOLVED IN WATERBORNE ACCIDENTS, 1986-1987^P



^P preliminary

* Includes foreign vessels having casualties in U.S. navigable waters.

NOTE: Data for 1986 and 1987 are incomplete.

More than one vessel may be involved in a marine accident.

SOURCE: USCG, Marine Investigation Division, G-MMI.

CHART 46.
WATERBORNE FATALITIES RESULTING FROM VESSEL CASUALTIES*, 1986 - 1987^P

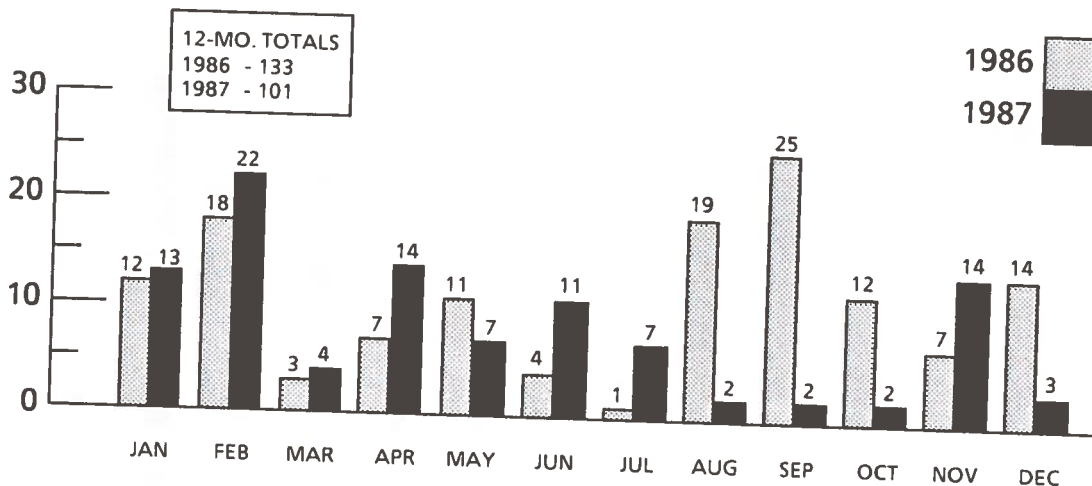
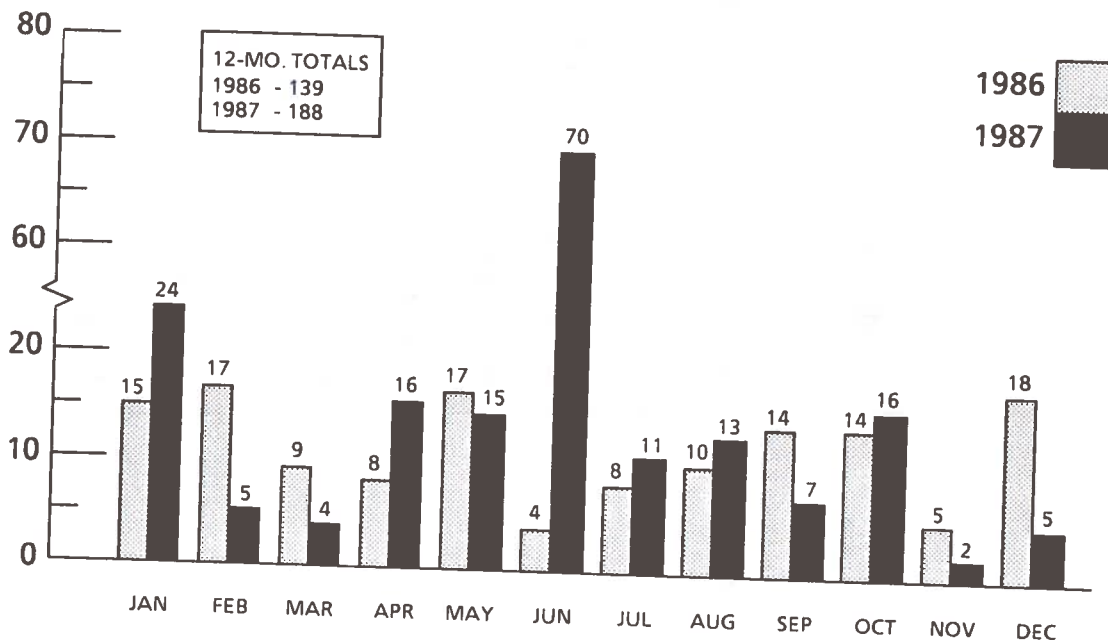


CHART 47.
WATERBORNE INJURIES RESULTING FROM VESSEL CASUALTIES*, 1986 - 1987^P

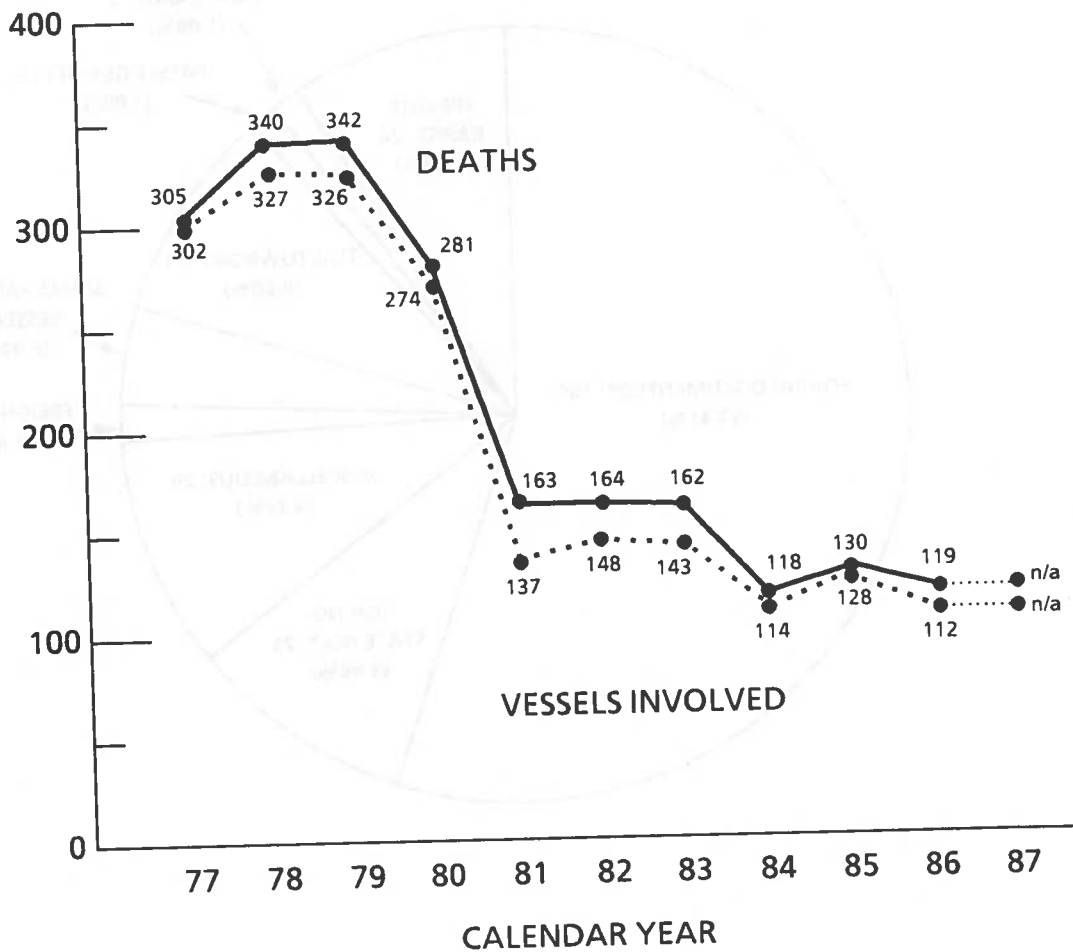


P preliminary
 * Includes foreign vessels having casualties in U.S. navigable waters.
 n/a: Not available.
 NOTE: Data for 1986 and 1987 are incomplete

SOURCE: USCG, Marine Investigation Division, G-MMI

CHART 48.

**WATERBORNE FATALITIES
NOT RELATED TO VESSEL CASUALTIES
1977 - 1987**

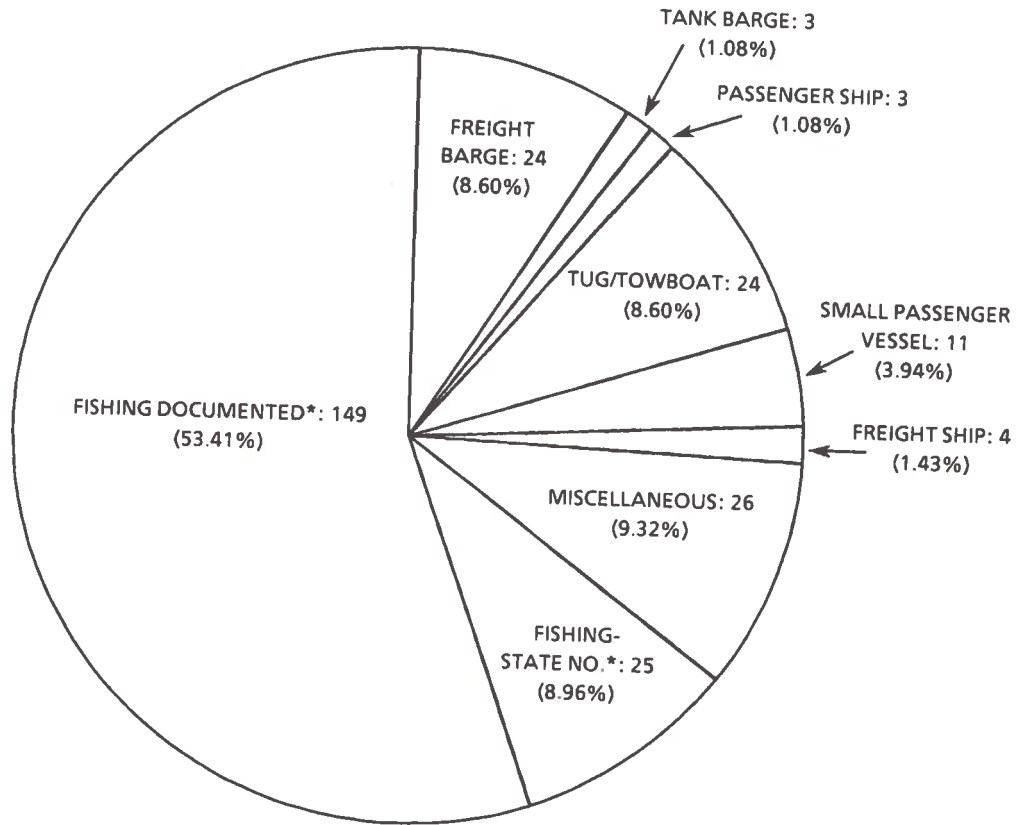


n/a: Not available.

NOTE: 1986 data are incomplete. 1987 data not available.

SOURCE: USCG, Marine Investigation Division, G-MMI.

CHART 49.
U.S. VESSELS TOTALLY LOST IN 1986



TOTAL VESSELS LOST: 279

* All commercial fishing vessels over 5 net tons are documented by the Coast Guard; if less than 5 net tons, commercial fishing vessels are registered in the state.

NOTE: Data supplied as of 9/14/88.
 SOURCE: USCG, Marine Investigation Division, G-MMI.

CHART 50.

FATALITIES RESULTING FROM TOTAL LOSS OF U.S. VESSELS, 1986

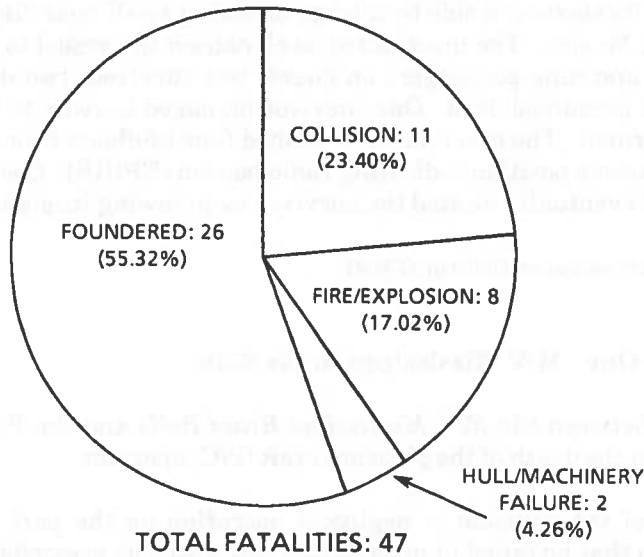
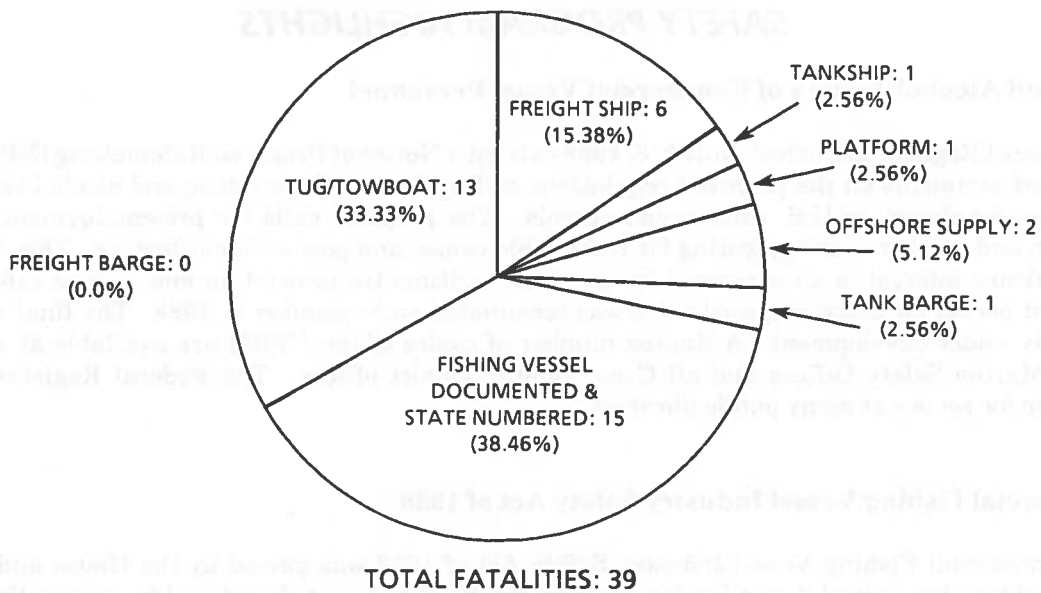


CHART 51.

ACCIDENTAL DEATHS RESULTING FROM FALLS OVERBOARD (NO VESSEL CASUALTY), 1986



NOTE: Data supplied as of 9/14/88.
SOURCE: USCG, Marine Investigation Division, G-MM1.

MODAL SAFETY HAZARDS

Fishing Vessel Fish-N-Fool, D.N. 293888

At approximately 1300 on 5 February 1987, the Coast Guard-inspected small passenger vessel *Fish-n-Fool* was struck on its starboard side by a large breaking swell near "Ben's Rock", 2.6 miles south of Isla de San Martin, Mexico. The unexpected swell caused the vessel to broach and capsize. Of the three crew members and nine passengers on board, two survived, two drowned and the remaining eight are missing and presumed dead. One survivor managed to swim to Isla de San Martin and was rescued by local fishermen. The other survivor lashed four lifefloats from the sunken vessel together and activated an electronic position indicating radio beacon (EPIRB). Coast Guard aircraft picked up the EPIRB signal and eventually located the survivor by following its signal.

SOURCE: USCG, Marine Investigation Division, G-MMI.

P/C Waydafugawee One - M/V Mississippi Brass Belle

A collision occurred between the M/V *Mississippi Brass Belle* and the P/C *Waydafugawee One* on 4 July 1987, resulting in the death of the pleasure craft (P/C) operator.

