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Module 3: Driver Inexperience and Driver Licensing, part I

Purpose:

To provide an overview of research on vehicle crashes and the effects of driver inexperience

Learning Outcomes:

Upon completion of the modules the participant will be able to:

- Recall typical crash rates for inexperienced drivers (primarily young drivers)
- Identify common causes of crashes (e.g., types of driver error)
- Discuss how driver skills and attitudes are developed through driving experience
- Identify challenges for new drivers in various driving environments and when sharing the road

Contents:

- A. Crash statistics involving novice drivers
- B. Common types of driver errors in crashes involving novice drivers
- C. How driving skills develop with experience
- D. Issues for new drivers in city vs. highway driving
- E. Common problems with other road users

Format:

1. Overhead Presentation

- General information on research regarding crashes and driver inexperience, particularly among young drivers

2. Group Discussion

1. List common types of driver errors encountered by traffic police officers in their work in China
 - passenger vehicle
 - motorcycles
 - heavy trucks
2. Identify the causes errors most closely associated with driver inexperience or age
3. Compare similarities and differences in crash types and causes typical in China with those reported for other countries

Crash statistics involving novice drivers

Although the most readily available crash statistics involve young drivers, publications report that inexperienced drivers of all ages are involved in crashes, for example in British Columbia, Canada:

- One in five new drivers is involved in a crash in the first two years on the road
- New drivers are almost twice as likely to cause a collision as experienced drivers

Research shows that many countries and organizations are concerned about crash rates of young drivers and the consequent cost in terms of financial and social costs. As stated in *Recovery* (Follis, 1997, p. 20),

“It’s difficult to put a value on the lost opportunities that a young person’s death represents, or the pain and suffering for the thousands of non-fatal injuries incurred. We know, however, that injuries and deaths among youth carry high social costs for families and high financial costs for our health-care system. The provincial Office of Injury Prevention reports that ‘a young person suffering a serious brain injury in BC can easily incur injury costs over \$1 million in a lifetime.’”

The following crash statistics provide examples of typical crash rates across jurisdictions for passenger vehicles, motorcycle and heavy vehicles:

Canada

- A 1999 report stated that at least one teenager dies in crashes on Canada’s roads each day. (Canadian Press)
- In British Columbia, 33% of all crash-related deaths and injuries are sustained by people between 13 and 24 years of age. In an average week, the toll of injured young people is enough to fill 8 classrooms; in one year, it could fill 10 secondary schools. (Follis, 1997, p. 20)

Australia

- More than 30% of road deaths and injuries in the ACT involve drivers aged 17 to 25 – an age group that accounts for only 15% of the population (ICBC Road & Safety News, 2000)
- Over the ten-year period 1987-1996 in Western Australia (The Way Ahead, 1998, p. 10),
 - 36% of all drivers killed or seriously injured were aged 17-24 (16% of these were aged 17-19 and 20% were aged 20-24).
 - Of the 17-24 age group of drivers killed or seriously injured, males (59%) were more likely to be killed or seriously injured than females (41%).

- 17-24 year old motorcycle riders account for 43% of all motorcycle riders killed and 41% of all motorcycle riders seriously injured.
- Most of crashes [involving commercial vehicles] involved rigid trucks (56%), and a smaller number (29%) involved tractor-semi-trailers; a relatively small percentage of all crashes (24%) involved long-haul vehicles. Most crashes involved smaller delivery trucks. (Sweatman, 1995, p. 161)

United Kingdom

- In 1998, 8,657 people were killed or seriously injured in accidents involving at least one young car driver. This represents 20% of all fatally and seriously injured casualties in Great Britain.
- Car drivers aged 17 to 21 account for 4.4% of license holders, but represented 13% of all car drivers involved in accidents.
- Of all fatalities in accidents involving young car drivers, 71% were car occupants, of whom 57% were drivers. 77% of car drivers killed in these accidents were the young drivers themselves.
- More than one in four young drivers involved in accidents lost control of the vehicle, and when involved in accidents on slippery road surfaces, 35% lost control, compared with an average of 20% for other drivers. One in twenty young car drivers involved in accidents on any road surface condition overturned their car.

(Source: Factsheet 6, 1998)

United States

- Motor vehicle crashes are the leading cause of death for people from 15 to 20 years old
- In 1999, 15% of all drivers involved in fatal crashes were young drivers 15 – 20 years old, and 18% of all the drivers involved in police-reported crashes were young drivers.
- In 1999, 21% of the young drivers who were killed in crashes were intoxicated.

(Source: Traffic Safety Facts, 1999)

Common types of driver errors in crashes involving novice drivers

Novice drivers are typically involved in similar types of crashes across jurisdictions, as demonstrated by examples from Australia and Sweden.

Types of Passenger Vehicle Driver Errors

Australia

Novice drivers in Australia are reported to face a significantly higher risk of being seriously injured than experienced drivers. The major contributing factors to this greater risk are (*The Way Ahead*, 1998, p. 9):

- A tendency among the age group to take risks
- A less well-developed ability to process information
- A lack of skills resulting from a lack of driving experience.

The Australian publication provides statistics about causal factors of crashes for drivers 17-24 years in the same ten-year period (pp. 24-25):

Causal factors of crashes resulting in drivers aged 17-24 years being killed or seriously during the ten-year period 1987-1996.

Speed

32 percent of 17-24 year old drivers were killed or seriously injured where speed was determined to be a contributing factor. Speed as a pre-crash causal factor is assessed by the attending police officer and relies on information supplied by those involved in the crash, witnesses to the crash or other indicators.

Not wearing seat belts

Of **all** drivers killed or seriously injured know to be **not** wearing seat belts, 44% were 17-24 year olds.

- 35% died;
- 9% were seriously injured.

Seat belt use by injured drivers is obtained from the attending police officer and recorded based on best available 'evidence'.

Alcohol

Of the know Blood Alcohol Content levels of 17-24 year old drivers killed or seriously injured:

- 33% of 17-19 year old drivers were 0.05 – 0.15+.
- 36% of 20-24 year old drivers were 0.05 – 0.15+.

Reliable information on the know BAC of killed or seriously injured drivers has only been available since 1995. Statistics for 1995 and 1996 show the number of drivers killed or seriously injured was 628.

Gender

The ratio of male to female driver deaths was calculated to be:

- 2.6:1 for those aged 17-19 years;
- 2.7:1 for those aged 20-24 years.

Location and Type of Crash

Of the 17-24 year old drivers killed, 66% crashed in rural areas, and 34% in metropolitan Perth. Nearly double the number of 17-24 year olds die in single-vehicle crashes, than die in multi-vehicle crashes.

