

Quantitative road safety targets

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Quantitative road safety targets

Overview

A high price in human and economic terms is currently being paid in Europe for motorized road mobility. Current levels and socio-economic costs of deaths and injuries resulting from road crashes are considered unacceptable in ECMT and EU countries. An increasing number of countries, therefore, are implementing long term road safety strategies and programmes towards their reduction or eventual elimination around a framework of quantitative road safety targets and long term goals [2][14].

What are quantitative targets?

Targets are expressions of national road safety ambition

Quantitative targets represent the road safety results which a country or jurisdiction wishes to achieve over a given time frame. A country's focus on results and how they are to be achieved by system-wide intervention and effective institutional management is at the core of an effective national road safety management system and national road safety strategy. Countries have become more ambitious over time in their choice of long term goals and interim quantitative targets with implications for the interventions selected and their delivery by institutions across the road safety partnership [4].

Target types: final, intermediate and output targets

Targets for final outcomes (long and interim targets to reduce deaths and injuries) are used widely in many countries in national, regional and local road safety strategies and programmes. Targets have also been set for intermediate outcomes (e.g. decreases in mean speeds, increases in seat belt use) and institutional delivery outputs (e.g. numbers of random breath tests, speed checks) which allow closer management of the range of interventions needed to achieve final outcome targets.

Why set targets?

In the latest evolution of the road safety management system, key *institutional management functions* provide the foundation for system-wide *interventions* to achieve a range of *results* expressed as different types of quantitative targets [4]. Targets provide the focus for the national road safety strategy and the level of their ambition drive decisions about coordination needs, legislative needs, funding and resource allocation, promotion needs, monitoring and evaluation, as well as research, development and knowledge transfer. Research and experience indicate that long term goals and interim targets lead to:

- Increased political will and stakeholder accountability for road safety
- Closer management of strategies and programmes, better safety programmes and better safety performance, especially when targets are ambitious
- Better use of public resource
- Increased motivation of stakeholders

How to set targets?

Current good practice involves a combination of top down long term goals as well as bottom up interim targets (usually of 7-10 year duration), which are soundly related to interventions, their likely effectiveness in the national road safety strategy and the quality of their delivery [28][2]. *Result focus* is the overarching function of lead agency management for road safety which defines the country's level of ambition for road safety and takes into account the

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interventions and institutional arrangements which need to be put in place in order to realise it [4]. The process involves:

- Appraising current road safety performance through high-level strategic review
- Adopting a far-reaching road safety vision or goal for the longer term
- Analysing what could be achieved in the shorter term
- Agreeing targets and ensuring accountability across the road safety partnership

How to ensure accountability?

Targets need to be agreed across the road safety partnership since they specify the desired safety performance which is endorsed by governments at all levels, stakeholders and the community. Good practice indicates that governmental and professional consultation on targets forming the focus of the road safety strategy is usually conducted within the national road safety coordination hierarchy followed by a public consultation process. Governmental approval of the targets and national strategy is carried out within the upper tier of the multi-sectoral coordination body. Public service targets and agreements are means by which Government demonstrates its role and accountability for road safety responsibilities. Audit, independent reviews and inspection bodies monitor compliance.

How to monitor targets?

This involves continuous monitoring of targeted and other safety performance indicators, establishing the effectiveness of specific road safety measures by carrying out before and after studies; reviewing and updating of policies and measures with re-distribution of resources towards more cost-effective measures; identifying delays in implementation requiring corrective action; establishing the level of public support for interventions

Avoiding pitfalls

Targets lacking political support are unlikely to obtain the level of funding or other resources needed for their attainment. A purely symbolic target has no value. Targets should be accompanied by well-orchestrated and funded safety programmes designed to realise them. The national target should have currency in the actions and goals of all responsible key agencies. Good practice shows that interim targets set within the specific time frame of a national road safety strategy or programme need to be ambitious but realistic.

1. What are quantitative targets?

Quantitative road safety targets represent the desired road safety results which a country or jurisdiction wishes to achieve over a given timeframe.

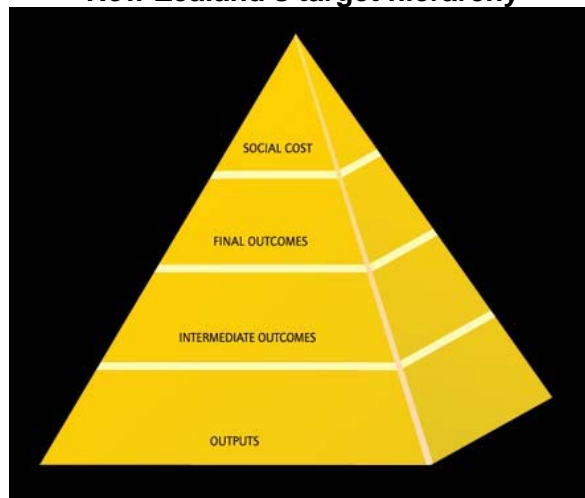
Targets are used widely in many countries in national, regional and local road safety strategies and programmes. Road safety targets in EU Member States differ widely as to performance indicator, timescale and degree of challenge [2]. Countries have become more ambitious over time in their choice of quantitative target with implications for the interventions selected and their delivery by institutions across the road safety partnership [4]. Most EU countries aim to reduce the annual number of deaths by 40 to 50% within typically about 10 years. These percentages represent an ambition to reduce the number of deaths more quickly than continuation of past trends would imply.

Targets are usually expressed in terms of *final outcomes* e.g. reduction in numbers of deaths and serious injuries. Some EU countries are pursuing the long-term outcome of elimination of deaths and serious injuries with interim targeted reductions. There need be no contradiction

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between a far-reaching long-term goal and a challenging but achievable, and thus necessarily more modest, shorter-term target associated with a strategy for the foreseeable future [2]. Targets can also be expressed as *intermediate outcome* targets e.g. reductions in average mean speed or increases in seat belt use. Some countries set *output targets* for their institutional service delivery e.g. number of breath tests required to be administered annually by the police. The New Zealand targets illustrates some of the different types of targets which can be set, although this comprehensive target hierarchy is not yet in use in European countries.