The apparent cause of the collision is negligent operation on the part of the operator of the P/C *Waydafugawee One* in that he failed to proceed at a safe speed as prescribed in the Inland Navigation Rules Act of 1980, Rule 6(a)(iv); failed to keep out of the way of the vessel being overtaken as prescribed in the Inland Navigation Rules Act of 1980, Rule 13(a); and was operating the vessel while under the influence of alcohol. At the time of the accident, the operator was considered legally intoxicated by the laws of Minnesota.

SOURCE: USCG, Marine Investigation Division, G-MMI.

SAFETY PROGRAM HIGHLIGHTS

Drug and Alcohol Testing of Commercial Vessel Personnel

The Federal Register published on July 8, 1988 carried a Notice of Proposed Rulemaking (NPRM) and requested comments on the proposed regulations calling for mandatory drug and alcohol testing for personnel employed on U.S. commercial vessels. The proposal calls for pre-employment testing, periodic, and random testing, testing for reasonable cause, and post-accident testing. This NPRM is of significant interest to all personnel involved in maritime transportation and marine safety. The comment period for these proposed rules was terminated on September 6, 1988. The final rules are currently under development. A limited number of copies of the NPRM are available at all Coast Guard Marine Safety Offices and all Coast Guard District offices. The Federal Register is also available for review at many public libraries.

Commercial Fishing Vessel Industry Safety Act of 1988

The Commercial Fishing Vessel Industry Safety Act of 1988 was passed by the House and Senate. The President has signed it and implementation by the U.S. Coast Guard will be accomplished in a relatively short time.

RECREATIONAL BOATING

- The number of fatalities in 1987 was the lowest the annual total has been since 1961, when fatalities were first counted completely. Fatalities dropped to 1,036 during 1987. The fatality rate also dropped to a record low of 6.1 fatalities per 100,000 boats. Several factors have contributed to the reduction in the fatality rate, including safer boats, wider selection of personal flotation devices, better safety education, safety publicity, and better emergency care following boating accidents. However, the number of accidents and injuries continued their annual increase due to the increasing popularity of recreational boating. The estimated number of recreational boats reached 16.9 million in 1987.
- The number of reported injuries rose to 3,501 in 1987, an increase of 23 percent from the 2,847 reported in 1986.
- Property damage reported also reached a record high of \$21.4 million in 1987. Only a small fraction of property damages are reported to the Coast Guard.

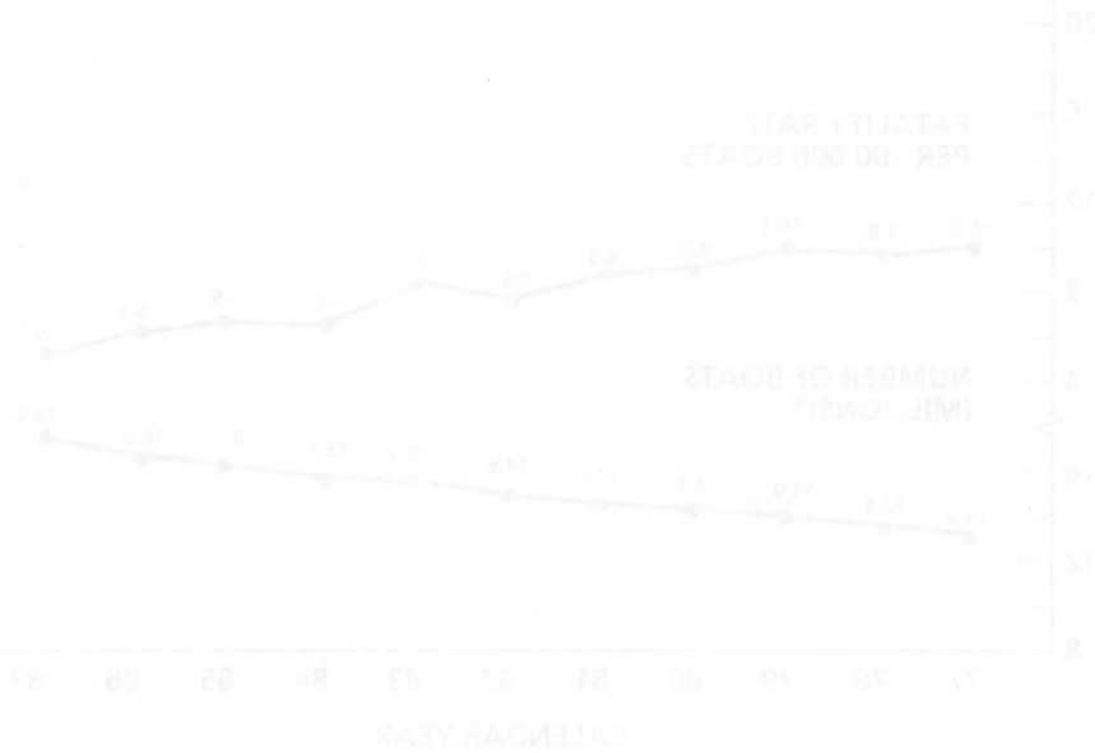
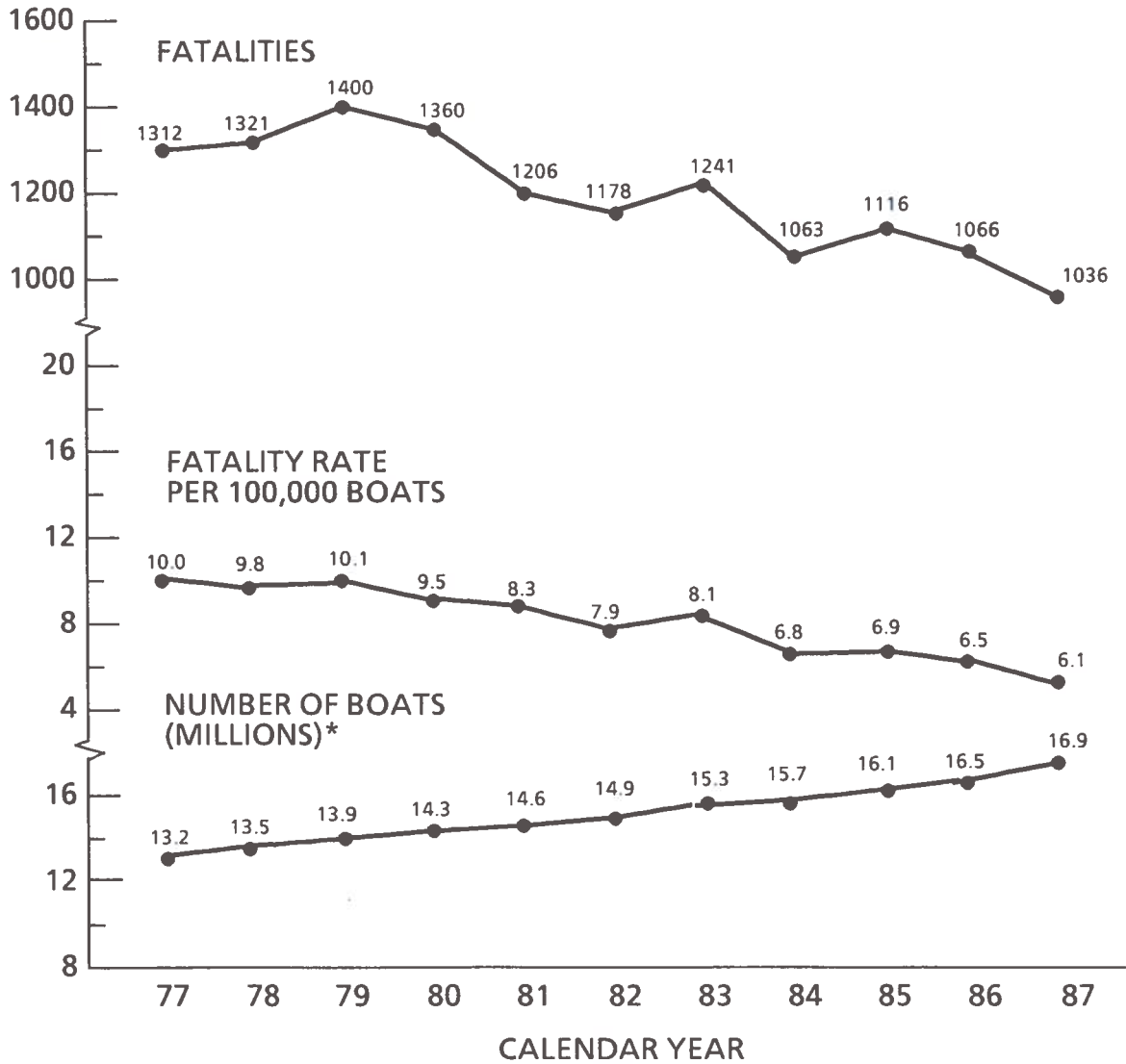


CHART 52.

RECREATIONAL BOATING FATALITY RATES, 1977 - 1987

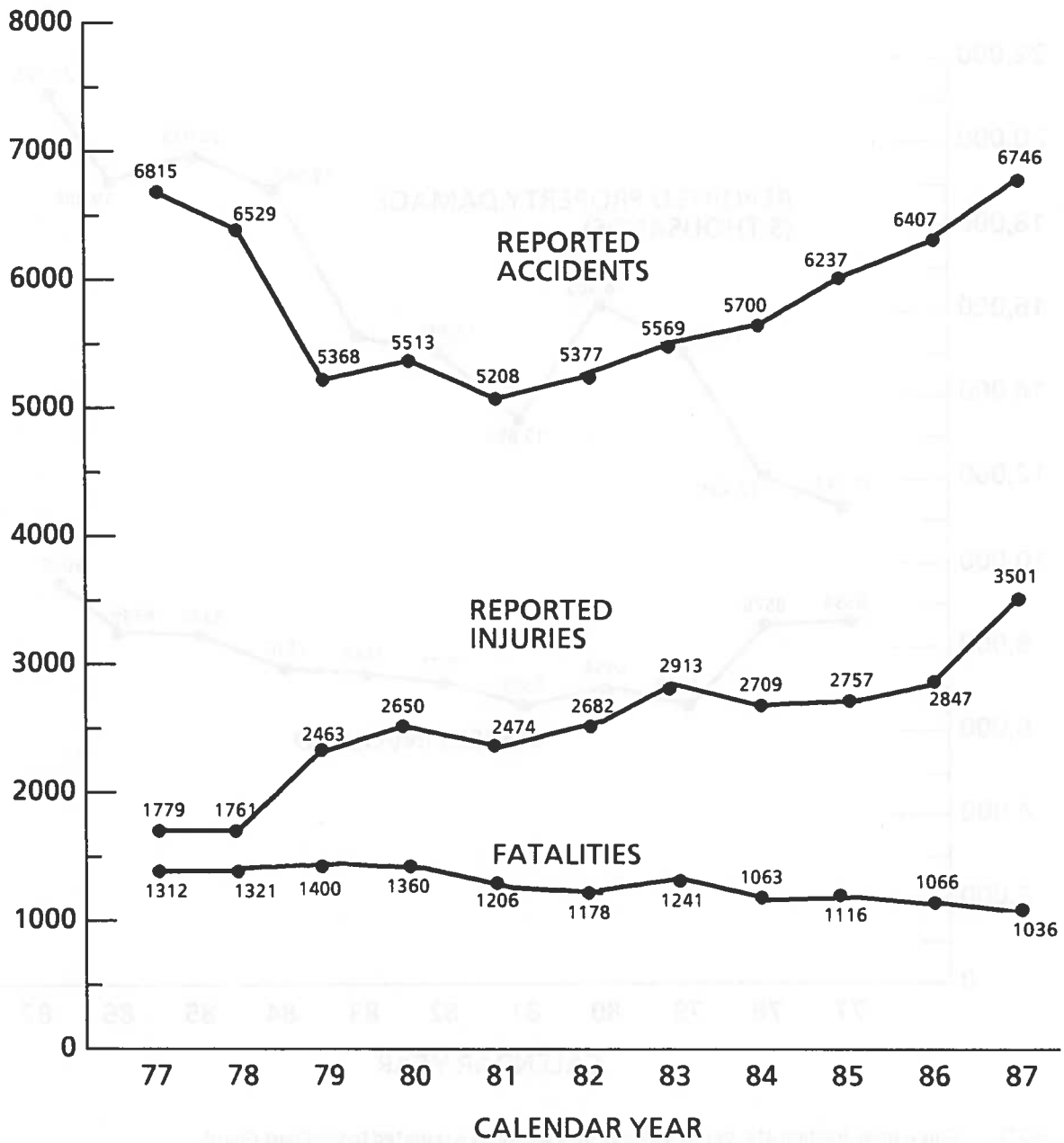


* The total number of boats are estimated by the USCG each year.

SOURCE: Boating Accident Report (BAR) File, USCG, Auxiliary, Boating, and Consumer Affairs Division, G-NAB.

CHART 53.

**RECREATIONAL BOATING FATALITIES,
INJURIES, AND ACCIDENTS, 1977 - 1987**

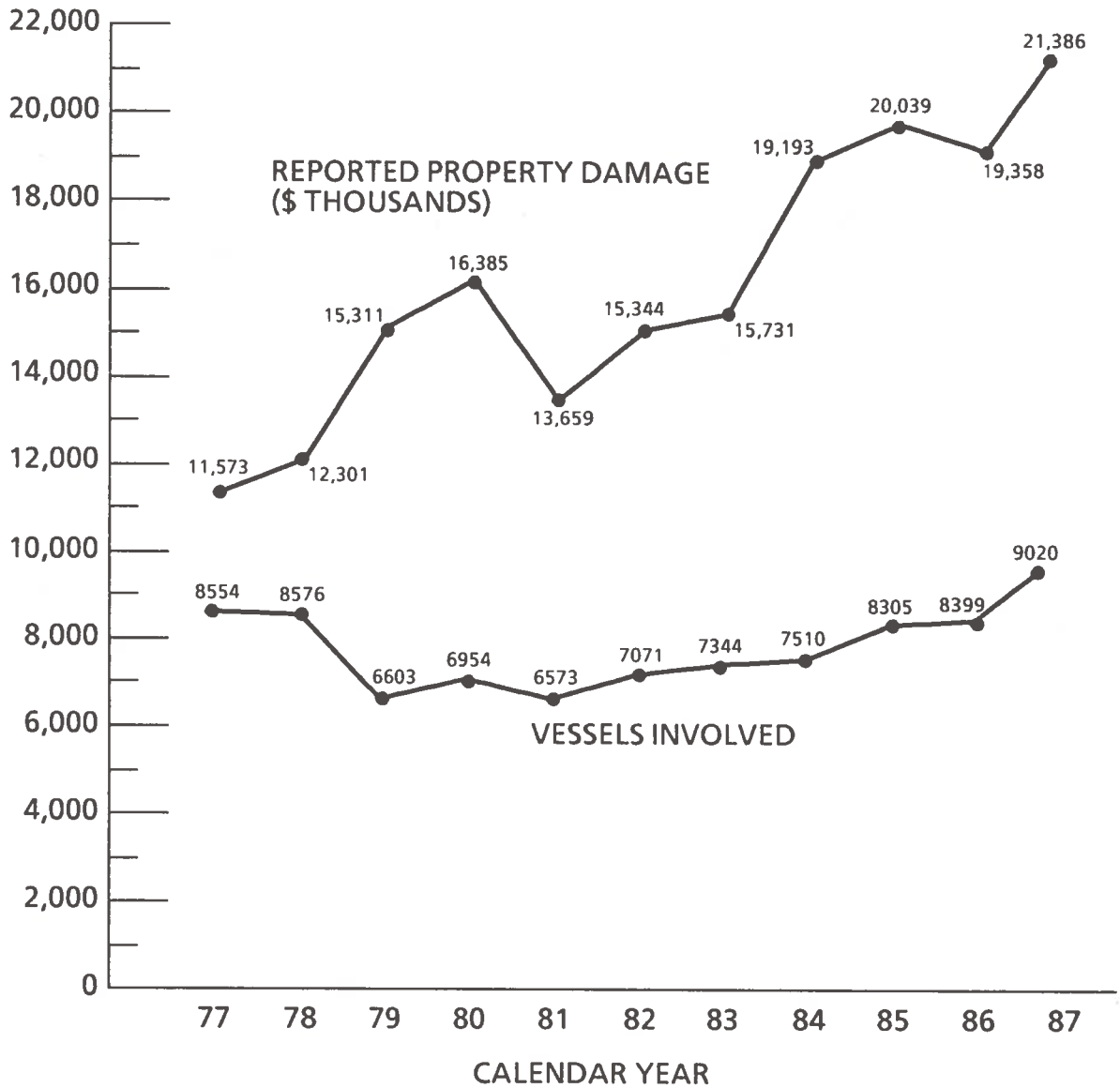


NOTE: Only a small fraction of property damages and non-fatal accidents are reported to the Coast Guard.