- **Time of Day**
The time of day that 17-24 year old drivers are most likely to be killed and seriously injured was the period between 3:00pm and 3:00am. 20-24 year old drivers are more likely to be killed between 3:00pm and 6:00pm. Male drivers are more likely to be killed between 9:00pm and 3:00am, whereas female drivers are more likely to be killed between 3:00pm and 9:00pm.
- **Day of the Week**
Friday, Saturday and Sunday are the days of the week when 17-24 year old drivers are most likely to be killed and seriously injured. Females aged 17-19 years show a higher proportion of deaths on Fridays and Sundays, whereas Saturday is higher for males in this age group. Males aged 20-24 years show a higher proportion of deaths on Fridays and Saturdays, whereas Sunday is higher for females in this age group.

*All data obtained from *A Review Of Selected Road Crash Statistics by Age of Road User: Western Australia 1987-1996*. Report from Road watch, University of Western Australia.

Sweden

An inquiry into reasons for a relatively high risk of novice drivers injuring themselves or others in traffic showed that younger drivers are involved in a greater number of accidents than their older counterparts (SNRA, 2000). This is shown dramatically in the figure included in an article published by the Swedish National Road Administration:

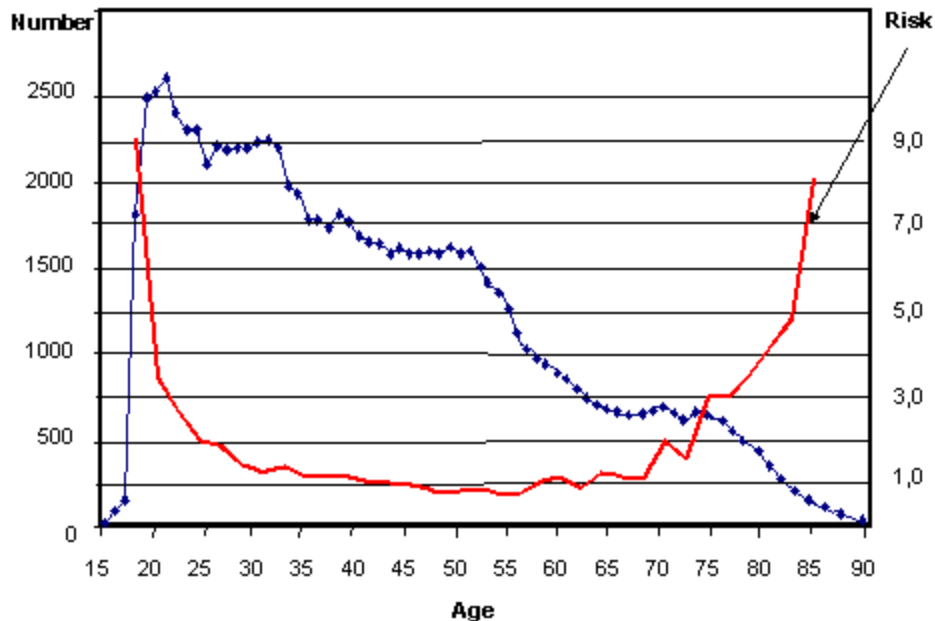


Figure 1: Number of drivers in accidents involving injury and the relative risk (accidents / distance travelled) at different ages. Results from two different studies compiled into one diagram to facilitate comparison (STEFUS, 1999)

The article continues, offering an explanation for this situation:

The social lifestyle of young *newly licensed drivers* makes them particularly vulnerable. Accidents involving young drivers often driving at night on weekends. These are often single vehicle accidents having high speed as a contributory factor. Several passengers are commonly found in the car. The drivers are often young men, and cars are usually of an older model. The injuries in accidents where young people are involved are often more serious due to the fact that many neglect to use their seat belts and the cars are often older with fewer built-in safety features. While driving under the influence of alcohol does not appear to be common, those young drivers who actually have consumed alcohol are subjected to a considerably greater risk than impaired drivers in other ages (Gregerson, Nils, 1996).

The SNRA article also reports that newly licensed drivers are also involved in fatal accidents where one vehicle is overtaking another or accidents involving pedestrians (p. 4):

Two-thirds of those accidents causing injury that happen *during practice driving* occur on roads where the speed limit is 70 km/hr. or more. The most common kinds of accident are either rear-end collisions or those that occur at intersections. Nearly all accidents causing death that happen while practice driving have been on country, national or European highways where [high] speeds are involved. Single vehicle accidents and head-on collisions are the most common type here.

Canada

An article by John Vavrik lists common explanations why young people as a group have a higher proportion of crashes than other drivers (1997, pp. 4-7). Vavrik highlights the following common explanations for new driver involvement in crashes such as those identified above:

- Lack of knowledge
- Lack of experience
- Optimism/pessimism
- Underarousal/overarousal
- Social deviance
- Chronic sleep deprivation
- High exposure

Adolescents at Risk

To stop young people from having more than their fair share of crashes, we must understand the underlying dynamics in risk taking and adolescence, says ICBC psychologist John Vavrik.



John Vavrik, PhD

JOE NEEDS TO pass other drivers constantly to feel he's "getting ahead." Every vehicle in his path is both a nuisance and a challenge. He likes to "ride their tails" in order to "send the guy a message": Move over and get out of my way.

To Joe, this is good aggressive driving; it gives him a thrilling sense of power. Joe is 19 years old and has two speeding violations and two at-fault crashes.

To anyone crossing his path, Joe reinforces the stereotypical image of adolescent male drivers as impulsive, testosterone-fuelled, thrill-seeking yahoos who ignore and evade the law and wreak havoc on our streets. After encountering Joe -- or someone like him -- older people often demand that the authorities or the politicians "do something" about young drivers.

The adults responsible for doing this "something" have a difficult task. They first need to determine whether Joe is a typical young driver.

The answer is no. Although there are more drivers like Joe in the 16- to 25-year-old age group than in any other age bracket, crash rates vary widely among adolescent subgroups, and overall, the vast majority of young drivers are crash-free.

Nevertheless, why do young people as a group have more than their fair share of crashes? The answer depends on whom you ask, and since quality data are lacking, the answer usually reflects the respondent's ideology. The more common explanations include the following:

Lack of knowledge: Lack of knowledge of roadway rules and regulations may appear to be a plausible explanation for young drivers having more crashes, but no evidence has been assembled demonstrating that their knowledge actually differs from that of the rest of the driving population. Besides, crash statistics as a whole do not show any correlation with level of knowledge.

Lack of experience: Unlike knowledge *per se*, being new to the road (whether young or not) does correlate with increased risk, and so inexperience probably accounts for many youth crashes. Inexperience often manifests itself in poor recognition of hazards, a key factor in many crashes.

Optimism / pessimism: Some researchers have theorized that young drivers are overly optimistic, believing themselves to be unique and thus invincible: the "it can't happen to me" syndrome. Others have suggested, however, that pessimism is the problem: that young people who suffer from anxiety and depression are at greater risk of having a crash and in extreme cases may use their vehicle in a suicide attempt.