New Zealand's target hierarchy



- The overall target is to reduce the socio-economic costs of road crashes
- To be achieved by meeting the second level of targets, requiring specific reductions in the numbers of fatalities and serious injuries
- A third level of targets consists of performance indicators (including those related to speed, drink driving and rates of seat-belt wearing) that are consistent with the targeted reductions in final outcomes;
- A fourth level of targeting is concerned with institutional delivery outputs such as the enforcement outputs that are required to achieve the third-level targets

1.1 Final outcome targets

A range of final outcome targets are used in national road safety strategies and programmes:

Long term final outcome targets include highly ambitious goals of eliminating death and serious injury in the road traffic system, incremental quantitative targets or stand-alone targets for the duration of a road safety strategy. They usually comprise targets aimed at reducing numbers of deaths or serious injuries expressed as targeted percentage reductions. Some countries use target reductions in casualty rates e.g. deaths per 100,000 population or deaths per 10,000 motor vehicles. However, a declining rate such as deaths per numbers of vehicles may mask increases in numbers of deaths and injuries which is why numbers rather than rates are, in general, found to be more useful. An additional reason for selecting numbers rather than rates is the perception that communication with stakeholders and the public will be easier [2].

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International, national, regional and local targets Final outcome targets can be set by different levels of government.

International targets

For example, European targets have been set by the European Union and the ECMT which all member countries have signed up to. However, these are, generally, regarded as aspirational rather than achievable targets within the set time frame.

Without increasingly effective road safety efforts of authorities on all levels the EU target for EU-15 will not be achieved [18]. It was estimated that given the willingness to invest and to give priority to effective policies, the application of known and available road safety measures for vehicles and roads and via intensified police enforcement, could reduce about 70% of deaths to 2010 compared with 2003 [18].

European-wide targets

- The WHO Health for All policy in Europe set international targets to reduce mortality and disability from road crashes by at least 30% by 2020.
- ECMT countries agreed in 2002 to reduce deaths by 50% by the year 2012 compared with the year 2000.
- EU countries have agreed a target to reduce deaths by 50% by the year 2010 compared with the year 2001.

National targets

Since the 1970s when the first road safety outcome target was set in Europe, national targets have been used widely in road safety strategies and programmes.

30 years of target and goal setting in Finland

Finland was the first European country to set a national target in 1973. It met this first very challenging target - to reduce deaths by 50% by the end of the 1970s – and achieved the largest fatality reduction in Europe during the 1970s [17]. Contributing to the success of the target were the introduction of speed limits, compulsory use of seat belts, as well as external factors such as the oil crisis.

The second target to reduce road deaths by 50% by the year 2000 was set in 1989 and was also successful. A more structured approach to speed limits was introduced for urban areas, pedestrian and cycle paths were built. Economic recession also played its part in the reduced numbers of road deaths.

The third target to halve the number of deaths by 2005 was set in 1997 but after a fairly poor start was later revised to 2010. In 2001, the long term goal was set that ‘the road transport system should be designed so that nobody should die or be seriously injured on the roads’ in addition to the ambitious interim target.

Source: Peltola, 2003

Several EU countries have set long term final outcome goals to make the road system intrinsically safe e.g. Sweden, The Netherlands, Denmark, Finland and Norway. The Swedish [Vision Zero](#) for example, seeks the elimination of death and serious injury from road crashes.

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Such countries have also set interim targets towards achieving incremental improvements in performance over a period of 7-10 years. A range of outcome targets in current use are described in the table.

Examples of quantified final outcome safety targets (deaths) in Europe (Elvik, 2003)			
Country	Base-year for target	Year in which target is to be realised	Target for reduction of the number of road fatalities
Austria	1998-2000	2010	-50%
Denmark	1998	2012	-40%
Estonia	2002	2015	-55%
Finland	2000	2010	-37%
Finland	2000	2025	-75%
France	1997	2002	-50%
Great Britain	1994-98	2010	-40%
Greece	2000	2005	-20%
Greece	2000	2015	-40%
Ireland	1997	2002	-20%
Italy	1998-2000	2010	-40%
Netherlands	1998	2010	-30%
Poland	1997-1999	2010	-43%
Sweden	1996	2007	-50%

Example of final outcome targets set in Britain between 1987 - 2005

Against the background of changes in general public service delivery, the first national casualty reduction target was set in Britain in 1987, following a comprehensive review of road safety policy and research. The target was to reduce casualties by one third by 2000 compared with the average for 1981-85. Although the overall target was not achieved due to increasing minor injuries, deaths declined by 39% and serious injuries by 49%. The target process led to an increased profile for road safety; increased resources for and more discussion of national and local action.

Following a consultation exercise launched in 1996, new bottom-up targets based were proposed by the Department for Transport and approved by Cabinet and Parliament. Compared with the average of 1994-98, new targets were set to achieve a 40% reduction in killed and seriously injured casualties, a 50% reduction in children killed and seriously injured and a 10% reduction in the casualty rate for slight injuries per kilometre travelled by 2010. A further public service agreement target was set for the Department for Transport for 2005 – to reduce casualties in deprived areas of England more rapidly than in Britain as a whole.

In 2002, the UK joined other member countries in signing up to highly ambitious aspirational targets set by the European Union and the European Conference of Ministers of Transport.

Regional and local targets Regional and local targets are also set, especially where such jurisdictions have specific responsibilities for the road network and where the direct influence of national government programmes may be more limited.