SOURCE: BAR File, USCG, Auxiliary, Boating, and Consumer Affairs Division, G-NAB.

CHART 54.

**REPORTED PROPERTY DAMAGE AND VESSELS INVOLVED IN RECREATIONAL BOATING ACCIDENTS
1977 - 1987**



NOTE: Only a small fraction of property damage-only accidents is reported to the Coast Guard.

SOURCE: BAR File, USCG, Auxiliary, Boating, and Consumer Affairs Division, G-NAB.

CHART 55.

RECREATIONAL BOATING FATALITIES, 1986-1987

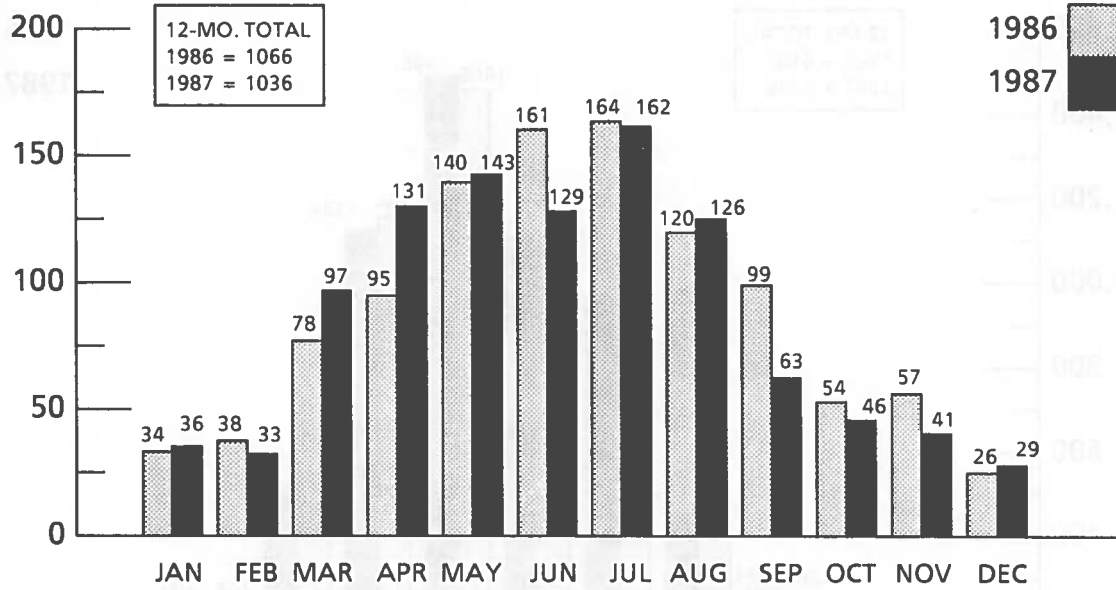
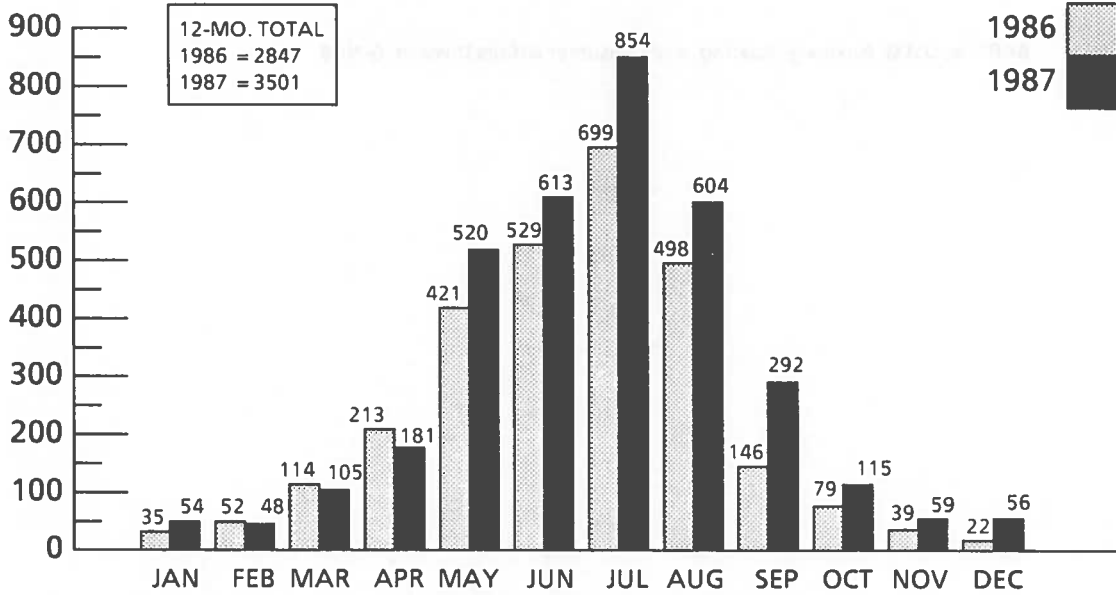


CHART 56.

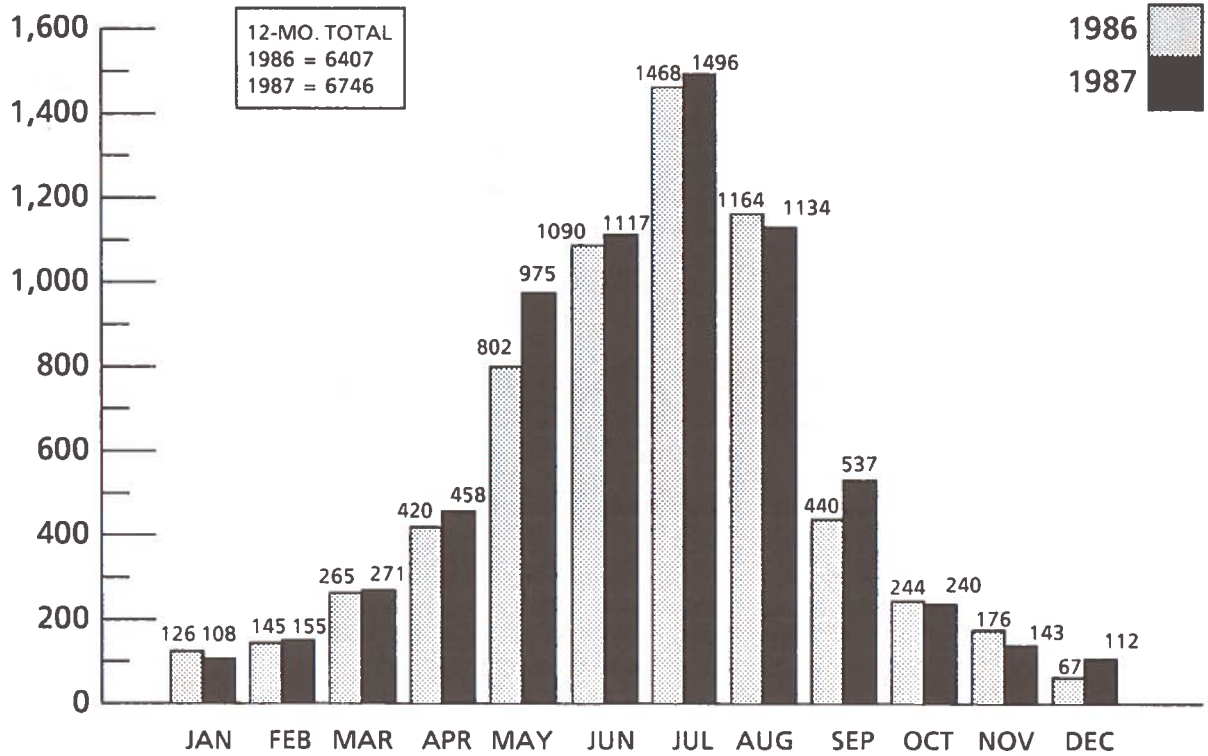
RECREATIONAL BOATING INJURIES, 1986 - 1987



SOURCE: BAR File, USCG, Auxiliary, Boating, and Consumer Affairs Division, G-NAB.

CHART 57.

RECREATIONAL BOATING, REPORTED ACCIDENTS 1986-1987



SOURCE: BAR File, USCG, Auxiliary, Boating, and Consumer Affairs Division, G-NAB.

MODAL SAFETY HAZARDS

Personal Watercraft

Personal watercraft are small motorboats, just large enough to carry the operator alone, although some are built for two people. The popularity of personal watercraft is increasing quickly. The most popular varieties are built for the thrill of making tight turns or jumping waves or wakes. Since this type of operation is riskier and not the traditional use for a motorboat, the craft are sometimes confusing and annoying to other boaters. Along with the increased risk of falling from the boat, there is an increased risk of collision with other boats. The sudden movements of the personal watercraft are new to the water and do not blend with the usual sluggish maneuvering capability of larger or unpowered boats. Safety education of operators of personal watercraft and more familiarity with their mode of operation by other boat operators will help minimize potential safety problems.

The Hazards of Speed

There are a number of boat types that are built to go very fast. Cigarette boats are built to go fast in ocean waters. Ski boats are designed to pull skiers at high speeds. Bass boats can rush their occupants to the other fishing spots. The hazard is that the boat produces the speed, but the operator must control it. Motors can perform to their speed limit if the operator chooses. However, many conditions found in the boating environment are dangerous for speeding. Speeding can result in a lack of time to avoid collisions with other boats or objects floating in the water, or underwater obstacles that aren't seen until too late.

Cigarette boats can have trouble in rough water. If the bow is pushed too high by one wave, the next wave can hit the boat behind the center of gravity, flipping the boat forward with the bow submarining into the water. On some low profile ski boats the bow can bounce too high, allowing the air underneath the boat to flip the boat end over end. All speeding boaters should be aware of the possibility of submerged objects in the water. Bass fishermen may encounter submerged tree trunks or branches.

The amount of horsepower on boats has been increasing for many years and probably will continue to increase. Boaters should be aware that they do not need to use all of their boat's power. With operator experience and under the right conditions, speed can be used safely.

Alcohol Use in Recreational Boating

Although boating is a mode of transportation, it is unique among the modes because many recreational boaters would say that they are not going anywhere. They are fishing, skiing, sailing, or cruising. They are on their boats for relatively long periods of time, many times without going very far from their starting point. In this type of atmosphere, boaters who normally drink alcohol on land would not think twice about drinking alcohol on the water while fishing, cruising, or sailing.

However, because the operators of boats have the same responsibility on the water as automobile operators have on roads, the use of alcohol contributes to the same types of problems as have been publicized recently about drunken driving. In fact, alcohol compounds the effects on the operator's ability to deal with other boats, pounding waves, hot sun, loud engines noises, and stiff winds. The level of concentration required for navigating under bridges, interpreting navigation aids, and docking a boat is much greater than that needed for driving an automobile.

SOURCE: USCG, Auxiliary, Boating and Consumer Affairs Division, G-NAB.

SAFETY PROGRAM HIGHLIGHTS

Boating Safety Hotline

The Boating Safety Hotline processed more than 6,000 calls in 1986, its first year of operation. The total number of calls has now passed 25,000. The hotline is such a success that the Coast Guard decided to make it a regular part of its consumer services for recreational boaters. It is used to take consumer complaints about possible boat safety defects and to provide information on boating safety regulations, volunteer U.S. Coast Guard Auxiliary services, recalls for a particular boat, or other safety topics. An analysis of questions asked by callers on the hotline led the Coast Guard to produce a series of more than 17 Consumer Fact Sheets on various topics of interest to boaters.

SOURCE: USCG, Office of Navigation Safety and Waterway Services, G-NAB-5.

National Safe Boating Week

The theme for the 1988 and 1989 National Safe Boating Weeks is "Know Before You Go", the intent being to underscore the importance of boating safety education. The Coast Guard depends on local publicity committees to get the message across. Thousands of publicity manuals are distributed throughout the country suggesting several ideas for the committees' use. Material includes articles on many boating safety topics for newspapers, public service announcements, and graphics. An order form is included in the manual to provide attractive posters and bumper stickers or boating safety pamphlets.

SOURCE: USCG, Office of Navigation Safety and Waterway Services, G-NAB-3.

Operating a Recreational Vessel While Intoxicated

The Coast Guard Authorization Act of 1984 required the Coast Guard to prescribe standards for determining intoxication of vessel operators. It also established civil and criminal penalties and required reporting of information to determine if alcohol or drug use contributed to marine casualties.

The Coast Guard issued a final rule, effective January 13, 1988, setting standards applicable to operating recreational and commercial vessels. The rule sets a Federal standard for behavioral signs of intoxication and an independent blood alcohol concentration (BAC) standard. The BAC is .10 per cent for operators of recreational vessels being used only for pleasure and .04 per cent for operators of all other vessels.

In issuing the rulemaking, the Coast Guard considered public comment on a Notice of Proposed Rulemaking for commercial marine operations and an Advance Notice of Proposed Rulemaking for recreational boating, both issued on May 23, 1986, plus a subsequent combined Notice of Proposed Rulemaking issued on February 9, 1987.

The rule is consistent with fundamental federalism principles described in Executive Order 12612 of October 26, 1987, providing that the Federal standards will conform to any enacted state BAC standard, higher or lower than .10 percent, on waters within the geographical boundaries of that state. The Coast Guard encourages all states to strengthen their intoxicated operation laws, including setting a BAC standard. Since 1984, the number of states setting BAC standards has risen from 12 to 30, of which 29 set .10 per cent BAC (Utah set .08 per cent BAC).

SOURCE: USCG, Office of Navigation Safety and Waterway Services, G-NAB-5.

MATERIALS TRANSPORT

PIPELINES

- During 1987, liquid pipeline leaks/failures increased over 15 percent when compared with 1986. A total of 204 leaks/failures were reported in 1987 versus 236 in 1986. Gas pipeline leaks/failures also increased from 220 to 231 during the same period.
- Injuries resulting from incidents involving the transport of natural gas decreased from 106 during 1986 to 96 during 1987. Liquid pipeline injuries also decreased from 32 in 1986 to 17 in 1987.
- Gas pipeline leaks/failures increased from 220 in 1986 to 231 in 1987, an increase of 5 percent. Liquid pipeline leaks/failures also increased from 204 in 1986 to 236 in 1987, up over 15 percent.

HAZARDOUS MATERIALS

- Hazardous materials fatalities decreased in 1987 when compared with 1986. A total of 11 fatalities were reported in 1987 compared with 16 for 1986. Most fatalities occurred while transporting gasoline.
- In 1987, the number of incidents involving the transport of hazardous materials increased when compared with 1986. There were 6,179 incidents reported in 1987 and 5,758 in 1986.
- Major injuries resulting from hazardous materials incidents decreased from 56 in 1986 to 20 in 1987. However, minor injuries increased from 260 in 1986 to 308 in 1987.
- Total damages resulting from hazardous materials incidents increased to \$23,376,750 in 1987. Transporting gasoline caused more damages than any other single hazardous material.

