ROAD SAFETY PROGRAMMES AS AN EFFECTIVE TOOL FOR DEVELOPING SYSTEM-BASED ROAD SAFETY POLICIES

Jamroz K., Michalski L., Gaca S.

Gdansk University of Technology, Department of Highway Engineering, Gdańsk, Poland
Krakow University of Technology, Department of Traffic and Highway Engineering, Kraków, Poland

Abstract: Because of low traffic safety level, Poland, in accordance with tendencies and recommendations of EU, established ambitious target of fatalities decrease by 50% till year 2013 in relation to year 2003. The matter consists in undertaking coordinated actions, resulting from previously prepared road safety programs. In paper are presented programs and road safety improvement tools characteristics. Moreover were described rules of implementation, monitoring and modification of programs.

1. Introduction

Despite Poland's recent success in reducing the road traffic risk, our road safety record (number of road deaths /100.000 population) continues to be significantly worse than that of the best performing EU countries. This is why, following up on the EU's tendencies and recommendations, Poland has adopted an ambitious goal, which is to reduce the number of road deaths in 2013 by 50 % compared to 2003 [1]. The formulation of this target was preceded with work designed to develop a system-based approach to road safety problems.

The last century has seen some major changes in how road safety is approached, particularly in countries with high motorisation levels. Destiny, which put an effective stop to scientific road safety methods, is no longer considered a cause. Instead there are intensified efforts to develop system-based approaches. The "cause and effect" methods, which put all the blame on the vehicle, road and (or) people are now a thing of the past. In addition, it has been proved that the effect of a combined and coordinated action in several sectors, known as the 3E (education, engineering and enforcement), 3E + 3C (cooperation, coordination and collaboration) or 6E (education, engineering and enforcement, economics, encouragement and emergency) method is much greater than the sum of individual and independent actions. This leads to the growing popularity of integrated

policies, which target the transport system with man as the main actor – system operator [2].

Road safety policies make an increasing use of scientific backing. In recent years, the meta road safety model has been used extensively, comprising sequential, epidemiological and systemic models [3]. Sequential models are used to analyse recognisable causes of accidents and define the relation between the number and effects of an accident and a set of critical factors (social, economic, road and traffic factors). The idea is to avoid or restrict the most critical causes and circumstances of accidents. Epidemiological models are used to analyse "carriers" and hidden relations that affect the consequences of road accidents to build protective barriers and define the indicators for a public health model. The programme of preventative action, known as Haddon matrix, is an example [4]. Haddon is considered a precursor of the multi-disciplinary approach to road safety and is credited with the development of a basis for subsequent system-based work [5]. [6]. System-based models are used to identify all relations and interdependencies that have an affect on an accident actually occurring (so called factors moved in time and space) and the factors at the scene and time of the accident; the idea is to build a system of preventative schemes and a system for monitoring and checking the operation of the interdependencies and relations [7].]. The outcome is an increasing number of integrated schemes, targeting the transport system with the human being as its main actor – system operator.

2. Designing road safety programmes in Poland

15 years ago the number of road deaths continued to increase rapidly amidst opinions that it was the result of the dynamic growth of motorisation. It was not until a group of World Bank experts carried out an assessment of Poland's road safety in 1992, that the realisation was made that real improvement can only come from systemic efforts. The Government of Poland acknowledged the experts' report and took some decisions; in 1993 the National Road Safety Council was appointed and a year later the Transport Minister commissioned the Scientific Research Committee to develop a research project Integrated Road Safety Programme. It was called GAMBIT. This was followed by a subsequent National Road Safety Programme 2000 – 2010 GAMBIT 2000 [12] and a number of regional programmes.

In May 2004 Poland joined the European Union, which set an ambitious goal for its members: to halve the number of deaths within the next decade. Poland took the challenge and in April 2005 the Council of Ministers adopted the new GAMBIT 2005 Programme as the 2005-2007-2013 National Road Safety Programme. The Programme was developed for the Ministry of Infrastructure by a Consortium comprising researchers from the Gdansk University of Technology, Krakow University of Technology and the Motor

Transport Institute from Warsaw and a number of specialists from government agencies and local authorities [13]. Work on the Programme was scheduled around four stages:

- Stage One – to develop the *Diagnosis* of Poland's road safety and road safety system,
- Stage Two – to develop the *Vision* of road safety as a long-term programme,
- Stage Three – to develop the *Strategy* of road safety until 2013, as a mid-term programme with specific measures; and
- Stage Four – *Operational Programme* 2005 – 2007, as a short-term programme.