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In the Netherlands, for example, regional targets aggregating to the national target are required and local authorities are required to prepare a plan comprising a general package of measures and to indicate budgets, staffing levels and organization. (<http://www.swov.nl/UK/Research/Kennisbank/inhoud/kennisbank.htm>)

Example of final national and regional outcome targets in the Netherlands

Current targets in the Netherlands comprise:

- Reducing the number of traffic deaths to a maximum of 750 in 2010 and 580 in 2020 (respective decreases of more than 15% and 45% in comparison with 2002)
- Reducing the number of injuries requiring hospitalization to a maximum of 17,000 injuries requiring hospitalization in 2010 and a maximum of 12,250 injuries requiring hospitalization in 2020 (compared to 2002 this represents a decline of 7.5% and 34% respectively)
- National quantitative targets to reduce deaths are split up into 19 regional targets. Each region has an equal target, given that the conditions between regions do not differ greatly. The regions and provinces determine their own plans and measures to reach these targets
- Retaining the Netherlands position among the top 4 within the European Union in 2010 and 2020.

In some countries, the difference between regions in terms of traffic volumes and mixes may be too large to enable simple, equal disaggregation of the national target and further analysis will be needed to identify an appropriate level of ambition.

In Germany, a target has been set in the region of North Rhine Westphalia although there is no national target. Devolution of key aspects of road safety from the federal government to provincial governments can make it less than straightforward to work through a national strategy and target [2]. Traditionally, Norwegian politicians have been opposed to quantified national road safety targets, arguing that such targets are unethical, and that the only ethically defensible target for road accident fatalities is zero, but an interim target is currently being discussed. *Vision Zero* has been officially adopted as the basis for transport safety policy in Norway [16].

Targets are also set at local level e.g. in Norway and Great Britain. A review of local target-setting in Norwegian counties in the 1980s found that counties where quantified safety targets were set succeeded in reducing the accident rate per kilometre of travel more than counties relying on qualitative targets only. Counties with highly ambitious targets had a better safety performance than did counties with less ambitious targets or no quantified targets [14].

Other types of final outcome target

Child casualties In addition to targets to reduce killed and seriously injured casualties and the casualty rate for slight injuries, Britain has set a target for 50% reduction in children killed and seriously injured by 2010 (baseline 1994-1998 average).

Social costs In New Zealand a reduction in social costs of road injury crashes has been specifically targeted within the duration of the current road safety strategy.

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Social costs of injury crashes: targets and outcomes 2003/2004	Base	Targets	
	2001	2004 not exceeding	2010 not exceeding
Social Cost (2001 prices)			
\$ billion	3.02	2.75	2.15
Cents per vehicle-km	8.4	6.7	4.4
\$ per person	783	700	650
\$ per vehicle	1145	1020	940

1.2 Intermediate outcome targets

Intermediate outcome targets are used in several countries e.g. New Zealand and Canada to help achieve final outcomes. They can include targets to reduce average traffic speeds, to reduce the proportion of drunk drivers in crashes or on traffic, to increase seatbelt and helmet wearing rates, to improve the physical condition of the road network or the standard of the vehicle fleet or the quality of post-crash services.

In Canada, the national target calls for a 30% decrease in the average number of road users killed or seriously injured during the 2008-2010 period compared with 1996-2001 average figures. A range of sub-targets or intermediate outcome targets were set.

Intermediate outcome targets in the Canadian road safety strategy (CCMTA, 2002)

- A 95% rate of seat belt wearing and proper use of appropriate child restraints by all motor vehicle occupants
- A 40% decrease in the number of fatally or seriously injured unbelted occupants.
- A 40% decrease in the percentage of road users fatally or seriously injured in crashes involving drinking drivers
- A 40% decrease in the number of road users fatally or seriously injured on rural roadways (defined as roads where the speed limit is 80-90 km/hr).
- A 20% decrease in the number of road users killed or seriously injured in speed or intersection-related crashes.
- A 20% decrease in the number of road users killed or seriously injured in crashes involving commercial vehicles
- A 20% decrease in the number of young drivers/riders (those aged 16-19 years) killed or seriously injured in crashes
- A 30% decrease in the number of fatally or seriously injured vulnerable road users (pedestrians, motorcyclists and cyclists).
- A 20% decrease in the number of road users fatally or seriously injured in crashes involving high-risk drivers

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Intermediate outcome targets for speed, excess alcohol and restraint use in New Zealand's Road Safety to 2010 strategy against 2001 baseline (LTSA, 2003)	Target
	2004
Speed	not exceeding
Open road mean speed (km/h)	99
Open road 85 th percentile (km/h)	107
Urban mean speed (km/h)	55.2
Urban 85th percentile (km/h)	61
Alcohol	
Percent of driver deaths with excess alcohol	21%
Number of driver deaths with excess alcohol	48
Restraints	At least
Seat belts – front	92%
Seat belts – rear	75%
Children (under 15) restrained	90%

Such targets can help to provide focus for multi-sectoral interventions and resource and provide the opportunity for closer management of activity within the national strategy towards achieving headline outcome targets.

In Europe to date, intermediate outcomes have usually been monitored rather than targeted in national road safety strategies.

1.3 Institutional output targets

Output measures represent physical deliverables of the key stakeholders which are used to achieve intermediate outcome targets. Example include targeting the number of speed enforcement operations required to reduce average traffic speeds or the number of breath tests to be administered to ensure a highly visible police presence to deter drinking and driving.