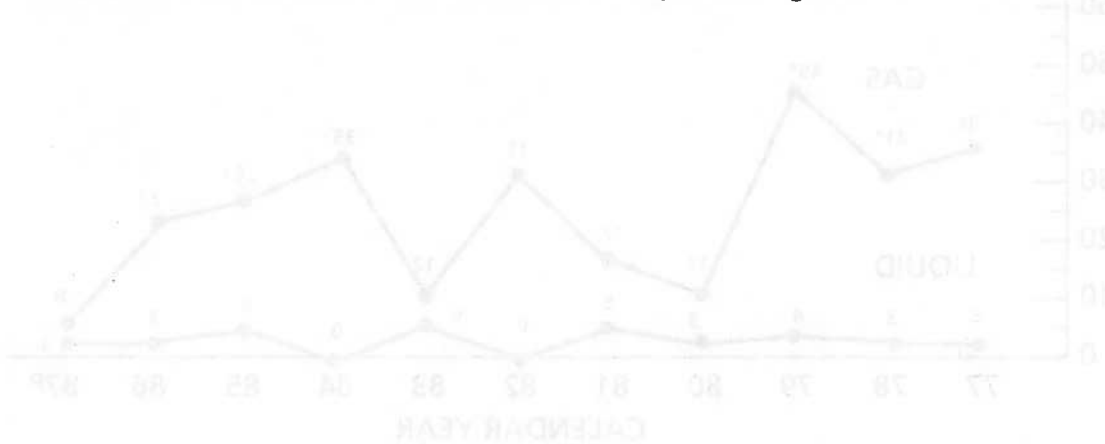


CHART 58.

LIQUID AND GAS PIPELINE LEAKS/FAILURES, 1977 - 1987

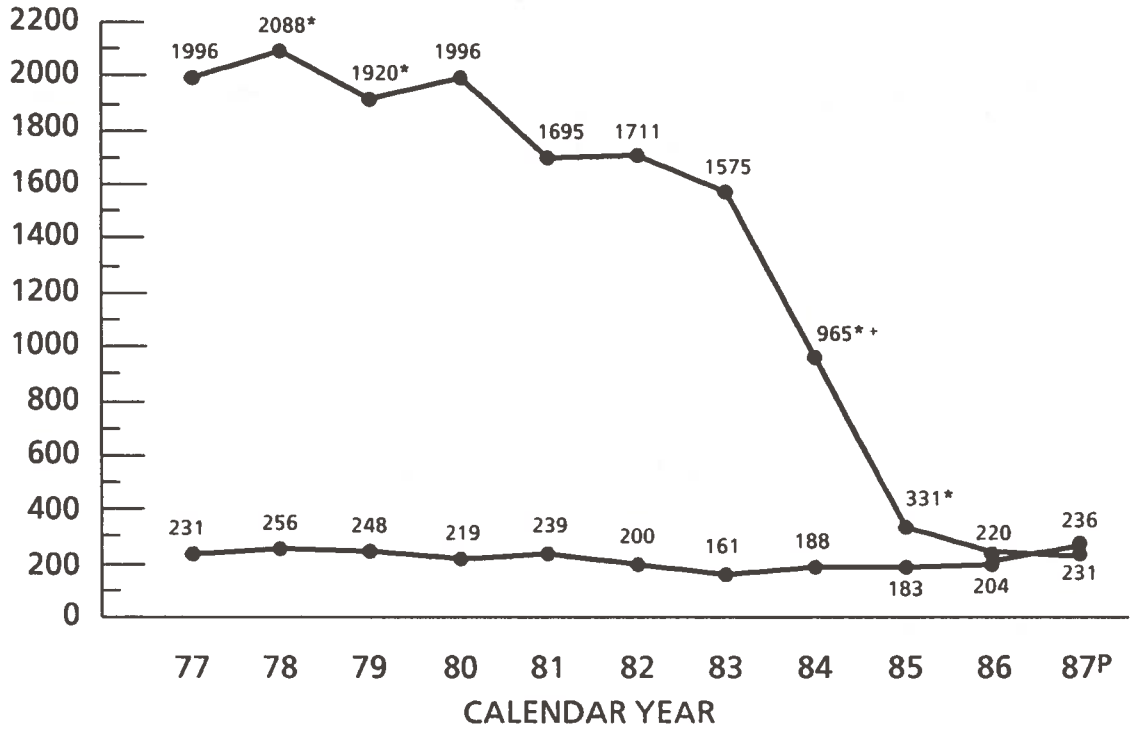
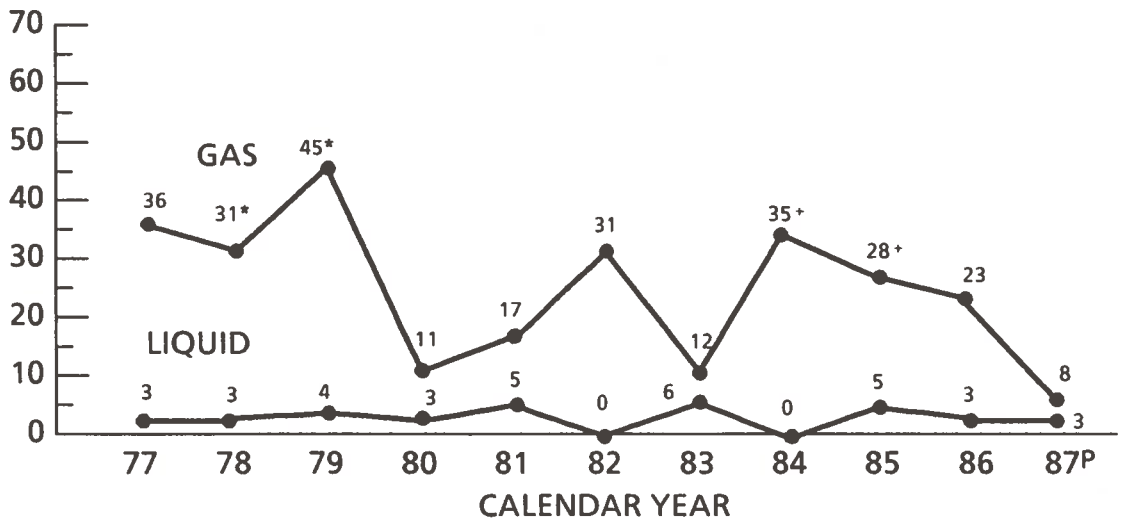


CHART 59.

LIQUID AND GAS PIPELINE FATALITIES, 1977 - 1987



P = Preliminary.

* Includes preliminary notification of pipeline leaks via telephonic reports.

+ Effective July 1, 1984, the criteria for reporting gas pipeline incidents changed. See glossary for definition.

NOTE: Data supplied as of 11/18/88.

Beginning with 1983 data, pipeline incidents are credited to the year in which they occurred, not the year in which the report was received.

SOURCE: Liquid Pipeline: DOT F 7000-1 Pipeline carrier accident report.
 Gas Pipeline: DOT F7100.1; F7100.2 and telephone reports.
 RSPA, Hazardous Materials Information Systems, DPS-20.

TABLE 14.

PIPELINE FATALITIES BY MONTH, 1986-1987

	JANUARY		FEBRUARY		MARCH	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
GAS PIPELINE*	0	0	8	0	1	1
LIQUID PIPELINE	0	0	0	0	0	0
TOTAL	0	0	8	0	1	1

	APRIL		MAY		JUNE	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
GAS PIPELINE*	1	0	1	0	1	2
LIQUID PIPELINE	0	0	0	0	0	1
TOTAL	1	0	1	0	1	3

	JULY		AUGUST		SEPTEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
GAS PIPELINE*	1	1	0	1	3	0
LIQUID PIPELINE	2	2	0	0	0	0
TOTAL	3	3	0	1	3	0

	OCTOBER		NOVEMBER		DECEMBER	
CLASSIFICATION	1986	1987	1986	1987	1986	1987
GAS PIPELINE*	1	0	1	2	5	1
LIQUID PIPELINE	1	0	0	0	0	0
TOTAL	2	0	1	2	5	1

	12-MONTH TOTAL		
CLASSIFICATION	1986	1987	% CHANGE
GAS PIPELINE*	23	8	-65.2
LIQUID PIPELINE	3	3	0.0
TOTAL	26	11	-57.7

NOTE: 1987 data are preliminary. Data supplied as of 11/18/88.

[1] Not calculable.

* Includes preliminary notification of pipeline leaks via telephonic reports.

SOURCE: Liquid Pipeline: DOT F7000-1 Pipeline Carrier Accident Report.
 Gas Pipeline: DOT F7100.1 and F7100.2.
 RSPA, Hazardous Materials Information Systems, DPS-20.

CHART 60.

GAS PIPELINE FATALITIES, 1986-1987

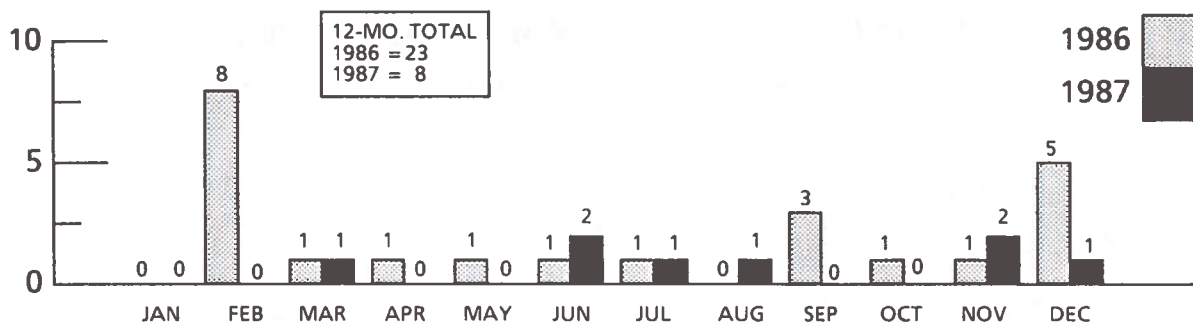


CHART 61.

GAS PIPELINE INJURIES, 1986-1987

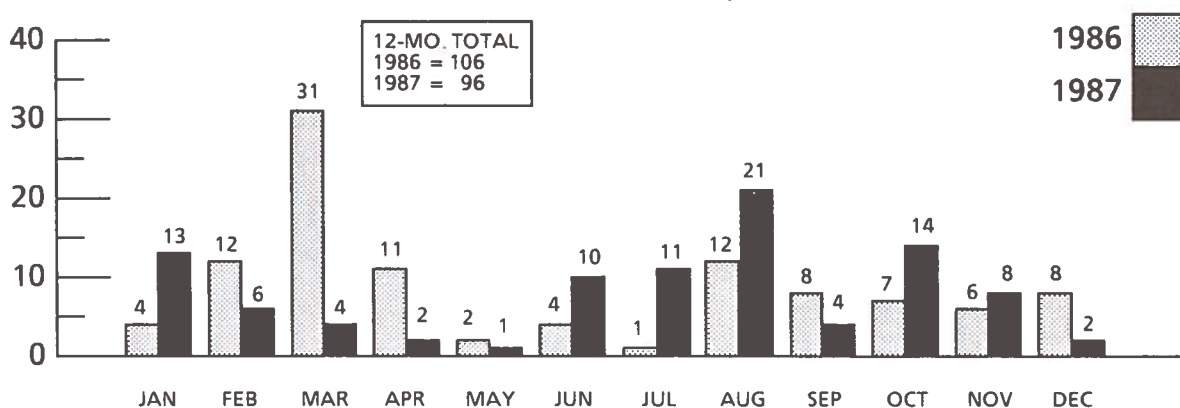
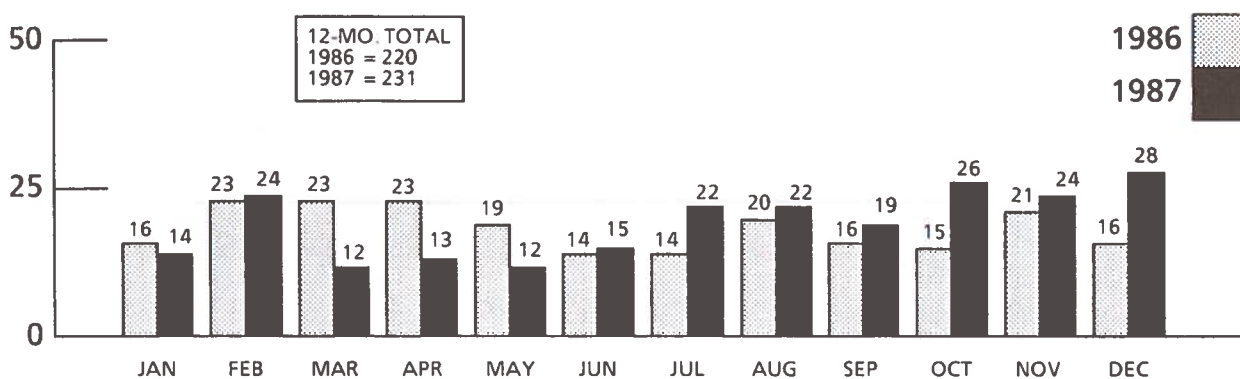


CHART 62.

GAS PIPELINE LEAKS/FAILURES*, 1986-1987



NOTE: 1987 data are preliminary. Data supplied as of 11/18/88.
 Pipeline Incidents are credited to the year in which they occurred, not the year in which the report was received.
 * Effective July 1, 1984, the criteria for reporting gas pipeline incidents changed. See glossary for definition.
 Includes preliminary notification of pipeline leaks via telephonic reports.

SOURCE: Gas Pipeline: DOT F 7100.1 and F7100.2.
 RSPA, Hazardous Materials Information Systems, DPS-20.

CHART 63.

LIQUID PIPELINE FATALITIES, 1986-1987

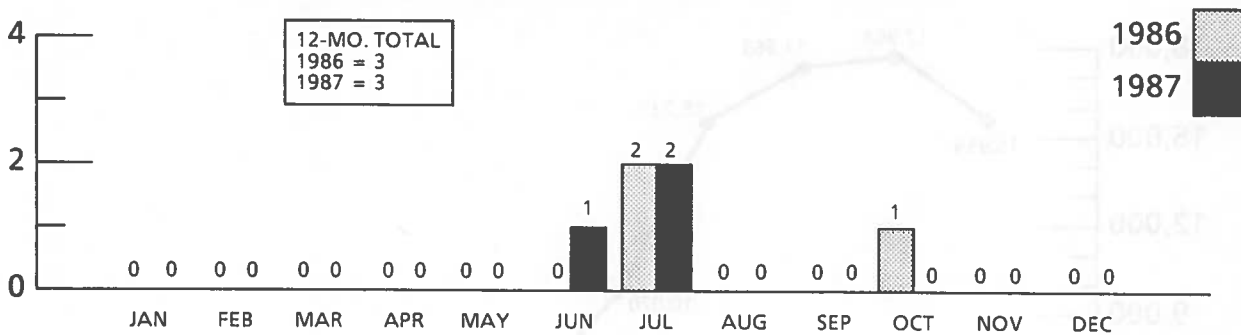


CHART 64.

