What works for young road users and why

The following summarises key road safety interventions supported by research to improve the safety of young road users.

Parental Influence

Parents are the first and most important teachers of safe road use. By modelling responsible behaviours as pedestrians, cyclists, drivers and passengers, and by providing practical, real-world experience in a supportive environment, parents can shape attitudes and habits that prepare young people to be lifelong safe road users.[1]

What does the evidence show?

- Research indicates that parents' consistent, positive examples help their children develop awareness, judgement and responsibility across all forms of road use.
- Parents can set protective boundaries, monitor young drivers' behaviour, encourage compliance with road rules and set expectations for access to family vehicles.
- Parents can protect young drivers by facilitating extensive driving practice, offering a 'taxi service' or alternative transport in high-risk situations, and providing sound advice on purchasing a safe first car.
- Parents provide consistent, positive influences that help shape young drivers' attitudes and habits towards road safety and safe driving practices.[2]

Why does it work?

From a very young age, children learn by observing their parents and guardians. Parents influence children's behaviour through observational learning and explicit instruction.[3]

Parents can practice handholding, demonstrate safe road-crossing behaviour, and require that children wear helmets (and wear one themselves when cycling).

The road and traffic environment is complex and cannot be mastered through formal education alone. Developing lifelong safe driving practices also requires practical experience in supervised, safe conditions.

References

1. *SWOV Institute for Road Safety Research. Necessity, Contents and Evaluation of Traffic Education. SWOV Fact Sheet. [Internet]. Leidschendam (NL):SWOV; 2013 [updated 2013 July]. Available from: https://swov.nl/system/files/publication downloads/fs_education_ archived*
2. *Pressley A, Fernandez-Medina K, Helman S, McKenna FP, Stradling S, Husband P. A review of interventions which seek to increase the safety of young and novice drivers. 2017 Aug.*
3. *Muir C, O'Hern S, Oxley J, Devlin A, Koppel S, Charlton JL. Parental role in children's road safety experiences. Transportation research part F: traffic psychology and behaviour. 2017 Apr;46:195-204.*

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Road Safety Education in Schools

Road Safety Education (RSE) is most effective where errors stem from gaps in knowledge, understanding, or skills, but is considered less appropriate for changing habitual behaviour.[1]

What does the evidence show?

A review of safety research and literature identified 10 best-practice principles for school-based safety interventions.[4,5]

School leaders and educators can use these principles to identify high-quality programs or to guide their school's road safety approach.

1. Encourage or reinforce a whole-of-school approach that fits within the wider community
   - Formal and informal curriculum
   - School policies
   - Involve staff, students, parents/carers, and the community
2. Use active learning approaches – interactive and experiential learning
   - Seeking out information independently
   - Learning a new physical skill
   - Playing a role or taking another's viewpoint
3. Involve students in decisions about safety, including identifying hazards or assessing risk
   - Participation in the school council or other formal decision-making forums
   - Peer education
4. Assess and understand the individual learning needs of children and young people
   - Understand the risks faced by students at their age
   - Consider social and cultural factors
   - Understand differential risk levels associated with gender and other factors
5. Teach safety as part of a comprehensive personal and social health curriculum
   - Learning specific topics around health and safety
   - Appropriately targeted, across the education life span, cross-curricular
6. Use realistic settings and resources relevant to young people
   - Use real-world data and scenarios
   - Avoid examples used for their 'shock value'
7. Work in partnership with agencies and community members
   - Local authorities, parents and the wider community should be involved
   - Advocate for local changes to improve safety
8. Understand and address known risk and protective factors
   - Risk and protective factors that span multiple domains, including individual, family, school and peer group
   - Risk factors change with development and life transitions
9. Understand and address psychosocial factors that influence safety
   - Resilience, confidence, self-esteem, and self-efficacy can mitigate risk
10. Create a safe, supportive environment that models and rewards safe behaviour
    - Children learn by observing
    - Teachers, family, and peers are influential role models

References

4. *McWhirter J. A Review of Safety Education: Principles for effective practice. Birmingham, UK, Royal Society for the Prevention of Accidents. 2008 Jan.*
5. *McWhirter J, Francis C. Effective safety education revisited. Royal Society for the Prevention of Accidents. RoSPA. 2012.*

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What works for young road users and why

Why does it work?

