Traffic safety: the Flanders integrated mobility management plan

E. De Winne
Faculty of Engineering, Ghent University, Belgium

Abstract

Traffic censuses are carried out to determine traffic parameters and to provide online information to supervise traffic flows, as well as the evolution coefficients for road traffic on Flemish regional roads and motorways.

Traffic safety in the Flemish region is compared with regard to the evolution of the number of traffic fatalities in Europe.

Road safety management initiatives are related to the most important three classic piles: the vehicle, the infrastructure and the road user.

A Flemish mobility plan in order to increase traffic safety and the decreasing number of victims has been developed as an integrated approach: risks, short and long term strategies, technological evolutions, traffic education, speed control measurements, influence by traffic lights, the problem of black spots, etc. taking into account ambitions until 2010.

Keywords: traffic censuses, traffic safety, traffic life-ability, road infrastructure, road safety management, mobility plan.

1 Introduction

Hereby some statistical information about the actual situation [2, 3]:

The graph shows the evolution of the fleet of cars and the evolution coefficients for road traffic in Flanders for regional roads (N-roads) and motorways (A-roads) in Flanders:
- 2000: 295 passenger cars/km² (465 passenger cars/1000 inhabitants); it is a little lower than the European average.
- 2002: about 3.5 million vehicles were registered, of which 2.8 million are passenger cars.

In comparison with 1990, it is increasing by about 25%.
Figure 1: Evolution of the fleet of cars per type of vehicle and the road traffic per type of road.

Figure 2: Number of victims per 100,000 inhabitants (EU) [1] - Evolution of the number of victims relating to the seriousness of injury and the number of injuries [5].
The number of commercial cars increased by 45% between 1990 and 2002 until about 400,000 pieces. The number of trucks, especially, has increased in recent years.

Every year, road traffic is increasing. In 2002 road traffic increased by 1.4% on regional roads (N-roads) and by 1.7% on motorways (A-roads). Between 1990 and 2002 road traffic increased on regional roads (N) by 28% and on motorways (A) by 40%.

2 Traffic safety

Since 1995, the number of injuries as well as the number of victims, seriously and slightly injured people decreased.

In 2001, 32,073 accidents were registered (-2.9% compared to 2000). The number of victims decreased by 3.6%; the seriously injured by 9.6% and slightly injured people by 2.6%.

Since 1990, the number of accidents and victims decreased by about 19%. The number of seriously injured people decreased by about 25%. The lowest decrease is registered for slightly injured people: a reduction of about 12%.

3 Subjective traffic unsafety

Important is:
- showing maladjusted speed behaviour;
- aggressive traffic behaviour;
- noise pollution due to traffic (from 6th place in 2000 to 4th place in 2002);

In 2002, 39.8% of people expect to be victims of injury (accident, aggression, flee) in the next 12 months (a decrease of 4% compared with 2000).

4 Reachability

During weekend traffic, the peak levels are comparative with the peak levels during weekdays, but with a shift of the peak level in the morning as well in the evening.

Some figures:
Congestion is due to:
21% home-work traffic
31% recreation traffic
19% shopping traffic

At the evening peak level: 62% for the total traffic
69% for the home-work traffic

Average occupancy was in 1990: 1.46 person/car
2002: 1.37 person/car

Occupancy home-work traffic: 1.20 person/car
Potential amount of traffic: 205 passengercars/km². (largest of the EU)
Modal split using the road:
- freight transport: 70.0% ton x km
- passenger transport: 77.5% persons x km

Growth market share on the way during 30 years:
- freight transport: 23.9%
- passenger transport: 13.5%

Figure 3: Modal split passenger transport – modal split freight transport [2, 4].

Mobility behaviour: (= accept to let the car in the parking place / garage)
- 16 – 24 year: a decrease by 10% since 1996
- 24 – 34 year: less willingness not to use the car and a decrease by 10% in the period 1996-2003.
- 25 – 54 year: this professional group doesn’t use so much public transport.
- > 55 year: is more interesting to use public transport.

Carpooling: the group between 25 – 34 year is less interested but promotion actions could influence their behaviour.

5 Movement possibilities

Basic mobility means that everybody must have the possibility to move and to participate on a normal way at social life. Some figures:
- Means of transport ownership (2001):
  - Bicycles: 78% are owners of min. 1 bicycle per family
  - Motorbike: ownership increased by 1.3% in the period 1991-2001
  - Motorcycle: families represent 5.7% of owners (since 1991: increased by 171%)
  - Passenger cars: 80.6% of the families are owners of min. 1 car
    20.0% of families do not have a car
    22.4% of families are owners of min.2 cars
    2.8% of families are owner of 3/more cars
- Expenses for transport:
  - 10% of the family income is used for transport (in 2001: 12%)
  - The repartition is 42.0% to buy cars
    - 49.9% maintenance, reparations cars
    - 3.3% to buy bicycles
    - 4.8% public transport, and taxis

6 Traffic liveability and environmental pollution

![Graph showing the evolution of passenger and freight transport efficiency](image)

Figure 4: Evolution ECO – efficiency passenger transport with parameter persons x km and evolution ECO – efficiency freight transport with parameter ton x km [3].

7 Road safety management

To manage traffic safety, it is necessary to be more attentive for the three classic piles: road user, infrastructure and vehicle.

