STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

MEMORANDUM

To: **Terrance D. Schiavone**
Regional Administrator, NHTSA Region IV

From: **Darrell Jernigan**
Director

Re: **North Carolina FY 2007 Highway Safety Plan**

Date: **September 7, 2006**

The Governor's Highway Safety Program is submitting its Fiscal Year 2007 Highway Safety Plan (HSP) for your review and consideration.

The HSP outlines specific expenditures of funds for FY 2007 and includes a brief description of each contract. The project contracts included in the Plan were selected for funding based on the probability that each would provide a positive impact on the goals outlined in the HSP.

Included in the front of the Plan are the necessary certifications followed by a listing of all equipment costing $5,000 or more for your review.

Should you have any questions concerning the FY 2007 HSP, I would welcome them.

cc: John Sullivan
Administrator, FHWA

Enclosures: As stated

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GOVERNOR'S HIGHWAY SAFETY PROGRAM
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LOCATION:
215 EAST LANE STREET
RALEIGH NC

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
711	PT-07-04-04-17	Aberdeen Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
711	PT-07-04-04-17	Aberdeen Police Department	1	Mobile Data Terminal	$5,500	$5,500	
733	PT-07-04-04-11	Alamance County Sheriff's Office	1	Speed Monitoring Trailer	$12,000	$12,000	
783	PT-07-04-04-16	Apex Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
783	PT-07-04-04-16	Apex Police Department	1	In-car Video System	$6,000	$6,000	
783	PT-07-04-04-16	Apex Police Department	1	Mobile Data Terminal	$8,000	$8,000	
766	PT-07-04-04-59	Archdale Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
766	PT-07-04-04-59	Archdale Police Department	1	Mobile Data Terminal	$8,000	$8,000	
766	PT-07-04-04-59	Archdale Police Department	1	In-car Video System	$5,000	$5,000	
796	PT-07-04-04-62	Ayden Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
796	PT-07-04-04-62	Ayden Police Department	1	In-car Video System	$6,000	$6,000	
796	PT-07-04-04-62	Ayden Police Department	2	Mobile Data Terminal	$8,000	$16,000	
720	PT-07-04-03-05	Belmont Police Department	4	Mobile Data Terminal	$7,885	$31,540	
721	K9-07-05-09	Biscoe Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
721	K9-07-05-09	Biscoe Police Department	1	Mobile Data Terminal	$8,000	$8,000	
721	K9-07-05-09	Biscoe Police Department	1	Speed Monitoring Trailer	$12,000	$12,000	
721	K9-07-05-09	Biscoe Police Department	1	In-car Video System	$6,000	$6,000	
728	K4-07-05-11	Boiling Springs Police Department	1	Vehicle - Enforcement	$19,970	$19,970	
7109	K4-07-05-31	Bridgeton Police Department	2	In-car Video System	$6,000	$12,000	
7109	K4-07-05-31	Bridgeton Police Department	1	Mobile Data Terminal	$8,000	$8,000	
798	K4-07-05-30	Camden County Sheriff's Office	1	Vehicle - Enforcement	$30,000	$30,000	
798	K4-07-05-30	Camden County Sheriff's Office	1	Mobile Data Terminal	$8,000	$8,000	
798	K4-07-05-30	Camden County Sheriff's Office	1	In-car Video System	$6,000	$6,000	
715	K4-07-05-08	Candor Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
715	K4-07-05-08	Candor Police Department	1	Mobile Data Terminal	$8,000	$8,000	
712	PT-07-04-04-13	Carthage Police Department	1	Vehicle - Enforcement	$28,000	$28,000	
755	K4-07-05-19	Cary Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
755	K4-07-05-19	Cary Police Department	2	Mobile Data Terminal	$8,000	$16,000	
755	K4-07-05-19	Cary Police Department	2	In-car Video System	$6,000	$12,000	
7131	PT-07-04-04-55	Chatham County Sheriff's Office	1	Vehicle - Enforcement	$30,000	$30,000	
7131	PT-07-04-04-55	Chatham County Sheriff's Office	1	In-car Video System	$6,000	$6,000	
714	PT-07-04-03-04	Cherryville Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
714	PT-07-04-03-04	Cherryville Police Department	1	Mobile Data Terminal	$8,000	$8,000	

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
714	PT-07-04-03-04	Cherryville Police Department	1	In-car Video System	$6,000	$6,000	
701	K4-07-05-02	China Grove Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
701	K4-07-05-02	China Grove Police Department	1	Mobile Data Terminal	$6,000	$6,000	
758	K4-07-05-20	Chocowinity Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
758	K4-07-05-20	Chocowinity Police Department	1	Mobile Data Terminal	$8,000	$8,000	
758	K4-07-05-20	Chocowinity Police Department	1	In-car Video System	$6,000	$6,000	
781	PT-07-04-03-48	Conway Police Department	1	Speed Monitoring Trailer	$12,000	$12,000	
729	PT-07-04-03-07	Creedmoor Police Department	1	Speed Monitoring Trailer	$9,554	$9,554	
778	K8-07-03-19	Currituck County Sheriff's Office	5	In-car Video System	$6,000	$30,000	
749	PT-07-04-03-10	Dobson Police Department	1	In-car Video System	$6,000	$6,000	
732	PT-07-04-03-47	Eden Police Department	2	Mobile Data Terminal	$8,000	$16,000	
7118	PT-07-04-03-21	Fairmont Public Safety	1	Speed Monitoring Trailer	$12,000	$12,000	
7118	PT-07-04-03-21	Fairmont Public Safety	1	Equipment Trailer	$5,000	$5,000	
736	PT-07-04-03-09	Farmville Police Department	3	Mobile Data Terminal	$8,000	$24,000	
742	K8-07-03-03	Forensic Tests for Alcohol Branch	138	Evidential Breath Testing Instrument	$7,500	$1,035,000	
787	K4-07-05-28	Fuquay-Varina Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
787	K4-07-05-28	Fuquay-Varina Police Department	2	Mobile Data Terminal	$8,000	$16,000	
787	K4-07-05-28	Fuquay-Varina Police Department	2	In-car Video System	$6,000	$12,000	
7117	K4-07-05-26	Gastoina Police Department	1	In-car Video System	$5,600	$16,800	
768	PT-07-04-04-50	Goldsboro Police Department	3	Vehicle - Enforcement	$30,000	$90,000	
768	PT-07-04-04-50	Goldsboro Police Department	3	Mobile Data Terminal	$7,500	$22,500	
768	PT-07-04-04-50	Goldsboro Police Department	3	In-car Video System	$6,000	$18,000	
7141	K8-07-03-15	Governor's Highway Safety Program	2	Crash Trailers for PI&E	$50,000	$100,000	
7141	K8-07-03-15	Governor's Highway Safety Program	2	Vehicle - Towing of Crash Trailers	$70,000	$140,000	
707	K4-07-05-06	Hamlet Police Department	1	Vehicle - Enforcement	$26,211	$26,211	
707	K4-07-05-06	Hamlet Police Department	1	Mobile Data Terminal	$7,361	$7,361	
707	K4-07-05-06	Hamlet Police Department	1	In-car Video System	$5,999	$5,999	
746	K4-07-05-15	Henderson County Sheriff's Office	1	Vehicle - Enforcement	$30,000	$30,000	
746	K4-07-05-15	Henderson County Sheriff's Office	1	Mobile Data Terminal	$8,000	$8,000	
746	K4-07-05-15	Henderson County Sheriff's Office	1	In-car Video System	$6,000	$6,000	
762	K4-07-05-22	Hillsborough Police Department	2	Vehicle - Enforcement	$24,625	$49,250	
761	K4-07-05-21	Hoke County Sheriff's Office	4	Vehicle - Enforcement	$29,000	$116,000	
761	K4-07-05-21	Hoke County Sheriff's Office	4	Mobile Data Terminal	$8,000	$32,000	

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
761	K4-07-05-21	Hoke County Sheriff's Office	4	In-car Video System	$6,000	$24,000	
730	PT-07-04-04-22	Huntersville Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
730	PT-07-04-04-22	Huntersville Police Department	1	In-car Video System	$6,000	$6,000	
730	PT-07-04-04-22	Huntersville Police Department	1	Mobile Data Terminal	$8,000	$8,000	
782	K4-07-05-25	Jacksonville Police Department	3	Vehicle - Enforcement - Motorcycle	$20,000	$60,000	
782	K4-07-05-25	Jacksonville Police Department	3	In-car Video System	$6,000	$18,000	
769	K8-07-03-18	Jonesville Police Department	2	In-car Video System	$6,000	$12,000	
752	K4-07-05-17	Kenly Police Department	1	Vehicle - Enforcement	$29,508	$29,508	
752	K4-07-05-17	Kenly Police Department	1	In-car Video System	$5,100	$5,100	
795	PT-07-04-03-14	Kill Devil Hills Police Department	5	In-car Video System	$6,000	$30,000	
702	K4-07-05-03	Laurinburg Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
702	K4-07-05-03	Laurinburg Police Department	1	Mobile Data Terminal	$8,000	$8,000	
702	K4-07-05-03	Laurinburg Police Department	1	In-car Video System	$6,000	$6,000	
785	K8-07-03-20	Lexington Police Department	2	In-car Video System	$6,000	$12,000	
0	PT-07-04-04-54	Locust Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
0	PT-07-04-04-54	Locust Police Department	1	Mobile Data Terminal	$8,000	$8,000	
0	PT-07-04-04-54	Locust Police Department	1	In-car Video System	$6,000	$6,000	
738	K4-07-05-13	Maggie Valley Police Department	1	Vehicle - Enforcement	$23,500	$23,500	
738	K4-07-05-13	Maggie Valley Police Department	1	In-car Video System	$6,000	$6,000	
737	K4-07-05-12	Marion Police Department	1	Vehicle - Enforcement - Motorcycle	$19,000	$19,000	
7148	K4-07-05-23	Marshall Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
7148	K4-07-05-23	Marshall Police Department	1	Mobile Data Terminal	$8,000	$8,000	
7148	K4-07-05-23	Marshall Police Department	1	In-car Video System	$5,500	$5,500	
7063	PT-07-04-04-30	Marshville Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
7063	PT-07-04-04-30	Marshville Police Department	1	Mobile Data Terminal	$6,700	$6,700	
7063	PT-07-04-04-30	Marshville Police Department	1	In-car Video System	$5,600	$5,600	
775	K4-07-05-24	Maxton Police Department	1	Vehicle - Enforcement	$24,000	$24,000	
775	K4-07-05-24	Maxton Police Department	1	Mobile Data Terminal	$8,000	$8,000	
775	K4-07-05-24	Maxton Police Department	1	In-car Video System	$5,164	$5,164	
757	K8-07-03-17	Mecklenburg County ABC Law Enf	1	Vehicle - Enforcement	$30,000	$30,000	
757	K8-07-03-17	Mecklenburg County ABC Law Enf	1	Mobile Data Terminal	$8,000	$8,000	
757	K8-07-03-17	Mecklenburg County ABC Law Enf	1	In-car Video System	$6,000	$6,000	
753	K4-07-05-18	Middlesex Police Department	1	Vehicle - Enforcement	$30,000	$30,000	

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
753	K4-07-05-18	Middlesex Police Department	1	In-car Video System	$6,000	$6,000	
753	K4-07-05-18	Middlesex Police Department	1	Mobile Data Terminal	$8,000	$8,000	
764	PT-07-04-04-39	Monroe Police Department	1	Speed Monitoring Trailer	$12,000	$12,000	
747	K4-07-05-16	Moore County Sheriff's Office	2	Vehicle - Enforcement	$30,000	$60,000	
747	K4-07-05-16	Moore County Sheriff's Office	2	Mobile Data Terminal	$8,000	$16,000	
747	K4-07-05-16	Moore County Sheriff's Office	2	In-car Video System	$6,000	$12,000	
0	PT-07-04-03-37	Mount Holly Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
0	PT-07-04-03-37	Mount Holly Police Department	1	Mobile Data Terminal	$6,700	$6,700	
0	PT-07-04-03-37	Mount Holly Police Department	1	In-car Video System	$5,600	$5,600	
734	PT-07-04-04-25	Nashville Police Department	1	Speed Monitoring Trailer	$11,705	$11,705	
7111	K4-07-05-01	New Bern Police Department	6	In-car Video System	$6,000	$36,000	
7111	K4-07-05-01	New Bern Police Department	6	Mobile Data Terminal	$8,000	$48,000	
7111	K4-07-05-01	New Bern Police Department	2	Motorcycle Camera Systems	$6,000	$12,000	
791	K8-07-03-21	New Hanover County Sheriff's Office	6	In-car Video System	$5,500	$33,000	
7123	PT-07-04-04-26	Newport Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
7123	PT-07-04-04-26	Newport Police Department	1	Mobile Data Terminal	$8,000	$8,000	
7123	PT-07-04-04-26	Newport Police Department	1	In-car Video System	$6,000	$6,000	
7123	PT-07-04-04-26	Newport Police Department	1	Speed Monitoring Trailer	$12,000	$12,000	
756	PT-07-04-03-12	North Carolina State Highway Patrol	50	Mobile Data Terminal	$7,000	$350,000	
7114	PT-07-04-03-18	Northwest Police Department	1	Vehicle - Enforcement (used)	$6,000	$6,000	
723	K8-07-03-13	Oakboro Police Department	2	In-car Video System	$5,377	$10,754	
767	PT-07-04-04-60	Oriental Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
767	PT-07-04-04-60	Oriental Police Department	1	In-car Video System	$6,000	$12,000	
744	K4-07-05-14	Pine Knoll Shores Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
744	K4-07-05-14	Pine Knoll Shores Police Department	1	Mobile Data Terminal	$8,000	$8,000	
706	K4-07-05-05	Pinebluff Police Department	1	Vehicle - Enforcement	$25,600	$25,600	
789	K4-07-05-29	Pinehurst Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
789	K4-07-05-29	Pinehurst Police Department	2	Mobile Data Terminal	$7,500	$15,000	
789	K4-07-05-29	Pinehurst Police Department	2	In-car Video System	$6,000	$12,000	
7101	PT-07-04-03-15	Plymouth Police Department	2	Mobile Data Terminal	$8,000	$16,000	
705	PT-07-04-03-01	Raeford Police Department	2	Mobile Data Terminal	$7,311	$14,622	
735	PT-07-04-04-29	Richmond County Sheriff's Office	2	Vehicle - Enforcement	$30,000	$60,000	
735	PT-07-04-04-29	Richmond County Sheriff's Office	2	Mobile Data Terminal	$8,000	$16,000	

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
735	PT-07-04-04-29	Richmond County Sheriff's Office	2	In-car Video System	$6,000	$12,000	
704	K4-07-05-04	Rockingham Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
704	K4-07-05-04	Rockingham Police Department	2	Mobile Data Terminal	$7,500	$15,000	
704	K4-07-05-04	Rockingham Police Department	2	In-car Video System	$6,000	$12,000	
704	K4-07-05-04	Rockingham Police Department	1	Golf Cart	$6,000	$6,000	
713	K4-07-05-07	Rockwell Police Department	1	Vehicle - Enforcement	$28,830	$28,830	
713	K4-07-05-07	Rockwell Police Department	1	Mobile Data Terminal	$7,110	$7,110	
779	PT-07-04-04-09	Rolesville Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
779	PT-07-04-04-09	Rolesville Police Department	1	Mobile Data Terminal	$8,000	$8,000	
779	PT-07-04-04-09	Rolesville Police Department	1	In-car Video System	$6,000	$6,000	
731	PT-07-04-03-08	Roxboro Police Department	2	Mobile Data Terminal	$8,000	$16,000	
731	PT-07-04-03-08	Roxboro Police Department	2	In-car Video System	$6,000	$12,000	
731	PT-07-04-03-08	Roxboro Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
727	PT-07-04-04-31	Shelby Police Department	2	Mobile Data Terminal	$8,000	$16,000	
7152	K8-07-03-28	Shelby Police Department	1	Equipment Trailer	$5,000	$5,000	
7152	K8-07-03-28	Shelby Police Department	1	Light Tower with Generator	$8,000	$8,000	
725	K4-07-05-10	Siler City Police Department	2	Vehicle - Enforcement	$26,650	$53,300	
7115	PT-07-04-03-19	Simpson Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
7115	PT-07-04-03-19	Simpson Police Department	1	Mobile Data Terminal	$8,000	$8,000	
7115	PT-07-04-03-19	Simpson Police Department	1	In-car Video System	$6,000	$6,000	
0	K8-07-03-30	Southern Pines Police Department	1	Light Tower with Generator	$8,000	$8,000	
0	K8-07-03-30	Southern Pines Police Department	1	Equipment Trailer	$5,000	$5,000	
7112	PT-07-04-03-49	St. Pauls Police Department	1	Mobile Data Terminal	$8,000	$8,000	
719	PT-07-04-03-03	Stanley Police Department	2	In-car Video System	$6,000	$12,000	
719	PT-07-04-03-03	Stanley Police Department	2	Mobile Data Terminal	$8,000	$16,000	
0	K8-07-03-29	Stanly County Sheriff's Office	1	Light Tower with Generator	$7,900	$7,900	
7110	PT-07-04-04-63	Tabor City Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
7110	PT-07-04-04-63	Tabor City Police Department	1	In-car Video System	$6,000	$6,000	
7110	PT-07-04-04-63	Tabor City Police Department	1	Mobile Data Terminal	$8,000	$8,000	
7102	PT-07-04-03-16	Taylorsville Police Department	3	Mobile Data Terminal	$7,400	$22,200	
788	PT-07-04-03-13	Transylvania County Sheriff's Office	2	Vehicle - Enforcement	$27,395	$54,790	
788	PT-07-04-03-13	Transylvania County Sheriff's Office	2	Mobile Data Terminal	$8,000	$16,000	
788	PT-07-04-03-13	Transylvania County Sheriff's Office	2	In-car Video System	$5,500	$11,000	

Ref Nu	Project Number	Agency	Quantity	Equipment Description	Cost per Each	Total Amount	Previous Proje
7116	PT-07-04-03-20	UNC-Greensboro Police Department	2	Light Tower with Generator	$6,000	$12,000	
7116	PT-07-04-03-20	UNC-Greensboro Police Department	2	Vehicle - Enforcement	$30,000	$60,000	
7116	PT-07-04-03-20	UNC-Greensboro Police Department	2	Mobile Data Terminal	$5,200	$10,400	
7116	PT-07-04-03-20	UNC-Greensboro Police Department	2	In-car Video System	$6,000	$12,000	
722	PT-07-04-03-06	Vass Police Department	1	In-car Video System	$6,000	$6,000	
722	PT-07-04-03-06	Vass Police Department	1	Mobile Data Terminal	$7,500	$7,500	
703	PT-07-04-03-46	Whispering Pines Police Department	1	Speed Monitoring Trailer	$11,360	$11,360	
743	PT-07-04-04-58	Wilson's Mills Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
743	PT-07-04-04-58	Wilson's Mills Police Department	1	Mobile Data Terminal	$8,000	$8,000	
743	PT-07-04-04-58	Wilson's Mills Police Department	1	In-car Video System	$6,000	$6,000	
0	PT-07-04-03-23	Wingate Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
0	PT-07-04-03-23	Wingate Police Department	1	In-car Video System	$6,000	$6,000	
716	PT-07-04-03-02	Winston-Salem Police Department	1	Vehicle - Enforcement	$23,200	$23,200	
794	PT-07-04-04-33	Winterville Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
794	PT-07-04-04-33	Winterville Police Department	1	Mobile Data Terminal	$8,000	$8,000	
794	PT-07-04-04-33	Winterville Police Department	1	In-car Video System	$6,000	$6,000	
780	PT-07-04-04-61	Zebulon Police Department	1	Vehicle - Enforcement	$30,000	$30,000	
780	PT-07-04-04-61	Zebulon Police Department	1	Mobile Data Terminal	$8,000	$8,000	
780	PT-07-04-04-61	Zebulon Police Department	1	In-car Video System	$6,000	$6,000	

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North Carolina

FY 2007 Highway Safety Plan

STATE CERTIFICATIONS AND ASSURANCES

Failure to comply with applicable Federal statutes, regulations and directives may subject State officials to civil or criminal penalties and/or place the State in a high risk grantee status in accordance with 49 CFR §18.12.