Best-practice education programs are grounded in a sound theory of behaviour change that helps us understand how people function and which factors to target.[6,7,8]

Research recommends tailoring RSE programs to the developmental needs of children and adolescents. [7,9,10,11] The following examples illustrate some of the key developmental concerns when considering programs that aim to educate children about safe pedestrian behaviour[10]:

- Among young children, learning is domain-specific - skills and knowledge learned in one setting may not transfer to another; simulated traffic environments are likely to have limited value.
- At ages 5-6 years, children lack the cognitive ability to distinguish which features are relevant or irrelevant to the task of crossing the road; crossing with parents/adults and handholding are vital at this age.
- At ages 11-12 years, road-crossing performance approaches the adult level; safety as an independent traveller is relevant at this age.
- Children who are impulsive and have difficulty switching attention between tasks perform more poorly at road crossing.

RSE programs planned for adolescents should acknowledge and address their developmental vulnerabilities.[11] These include:

- Adolescents are influenced by their perceptions of what their peers think of them.
- Adolescents tend to experience mood swings, and emotions can be heightened in groups.
- Adolescents seek independence from adults and may experiment with rule-breaking.
- They tend to be overconfident and overestimate their skills.
- They underestimate the likelihood of negative consequences, such as crashes.
- Young men are prone to sensation-seeking behaviour, and aggressiveness generally peaks in adolescence/early adulthood.

References

6. *Fylan F, Stradling S. Behavioural Change Techniques used in road safety interventions for young people. European review of applied psychology. 2014 May 1;64(3):123-9.*
7. *Orton E, Whitehead J, Mhizha□Murira J, Clarkson M, Watson MC, Mulvaney CA, Staniforth JU, Bhuchar M, Kendrick D. School□based education programmes for the prevention of unintentional injuries in children and young people. Cochrane database of systematic reviews. 2016(12).*
8. *Bjørnskau T, Gregersen NP, Isnes A, Grytli T, Johansen BM, Strømme KE. The Norwegian Council for Road Safety's model for behaviour modification. Saatavilla (viitattu 19.2. 2022): https://www.sicurstrada.it/Risorse/The%20Norwegian%20Council%20for%20Road. 2017;20.*
9. *Assailly JP. Road safety education: What works?. Patient education and counseling. 2017 Jan 1;100:S24-9.*
10. *Dragutinovic N, Twisk D. The effectiveness of road safety education: A literature review. SWOV Institute for Road Safety Research. 2006.*
11. *Chamberlain M, Hook P. Changing mental models: How recent developments in teaching and learning can be applied to road safety education in schools. Proceedings of ULearn. 2012 Oct:3-15.*