Underarousal / overarousal: According to the proponents of "underarousal theory," people of all ages strive to maintain an optimum level of arousal. Individuals whose neuropsychological system tends to inhibit or reduce their reaction to normal environmental stimuli compensate for this diminished neural activity by actively seeking arousal-provoking stimuli -- for example, by driving more dangerously. Inconsistent data have been cited to support this theory. No data have been assembled to support a contrary theory on overarousal: that high crash risk is related to high sex drive coupled with low impulse control.

Social deviance: Psychologists have suggested that dangerous driving among young people arises when three factors converge: a minimal respect for law and order, a willingness to engage in petty theft, and a tendency to break the rules of the road. The evidence cited to support this egocentric pattern, however, is not limited to the adolescent population.

Chronic sleep deprivation: Most people chronically get less sleep than they require, particularly young people. Although sleep deprivation might well correlate with crash propensity, the hypothesis requires further study.

High exposure: Looking at the minority of young drivers responsible for crashes reveals that many of them actually drive more. In other words, their higher exposure to risk likely accounts for a significant portion of the incidents they cause. Following this logic, youth can be kept out of trouble by grounding them -- which, in effect, largely explains why graduated licensing programs tend to work. Of course, by following this logic to the extreme, even greater safety benefits could be realized if we restricted the driving privileges of the entire driver population.

Of all the explanations described above, inexperience and high exposure provide the most compelling, and most frequently cited, arguments. Neither, unfortunately, can account completely for the adolescent over-representation in crashes. Consequently, safety programs relying solely on some form of driving prohibition provide only a partial solution.

We still lack an adequate understanding of why many young people (and a good many older drivers as well) willingly engage in risky activities that result in harm to themselves or others. We can gain a clearer understanding of risk taking by first looking closely at what is meant by risk itself.

Risky benefits

Risk can be visualized as a combination of (a) the probability that a particular event will occur -- such as having a crash, making a good impression with friends, or winning the lottery -- and (b) the costs or benefits associated with that event.

Interestingly, problems with the first part of the equation -- an inability to estimate crash likelihood -- do not explain young people's propensity to take risks. Adolescents tend to over-estimate some probabilities and underestimate others. But overall their estimates appear similar to those of older drivers -- with one notable exception. As mentioned above, inexperienced young drivers often fail to recognize some road or traffic-configuration hazards.

On the whole, however, risk taking by young people results not so much from poor perception of probabilities as from skewed perceptions of the associated costs and benefits of risky behaviour (the second half of the risk equation). But it's not in the costs where the problem lies. Market research suggests that younger as well as older audiences perceive the costs (particularly the human costs) of crashes. Therefore, it's in how they perceive the *benefits* of risky driving that younger and older drivers appear to differ most critically.

Risk taking plays a key role in a young person's adaptation and development in life. Indeed, adolescence is a physical, intellectual, social, and moral transition during which familiar perspectives and values are abandoned for new, less secure but ultimately more adaptive world views.

An adolescent's evolving world view rests fundamentally on his or her self-image as a competent, autonomous individual. To develop competence and independence, young people need to experiment, explore, and test their environment and their limits. In our culture, young people during their adolescence develop a balance between themselves and others, gradually achieving a sense of individual identity and autonomy.

Also in our culture, males generally strive towards attaining independence and autonomy more than females do. Women tend to become socialized and to develop their identities based more on interdependence. This may partly explain why young males have much higher crash rates than young females. In traffic, as in other aspects of life, people adapt and survive better through cooperation than through competition.

Because some level of risk taking is essential for healthy development, when adolescents lack opportunities to take risks or when they avoid them in one area of their life, they may compensate by taking extra risks in other, less appropriate areas. This may explain why, paradoxically, many young drivers who take undue risks on the road often avoid challenges off the road.

Young people who lack adequate amounts of constructive risk-taking may also compensate by substituting symbols of competence for actual competence. In effect, they choose to establish their identities through symbolic artefacts and behaviours -- like speed, performance, and zippy-looking cars -- which our culture construes and legitimates as representing competence, independence, and control ("you are what you drive").

Moral reasoning

The fundamental dynamics at work in adolescent development are not of just academic or theoretical interest. They have critical implications for our efforts to improve adolescent driving.

For example, given adolescent development in our culture, it makes more sense to focus on the motivations for risky driving than on the consequences of crashes. Most young people already know what can happen when vehicles collide.

Intervention programs should strive instead to make people recognize and question what drives them to take risks in the first place. Our communication and educational strategies need to focus on dismantling the appeal and credibility of risk-enhancing symbols (like fast-looking cars) and the risk-taking behaviours (like speeding) that they represent.

We must also recognize that the physical and intellectual development during adolescence is paralleled by a development in moral reasoning. This process can be made considerably easier for young people if society clearly and consistently communicates its own values and norms. The legislative policies concerning risky driving, therefore, should be uncompromising, unambiguous, and fair, applying the same standards for all drivers.

In the course of broadening their moral reasoning, adolescents are highly motivated to explore, test, and debate moral and legal issues. We need to take advantage of this all-too-brief openness and receptivity and give youth ample opportunity to participate in debating the rationale and content of the proposed policies and initiatives directed at them.

As parents, teachers, counsellors, employers, and policymakers, we need to provide more opportunities for young people to take risks that enhance their development, not those that terminate their lives. At the same time, we need to consider the possibility that by preventing them from taking a risk (by, say, restricting their driving) we may also raise its symbolic appeal. We may want to keep them out of the driver's seat, but that's exactly where young people want to be.

Clearly, the issues are very complex. There are no magic bullets and no quick fixes. But to reduce the over-representation of young people in crashes, we also need to take some positive risks.

We need to commit ourselves to long-term, in-depth research and to the development of programs that are founded on a deeper understanding of the dynamics of adolescent risk taking. Going for simplistic or safe interventions may avoid crashing our good intentions, but these do little to stop many young people like Joe from crashing their lives.

