Road Safety Factsheet

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Road Safety Engineering: Cost Effective Local Safety Schemes

Great Britain has one of the best road safety records in Europe and the world. Despite massive increases in traffic over the last few decades, the number of people killed on our roads has fallen from around 5,500 per year in the mid 1980s to well under 2,000 in 2018.[1] Over the same period, road casualties have decreased from 240,000 (including 75,000 serious injuries) to just over 160,000 (including 28,122 serious injuries).[1*]

Reported Road Casualties in Great Britain, 2018[1*]

Severity of Injury	Number of casualties
Killed	1,784
Seriously injured	28,122
Slightly injured	130,691
All casualties	160,597

These figures are for road accidents in which someone was injured on a public road and that were reported to the police.* Although virtually all fatal road accidents are reported to the police, it is known that many involving injury are not reported, even when some of those involved required medical or hospital treatment. It is estimated that the total number of road casualties in Great Britain is around 670,000. This includes an estimated 57,000 people who are seriously injured.

The municipal engineer has an important role to play in providing a 'safer' infrastructure for all road users. The level of human suffering caused by road accidents is immense and engineers are well placed to help reduce the number of accidents, casualties and the impact on society.

In addition to the terrible human cost of road accidents, they also impose a massive financial burden on the country, including lost production, health-care, and social benefits and in personal pain, grief and suffering. Reported road accidents are estimated to cost the country around £15.3 billion per year. If unreported accidents are taken into account, the cost rises to around £35 billion.[2]

Average value of prevention per reported casualty and per reported road accident, Great Britain, 2018[3]

		£ (2018 prices)
Accident/casualty type	**Cost per casualty**	**Cost per accident**
Fatal	1,958,303	2,196,534
Serious	220,058	251,458
Slight	16,964	26,087
Average for all severities	70,791	98,232
Damage only	-	2,344

This information is an essential point of reference for engineers when assessing the cost/benefit ratio of casualty reduction or accident prevention schemes.

What Can Engineers Do About The Road Accident Problem?

All civil engineers working within the highway and transportation environment are ideally placed to make a significant impact in helping to reduce the number and severity of road traffic casualties.

There are two complementary approaches to this work - accident reduction and accident prevention.

Accident Reduction

Accident reduction involves measures designed to reduce the number and severity of accidents based on an existing known pattern. This includes:

- Accident analysis and remedial engineering measures.
- An effective road safety strategy and reduction plan.

Accident Prevention

Accident prevention relates to the application of measures to prevent accidents taking place in the future. This includes:

- Road Safety and User Audits on all new infrastructure or alterations.
- Periodic Road Safety Audits on existing infrastructure as an element of the total risk assessment philosophy.
- Training engineers in up to date accident investigation & prevention (AIP)[4]

This factsheet focuses on remedial engineering measures, primarily because there is a greater potential for engineers to deliver effective accident prevention. The numbers of accidents (and their severity) are still too high and engineers must address this problem by implementing cost effective remedial engineering measures.

In parallel with the increase in engineering remedial measures, a greater emphasis needs to be placed on accident prevention, which is in essence even more cost effective.

Low Cost Remedial Engineering Measures

Road safety engineers and urban designers use a wide range of measures to improve the safety of the road environment for all road users and to encourage increased use of streets as places that meet the needs of pedestrians, cyclists and public transport users, and not just the movement of motor vehicles, as outlined in 'Manual for Streets'[5] and 'Manual for Streets 2'[6]. These measures can range from improvements to road signs and markings, road surface improvements, applying naked streets principles to street clutter, junction re-design, traffic calming schemes, 20-mph limits and zones, improved walking or cycling facilities to major road improvement schemes or Shared Space schemes.

When collating, sifting and sorting data, and diagnosing accident problems, it is essential to focus on the many factors that led to them happening in considerable detail. The four main approaches adopted to reduce accidents by highway engineering measures are:

- Single site
- Mass action
- Route action
- Area-wide action

Local Safety Schemes

Local safety schemes can provide excellent value for money in places with existing accident problems. By focusing on sites and areas with poor accident records, road safety engineers concentrate their efforts on places where it is known that people are actually being killed or injured, rather than on perceived risks. Safety engineers usually have an even greater impact on accident reduction by undertaking area-wide safety schemes rather than focusing only on selected individual sites.