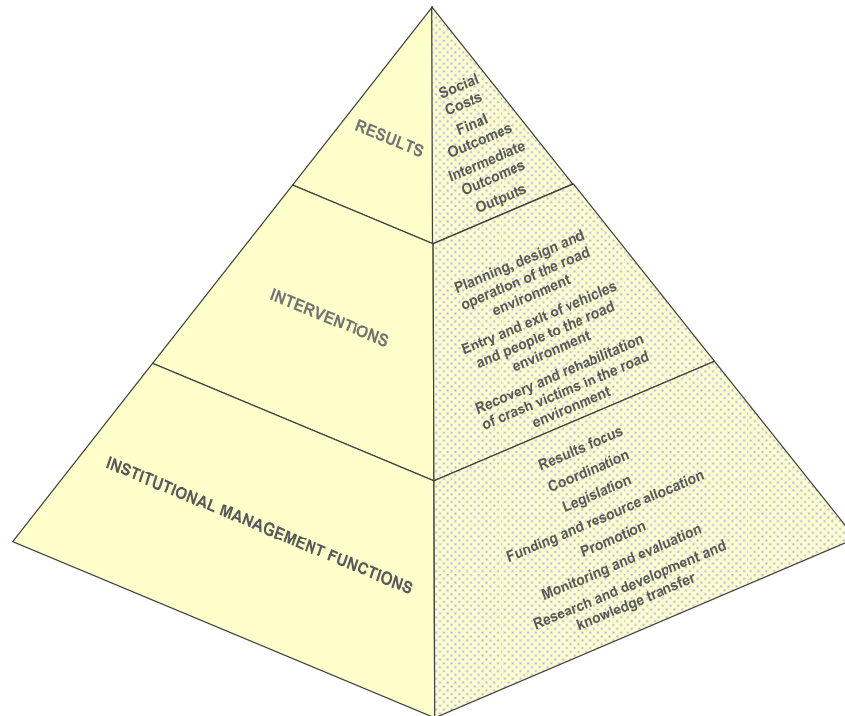
Examples of annual output targets for breath-testing for excess alcohol in New Zealand (Breen, 2004)	2001/02	2002/03	2003/04
hours to be delivered	505,920	543,025	574,140
number of Compulsory Breath Tests to be conducted (at the roadside)	1.4-1.6M	1.5-1.7M	1.5-1.7M
number of Mobile Breath Tests s to be conducted	370-410K	500-550K	500-550K
offence notices to be issued	26-30,000	23-26,000	23-26,000
Examples of annual police output targets for speed in New Zealand (Breen, 2004)	2001/2	2002/3	2003/4
hours to be delivered	310,380	316,950	321,980
speed camera hours	74,000	74,000	74,000
on-road speed TONs and IONs to be issued	110-130K	200-250K	275-325K
speed camera IONs to be issued	515-610K	500-550K	400-460K
offence notices issued	176,684	259,323	356,193
speed camera infringement notices	523,362	458,618	466,409

2. Why set targets?

2.1 Targets aid management

A country's focus on results and how they are to be achieved is at the core of an effective national road safety management system and the driver of an effective national road safety strategy. Quantitative targets form an important part of the road safety management system. In this system, key *institutional management functions* provide the foundation for system-wide *interventions* to achieve a range of *results* expressed as different types of quantitative targets [4].

The road safety management system [4]



This Figure has been adapted further from the original road safety management pyramid outlined in the consultation document of the *Road Safety Strategy 2010* of New Zealand, and further developed by Wegman ed., 2001 and Koomstra et al, 2003 'Institutional management functions' used in this manual equate with 'implementation' and 'structure and culture' in these documents.

The overarching management function which is orchestrated on behalf of government by a lead agency/department/bureau is *results focus* which 1) determines the level of ambition expressed in quantitative targets which a country wishes to achieve in road safety and 2) ascertains how this desired result is to be achieved [4].

The more ambitious the target(s), the more effective the institutional arrangements will need to be to deliver the system-wide intervention set needed to achieve the target(s). The level of ambition drives the intervention set. Ambitious targets require *safe system* approaches which require 1) understanding of the safety principles which determine risk e.g. speed and crash protection, and 2) political willingness to implement the necessary interventions based on these principles. The ambitious intervention set, in turn, necessitates multi-sectoral implementation which is properly orchestrated and accountable in its focus on achieving the targets agreed across the partnership.

Targets provide the framework for the national road safety strategy. Targets drive decisions about coordination needs, legislative needs, funding and resource allocation, promotion needs, monitoring and evaluation, as well as research, development and knowledge transfer.

The adoption of quantitative targets and achieving agreement on a clear means of achieving them provides the focus of an effective road safety management system.

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2.2 Do targets work?

Increase political will and stakeholder accountabilities. Experience in Europe indicates that targets get and keep road safety on to the political agenda.

Increase accountability Experience also shows that targets are an efficient management tool for defining responsibilities for different levels of administration and among other actors.

Better safety programmes Research shows that quantitative targets can lead to better programmes, a more effective use of scarce resources and an improvement in road safety performance [27]. Countries and counties with quantitative targets perform better than those without targets [37] [14].