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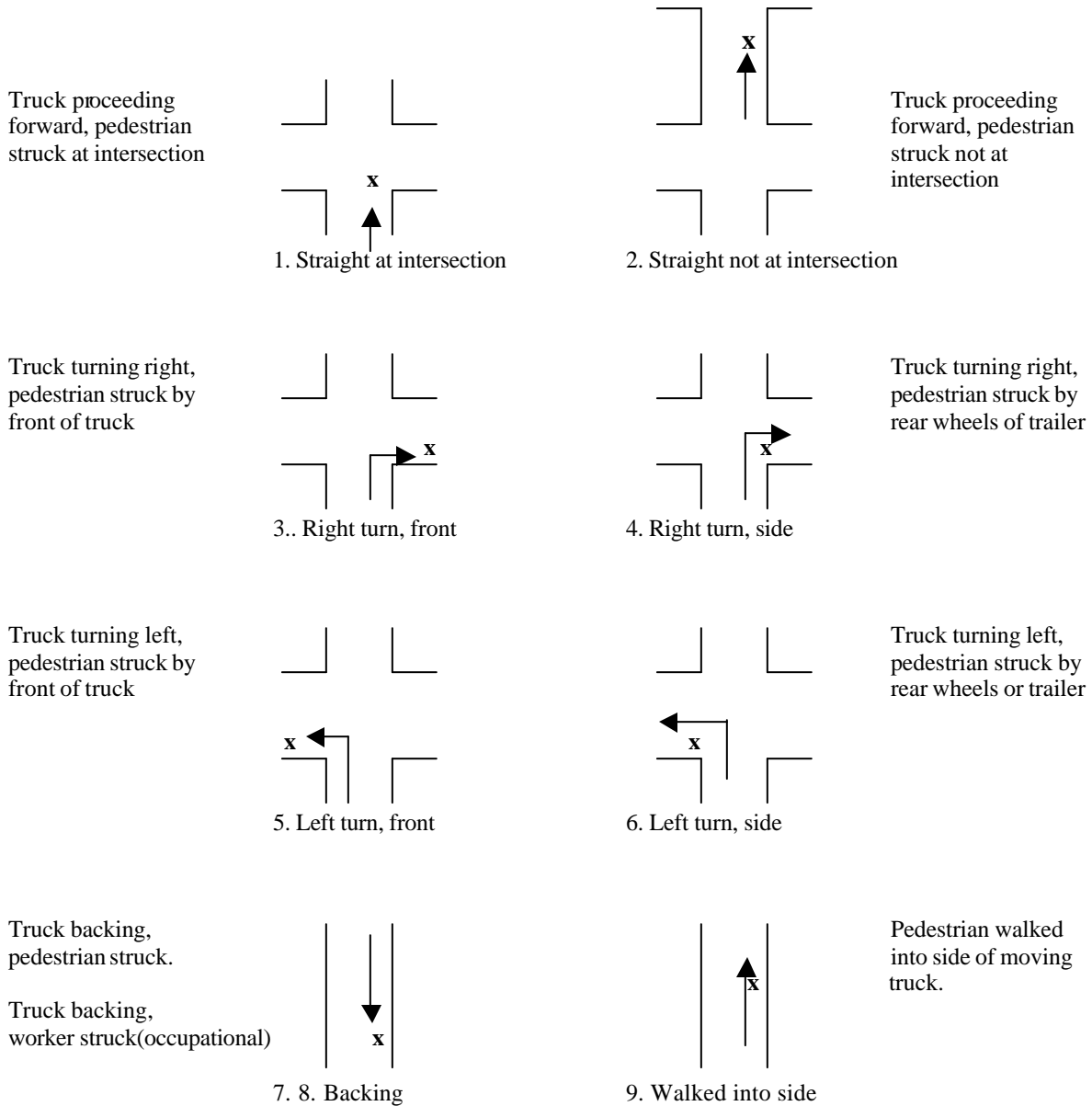
Types of Heavy Vehicle Driver Errors

United States

A study in 1993 analyzed crashes between pedestrians and large trucks which were fatal to the pedestrians in four American cities (Chicago, Los Angeles, New York, and Philadelphia) in the years 1986-90 (Retting, 1993). The study found that 51% of pedestrians killed in collisions with trucks were over 60 years old, compared with 37% killed in collisions with other vehicles. The major contributing factor in crashes at intersections was obstruction of truck driver visibility, caused by the design of truck cabs.

As truck/pedestrian crashes at intersections are of particular interest in China, Retting's typology of crashes is reproduced below.

TRUCK/PEDESTRIAN CRASH TYPOLOGY



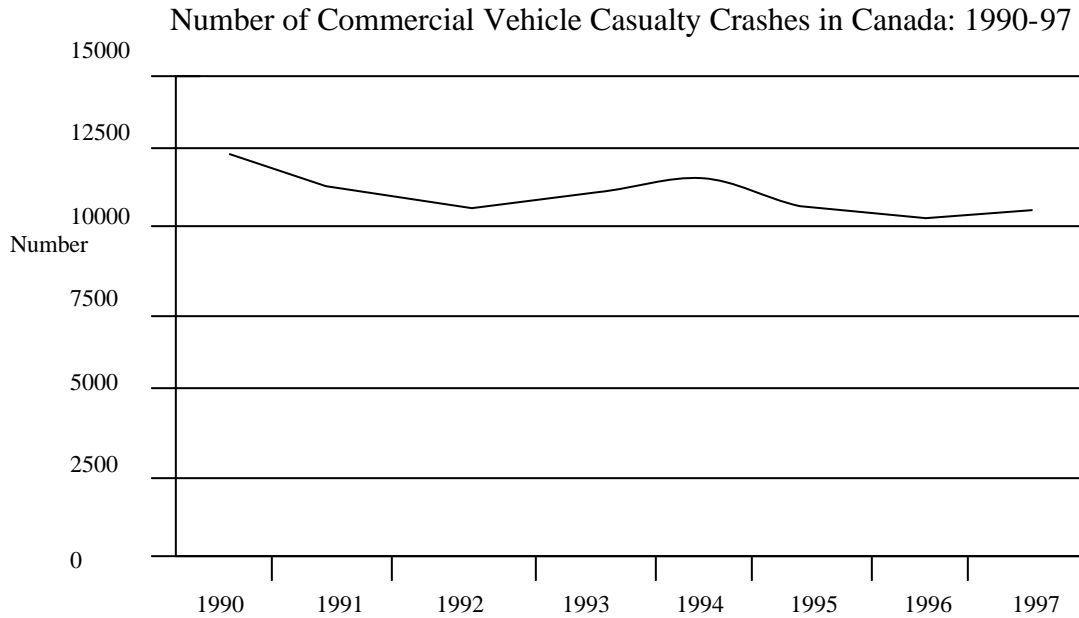
Source: Retting, 1993

Canada

The first six conclusions of a major study regarding truck driver crashes in Canada (Christie and Mayhew's, 1999, p. ii-iii) are:

1. Commercial vehicle safety in Canada has generally improved over the past decade – the number of commercial vehicle casualty crashes has declined and the relative contribution of commercial vehicles to all casualty crashes has remained stable, despite increases in travel by commercial vehicles.