Collision Reduction Schemes in Oxfordshire[7]

Treatment	Reduction in collisions	No. of sites
Urban – Pelican crossing	25%	39
Urban – traffic signals	50%	12
Urban – mini-roundabout	40%	34
Urban – road humps	50%	49
Urban – speed cameras	25%	46
Rural – right turn lanes	60%	10
Rural – signing treatments	30%	103
Rural – anti-skid junction treatment	30%	11
Rural – visibility improvement at a junction	20%	18
Rural – visibility improvement on bend	40%	13
Rural – bend signing	30%	140
Rural - anti-skid bend treatment	50%	13
Rural – 20mph village speed limits	25%	180
Rural – speed cameras	15%	16

These schemes, in comparison with other construction projects, are relatively low-cost (<£100,000), yet the level of funding earmarked for such works across Great Britain does not even equal 1% of the true cost to the economy of all the road traffic accidents.

A greater level of funding should be allocated to local safety schemes, and far greater importance needs to be placed upon them. Their contribution to the creation of a safer environment cannot be understated

In many cases, especially new developments, financial contributions may be made available from the private sector.

Road safety engineers also conduct road safety audits of existing roads and planned developments to identify road safety problems and solutions.

For many road engineering schemes, the prime purpose may be to improve congestion or to encourage more people to cycle or to walk. However, safety improvements are an integral part of such schemes.

Maintenance

Road maintenance is a fundamental feature of safe roads, and factors such as surface condition, road alignment, drainage, signs, road markings and traffic signals can reduce the chance of a crash.

Sustainable Travel

Local authorities are seeking to create sustainable local transport systems that support their economy and reduce carbon emissions in their areas (central government funding is available for this, including through the Local Sustainable Transport Fund). A key way of achieving these goals is to encourage walking and cycling by introducing measures to make them a safer, convenient and more practical alternative to driving, especially for shorter journeys. There are many aspects of this in which your local authority can play an important role.

Cycling

Local authorities are seeking to encourage more people to cycle more safely and more often by making the roads safer for cyclists, providing cyclist training, providing cycle parking and safer routes to school projects.

Walking

Local authorities are also promoting walking as a healthy and better alternative to driving for short journeys and are working to make walking safer, and more convenient and enjoyable.

References

[1] Department for Transport (2019) 'Reported road casualties in Great Britain: 2018 annual report'
URL:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/864873/rrcgb-2018-print-ready-version.pdf
Date Accessed: 11/06/2020.

[2] Department for Transport (2016) 'Reported Road Casualties Great Britain: 2015 Annual Report'
URL: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/568484/rrcgb-2015.pdf
Date Accessed: 10/03/2017.

[3] Department for Transport (2019) 'Table RAS60001: Average value of prevention per reported casualty and per reported road accident'
URL:https://www.gov.uk/government/statistical-data-sets/ras60-average-value-of-preventing-road-accidents#table-ras60001
Date Accessed: 11/06/2020

[4] RoSPA (2016) 'Accident Investigation and Prevention'
URL: https://www.rospa.com/safety-training/on-road/rse/accident-investigation/ Date Accessed: 10/03/2017.

[5] DfT (2007)'Manual for Streets'

URL:https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf Date Accessed: 10/03/2017.

[6] Chartered Institute of Highways and Transportation (2010) 'Manual for Streets 2- Wider Application of the Principles'

URL:http://www.ciht.org.uk/en/document-summary/index.cfm/docid/055693F6-8DB0-4BBE-AA9FF1B5BC5E9412 Date Accessed: 10/03/2017.

[7] RoSPA and TMS Consultancy (2007) 'Road Safety Engineering Manual'

***Due to changes in severity reporting across some police forces since 2016, newer statistics are not comparable to earlier years. Therefore, the DfT provides both adjusted and unadjusted casualty figures in their statistical data tables. RoSPA uses adjusted figures as the DfT states that they are recommended for "the analysis of trends over time".**