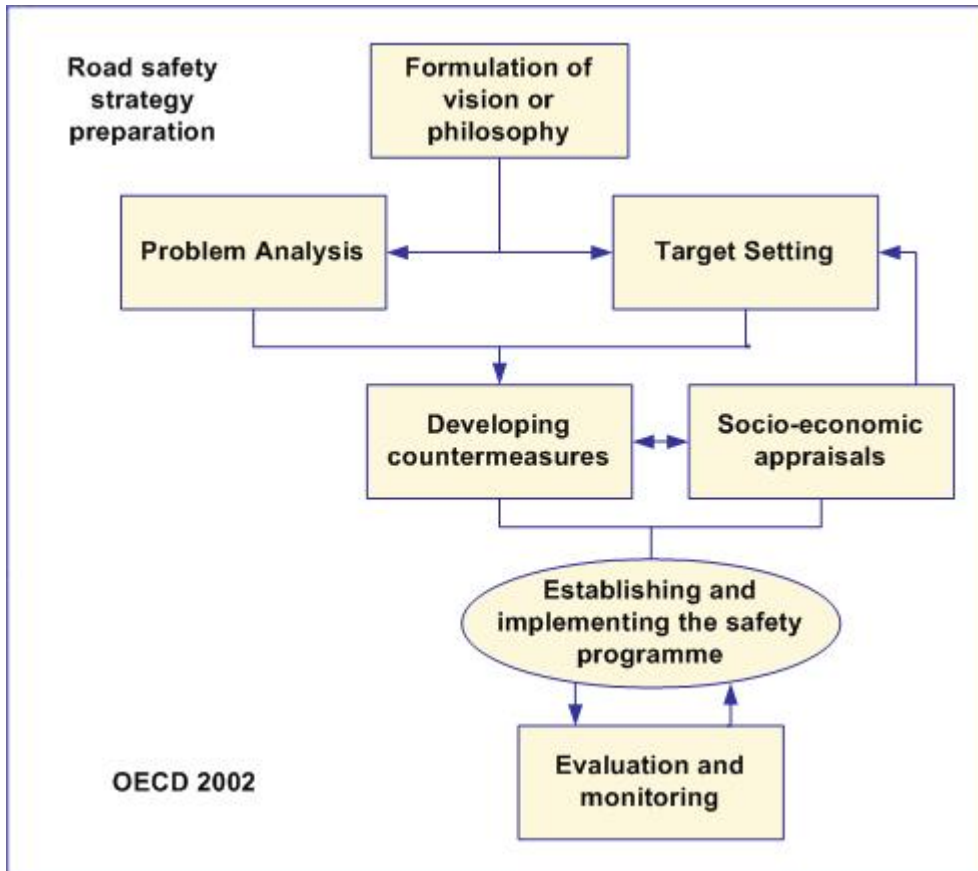
Better safety performance Research shows that targets that are ambitious are associated with better performance than less ambitious targets [12] [13] [25]. However, if targets are set that are perceived as too ambitious to be delivered by the current road safety strategy, they may not have the motivating effects that challenging, yet achievable, targets often have [3].

Motivate stakeholders Current good practice combines highly ambitious long term goals using incremental quantitative targets sought within the life of a particular road safety strategy, usually of 10 years duration. A vision or philosophy providing a long term goal and a succession of shorter-term targets directed towards its realisation can have complementary effects in motivating the initial development and subsequent implementation of road safety strategies [2]. The setting of challenging but achievable quantitative targets can strengthen motivation to contribute to casualty reduction and this can be maintained by regular and transparent monitoring of progress towards targets [2].

Tighter management The use of the target hierarchy comprising intermediate outcome targets (e.g. on seat belt use, speed and excess alcohol) as well as institutional output targets (e.g. for police enforcement activity) in addition to final outcome targets, as used in Australasia, represents best international management practice [4].

Targets need programmes Success in improving road safety performance by setting a target is not guaranteed. Target require realistic programme of interventions to be developed and faithfully implemented (Elvik, 2003) made possible by a solid foundation of effective institutional arrangements [4]. Target setting is but one step in the road safety programming process [28].

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3. How to set targets?

3.1 Different approaches

There are two different approaches to quantitative target-setting. Current good practice involves a combination of **top down long term goals** as well as **bottom up interim targets** (usually of 7-10 year duration) which are soundly related to the stated measures and their likely effectiveness in the national road safety strategy [28].

Top down long term goals are based on an idealistic objective with little prior consideration of how the target is to be reached (e.g. the EU and ECMT target or the elimination or virtual elimination of deaths and serious injuries as defined in [Vision Zero](#)).

Bottom up interim targets are set on the basis of forecasting long term past and future trends and relate to achievable outcomes for a specified package of measures within a given timeframe. Targets that are soundly related to the stated measures and their likely effectiveness can provide both clear motivation for stakeholders from whom action is expected and meaningful yardsticks against which progress with implementation of the strategy can be measured. Such a sound relationship between targets and measures can be reached by stakeholders either first agreeing on the measures and then deducing matching targets, or first deciding on targets and then finding a set of measures that makes the targets achievable, or, probably most typically, by a subtle mixture of these two approaches. In this

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way, targets can be identified for the timeframe of the next national strategy which achieve a balance between challenge, achievability, and public and political acceptability [2].

3.2 How ambitious?

In good practice road safety management, ‘results focus’ is the overarching institutional management function [4]. It determines the country’s level of ambition for road safety and takes into account the interventions and institutional arrangements which need to be put in place in order to realise it. The process involves:

- Appraising current road safety performance through high-level strategic review
- Adopting a far-reaching road safety vision or goal for the longer term
- Analysing what could be achieved in the shorter term and proposing targets
- Agreeing targets across the road safety partnership and ensuring stakeholder accountability for results

All other management functions influence this activity and what can be achieved in road safety for the future such as the effectiveness of the coordination framework as a decision-making forum across government including consultation with the broader partnership; whether sustainable funding and resource allocation mechanisms are in place; the possibility of securing legislative time for interventions; the likelihood of high-level promotion; the quality of data sets for target-setting work and for subsequent monitoring and evaluation as well as ready access to research and development and knowledge transfer [4].

3.2.1 Appraising performance

The aim is to achieve a clear overview of country organizational needs to understand present road safety performance - what is working and where there is room for improvement - and to specify or better specify challenging but achievable road safety outcomes in the national road safety strategy. The process of appraising current road safety performance will involve high-level multi-sectoral strategic examination of a range of activity and typically involve a senior coordination group of officials from Transport, Health, Justice and Education sectors. In-house technical input from the lead agency as well outside research sector input support this activity.

3.2.2. Adopting an ambitious long term goal

European countries are increasingly adopting long term visions or goals for road safety e.g [Vision Zero](#) and [Sustainable Safety](#). Such visions for a safer road traffic system where deaths and serious injuries can be substantially reduced and ultimately avoided, as sought in other areas of public safety can stimulate, guide and ensure continuity in road safety work.