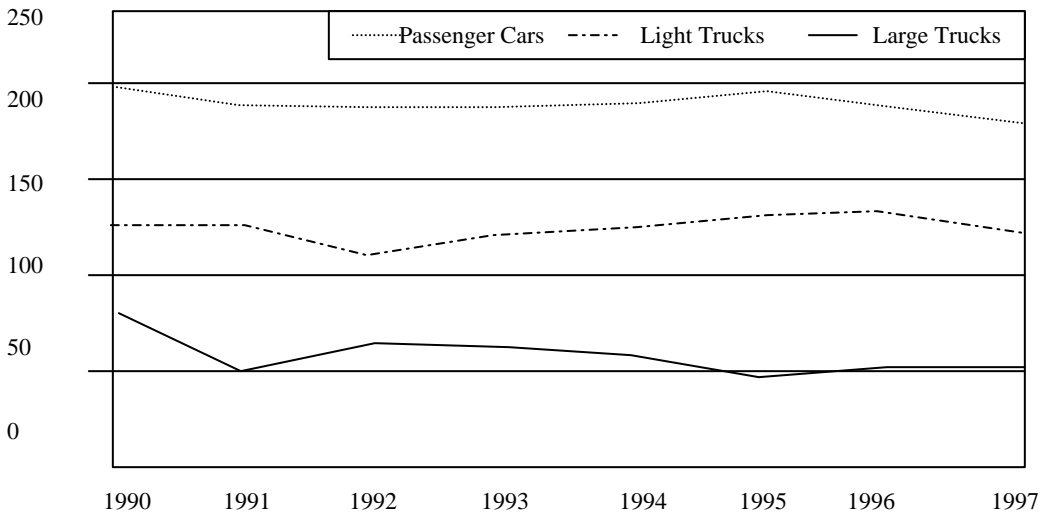
The authors also report (p. 13) that this a slightly greater decrease has occurred in the number of other (principally, passenger vehicles and motorcycles) motor vehicle casualty crashes over the eight-year period, and that the downward trend is similar to that reported in the USA and Australia.



Source: Christie & Mayhew, 1999, Pg 13

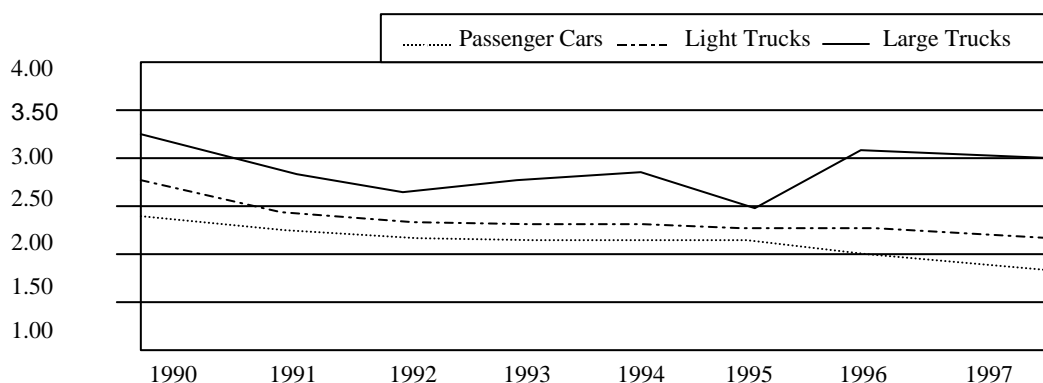
2. Commercial drivers are at fault in less than one third of crashes involving trucks/buses and other road users – most at fault crashes involved failing to give way and loss of control.

Vehicles in Injury Crashes per 100 million Vehicle Miles Travelled: United States, 1990-1997



Source: Christie & Mayhew, 1999, Pg 22

Vehicles in Fatal Crashes per 100 million Vehicle Miles Travelled: United States, 1990-1997



Source: Christie & Mayhew, 1999, Pg 21

3. Young, inexperienced commercial drivers are over-represented in truck crashes – three to four times the rate per distance traveled of older drivers.
4. Young US truck drivers in crashes have problems of: overly aggressive driving, as in following other vehicles too closely, unsafe speed; vehicle control, as in speed, turning and backing accidents; and attentional deficits, as in some loss of control accidents.
5. Young Canadian bus, heavy truck and tractor-trailer drivers are involved in crashes that differ from older, more experienced drivers – e.g., more single vehicle crashes – that could be attributable to relative inexperience (lack of skills/knowledge) and/or risk-taking behaviours).

The authors also report (page 24-25),

- In the United States 16-19 year old drivers have a crash risk per mile four times that of older drivers.
- In Australia, the relative risk of young drivers is two to four times higher than that for older drivers.
- Only one study has compared the crash rates of young and older bus drivers. In a comparison of the driving performance of 54 bus drivers, researchers found that younger drivers had higher accident rates than older ones. Their findings also indicated an increase in crash risk in the second year of employment.

Extensive analysis of crash data shows that the majority of drivers operating buses, heavy trucks and tractor-trailers were involved in the following types of collisions regardless of age (p. 27):

- Property damage only
- Multiple vehicle

- On a weekday
- Between 6 am and 6 pm
- In normal weather conditions
- In daylight
- At an intersection
- On undivided roads
- On dry road surfaces
- On straight roads
- With an moving object

In addition, the majority of bus and heavy truck drivers are involved in crashes on roads with a posted speed limit of 50-70 km/hr and in urban locations. Tractor-trailer drivers are more likely to crash on roads with a higher speed limit and in rural locations than bus and heavy truck drivers.

How driving skills are developed with experience

This section focuses on driver inexperience, one of the key factors perceived to contribute to new driver vulnerability in crash situations.

Type of skills developed for driving

Young drivers tend to have less-developed driving skills. The term “skills” includes perceptual and cognitive skills, and attitudes/motivations, as well as psychomotor (vehicle handling) skills. A BC review of the research into the causes of crashes (MacLean, p. 2) showed that

Novice drivers often exhibit inadequate reception and processing of relevant information pertaining to the driving task. As a result, they demonstrate less efficient use of visual scanning, longer fixations, and do not look far enough ahead. They also make less use of peripheral vision, use the rear view mirror less and use it at less appropriate times. Inexperienced drivers are more likely than those who are experienced to miss seeing hazards, especially those that are more distant, and tend to take longer to notice them. They also tend to pay attention to non-moving hazards often at the expense of more important moving hazards associated with changing traffic situations. They are less able to integrate various sources of hazards or risk into an overall assessment of a situation, and tend to assess levels of risk within a narrower range. This is likely due to a poorly developed ability to discriminate between different types and levels of risk.

While it is true that inexperienced drivers involved in accidents are more likely to have been traveling at excessive speed than more experienced, accident-involved drivers, vehicle control skills also develop more quickly than the perceptual abilities required for safe driving. MacDonald (1987) contends that as drivers perceive their control skill increasing, their confidence increases and they increase their speed accordingly, without making due allowance for their relatively

undeveloped perceptual and cognitive skill. An overestimation of one's control skills may motivate inexperienced drivers to accept higher risk in some situations, and it is likely to be a major contributor to speed related crashes involving novice drivers.

Theory of skill development

Nils Petter Gregersen of the Swedish National Road and Transport Research Institute provided some insights into the theory of how skills are acquired. According to Gregersen,

The Swedish model, which lowered the age limit, was designed to enable learner drivers to practice more and thus to increase their experience behind the wheel before they are left alone as drivers. The hypothesis was that this increased experience would also lead to a reduction in accident involvement.