Each fiscal year the State will sign these Certifications and Assurances that the State complies with all applicable Federal statutes, regulations, and directives in effect with respect to the periods for which it receives grant funding. Applicable provisions include, but not limited to, the following:

- 23 U.S.C. Chapter 4 - Highway Safety Act of 1966, as amended;

- 49 CFR Part 18 - Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments

- 49 CFR Part 19 - Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals and Other Nonprofit Organizations

- 23 CFR Chapter II - (§§1200, 1205, 1206, 1250, 1251, & 1252) Regulations governing highway safety programs

- NHTSA Order 462-6C - Matching Rates for State and Community Highway Safety Programs

- Highway Safety Grant Funding Policy for Field-Administered Grants

Certifications and Assurances

The Governor is responsible for the administration of the State highway safety program through a State highway safety agency which has adequate powers and is

suitably equipped and organized (as evidenced by appropriate oversight procedures governing such areas as procurement, financial administration, and the use, management, and disposition of equipment) to carry out the program (23 USC 402(b) (1) (A));

The political subdivisions of this State are authorized, as part of the State highway safety program, to carry out within their jurisdictions local highway safety programs which have been approved by the Governor and are in accordance with the uniform guidelines promulgated by the Secretary of Transportation (23 USC 402(b) (1) (B));

At least 40 per cent of all Federal funds apportioned to this State under 23 USC 402 for this fiscal year will be expended by or for the benefit of the political subdivision of the State in carrying out local highway safety programs (23 USC 402(b) (1) (C)), unless this requirement is waived in writing;

The State will implement activities in support of national highway safety goals to reduce motor vehicle related fatalities that also reflect the primary data-related crash factors within the State as identified by the State highway safety planning process, including:

- **National law enforcement mobilizations,**
- **Sustained enforcement of statutes addressing impaired driving, occupant protection, and driving in excess of posted speed limits,**
- **An annual statewide safety belt use survey in accordance with criteria established by the Secretary for the measurement of State safety belt use rates to ensure that the measurements are accurate and representative,**
- **Development of statewide data systems to provide timely and effective data analysis to support allocation of highway safety resources.**

The State shall actively encourage all relevant law enforcement agencies in the State to follow the guidelines established for vehicular pursuits issued by the International Association of Chiefs of Police that are currently in effect.

This State's highway safety program provides adequate and reasonable access for the safe and convenient movement of physically handicapped persons, including those in wheelchairs, across curbs constructed or replaced on or after July 1, 1976, at all pedestrian crosswalks (23 USC 402(b) (1) (D));

Cash drawdowns will be initiated only when actually needed for disbursement, cash disbursements and balances will be reported in a timely manner as required by NHTSA, and the same standards of timing and amount, including the reporting of cash disbursement and balances, will be imposed upon any secondary recipient organizations (49 CFR 18.20, 18.21, and 18.41). Failure to adhere to these provisions may result in the termination of drawdown privileges);

The State has submitted appropriate documentation for review to the single point of contact designated by the Governor to review Federal programs, as required by Executive Order 12372 (Intergovernmental Review of Federal Programs);

Equipment acquired under this agreement for use in highway safety program areas shall be used and kept in operation for highway safety purposes by the State; or the State, by formal agreement with appropriate officials of a political subdivision or State agency, shall cause such equipment to be used and kept in operation for highway safety purposes (23 CFR 1200.21);

The State will comply with all applicable State procurement procedures and will maintain a financial management system that complies with the minimum requirements of 49 CFR 18.20;

The State highway safety agency will comply with all Federal statutes and implementing regulations relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin (and 49 CFR Part 21); (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps (and 49 CFR Part 27); (d) the Age Discrimination Act of 1975, as amended (42U.S.C. §§ 6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970(P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse of alcoholism; (g) §§ 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§ 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

The Drug-free Workplace Act of 1988(49 CFR Part 29 Sub-part F):

The State will provide a drug-free workplace by:

a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

b) Establishing a drug-free awareness program to inform employees about:

1) The dangers of drug abuse in the workplace.

2) The grantee's policy of maintaining a drug-free workplace.

3) Any available drug counseling, rehabilitation, and employee assistance programs.

4) The penalties that may be imposed upon employees for drug violations occurring in the workplace.

c) Making it a requirement that each employee engaged in the performance of the grant be given a copy of the statement required by paragraph (a).

d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will --

1) Abide by the terms of the statement.

2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction.

e) Notifying the agency within ten days after receiving notice under subparagraph (d) (2) from an employee or otherwise receiving actual notice of such conviction.

f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d) (2), with respect to any employee who is so convicted -

1) Taking appropriate personnel action against such an employee, up to and including termination.

2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a

Federal, State, or local health, law enforcement, or other appropriate agency.

g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e), and (f) above.

BUY AMERICA ACT

The State will comply with the provisions of the Buy America Act (23 USC 101 Note) which contains the following requirements:

Only steel, iron and manufactured products produced in the United States may be purchased with Federal funds unless the Secretary of Transportation determines that such domestic purchases would be inconsistent with the public interest; that such materials are not reasonably available and of a satisfactory quality; or that inclusion of domestic materials will increase the cost of the overall project contract by more than 25 percent. Clear justification for the purchase of non-domestic items must be in the form of a waiver request submitted to and approved by the Secretary of Transportation.

POLITICAL ACTIVITY (HATCH ACT).

The State will comply with the provisions of 5 U.S.C. §§ 1501-1508 and implementing regulations of 5 CFR Part 151, concerning "Political Activity of State or Local Offices, or Employees".

CERTIFICATION REGARDING FEDERAL LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-award at all tiers (including subcontracts, subgrants, and contracts under grant, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

RESTRICTION ON STATE LOBBYING

None of the funds under this program will be used for any activity specifically designed to urge or influence a State or local legislator to favor or oppose the adoption of any specific legislative proposal pending before any State or local legislative body. Such activities include both direct and indirect (e.g., "grassroots") lobbying activities, with one exception. This does not preclude a State official whose salary is supported with NHTSA funds from engaging in direct communications with State or local legislative officials, in accordance with customary State practice, even if such communications urge legislative officials to favor or oppose the adoption of a specific pending legislative proposal.

CERTIFICATION REGARDING DEBARMENT AND SUSPENSION

Instructions for Primary Certification

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The

prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

4. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if at any time the prospective primary participant learns its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded*, as used in this clause, have the meaning set out in the Definitions and coverage sections of 49 CFR Part 29. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of those regulations.

6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under 48 CFR Part 9, subpart 9.4, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification , in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under 48 CFR Part 9, subpart 9.4, debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is

not required to, check the list of Parties Excluded from Federal Procurement and Non-procurement Programs.

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under 48 CFR Part 9, subpart 9.4, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters-Primary Covered Transactions

(1) The prospective primary participant certifies to the best of its knowledge and belief, that its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of record, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the Statements in this certification, such prospective participant shall attach an explanation to this proposal.

Instructions for Lower Tier Certification

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms *covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded*, as used in this clause, have the meanings set out in the Definition and Coverage sections of 49 CFR Part 29. You may contact the person to whom this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under 48 CFR Part 9, subpart 9.4, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this proposal that is it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. (See below)

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under 48 CFR Part 9, subpart 9.4, debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the List of Parties Excluded from Federal Procurement and Non-procurement Programs.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under 48 CFR Part 9, subpart 9.4, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

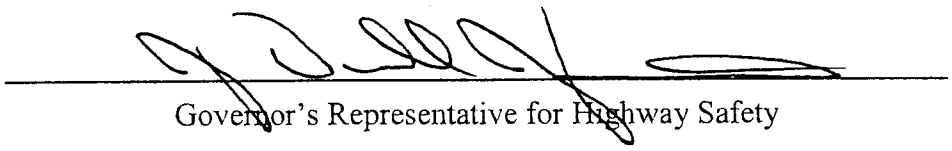
Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

ENVIRONMENTAL IMPACT

The Governor's Representative for Highway Safety has reviewed the State's Fiscal Year 2007 highway safety planning document and hereby declares that no significant environmental impact will result from implementing this Highway Safety Plan. If, under a future revision, this Plan will be modified in such a manner that a project would be instituted that could affect environmental quality to the extent that a review and statement would be necessary, this office is prepared to take the action necessary to comply with the National Environmental Policy Act of 1969 (42 USC 4321 et seq.) and the implementing regulations of the Council on Environmental Quality (40 CFR Parts 1500-1517).



Governor's Representative for Highway Safety

9/5/06

Date

North Carolina Highway Safety Enforcement Plan

The North Carolina Governor's Highway Safety Program (GHSP) Enforcement Plan consists of a network of 10 Regions across the state. These regions mirror the eight regions that are established by the State Highway Patrol (SHP), with the exception of the northeastern and the southwestern region. These were subdivided due to the large size of the two areas.

In each of the 10 regions, GHSP has identified and contracted with a law enforcement agency to allow an officer to serve as a Regional Law Enforcement Liaison (RLEL). Each agency that an officer represents receives a $10,000 grant to allow for support of regional coordination efforts and to provide compensation to the agency for traffic safety in the form of equipment purchases approved by GHSP.

The RLEL position requires the identification of law enforcement personnel to coordinate GHSP campaigns, which include "Click It or Ticket", "Booze It & Lose It", "R U Buckled" and "Truckers 4 Safety". The RLEL's manages these campaigns with Law Enforcement County Coordinators (LECC) in their region. Each county has a LECC. The LECC positions are not funded and do not receive compensation from GHSP. These positions are volunteer positions. The LECC is responsible for coordination of the GHSP campaigns with all law enforcement agencies in their county. This includes coordination of checkpoints and patrols during the campaign periods and the collection of enforcement data from participating agencies during the campaigns.

All North Carolina law enforcement agencies are encouraged to participate in GHSP campaigns. Law enforcement agencies that received grant funding are required to report and participate during national mobilizations. Statewide support is in place from the State Highway Patrol (SHP), Alcohol Law Enforcement (ALE), Sheriff's Association, and the Police Chief's Association.

North Carolina will participate in the Memorial Day 2007 "Click It or Ticket" mobilization and the Labor Day 2007 "Booze It & Lose It" mobilization, mirroring the NHTSA campaign dates. In addition, North Carolina plans to conduct additional "Booze It & Lose It" efforts. The GHSP plans to maintain a minimum of 440 agencies participating or 80%, while continuing to build additional agencies. Additionally, GHSP will continue to increase "R U Buckled", a campaign aimed at the high school age driver and safetybelt usage.

The RLEL is encouraged to create earned media opportunities during mobilizations, distribute PI&E among partnering agencies, and serve as a representative of his or her collective counties. In addition, the RLEL serves as spokesperson relative to campaign and enforcement needs from locals. The GHSP will continue to support the attendance of the RLEL to two National Highway Traffic Safety Administration (NHTSA) law enforcement liaison conferences each year. In addition, the GHSP requires the RLEL to attend four quarterly meetings.

The RLEL's will require leadership for law enforcement executives statewide, motivate law enforcement for enforcement 24/7, support the request of BAT Mobiles statewide and support national objectives requiring local law enforcement participation.

North Carolina Highway Safety Media Plan

The North Carolina Governor's Highway Safety Program (GHSP) Media Plan will target three areas of immediate concern: safety belt usage, impaired driving and speeding. All media for these areas will utilize both paid media and earned media.

In the area of safety belt usage, North Carolina will participate in the national "Click It or Ticket" mobilization in May 2007. GHSP will dedicate current allocations to target low safety belt usage areas and demographics. The paid media spots will convey an enforcement message. Earned media will be conducted statewide with a planned kickoff and approximately 120 media checkpoints planned for the mobilization.

North Carolina will also participate in the September 2007 impaired driving mobilization. Paid media will be utilized in target markets across the state. Funding for paid media will come from Section 410 funds. Again, the spots will convey a strong enforcement message and will feature the usage of the state's mobile breath testing units. Earned media will also be gained from the kickoff as well as the high visibility checkpoints throughout the campaign.

North Carolina will continue to implement "R U Buckled", a safety belt campaign targeting high school age drivers in FY 2007. This program launched in the fall of 2005 in 53 high schools across the state and is now in 119 high schools covering 54 counties and impacting over 40,000 student drivers in North Carolina. North Carolina plans to eventually have this campaign implemented in all high schools in the state.

GHSP will also utilize sports marketing to reach target demographics. Currently, GHSP has commitments from the Stanley Cup Champions of the National Hockey League, the Carolina Hurricanes, the Carolina Panthers of the NFL and the 10 Minor League Baseball teams in the state to provide advertising to reach their fans. Advertising will target all three areas of traffic safety mentioned.

Problem Identification and Promising Solutions for the Annual Highway Safety Plan

Submitted by

North Carolina Governors Highway Safety Program

August, 2006

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EXECUTIVE SUMMARY

Each year, the NC Governor's Highway Safety Program (GHSP) prepares a Highway Safety Plan (HSP) as a guide for the State's federally funded safety activities. A major component in the production of this document is the identification of safety problems within the state through an analysis of crash data. The results of this problem identification effort are then used as one means of justification for determining where safety improvement funds are spent. With the available funding for safety improvements and programs diminishing, it is critical that such funding be carefully allocated to have the greatest impact on safety.

The objective of this report is to help GHSP in the identification of safety problems within the state. Here is a summary of the findings:

Overall trends in crashes by severity in North Carolina

- Fatality rates (fatalities per 100 MVM) in North Carolina have been decreasing in the last 10 years. However, the number of fatalities has remained somewhat steady.

- During the last 3 years, the total number of injury and fatal crashes has not changed significantly. However, the number of reported property damage only (PDO) crashes has increased significantly.

Alcohol-involved crashes

- During the last 3 years, there has been a decline in both the total number of drinking drivers in crashes and the percent of all-crash involved drivers who had been drinking.

- The 21-24 age group is associated with the highest percentage of drivers who had been drinking while being involved in a crash.

- Hispanic/Latino drivers have the highest rate of drinking while being involved in a crash. Part of the reason for their high rate is that the North Carolina Latino population is largely male and young – the primary group of drinking drivers in all racial/ethnic groups.
- Crashes involving drinking and driving is most common during early morning hours.

- About 54% of drinking driver crashes occurred on rural roadways.

Young driver crashes

- Crashes involving drivers age 15-20 have increased in the last 3 years, but this can completely be explained by population growth. There has been very little change in the severity of crashes during this period.

- Among young drivers, the driver did something to contribute to the crash in 68% of all crashes, while only 48% of drivers age 25-54 contributed to their crash. A substantial proportion of young driver errors are accounted for by three actions: failure to yield, failure to reduce speed appropriately, and driving too fast for conditions.

- Alcohol involvement by crash-involved young drivers, all of whom are under the legal drinking age, is lower than for all age groups up to age 50.

Motorcycle safety

- The number of motorcycle crashes has been increasing for about 5-years along with the North Carolina population and number of registered motorcycles.

- The typical motorcycle crash occurs between April and October on a Friday, Saturday, or Sunday between 12:00 noon and 7:00 p.m. during clear weather on a rural two-lane state secondary road with a 55 MPH speed limit.

- Curved roadway crashes are overrepresented in motorcycle crashes and are associated with greater risk for fatal/severe injury than crashes straight roadway segments.

- Rollovers, hitting a fixed object, rear-ending another vehicle, the motorcyclist or another vehicle making a left/right turn, and running off the roadway are the most harmful precipitating events of motorcycle crashes.

- Fatal/severe injury to the motorcyclist was strongly associated with head-on crashes, hitting a fixed object, left/right turns, and leaving roadways.

Pedestrian safety

- Although crashes involving pedestrians represent less than 1% of the total reported motor vehicle crashes in North Carolina, pedestrians are highly over-represented in fatal and serious injury crashes. Approximately 12% of the fatal crashes and 9% of A-type (disabling injury) crashes in North Carolina involved pedestrians.

- Pedestrian crashes are most likely to occur in the afternoon and early evening between the hours of 2 pm to 6 pm and 6 pm to 10 p.m., with over half of pedestrian crashes occurring during these eight hours.

- While most crashes (55%) occurred during clear or cloudy weather *and* under daylight conditions, 18% occurred during night-time on lighted roadways (clear or cloudy) and another 15% occurred during night-time on unlighted roadways (clear or cloudy conditions).

- The 51 to 60 year group has shown numerical and proportional increases in the pedestrian crashes each of the three years while the 26 to 30 year group has shown a decline. On average, older teens (16 to 20) and young adults (21 to 25) accounted for greater numbers and proportions of pedestrian crashes than other groups. However, the proportions of those killed and seriously injured in a pedestrian crash is higher for the older age groups.

- Blacks are over-represented in pedestrian crashes, and Whites are under-represented based on the population. However, there appears to be a decreasing trend in the proportion of crashes involving black pedestrians.

- The most frequent crash type involves *Pedestrian failure to yield.* It should be pointed out, however, that this crash type does not necessarily imply fault. For example, a pedestrian may detect a gap at a mid-block area and begin crossing, but a speeding motorist closes the gap sooner than expected and strikes the pedestrian.

Bicyclist safety

- Bicyclists represent less than 0.5% of the total reported motor vehicle crashes in North Carolina, but represent 1.5% of the fatal crashes, and 2% of A-type (disabling injury) crashes.

- The number of bicyclist crashes has fluctuated over the past 3 years, but no obvious trend is apparent over this time.

- Bicyclist crashes peak on Friday and Saturday.

- While most crashes (74%) occurred during clear or cloudy weather and under daylight conditions, 17% occurred during night-time on lighted or unlighted roadways (clear or cloudy conditions).

- There seems to be an increasing in the number of bicycle crashes involving adults ages 40 to 69, and a decreasing trend among children up to age 15. It is not clear if this may be due to changes in riding patterns among the different age groups and/or change in the population of the specific age groups.

- The most frequent crash type (about one-fifth of bicycle-motor vehicle crashes), involved *Sign-controlled intersection* violations by bicyclists and motorists.

- Children were most often involved in *mid-block ride out* crashes, more typically occurring in urban areas.

Older driver safety

- The number of crash-involved older drivers has shown only modest increases over the past 3 years. Although drivers ages 65+ make up only 7.5% of the crash-involved driver population, they comprise 15% of fatally-injured drivers.

- Nearly one in five drivers killed in crashes in the western Mountain region of the state is age 65+. As the North Carolina population ages, this proportion will rise, not only in western North Carolina but in all parts of the State.

- For the most part, older driver crashes tend to mimic the locations and situations where older adults drive, (i.e., on shorter trips, lower speed roadways, about town, during the daytime, under favorable weather conditions, etc.).

- Drivers ages 65+ are more likely to crash while making a left turn, and the crash risk increases along with their age.

- Older drivers are more likely to be cited for contributing to their crash, with the most commonly cited contributing factor being failure to yield to other traffic.

Speed-related crashes

- Speed-related PDO crashes have increased substantially in the last two years. However, the number of injury and fatal speed-related crashes has changed very little during this period.

- Speed-related crashes are in general more severe compared to non-speed-related crashes.

- A higher percentage of crashes in rural areas are speed-related compared to urban areas.

- The 16-17 age group is associated with the highest percentage of speed-related crashes.

- A large number of speed-related crashes occur during the morning peak, the afternoon peak, and between 1:00 and 3:00 a.m.

- Interstates have the lowest number of speed-related crashes, but the highest percentage of speed-related crashes. Local streets have the highest number of speed-related crashes, but the lowest percentage of speed-related crashes.

- Close to 80% of crashes where a rear-end crash was the first harmful event, are speed-related. A significant percentage of crashes (close to 50%) where the first harmful event is a Jacknife/Overturn/Rollover, collision with a fixed object, or ran-off-the-road, are speed-related.

Occupant restraint

- Following the enactment of a primary enforcement seat-belt law and the "Click It or Ticket: campaign, the observed driver seat belt usage rate has increased from approximately 65% in the early 1990's to 88.5% in 2006.

- The latest survey of seat-belt usage was conducted during Memorial Day 2004. The estimated usage rate at that time was 88.9% of drivers and 86.3% for passengers.

- A larger percentage of women use a seat belt (92%) compared to men (86.8%).

- Typically, middle-aged and older drivers have a higher usage rate compared to young drivers.

- Information on restraint usage for individuals involved in an accident is usually self-reported and not reliable, especially for less severe crashes.

Traffic Records and Data Collection

- It has become very obvious during the compilation of this plan that numerous problems exist in the area of record collection and disbursement. The data for this years Highway Safety Plan has been gathered by GHSP directly from NCDOT rather than going through a third party. This has resulted in several glaring differences from prior years reporting. The overall system is being studied and modernized as a part of the activities of the Executive Committee on Highway Safety. Future years will be more accurate and will show trending in a more accurate method.

1. INTRODUCTION

The objective of this report is to help this agency in the identification of safety problems within the state. This section gives an overview of the frequency and severity of crashes in North Carolina during the last several years. In the subsequent sections, the following areas that are of primary interest to GHSP are discussed in more detail:

- Alcohol related crashes
- Young driver crashes
- Motorcycle crashes
- Pedestrian crashes
- Bicycle crashes
- Older driver crashes
- Speed-related crashes
- Occupant restraint usage

Fatalities and Fatality Rates

The fatality rates in North Carolina and Nation during the last several years are presented in Table 1.1. Fatality rates for the nation were obtained from the Fatality Analysis Reporting System (FARS) (http://www-fars.nhtsa.dot.gov/). For North Carolina, the number of fatalities in 2005 was obtained from NCDOT crash records. Exposure (i.e., miles traveled) for 2005 was obtained from NCDOT. Data for the prior years for North Carolina were taken from the 2003 *North Carolina Traffic Crash Facts* report.

Table 1.1: *Fatalities and fatality rates*

Year	National Rate (per 100 MVM[1])	NC Rate (per 100 MVM)	NC Fatalities
1966	5.50	6.78	1724
1967	5.26	6.57	1751
2000	1.53	1.75	1563
2001	1.51	1.67	1530
2002	1.50	1.68	1573
2003	1.48	1.63	1525
2004	1.46	1.62	1557
2005	NA	1.53	1546

Frequency and severity of crashes during the last 3 years

Table 1.A shows the frequency and severity of crashes in North Carolina during the last 3 years. The number of injury do not seem to have changed significantly during the last 3 years, but the number of property damage only crashes (PDO) has increased significantly while the number of fatal crashes has actually decreased. This would indicate that the fatal crashes may be decreasing but the number of fatalities per crash are increasing.

