Submission 89

I'd like to draw your attention to one of the questions asked by the Chair at the public departmental briefing on the 18th of June.

CHAIR: *I have a further question perhaps to Mr Fraine or maybe to Acting Superintendent Pointon. These days bikes have a lot of safety equipment on them and much better brakes and that type of thing. Do you think there is further safety enhancement that can be made to bicycles that you have noticed somewhere else or that someone else is using? Are there any add-ons that people use, or accessories?*

Mr Stapleton: *Part of my coverage includes vehicle safety. There are a lot of developments in the area in both motor vehicle and motorcycle safety. As far as I am aware, there is very little in the area of bicycle safety. So I am not aware of any developments that would improve the safety of a bicycle as a vehicle, so to speak.*

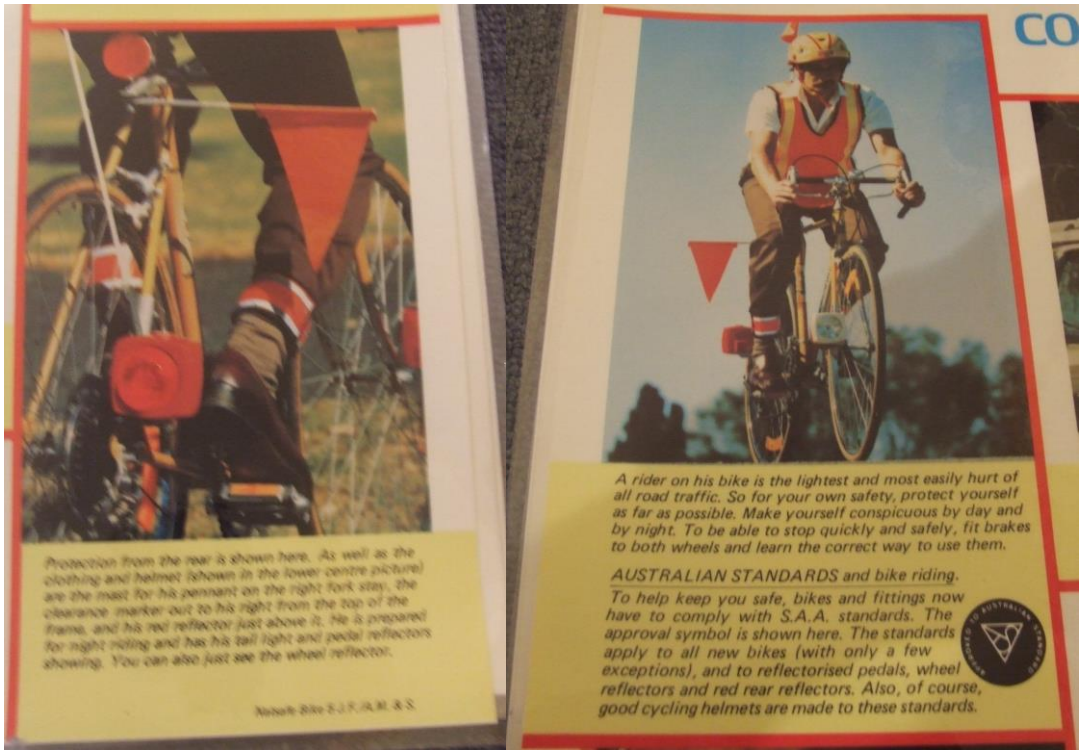
I am aware of at lest 4 devices that could be added on to a bicycle to make them safer. I use them myself and would highly recommend them.

(1) Battery-free lights - Permanently mounted, so you always have your lights with you. They are on whenever you cycle, which makes you more visible and safe in traffic – day and night.
http://www.reelight.com/the-benefits/
According to a study conducted by Reelight, Odense Cycle City and the University of Aalborg, permanent battery-free bike lights reduce accidents by 32% while boosting a cyclists' sense of security by up to 85%.