LIQUID PIPELINE INJURIES, 1986-1987

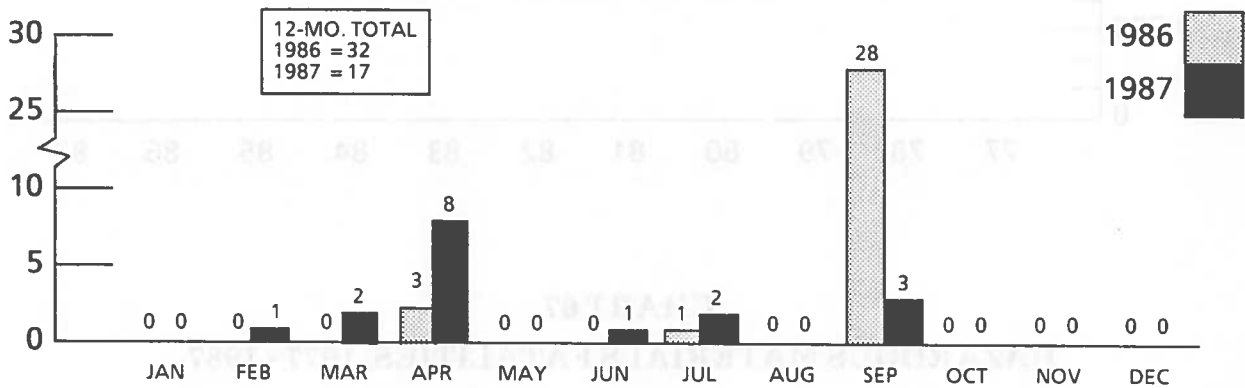
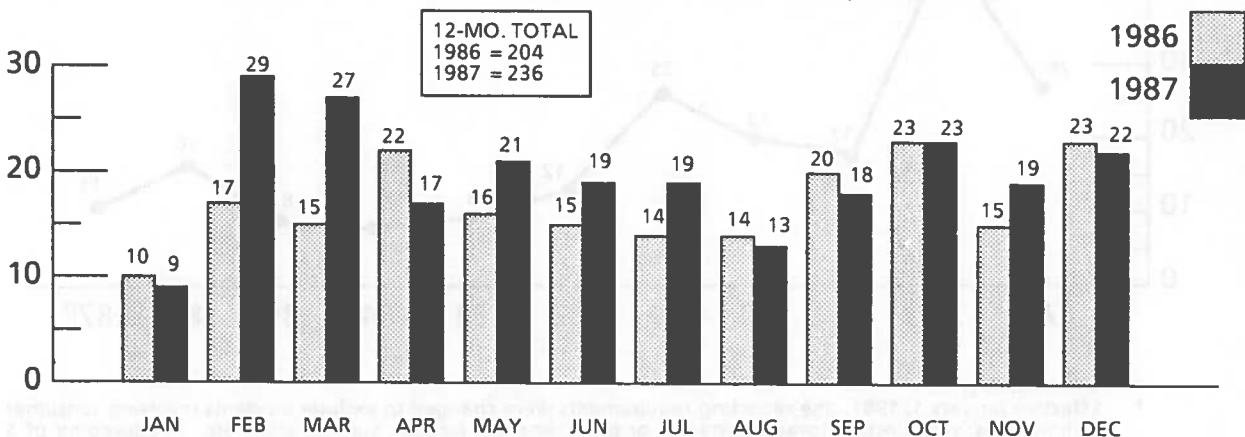


CHART 65.

LIQUID PIPELINE LEAKS/FAILURES, 1986-1987



NOTE: 1987 data are preliminary. Data supplied as of 11/18/88.
Pipeline Incidents are credited to the year in which they occurred, not the year in which the report was received.

SOURCE: Liquid Pipeline: DOT F 7000.1.
RSPA, Hazardous Materials Information Systems, DPS-20.

CHART 66.
HAZARDOUS MATERIALS INCIDENTS, 1977 - 1987*

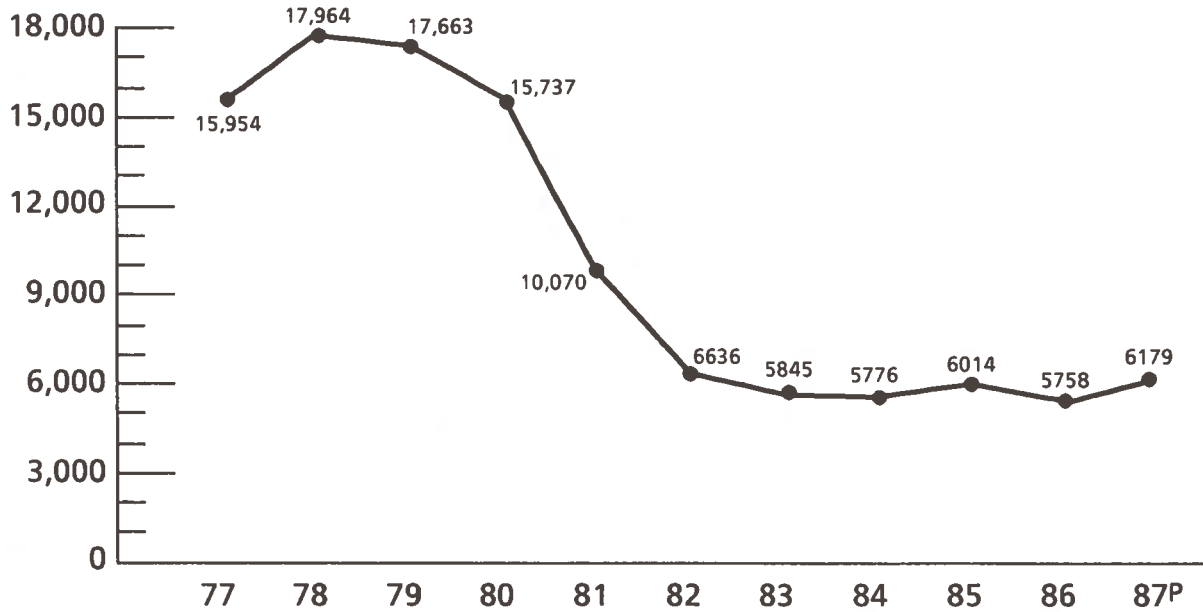
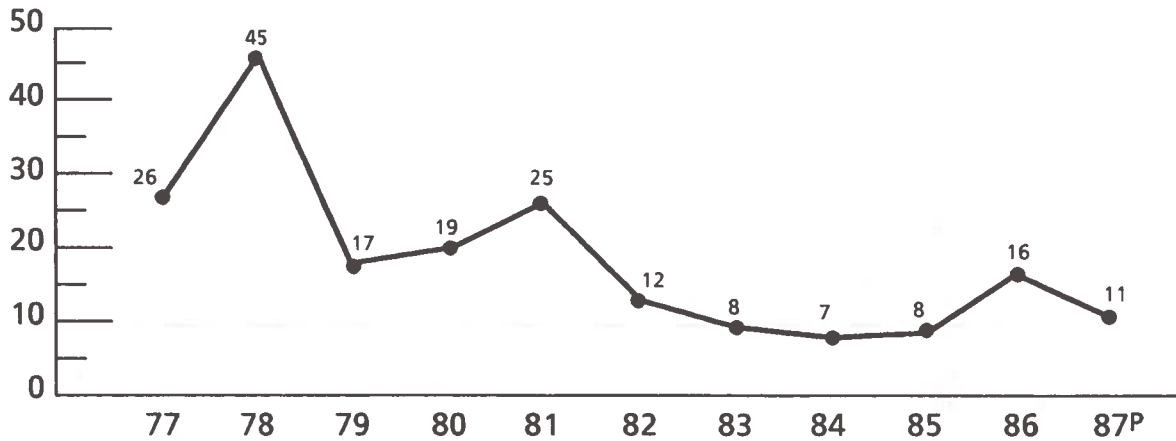


CHART 67.
HAZARDOUS MATERIALS FATALITIES, 1977 - 1987



P = Preliminary.

* Effective January 1, 1981, the reporting requirements were changed to exclude incidents involving consumer commodities, wet electric storage batteries, or paint, enamel, lacquer, stain, shellac, etc., in packaging of 5 gallons or smaller unless the incident results in death, injury or property damage over \$50,000; the material is being transported by air or the material is classified as a hazardous waste.

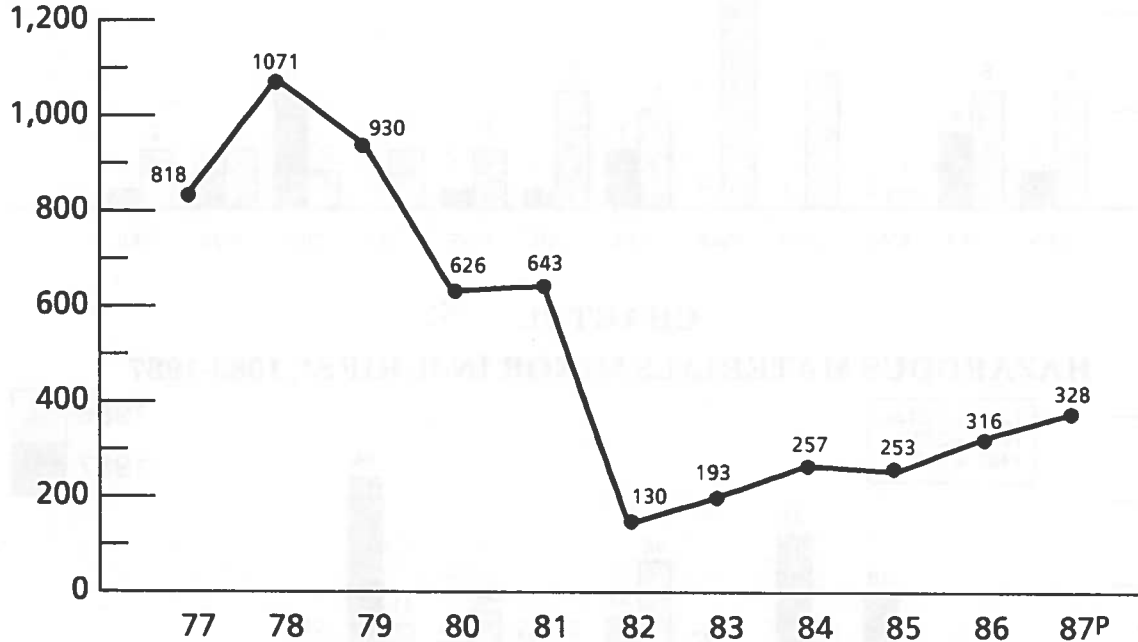
NOTE: Data supplied as of 10/20/88.

Hazardous Materials incidents are reported in the year in which they occurred.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 68.

HAZARDOUS MATERIALS INJURIES⁺, 1977 - 1987*



P = Preliminary.

* Effective January 1, 1981, the reporting requirements were changed to exclude incidents involving consumer commodities, wet electric storage batteries, or paint, enamel, lacquer, stain, shellac, etc., in packaging of 5 gallons or smaller unless the incident results in death, injury or property damage over \$50,000; the material is being transported by air or the material is classified as a hazardous waste.

+ Includes major and minor injuries.

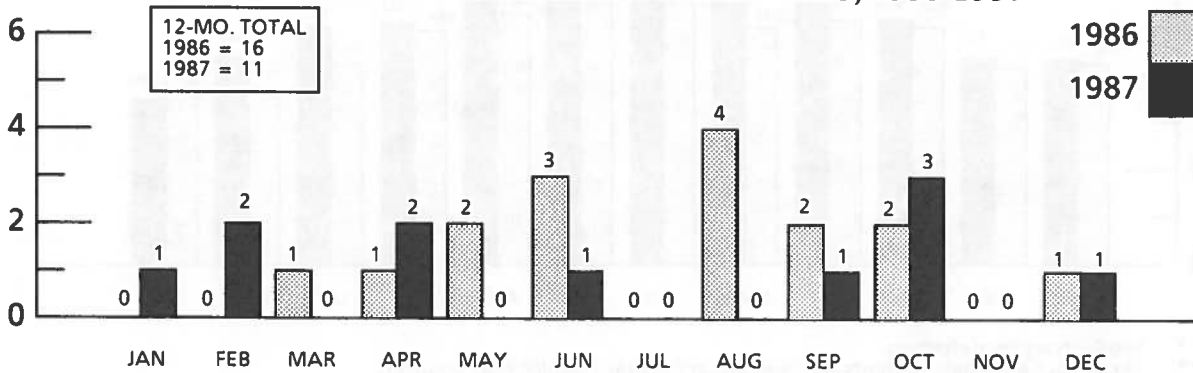
NOTE: Data supplied as of 10/20/88.

Hazardous Materials incidents are reported in the year in which they occurred.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 69.

HAZARDOUS MATERIALS FATALITIES, 1986-1987^P



12-MO. TOTAL
1986 = 16
1987 = 11

1986
1987

P = Preliminary.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63

CHART 70.

HAZARDOUS MATERIALS MAJOR INJURIES*, 1986-1987

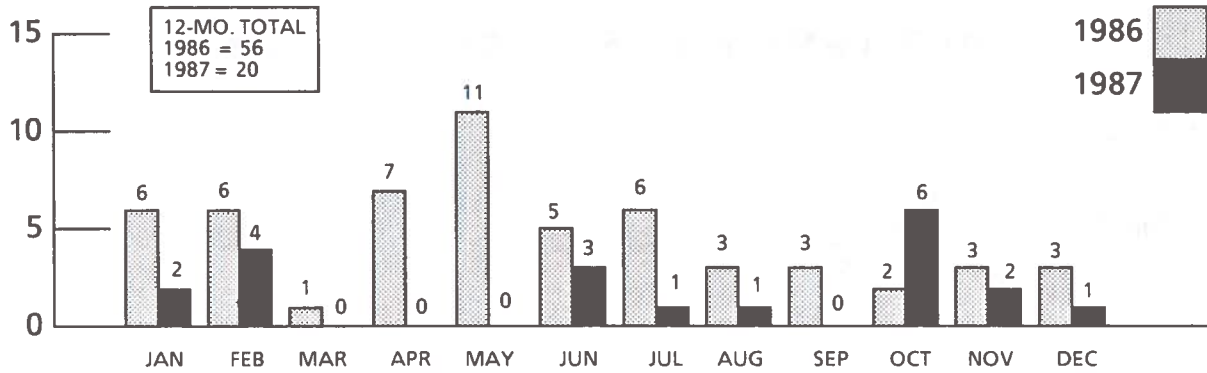


CHART 71.

HAZARDOUS MATERIALS MINOR INJURIES*, 1986-1987

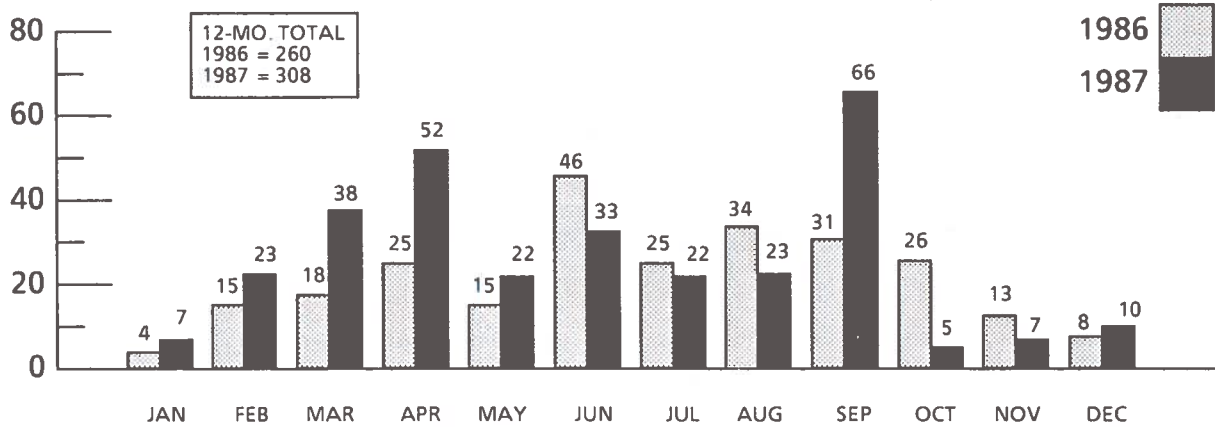
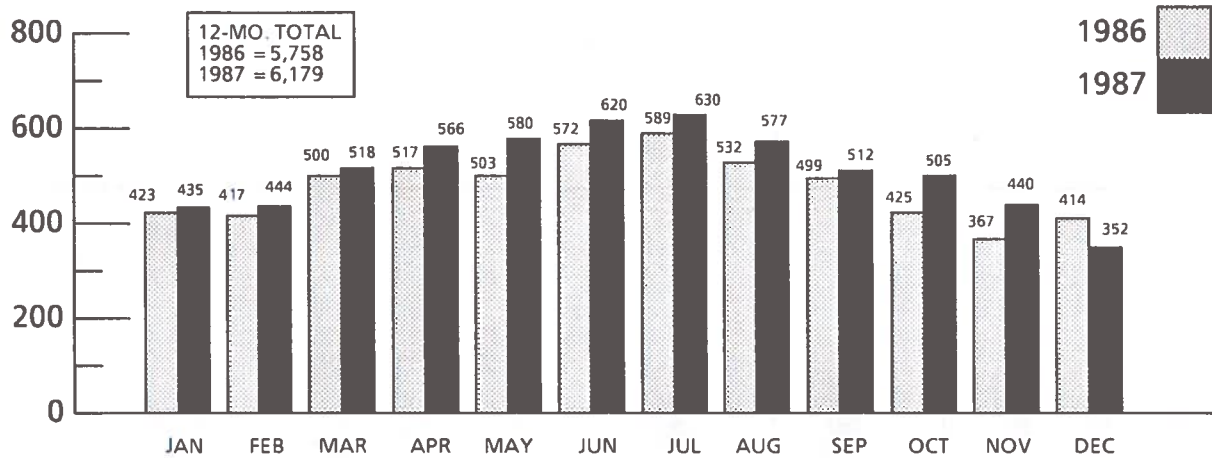


CHART 72.