In 1984 [Rasmussen] described three stages of behavioural control, the knowledge based, the rule based and the skill-based level. The essence of the theory, when applied to driving is that a development takes place from initial conscious problem solving through gradual construction of mental rules to automation and reduction of mental workload. In the process the driver will become more and more familiar with traffic situations, construct rules of how to behave and through the automation release mental capacity for tasks that are important for safe driving such as co-operating with other road users, predict oncoming traffic situation, etc. (VTI 2000, p. 1)

Relationship between experience and safe driving practices

An article by A. James McKnight (1995, pp. 35-40) provides an overview of current research into the relationship between experience and safety of motor vehicle operation.

McKnight explains that “a convenient classification of the [some of the] driver characteristics that mediate between driving experience and the safety of operation is one that divides the characteristics into: *knowledge*, *skills*, and *beliefs*.” He concludes his article by summarizing the relationship of driving experience to safety:

What seems to improve more with experience:

Accident Avoidance	Mileage-adjusted accident rates decline over several years of operating experience, independent of age.
Visual Search	Exposure to hazards may contribute to knowing where to look for hazards; routinization of vehicle control and maneuvering may allow attention sharing.
Spatial Perception	The ability to judge distances, closure, curves increases with continued exposure.
Hazard perception	Repeated exposure to hazard may facilitate quick recognition of imminent dangers.

Practiced advanced skills	Frequent experience in rapid braking and braking on slippery surfaces develops emergency braking skills.
Beliefs	Exposure to the rigors of the highway – traffic environment, real and simulated, paves the way for acceptance of safety practices.

What seems to improve less with experience:

Traffic Violations	Mileage-adjusted traffic violation do not vary consistently with experience. The decline in accidents with experience seems less attributable to driving by the rules than to being better able to cope with driving outside of them.
“Book” Learning	Knowledge of laws, procedures, and principles is acquired prior to driving.
Basic Skills	Controlling and maneuvering a vehicle is learned very quickly.
Unpracticed Advanced Skills	Infrequent experience in evasive steering and other infrequently performed maneuvers does not appear to develop emergency response skills.

(Source: Adapted from McKnight, 1995, p. 40)

Issues for new drivers in city vs. highway driving

Some of the differences between driving in the city and the country have been noted by researchers.

For example, of the drivers/motorcycle riders killed or seriously injured in the Perth metropolitan area in the ten years to 1996, 34% were aged 17-24. In country areas during this period, 39% were aged 17-24. Of 17 – 24 year old drivers killed, 66% crashed in country areas (The Way Ahead, 1998, p. 11). In country areas, the most common elements in road crashes for drivers/motorcycle riders in this age group are:

- Single occupant of vehicle
- Vehicle running off the road due to:
 - Excessive speed
 - Reckless driving
 - Fatigue
 - Alcohol
 - Not wearing a seat belt

In metropolitan areas, the most common elements are:

- Multi-vehicle crashes
- Higher passenger levels

Common problems with other road users

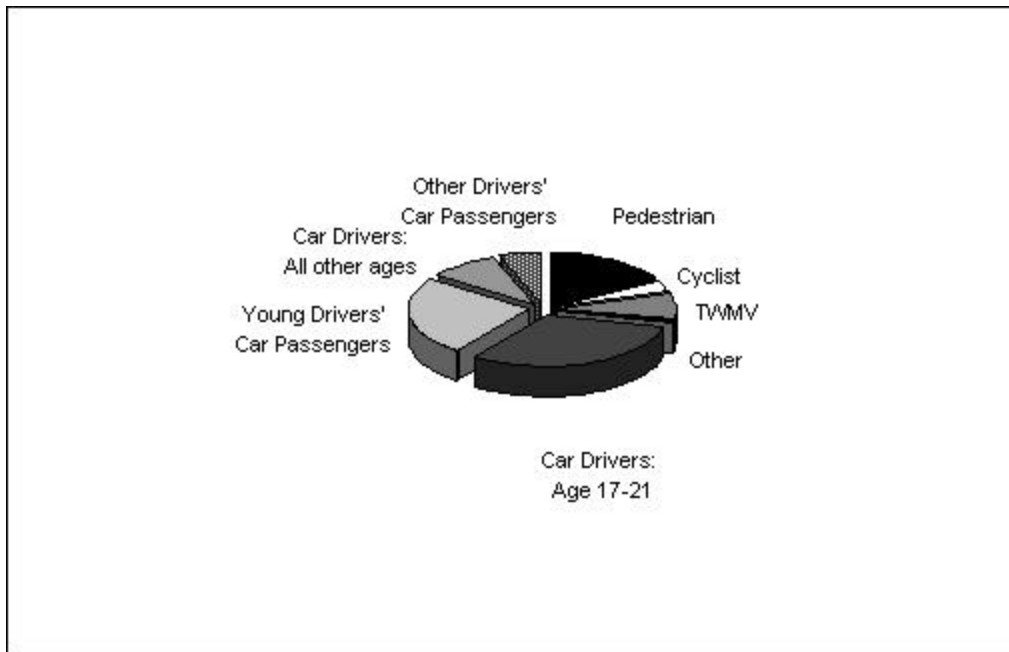
Problems with other road users, identified in one publication (ICBC, Road Sense for Drivers), are common across jurisdictions:

Pedestrians	Of all road users, pedestrians are among the most vulnerable. Drivers always need to watch out for them. Pedestrians, like all road users, can be unpredictable. You never know when a child might dash into the street, or someone might step out from behind a parked car. Pedestrians are often hard to see, especially at night.
Motorcycle Riders	Like cyclists, motorcycle riders are vulnerable road users. They don't have the protection of an external frame, air bags or bumpers, and are sometimes difficult to see.
Vehicles	Drivers interact with the drivers of cars, vans and small trucks. Drivers of passenger vehicles can be just as unpredictable as the other road users. They may not always look ahead. Their vehicles may not be well maintained; for example, their brakes and signal lights may not be working properly. And some drivers may be tired, impatient or impaired.
Trains	Most trains require approximately two kilometers to stop – drivers

should never try to cross the tracks when a train is coming.

Involvement of other road users in accidents involving young drivers in Great Britain was shown in a graph produced in a government factsheet:

Fatalities in Accidents Involving Young Car Drivers by Road User Type 1998



Source: Factsheet 6 (UK)

Slide 1

Inexperienced Drivers (any age) and Crashes

- One in five new drivers is involved in a crash in the first two years on the road
- New drivers are almost twice as likely to cause a collision as experienced drivers

Source: ICBC

Slide 2

Young Drivers and Crashes

BC	33% of all crash-related deaths and injuries are sustained by people between 13 and 24 years of age
Australia	More than 30% of road deaths and injuries in the ACT involve drivers aged 17 to 25 – an age group that accounts for only 15% of the population
UK	20% of all fatally and seriously injured casualties involved at least one young car driver
US	Motor vehicle crashes are the leading cause of death for people from 15-20 years old. In 1999, 21% of the young drivers who were killed in crashes were intoxicated.