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Graduated Licensing

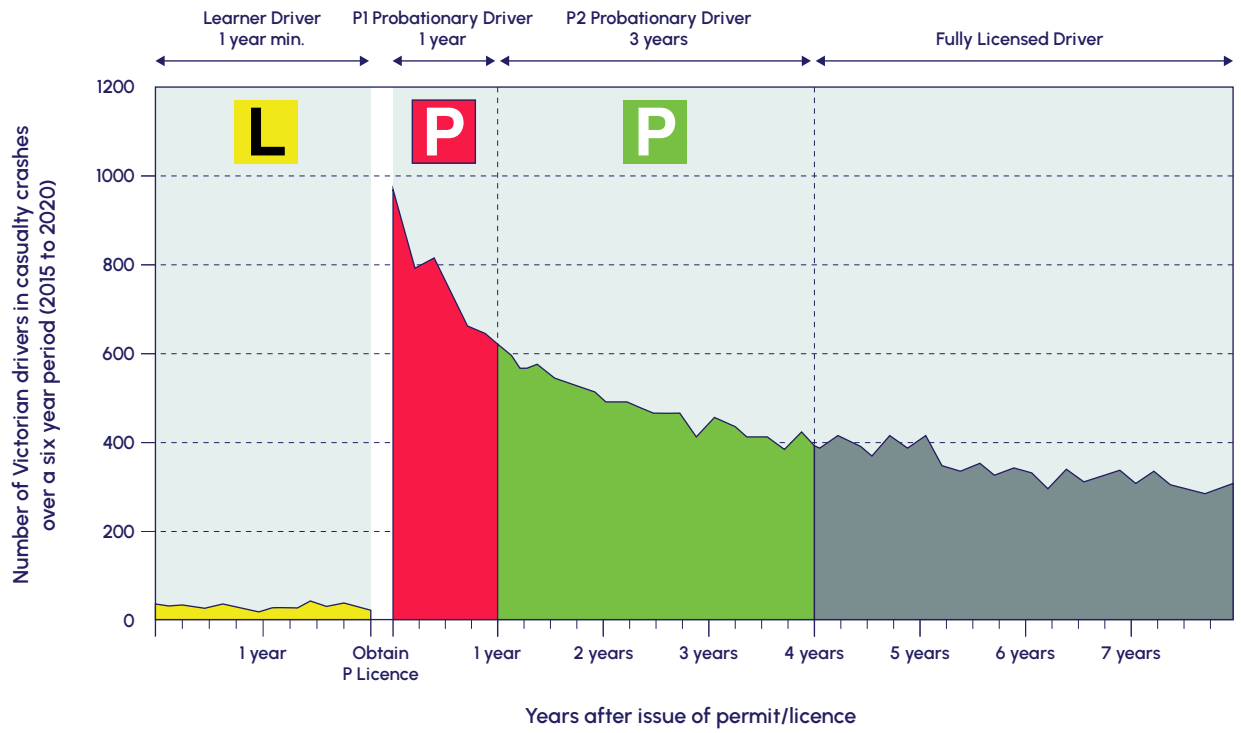
Crash risk for young drivers is highest in the first year of driving and decreases with experience. Victoria's Graduated Licensing System (GLS) provides a scaffold for young drivers, managing this high-risk period. Through a staged approach, learner drivers progressively gain experience under the supervision of a licensed driver.

What does the evidence show?

The research shows that Victoria's GLS is aligned with best practice and has improved safety. Following its introduction in 2007-2008, there was a 20% reduction in the rate of involvement in fatal and serious injury crashes among 18–20-year-old drivers.[13]

Research also shows that undertaking extended practice as a learner driver can reduce driving risk when licensed.[14]

Figure 1. Crash risk by driving experience[12]



References

12. *VicRoads. Reducing P driver crash risk graph [image on the Internet]. 2023 [updated 2023 April]. Available from: https://www.vicroads.vic.gov.au/-/media/images/safety-and-road-rules/driver-safety/young-drivers/reducing-p-driver-crash-risk-graph.ashx*
13. *VicRoads. Examination of the impact of the graduated licensing system on young novice driver safety: summary report [Internet]. 2017. Available from: https://www.vicroads.vic.gov.au/~/media/files/documents/safety-and-road-rules/examination-of-the-impact-of-the-gls-on-young-drivers-oct-2017.pdf?la=en*
14. *Gregersen NP, Berg HY, Engström I, Nolén S, Nyberg A, Rimmö PA. Sixteen years age limit for learner drivers in Sweden—an evaluation of safety effects. Accident Analysis & Prevention. 2000 Jan 1;32(1):25-35.*

Why does it work?

Extensive driving practice before obtaining a probationary licence is a key component of an effective GLS; Victoria requires 120 hours of practice before a young driver is eligible for a probationary licence.

GLS limit probationary drivers' exposure to especially risky scenarios until young drivers have gained more experience; measures are designed to address:

- Alcohol – even at low levels – impairs driving performance and is especially risky for young drivers[15]. Victoria has a zero BAC limit for probationary drivers.
- Travel with peers – research shows that having peers present increases risk, especially among young male drivers.[16,17] Victoria's GLS limits the number of young passengers who can travel with a young driver during their first 12 months of licence.
- Mobile phone use – mobile phones are deeply embedded in the lives of young people. Young drivers are more adversely affected by distraction than more experienced drivers[18]. Accordingly, no mobile phone use is permitted under the Victorian GLS.
- Good behaviour requirement – to progress through the licensing system, there is a strict limit on demerit points, which encourages compliance with road rules and limits driving violations; violations are associated with crashes.[19]

Enforcement

What does the evidence show?