HAZARDOUS MATERIALS INCIDENTS, 1986-1987**



* See Glossary for definition.

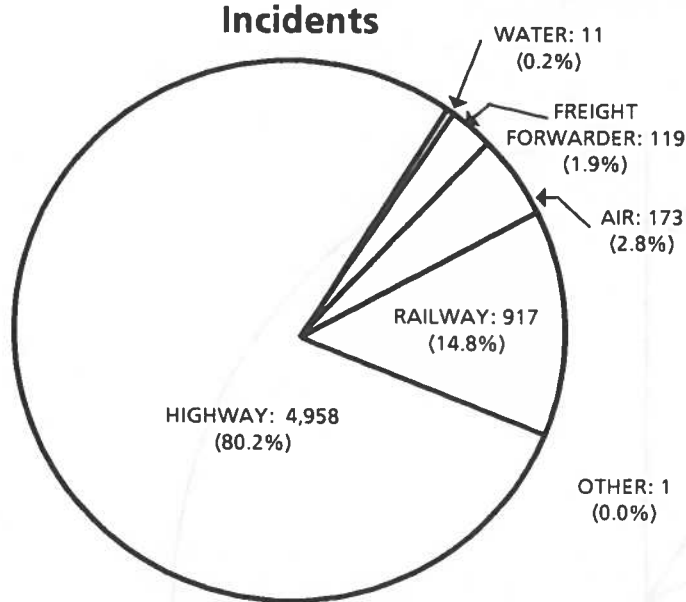
** Hazardous Materials Incidents are reported in the year in which they occurred.

NOTE: 1987 data are preliminary as of 10/20/88.

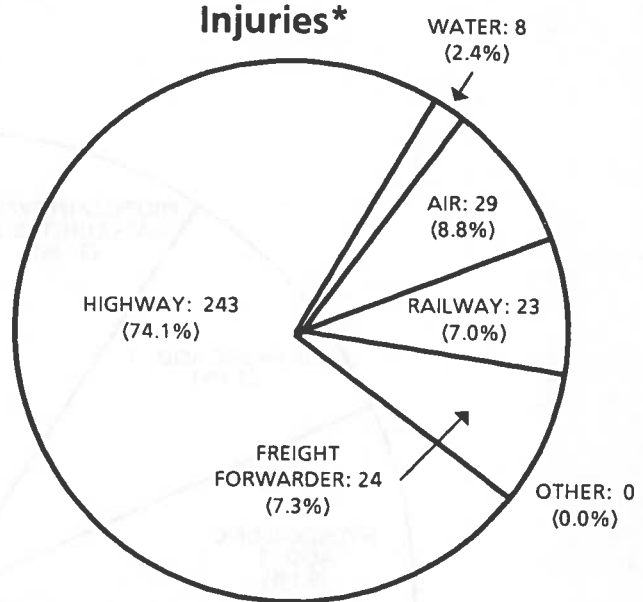
SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 73.

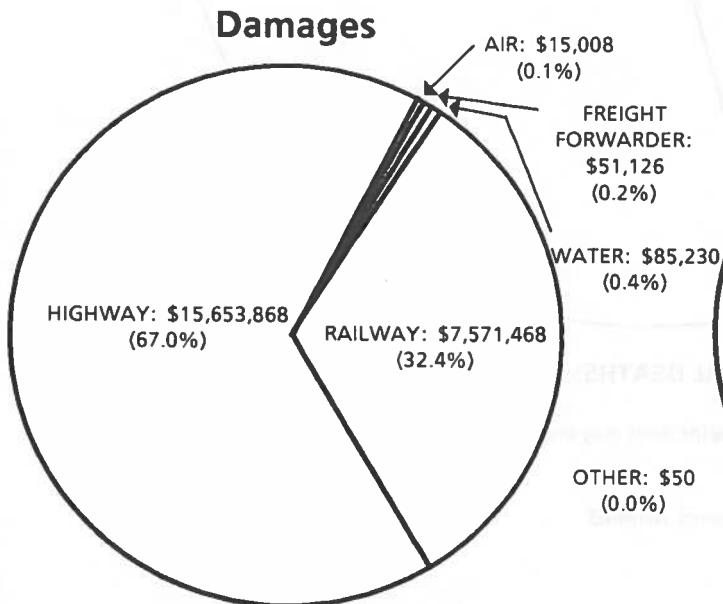
**HAZARDOUS MATERIALS INCIDENTS, INJURIES, DEATHS AND DAMAGES
BY MODE, 1987^P**



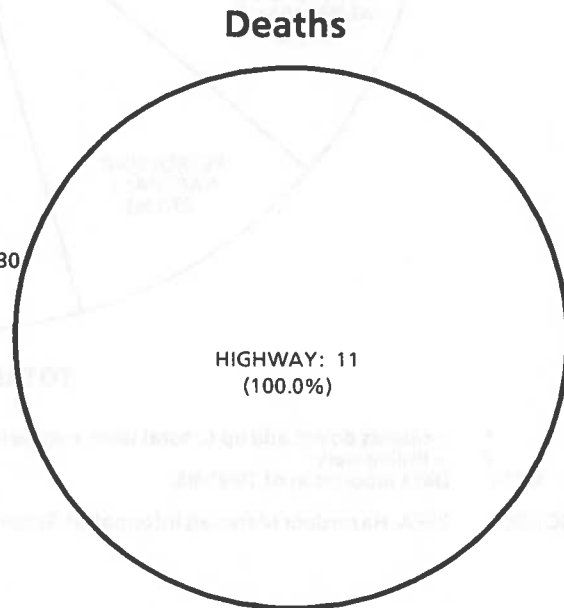
TOTAL INCIDENTS: 6,179



TOTAL INJURIES: 328



TOTAL DAMAGES: \$23,376,750



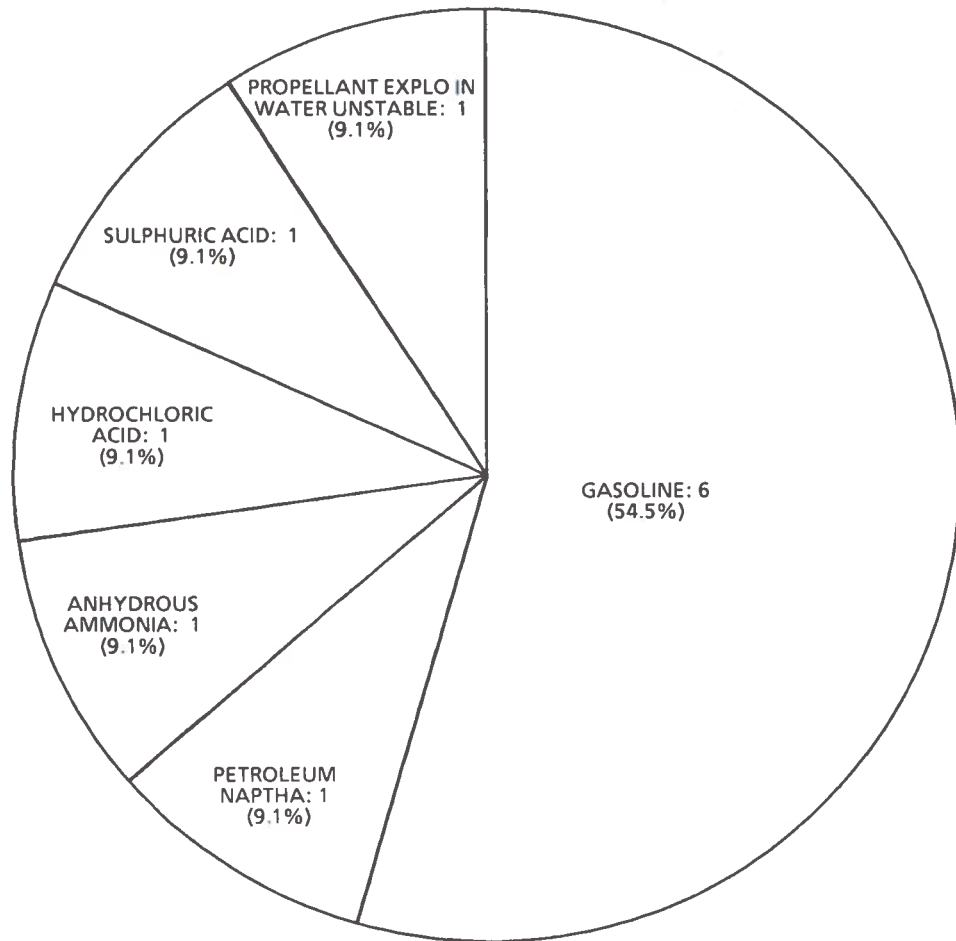
TOTAL DEATHS: 11

^P = Preliminary. Data supplied as of 10/20/88.
^{*} Includes Major and Minor Injuries.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 74.

**HAZARDOUS MATERIALS DEATHS
BY TOP SIX COMMODITIES INVOLVED, 1987^P**



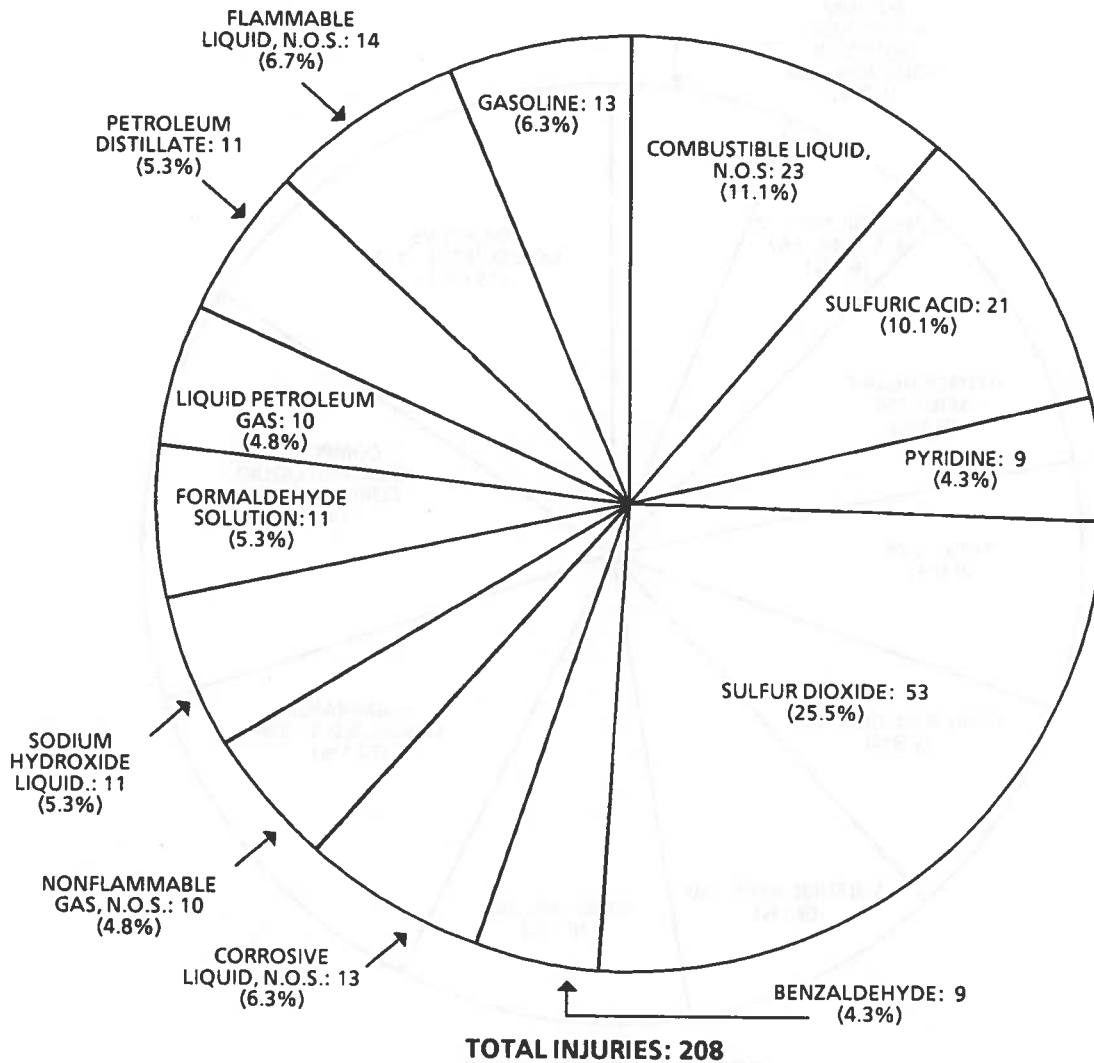
TOTAL DEATHS: 11

* Incidents do not add up to total since a single incident may involve more than one commodity.
P = Preliminary.
NOTE: Data supplied as of 10/20/88.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 75.

HAZARDOUS MATERIALS INJURIES BY TOP 13 COMMODITIES INVOLVED, 1987^P



* Incidents do not add up to total since a single incident may involve more than one commodity.

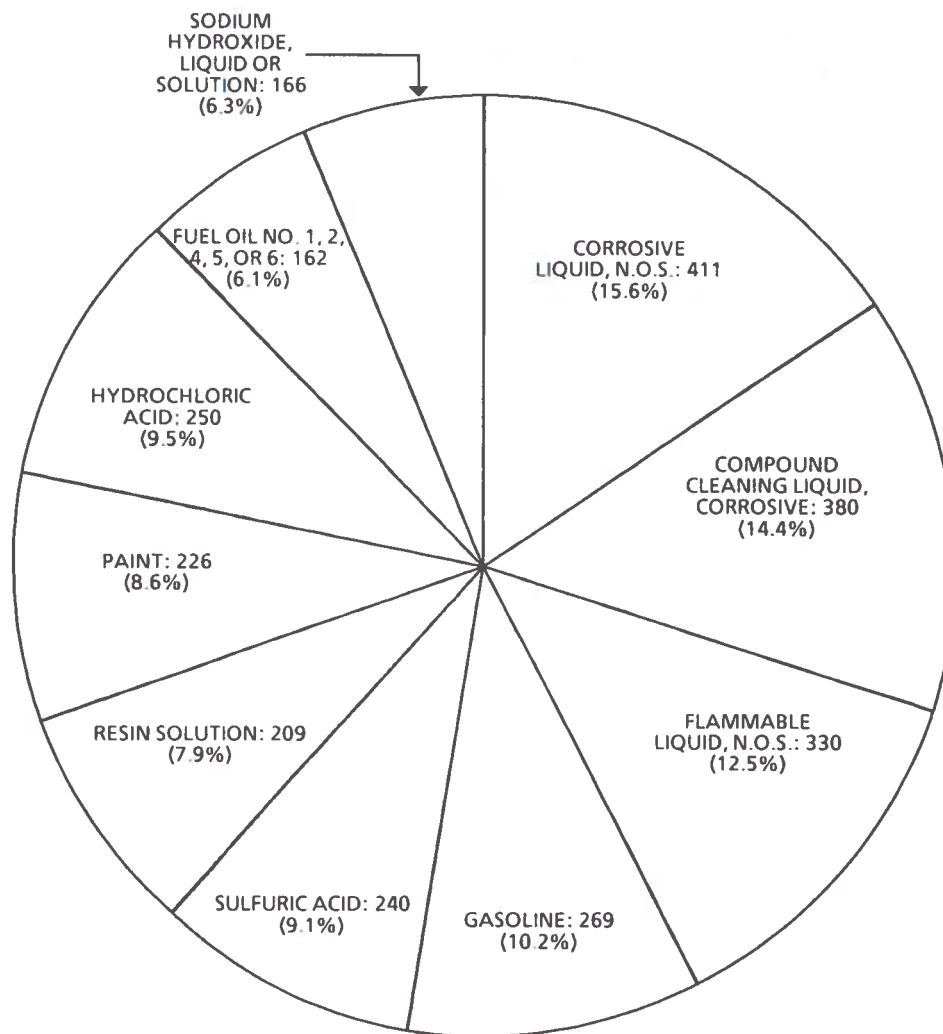
^P = Preliminary.