Table 1.A *Crash frequency and severity in North Carolina*

	Oct 02 - Sep 03	Jan 04 - Dec 04	Jan 05 - Dec 05
Severity	Number	Number	Number
PDO	144979	145774	287261
Injury	83429	83044	83135
Fatal	1339	1423	1018
TOTAL	229747	230241	371414

Table 1.B shows the number of crashes, number of injury and fatal crashes, crash rate, and the rate of injury and fatal crashes for different counties in North Carolina. The table also highlights the 15 counties that have the highest crash rates, high rate of injury and fatal crashes, and high frequency of total crashes, and a high frequency of total injury and fatal crashes. Alamance, Buncombe, Cabarrus, Catawba, Cumberland, Durham, Forsyth, Gaston, Guilford, Iredell, Mecklenburg, New Hanover and Wake have a large number of crashes as well as high crash rates.

Table 1.B *County Rates for All, Injury/Fatal Crashes*

County	Total Crashes In County	Overall Crash Rate Per 1000 Population	Number Of Fatal/Injury Crashes IN County	Fatal/Injury Crash Rate Per 1000 Population
Alamance	6148	44.3	1339	9.6
Alexander	831	23.4	218	6.1
Alleghany	335	30.7	90	8.2
Anson	866	33.5	234	9.1
Ashe	876	34.7	198	7.8
Avery	479	26.3	117	6.4
Beaufort	1832	39.8	481	10.4
Bertie	627	31.8	191	9.7
Bladen	1096	33.0	423	12.7
Brunswick	3280	37.4	829	9.5
Buncombe	9011	41.4	2217	10.2

Burke	3347	37.6	830	9.3
Cabarrus	6971	46.4	1503	10.0
Caldwell	2718	34.5	694	8.8
Camden	237	26.7	63	7.1
Carteret	2266	36.3	496	7.9
Caswell	499	20.9	145	6.1
Catawaba	7574	50.7	1607	10.8
Chatham	1938	34.4	440	7.8
Cherokee	707	27.1	223	8.6
Chowan	346	23.8	94	6.5
Clay	268	27.3	80	8.2
Cleveland	3618	37.0	890	9.1
Columbus	2043	37.4	703	12.9
Craven	3052	33.1	688	7.5
Cumberland	14268	45.6	3340	10.7
Currituck	677	29.9	159	7.0
Dare	1699	48.3	323	9.2
Davidson	5674	36.7	1447	9.3
Davie	1210	31.3	264	6.8
Duplin	1973	37.8	522	10.0
Durham	14737	60.8	2610	10.8
Edgecombe	1770	33.1	464	8.7
Forsyth	14938	46.1	3028	9.3
Franklin	1523	28.1	445	8.2
Gaston	9206	47.8	2339	12.1
Gates	362	32.7	128	11.6
Graham	260	32.1	121	14.9
Granville	1441	26.7	365	6.8
Greene	615	30.3	172	8.5
Guilford	21192	48.3	4780	10.9
Halifax	1876	33.3	448	8.0
Harnett	3056	30.0	854	8.4
Haywood	1688	29.6	454	8.0
Henderson	4039	41.3	844	8.6
Hertford	825	34.6	236	9.9
Hoke	1001	25.1	386	9.7
Hyde	131	23.4	29	5.2
Iredell	6545	47.0	1571	11.3
Jackson	1311	36.2	343	9.5
Johnston	5804	39.8	1430	9.8
Jones	380	37.2	113	11.1
Lee	2690	53.3	526	10.4
Lenoir	2270	38.9	709	12.1
Lincoln	2723	39.4	685	9.9

Macon	998	30.9	297	9.2
Madison	408	20.0	115	5.6
Martin	732	29.8	180	7.3
McDowell	1121	25.7	315	7.2
Mecklenburg	45620	58.0	9391	11.9
Mitchell	482	29.9	133	8.3
Montgomery	717	26.3	200	7.3
Moore	2792	34.7	747	9.3
Nash	3885	42.4	1040	11.4
New Hanover	10964	61.7	2387	13.4
Northampton	621	28.9	195	9.1
Onslow	6404	39.5	1277	7.9
Orange	4584	37.4	705	5.8
Pamlico	309	23.5	91	6.9
Pasquotank	1552	40.7	305	8.0
Pender	1823	39.5	483	10.5
Perquimans	272	22.8	76	6.4
Person	1301	34.8	292	7.8
Pitt	6481	45.2	1506	10.5
Polk	485	25.3	125	6.5
Randolph	4898	35.7	1180	8.6
Richmond	1456	31.3	528	11.4
Robeson	4949	38.8	1550	12.2
Rockingham	2870	31.1	735	8.0
Rowan	5350	39.9	1222	9.1
Rutherford	2036	32.1	551	8.7
Sampson	2218	35.0	666	10.5
Scotland	840	22.7	349	9.4
Stanly	1936	32.6	481	8.1
Stokes	1216	26.3	335	7.2
Surry	2550	35.1	663	9.1
Swain	345	25.4	124	9.1
Transylvania	891	29.8	188	6.3
Tyrrell	179	42.8	37	8.9
Union	6207	39.3	1232	7.8
Vance	1791	40.6	410	9.3
Wake	38932	52.2	6515	8.7
Warren	458	22.7	117	5.8
Washington	358	26.7	89	6.6
Watauga	2237	52.1	410	9.5
Wayne	4337	37.5	1157	10.0
Wilkes	2279	33.8	607	9.0
Wilson	3207	41.6	838	10.9
Yadkin	1094	29.3	280	7.5

Yancy	380	20.9	101	5.6
State Total	371414	42.9	84153	9.7

2. ALCOHOL-INVOLVED CRASHES

Driving after drinking continues to be one of the major causes of motor vehicle crashes in North Carolina as well as the U.S. as a whole. As shown in Table 2.A, both the total number of drinking drivers in crashes and the percent of all crash-involved drivers who had been drinking have remained somewhat steady over the last four years with a slight decrease in 2004 as compared to 2001.

Table 2.A: *Number and percentage of drivers involved in crashes judged to have been drinking- by year*

	Number of Drinking Drivers	Total Driver Crashes	Percent of Drinking Drivers
Oct 2000 - Sep 2001	14,119	369,894	3.82%
Oct 2001 - Sep 2002	12,952	372,426	3.48%
Oct 2002 - Sep 2003	10,944	384,447	2.85%
Jan 2004 - Dec 2004	11,376	381,183	2.98%
Jan 2005 - Dec 2005	10986	371,414	2.96%

Demographic Difference in Alcohol Use by Drivers

Driver Age

Alcohol use is strongly related to age and that is also seen in drinking by crash-involved drivers. The very youngest drivers have very low levels of alcohol use, but the prevalence of drinking among crash-involved drivers increases sharply with each year of age to a peak among the 21-24 year-old age group. As is seen in Table 2.B, the likelihood a crash-involved driver has been drinking drops again by age 25 and then declines until reaching a stable, relatively low level among drivers 60 and older.

Table 2.B *Table of Age of Driver*
Driver Alcohol Assessment

	No Alcohol		Alcohol		
Age	Number	Percentage	Number	Percentage	Total
Under 16	1067	97.68%	26	2.32%	1093
16-17	18976	99.06%	182	0.94%	19158
18-20	36908	97.09%	1139	2.91%	38047
21-24	40846	95.20%	2167	4.80%	43013
25-29	41174	96.06%	1762	3.94%	42936
30-39	72521	96.77%	2508	3.23%	75029
40-49	62715	97.10%	1931	2.90%	64646
50-59	44578	98.07%	893	1.93%	45471
60 and Above	41620	99.11%	377	0.89%	41997
Unknown	23	96.00%	1	4.00%	24
TOTAL	360428	97.13%	10986	2.87%	371414

Race/Ethnicity

The use of alcohol varies substantially within the various subcultures in North Carolina and this is also apparent in the involvement of alcohol in crashes. Table 2.C shows the percent of crash-involved drivers who had been drinking by race/ethnicity. The most striking finding is the extremely high rate of drinking by Hispanic/Latino drivers. This is out of line with national data which consistently show that Native Americans have the highest rates of driving after drinking and that Hispanic/Latino rates fall in between those of Native Americans and whites.

Table 2.C Table of Race of Driver
Driver Alcohol Assessment

	No Alcohol		Alcohol		
Race	Number	Percentage	Number	Percentage	Total
White	241327	97.18%	7005	2.82%	248332
Black	84948	97.72%	1986	2.28%	86934
Native American	2437	95.16%	124	4.84%	2561
Hispanic	22481	92.96%	1702	7.04%	24183
Asian	4316	98.83%	51	1.17%	4367
Other	3279	97.88%	71	2.12%	3350
Unknown	1640	97.21%	47	2.79%	1687
Total	360428	97.04%	10986	2.96%	371414

The explanation for the abnormally high rate among Hispanic drivers in North Carolina lies in the nature of this population subgroup. Unlike Hispanics in most other regions of the U.S., the North Carolina Latino population is composed mostly of first generation immigrants, a large number of whom have come to the state in the past decade. As such this group is largely male and young – the primary group of drinking drivers among all racial/ethnic groups. Forty-nine percent of Hispanic drivers in crashes were 20 – 29 years old, compared to 26% of blacks and 21% of whites. Thus, whereas white and black crash-involved drivers include many older drivers who are less likely to drink and drive, Hispanic drivers are mostly young males (only 2% of Hispanic drinking driver crashes were females whereas 26% of black and white drinking drivers were females).

Table 2.D *Percent of Crash-Involved Drivers Who Had been Drinking*

By Race/Ethnicity and Age (Jan 2005 through Dec 2005)

	White	Black	Nat Amer	Hispanic	Asian	Other	Unknown
15-20	2.22%	1.40%	3.56%	6.44%	1.55%	2.56%	1.29%
21-24	5.14%	2.91%	7.75%	9.51%	1.50%	3.08%	3.09%
25-29	3.98%	2.68%	6.47%	7.56%	1.63%	3.35%	3.92%
30-39	3.36%	2.39%	4.54%	6.49%	1.34%	2.02%	2.56%
40-49	3.07%	2.57%	5.02%	4.79%	0.85%	1.76%	4.23%
50-59	1.83%	2.27%	4.56%	2.92%	0.45%	0.63%	2.70%
60 and above	0.78%	1.29%	1.57%	4.08%	0.00%	0.00%	1.78%

Time of day, week and year of drinking driver crashes

Not surprisingly the proportions of drinking and driving are particularly high during the early morning hours. For most individuals, drinking is an evening/nighttime activity. Another issue that contributes to the sharp peak in the proportion of drivers who had been drinking is the fact that most of the general driving public is not out at that late hour. Hence, drinkers represent a greater proportion of all drivers on the road.

Driving after drinking is substantially more common among males than among females. Whereas about 4.7% of crash-involved male drivers had been drinking only 1.8% of females in crashes had been drinking. Moreover, this difference is related to driver age. Among crash-involved drivers from 18 to 30, males were 3.5 times as likely to have been drinking as females. From age 31 to 64 males were about 2.2 times as likely to be drinking and among drivers over 65, males were only 1.3 times as likely as females to have been drinking.

It is also important to consider that the actual number alcohol-related crashes are distributed very differently. Even though smaller proportions of crash-involved drivers

are drinking during the early evening hours, there are far more of them on the roads than in the early morning hours. Whereas the peak times for crashes to involve a drinking driver are from 1 – 4 a.m., those three hours only account for 18% of alcohol-related crashes. Even though the rate of drinking and riving is much lower, the hours from 6 p.m. to 9 p.m. involve an equal number of alcohol-related crashes (18%) There is a spike from 2 – 3 a.m. which is explained by the fact that the bar closing time is 2 a.m.

Drinking driving by month and day of week

Despite common beliefs about the prevalence of drinking and driving, there is almost no variation in the percent of crash-involved drivers who have been drinking by month. The lowest rate is in January (3.1%), the highest in March (3.6%) with all other months ranging from 3.3 to 3.5%. In contrast, crashes on weekends are far more likely to involve a drinking driver (6.5%) compared to weekdays/nights (2.5%). It is worth remembering, however, that the actual number of drinking-driver crashes doesn't differ nearly so much, with about 5,300 drinking driver crashes on weekdays/nights and 7,300 on weekends in each of the years examined.

Crash Characteristics among Drinking Drivers

There is a substantial folklore about the nature of drinking driver crashes, some of which is not in keeping with the reality of these crashes. A widespread belief is that drinking drivers generally crash into "innocent victims." Although such crashes do occur much too frequently, they are not the typical drinking driver crash. National data from the fatality analysis reporting system indicate that 70 – 80% of those killed in alcohol-related crashes are the drinking driver, a drinking non-occupant, or a passenger of the drinking driver, who has usually been drinking as well. It is clear that the typical drinking driver crash involves only the driver's vehicle, usually either running off the road or hitting a fixed object.

Roadway Characteristics and Location

Two-thirds (68%) of drinking driver crashes in North Carolina occur on 1- or 2-lane roadways. That is partly because crashes on 2-lane roads are more than twice as likely to involve a drinking driver (4.9% vs. 2.2% on roads with 3 or more lanes) and because more travel occurs on 2-lane roads. Similarly, 54% of all drinking driver crashes occur on rural roadways, which is also due to the fact that rural crashes are much more likely to involve a drinking driver than urban crashes (4.6% vs. 2.5%). One third of all drinking driver crashes occur on secondary routes; another third occur on local streets and the remaining third occurs on all other types of roads combined.

Drinking Driver Crashes by County

The following table, Table 2.E, illustrates the presence of alcohol in crashes by county. These further illustrate the point made above about the location of drinking driver crashes. The twelve counties with the highest rate of alcohol involvement in crashes account for only 4.36% of all drinking driver crashes in North Carolina. This is because alcohol-related crashes are much more likely in rural locations and these rural counties have less traffic, hence fewer crashes in general. In contrast, the top 10 counties in number of drinking driver crashes account for close to half (40.64%) of all drinking driver crashes in North Carolina, yet they are among the lowest in alcohol-involved crash rates (representing 6 of the 12 counties with the lowest *rates* of drinking driver crashes.

Table 2.E *Table of County by Driver Alcohol Assessment*

	No Alcohol		Alcohol		
County	Number	Percentage	Number	Percentage	Total
Alamance	5954	96.84%	194	3.16%	6148
Alexander	788	94.83%	43	5.17%	831
Alleghany	320	95.52%	15	4.48%	335
Anson	839	96.88%	27	3.12%	866
Ashe	847	96.69%	29	3.31%	876
Avery	456	95.20%	23	4.80%	479
Beaufort	1761	96.12%	71	3.88%	1832
Bertie	608	96.97%	19	3.03%	627
Bladen	1055	96.26%	41	3.74%	1096
Brunswick	3135	95.58%	145	4.42%	3280
Buncombe	8710	96.66%	301	3.34%	9011
Burke	3258	97.34%	89	2.66%	3347
Cabarrus	6795	97.48%	176	2.52%	6971
Caldwell	2613	96.14%	105	3.86%	2718
Camden	226	95.36%	11	4.64%	237
Carteret	2170	95.76%	96	4.24%	2266
Caswell	463	92.79%	36	7.21%	499
Catawaba	7337	96.87%	237	3.13%	7574
Chatham	1872	96.59%	66	3.41%	1938
Cherokee	677	95.76%	30	4.24%	707
Chowan	330	95.38%	16	4.62%	346
Clay	256	95.52%	12	4.48%	268
Cleveland	3492	96.52%	126	3.48%	3618
Columbus	1947	95.30%	96	4.70%	2043
Craven	2950	96.66%	102	3.34%	3052
Cumberland	13965	97.88%	303	2.12%	14268
Currituck	652	96.31%	25	3.69%	677

Dare	1638	96.41%	61	3.59%	1699
Davidson	5484	96.65%	190	3.35%	5674
Davie	1169	96.61%	41	3.39%	1210
Duplin	1891	95.84%	82	4.16%	1973
Durham	14445	98.02%	292	1.98%	14737
Edgecombe	1694	95.71%	76	4.29%	1770
Forsyth	14541	97.34%	397	2.66%	14938
Franklin	1452	95.34%	71	4.66%	1523
Gaston	8931	97.01%	275	2.99%	9206
Gates	341	94.20%	21	5.80%	362
Graham	247	95.00%	13	5.00%	260
Granville	1384	96.04%	57	3.96%	1441
Greene	580	94.31%	35	5.69%	615
Guilford	20667	97.52%	525	2.48%	21192
Halifax	1824	97.23%	52	2.77%	1876
Harnett	2934	96.01%	122	3.99%	3056
Haywood	1626	96.33%	62	3.67%	1688
Henderson	3933	97.38%	106	2.62%	4039
Hertford	795	96.36%	30	3.64%	825
Hoke	942	94.11%	59	5.89%	1001
Hyde	121	92.37%	10	7.63%	131
Iredell	6348	96.99%	197	3.01%	6545
Jackson	1247	95.12%	64	4.88%	1311
Johnston	5582	96.18%	222	3.82%	5804
Jones	365	96.05%	15	3.95%	380
Lee	2616	97.25%	74	2.75%	2690
Lenoir	2201	96.96%	69	3.04%	2270
Lincoln	2614	96.00%	109	4.00%	2723
Macon	949	95.09%	49	4.91%	998
Madison	394	96.57%	14	3.43%	408
Martin	709	96.86%	23	3.14%	732
McDowell	1072	95.63%	49	4.37%	1121
Mecklenburg	44636	97.84%	984	2.16%	45620
Mitchell	467	96.89%	15	3.11%	482
Montgomery	695	96.93%	22	3.07%	717
Moore	2706	96.92%	86	3.08%	2792
Nash	3771	97.07%	114	2.93%	3885
New Hanover	10672	97.34%	292	2.66%	10964
Northampton	592	95.33%	29	4.67%	621
Onslow	6150	96.03%	254	3.97%	6404
Orange	4429	96.62%	155	3.38%	4584
Pamlico	286	92.56%	23	7.44%	309
Pasquotank	1513	97.49%	39	2.51%	1552
Pender	1740	95.45%	83	4.55%	1823

Perquimans	259	95.22%	13	4.78%	272
Person	1262	97.00%	39	3.00%	1301
Pitt	6307	97.32%	174	2.68%	6481
Polk	465	95.88%	20	4.12%	485
Randolph	4711	96.18%	187	3.82%	4898
Richmond	1408	96.70%	48	3.30%	1456
Robeson	4742	95.82%	207	4.18%	4949
Rockingham	2762	96.24%	108	3.76%	2870
Rowan	5213	97.44%	137	2.56%	5350
Rutherford	1953	95.92%	83	4.08%	2036
Sampson	2108	95.04%	110	4.96%	2218
Scotland	821	97.74%	19	2.26%	840
Stanly	1872	96.69%	64	3.31%	1936
Stokes	1152	94.74%	64	5.26%	1216
Surry	2446	95.92%	104	4.08%	2550
Swain	328	95.07%	17	4.93%	345
Transylvania	853	95.74%	38	4.26%	891
Tyrrell	174	97.21%	5	2.79%	179
Union	6034	97.21%	173	2.79%	6207
Vance	1729	96.54%	62	3.46%	1791
Wake	38090	97.84%	842	2.16%	38932
Warren	437	95.41%	21	4.59%	458
Washington	344	96.09%	14	3.91%	358
Watauga	2167	96.87%	70	3.13%	2237
Wayne	4204	96.93%	133	3.07%	4337
Wilkes	2198	96.45%	81	3.55%	2279
Wilson	3096	96.54%	111	3.46%	3207
Yadkin	1060	96.89%	34	3.11%	1094
Yancy	364	95.79%	16	4.21%	380
STATE TOTAL	360428	97.04%	10986	2.96%	371414

3. YOUNG DRIVERS

Drivers ages 16 – 20 account for 16% of all motor vehicle crashes in North Carolina. Only among the very oldest drivers is it as important to differentiate between single years of age to understand the fundamental issues underlying these crashes. Accordingly analyses presented below show results by single year of age, including 15 year-olds. Although no 15 year-old can legally drive without an adult supervisor in North Carolina some do so, and there are a substantial number who are driving with a supervisor though few of them crash while doing so.

Injury Severity by Year and Driver Age

There was no meaningful change in the severity of young driver injuries from 2001 to 2003. Table 3.2 shows, somewhat surprisingly, that injury severity does not differ for young drivers of varying ages.

Table 3.A: *Number and Percent of Crash-Involved Young Drivers by Driver Injury Severety and Age*
(Jan 2005 through Dec 2005)

Driver Age	PDO	Minor/ Moderate	Severe/ Fatal	Unknown	Total
15	73.30%	29.21%	1.39%	1.81%	719
16	77.55%	29.81%	0.83%	0.78%	8340
17	77.36%	29.93%	0.74%	1.08%	10818
18	75.04%	32.69%	1.08%	1.00%	13148
19	75.77%	32.29%	0.85%	1.20%	12615
20	75.90%	32.48%	0.89%	1.26%	12284
					57924

Summary Points

- Approximately 76% of young driver crashes involved no injury to the driver.
- Driver injuries were equally (non) severe at each age among young drivers.
- Although the number of young driver crashes increased, this is completely explained by population growth in this age group.