The risk of getting caught and receiving a sanction for doing the wrong thing, plays an important role in deterring unsafe behaviours among all road users.

Why does it work?

Effective police enforcement can improve safety by encouraging young drivers to comply with speed limits, use seat belts, refrain from driving after drinking or taking drugs, and comply with the conditions of their probationary licence.

Police enforcement is effective at changing behaviour, especially when combined with mass media advertising.[20,21,22]

References

15. *Zador PL, Krawchuk SA, Voas RB. Alcohol-related relative risk of driver fatalities and driver involvement in fatal crashes in relation to driver age and gender: an update using 1996 data. Journal of studies on alcohol. 2000 May;61(3):387-95.*
16. *Ouimet MC, Pradhan AK, Brooks-Russell A, Ehsani JP, Berbiche D, Simons-Morton BG. Young drivers and their passengers: a systematic review of epidemiological studies on crash risk. Journal of Adolescent Health. 2015 Jul 1;57(1):S24-35.*
17. *Curry AE, Mirman JH, Kallan MJ, Winston FK, Durbin DR. Peer passengers: How do they affect teen crashes?. Journal of Adolescent Health. 2012 Jun 1;50(6):588-94.*
18. *Guo F, Klauer SG, Fang Y, Hankey JM, Antin JF, Perez MA, Lee SE, Dingus TA. The effects of age on crash risk associated with driver distraction. International journal of epidemiology. 2017 Feb 1;46(1):258-65.*
19. *de Winter JC, Dodou D. The Driver Behaviour Questionnaire as a predictor of accidents: A meta-analysis. Journal of safety research. 2010 Dec 1;41(6):463-70.*
20. *Cavallo A, Cameron MH. Evaluation of a random breath testing initiative in Victoria 1990 & 1991: summary report. 1992 Dec.*
21. *Cameron MH, Cavallo A, Gilbert A. Crash-Based Evaluation of the Speed Camera Program in Victoria 1900-1991; Phase 1: General Effects; Phase 2: Effects of Program Mechanisms. 1992 Dec.*
22. *Terer K, Brown R. Effective drink driving prevention and enforcement strategies: Approaches to improving practice. Trends and issues in crime and criminal justice. 2014 Feb(472):1.*

The Safe System

Road user behaviour is only a small part of the picture in road safety. The Safe System is a holistic approach that recognises that different elements of the road environment must work together to keep everyone safe. These elements include roads and roadsides, vehicles, travel speeds, and road users.[23,24,25]

What does the evidence show?

Four central principles guide the development of a Safe System:

1. The transport system needs to understand and account for human error.
2. The human body has a limited capacity to withstand crash forces before harm occurs. The impact forces experienced in a crash must be limited to prevent fatal or serious injury.
3. Road users have a responsibility to comply with traffic laws. However, ultimate responsibility for road safety rests with those who design, build, and manage roads and vehicles.
4. All parts of the system must be robust enough to protect road users if any part of the system fails.

Why does it work?

While all road users are expected to share responsibility for road safety, children and young people are less equipped to use the roads safely because of their developmental stage.

As designers and operators of the system, road and transport authorities can improve safety for children and young people by supporting them within a protective system that recognises their limitations.

Best-practice road safety education should explore the Safe System and its central concepts, looking beyond road user behaviour to the broader range of factors that contribute to crash incidence and severity.

Figure 2. The Safe System[26]

References

23. Tingvall C, Haworth N. Vision Zero-An ethical approach to safety and mobility. In6th ITE international conference road safety & traffic enforcement: Beyond 2000 1999 Sep 7.
24. International Transport Forum. The Safe System Approach in Action. OECD Publishing; 2022.
25. SWOV Institute for Road Safety Research. Sustainable Safety: The Advanced Vision for 2018-2030, 3rd edition [Internet]. The Hague (NL): SWOV; 2018. Available from: https://swov.nl/nl/publicatie/sustainable-safety-3rd-edition-advanced-vision-2018-2030
26. https://www.tac.vic.gov.au/road-safety/victorian-road-safety-strategy

Road Infrastructure and Design

In a Safe System, roads can be designed to reduce impact speeds to survivable levels and change impact angles to produce less severe outcomes in the event of a crash.[25,27]

What does the evidence show?