Vision Zero is presented as a long-term, ideal objective for a traffic system where the amount of biomechanical energy to which people can be exposed without sustaining serious injury is the basic design parameter. As with the [Sustainable Safety](#). Strategy being implemented in the Netherlands which has a similar approach, Parliamentary scrutiny and approval stimulated public debate and prepared the way for future successful work. Finland has recently adopted a policy based on the Vision Zero strategy. Switzerland’s Via Secura theme and the Safe System concept of the Australian State of Victoria’s are also derived from the Vision Zero philosophy. These long-term strategies for a safer traffic system supplemented with casualty reduction targets require fundamental and wide-scale re-working of various aspects of the design and operation of the national traffic system, to achieve better interface between human, vehicle and road environment.

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Far reaching visions of total road safety promote a level of ambition that goes beyond incremental performance gains and the implicit acceptance of death and injury that will be determined by the rate of improvement shown by the best performing countries. These desired longer term results, together with shorter term targets, underpin the national road safety strategy in several EU countries and can help to create a sympathetic climate for the introduction of interventions [4]

3.2.3 Analysing short term potential

This entails analysis by a high-level expert group of the identification of the most important road casualty problems throughout the road traffic system on the basis of data analysis, survey and research. It involves survey of the current safety performance of different aspects of the traffic system, analysis of information on the effectiveness of different countermeasures in achieving road safety outcomes, socio-economic appraisals and the identification of useful implementation tools [28]. This analytical activity usually involves a high-level multi-sectoral group supported by advisory groups comprising in-house, external research expertise and sometimes technical experts from abroad.

Use of a sound methodology Effective national target-setting requires a sound statistically based methodology to set credible casualty reduction targets. Several countries have used models which provide a powerful means of organizing available knowledge and thinking systematically about the future development of road transport and its safety [6][20][21][22][23]. The model used for the development of the New Zealand 2010 targets can be used to determine what target is achievable with given amounts and types of interventions and to determine the amounts and types of intervention needed to achieve a given target [20][21].

Forecasting future trends on the basis of past performance The starting point is analysis of past and current safety performance and on the basis of this forecasting what may be realistically achieved in future with additional efforts. The first stage of the forecasting process consists of developing statistical models that explain past changes in the casualty numbers for different user groups with reference to measures of the changing exposure to risk of these groups, including the amount of motor traffic and the average distances walked and cycled per person per year; and available information about the effectiveness at the national level of measures that have influenced casualty numbers substantially [7].

Identifying the potential for further improvements The forecasting process produces a wide range of results reflecting different scenarios about the future development of road transport and road safety measures. Scenario planning and computer modelling is often used to predict possible outcomes. Assessment of future long-term casualty, traffic and demographic trends is also necessary to understand underlying factors which may influence achievement of future results

Typically, working papers analysing a range of countermeasures in terms of their cost-effectiveness and public acceptability are developed to inform target-setting and strategy development [23][6]. These working papers are typically published at the same time of the road safety strategy. Information is derived from surveys, practical trials or from national or overseas experience of successful implementation effectiveness of policies. During the last forty years a substantial international knowledge base of effective interventions has grown up to inform national policymaking [15][29][28]

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Developing countermeasures and action plans at national, regional and/or local levels are integral to the formulation of road safety targets. For further information on relevant considerations [6]. Proposed plans, supported by analysis to identify the best suite of measures, need to be discussed with stakeholders and divergent interests need to be considered.

Technical support for target setting in several countries

Source: Bliss and Breen eds., World Bank in print 2008

New Zealand – in house research support and international experts

The target-setting methodology and modelling activity underpinning the New Zealand *Road Safety to 2010* strategy targets was carried out by review teams comprising Government officials in road safety and independent road safety experts from Australia and the United Kingdom with substantial experience of national and regional strategic planning in road safety. Expert analysis of benefits, costs and funding demonstrated that the overall safety target to 2010 could be reached by an appropriate mix of engineering, enforcement and education interventions. Findings were published in two Working Papers in 2000, which informed the broad stakeholder consultation which was carried out subsequently. The National Road Safety Committee considered three scenarios to achieve the goal using different approaches and mixes of interventions.

Britain – the role of the STAR group

In Britain, the safety targets were informed by modelling, forecasting activity and analysis work which was published simultaneously with the last target announcement. The Safety Targets and Accident Reduction Steering (STAR) Group was set up by the lead agency to provide technical support and advice to Minister on the setting of the 2010 targets. It comprised representation from local authorities, the Royal Society for the Prevention of Accidents, the Parliamentary Advisory Council for Transport Safety, TRL, the Department for Transport and its Regional Offices and individual experts. A new Road Safety Advisory Panel comprising a broad group of road safety stakeholders has since been established which will take over this function.

Netherlands – the role of the AVV – the research arm of the Ministry of Transport

Setting targets (or revising targets) is conducted by a small group of Ministry of Transport officials with preparatory work conducted by the AVV. A consultative meeting is carried out with representatives of national, regional and local authorities and, following approval targets are presented to Parliament.

Socio-economic appraisals need to be carried out to determine the best use of public resource to meet the objectives. In some countries targeted plans are also established at regional and local levels. Opportunities for road safety through integrating road safety into other areas of Government policy at national, regional and local levels need to be analysed. This involves discussion and agreement with key Government stakeholders.

Public opinion survey data informs about the acceptability of potential measures. Most road safety lead agencies put in place public opinion tracking, usually with an outside agency to monitor the public acceptability of different measures. The European [SARTRE](#) survey is a cross national study of attitudes to road safety.

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Proposing targets

Road safety targets are proposed by the lead agency and/or the coordination body and are then submitted for Ministerial/Cabinet approval and Parliament. The activity is driven by the lead agency which reviews safety performance, identifies priorities, and organizes the other key government stakeholders to consider and approve proposed outcomes and outputs. Several examples of targeted road safety programmes can be found through the following links:

Finland <http://www.mintc.fi/oliver/upl762-Finnish%20transport%20policy.pdf>

Denmark http://www.trm.dk/graphics/synkron-library/trafikministeriet/publikationer/pdf_uk/003.pdf

New Zealand <http://www.landtransport.govt.nz/strategy-2010/strategy-content.html>

Great Britain <http://www.dft.gov.uk/pgr/roadsafety/strategytargetsperformance/2ndreview/print>

An OECD/Joint Research Transport Centre working group is currently working on an international review on [Achieving Ambitious Road Safety Targets](#).