Other Demographic Characteristics of Crash-Involved Young Drivers

As is shown in Table 3.B, among the youngest drivers, males and females are about equally likely to crash. However, among 18 through 20 year-old drivers, females represent only about 43% of crashes. It is not known what accounts for this differential.

Research on sex differences in crash rates among the general driving population indicates that much of the difference between the number of males and females in crashes results from the greater amount of driving done by males. That undoubtedly explains some, though perhaps not all, of the sex difference in young driver crashes as well.

Table 3.B *Table of crashes by age and sex*

(Jan 2005 through Dec 2005)

Driver Age	Male	Female	Unknown	Total
15	398	316	5	719
16	4238	4095	7	8340
17	5807	4999	12	10818
18	7510	5625	13	13148
19	7335	5269	11	12615
20	7002	5268	14	12284
Total	32290	25572	62	57924

Table 3.C *Alcohol Involvement in Young Driver Crashes by Age*

(Jan 2005 through Dec 2005)

	No Alcohol		Alcohol		
Driver Age	Number	Percentage	Number	Percentage	Total
15	707	98.33%	12	1.67%	719
16	8287	99.36%	53	0.64%	8340
17	10689	98.81%	129	1.19%	10818
18	12846	97.70%	302	2.30%	13148
19	12223	96.89%	392	3.11%	12615
20	11839	96.38%	445	3.62%	12284
	56591	97.70%	1333	2.30%	57924

Table 3.C shows the average number of yearly crashes by age and the investigating officer's assessment of whether the young driver had been drinking.

Summary Points

- The number of crashes increases as more young drivers are driving without an adult supervisor in the vehicle.
- Among the youngest drivers females have nearly as many crashes as males
- Among drivers 18 through 20, males account for 56% of crashes.

Time of day, week and year of Young Driver Crashes

Young driver crashes exhibit a distinct pattern throughout the day. This clearly reflects the life conditions that determine the driving patterns of young adults. For 16 and 17 year-old drivers there are sharp peaks during the hours immediately before and after school and lows in the late evening and early morning hours. Nineteen and 20 year-old drivers show a very different pattern, with crashes reaching the highest point during the evening commuting period from 5 to 6 p.m. Eighteen year-old driver crashes represent the fact that this age group is in transition between high school and work worlds, falling between younger and older drivers.

The low percent of 16 & 17 year-old crashes during the day reflect reduced driving during school hours, and this difference would be greater if crashes were looked at only on weekdays during months when school is in session. The lower number of crashes after 9 p.m. clearly reflects the effect of the night driving restriction that applies for 6 months to many 16 and 17 year-old drivers.

Crashes among the youngest drivers (ages 16 & 17) are distributed differently than other driver crashes across months of the year. This is due partly to the effects of the school year, which result in more driving by the youngest drivers. Crashes then decline markedly in June and July, followed by a rise in the fall months.

Despite the influence of school on 16 & 17 year-old driving, the weekday vs. weekend crash distribution for young drivers is essentially the same as for older drivers. Among all drivers 24% of crashes occur on weekends; among 16 & 17 year-olds 23% of crashes occur on weekends and 26% of 18 – 20 year-old driver crashes happen on weekends.

Nature of Driver Errors/Crash Causes Among Young Drivers

Among young driver crashes, the driver did something to contribute to the crash in 68% of all crashes, ranging from 74% for 16 year-olds to 63% for 20 year-old drivers. By comparison, only 48% of drivers ages 25-54 contributed to their crash. A substantial proportion of young driver errors are accounted for by just three actions: Failure to yield, failure to reduce speed appropriately and driving too fast for conditions. With each additional year of age there are fewer cases of each of these driver errors.

Young drivers are much more likely than older drivers to have had a speed-related crash. Whereas 19% of crashes among drivers ages 25 - 54 involved speed, 33% of 15 - 20 year-old drivers were involved in a speed-related crash. Speed involvement in crashes decreases with each year of driver age. It is important to note that in most of these cases, exceeding the speed limit was not considered to be the problem. Rather it was a failure to appropriately manage the vehicle's speed that contributed to the crash. In most cases for young drivers, it was the failure to reduce speed as needed that caused the problem, rather than the driver exceeding the posted speed limit. This is an important point because it indicates that speed-related crashes among young drivers are not so much a matter of

violating the speed limit as they are a case of the young driver not doing a good enough job assessing the situation and responding appropriately.

Roadway Characteristics and Location

Especially in view of the lack of experience and different driving tendencies of the youngest drivers we might expect that crashes at certain roadway locations or in conjunction with particular roadway characteristics would be different among young drivers. That is in fact the case, although it appears that most of the difference is merely a result of differential exposure. That is, as drivers get older they tend to do more driving in some situations than others. For example, there is a substantial increase in the proportion of crashes that occur on multi-lane roadways. In general, multilane roads are safer than 2-lane roads. Hence the only apparent reason that 'older' young drivers have more crashes on these roads is simply that they do more driving there.

With each additional year of age the proportion of crashes that occur in rural locations decreases. The only explanation we can find for this is that rural roadways are more dangerous and that 16 and 17 year-old drivers are particularly vulnerable to errors in judgments that rural roads require and are lacking in skills necessary to safely maneuver many of these roads.

Between age 16 and 20, the proportion of crashes that occur at an intersection with a traffic light increases from 17% to 22% (a 28% increase). The percent of crashes that occur in this setting continues to climb until age 45 at which point it levels off at 26%. It may be that this reflects an increasing boldness in driving as a result of experience and other changing life conditions that result in a slight increase in risky behaviors at intersections (e.g., running yellow and red lights, right turns on red without stopping, etc.).

Despite the difference in crashes at signalized intersections, there is no overall difference in intersection crashes among younger and older drivers. Among drivers under age 45, about 31% of crashes occur at intersections; young drivers have an essentially identical proportion of crashes at intersections (30%). Moreover there is little variation in the proportion of intersection crashes by age among young drivers, ranging from 32% for 16 year-olds to 30% for 20 year-old drivers.

Alcohol Use by Young Drivers in Crashes

Drinking among young drivers is often misunderstood to be far more common than is actually the case. Among the youngest drivers, alcohol use is quite uncommon, but with each year of age it increases. From this it is clear that drinking among "teen" drivers is not a meaningful notion. The lives of young teens differ dramatically from those of older teens and this is reflected in the dramatically different rates of alcohol-involvement in crashes. Whereas alcohol is very rarely involved in crashes of 16 and 17-year old drivers, involvement by 19 year-old drivers is nearly as common as among drivers ages 30 – 45. In contrast, alcohol involvement in crashes of 16 & 17 year-olds is lower than for any age

group – even those older than 85. Because younger drivers have a higher crash risk at comparable blood alcohol concentration levels, these data suggest that the actual amount of driving after drinking is even lower in comparison to older drivers than the crash data would indicate. This is consistent with national research.

Table 3.D *Table of Drivers Age by Crashes by Severity*

(Jan 2005 through Dec 2005)

Driver Age	PDO	Fatal	Injury	Unk	Totals
15	527	2	177	13	719
16	6468	17	1790	65	8340
17	8369	20	2312	117	10818
18	9866	35	3116	131	13148
19	9558	35	2871	151	12615
20	9324	25	2780	155	12284
Total	44112	134	13046	632	57924

Summary Points

- Alcohol use by crash-involved young drivers, all of whom are under the legal drinking age, is lower than for all age groups up to age 50.
- Alcohol use among underage persons involved in crashes varies dramatically by driver age. From age 16 thorough 20, alcohol involvement in crashes increases in nearly linear fashion.

Young Driver Crashes by County

Crash rates per capita vary widely across North Carolina counties. It is not known why this is the case, however, there are several partial causes. Since crash rates are based on population rather than licensed drivers, it is likely that those counties where the driver education system is able to move young drivers through at earlier ages will have more young drivers and, as a result more crashes. Conversely, counties where the driver education system is backlogged will delay licensure among the youngest drivers and reduce the number of crashes they experience as a result.

Another factor in young driver crash rates is the road system on which they drive. Those counties with more dangerous roads will experience more crashes overall and this will apply to young drivers as well. It is not clear whether a greater proportion of narrow rural, mountainous roads will produce more young driver crashes or whether a preponderance of heavily congested urban roadways will result in more crashes.

Certainly the latter will result in fewer serious crashes because crash speeds will be lower.

Finally, those counties that attract young drivers from other areas, including other states, will exhibit higher crash rates because of more travel within their borders by young drivers. This would be the case in border counties as well as resort communities; it may explain the particularly high crash rates in Dare and New Hanover counties.

Table 3.E provides detailed information about young driver crashes by county for the period from January, 2005 through December, 2005. In addition to showing where crash rates are high this table also indicates where the majority of young driver crashes occur.

Not surprisingly, these are concentrated in counties with larger populations. This is important information for deciding where to concentrate efforts to reduce young driver crashes. Those counties where both the number and rate of young driver crashes is high represent promising targets for community programs.

Table 3.E *Table of County by Age*

(Jan 2005 through Dec 2005)

	15 Yrs	16 Yrs	17Yrs	18 Yrs	19 Yrs	20 Yrs	Total
Alamance	17	165	208	242	213	229	1074
Alexander	2	22	42	41	26	31	164
Alleghany	1	7	15	12	9	8	52
Anson	5	26	28	29	23	20	131
Ashe	3	33	38	32	24	29	159
Avery		13	13	18	18	13	75
Beaufort	3	54	50	55	66	38	266
Bertie	1	12	8	24	29	16	90
Bladen	6	34	34	32	22	33	161
Brunswick	2	67	95	128	104	94	490
Buncombe	19	207	282	320	341	282	1451
Burke	10	123	129	152	141	116	671
Cabarrus	18	188	260	295	236	196	1193
Caldwell	8	90	92	111	93	74	468
Camden		11	9	14	5	4	43
Carteret	4	69	78	92	85	72	400
Caswell	1	7	16	15	17	20	76
Catawaba	17	171	288	328	214	270	1288

Chatham	8	72	57	67	58	54	316
Cherokee	3	29	31	27	22	25	137
Chowan		14	6	12	10	14	56
Clay		9	10	14	8	7	48
Cleveland	6	107	120	137	105	97	572
Columbus	6	60	66	75	81	67	355
Craven	5	66	98	96	114	113	492
Cumberland	25	183	350	514	562	567	2201
Currituck		10	28	24	22	16	100
Dare	1	59	68	66	49	52	295
Davidson	16	224	221	248	173	166	1048
Davie		56	56	45	34	41	232
Duplin	3	49	72	67	72	80	343
Durham	11	159	256	361	391	396	1574
Edgecomb	5	33	51	53	56	52	250
Forsyth	36	355	445	504	435	473	2248
Franklin	3	49	39	52	46	55	244
Gaston	25	239	291	329	296	300	1480
Gates	3	8	12	16	11	12	62
Graham		9	10	14	10	8	51
Granville	1	38	37	55	41	31	203
Greene	2	15	12	24	26	18	97
Guilford	25	435	535	685	781	780	3241
Halifax	3	45	55	64	63	51	281
Harnett	11	96	115	128	112	103	565
Haywood	3	43	56	71	44	45	262
Henderson	6	99	110	140	146	107	608
Hertford	3	14	22	30	28	35	132
Hoke	5	19	18	24	27	22	115
Hyde		4	4	4	1	6	19
Iredell	8	170	176	259	282	207	1102
Jackson	5	24	30	59	77	59	254
Johnston	12	155	214	212	206	163	962
Jones	1	5	5	20	16	14	61
Lee	11	69	94	109	101	97	481
Lenoir	7	74	72	76	90	90	409
Lincoln	12	93	110	95	92	99	501
Macon	1	17	32	47	48	23	168
Madison		14	13	17	12	16	72
Martin	3	14	22	31	20	17	107
McDowell	4	37	41	37	41	31	191
Mecklenburg	55	577	931	1305	1271	1223	5362

Mitchell	1	10	22	31	16	13	93
Montgomery	1	22	28	26	25	21	123
Moore	6	87	100	111	104	87	495
Nash	11	102	137	139	124	137	650
New Hanover	15	235	267	369	456	493	1835
Northampton		11	16	10	19	17	73
Onslow	8	106	189	254	362	426	1345
Orange	8	105	117	137	165	178	710
Pamlico		8	18	12	17	10	65
Pasquotank	1	33	57	72	70	46	279
Pender	4	42	65	81	54	65	311
Perquimans		12	12	16	7	5	52
Person	4	44	51	62	36	31	228
Pitt	9	127	175	275	268	326	1180
Polk		12	12	23	14	13	74
Randolph	13	176	188	208	179	166	930
Richmond	2	44	49	61	58	40	254
Robeson	11	88	149	167	187	185	787
Rockingham	3	75	82	102	103	85	450
Rowan	12	135	170	204	177	199	897
Rutherford	1	49	82	95	75	82	384
Sampson	8	68	51	96	74	76	373
Scotland	4	24	28	34	32	28	150
Stanly	6	81	73	93	78	60	391
Stokes	3	45	71	55	52	43	269
Surry	6	91	87	116	91	75	466
Swain		12	17	14	13	11	67
Transylvania	3	31	27	39	41	27	168
Tyrrell	1	6	4	9	5	4	29
Union	18	162	238	241	193	181	1033
Vance	3	34	55	70	57	52	271
Wake	71	720	1026	1211	1190	1188	5406
Warren	1	7	14	14	19	22	77
Washington	2	4	11	4	11	6	38
Watauga	2	49	71	103	125	154	504
Wayne	6	119	164	156	138	131	714

Wilkes	3	80	58	100	86	68	395
Wilson	7	81	85	109	112	109	503
Yadkin	3	36	61	57	31	34	222
Yancy	1	21	18	22	8	14	84
State Total	709	8340	10821	13151	12618	12285	57924

Summary Points

- Three counties (Mecklenburg, Wake, and Guilford) account for more young driver crashes than the 70 counties with the smallest number of crashes. Mecklenburg alone accounts for more crashes than the 46 bottom-ranked counties

4. MOTORCYCLE SAFETY

Motorcycle Crashes by Injury Severity Level

North Carolina has over 263,000 licensed motorcyclists, which is only a small portion of the total licensed driver population; however, motorcyclist crashes represent a high percentage, (9%) of our overall crashes statewide and (12%) of our fatal crashes. When motorcycle drivers are involved in crashes, the outcome is usually more serious in terms of injury and death, as is demonstrated in Table 4.A for Jan 2005 – Dec 2005.

Table 4.A 2005 Motorcycle Crashes vs All Vehicle Crashes

(Jan 2005 through Dec 2005

Type Crash	Number of Motorcycle Crashes	Percent of Total M/C Crashes	Number All Vehicle Crashes	Percent of Total Veh Crashes
PDO	471	14.00%	287261	77.34%
Type A Injury	387	11.50%	2601	0.70%
Type B Injury	1,570	46.67%	19,906	5.36%
Type C Injury	794	23.60%	60,628	16.32%
Fatals	124	3.69%	1,018	0.27%
Unknown	18	0.54%	4,533	1.22%
Total	3,364	100.00%	371,414	100.00%

Findings

- Approximately 86% of annual motorcyclist crashes involves death or injury for the driver as compared to only 13% for all other vehicles. This is not surprising as motorcycles offer no protection to the rider and the rider is almost always ejected having to rely solely on personal protective gear.

- The number of motorcycle crashes has been increasing for the last five years along with the North Carolina population and number of registered motorcycles, the crash rate for 2005 suggests a continuation of this trend with expectations of it increasing as the number of miles ridden will most likely increase due to the increasing number of riders and rising fuel costs.

- Fatal/severe injury crashes were higher during 2005 and as expected are nearly 40% ahead of last years year-to-date numbers most likely due to increased rider population and increased fuel pricing causing a much higher numbers of motorcycle miles driven.

Crash-Involved Motorcycle Driver Demographic Characteristics

The motorcycle crashes over the years were analyzed as a function of a number of demographic variables such as sex, age, and ethnicity of the driver. The age distribution of crash-involved motorcycle drivers over the period Jan 2005 – Dec 2005 is shown in Table 4.B as a function of crash injury severity.

Table 4.B Motorcycle Drivers by Age and Injury

(Jan 2005 through Dec 2005)

Age	Fatal	A Injury	B Injury	C Injury	No Injury	Unknown	Totals	Percent
15 or Less	2	5	13	5	4	0	29	0.9%
16-17	0	3	19	6	4	0	32	1.0%
18-19	6	9	69	35	25	0	144	4.3%
20-24	13	58	281	122	88	8	570	16.9%
25-29	18	52	180	80	58	4	392	11.7%
30-39	28	63	368	197	104	1	761	22.6%
40-49	32	101	338	194	101	2	768	22.8%
50-59	16	65	224	111	66	2	484	14.4%
60 or Above	9	31	78	44	21	1	184	5.5%
Totals	**124**	**387**	**1,570**	**794**	**471**	**18**	**3,364**	100.0%

Findings

- Motorcycle drivers between the ages of 20 and 29 accounted for 28.6% of all motorcycle crashes and the majority of crashes in each crash severity level.

- There has been a steady shift in the average age of motorcycle drivers, with 40-59 aged motorcyclists becoming an increasingly greater percentage of the riding population.

- Male motorcycle drivers were involved in 94-95% of crashes across the three severity levels. The involvement rates for both sexes remained fairly constant over the 3 years.

- White motorcycle drivers appear to have a higher risk for involvement in fatal/severe injury crashes (17%), whereas Latinos (6%) have lower risk. The

crash injury risk was about the same for moderate/minor injury (69-75%) and no injury (11-19%) crashes across the ethnic categories.

Weather, Time, and Light Characteristics of Motorcycle Crashes

The motorcycle crashes were analyzed as a function of month. Table 4.C shows the percentages of crashes occurring each month.

Table 4.C Month of Crash

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Frequency	85	90	262	344	455	372	435	392	320	281	230	98
Percent	2.53	2.68	7.79	10.23	13.53	11.06	12.93	11.65	9.51	8.35	6.84	2.91

Findings

- About 77% of all motorcycle crashes occur between April and October (7 months).
- Almost 57% of motorcycle crashes occur Friday-Sunday and 65% occur from 12:00 noon to 7:00 p.m. Crashes around 2:00 a.m. are more likely to result in fatal/severe injury, likely because bars close at this hour and alcohol is a major factor in fatal crashes.
- Only 2.5% of motorcycle crashes occur during rainy, snowy, or other adverse weather conditions.
- Across the 3 years, about 23% of motorcycle crashes occurred during the nighttime hours. Level of ambient light was not found to be related to crash injury severity.

Number of Parties Involved in Motorcycle Crashes

Single-vehicle automobile crashes are often considered to be more strongly related to driver inexperience, immaturity, and risk-taking factors, given that the primary cause of these crashes would seemingly be the drivers themselves, rather than the actions of another party. Although this may also be true for single-vehicle motorcycle crashes, a higher percentage of such crashes for motorcyclists are likely causatively related to weather, environment, and road conditions than is the case for automobile crashes.

Findings

- Single vehicle (motorcyclist only) crashes represent about 50% of all motorcycle crashes each year, and over 50% of all moderate/minor and fatal/severe injury crashes. Weather, environment, and road conditions, in addition to the usual inexperience, risk-taking, and immaturity factors may influence these high percentages of single-vehicle fatal/injury motorcycle crashes.

- Motorcycle drivers involved in single-vehicle crashes are more likely to have moderate/minor injuries (74%) and less likely to have no injuries (9%) than are motorcycle drivers involved in multiple vehicle crashes (66% and 19%, respectively). Drivers involved in single and multiple vehicle crashes were equally as likely to be fatally or severely injury.

Road Size and Locality of Motorcycle Crashes

Number of roadway lanes, road class (e.g., interstate, U.S. route, local street) and locality (i.e., urban vs. rural) were both associated with crash injury severity level. Table 4.D presents the statistics as a function of the class of road on which the crash occurred.

Table 4.D Motorcycle Drivers by Road Class and Injury

(Jan 2005 through Dec 2005)

Road	Fatal	A Injury	B Injury	C Injury	No Injury	Unknown	Total	Percent
Interstate	8	20	44	30	18	1	121	3.6%
US Route	23	69	258	140	81	1	572	17.0%
NC Route	24	62	245	141	79	2	553	16.4%
State Secondary Route	45	155	566	242	123	0	1131	33.6%
Local Route	21	77	434	224	144	14	914	27.2%
Public Vehicular Area	0	2	12	8	4	0	26	0.8%
Other/Unknown	3	2	11	9	22	0	47	1.4%
Total	**124**	**387**	**1,570**	**794**	**471**	**18**	**3364**	100.0%

Findings

- The majority (67%) of all motorcycle crashes, and 73% of all fatal/severe injury crashes, occurs on two-lane roadways.