In developing the programme use was made of:

- the sequential approach to identify the most significant factors affecting road safety and high risk groups,
- the epidemiological approach to select effective preventative measures,
- the systemic approach to determine how the measures should be checked and monitored.

3. Characteristics of the programme

Road safety diagnosis. Within 5 years (1999 – 2003) the number of road deaths in Poland was stable, suggesting that the current road safety efforts should be intensified and new, more effective ones undertaken. Within that period:

- 29,000 people died, i.e. about 5.8 thousand annually,
- 335,000 people were injured, i.e. about 67,000 annually,
- the costs of road accidents amounted to some PLN 150 billion - 30 billion annually.

Within the same period:

- population went down by 0.1%,
- the number of registered vehicles went up by 20%,
- vehicle-distance travelled (vehicle kilometres) went up by 36%.

In 2003, which was adopted as the baseline for this Programme, Poland's basic road safety rates were as follows:

- 14.7 fatalities per 100,000 population.
- 3.5 fatalities per 10,000 vehicles.
- 31.6 fatalities per 1 billion vehicle kilometres.
- 11.2 fatalities / 100 accidents.

The above casualty numbers place Poland at the level of Sweden, the Netherlands and United Kingdom as they were in the seventies. Today's figures are two or even three times higher.

Studies have shown that in Poland those at the highest risk of death on the road are pedestrians, cyclists, children and young drivers. Poland's basic road safety problems include:

- dangerous behaviour of road traffic users,

- poor road infrastructure,
- ineffective road safety system.

Poland's motorisation forecasts suggest that by 2020 the number of passenger cars could go up by 50 to 70%. Unless road safety is significantly improved by 2020, accidents

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could claim as many as 90,000 lives and more than 1.15m people could be injured. The economic and social loss would amount to more than 470 billion zloty.

Vision. As a member of the European Union Poland is required to give priority to road safety problems and make it an important part of its transport policy. Considering the experience of best-performing countries, Poland's long-term and ethically justified road safety vision is to completely eliminate road accident fatalities from Polish roads. With this as the basis the POLISH VISION ZERO means that:

- schemes designed to protect road users should be given priority before mobility and other transport objectives;
- when designing, building, operating and managing the transport system, efforts must be taken to ensure that it compensates for the shortcomings of the infrastructure and forgives the users' for their errors;
- reducing accidents and their consequences is the basic obligation of all those who design, manage and use Poland's transport system.

*Road safety strategy by 2013***.** For the purpose of the analysis four scenarios were defined of how Poland's road safety would develop by 2013. Figure 1 shows the forecast of road deaths annually in Poland broken by the four preventative scenarios.

Fig. 1. Fatality forecast in Poland by 2013

Considering the experience from GAMBIT 2000, the requirements of the EU and the funding available for road safety work, the decision was made to take on the more ambitious goal of scenario S3, which is to reduce fatalities by more than 50% compared to 2003.

The strategic goal of the GAMBIT 2005 road safety programme by 2013 is to reduce the number of road deaths by 50%, i.e. to 2800 people annually. Key to the overall goal will be to assign the actions to specific road categories. At present, Poland's national roads, making up a mere 6%, carry nearly 40% of vehicles. More than 36% of road accidents, involving deaths, happen on these roads. However, because the national road network is expected to expand within the next strategy period, very high road safety standards have been set for them, i.e. to reduce road deaths by 2013 by as much as 75%. As regards roads managed by local authorities, these standards are slightly lower. The expected reduction in road deaths by 2013 is by 35 % .

This ambitious strategic goal calls for a number of actions defined in specific objectives. The strategic programme envisages five specific objectives. They call for comprehensive, intensified, effective and integrated efforts across the country. But not all the schemes can be run at the same time, due to the resources required, and the results are not always proportionate to the outlays. This is why the strategy is divided into priorities, which pin down the specific objectives, looking at the main road safety problems and high risk groups identified in the diagnosis.