The government as well as the vehicle designers have already made a lot of effort towards safety and safety in infrastructure.
7.1 Safer traffic behaviour

- But it is important to change the driver’s behaviour by traffic education and driver experience, because most accidents with victims are due to this maladjusted behaviour.
- Traffic education, including attention for defensive driver behaviour and traffic policy; must be integrated in the education program of the basic school. Some aspects of effective driver education could make part of the lessons in the secondary level.
- E.g. new drivers, after having passed a first (driver) exam, receive a temporary driver license for two or three years. This time can be used to get driver experience. If more than three serious contraventions or once a time too exaggerated alcohol or drugs intoxication, the temporary driver license is withdrawn and the complete procedure must be repeated.
- After a period of two to three years, a last final exam is necessary to check the experience before getting the definitive driver license.

7.2 More safe infrastructure

- The use and control of variable maximum speed and the temporary and local decrease of the allowed maximum speed dependent on the traffic density.
- Increasing traffic safety by the construction of separated bicycle paths along routes for home-work traffic and introducing 30 (km/h) zones at school areas.
- Accelerate investments in order to eliminate the big number of ‘black spots’.
- More facilities for cyclists, pedestrians, children, seniors and disabled people concerning parking possibilities, bicycle racks and sheds, organising and stimulating of organised bicycle traffic, construction of and well maintained bicycle paths and foot paths, construction of sufficient rest points, construction of orientation points, measurements taking into account the ‘visibility of children’, elaborating a priority road network for pedestrians, etc…

7.3 Safer vehicles

- Decreasing taxes (TVA) for accessories for cars which increase safety.
- To establish an agreement with the car industry concerning the discouragement of publicity for new cars which allow irresponsible and too fast driver behaviour.
- To introduce speed limit apparatus for vehicles as well as promoting the intelligent speed limit accessories by financial advantages.

8 The Flemish mobility plan

The Flemish government approved the Mobility Plan in October 2003 with following strategic targets about ‘Sustainable Mobility in Flanders’:
To assure the reach ability of the economical junctions, intersections and interchanges.
To offer movement possibilities for everybody in Flanders, which allows everybody to participate at social life.

To reduce traffic unsafety in Flanders by a real decreasing of the number of traffic victims. About traffic unsafety, the Flemish government proposes the ‘zero-version’ what means traffic without victims. Of course, this is a long term target.

A short term target (2010) is to reduce the arrears in traffic safety compared to the European top level.

This means that:

- max. 375 victims at 2010 or 50% less than in 1999. It means an annual decrease by ca. 5%.
- max. 3250 seriously injured people at 2010 or 50% less than in 1999. It means also an annual decrease by ca. 5%.
- max. 55 victims per 1 million young people below 26 years old at 2010 instead of 143.5 in 1999. Therefore an average annual decrease is necessary by about 6%.
- Max. 57 slightly injured people per 100 million vehicle x km in 2010 instead of 78.4 in 1999 or an annual decrease by ca. 2.5%.

To ameliorate traffic liveability and to reduce environmental and natural damages while mobility is increasing. Concerning traffic liveability, in 2002 road passenger’s traffic was responsible for an environmental damage cost for air pollution of about 892 million EUR. This is ca. 30% less than in 1990. The decrease is the result of the European management implementing more and more severe emission requirements for new vehicles.

It is remarkable that the transport flows for passengers increased in the same time with ca. 21%.

In the last 10 years, road freight transport in ton x km increased by 50%, with a stagnation in 2001. In 2002 the environmental damage cost due to road freight transport was estimated to be 652 million EUR, ca. 20% higher than in 1990. A decrease was noticed for the first time in 2002 due to the stagnation of the transport flows of freight transport as well as due to the severe European emission rules for new trucks. The recent decrease is smaller compared to the passenger transport because the new rules are less severe for trucks and also because the truck lifetimes are higher.

9 Conclusion

Flanders is a good way along the path to realising by 2010 the targets about traffic safety for serious and slightly injured people as indicated in the Mobility Plan, but for victims and the number of young victims, nevertheless the amelioration in 2001, there is still a lot of work to do.

- The accessibility objective aims to guarantee the accessibility of the economic focal points and gates in a selective way. The desired effect of this objective is to restrict the number of hours currently lost by the users of the different modes of transport to a social optimum.
- The availability objective: the mobility policy is considering the fact that in our society not everyone has the same access to mobility. The Flemish mobility policy aims at eliminating the barriers that restrict the availability of the transport system, which will improve the participation in social life for socially vulnerable groups. The barriers restricting the availability of access to mobility relate to the individual skills of road users, but may also be of a legal, spatial, physical or financial nature.

- The road safety objective: the target is to catch up with the European leaders by 2010, which means decreasing the number of deaths and serious injuries due to road traffic accidents by 50%. Account was taken here of the ambitious which these countries themselves have to increase road safety even more.

- Traffic life-ability: our cities are not life-able in terms of traffic, as the environmental quality is low and the means of transport are not or not sufficiently guaranteed for a growing number of people. The situation is even likely to become worse as a result of the growing cities. Therefore, it is intended to reduce traffic pressure and traffic nuisance in cities by intervening in both the volume and the driving speed of cars as well as freight traffic.

- Reduce damage to environment: the target is to improve the environmental quality in a progressive way so as to meet the obligations resulting from the European directives and commitments made within the framework of international proposals. With respect to the transport related CO2 emissions, a stabilisation of these emissions is proposed for 2010 compared to 1990.

- Reduce damage to nature: the target in the field of nature is to reduce nature fragmentation, to better integrate transport infrastructure in the environment at an ecological level, and to protect nature as much as possible against the negative effects of artificial light without jeopardising the (road) safety.

References