- Whereas moderate/minor injury crashes were equally likely to occur on roadways with any number of lanes, fatal/severe injury crashes were less likely to occur on 3-lane (10%) and 5-lane (13%) roadways and more likely to occur on those with 2-lanes (18%).

- About 59% of all crashes and 73% of fatal/severe injury crashes occur on rural roadways.

- Motorcycle drivers involved in urban crashes are more likely to receive moderate or minor injuries (72%) or no injuries (17%), and less likely to receive fatal or severe injuries (11%), than are those involved in rural crashes (67%, 12%, and 20%, respectively).

- About 62% of all crashes occur on state secondary roads (34%) or local streets (29%). In addition, 40% of fatal/injury crashes and 34% of moderate/minor injury crashes occur on state secondary roads. Crashes occurring on North Carolina local streets (11%) are less likely to result in fatal/severe injuries.

Speed Limits and Travel Speed in Motorcycle Crashes

The motorcycle crashes were analyzed as a function of the roadway speed limit where the crash occurred and the estimated travel speed of the motorcycle prior to impact. Table 4.E presents the percentage of crashes combined as a function of crash injury severity and estimated speed of travel.

Table 4.E Motorcycle Injury Severity by Estimated Speed
(Jan 2005 through Dec 2005)

	No Injury		Moderate/Minor Injury		Severe/Fatal Injury		Unknown		
Speed	Number	Percent	Number	Percent	Number	Percent	number	Percent	Total
Not Moving	26	36.1%	43	59.7%	2	2.8%	1	0	72
1 to 20	91	23.2%	273	69.5%	26	6.6%	3	0.8%	393
21 to 40	149	14.1%	790	74.8%	110	10.4%	7	0.7%	1056
41 to 60	132	10.1%	937	71.5%	238	18.2%	3	0.2%	1310
61 to 80	18	6.7%	169	63.1%	80	29.9%	1	0.4%	268
Over 80	5	6.5%	41	53.2%	31	40.3%	0	0.0%	77
Unknown	50	26.6%	111	59.0%	24	12.8%	3	1.6%	188
	471	14.0%	2,364	70.3%	511	15.2%	18	0.5%	3364

Findings

- Not surprisingly, the risk of fatal/severe injury increases linearly as a function of increasing speed limit. In fact, 52% of fatal/injury crashes occurred at speeds of 50 MPH or higher. The highest fatal/severe injury risk was 41-60 MPH (47%), and 61+ MPH (16%) on our roadways.

- Moderate/minor injury crashes were the less likely to occur on roadways with 60-65 MPH (56%) and 70+ MPH (50%) roadways, because even more severe injury was likely on these roads.

- Estimated speed of travel was strongly associated with crash injury severity level with higher speeds almost uniformly associated with greater risk of injury.

- Whereas 8% of all motorcyclist crashes occurred at speeds above 60 MPH, 22% of the fatal/severe injury crashes were associated with such speeds.

Roadway Characteristics, Composition, and Condition in Motorcycle Crashes

To determine the effect of road-related factors, motorcycle crashes were analyzed as a function of the type of road surface (i.e., smooth concrete/asphalt vs. more adverse road surface), condition of road surface (i.e., dry road vs. wet, sandy, icy, etc.), road characteristics (i.e., straight vs. curve or other), and special road features (in particular, work zones, bridges, and railroad crossings).

Findings

- The type of road surface (i.e., smooth concrete/asphalt vs. grooved pavement or other more adverse road surface) was not found to be related to crash severity.

- Adverse roadway surface conditions (e.g., water, gravel, or ice) were found to be associated with higher risk for non-injury crashes (20%) and lower risk for fatal/severe injury crashes (11%) than would be expected if roadway surface condition and crash severity were unrelated. This could be associated with lower travel speeds under these conditions. Risk for other injury was the same as for dry/clean roads (69%).

- About 34% of all motorcycle crashes occur on curved roadway segments, though 46% of fatal/severe injury crashes occur on curved segments. Curved segment crashes are more likely to result in fatal/severe injury (23%) than are crashes on straight segments (14%).

- Intersection was the special roadway feature most often associated with motorcycle crashes of all types (24%), but was not related to crash severity. Although crashes at driveway intersections represented only a small percentage of motorcycle crashes (8%), they were somewhat overrepresented in fatal/severe injury crashes (10%).

- Although railroad crossings and bridges are considered to be more treacherous for motorcycles than for automobiles, only small percentages of crashes (0-1%) were found to coincide with these special road features, and neither was related to crash severity.

- Similarly, road work zones are considered to be more dangerous for motorcyclists because of road debris and changes in the road grade associated with such areas, but only very small percentages of motorcyclist crashes were found to occur in work zones across the 3 years (1-2%), and crashes in work zones were not associated with any higher severity level for the motorcyclist.

Precipitating Events and Driver Actions in Motorcycle Crashes

Among other things, law enforcement officers are asked to code the first harmful precipitating event that lead to the crash on the report form as well as the vehicle maneuvers just before the crash occurred. Table 4.F shows the percentage of crashes of each severity level combined across all 3 years as a function of the first harmful precipitating event that lead to the crash.

Table 4.F: *Percentage of Motorcycle Crashes by First Harmful Crash Event and Crash Injury Severity Level during a 3-Year Time Period (2000-2003)*

First harmful crash event	Crash injury severity level			Combined total	
	No injury	Moderate/minor	Fatal/severe		
	Row %	Row %	Row %	*N*	Col %
Ran off road	10.0	71.8	18.2	908	11.9
Hit movable object	16.2	75.1	8.6	394	5.2
Rollover	8.4	75.9	15.7	1477	19.4
Hit fixed object	8.6	66.6	24.8	999	13.1
Rear end	27.4	63.0	9.6	964	12.6
Left/right turn	12.9	65.8	21.3	957	12.5
Head-on	8.7	51.7	39.6	149	2.0
Sideswipe	24.2	60.0	15.7	458	6.0
Angle	14.7	69.7	15.6	726	9.5
Other	14.8	78.2	7.1	595	7.8

Note. First harmful event or crash injury severity level was missing for 47 (0.6%) of the cases.

Findings

- For the majority (80%) of crashes across severity levels and years, the motorcyclist was simply driving straight on a roadway. This was particularly the case for severe/fatal (88%) and moderate/minor injury (81%) crashes than for no injury crashes (64%).

- The most common harmful precipitating events combined across all crashes were rollovers (19%), followed by hitting a fixed object (13%), rear-ending another vehicle (13%), the motorcyclist or another vehicle making a left/right turn (13%), and running off the roadway (12%).

- Fatal/severe injury to the motorcyclist was strongly associated with head-on crashes (40%), hitting a fixed object (25%), left/right turns (21%), and running off roadways (18%).

Alcohol and Drug Use in Motorcycle Crashes

The motorcycle crashes were analyzed as a function of whether alcohol, illegal drugs, or medications were considered to be a factor in the crash by law enforcement. Table 4.G presents the percentage of crash-involved motorcycle drivers as a function of alcohol/drug use.

Table 4.G Motorcycle Drivers by Age/Injury by DRINTOX

(Jan 2005 - Dec 2005)

							Alcohol Involved		No Alcohol Involved	
Age	Fatal	A Injury	B Injury	C Injury	No Injury	Unknown	Totals	Percent	Totals	Percent
>=15	0	0	1		0	0	1	0.5%	28	0.9%
16-17	0	0	0		0	0	0	0.0%	32	1.0%
18-19	0	1	1		0	0	2	1.0%	142	4.5%
20-24	2	4	12	2	2	0	22	10.5%	548	17.4%
25-29	1	5	17	2	1	0	26	12.4%	366	11.6%
30-39	10	12	28	9	4	0	63	30.0%	698	22.1%
40-49	4	12	32	5	8	1	62	29.5%	706	22.4%
50-59	3	4	19	4	1	1	32	15.2%	452	14.3%
<=60	0	0	1	1	0	0	2	1.0%	182	5.8%
Totals	**20**	**38**	**111**	**23**	**16**	**2**	**210**		3,154	100.0%

Findings

- Alcohol use was reportedly involved in 7% of all motorcycle crashes, but 26.7% of fatal/severe injury crashes.

- Whereas only 16% of crashes not reporting alcohol or illegal drug involvement resulted in fatal/severe injury, 28% of crashes reporting alcohol use resulted in fatal/severe injury.

Safety Equipment Use and Vehicle Defects in Motorcycle Crashes

The motorcycle crashes were analyzed as a function of helmet usage and vehicle defects identified by law enforcement during the crash investigation

Findings

- The percentages of crash-involved motorcyclists wearing helmets was uniformly high (91%) across all years and levels of crash injury severity. However, it is not known to what extent novelty (i.e., unapproved) motorcycle helmets are being worn, or how these are identified and coded by law enforcement officers. It is also not known whether improperly worn helmets (e.g., strap unbuckled) are coded as helmeted or no helmet.

- Probably due to the high helmet usage rate, there was little evidence of a relationship between helmet usage and crash injury severity.

- The most common motorcycle defect associated with the crashes coded by law enforcement officers were tire defects, which were noted for about 2% of the crashes and were somewhat overrepresented (3.5%) in fatal/severe injury crashes.

Motorcycle Passengers by Crash Injury Severity

Motorcycle drivers are not the only persons at increased risk of injury or death when crashes occur. Passengers on motorcycles are also at higher risk for serious injury

Findings

- About 274 motorcycle passengers are involved in crashes each year, in which 13% receive fatal/severe injuries, 70% receive moderate/minor injuries, and 16% are not injured. These percentages are very similar to those for motorcycle drivers.

- The overwhelming majority of crash-involved passengers (83%) are women, who appear to be somewhat less likely to escape injury in the crash (15%) than are men passengers (23%).

Summary of Motorcycle Crash Findings

- The overwhelming majority of motorcycle crashes involve death or injury for the driver. Most crash-involved motorcycle drivers are men between the ages of 20 and 54.

- The typical motorcycle crash occurs between April and October on a Friday, Saturday, or Sunday between 12:00 noon and 7:00 p.m. during clear weather on a rural two-lane state secondary road with a 55 MPH speed limit.

- Single vehicle (motorcyclist only) crashes represent about half of all motorcycle crashes, and over half of all moderate/minor and fatal/severe injury crashes.

- Both higher speed limits and higher speeds of travel were associated with greater risk of injury in the crash to the driver.

- Curved roadway crashes are overrepresented in motorcycle crashes and are associated with greater risk for fatal/severe injury than straight roadways.

- Although railroad crossings, bridges, and highway work zones are considered to be more treacherous for motorcycles than for automobiles, only small percentages of crashes (0-2%) were found to coincide with these special road features, and none were related to severity.

- Rollovers, hitting a fixed object, rear-ending another vehicle, the motorcyclist or another vehicle making a left/right turn, and running off the roadway are the most harmful precipitating events of motorcycle crashes.

- Fatal/severe injury to the motorcyclist was strongly associated with head-on crashes, hitting a fixed object, left/right turns, and leaving roadways.

- The percentages of crash-involved motorcyclists wearing helmets were uniformly high across all levels of crash injury severity. This does not identify if helmets worn wore of the type that met DOT standards or were the novelty type.

- About 274 motorcycle passengers are involved in crashes each year, many of which are women who are injured or killed as a result.

- The following 20 counties had both an overrepresentation of crashes and severe injury / fatalities: Buncombe, Burke, Catawba, Cumberland, Durham, Forsyth, Graham, Guilford, Hanover, Iredell, Mecklenburg, Onslow, Pitt, Randolph, Wake, Cabarrus, Davidson, Gaston, Johnston, Robeson, and Union. These counties are in the greatest need of motorcycle crash interventions.

5. PEDESTRIAN SAFETY

More than 2,500 pedestrian-motor vehicle crashes have been reported to the NC Division of Motor Vehicles during the year 2005.

Although crashes involving pedestrians represent only about 1% of the total reported motor vehicle crashes in North Carolina, pedestrians are highly over-represented in fatal and serious injury crashes. Approximately 12% of the fatal crashes and 9% of A-type (disabling injury) crashes in North Carolina involved pedestrians. On average, 170 (over 7% of those struck) pedestrians were killed and an additional 354 were seriously injured each year from 2000 to 2002.

Although the number of pedestrian crashes has increased over the past three years, an apparent declining trend in the proportion of disabling (A-type) injuries reported has continued. These changes, which began with the year 2000, and echo those for all crashes, may result at least in part from new reporting practices (perhaps more stringent definition of A-type injuries) instituted with the new crash report form and instruction manual in use beginning with the year 2000. The proportion of reported A-type injuries has dropped from 15% in 2000 to 10% in 2002. The proportions of B type, C type, and no injury crashes have increased proportionally.

Pedestrians should be expected to walk anywhere they are not strictly prohibited and reasonable accommodation for their safety and access should be provided on all roadways. Even on interstates, motorists may have to walk from disabled vehicles, or pedestrians may try to cross busy interstates that pass through urban areas. The tables, figures, and text that follow are intended to illuminate the characteristics of pedestrian crashes and highlight some of the pedestrian safety issues across North Carolina. Some discussion of potential countermeasures is included. Nevertheless, more in depth analyses of particular locations and conditions are required in most cases, before definite countermeasures can be implemented.

Temporal factors

There are slight year to year fluctuations, but pedestrian crashes in North Carolina are fairly evenly distributed throughout the year each year. The highest proportions occurred during the months of October (10.1% of the total) followed by September (9.5%) and May (9.1%) for the years 2000 – 2002. The lowest total occurred in February (6.9%), followed by July (7.2%) for the three years. Other months account for about 8 to 9%.

Pedestrian crashes peak on Friday (17.9%) and Saturday (16.5%), with the lowest proportion occurring on Sunday (10.1%) for the three-year. Thursday also accounts for a slightly higher proportion than other weekdays at 14.7%.

Pedestrian crashes are most likely to occur in the afternoon and early evening between the hours of 2 pm to 6 pm and 6 pm to 10 p.m., with over half of pedestrian crashes

occurring during these eight hours. The mid-day period of 10 am to 2 pm accounts for the third highest proportion of crashes. There is no significant year to year variability in these trends.

Temporal factors are doubtlessly related to exposure. For greatest effect, enforcement or other safety measures would be targeted toward afternoon to evening hours, with an emphasis on Fridays and Saturdays (evenings), and, with particular emphasis during the months of September – October, and May. The fall peaks in pedestrian crashes are likely related to back-to-school periods, so special emphasis on enforcement around schools during these time periods could pay off.

Environmental factors

About 40% of pedestrian crashes over the three years have occurred during non-daylight conditions, including dusk and dawn. Most non-daylight crashes occurred under conditions of darkness. Over half of night-time crashes occurred on lighted roadway segments, although almost as many occurred in unlighted areas. The remaining 58% of pedestrian crashes occurred during daylight hours. Trends are fairly consistent across years, but there are slight year-to-year fluctuations.

The vast majority (above 93%) of pedestrian crashes occur under clear or cloudy weather conditions on average no doubt reflecting exposure (fig. 5.4). Year to year variation in the number of crashes occurring under rainy, or other conditions (frozen precipitation, or foggy/smoky, etc.) conditions, is also likely a reflection of exposure to these conditions (e.g., more pedestrian crashes under snowy conditions in years when the state received more snowfall).

While most crashes (55%) occurred during clear or cloudy weather *and* under daylight conditions, 18% occurred during night-time on lighted roadways (clear or cloudy) and another 15% occurred during night-time on unlighted roadways (clear or cloudy conditions). Countermeasures include adding lights to non-lighted areas where pedestrians may be expected, as well as education about pedestrian conspicuity: wear bright clothing, carry lights at night, walk facing traffic.

Pedestrian characteristics

It is difficult to draw any conclusions about the year-to-year fluctuations in crash proportions by age group. The 51 to 60 year group has, however, shown numerical and proportional increases each of the three years while the 26 to 30 year group has shown a decline. These changes may reflect increases in the proportion of the population in this age group, as well as possible changes in exposure (more walking) and/or simply random variation. On average, older teens (16 to 20) and young adults (21 to 25), accounted, however, for greater numbers and proportions of pedestrian crashes than other groups, probably reflecting greater pedestrian mobility among these ages. Beginning with the 41 to 50 year group, the proportion of crash involvement starts declining as age increases.

The proportions of those killed and seriously injured (disabling type injuries) is, however, higher than the overall crash involvement for age groups beginning with the 31 to 40 age group and above. These results probably ensue for the most part, from differences in crash location and types of crashes that different age groups tend to be involved in, and thus discussion of countermeasures will be included in the section on crash type involvement. The results of increasing crash seriousness with increasing age also likely reflect to some extent increasing vulnerability, particularly of the oldest age group.

Males consistently accounted for nearly 2/3 (63%) of the pedestrians reported involved in crashes in each of the 3 years while females were involved in a little over 1/3 or 37% of pedestrian crashes.

Although pedestrian crashes in North Carolina are most likely to involve pedestrians of White racial background (approximately 47%), Blacks are almost as likely to be victims (approximately 40% - Table 5.A). Considering they comprise about 22% of persons living in the State (2000 census data), Blacks are clearly over-represented in pedestrian crashes, and Whites are under-represented based on the population (about 72%). There appears, however, to be a decreasing trend in the proportion of crashes involving black pedestrians, from around 45% in 1998 to about 40% in 2005, while involvement by other groups has increased slightly. Whether these trends reflect changes in exposure (the amount or conditions of walking) or other factors is unknown. Asians and Native Americans each account for less than 1% of the total pedestrian crashes. Since the year 2000, when the state began identifying Hispanics and persons of Asian descent on crash report forms, Hispanics have accounted for about 5 – 7% of the pedestrian crashes each year, and a comparable proportion of the population, 4.7% in 2000.

Table 5.A

Table of Pedestrian Age by Race

(Jan 2005 through Dec 2005)

Age	White	Black	Hispanic	Native American	Asian	Other	Unknown	Total
6 and Under	43	77	27		1	1	5	154
7 to 10	31	44	11		1	1	3	91
11 to 14	44	65	9	1	1		4	124
15 to 20	138	131	18	4	2		15	308
21 to 30	205	196	60	6	8	4	10	489
31 to 40	218	164	32	3	5	3	13	438
51 to 60	198	154	12	5		1	9	379
51 to 60	142	94	11	3	1	3	8	262
Over 60	162	69	11	6	5	2	15	270
Total	1181	994	191	28	24	15	82	2515

The investigating officer indicated alcohol use by about 7% of the pedestrians struck by motor vehicles over this period with the proportion apparently declining from around 13% in 2000 to 7% in 2005 (Table 5.B). Indicated use does not necessarily imply that the pedestrian was intoxicated at the time of the crash, only that alcohol use was detected.

Table 5.B Pedestrian by Age by DRINTOX
(Jan 2005 through Dec 2005)

	Alcohol Involved		No Alcohol		Unknown		
Age	Number	Percent	Number	Percent	Number	Percent	Total
6 and Under	2	1.20%	162	97.01%	3	1.80%	167
7 to 10			113	96.58%	4	3.42%	117
11 to 14	1	0.60%	165	98.21%	2	1.19%	168
15 to 20	19	2.80%	636	93.81%	23	3.39%	678
21 to 30	121	10.47%	981	84.86%	54	4.67%	1156
31 to 40	100	10.47%	806	84.40%	49	5.13%	955
41 to 50	100	11.64%	726	84.52%	33	3.84%	859
51 to 60	49	8.52%	506	88.00%	20	3.48%	575
60+ or Unk	16	1.14%	624	44.51%	762	54.35%	1402
Total	**408**	6.71%	**4719**	77.65%	**950**	15.63%	**6077**

Driver use of alcohol was detected in an average of 4% of the drivers involved in collisions with pedestrians over the period. This rate is slightly lower than alcohol detection reported for crashes overall over the same period (5.7%).

Roadway and location characteristics of pedestrian crashes

Although rural crashes accounted for about 33% of crashes each year (and 34% of all injuries), they tend to be more serious, comprising 44% of the A type (disabling) injuries and 56% of those killed in pedestrian crashes.

Additionally, fatal and serious injuries are highly over-represented in crashes on roadways with speed limits of 50 mph and above. Above 21% of crashes on these roadways resulting in fatal injuries compared with 7.5% for all speed limits, and 18% resulting in A-type injuries compared with 9.6% over all.

Crash severity also tends to vary by roadway classification, as might be expected (Table 5.C).

Table 5.C Pedestrian Injury by Roadclass
(Jan 2005 through Dec 2005)

Roadclass	Fatal	Injury	PDO	Total
Interstate	19	32	4	55
US	40	137	13	190
NC	22	118	5	145
SSR	38	276	19	333
Local Street	52	1125	190	1367
Private road/drive	4	62	6	72
PVA	4	568	82	654
Total	179	2318	319	2816

The majority of reported pedestrian roadway crashes occurred on two-lane roads (62% on average), while approximately 28% occurred on roadways with four or more through travel lanes. There are year-to-year fluctuations in most categories, but an apparent increasing trend in the number of pedestrian crashes on single-lane roads (avg. of 5%), and a slight downward trend in the proportion occurring on three-lane roadways (data not shown). These changes may reflect changes in the extent of roadways in operation with these numbers of lanes, extent of walking on such roadways, or other factors.