Sources:

Canadian Press; The Way Ahead; Factsheet 6; Traffic Safety Facts

Slide 3

Causal factors of crashes

- Speed
- Not wearing seat belts
- Alcohol
- Gender
- Location and Type of Crash
- Time of day and Day of Week

Source: The Way Ahead

Slide 4

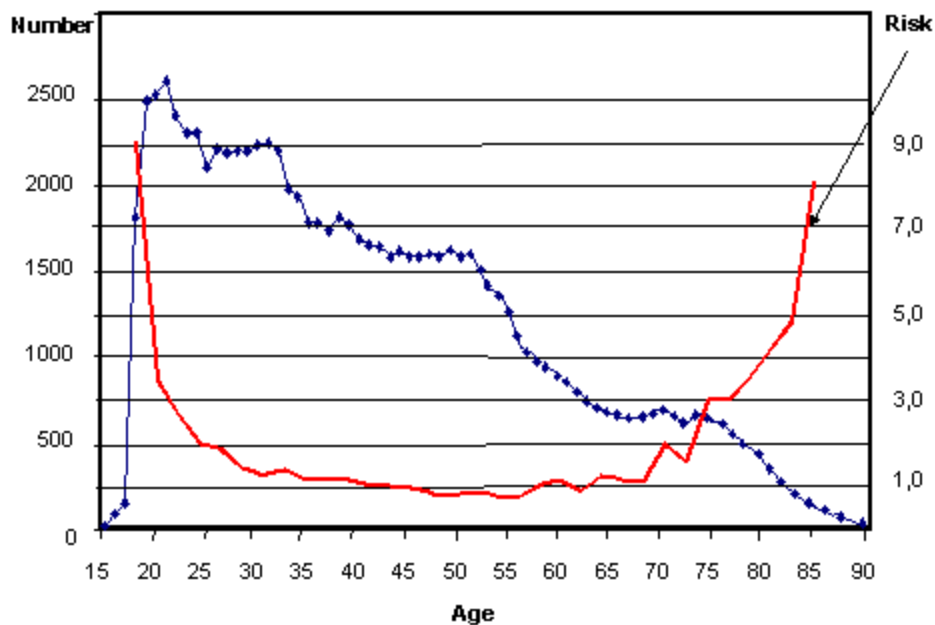


Figure 1: Number of drivers in accidents involving injury and the relative risk (accidents / distance travelled) at different ages. Results from two different studies compiled into one diagram to facilitate comparison (STEFUS, 1999)

Source: SNRA (2000)

Slide 5

Common types of driver errors in crashes involving novice drivers

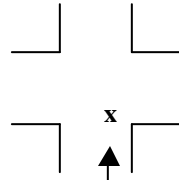
- Lack of knowledge
- Lack of experience
- Optimism/pessimism
- Underarousal/overarousal
- Social deviance
- Chronic sleep deprivation
- High exposure

Source: Vavrik (1997)

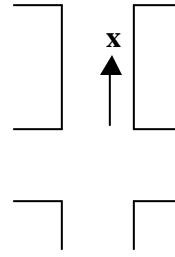
Slide 6:

TRUCK/PEDESTRIAN CRASH TYPOLOGY

Truck proceeding forward, pedestrian struck at intersection



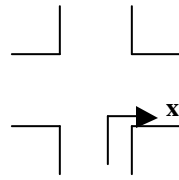
1. Straight at intersection



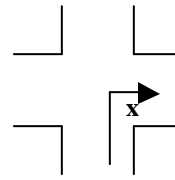
2. Straight not at intersection

Truck proceeding forward, pedestrian struck not at intersection

Truck turning right, pedestrian struck by front of truck



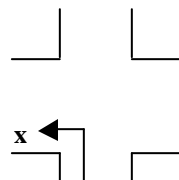
3.. Right turn, front



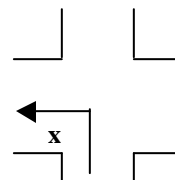
4. Right turn, side

Truck turning right, pedestrian struck by rear wheels of trailer

Truck turning left, pedestrian struck by front of truck



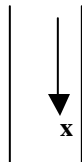
5. Left turn, front



6. Left turn, side

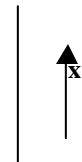
Truck turning left, pedestrian struck by rear wheels or trailer

Truck backing, pedestrian struck.



7. 8. Backing

Truck backing, worker struck(occupational)



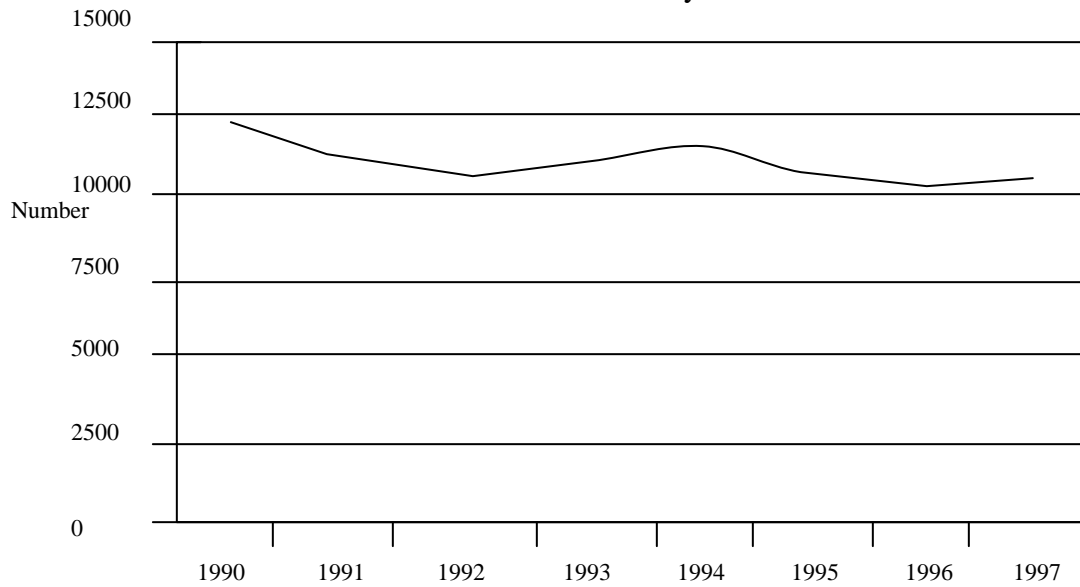
9. Walked into side

Pedestrian walked into side of moving truck.