NOTE: N.O.S. = Not Otherwise Specified.
Data supplied as of 10/20/88.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 76.

HAZARDOUS MATERIALS INCIDENTS BY TOP 10 COMMODITIES INVOLVED, 1987^P



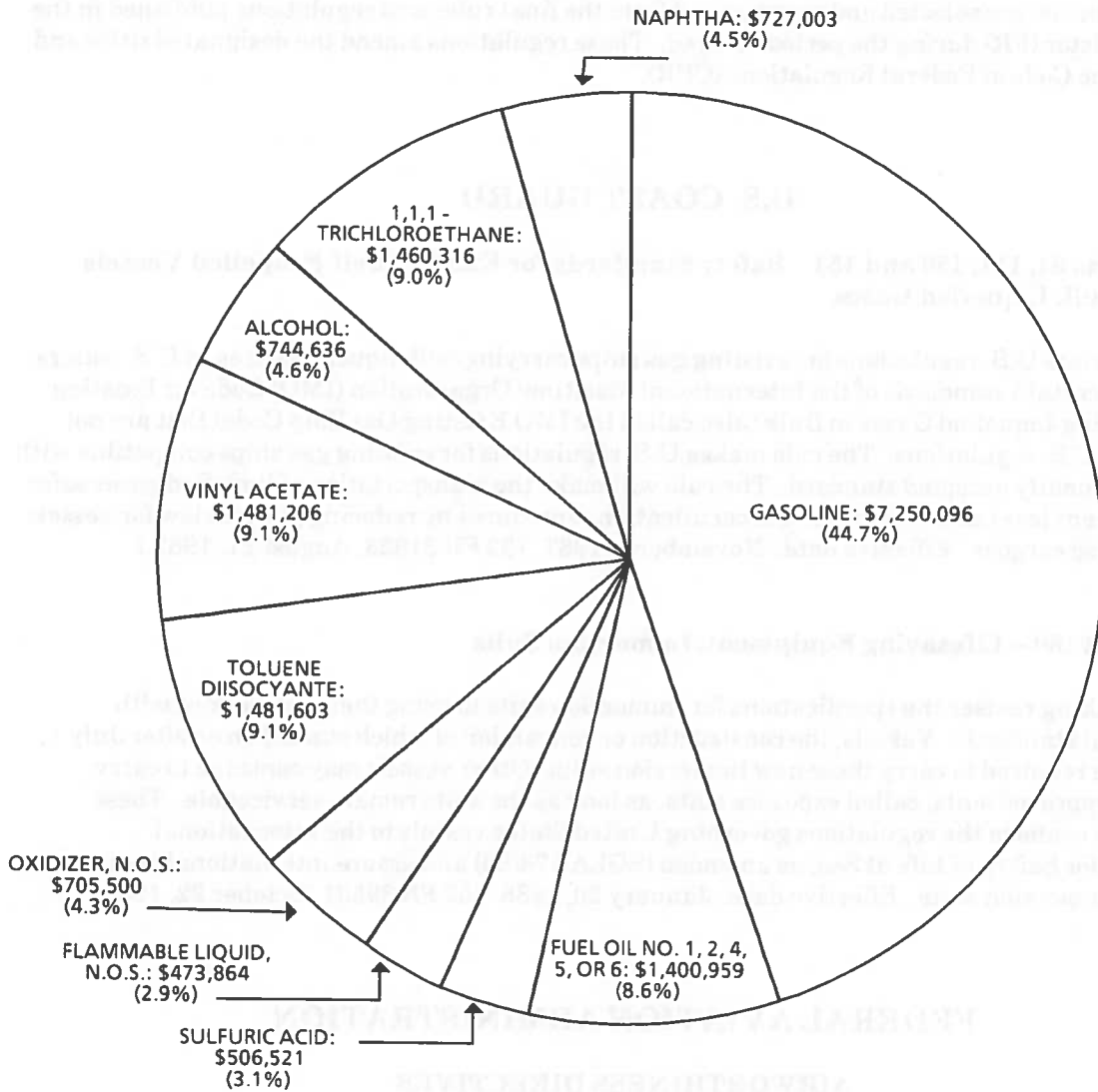
TOTAL INCIDENTS: 2,643

* Incidents do not add up to total since a single incident may involve more than one commodity.
P = Preliminary.
NOTE: N.O.S. = Not Otherwise Specified.
Data supplied as of 10/20/88.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

CHART 77.

**HAZARDOUS MATERIALS DAMAGES
BY TOP 10 COMMODITIES INVOLVED, 1987P**



TOTAL DAMAGES: \$16,231,704

* Incidents do not add up to total since a single incident may involve more than one commodity.

P = Preliminary.

NOTE: N.O.S. = Not Otherwise Specified.
Data supplied as of 10/20/88.

SOURCE: RSPA, Hazardous Materials Information Systems, DHM-63.

MAJOR DOT SAFETY REGULATIONS

JULY 1, 1987 - DECEMBER 31, 1987

The actions below are selected and summarized from the final rules and regulations published in the Federal Register (FR) during the period covered. These regulations amend the designated titles and sections of the Code of Federal Regulations (CFR).

U.S. COAST GUARD

46 CFR Parts 54, 111, 150 and 154 -- Safety Standards for Existing Self-Propelled Vessels Carrying Bulk Liquefied Gases

This rule revises U.S. regulations for existing gas ships carrying bulk liquefied gases in U.S. waters by adopting certain standards of the International Maritime Organization (IMO) Code for Existing Ships Carrying Liquefied Gases in Bulk (also called the IMO Existing Gas Ship Code) that are not currently in U.S. regulations. The rule makes U.S. regulations for existing gas ships compatible with the internationally accepted standard. The rule will make the transportation of liquefied gases safer than its current level and streamline the certification procedures by reducing plan review for vessels carrying these cargoes. Effective date: November 1, 1987. (52 FR 31623, August 21, 1987.)

46 CFR Part 160 -- Lifesaving Equipment; Immersion Suits

This rulemaking revises the specifications for immersion suits to bring them into accord with international standards. Vessels, the construction or conversion of which started on or after July 1, 1986, will be required to carry these new immersion suits. Other vessels may continue to carry previously approved suits, called exposure suits, as long as the suits remain serviceable. These changes will conform the regulations governing United States vessels to the International Convention for Safety of Life at Sea, as amended (SOLAS 74/83) and assure international acceptance of the new immersion suits. Effective date: January 20, 1988. (52 FR 39531, October 22, 1987.)

FEDERAL AVIATION ADMINISTRATION

AIRWORTHINESS DIRECTIVES

14 CFR Part 39 -- McDonnell Douglas Model DC-9 Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to McDonnell Douglas DC-9 series airplanes, which requires the installation of a "tailcone missing" warning system. This amendment is prompted by reports of inadvertent tailcone deployment. This condition, if not corrected, could result in a hazard to incoming or outgoing aircraft during night or IFR conditions by an inadvertently deployed tailcone being on the active runway, unknown to the flight crew. Effective date: August 8, 1987. (52 FR 24982, July 2, 1987.)

14 CFR Part 39 -- McDonnell Douglas Model DC-9-30 Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to McDonnell Douglas Model DC-9-30 series airplanes, which requires structural inspections and repair or replacement, as necessary, to assure continued airworthiness. Some McDonnell Douglas DC-9-30 series airplanes are approaching or have exceeded the manufacturer's original fatigue design life. This AD is prompted by a structural reevaluation, which has identified certain significant structural components to inspect for fatigue cracks as these airplanes approach and exceed the manufacturer's original design life goal. Fatigue cracks in these areas, if not detected and corrected, could result in a compromise of the structural integrity of these airplanes. Effective date: August 10, 1987. (52 FR 25589, July 8, 1987.)

14 CFR Part 39 -- McDonnell Douglas Model DC-8 Series Airplanes

This amendment adopts a new airworthiness directive, applicable to McDonnell Douglas Model DC-8 series airplanes, which requires structural inspections and repair or replacement, as necessary, to assure continued airworthiness. Some McDonnell Douglas DC-8 series airplanes are approaching or have exceeded the manufacturer's original fatigue design life. This amendment is prompted by a structural reevaluation, which has identified certain significant structural components to inspect for fatigue cracks as these airplanes approach and exceed the manufacturer's original design life goal. Fatigue cracks in these areas, if not detected and corrected, could result in a compromise of the structural integrity of these airplanes. Effective date: August 10, 1987. (52 FR 25591, July 8, 1987.)

14 CFR Part 39 - McDonnell Douglas Model DC-10-10, 10F, -15, -30, -30F, -40, and KC-10A (Military) Series Airplanes

This action publishes in the Federal Register and makes effective as to all persons an amendment adopting a new airworthiness directive (AD) which was previously made effective as to all known U.S. owners and operators of McDonnell Douglas DC-10 and KC-10A (Military) series airplanes by individual telegrams. This AD requires inspections and repair of the horizontal stabilizer upper outer section rear spar cap or rear skin panel. This action is necessary to detect cracks that may progress until the spar cap or skin panel is severed, which could result in structural failure. Effective date: August 14, 1987. (52 FR 28133, July 28, 1987.)

14 CFR Part 39 -- Lockheed-California Company Model L-188A and L-188C Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to certain Lockheed Model L-188A and L-188C series airplanes, which requires structural inspections and repairs or replacements, as necessary, to assure continued airworthiness. This amendment is prompted by a structural reevaluation which has identified certain structural details likely to develop fatigue cracks as these airplanes continue in operational service. This condition, if not corrected, could result in a compromise of the structural integrity of these airplanes. Effective date: August 31, 1987. (52 FR 28245, July 29, 1987.)

14 CFR Part 39 -- Boeing Model 747 Series Airplanes

This amendment adds a new airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, which requires inspection for disbonding of tear straps in fuselage body section 46, and repair, if necessary. This AD is prompted by reports of disbonding of upper body hot bonded skin tear straps on eight airplanes. This condition, if not corrected, could lead to rapid depressurization if a longitudinal body skin crack should occur adjacent to the area of ineffective tear strap attachment. Effective date: September 13, 1987. (52 FR 28973, August 5, 1987.)

14 CFR Part 39 -- Lockheed-California Model L-1011-385 Series Airplanes

This action publishes in the Federal Register and makes effective as to all persons an amendment adopting a new airworthiness directive (AD) which was previously made effective as to all known U.S. owners and operators of Lockheed-California Model L-1011-385 series airplanes by individual telegrams. This AD requires repetitive ultrasonic inspections for cracks of the inboard retract lugs of both the left and right main landing gear (MLG) shock strut cylinder. Failure to detect and correct cracks can result in structural failure of the MLG shock strut cylinder and ultimate collapse of the MLG. Effective date: August 24, 1987. (52 FR 28974, August 5, 1987.)

14 CFR Part 39 -- Boeing Model 727 Series Airplanes

This amendment amends an existing airworthiness directive (AD), applicable to certain Boeing Model 727 series airplanes, which currently requires the inspection and repair of cracks in the forward frame of the Number 3 cargo door cutout. This amendment is prompted by a reported case of one operator who did not repair several cracks discovered during the inspection required by this AD. The cracking, if not repaired, could result in the failure of the frame and could result in rapid depressurization of the airplane. To assure continued compliance with this AD, a statement is being added to reaffirm the repair requirements. Effective date: September 3, 1987. (52 FR 32534, August 28, 1987.)

14 CFR Part 39 -- McDonnell Douglas Helicopter Company, Model 369D, E, F, and FF Helicopters

This amendment adopts a new airworthiness directive (AD) which requires inspection of the main rotor transmission tail rotor output drive pinion shaft and removal from service of all unairworthy shafts on McDonnell Douglas Helicopter Company (MDHC) Model 369D, E, F, and FF helicopters. The AD is prompted by reports that main rotor transmission rail rotor output drive shafts have failed in flight, which could result in loss of power to the tail rotor and loss of control of the helicopter. Effective date: September 1, 1987. (52 FR 32913, September 1, 1987.)

14 CFR Part 39 -- Boeing Model 737 Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to certain Boeing Model 737 series airplanes, which requires inspection for cracking, and repair or replacement, as necessary, of the skin along the upper row of fasteners of certain fuselage lap joints. This amendment is prompted by recent inspection reports on three airplanes of extensive skin cracking adjacent to lap splice fasteners. Delamination of fuselage tearstraps has also been found in these same areas. Failure to detect and repair cracks could result in rapid depressurization of the airplane. Effective date: November 2, 1987. (52 FR 38395, October 16, 1987.)

14 CFR Part 39 -- Boeing Model 747 Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, which requires inspection for damage and cracking, and repair or replacement, as necessary, of the aft pressure bulkhead. This amendment is prompted by inspection reports and the results of recent testing by the manufacturer. It has been determined that to maintain an adequate level of safety, the aft pressure bulkhead must be inspected. Failure to detect and repair damage and cracks could result in possible rapid depressurization of the airplane. Effective date: December 10, 1987. (52 FR 41551, October 29, 1987.)

14 CFR Part 39 -- Boeing Model 747 Series Airplanes

This amendment adopts a new airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, which requires inspection for cracking of longeron skin splice fittings and for breakage of the tension bolts common to these fittings, fuselage Body Section 48, and replacement, if necessary. This amendment is prompted by reports of cracked longeron skin splice fittings or tension bolts on six airplanes. This condition, if not corrected, could lead to the inability to withstand required loads. Effective date: December 24, 1987. (52 FR 43744, November 16, 1987.)

14 CFR Part 39 -- Sikorsky Model S-76A and S-76B Series Helicopters

This amendment adopts a new airworthiness directive (AD) which requires a one-time modification to provide separate ground connections for 26 volt alternating current (VAC) step down transformers 1 and 2 on Sikorsky Model S-76A and S-76B series helicopters. This AD is needed to prevent complete loss of AC electrical power which could result in loss of the aircraft. Effective date: December 31, 1987. (52 FR 45452, November 30, 1987.)

14 CFR Part 39 -- McDonnell Douglas Model DC-9-10 Through -50, and C-9 (Military) Series Airplanes

This amendment supersedes an existing airworthiness directive (AD), applicable to all McDonnell Douglas DC-9-10 through -50, and C-9 (Military) series airplanes, which currently requires inspection and repair, as necessary, of wing rear spar lower tee caps at wing station $X_{RS} = 164.00$. This amendment requires expanding the inspections to include the wing rear spar upper caps, and incorporates a provision for optional eddy current inspections. This action is prompted by recent reports of cracks found in the wing rear spar upper caps. If this condition is not corrected, spar cracks may develop and progress to a point where the structural integrity of the wing is affected. Effective date: February 16, 1988. (52 FR 47703, December 16, 1987.)

14 CFR Part 39 -- Boeing Model 747 Series Airplanes

This amendment amends an existing airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, which requires inspection and replacement, as necessary, of the nacelle strut midspar fuse pins. This action amends the applicability and is prompted by the discovery by the manufacturer that three additional airplanes may have had the older style fuse pins installed as an option in production. This condition, if not corrected, could result in failure of the pin and separation of the engine from the airplane. Effective date: January 19, 1988. (52 FR 48392, December 22, 1987.)

FEDERAL HIGHWAY ADMINISTRATION

49 CFR Part 392 -- Driving of Motor Vehicles; Out of Service Criteria

This amendment is in response to section 12008(d) of the Commercial Motor Vehicle Safety Act of 1986 (Pub. L. 99-570). The FHWA is amending Part 392 to establish and enforce an out-of-service period of 24 hours for any commercial driver of a motor carrier who violates the provisions of section 392.5 of the Federal Motor Carrier Safety Regulations (FMCSR) (49 CFR 392.5). Effective date: August 19, 1987. (52 FR 27200, July 20, 1987.)