When typing crashes, reviewers coded on average, approximately one-fourth of pedestrian crashes for the three years as having occurred at intersections, slightly less than ½ occurred at non-intersection roadway locations, with the remainder (29%) occurring at non-roadway locations. These proportions vary considerably by rural and urban location, with 64% of rural crashes occurring at non-intersection locations compared to 38% of urban crashes. Only 11% of rural crashes occurred at intersections, while 31% of urban crashes took place at intersections.

Understanding the location characteristics of crashes (both numbers and severity) can help in determining where to direct resources and countermeasures. Additional information by county will also be provided below. The types of countermeasures that may be implemented depend, however, on the types of crashes occurring at urban / rural locations, by roadway type, intersection versus non-intersection, as well as other location variables. These characteristics are discussed below.

Counties

Obviously, the more urbanized areas tend to account for the highest numbers and percentages of crashes in the state. The ten counties that account for the highest percentages of pedestrian-motor vehicle crashes for the years 2003 – 2004 were:

Pedestrian Top Ten Counties

MECKLENBURG	385	15.31%
WAKE	236	9.38%
GUILFORD	125	4.97%
CUMBERLAND	115	4.57%
DURHAM	112	4.45%
BUNCOMBE	90	3.58%
NEW HANOVER	79	3.14%
GASTON	75	2.98%
FORSYTH	71	2.82%
ROBESON	66	2.62%
		53.84%

The ten highest crash counties accounted for 53.84% of NC's reported pedestrian / motor-vehicle crashes.

Summary of findings

While pedestrian crash rates may seem low compared with overall crash rates, the high proportions of fatalities and serious injuries and the need to provide a safe and encouraging environment for pedestrians on the roadways warrants a serious effort to address pedestrian safety on the state's roadways. While more crashes occurred in urbanized areas, rural crashes tend to be particularly serious, with nearly 28% of those hit in rural areas killed or seriously injured.

Crashes typically occur during daylight hours (58%) but nighttime crashes are probably over-represented. We have, however, no exposure data to test this hypothesis. Crashes also occurred the majority of the time during clear or cloudy weather, also no doubt reflecting the greater amounts of walking / exposure that occur under these conditions.

The most frequent crash type involves Pedestrian failure to yield. It should be pointed out, however, that this crash type does not necessarily imply fault. For example, a pedestrian may detect a gap at a mid-block area and begin crossing, but a speeding motorist closes the gap sooner than expected and strikes the pedestrian. While the pedestrian may not have been visible, and strictly speaking, may not have had the right-of-way, the motorist was clearly at fault under these circumstances by speeding, and failing to slow and avoid the crash.

Actual speed has not been directly addressed to this point, due to the difficulty in obtaining meaningful speed data from the limited number of pedestrian crash reports. The evidence, based on national data suggests that speeding is a contributing factor in 31% of crashes of all types, nationally, and in 38% in NC. Lowering travel speeds may therefore help prevent crashes and reduce the occurrence of pedestrians being struck. Additionally, a widely cited study found that when a crash does occur, the chance of death increases dramatically as speed of the vehicle involved increases. The chance of death is 5% at 20 mph, increasing to a 45% chance at 30 mph, and an 85% chance of death, if the vehicle is traveling at 40 mph. The NC data included in this report, including the greater seriousness of crashes in rural areas, the higher proportions killed and seriously injured on 50 mph and above roadways, and on interstate, NC, and US highways, where speeds are significantly higher than in urban areas and on local streets, also suggest that speed has a serious effect on pedestrian crash outcomes, given that a crash occurs. Thus, addressing the problem of speeding statewide is a key to improving pedestrian safety as well as the safety of all road users.

Pedestrian Dart / dash crashes which typically (but not always) involve children, and occur mid-block on local streets is another crash type that warrants attention through calming these streets. Walking along roadway crashes occur most often at night on unlit roadways where sidewalks are lacking and occur in greater proportion and number in rural areas than urban. Other high frequency crash types include Unusual circumstance, unusual pedestrian, and unusual vehicle type crashes. While these may not seem to lend themselves to intervention, they illustrate that pedestrians are likely to be found in a variety of places and circumstances doing a variety of things. Virtually everyone becomes a pedestrian at some time and under some circumstances. Therefore, pedestrian safety improvements to the states roadways are warranted to protect all users, many of whom may not be readily apparent as pedestrians.

Providing space for pedestrians, facilities to assist safe crossing of busy roadways, calming neighborhood streets, and instituting appropriate speed limits and ensuring that motorists comply with them either through enforcement or engineering countermeasures, will help provide protection for pedestrians and enhance the quality of life throughout the state. Pedestrians should not feel unable to move about due to barriers of high-speed, and increasingly high-volume roadways with no place to safely walk.

6. BICYCLIST SAFETY

More than 700 bicyclist-motor vehicle crashes have been reported to the NC Division of Motor Vehicles during each of the years 2003 and 2004 (753 and 788 crashes, respectively). This number increased to 1174 crashes in 2005.

Although crashes involving bicyclists represent less than ½% of the total reported motor vehicle crashes in North Carolina, bicyclists are over-represented in fatal and serious

injury crashes. Approximately 1½ % of the fatal crashes and 2% of A-type (disabling injury) crashes in North Carolina involved bicyclists. The reported bicyclist injuries resulting from crashes with motor vehicles each year are as shown in Table 6.A.

Table 6.A Report by Crash Year by Severity

Year	2003	2004	2005
PDO	12	18	133
% of Year Total	1.59%	2.28%	11.33%
Fatal	19	27	47
% of Year Total	2.52%	3.43%	4.00%
Injury	722	743	994
% of Year Total	95.88%	94.29%	84.67%
Total	753	788	1174
% of Year Total	100.0%	100.0%	100.0%

On average, 33 bicyclists were killed and an additional 67 were seriously injured each year. Fortunately most bicyclist crashes do not result in serious or fatal injuries, with about 90% resulting in B-type or lesser injuries, and about 10% resulting in fatal or serious injuries.

The number of bicyclist crashes has fluctuated over the past three years, but no obvious trend is apparent over this time period. Over a longer period, crashes appeared to be declining in North Carolina until 2005. This trend may be a result of decreasing exposure, particularly among children. The proportion of disabling (A-type) injuries has not declined as consistently as A-type injuries in other categories. This general downward trend in A-type injuries, which began with a significant decrease from 1999 to 2000, and echo those for all crashes, may result at least in part from new reporting practices (perhaps more stringent definition of A-type injuries) instituted with the new crash report form and instruction manual in use beginning with the year 2000. The proportions of B type (evident) and C type (possible) injuries have remained relatively constant. The proportion of no injury crashes have increased from 5.3 to 11.3% over this time period.

Bicyclists should be expected to ride anywhere they are not strictly prohibited and reasonable accommodation for their safety and access should be provided on all roadways. An increasing emphasis on health and physical activity and improving multi-modal access to roadways warrants consideration of bicyclists whenever new roadways are developed or old ones improved. The tables, figures, and text that follow are intended

to illuminate the characteristics of bicyclist crashes and highlight some of the bicycle safety issues across North Carolina.

Temporal factors

Crashes involving bicyclists vary seasonally with the highest levels during the spring and summer months, and the lowest percentages during late fall and.winter months .These trends no doubt reflect seasonal riding trends. The peak months are July and August at approximately 12%, followed closely by May, June and September. December and January are the lowest crash months.

Bicyclist crashes peak on Friday (16.3%) and Saturday (15.2%), with the lowest proportion occurring on Sunday (11.3%). Other weekdays account for about 14 to 15% of crashes, with Monday being slightly lower (13.9%).

Forty percent of bicycle – motor vehicle crashes occurred in the afternoon hours of 2 pm to 6 pm over this two year period. Twenty-six percent of crashes occurred during early evening between 6 pm to 10 pm, followed by 20% around midday. Slight year to year fluctuations in these proportions may reflect differences in exposure due to weather and other factors.

Temporal factors are doubtlessly related to exposure or when bicyclists ride most.

Environmental factors

The vast majority of crashes occur under daylight conditions. Three-fourths of bicycle crashes with motor vehicles occurred under daylight conditions. Eighteen percent occurred at night, with10% on lighted roadway segments and 8% on unlighted. There was a drop from 15 crashes (about 2%) to 2 crashes (0.2%) that occurred during early morning (dawn) hours from 2000 to 2002 and slight year-to-year increases in crashes at nighttime (on both lighted and unlighted roadways). These results may be due to random variation or may reflect exposure differences – more or less riding under those conditions.

The vast majority of bicyclist crashes occurred under dry weather conditions (clear or cloudy) on average no doubt reflecting exposure. Only 3% occurred during rain and less than 1% occurred under all other conditions (freezing precipitation, fog/smog/smoke, and other). Slight year to year fluctuations in the number of crashes occurring under rainy and other conditions, is also likely a reflection of exposure to these conditions (e.g., more bicyclist crashes under rainy conditions in years when the state received more rainfall).

While most crashes occurred during clear or cloudy weather and under daylight conditions, 17% occurred during night-time on lighted or unlighted roadways (clear or cloudy conditions). Most bicyclists apparently try to avoid riding during rain or other precipitation with only about 1 ½ % of crashes occurring during rain in daylight hours

and slight more than 1% occurring during rain at night, dusk or dawn. The highest proportions of night-time crashes occur during the fall months of September to November, with the lowest proportion occurring during winter months. Countermeasures for night-time crashes include adding lights to non-lighted areas where bicyclists may be expected, as well as education about bicyclist conspicuity: wear bright clothing, and use lights at night, and perhaps including reminders of decreasing day length as fall approaches in safety publications.

Bicyclist characteristics

It is difficult to draw firm conclusions about the year-to-year fluctuations in crash proportions by age group (Table 6.B). There seems, however, to be an increasing trend across the board within all age groups. Whether these trends will be sustained or are due to more than random variation is unknown; we do not have information about the amount of riding or exposure that goes on in the state or among different age groups. There are, however, some suggestions that child bicycling may be decreasing while that among adults may be increasing. As with pedestrian crashes, the somewhat dramatic increase in crashes among the 41 to 59 year group from 2004 to 2005 may reflect increases in the proportion of the population in this age group, as well as possible changes in the amount of riding.

Table 6.B Pedalcyclists Age by Crash Year

Age Group	2003	2004	2005	Total
6 and under	9	24	36	69
Age 7-10	81	98	90	269
Age 11-14	160	145	163	468
Age 15-20	105	102	291	498
Age 21-30	111	111	417	639
Age 31-40	109	116	379	604
Age 41-50	119	130	391	604
Age 51-59	44	50	231	325
60+ or unknown	35	42	387	464
Total	773	818	2385	3940

It is also difficult to draw firm conclusions about relationship of seriousness of bicyclist injuries to age. There is, however, apparently over-involvement of children 6 to 10 and young teens 11 to 15 in serious (type A) injury crashes, although not in fatal crashes. Adults twenty-five and up seem, however to be over-involved in crashes resulting in fatal injuries, particularly the 50 to 59 year group. These results may result primarily from differences in crash location and types of crashes that different age groups tend to be involved in (see below), rates of helmet wearing by different age groups, and other factors, and thus discussion of countermeasures will be delayed until those factors are

discussed. The apparent results of increasing crash seriousness with increasing age may also likely reflect to some extent, increasing vulnerability with age, particularly of the oldest age group.

Males consistently accounted for the vast majority (85%) of bicyclists involved in crashes with motor vehicles. These results are consistent with national data.

Although bicycle crashes in North Carolina are most likely to involve bicyclists of White racial background (47% on average), Blacks are involved in almost as many crashes (approximately 43% - Table 6.C). Considering they comprise about 22% of persons living in the State (2000 census data), Blacks are clearly over-represented in bicycle crashes, and Whites are under-represented based on the population (about 72%). There has been a slight decrease in the proportion of crashes involving black bicyclists, from around 46% in 2000 to about 44% in 2002. Asians and Native Americans account for less than ½ % and about 1 ½%, respectively of the total bicyclist crashes. Since the year 2000, when the state began identifying Hispanics and persons of Asian descent on crash report forms, Hispanics have accounted for about 5 – 6% of the bicyclist crashes each year, and a comparable proportion of the population, 4.7% (in 2000).

Table 6.C Pedacyclists by Race by Tear

Race	2003	2004	2005
White	364	400	371
Black	345	364	337
Hispanic	11	17	45
Native	31	28	13
Asian	9	1	5
Other	7	1	3
Unknown	9	7	14
Total	776	818	788

Reported helmet use for bicyclists involved in crashes is extremely low, <2% on average. These data are not, however, considered to be extremely reliable since often an injured bicyclist is transported from the crash scene prior to the reporting officer's arrival. Nevertheless we know from a 2002 statewide observational helmet use survey that bicycle helmet use is unacceptably low. Over all ages, helmet use was estimated to be 24% among those riding on streets. Observed use for those 15 and under was, however, only 16%. Use was lowest in the coastal plain region, followed by the Piedmont region, and highest in the mountain region. It is possible that those involved in crashes use helmets at a lower rate than overall.

The investigating officer indicated alcohol use by only about 1% of the bicyclists involved in collisions with motor vehicles over a 5 year period. Indicated use does not necessarily imply that the bicyclist was intoxicated at the time of the crash, only that alcohol use was detected.

Driver use of alcohol was detected for an average of 2% of the drivers involved in collisions with bicyclists over the three year period. This rate is lower than alcohol detection reported for crashes overall over the same period (5.7%).

Roadway and location characteristics of bicyclist crashes

Although approximately 34% of bicyclist crashes occurred at rural locations each year (and 34% of all injuries), they are more serious, more often than urban crashes, comprising 57% of the A type (disabling) injuries and 53% of those killed in crashes (Table 6.5).

In 2003 and 2004, above 55%, on average, of bicycle – motor vehicle crashes occurred on local streets, likely reflecting more riding in urbanized areas and in neighborhoods (Table 6.5). There were year-to-year fluctuations, but no obvious trends over time. Nearly 20% of bicycle crashes occurred along state secondary routes (which includes the former categories Rural Paved and Rural Unpaved). Around 6 - 7% occurred on US Routes and NC Routes. Nearly 7% of reported bicyclist crashes in this three year period occurred in parking lots, public driveways, or other public vehicular areas, with an additional 3% indicated to be on private property.

Crash severity also tends to vary by roadway classification, as might be expected, with higher proportions of struck bicyclists being killed and seriously injured on interstate routes (2 struck), U.S., NC, and state secondary routes than on local streets or PVA's (public vehicular areas) (fig. 6.5).

The majority of reported bicyclist roadway crashes occurred on two-lane roads (65% on average), while approximately 29% occurred on roadways with four or more through travel lanes (fig. 6.D). These trends were largely consistent from year-to-year

Understanding the location characteristics of crashes (both numbers and severity) can help in determining where to direct resources and countermeasures. Additional information by county will also be provided below

Table 6.D Pedalcyclist by Roadclass by Injury Level
(jan 2005 Through Dec 2005)

ROAD CLASS	FATAL	INJURY	PDO	Total
Interstate	3	4	1	8
US	9	67	6	82
NC	6	62	4	72
SSR	11	153	10	174
LCL	17	614	94	725
PP		2	1	3
PVA	1	92	17	110
Grand Total	47	994	133	1174

Crash types

As with pedestrian crashes, the development of effective countermeasures to help prevent bicyclist crashes is aided by an understanding of events leading up to a crash and contributing factors. Analysis of the data from state crash report forms that are stored in electronic databases can provide information on *where* bicyclist-motor vehicle crashes occur (city street, two-lane roadway, intersection location, etc.), *when* they occur (time of day, day of week, etc.), and *to whom* they occur (age of victim, gender, level of impairment, etc.), but can provide very little information about the actual sequence of events leading to the crash.

Each identified crash type is defined by a specific sequence of events, and each has precipitating actions, predisposing factors, characteristic locations, and sometimes characteristic populations, that can be targeted for interventions

Factors that may contribute to bicycle crashes with motor vehicles include the position and direction the bicyclist is riding. As vehicles, bicyclists should travel in the direction of other vehicular traffic. Motorists do not expect bicyclists to be approaching from the right, nor do they expect them on the sidewalk.

- Thirty-three percent of those involved in crashes with motor vehicles, and for whom this information was relevant (i.e., they were not on PVAs, driveways, trails, or other off-road areas) were riding facing traffic.
- 8% were riding on the sidewalk.
- And when bicyclists involved in crashes were reported to be riding on the sidewalk, in more than ¾ of the occasions they were also riding against the direction of traffic (fig. 6.10).
- When riding on the street in either a shared lane or bike lane or shoulder, bicyclists involved in crashes with motor vehicles were riding against traffic 24% and 31% of the time, respectively.
- Adults were about equally as likely as children to be riding facing traffic.

Over the most recent three years of data, the five crash groups responsible for the highest proportions of crashes in NC (not including "Other" which includes a variety of crash types) were the following types:

- Sign-controlled intersection - 19.8%
- Bicyclist turn / merge - 13.5%
- Bicyclist ride-out - mid-block - 11.8%
- Motorist overtaking - 11.7%
- Motorist turn / merge - 9.8%

- The above five groups accounted for two-thirds of the bicycle – motor-vehicle crashes in NC.

Counties

The ten highest crash rate counties account for only 19% of the states bicycle crashes. Thus, the more urbanized counties do not necessarily have the highest bicycle crash rates, as was more or less the case with pedestrian crashes. Many of the high bicycle crash rate counties have low populations compared to the more urban counties. Twenty-two of the top 25 counties are also in the eastern part of the state. It is likely that there is more bicycle riding per population, and hence a higher crash rate, in these counties for reasons other than population – as examples, a large university student population in Orange County, an aesthetically-pleasing rural riding environment, or the flat topography in the coastal plain which may encourage riding by a larger proportion of the population in eastern counties. There is also likely to be more recreational riding by people from other locations in some of the coastal counties. We cannot, however, say with any certainty that there is greater riding per capita in the eastern part of the state or in the higher crash rate counties, as we do not have exposure data. Therefore, it is also possible, that there are more crashes for other reasons.

Table 6.F Pedacylist by County by Year

County	2003	2004	2005
Alamance	5	14	9
Alexander	0	2	0
Alleghany	0	0	0
Anson	4	1	2
Ashe	0	0	0
Avery	0	0	0
Beaufort	6	12	14
Bertie	0	2	1
Bladen	2	3	4

Brunswick	6	8	7
Buncombe	22	14	30
Burke	4	0	5
Cabarrus	12	2	18
Caldwell	2	5	2
Camden	1	0	2
Carteret	5	8	11
Caswell	0	2	3
Catawaba	10	8	20
Chatham	5	3	2
Cherokee	0	1	0
Chowan	0	1	3
Clay	0	0	0
Cleveland	4	4	10
Columbus	8	3	7
Craven	6	15	15
Cumberland	38	35	41
Currituck	0	5	4
Dare	19	9	19
Davidson	8	7	14
Davie	0	1	2
Duplin	3	5	2
Durham	21	20	42
Edgecombe	14	9	16
Forsyth	20	34	34
Franklin	4	3	2
Gaston	14	29	25
Gates	2	1	0
Graham	0	1	1
Granville	3	4	3
Greene	1	1	0
Guilford	51	63	105
Halifax	7	9	4
Harnett	8	9	9
Haywood	4	0	3
Henderson	5	8	5
Hertford	3	4	1
Hoke	0	4	4
Hyde	1	1	1
Iredell	14	12	19
Jackson	0	0	0
Johnston	9	9	18
Jones	0	1	1
Lee	4	6	7

Lenoir	12	9	14
Lincoln	1	1	1
Macon	0	0	0
Madison	2	0	0
Martin	3	2	6
McDowell	2	0	1
Mecklenburg	66	91	123
Mitchell	0	0	1
Montgomery	0	3	1
Moore	0	1	9
Nash	11	6	23
New Hanover	50	37	70
Northampton	1	2	0
Onslow	16	23	24
Orange	16	15	45
Pamlico	0	1	0
Pasquotank	8	4	5
Pender	1	2	5
Perquimans	2	0	0
Person	0	1	2
Pitt	24	25	8
Polk	0	0	0
Randolph	13	6	4
Richmond	6	7	5
Robeson	20	21	40
Rockingham	8	5	9
Rowan	14	7	10
Rutherford	2	2	5
Sampson	4	5	5
Scotland	9	11	13
Stanly	6	4	5
Stokes	2	0	2
Surry	1	4	6
Swain	0	0	3
Transylvania	0	2	1
Tyrrell	0	0	0
Union	13	6	15
Vance	0	1	3
Wake	69	77	113
Warren	0	0	2
Washington	1	3	4
Watauga	6	3	4
Wayne	15	11	18
Wilkes	2	3	2

Wilson	13	19	20
Yadkin	2	0	0
Yancy	0	0	0
State Total	776	818	1174

Summary of findings

As with pedestrian crashes, bicycle – motor vehicle crashes are a low percentage of overall crashes. But when collisions between bikes and motor vehicles occur, they are often serious with 2.2% of those struck being killed and another 7.5 % being seriously injured. More crashes occur in urbanized areas and on local streets, but rural crashes tend to be more serious, likely because more occur on higher speed roadways, predominantly state secondary roads.