Over the strategy period 2005 – 2007 – 2013 there are fifteen priorities designed to pursue the detailed objectives (Table 1). The majority of the priorities use a system-based approach to solving road safety problems, with action undertaken in several sectors (e.g. education, traffic law enforcement, engineering and emergency services). This is because combined action is more beneficial than the sum of individual independent actions. A system-based approach to solving road safety problems must be operated within a transparent system management model, with legal, organisational and financial regulations, rules for how organisations, institutions and individuals should work together to improve road safety. The Programme will help undertake, coordinate and promote schemes in three groups of activity, the pillars of the national road safety system:

- system-based schemes (central).
- sectoral schemes,
- territorial schemes (regional).

System-based work includes all activities designed to build and develop the national road safety system. This group of activities comprises six strands: construction and development of road safety structures, creating good laws (legislation), road safety management, road safety funding, research and international cooperation. Sectoral action means specific action pursued by specific sectors of government with responsibility for road safety. Eight road safety relevant sectors have been identified. They are school education, driver training and examinations, road traffic enforcement, justice system, road infrastructure, technical condition of vehicles, rescue services and emergency help for accident victims. These sectors are the basic links of Poland's road safety system.

Table 1. GAMBIT 2005 Goals and Priorities

Objectives		Priorities		
1.	To build a basis for effective and long-term road safety efforts	1.1 Road safety organisation	1.2 Road safety management	1.3 Sectoral action
2.	To develop safe road user behaviour	2.1 Speed	2.2 Seat belts	2.3 Alcohol
3.	To protect pedestrians, children and cyclists	3.1 Pedestrians	3.2 Children	3.3 Cyclists
4.	To build an maintain a safe road infrastructure	4.1 Enforcement	4.2 Development of a safe network of roads and streets	4.3 Modern road traffic management
5.	To reduce accident severity	5.1 Secondary safety in cars	5.2 "Forgiving" roads and roadside environment	5.3 Optimisation of rescue efforts according to the "chain of survival"

Territorial work is work at regional and local level, defined in respective road safety programmes. These schemes should primarily reflect the specific problems and risks in these areas: design of regional and local road safety structures, road safety education, road traffic enforcement, road infrastructure and emergency services. These programmes should also fit in with national targets and be financially supported from the central level. At the central level three strands are important: programming, supporting regional and local action and monitoring of programmes and action.

The estimated cost of all schemes between 2005 and 2013, needed to meet the strategic goal will be 25 billion PLN. The highest cost will be infrastructure, representing more than 70% of estimated costs. This includes expenditure on infrastructure from other programmes: expressways, ringroads and improvements to the primary system. Poland is developing a programme to improve a significant part of the national road network, and it is all the more important to ensure that the programme is delivered to the best road safety standards. This will also involve the need to evaluate the effectiveness of the projects, when they are finished (road safety audit). If successfully implemented between 2003 to 2013, the priority tasks will produce the following results:

- 16,800 lives saved,
- injury reduction by 180,000,
- reduction in accident and collision costs by 68 billion zloty.

It must be stressed that:

- the biggest fatality reduction potential is in traffic law enforcement and improving the road infrastructure,
- the schemes proposed in this Programme will yield both a social and economic effect.

Programme implementation. The basic tools of GAMBIT 2005 will be three year operational programmes and annual programmes, as well as Sectoral, regional and county road safety programmes. All programmes should fit in with the overall target as defined in the National Road Safety Programme.

The chief coordinator for the GAMBIT 2005 National Road Safety Programme is the transport minister. The delivery of the road safety programme should be the responsibility of bodies in the capacity of implementing or paying authority. This is why the first priority is to establish a central road safety organisation to manage Poland's road safety at the national level. Until then the role of this organisation should be carried out by the Secretariat of the National Road Safety Council.

Fifteen indicators will help monitor the progress of the Programme. Monitoring GAMBIT 2005 will be the responsibility of the Monitoring Team, part of the National Road Safety Council, which will keep track of the progress of the Programme and evaluate its results.

4. Conclusion

The GAMBIT 2005 National Road Safety Programme fits in with Poland's transport policy documents:

- Poland's Transport Policy 2006-2025,
- National Development Plan (NDP) 2007-2013,
- Operational Programme Road Infrastructure 2007-2013.

The national programme provides an opportunity to intensify road safety efforts and improve the road safety record. When this Programme is completed several thousands lives will be saved and some fifty thousand people will not become disabled. With safer roads Poland's image will improve, making our country more attractive for business and tourism.

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