49 CFR Part 395 -- Hours of Service of Drivers

The FHWA is amending Part 395, Hours of Service of Drivers, of the Federal Motor Carrier Safety Regulations (FMCSR) to (1) eliminate four items currently required on the driver's record of duty status; (2) clarify the present exemption, pertaining to the preparation of a driver's record of duty status within 100-mile radius of the driver's work reporting location; (3) redefine the retail store delivery exemption (December 10 to December 25); (4) incorporate the current interpretation of both the 60-hour and 70-hour on-duty weekly limitation into the hours of service regulations; (5) revise the definition of on-duty time; and (6) revise the applicability section of this part. These amendments will reduce the paperwork burden, provide more judicious accounting of time worked thereby reducing the possibility of accrued driver fatigue, and make the regulations more easily understood. This action is in accord with the provisions of Section 206 of the Motor Carrier Safety Act of 1984 (Act). Effective date: November 30, 1987. (52 FR 41718, October 30, 1987.)

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

23 CFR Part 659 -- Certification of Speed Limit Enforcement

The Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA) are amending the regulations on certification of speed limit requirements to take into account provisions mandated by section 174 of the Federal-Aid Highway Act of 1987 (Act). Section 174 of the Act amended 23 U.S.C. 154 by giving the States the authority to increase, without loss of Federal-aid funds, the maximum speed limit to no more than 65 miles per hour (mph) on certain Interstate System highways. The regulations implementing 23 U.S.C. 154 are being revised to reflect the statutory amendment by providing the States the authority to adjust the speed sampling and analysis plan required for determining the level of 55 mph noncompliance. Effective date: August 3, 1987. (52 FR 28691, August 3, 1987.)

RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION

49 CFR Parts 171, 172 and 173 -- Bulk Packagings and Miscellaneous Amendments

This action is being taken to incorporate into the Department's Hazardous Materials Regulations definitions for bulk packaging and nonbulk packaging, and to make other miscellaneous changes including required identification of materials in bulk packagings. This action is necessary to improve identification of hazardous materials during transportation for emergency response purposes. Effective date: February 1, 1988. (52 FR 29526, August 10, 1987.)

49 CFR Part 192 -- Gas Pipeline Damage Prevention Programs

One part of the current damage prevention rule requires operators, when advised of intended excavation, to give the excavator notice of whether there is or is not a buried pipeline in the area of excavation. This amendment deletes the requirement to give such notice when the operator does not have a pipeline in the area of intended excavation. This final rule will reduce the burdens and costs to pipeline operators, particularly those who comply with the current rule by participating in "one-call" systems. The amendment will enhance the effectiveness of established "one-call" systems by providing uniformity of response procedures for all utility participants. Effective date: September 30, 1987. (52 FR 32798, August 31, 1987.)

49 CFR Part 192 -- Transportation of Natural and Other Gas by Pipeline; Confirmation or Revision of Maximum Allowable Operating Pressure Near Certain Occupied Buildings and Outside Areas

This final rule amends the criteria used to classify pipelines located near certain buildings and outside areas that are occupied infrequently. The effect is to relieve the undue burdens imposed by the current rules when pipelines are near these buildings or areas. Considering the risk, an acceptable level of safety will still be provided by the revised criteria and applicable safety standards. Effective date: October 1, 1987. (52 FR 32924, September 1, 1987.)

GLOSSARY

AVIATION

Air Carrier - beginning with 1975*, air carriers comprise three operational categories:

- (1) **Certificated Route Air Carrier** - one of a class of air carriers holding a certificate of public convenience and necessity issued by the Civil Aeronautics Board to conduct scheduled services over specified routes and a limited amount of nonscheduled charter operations.
- (2) **Supplemental Air Carrier** - one of a class of air carriers holding operating certificates issued by the Civil Aeronautics Board, authorizing them to perform passenger and cargo charter services supplementing the scheduled service of the Certificated Route Air Carriers.
- (3) **Commercial Operator (of large aircraft)** - one of a class of air carriers operating on a private for-hire basis, as distinguished from a public or common air carrier, holding a commercial operator certificate, issued by the Administrator of the Federal Aviation Administration (pursuant to Part 45 of the Civil Air Regulations) authorizing it to operate (large) aircraft in air commerce for the transportation of goods or passengers for compensation or hire.

Air Taxi - any use of an aircraft by the holder of an air carrier operating certificate authorized by the certificate, or carries mail on contract (see Paragraph 298.3 of FAR 38).

Aircraft Accident - is an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, and in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or in which the aircraft receives substantial damage.

Aviation Mid-Air Near-Collision - is broken down into three categories:

- (1) **Critical** - where collision avoidance was due to chance rather than any action taken by either pilot. Less than 100 feet of aircraft separation would be considered critical.
- (2) **Potential** - where a collision would have resulted had no action been taken by either pilot. Closest proximity of less than 500 feet would usually be required in this case.
- (3) **No Hazard** - where a report was made, but subsequent investigation determined that direction and altitude would have made a mid-air collision improbable regardless of evasive action taken.

Commuter Carrier - any operator who performs, pursuant to published schedule, at least five round trips per week between two or more points (see Paragraph 298.2 of FAR 38).

Fatal Injury - is any injury which results in death within seven days of the accident.

14 CFR 121 - all air carriers certificated for commercial operations with large aircraft.

*Prior to 1975, air carriers did not comprise commercial operators.

14 CFR 125 - aircraft with a seating capacity of 20 or more passengers or a maximum payload of 6,000 pounds or more.

14 CFR 127 - scheduled air carriers with helicopters.

General Aviation - refers to all civil aircraft operations except those classified as air carrier operations.

General Aviation Flying:

- o Personal - any use of an aircraft for personal purposes not associated with business or profession, and not for hire. This includes maintenance of pilot proficiency.
- o Business - any use of an aircraft, not for compensation or hire, by an individual for the purposes of transportation required by a business in which he is engaged.
- o Executive - any use of an aircraft by a corporation, a company or other organization for the purposes of transporting its employees and/or property not for compensation or hire and employing professional pilots for the operation of the aircraft.
- o Instructional - any use of an aircraft for the purposes of formal flight instruction with or without the flight instructor aboard.
- o Aerial Application - any use of an aircraft in agriculture to discharge material in flight and to perform activities such as antifrost agitation, agitating fruit trees, chasing birds from crops, checking crops, restocking of fish, animal and other wildlife, etc.
- o Other - any use of an aircraft not specified in the preceding uses. It includes research and development, demonstration, sport parachuting, ferry flight and industrial/special.

Serious Injury - an injury on an Air Carrier which:

- (1) Requires hospitalization for more than 48 hours commencing within seven days from the date when the injury was received;
- (2) Results in a fracture of any bone except fractures of fingers, toes or nose;
- (3) Involves a laceration which causes a severe hemorrhage, nerve, tendon or muscle damage;
- (4) Involves injury to any external organ; and
- (5) Involves second or third degree burns or any burn affecting more than 50 percent of the body surface.

HAZARDOUS MATERIALS

Fatality - the information received indicated that the death was due to the hazardous material involved.

Hazardous Material - a substance or material which has been designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

Incident - refers to any unintentional release of hazardous material while in transit or storage.

Major/Minor Injury - (1) injuries requiring hospitalization; (2) injuries involving second or third degree burns; (3) injury-related lost time at work of one or more days such as would be caused by inhalation of strong, irritating vapors are classified as major injuries. All other reported injuries are considered minor.

HIGHWAY

Motor Vehicle Occupant - is a driver of or passenger in a motor vehicle other than a motorcycle or motorscooter. For reporting purposes, this category also includes riders of animals, occupants of animal-drawn vehicles, occupants of streetcars, unauthorized riders, etc.

Motor Vehicle Traffic Accident - is any motor vehicle accident that occurs on a trafficway or that occurs after the motor vehicle runs off the roadway but before events are stabilized.

Motor Vehicle Traffic Fatality - is a death resulting from motor vehicle accident injuries occurring on a trafficway within 30 days of the accident.

Motorcycle - is a two-wheeled motor vehicle having one or more riding saddles, and sometimes a third wheel for the support of a sidecar. The sidecar is considered a part of the motorcycle. "Motorcycle" includes motorized bicycle, scooter, or tricycle.

Pedalcycle - is a vehicle operated solely by pedals, and propelled by human power.

Includes: Bicycle (any size, with two wheels in tandem), tricycle, unicycle, and sidecar or trailer attached to any of these devices.

Excludes: These devices when towed by a motor vehicle, including hitching.

Pedestrian - is any person not in or upon a motor vehicle or other road vehicle.

Includes: Person afoot, sitting, lying or working upon a land way or place; person in or operating a pedestrian conveyance.

Excludes: Person boarding or alighting from another conveyance, except pedestrian conveyance; person jumping or falling from a motor vehicle in transport.

Trafficway - is the entire width between property lines, or other boundary lines, of every way or place, of which any part is open to the public for purposes of vehicular travel as a matter of right or custom.

PIPELINES

Gas Distribution - refers to pipelines transporting natural gas, flammable gas or gas which is toxic or corrosive in distribution operations. (Injury, fatality or accident definitions as shown under "Gas Transmission" below.)

Gas Transmission - refers to pipelines transporting natural gas, flammable gas or gas which is toxic or corrosive in transmission or gathering operations.

- o Injury - refers to an injury involving lost time or other than on site medical treatment.
- o Fatality - is a death resulting from the failure or escape of gas.
- o Accident - is (1) an event that involves the release of gas from a pipeline or of liquefied natural gas or gas from an LNG facility resulting in a death, or personal injury necessitating in-patient hospitalization; or estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more; (2) an event that results in an emergency shutdown of an LNG facility; or (3) an event that is significant, in the judgement of the operator, even though it did not meet the criteria of (1) or (2).

Liquid Transmission - refers to pipelines carrying hazardous material, petroleum and petroleum products in liquid form.

- o Injury - refers to an injury requiring medical treatment other than on site first aid.
- o Fatality - is a death resulting from the escape of liquid.
- o Accident - is a release of the commodity transported as presented in 49 CFR Section 195.50.

RAIL RAPID TRANSIT (RRT)

RRT Accident - is any accident which satisfies the following threshold levels:

A. Train Collisions

1. All rail transit revenue train collisions involving other rail transit equipment (such as revenue or non-revenue trains, work trains or work equipment), persons and/or rail-highway crossings.
2. Collisions between revenue trains and other obstacles (shopping carts, foreign objects, etc.) which result in \$5,000 or greater property damage, or casualties.

"Property Damage" refers to the estimated cost to repair or replace damaged property (vehicles, equipment, right-of-way, etc.) to a state equivalent to that which existed prior to the accident. Property damage does not include the cost of clearing wreckage.

B. Train Derailments

1. All rail transit revenue train derailments regardless of severity.

C. Exclusions

1. Accidents (collisions or derailments) occurring in yards and non-revenue service areas which do not involve revenue trains; accidents (collisions or derailments) which involve only work trains and servicing equipment; and collisions between train cars resulting from coupling operations which do not involve passenger casualties are excluded.

RRT Casualty - is any casualty which satisfies the following threshold levels:

A. Employee Casualties

Employees who are on-duty and who are killed or sustain lost workdays resulting from reportable train accidents.

"Lost workday" means any full day or part of a day (consecutive or not) other than the day of the injury, that an employee is away from work because of the injury. The day of the reportable train accident is not to be reported as a lost workday even though the injured employee does not complete the work assignment that day.

B. Passenger and Other Casualties

Casualties involving passengers or other personnel (off-duty employees, contractors, etc.) which occur at or in exclusive approaches to or from faregates, or equivalent, or within the normal "paid" area, and which result in:

A. Fatalities, or

B. Personal injuries which require immediate medical treatment beyond first aid.

"Medical treatment" means treatment requiring the attention of a physician or registered professional medical personnel. "Medical treatment" as used here, does not refer to minor first aid treatment (one-time treatment), precautionary measures such as tetanus shots, or subsequent observation of minor scratches, cuts, bruises or splinters.

C. Exclusions

Assaults, attempted suicides, and suicides are excluded.

Fire -Reportable fires are all fires in stations, on trains in revenue service or on the right-of-way when the fire requires extinguishment by fire suppression system or person. Each fire is reported regardless of damage.

RAILROAD

Fatality -

- (1) The death of any person from an injury within 365 days of the accident/incident;
- (2) The death of a railroad employee from occupational illness within 365 days after the occupational illness was diagnosed by a physician.
- (3) Occupational illness of a railroad employee, as diagnosed by a physician.

Injury -

- (1) Injury to any person other than a railroad employee that requires medical treatment;
- (2) Injury to a railroad employee that requires medical treatment or results in restriction of work or motion for one or more workdays, one or more lost workdays, termination of employment, transfer to another job, or loss of consciousness; or

Non-Train Incident - is any event arising from the operation of a railroad, but not from the movement of equipment, which results in a reportable death, injury or illness.

Nontrespassers - are persons who are lawfully on that part of railroad property which is used in railroad operation and persons adjacent to railroad premises and injured as the result of the operation of a railroad.

Rail-Highway Grade Crossing - is a location where one or more railroad tracks cross a public highway, road, or street or a private roadway at grade, including sidewalks and pathways at, or associated with, the crossing.

Rail-Highway Grade-Crossing Accident/Incident - is any impact between railroad on-track equipment and an automobile, bus, truck, motorcycle, bicycle, farm vehicle, or pedestrian, at a rail-highway grade crossing.

Train Accident - is a collision, derailment, fire, explosion, act of God, or other event involving operation of railroad on-track equipment which, while it does not necessarily result in a reportable death, injury, or illness, results in more than \$4,900 in damages to railroad on-track equipment, signals, track, track structures, or roadbed. Prior to 1985, this threshold stood at \$4,500; prior to 1983, at \$3,700; prior to 1981, at \$2,900; prior to 1979, at \$2,300; prior to 1977, at \$1,750; and prior to 1975, at \$750.

Train Incident - is a collision, derailment, fire, explosion, act of God, or other event involving operation of railroad on-track equipment, which results in a reportable death, injury, or illness, but involves less than \$4,900 in damages to railroad on-track equipment, signals, track, track structures, or roadbed. Prior to 1985, this threshold stood at \$4,500; prior to 1983, at \$3,700, prior to 1981, at \$2,900; prior to 1979, at \$2,300; prior to 1977, at \$1,750; and prior to 1975, at \$750.

Trespassers - are persons who are on that part of railroad property used in railroad operation, and whose presence is prohibited, forbidden or unlawful. A person on a rail-highway grade crossing is classified as a trespasser if the crossing is protected by gates or other similar barriers which were closed when the person entered the crossing. He is also a trespasser if he attempts to pass over or under trains or cars at the crossings.

RECREATIONAL BOATING

Accident - occurrences involving recreational vessels or their equipment are required to be reported whenever they result in any of the following:

- a. A death;
- b. A person is injured and requires medical treatment beyond first aid;
- c. Damage to the vessel and other property damage totaling more than \$200; or
- d. A person's disappearing from the vessel under circumstances indicating death or injury.

Fatality - refers to all deaths (other than deaths by natural causes) and missing persons resulting from an occurrence that involves a vessel or its equipment.

Injury - refers to all injuries meeting the criteria set forth in b. above, resulting from an occurrence that involves a vessel or its equipment.

WATERBORNE TRANSPORTATION

Casualty - casualties involving commercial vessels are required to be reported to the Coast Guard whenever the casualty results in the following:

- a. Actual physical damage to property in excess of \$25,000.
- b. Material damage affecting the seaworthiness or efficiency of a vessel.
- c. Stranding or grounding.
- d. Loss of life.
- e. Injury causing any persons to remain incapacitated for a period in excess of 72 hours, except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

Fatality - refers to all deaths and missing persons resulting from a vessel casualty.

Injury - this term refers to all personal injuries resulting from a vessel casualty.

Non-Vessel-Casualty-Related Death - is one which occurs on board a commercial vessel, but not as a result of a vessel casualty, such as collision, fire, or explosion.

Vessel-Casualty-Related Death - is one which occurs on board a commercial vessel as a result of a vessel casualty, such as collision, fire, or explosion.

Waterborne Transportation - is the transport of freight and/or people by commercial vessels under USCG jurisdiction.