When motorists drove out into the path of a bicyclist, the cyclist was most often traveling against the direction of traffic. Wrong-way riding was also implicated in Signal-controlled intersection crashes as well as Motorist drive-out – mid-block crashes. All of these crash types occur most often in urban areas. Sidewalk riding is particularly over-represented in Signal-controlled intersection crashes as well as Motorist turn / merge crashes.

Reducing crashes involving crossing paths and turning vehicles is a challenge. Obviously, reducing sidewalk riding and wrong-way riding should help to reduce certain crash types, particularly those involving motorists pulling out to turn right at intersections or mid-block locations. Calming intersections by tightening turn radii, enhancing intersection markings, and other measures may help to reduce turning vehicle crashes. Replacing traditional intersections with low-speed roundabouts or mini-traffic circles could help to reduce the frequency and severity of intersection crashes with bicycles by forcing slow speeds through intersections and reducing the overall number of conflict points. Consideration must be given, however, to the best way to accommodate bicycles through a traffic circle – particularly if multiple lanes are involved.

Children were most often involved in mid-block ride out crashes, also more typically occurring in urban areas, but proportional to the overall urban crash rate. Calming speeds on local streets is one recommended countermeasure for this crash problem.

Crashes that occurred in a greater proportion in rural areas than urban, include Motorist overtaking crashes, and Bicyclist turn / merge crashes (about 61% each). Adults were over-represented in the former and youth, 11 – 15 were over-represented in the latter. Many of the bicyclist turn / merge crashes involving young riders crashes seem to involve the bicyclist changing lanes to avoid an overtaking vehicle. In particular, narrow, high speed roadways in rural areas need improvements to help bicyclists. Providing space on the roadway for bicyclists through adding paved shoulders, and in urban areas, through bike lanes or wide outside lanes, and educating motorists and bicyclists about traffic

rules, proper passing, and sharing the road are countermeasures for these two problems. Lower speeds would also help, since rapidly overtaking motor vehicles may have insufficient time to slow to wait for an appropriate gap to pass. Lower speeds also would assist bicyclists that have legitimate need to change lanes or turn, to merge with traffic.

Reducing speeds would help all crash types, since lower speeds help motorists to avoid crashes and also reduces the seriousness if a crash does occur. Lower speeds would help to create, not only a safer bicycling environment, but a more welcoming one.

Although ideally, most bicycle crashes would be prevented through implementation of appropriate countermeasures, when a crash does occur, a properly used safety helmet provides the best protection from serious and fatal injuries. Helmet use is very low in NC, only 24% over all, and even lower among children and the 11 to 15 year group most involved in crashes. Efforts to strengthen support of the statewide helmet law, and promote greater helmet use are therefore strongly recommended.

As public health agencies are increasingly advocating for more active forms of transportation, i.e. bicycling and walking, demand for safe multi-modal roadways will increase over the coming years. Adult bicycling already seems to be on the rise. Providing for the needs of bicyclists and pedestrians on the states roadways should be a key priority over the next period of road-building and improvements.

7. OLDER DRIVER SAFETY

Introduction

An average of nearly 28,000 drivers age 60 or older have been involved in reported crashes in North Carolina over each of the past three years. This number includes nearly 11,000 drivers age 75 or older. Older adults are of particular interest because:

1) Their numbers are increasing, and can be expected to continue to increase over the next 30+ years. Whereas the overall North Carolina population is projected to increase 46% by 2030, the age 65+ population will more than double, from just over 1 million to 2.2 million persons age 65+.

2) Declining functional abilities and health in older adults contribute to increased crash rates per mile driven. Only 16-19-year-old drivers have higher overall crash rates than do drivers age 80+.

3) Once in a crash, older adults are much more vulnerable to injury. Despite their generally lower speeds and less severe crashes, older adults are 4 to 6 times more likely to die as a result of their crash.

This section highlights characteristics of older driver crashes in North Carolina and identifies potential approaches for improving the safety of this vulnerable population.

Older Drivers Involved in Crashes

On average over the past year, 20.35% of crash-involved drivers in North Carolina were age 60 or older (see Table 7.A). This is much greater than their 11.9% representation in the overall population.

Table 7.A Numbers and Percentages of Crash involved Drivers by Age Group

	(Jan 2005 through Dec 2005)		
Age Group	Number		Percent
24 or less	101311		24.5%
25 - 39	117965		28.5%
40 - 59	110117		26.6%
6 and abov	83792		20.3%
Unknown	24		0.0%
Total	413209		100.0%

Information on the injury status of drivers involved in crashes is shown in Table 7.B. For all age groups combined, 0.3% of drivers were killed. This percentage is only slightly lower than for drivers over 60. (see Figure 7.B). Percentages of severe injuries are less elevated. These percentages fluctuated across crash years, due to the relative rarity of severe and fatal injuries, coupled with the relatively small numbers of crash-involved drivers in the oldest age categories.

Table 7B Age Group by Injury Level
(Jan 2005 through Dec 2005)

Age Group	Fatal	Col %	A	Col %	B+C	Col %	PDO	Col %	Unknown	Col %	Total	Col %
24 or less	242	21.6%	727	28.0%	22344	27.7%	76762	27.2%	1236	27.3%	101311	27.3%
25 - 39	370	33.0%	793	30.5%	25454	31.6%	89935	31.8%	1517	33.5%	118069	31.8%
40 - 59	308	27.5%	796	30.6%	24056	29.9%	83713	29.6%	1244	27.4%	110117	29.6%
60 and above	202	18.0%	284	10.9%	8680	10.8%	32316	11.4%	515	11.4%	41997	11.3%
Unknown		0.0%	1	5.9%		0.0%	2	1.0%	21	175.0%	24	6.4%
Total	1122	100.0%	2601	100.0%	80534	100.0%	282728	100.0%	4533	100.0%	371518	100.0%

Key Findings

- The number of crash-involved older drivers has shown only modest increases over the past 3 years. ("Baby boomers" have not yet entered the ranks of older drivers.)

- Once involved in a crash, older drivers are more likely than their younger counterparts to be severely injured or killed.

- Although drivers ages 65+ make up only 7.5% of the crash-involved driver population, they comprise 15% of fatally-injured drivers.

Temporal Characteristics of Older Driver Crashes

Three out of four crashes involving older drivers occurred between the hours of 10:00 a.m. and 6:00 p.m., and older drivers were especially overrepresented in crashes between 10:00 a.m. and 2:00 p.m. Very few, only about two percent, occurred at nighttime after 10:00 p.m. Again, these findings reflect the times when older adults are most likely to be on the road driving. As drivers age, this pattern of midday crashes becomes even more pronounced.

Older driver crashes are also more likely to occur on weekdays, although here the differences are relatively small. Overall in North Carolina, 78% of crashes occurred on weekdays (Monday – Friday) and 22% on weekends (Saturday or Sunday). For drivers ages 65+, 81% occurred on weekdays and 19% on weekends.

Key Findings

- Not surprisingly, older drivers tend to be involved in crashes during midday hours and on weekdays, reflecting the times they are most likely to be driving.

Roadway and Locational Characteristics of Older Driver Crashes

Overall, 62% of North Carolina crashes occur in the state's more highly populated Piedmont counties, 26% in its eastern coastal counties, and only 12% in its western mountain region counties. However, the western part of the state is home to a disproportionate number of older adults, and this is reflected in their crash data. With increasing age, the percentage of crashes occurring in the Mountain region counties increases, while the percentage occurring in the Piedmont counties declines. For drivers ages 85+, nearly one in five crashes (19%) are in the western Mountain region of the state.

Although older adults are under represented in crashes in the more urban Piedmont counties, their crashes are about equally likely to occur in urban areas, and increasingly so with age. Again, this likely reflects their greater exposure to potential crashes in urban driving environments and on urban roadways.

As drivers age, they are much less likely to be involved in crashes on Interstate and Secondary State Roads. Conversely, they are more likely to be involved in crashes on U.S. Route roadways and on local streets. Their crashes are also somewhat more likely to occur on private roadways, in parking lots, and so forth, especially for the oldest drivers.

Information with respect to the speed limits on roads mimics that of road type, with older drivers less likely to be involved in crashes on higher speed roadways, and more likely to be involved in crashes on lower speed roadways of 35 mph or less.

The crashes of older drivers are also much more likely than those of younger drivers to occur at intersections and especially those involving stop sign controls. .

Key Findings

- Nearly one in five drivers killed in crashes in the western Mountain region of the state is age 65+. As the North Carolina population ages, this proportion will rise, not only in western North Carolina but in all parts of the State.

- For the most part, older driver crashes tend to mimic the locations and situations where older adults drive, (i.e., on shorter trips, lower speed roadways, about town, during the daytime, under favorable weather conditions, etc.). Without more detailed driving exposure data, however, it is not possible to identify what driving situations pose the greatest risk for older drivers. For example, without knowing how many miles older adults drive on interstate roadways or at nighttime, it is not known whether these situations pose greater risk to their safety.

Maneuvers, Contributing Factors, and Physical Conditions in Older Driver Crashes
The majority of all drivers (57%) are going straight ahead when they crash. Older drivers, however, are less likely to be going straight ahead and much more likely to be making a left turn. In fact, older drivers are nearly twice as likely as younger drivers to be engaged in a left turn maneuver at the time of their crash. Other types of maneuvers where older drivers are overrepresented include right turns, changing lanes, and starting in the roadway (e.g., when starting up at a green light).

Like the youngest drivers, older drivers are more likely to be cited for one or more contributing factors to their crash. At least by this measure, middle-aged drivers, ages 45-64, are the "safest" drivers on the road. Moreover, the likelihood of contributing to their crash increases with age. Nearly four out of five crash-involved drivers age 85 or above were cited for some contributing factor to their crash.

Based on the first contributing factor noted when more than one factor is cited, failure to reduce speed is the most frequently cited contributing factor, but is most prominent for drivers in the younger two age categories. For older adults, by far the most commonly cited contributing factor is failure to yield. While only cited for 17.6% of drivers overall, it is cited for 31% of drivers ages 65-74, increasing to 41% for drivers ages 85+. Other contributing factors that are over represented among older drivers include improper turning, disregard of traffic signal, and disregard of stop or yield signs (primarily the former). In contrast, older drivers are less likely to be cited for speeding, careless/aggressive driving, alcohol or drug use, or following too closely.

A final "crash characteristic" factor examined is the driver's physical condition at the time of the crash. Although in reality a driver variable, this variable can provide insight into potential causative factors in crashes. Although the vast majority of older drivers are identified as being in a "normal" physical condition at the time of their crash, they are more likely to be impaired by a medical condition or by some other physical impairment. Interestingly, even though older adults are much greater consumers of medications, medication use does not appear in these data to be a factor in their crashes.

Key Findings

- Drivers ages 65+ are more likely to crash while making a left turn, and the crash risk increases along with their age.

- Older drivers are more likely to be cited for contributing to their crash, with the most commonly cited contributing factor being failure to yield to other traffic.

Conclusions

In terms of number of crashes, older adults do not yet represent a significant safety problem in North Carolina. However, this situation will change over the next decade as the large swell of baby boomers hits retirement age. Based on population growth alone, older driver crashes will more than double over the next 25 years. Older adults are by far the fastest growing segment of the North Carolina population.

If one is concerned about reducing traffic fatalities, older drivers already demand attention. The data analysis showed that while older adults represent 7.5% of all crash-involved drivers, they represent 15% of drivers killed in crashes. They also represent about 15% of pedestrians killed in crashes.

To reduce these numbers, most safety experts recommend a comprehensive approach that includes improvements to the driving environment (e.g., roadway markings, signage, traffic control, etc.), driver licensing practices (e.g., increased screening and licensing restrictions based on driver functional abilities), driver training and rehabilitation (e.g., driver refresher courses, adaptive vehicle equipment), increased public awareness,

improved vehicle design, and greater access to alternative modes of transportation. Many excellent materials and resources exist.

8. SPEED-RELATED CRASHES

Driver speed is a function of several factors, e.g., posted speed limits, alignment, lane and shoulder width, design speed, land use, surrounding land use, traffic volumes, percentage of trucks in the traffic stream, weather, time of day, enforcement, visibility, vehicle operating characteristics, and driver factors such as risk taking behavior. Despite several studies that have attempted to establish relationships between driver speed and crash rates, the results are not consistent. Although there is some evidence to indicate that, on a given road segment, crash involvement rates of individual vehicles rise with their speed of travel, it is not clear if across all roads crash involvement rates rise with the average speed of traffic, i.e., we cannot assume that roads with higher average traffic speeds have higher crash rates than roads with lower average traffic speeds. Many have argued that there is a relationship between crash involvement rates and deviation from average speed. Speed is however directly related to the severity of a crash.

In North Carolina, for each driver involved in a crash, the investigating officer can indicate a maximum of three contributing circumstances. These contributing factors are intended to provide information on driver actions that probably lead to their involvement in the crash. These contributing factors are not necessarily listed in any particular order, i.e., it is not necessarily that the first contributing factor was the most critical. There are 31 possible driver contributing factors, and three of these relate to speed: exceeding the posted speed limit, driving too fast for conditions, and failure to reduce speed. It is important to note that it is very difficult to get an objective measure of the true crash speeds of crash-involved vehicles. Numbers are typically based on estimates by the investigating officer and/or self-reports by the driver.

In the following discussion, 'speed related crashes' were identified by selecting all crashes where at least one of the contributing circumstances for at least one of the drivers was coded as exceeding the posted speed limit, driving too fast for conditions, and failure to reduce the speed.

Severity of Speed Related Crashes

Between 45 and 59% of fatal and injury crashes are speed related, whereas, just 35% of PDO crashes are speed related (Table 8.A).

Table 8.A Speed Related Crashes by Severity
(Jan 2005 through Dec 2005)

Severity	Non-Speed Related	Percent of Total	Speed Related	Percent of Total	Total
PDO	273415	95.2%	13846	4.8%	287261
Injury	71356	85.8%	11779	14.2%	83135
Fatal	560	55.0%	458	45.0%	1018
Unknown		0.0%	2011	100.0%	2011
Total	343320	92.4%	28094	7.6%	371414

Area Type

A higher percentage of crashes in rural areas are associated with speed compared to urban areas (Table 8.B). This is to be expected since roads in rural areas are usually associated with lower traffic volumes and allow speeding.

Table 8.B Speed Related Crashes By Area Type
(Jan 2005 through Dec 2005)

	Fatal	Injury	PDO	Unknown	Total
Rural	383	9378	10694	750	21941
%	83.6%	79.6%	77.2%	58.8%	78.1%
Urban	75	2401	3152	525	6153
	16.4%	20.4%	22.8%	41.2%	21.9%
Total	458	11779	13846	1275	28094

Driver Age

The under 24 age group is associated with the highest percentage of speed related crashes (Table 8.C). As drivers mature, the percentage of speed related crashes come down. Older drivers are associated with the least number of speed related crashes.

Table 8.C Driver Age By Speed
(Jan 2005 through Dec 2005)

Age Group	Not Speed Related	Percent of Total	Speed Related	Percent of Total	Total
Age 15 And Under	942	86.2%	151	13.8%	1093
Age 16	7151	85.7%	1189	14.3%	8340
Age 17	9403	86.9%	1415	13.1%	10818
Age 18	11339	86.2%	1809	13.8%	13148
Age 19	11045	87.6%	1570	12.4%	12615
Age 20	10940	89.1%	1344	10.9%	12284
Age 21-24	38693	90.0%	4320	10.0%	43013
Age 25-29	39427	91.8%	3509	8.2%	42936
Age 30-39	70300	93.7%	4729	6.3%	75029
Age 40-49	61404	95.0%	3242	5.0%	64646
Age 50-59	43694	96.1%	1777	3.9%	45471
Age 60+ or Unknown	38712	92.1%	3309	7.9%	42021
Total	343050	92.4%	28364	7.6%	371414

Time of Day

More crashes are speed related between 7:00 and 8:00 a.m., 3:00 and 5:00 p.m., and 1:00 and 3:00 a.m. It is possible that the relative high percentage of speed related crashes between 7:00 and 8:00 a.m. and between 3:00 and 5:00 p.m. is partly due to young drivers who drive to school in the morning and drive from school in the afternoon during these periods but a more likely reason might be adults commuting to and from work each day. The relatively high percentage of speed related crashes between 1:00 and 3:00 a.m. could be associated with alcohol.

Month of Year

In the last two years, January has seen a significant increase in the percentage of crashes that are speed related. It is not clear if this is a random variation or a systematic change in the pattern for speed related crashes.

Day of Week

Friday is associated with the highest number of speed related crashes. However, Fridays are also associated with the highest number of crashes. The percentage of speed related crashes are quite uniform over different days of the week.

Road Class

Interstate highways are associated with the highest speeds because they are designed to the highest standards. Interstates have the highest percentage of speed related crashes in North Carolina, although they have the lowest number of speed related crashes (Table 8.D). Local streets have the highest number of speed related crashes but the lowest percentage of speed related crashes.

Table 8D Speed Related Crashes By Road Type
(Jan 2005 through Dec 2005)

Road Class	Fatal	Injury	PDO	Unknown	Total
Interstate	29	1058	2158	69	3314
US	68	1564	2169	133	3934
NC	67	1532	1466	173	3238
SSR	219	5224	4901	1111	11455
LCL	71	2186	2758	431	5446
PP	2	36	46	12	96
PVA	2	179	348	82	611
Total	458	11779	13846	2011	28094

Speed Related Crashes by County

The rate of speed related crashes vary widely across North Carolina counties, as shown in Table 8.E. There are several factors that may influence why a particular county may have a high or low rate of speed related crashes including: number of young drivers in the county, extent of tourist traffic, and the type of road system in the county including the number of rural roads.

Table 8 E Speed Related Crashes by County
(Jan 2005 through Dec 2005)

County	Speed Related Crashes	Percent of Total Crashes	Total Crashes In County
Alamance	429	6.98%	6148
Alexander	151	18.17%	831
Alleghany	105	31.34%	335
Anson	98	11.32%	866
Ashe	165	18.84%	876
Avery	75	15.66%	479
Beaufort	113	6.17%	1832
Bertie	91	14.51%	627
Bladen	151	13.78%	1096
Brunswick	364	11.10%	3280
Buncombe	713	7.91%	9011
Burke	422	12.61%	3347
Cabarrus	306	4.39%	6971
Caldwell	260	9.57%	2718
Camden	25	10.55%	237
Carteret	154	6.80%	2266
Caswell	89	17.84%	499
Catawaba	438	5.78%	7574
Chatham	175	9.03%	1938
Cherokee	110	15.56%	707
Chowan	41	11.85%	346
Clay	45	16.79%	268
Cleveland	387	10.70%	3618
Columbus	332	16.25%	2043
Craven	261	8.55%	3052
Cumberland	636	4.46%	14268
Currituck	66	9.75%	677
Dare	76	4.47%	1699

Davidson	682	12.02%	5674
Davie	179	14.79%	1210
Duplin	214	10.85%	1973
Durham	627	4.25%	14737
Edgecombe	252	14.24%	1770
Forsyth	854	5.72%	14938
Franklin	194	12.74%	1523
Gaston	593	6.44%	9206
Gates	62	17.13%	362
Graham	96	36.92%	260
Granville	159	11.03%	1441
Greene	134	21.79%	615
Guilford	1119	5.28%	21192
Halifax	216	11.51%	1876
Harnett	305	9.98%	3056
Haywood	261	15.46%	1688
Henderson	402	9.95%	4039
Hertford	71	8.61%	825
Hoke	90	8.99%	1001
Hyde	22	16.79%	131
Iredell	571	8.72%	6545
Jackson	292	22.27%	1311
Johnston	583	10.04%	5804
Jones	52	13.68%	380
Lee	162	6.02%	2690
Lenoir	166	7.31%	2270
Lincoln	262	9.62%	2723
Macon	170	17.03%	998
Madison	125	30.64%	408
Martin	109	14.89%	732
McDowell	266	23.73%	1121
Mecklenburg	2068	4.53%	45620
Mitchell	67	13.90%	482
Montgomery	124	17.29%	717
Moore	198	7.09%	2792
Nash	403	10.37%	3885
New Hanover	277	2.53%	10964
Northampton	109	17.55%	621
Onslow	406	6.34%	6404
Orange	445	9.71%	4584
Pamlico	50	16.18%	309
Pasquotank	102	6.57%	1552
Pender	175	9.60%	1823
Perquimans	48	17.65%	272

Person	195	14.99%	1301
Pitt	341	5.26%	6481
Polk	141	29.07%	485
Randolph	651	13.29%	4898
Richmond	149	10.23%	1456
Robeson	560	11.32%	4949
Rockingham	392	13.66%	2870
Rowan	313	5.85%	5350
Rutherford	293	14.39%	2036
Sampson	317	14.29%	2218
Scotland	105	12.50%	840
Stanly	195	10.07%	1936
Stokes	245	20.15%	1216
Surry	421	16.51%	2550
Swain	94	27.25%	345
Transylvania	122	13.69%	891
Tyrrell	18	10.06%	179
Union	387	6.23%	6207
Vance	163	9.10%	1791
Wake	1394	3.58%	38932
Warren	111	24.24%	458
Washington	47	13.13%	358
Watauga	264	11.80%	2237
Wayne	325	7.49%	4337
Wilkes	312	13.69%	2279
Wilson	252	7.86%	3207
Yadkin	163	14.90%	1094
Yancy	62	16.32%	380
State Total	28072	7.56%	371414

Table 8.F shows the county listing in descending order by each county's speed related crashes shown as a percentage of their total crashes for the 2005 year. This ranking gives a better picture of the problem areas rather than simply looking at a total number. It ranks by action rather than by population.