3.2.4 Agreeing targets and ensuring accountability

Agreeing targets

Targets need to be agreed across the road safety partnership since they specify the desired safety performance which is endorsed by governments at all levels, stakeholders and the community. Full consultation with the key governmental stakeholders, the wide range of stakeholders involved in helping to achieve road safety results and the public is essential. Good practice indicates that governmental and professional consultation on targets is usually conducted within the national road safety coordination hierarchy followed by a public consultation process. Governmental approval of the targets and national strategy is carried out within the upper tier of the multi-sectoral coordination body

Performance assessment

The establishment and use of road safety targets in OECD countries has, in general, coincided with broader organisational change in governance and public sector reform. The accountability mechanisms put in place between central government and its agencies for key responsibilities and use of public resource can also underpin the accountabilities of road safety stakeholders.

Public service targets and agreements are means by which Government demonstrates its role and accountability for road safety responsibilities. Audit and inspection bodies monitor compliance.

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Public service targets and indicators in Britain and Sweden

In Britain, the Department for Transport's Public Service Agreement target is to reduce the number of people killed or seriously injured in Great Britain in road accidents by 40%, and the number of children killed or seriously injured by 50% by 2010 compared with 1994-98, tackling, at the same time, the significantly higher incidence in disadvantaged communities. The road safety strategy is assessed by the Department every 3 years. Progress can be assessed by Parliamentary Select Committee on Transport and by the Road Safety Advisory Panel. The Department's Highways Agency also has a specific Public Service Agreement target to reduce road casualties [10]. Best Value Performance Indicators are set by Central Government in order to ensure that local authorities can demonstrate they are improving services. Each year a Best Value Performance Plan needs to be submitted. By law, the delivery of road safety by a local authority has to be measured by a Best Value Performance Indicator which requires annual calculation of the number of road accident casualties per 100,000 population broken down by casualty and road user type. In addition, local authorities can set their own local performance indicators and many of these have been set relating to speed reduction, child casualties, accident involvement of young and old drivers and accidents in relation to distance travelled [26].

In Sweden, the Swedish Road Administration's responsibilities for road safety are set out every year in its Annual Report. The annual SRA target is to contribute to a reduction in the number of deaths and serious injuries and the number of deaths in road traffic is to be no more than 270 in 2007. Annual goals are specified in performance agreements. For example in 2003, the specified goal was to implement cost-effective road safety measures on the state road network so that the number of deaths is reduced. Measures that aim to improve traffic safety of children are to be prioritised. The outputs and contributions of other key stakeholders are based on formal Declarations of Intent and are published on the SRA website.

Source material: Bliss and Breen eds, World Bank 2008(in preparation)

Agreeing road safety targets and ensuring accountability across the partnership in New Zealand

Each government agency has to develop a strategic plan outlining its goals and the means of achieving them. Since 1989, public finance law in New Zealand has required all government agencies to prepare annual corporate management information, which includes performance targets, objectives and scope of activities.

Road safety targets are agreed by governmental agencies in the national coordination body – the National Road Safety Committee. Each governmental member signs up to these targets and a Memorandum of Understanding is put in place to ensure the systematic follow through which determine the success or failure of specific actions. This activity represents the cornerstone of New Zealand's road safety performance assessment regime.

The lead agency for road safety has to submit an Annual Performance Agreement to Government covering road safety activity for the next twelve months. New Zealand Police work within a performance management framework covering both outcomes (aims and objectives) and outputs (enforcement). Outcomes include road deaths, serious injuries and crashes as well as other intermediate outcomes, relating to driver behaviour that might be influenced by enforcement, and including mean speeds and the percentage of offenders driving in excess of 10km/h above the limit. Outputs include strategic offences per hour delivered (for speed, drink driving, restraints and visible road safety) and these are intended to maximise the efficiency of enforcement.

Source material: Bliss and Breen eds, World Bank 2008(in preparation)

Quantitative road safety targets – Web text of the European Road Safety Observatory

4. Monitoring targets

Systematic and transparent quantified monitoring of the implementation of road safety strategy and progress towards meeting Government targets is essential both for maintaining the motivation of stakeholders (and hence the effectiveness of implementation) and for updating of the strategy and targets in light of experience.

Data sources

Monitoring and updating are integral parts of implementation and require appropriate collection, processing and publication of reliable data for:

- Continuous monitoring of targeted and other safety performance indicators
- Establishing the effectiveness of specific road safety measures by carrying out before and after studies
- Reviewing and updating of policies and measures with re-distribution of resources towards more cost-effective measures
- Identifying delays in implementation requiring corrective action
- Establishing the level of public support for interventions

Most countries which are active in road safety have a comprehensive set of databases across transport, health and justice sectors to inform road safety problem analysis, target-setting, and the monitoring and evaluation of programmes, measures and performance. A range of organizations are involved.