Source: Retting, 1993

Slide 7

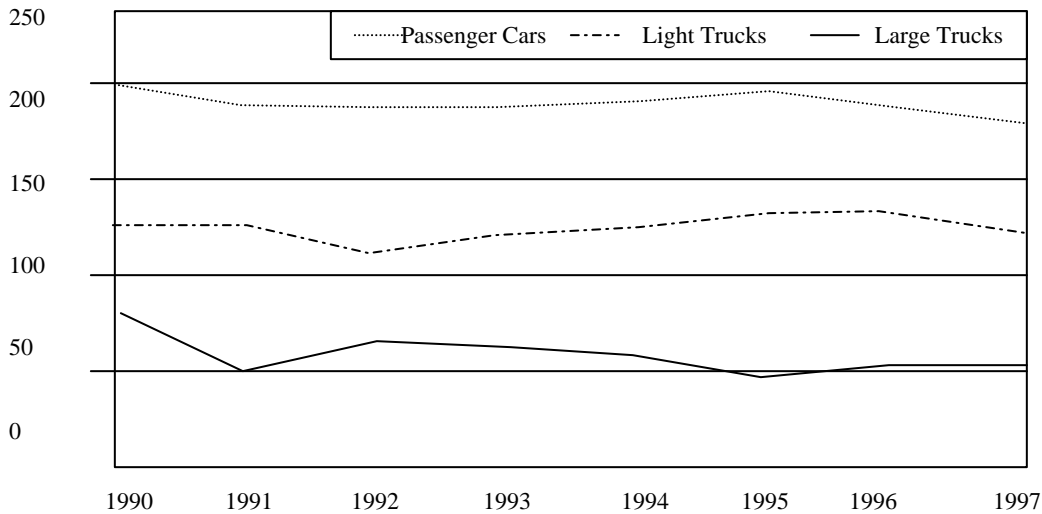
Number of Commercial Vehicle Casualty Crashed in Canada: 1990-97



Source: Christie & Mayhew, 1999, Pg 13

Slide 8

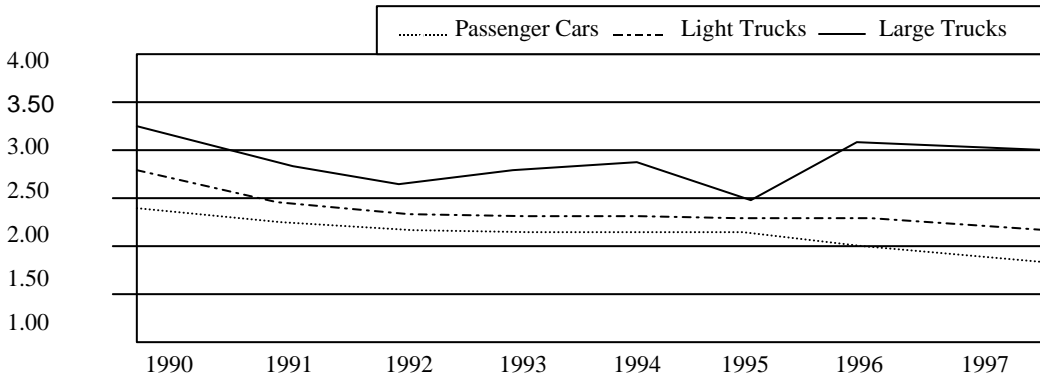
Vehicles in Injury Crashes per 100 million Vehicle Miles Travelled: United States, 1990-1997



Source: Christie & Mayhew, 1999, Pg 22

Slide 9

Vehicles in Fatal Crashes per 100 million Vehicle Miles Travelled: United States, 1990-1997



Source: Christie & Mayhew, 1999, Pg 21

Slide 10

Skills and aptitudes for safe driving

- Psychomotor Skills
- Perceptual Skills
- Cognitive Skills
 - Risk assessment
 - Decision making
- Attitudes and Motivations

Slide 11

Driving and Experience:

Improves more with experience	Improves less with experience
Accident Avoidance	Traffic Violations
Visual Search	“Book” Learning
Spatial Perception	Basic Skills
Hazard perception	Unpracticed Advanced Skills
Practiced advanced skills	
Beliefs	

Source: McKnight (1995)

Slide 12

Location and Crashes

Country	City
Single occupant of vehicle	Multi- vehicle crashes
<ul style="list-style-type: none">• Vehicle running off the road due to:<ul style="list-style-type: none">- Excessive speed- Reckless driving- Fatigue- Alcohol- Not wearing a seat belt	Higher passenger levels

Source: *The Way Ahead*

Slide 13

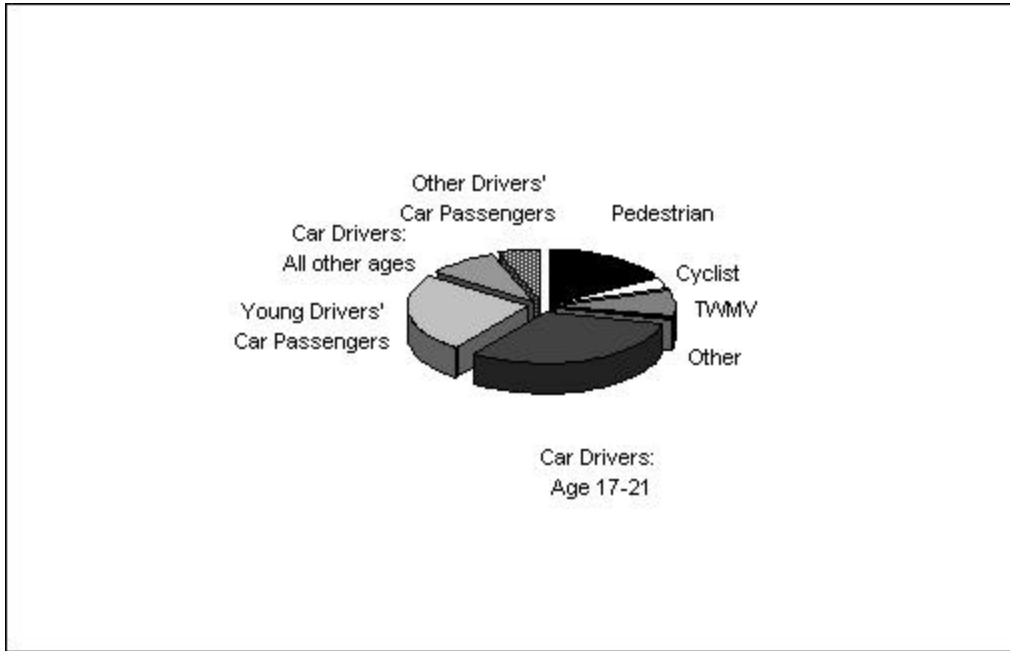
Problems with Other Road Users

- Pedestrians
- Cyclists
- Motorcycle Riders
- Vehicles
 - Cars
 - Vans
 - Trucks
- Trains

Source: *ICBC GLP*

Slide 14

Fatalities in Accidents Involving Young Car Drivers by Road User Type 1998



Source: Factsheet 6 (UK)