Table 8 F Speed Related Crashes by County
Descending Order by
Percentage
(Jan-2005 through Dec 2005)

County	Speed Related Crashes	Percent of Total Crashes	Total Crashes In County
Graham	96	36.92%	260
Alleghany	105	31.34%	335
Madison	125	30.64%	408
Polk	141	29.07%	485
Swain	94	27.25%	345
Warren	111	24.24%	458
McDowell	266	23.73%	1121
Jackson	292	22.27%	1311
Greene	134	21.79%	615
Stokes	245	20.15%	1216
Ashe	165	18.84%	876
Alexander	151	18.17%	831
Caswell	89	17.84%	499
Perquimans	48	17.65%	272
Northampton	109	17.55%	621
Montgomery	124	17.29%	717
Gates	62	17.13%	362
Macon	170	17.03%	998
Hyde	22	16.79%	131
Clay	45	16.79%	268
Surry	421	16.51%	2550
Yancy	62	16.32%	380
Columbus	332	16.25%	2043
Pamlico	50	16.18%	309
Avery	75	15.66%	479
Cherokee	110	15.56%	707
Haywood	261	15.46%	1688
Person	195	14.99%	1301
Yadkin	163	14.90%	1094
Martin	109	14.89%	732

Davie	179	14.79%	1210
Bertie	91	14.51%	627
Rutherford	293	14.39%	2036
Sampson	317	14.29%	2218
Edgecombe	252	14.24%	1770
Mitchell	67	13.90%	482
Bladen	151	13.78%	1096
Transylvania	122	13.69%	891
Wilkes	312	13.69%	2279
Jones	52	13.68%	380
Rockingham	392	13.66%	2870
Randolph	651	13.29%	4898
Washington	47	13.13%	358
Franklin	194	12.74%	1523
Burke	422	12.61%	3347
Scotland	105	12.50%	840
Davidson	682	12.02%	5674
Chowan	41	11.85%	346
Watauga	264	11.80%	2237
Halifax	216	11.51%	1876
Anson	98	11.32%	866
Robeson	560	11.32%	4949
Brunswick	364	11.10%	3280
Granville	159	11.03%	1441
Duplin	214	10.85%	1973
Cleveland	387	10.70%	3618
Camden	25	10.55%	237
Nash	403	10.37%	3885
Richmond	149	10.23%	1456
Stanly	195	10.07%	1936
Tyrrell	18	10.06%	179
Johnston	583	10.04%	5804
Harnett	305	9.98%	3056
Henderson	402	9.95%	4039
Currituck	66	9.75%	677
Orange	445	9.71%	4584
Lincoln	262	9.62%	2723
Pender	175	9.60%	1823
Caldwell	260	9.57%	2718
Vance	163	9.10%	1791
Chatham	175	9.03%	1938
Hoke	90	8.99%	1001
Iredell	571	8.72%	6545
Hertford	71	8.61%	825

Craven	261	8.55%	3052
Buncombe	713	7.91%	9011
Wilson	252	7.86%	3207
Wayne	325	7.49%	4337
Lenoir	166	7.31%	2270
Moore	198	7.09%	2792
Alamance	429	6.98%	6148
Carteret	154	6.80%	2266
Pasquotank	102	6.57%	1552
Gaston	593	6.44%	9206
Onslow	406	6.34%	6404
Union	387	6.23%	6207
Beaufort	113	6.17%	1832
Lee	162	6.02%	2690
Rowan	313	5.85%	5350
Catawaba	438	5.78%	7574
Forsyth	854	5.72%	14938
Guilford	1119	5.28%	21192
Pitt	341	5.26%	6481
Mecklenburg	2068	4.53%	45620
Dare	76	4.47%	1699
Cumberland	636	4.46%	14268
Cabarrus	306	4.39%	6971
Durham	627	4.25%	14737
Wake	1394	3.58%	38932
New Hanover	277	2.53%	10964
State Total	28072	7.56%	371414

Summary of Findings

- Speed-related crashes are in general more severe compared to non-speed-related crashes.

- Speed-related PDO crashes have increased substantially in the last two years. However, the number of injury and fatal speed-related crashes has changed very little during this period.

- A higher percentage of crashes in rural areas are associated with speed compared to urban areas.

- The 16-17 age group is associated with the highest percentage of speed-related crashes.

- A large number of speed related crashes occur during the morning peak, the afternoon peak, and between 1:00 and 3:00 a.m.

- Interstates have the lowest number of speed-related crashes, but the highest percentage of speed-related crashes. Local streets have the highest number of speed-related crashes, but the lowest percentage of speed-related crashes.

- Close to 80% of crashes where a rear-end crash was the first harmful event, are speed-related. A significant percentage of crashes (close to 50%) where the first harmful event is a Jacknife/Overturn/Rollover, collision with a fixed object, or ran-off-the-road, are speed-related.

Enforcement and Public Information

Enforcement will be an effective speed management tool as long as the posted speed limits are credible. The problem with traditional enforcement is their short-lived effect in deterring speeding. It may be possible to boost the longevity of the deterrence effect is through a public information campaign coupled with enforcement. It would be worthwhile to target enforcement efforts on those roads and times when speed-related crashes are most common. Automated enforcement (e.g., photo radar) can be used to complement traditional enforcement techniques.

9. OCCUPANT RESTRAINT

Seat-belt usage in North Carolina is among the highest in the nation due to the primary enforcement law and successful 'Click It or Ticket' campaigns. The observed driver seat belt usage rate has increased from approximately 65% in the early 1990's to 88.5% in 2006.

Each year, GHSP conducts statewide a survey to determine the safetybelt usage rates for the state. This survey is conducted in accordance with NHTSA guidelines and policy. The latest survey was conducted following the Memorial Day 2006 campaign. The usage rate for drivers at that time was determined to be 88.9%. The corresponding usage rate for passengers was 86.3%.

Typically, the Piedmont and Coastal areas have a higher belt usage rate compared to the Mountain region. This year there was a shift in the usage rates during the Memorial Day survey. The usage rate in the Piedmont region was 89.3% and the Mountain Region was 90.3% while the Coastal region was 86.4% during this survey. Cars, SUVs, and Minivans, typically have the highest usage rates – close to 90% during the Memorial Day survey. The usage rates also increase with increase in age: middle-aged and older drivers typically having a higher usage rate compared to young drivers. There is a significant difference in the seat belt usage rates among men and women. The latest survey found that approximately 92% of women used a seat belt while 87% of men used a seat belt.

Restraint usage in crashes

The investigating officer provides information on restraint usage for individuals involved in an accident. Based on 2003 North Carolina Traffic Crash Facts, over 97% of drivers involved in a crash in 2003 had used a belt. Unfortunately, this information does not match the usage rate that is estimated from the statewide surveys. It is possible that in many cases, especially in PDO crashes, the investigating officer asks the driver or passenger if they were using a seat belt and a significant number of people who were not wearing a seat belt would probably not admit to their non-compliance. In the case of fatal crashes, a more detailed investigation is usually conducted, and can provide more accurate information on whether a seat belt was used when the crash occurred. According to the 2003 North Carolina Traffic Crash Facts, close to 58% of drivers who were killed in a crash were wearing a seat belt (low enforcement reported). For A level injuries, the corresponding usage rate was around 97% (self reported). For B and C injuries, and the No-Injury cases, the usage rate was between 89% and 99% (self reported).

Table 1. Observed North Carolina Seat Belt Usage Rates: New 121-site June 2006 Survey

Category Subcategory	Unweighted Use %	Weighted Use %	 SE %	 Sample Size
Overall				
Driver	88.2	**88.9**	0.8	24,978
Passenger	83.3	**86.3**	1.2	6,576
Both	87.2	**88.5**	0.7	31,554
Urban / Rural				
Urban	**89.0**	89.2	0.8	15,239
Rural	**86.9**	86.8	2.2	9,739
Region				
Mountain	**90.3**	88.2	0.9	3,893
Piedmont	**89.3**	90.2	1.1	10,168
Coastal	**86.4**	85.8	1.2	10,917
Vehicle Type				
Car	**90.2**	91.2	1.1	12,815
Van	**79.1**	85.5	3.2	575
Minivan	**92.0**	90.7	3.2	1,762
Pickup Truck	**81.2**	78.9	4.8	4,842
Sports Utility	**89.6**	91.5	1.4	4,873
Sex of Driver				
Male	**86.8**	89.2	1.5	3,431
Female	**92.0**	93.7	1.3	2,651
Race/Ethnicity of Driver				
White	**88.6**	90.6	1.2	4,660
Black	**90.0**	89.3	2.1	1,105
Hispanic	**91.0**	93.5	2.4	210
Asian	**98.4**	99.7	0.3	61
Age of Driver				
16-24	**85.6**	92.0	2.1	849
25-44	**89.4**	90.4	1.2	3,253
45-64	**89.9**	92.6	2.0	1,429
65+	**90.2**	90.7	3.5	552

Table 2. Observed North Carolina Seat Belt Usage Rates by County: New 121-site June 2006 Survey

County Name	Driver (D)	Passenger (P)	Both (D + P)	Sample Size (N)
Alamance	91.5	84.8	90.6	2,160
Buncombe	89.3	83.9	88.1	1,462
Burke	92.2	88.7	91.3	1,263
Craven	92.6	90.5	92.2	2,303
Cumberland	84.1	68.6	81.7	1,496
Gaston	82.4	74.7	80.5	1,770
Granville	81.4	78.4	80.8	1,211
Mecklenburg	88.4	85.2	88.2	1,671
New Hanover	86.0	81.9	85.1	2,847
Pitt	83.9	79.6	83.2	1,765
Robeson	72.5	62.7	70.4	914
Stanly	85.7	81.8	85.1	1,296
Wake	94.2	89.8	93.5	2,089
Wayne	86.9	85.2	86.6	1,607
Wilkes	90.1	85.7	88.9	1,185

Table 3: Observed (Weighted) Seat Belt Use in North Carolina (%)

Observed (Weighted) Driver and Right Front Passenger Seat Belt Use (%)												
	SURVEY PERIODS											
	1997[1]				1998			1999			2000	
	Apr	Jun	Sep	Dec	Jun[1]	Sep[1]	Oct[2]	Apr[1]	Jun[1]	Nov[2]	Jun[3]	Sep[3]
Driver	81.5	82.7	83.9	81.0	82.2	82.0	77.7	81.0	83.5	79.7	81.6	80.3
RF Passenger	78.4	78.7	79.6	77.6	79.2	77.0	72.7	77.7	80.8	71.0	76.1	74.7
Front Seat (D+RF)	80.8	81.8	83.0	80.3	81.7	81.0	76.7	79.9	82.3	78.6	80.5	79.2

	SURVEY PERIODS													
	2001			2002		2003			2004		2005		2006	
	May[3]	Jun[3]	Sep[3]	Jun[3]	Sep[3]	Apr[3]	Jun[3]	Sep[3]	Apr[3]	Jun[3]	Apr[5]	Jun[4]	Apr[6]	Jun[4]
Driver	80.9	83.6	83.0	84.9	84.5	85.1	87.3	85.7	85.2	86.9	86.2	86.9	87.6	88.9
RF Passenger	74.8	79.1	77.3	80.6	76.5	79.2	81.0	80.4	79.1	82.0	82.2	85.6	84.4	86.3
Front Seat (D+RF)	79.6	82.7	81.9	84.1	82.7	84.1	86.1	84.7	83.8	86.1	85.4	86.7	86.9	88.5

[1] 72 site survey
[2] 306 site survey
[3] 152 site survey
[4] 121 site survey
[5] 50 site mini-survey
[6] Revised 50 site mini-survey

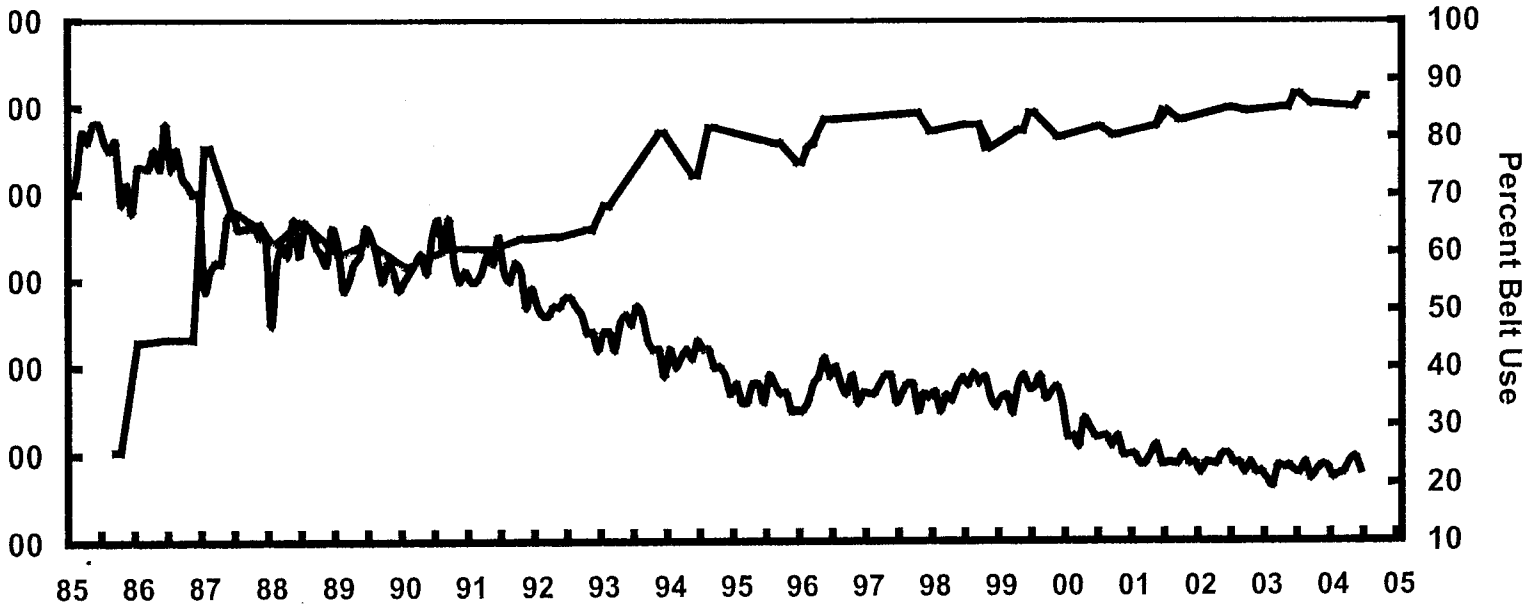
Table 4. Observed Seat Belt Use in North Carolina (%)

	2001			2002		2003			2004		2005		2006	
	May[1]	Jun[1]	Sep[1]	Jun[1]	Sep[1]	Apr[1]	Jun[1]	Sep[1]	Apr[2]	Jun[1]	Apr[2]	Jun[4]	Apr[3]	Jun[4]
Overall (D+RF) Rate[5]	79.6	82.7	81.9	84.1	82.7	84.1	86.1	84.7	83.8	86.1	85.2	86.9	87.6	88.5
Region														
Mountains	76.3	77.6	79.0	81.1	80.5	80.5	85.5	83.4	88.7	84.9	87.6	90.0	88.3	90.3
Piedmont	82.8	85.1	85.3	85.8	86.2	87.1	89.4	88.0	86.3	88.1	86.8	88.4	89.6	89.3
Coast	83.9	87.2	85.6	85.7	87.5	85.8	88.3	83.4	85.0	86.8	86.8	86.9	86.4	86.4
Vehicle Type														
Car	86.0	88.0	88.1	88.5	89.2	89.0	91.4	89.2	88.5	90.1	89.1	90.0	90.2	90.2
Van	63.1	70.7	68.4	70.9	71.1	71.4	74.9	67.3	75.1	74.9	72.6	75.9	74.3	79.1
Pickup	70.0	74.1	73.6	75.4	76.8	76.3	80.8	75.7	77.9	79.2	79.4	80.9	81.4	81.2
Sports Utility	84.2	85.4	85.8	86.4	87.5	87.0	90.2	88.2	87.5	89.9	88.5	89.1	89.8	89.6
Sex of Driver														
Male	77.6	81.1	80.2	82.5	83.0	83.0	85.6	82.5	82.8	85.3	83.0	85.6	85.4	86.8
Female	88.3	89.9	90.2	91.1	91.2	91.9	93.7	91.5	91.6	92.5	92.6	92.5	92.5	92.0
Age of Driver														
16-24	75.4	78.6	78.4	81.1	83.0	84.6	86.0	81.5	83.8	84.2	86.2	84.5	83.1	85.6
25-44	83.0	85.2	84.7	85.9	86.5	86.8	89.1	85.7	85.9	88.3	86.8	88.1	89.0	89.4
45-64	82.8	86.6	85.6	87.3	86.7	86.2	88.9	88.7	87.7	89.2	86.7	91.0	89.2	89.9
65+	83.7	86.2	87.1	91.7	90.1	90.2	91.0	91.3	90.5	92.5	92.6	91.3	92.0	90.2
Race / Ethnicity														
White	81.8	84.2	84.1	85.7	86.1	86.6	89.0	86.1	87.3	88.1	87.4	88.8	88.6	88.6
Black	83.5	86.8	85.9	87.1	87.3	86.3	89.0	86.5	83.7	88.5	85.0	87.1	87.6	90.0
Hispanic	84.3	88.6	84.6	85.4	87.5	90.6	87.9	86.4	84.9	91.6	92.5	88.1	91.1	91.0

[1] 152 site survey
[2] 50 site mini-survey
[3] Revised 50 site mini-survey
[4] 121 site survey
[5] Weighted Overall (D+RF) Rate

FIGURE 1
NC DRIVER SEAT BELT USAGE AND COVERED OCCUPANT INJURY RATES

Fatal and Serious Injuries ---------- Observed Driver Belt Use ----------



10. Commercial Motor Vehicles

CMV Crashes by Injury Severity Level

In 2004 (1) out every (8) traffic fatalities (12.72%) in North Carolina resulted from a crash involving a commercial vehicle. 198 persons died on our highways, an increase of 22% over 2003. This ranked North Carolina 5th in the nation in large truck related fatalities.

Table 10.A 2004 CMV Crashes vs All Vehicle Crashes

(Jan 2004 through Dec 2004

Type Crash	Number of CMV Crashes	Percent of Total CMV Crashes	Number All Vehicle Crashes	Percent of Total Veh Crashes
PDO	5,079	65.86%	145774	63.31%
Injury	2511	32.56%	83044	36.07%
Fatals	122	1.58%	1,423	0.62%
Total	7,712	100.00%	230,241	100.00%

Findings

- Large truck-related crashes are, in general, more severe compared to non-large truck related crashes because of the dynamic energy created by the mass/weight of these vehicles.

- Large truck-related fatal crashes (182) for year 2004 were 8.4% of vehicle involvement but accounted for (198) 12.72% of fatalities an increase of 22% large truck-related fatalities over 2003 in North Carolina.

- (1) out of (8) traffic fatalities in North Carolina in 2004 resulted in a collision involving a large truck.

Commercial Motor Vehicles by Type

Commercial motor vehicles are comprised of a number of different types and sizes of vehicles. Commercial motor vehicles for this report are defined as trucks with a GVWR of 10,000 lbs. or more. Table 10.B breaks down the vehicles by type and crash involvement.

Table 10.B Type CMV by Crash Involvement

	2003		2004		
CMV Type	Number	Percent	Number	Percent	Total
2 axle, 6 Tire	4440	32.09%	4575	32.32%	9015
3 Axle	1698	12.27%	1780	12.57%	3478
Truck/Trailer	2010	14.53%	2014	14.23%	4024
Tractor	353	2.55%	320	2.26%	673
Tractor/Semi-Trl	4878	35.26%	4977	35.16%	9855
Tractor/Doubles	128	0.93%	122	0.86%	250
Unknown CMV	329	2.38%	369	2.61%	698
Total	13836	100.00%	14157	100.00%	

Findings

- Tractors with semi-trailers are highly over represented in CMV crashes being over 1/3 of all CMV involved crashes in NC.
- 2 axle, 6 tire rank second in CMV involved crashes with just under 1/3 of the crashes.

Summary of Commercial Motor Vehicle Crash Findings

- The fatal rate in CMV involved-crashes is over 250% higher than non-CMV involved crashes.
- The Driver of the CMV is injured in about 8% of the CMV involved crashes, whereas occupants of other involved vehicles are injured over 31% of the time.

- CMV's are more likely to be involved in fatal multiple-vehicle crashes as opposed to a fatal single-vehicle crash, than were passenger vehicles.

- Of all large truck-related fatal crashes, 65% involved frontal impact of the large truck, which means that stopping distance of large truck was a factor.