Data systems in the Netherlands, 2006 Source: SWOV, 2006

- [Ownership and use of commercial vehicles \(CBS\)](#)
- [Population of the municipalities in the Netherlands \(CBS\)](#)
- [Causes of Death \(CBS\)](#)
- [Use of protection devices](#)
- [International Road Traffic and Accident Database IRTAD](#)
- [IIS \(Injury Surveillance System\)](#)
- [National Patient Register \(NPR\)](#)
- [National Road Database \(NRD\)](#)
- [Accidents and Physical Activities in the Netherlands \(APAN\)](#)
- [National Travel Survey \(NTS\)](#)
- [Car Panel PAP \(CBS\)](#)
- [Periodic Regional Road Safety Survey \(PRRSS\)](#)
- [Survey of drinking and driving in the Netherlands](#)
- [Speed measurements on state/national motorways \(TRC\)](#)
- [Road Statistics \(CBS\)](#)
- [Motor Vehicle Statistics \(CBS\)](#)
- [Passenger Traffic Statistics \(CBS\)](#)
- [Road crash registration \(BRON\)](#)
- [Traffic Offences](#)

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Safety performance indicators or intermediate outcome data. The data requirements and the level and type of disaggregation are closely linked to the detail of the road safety plan. They include:

- Crash or casualty indicators e.g. collision and casualty data from police, hospital and insurance records
- Behavioural indicators e.g. survey data on changes in speed or seat belt use
- Process and system indicators e.g. data on the number of hazardous locations treated, the number of junctions improved for safety, and the percentage of the vehicle fleet with 4* and 5* safety ratings.

A recent review of safety performance indicators in use can be found in [SafetyNet WP3 Safety Performance Indicators](#)

Safety performance indicators are used in many countries to monitor progress, although only a few countries have a comprehensive system which seeks to monitor the quality of the whole system. Sweden, which has been using safety performance indicators for several years, has been developing its monitoring system further to include:

Performance indicators in use or under development in Sweden (SRA 2006)

- Percentage of vehicle mileage on roads that fulfil Euro RAP four stars (rural areas)
- Percentage of vehicle mileage on roads that fulfil the criteria for good quality roads (urban areas)
- Percentage of vehicle mileage with vehicles that fulfil Euro NCAP five stars (newly registered)
- Percentage of vehicle mileage with vehicles that fulfil Euro NCAP five stars (existing vehicle fleet)
- Average speed above the speed limit (for all vehicle mileage)
- Average travel speed (on rural network)
- Percentage of vehicle mileage with intoxicated drivers
- Percentage of vehicle drivers that violate other regulations than speed limits
- Percentage of car transport where seat belts are used
- Percentage of pedestrians and cyclists with approved visibility
- Percentage of cyclists wearing helmets

Evaluation methodologies Evaluations of the effectiveness of countermeasures are essential to focus further development and prioritise further actions. National or EU level accident data can be used to describe overall trends but in-depth data is normally the most effective in assessing detailed engineering changes whether vehicle, infrastructure or road user behaviour based.

Public acceptance surveys covering representative samples of road user opinion are helpful in establishing levels of understanding and support for different interventions. These can often be used to place the contributions of narrowly focused lobbies into an appropriate context.

Independent review Sometimes, national road safety performance, strategy and targets are evaluated in formal, published and independent peer reviews to achieve impartial, expert and transparent assessment. In Britain, for example, there has been in-house review as well as

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two independent evaluations of road safety performance against the road safety targets [7] [8]. The 2007 review concluded that the headline target for reducing the the number of killed and seriously injured road casualties (40%) would probably be met, but that the principal challenge would be to achieve a greater reduction in deaths than the current reduction (19%) against baseline. The review looked at progress to date in implementation in various areas of the strategy compared with the original assessment made in the target-setting process.

Effects of new policies (% of reduction in killed and seriously injured), averaged over all types of road and road user (Broughton and Buckle, 2007)	Estimate in target-modelling (Table 6 TRL 382)	Period 2000-05	Period 2006-10	Combined
New road safety engineering programme	7.7	7.0	2.5	9.3
Improved secondary safety in cars	8.6	2.8	7.2	9.8
Other vehicle safety improvements	4.6	0.1	0.1	0.2
Motorcycle and pedal cycle helmets	1.4	0.3	0.2	0.5
Safety on rural single carriageways	3.4	1.0	0.5	1.5
Reducing accident involvement of novice drivers	1.9	0.0	0.0	0.0
Additional measures for pedestrian and cyclist protection	1.2	0.0	0.0	0.0
Additional measures for speed reduction	5.0	4.0	2.0	5.9
Additional measures for child protection	1.7	0.1	0.1	0.2
Reducing casualties in drink/drive accidents	1.2	0.0	0.0	0.0
Reducing accidents during high-mileage work driving	1.9	0.3	0.2	0.5
Additional measures for improved driver behaviour	1.0	0.0	0.0	0.0
Combined effect of all measures	33.4	14.8	12.2	25.2

Road safety inspection bodies monitor the rate of implementation of road safety measures and examine their quality. For example, the Swedish Road Traffic Inspectorate was established on 1st January 2003 as a division of the Swedish Road Administration. It has 14 employees. The Road Traffic Inspectorate is independent of the rest of SRA organization though it reports to the SRA Board of Directors [32].

The duties of the Road Traffic Inspectorate are to:

- Monitor and analyse conditions that could have a significant impact on safety in the road transport system.
- In discussion form, encourage responsible stakeholders to maintain a systematic approach in their road safety activities.
- Co-operate with other players.
- Follow and initiate R&D.

Swedish Road Traffic Inspectorate, 2006

5. Avoiding pitfalls

Research has shown that there are several pitfalls which need to be avoided in setting quantitative targets [2][16].

- Targets that do not have political support are unlikely to obtain the level of funding or other resources needed for their attainment.
- A purely symbolic target has no value. Targets should be accompanied by safety programmes designed to realise them. A realistic programme should exist to ensure progress towards a target. The national target should have currency in the actions and goals of all responsible key agencies.
- Many things can go wrong with implementation. Detecting problems early is important in order to steer the right course.
- Good practice shows that targets set within the specific time frame of a national road safety strategy or programme need to be ambitious but realistic. If unrealistically ambitious for the time-scale, requiring a rate of progress well in excess of what has been achieved previously, they will be perceived as being out of reach and will not be accepted. On the other hand, if the national strategy target for the next 5 to 10 years is too easy then a major opportunity for saving lives will have been lost.

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