In pedestrian and cycling environments (schools, shopping strips, and local streets), the following measures can help improve the safety of vulnerable road users, including children and young people:

- Separation of pedestrians and cyclists from road traffic.
- Traffic calming to encourage slower speeds (e.g. raised pedestrian crossings and speed humps).
- Low vehicle speed limits (30 km/h).

Some examples of road features that can help protect vehicle occupants, including young drivers and passengers, are:

- On high-speed roads, roadside and centre barriers (protect against run-off-road and head-on crashes, which are especially severe).
- Intersection treatments such as roundabouts and raised intersections.
- Matching speed limits to the safety level of the road infrastructure.

Why does it work?

School communities have a powerful voice and can advocate for changes in their local environments, for example, by reducing travel speeds in surrounding areas, making crossing points and intersections safer, or separating vehicles from vulnerable road users (e.g., cyclists and pedestrians).

References

25. SWOV Institute for Road Safety Research. Sustainable Safety: The Advanced Vision for 2018-2030, 3rd edition [Internet]. The Hague (NL): SWOV; 2018. Available from: https://swov.nl/nl/publicatie/sustainable-safety-3rd-edition-advanced-vision-2018-2030

27. Woolley J, Stokes C, Turner B, Jurewicz C. Towards safe system infrastructure: a compendium of current knowledge. Austroads; 2018.

Vehicles

Vehicle safety plays an important role in protecting young road users.

What does the evidence show?

Research shows that if every vehicle on the road were the safest model in its class, road safety would improve by 26%.[28]

The injuries sustained in crashes in '5-star' cars are less severe than those in cars with a lower safety rating.[29] Safety features to look for include Auto Emergency Braking (AEB), Electronic Stability Control (ESC), Lane Keep Assist (LKA), Reversing Camera, and Side Curtain and Front Airbags.

Vehicle safety is not top of mind for young people. Until they are ready to buy a car, vehicle safety information is of little relevance.[30] Therefore, the timing and delivery of vehicle safety information are important considerations. Parents and carers also play an important role in influencing safe vehicle choices for young road users.[31]

The How Safe Is Your Car website is a resource that helps parents and young and novice drivers search for the safest vehicle within their budget.[32]

Why does it work?

Young people are among our most vulnerable road users – whether as pedestrians, cyclists, passengers or drivers. Vehicle safety features improve safety by preventing crashes and reducing the severity of injuries if a crash occurs.[29]

References

28. *Newstead S, Delaney A, Watson L, Cameron M. A model for considering the'total safety' of the light passenger vehicle fleet. Monash University Accident Research Centre Reports. 2004 Aug (228):44.*
29. *Fitzharris M, Lenné M, Corben B, Pok Arundell T, Peiris A, Liu S, Stephens AN, Fitzgerald M, Judson R, Bowman D, Gabler H. Overview and analysis of serious injury crashes–crash types, injury outcomes and contributing factors, ECIS Report 1 (MUARC Report 343).*
30. *Transport Accident Commission (2023) Young Driver Evaluation: Qualitative Study for TAC, prepared by Quantum Research for the TAC (unpublished)*
31. *Newstead SV, Watson LM, Allen T, Keall MD. Modelling safety choices during the lifetime transition of vehicles through the fleet. Melbourne (AU): Monash University Accident Research Centre; 2024 Feb. Report No.: 368. Available from: https://doi.org/10.26180/25156304*
32. *Transport Accident Commission (TAC). How safe is your car? [Internet]. Available from: https://howsafeisyourcar.com.au/?gad_source=1&gclid=EAIaIQobChMIxP-P6sj6hQMVexWDAx38bA0NEAAYASAAEgLrwvD_BwE*