(2) Mirrors - Improve cyclists ability to see approaching vehicles (refer to attachment)

(3) Biometrics - Reflective strips on moving body parts, increases the ability of motorists to identify cyclists from a greater distance approach. (refer to attachment)
http://www.qut.edu.au/research/research-projects/pedestrian-and-cyclist-visibility-in-low-light-conditions

(4) Safety Flags - As bicycles are low to the ground and truck drivers are seated higher, flags can make the bicycle more visible. Horizontally mounted flags can 'encourage' safe overtaking gaps.
http://www.nordicgroup.us/s78/images/img_0277.jpg
http://www.flashback.ca/flashflags.html
http://www.bikecommuters.com/2007/08/18/d-tour-bicycle-safety-flag-first-impression/

These devices don't strictly make the bicycle safer, but would be useful for crash investigation.

Crash cameras - These devices mount on the vehicle and immediately record when the sensor detects an event of sudden change in motion, and instantly saves a protected file.
http://www.ja-gps.com.au/Navman/mivue-388-car-dvr-with-gps/
http://www.ja-gps.com.au/Myionu/myionu-smartcam-hd/

Helmet Cameras - these have to be manually activated, no gps or crash sensors
http://www.launchhelmetcams.com.au/buy/contour-2/VHRCPLUS2
http://www.helmetcamerasaustralia.com.au/video-cameras/action-video-cameras.html

If the proposed 1m passing clearance law was passed, I am concerned it would result in a flood of complaints to the police and demands for enforcement. In Townsville the local bicycle user group is already 'encouraging all cyclists to use cameras'[1]. As you can see the technology is readily available.

Refer to page 15 of the attached report for the specifications of a bicycle that had an ultrasonic sensor and camera attached to both video and measure overtaking behaviours.
http://cyclingresourcecentre.org.au/images/uploads/post/attachment/SB19219_Narrow_Bridge_Treatments_%28Final%29.pdf

Bicycle Registration

I've only one comment to make on the notion of bicycle registration, which comes as a direct quote from page 78 of *Bicycle transportation: a handbook for cycling transportation engineers*, 2nd ed, by Forester,J. Cambridge, Mass : MIT Press, 1994. 346p. First ed. published as: Cycling transportation engineering.

Several superstitions have become widespread as a result of the pre-eminence of automobiles, trucks, and buses in highway transportation. The first of these is that the use of the public highways is restricted to vehicles that are registered. Every state has a law requiring that motor vehicles and their trailers be registered. The general rule is that streetcars, trolley buses, horse-drawn wagons, bicycles, pushcarts, horses, street toys, and pedestrians are not registered. There are several reasons for registering motor vehicles. ***They are valuable, self-portable property; they are more dangerous than other vehicles; they may be used in the commission of crimes; they make their driver difficult to identify; they are hard to catch; and some of them are heavy enough to produce exceptionally intense deterioration of the roads. These are all reasons for registration, taxing, and fee collection, but these reasons do not apply to nonmotorized vehicles.*** *There is no justification whatever for the concept that a registration is required to get the right to use the public highways.*

John Forester has done a fair bit of research in this field, and this book, as well as others published by him, would be worth a review.

Enforcement
Submission 22 raises a few issues with regards to police ability to exercise 'discretion' and to decide which laws they will enforce. On what basis will the police exercise 'discretion', is it on an enforceability basis? If so, this sends a very dangerous message to the community that if a law is difficult to enforce it won't be policed. Is it on a policy basis? If so, is the policy set by the Minister, the Department or by individual officers? The question needs to be asked of police: how do they decide which laws to enforce?

[1] Townsville Bulletin, Townsville QLD, *Caught on Camera* 02 Jul 2013, by Emma Channon

The role of heavy vehicles in bicycle crashes

Currently heavy vehicle routes and licences are regulated through the National Heavy Vehicle Regulator:
http://www.tmr.qld.gov.au/business-industry/Heavy-vehicles.aspx
https://www.nhvr.gov.au/

But this does not take into account the road attributes the trucks use for the safety of 'vulnerable' road users. The focus is on the safety of the heavy vehicles and the drivers. If Road Safety Audits of heavy vehicle routes were required to ensure that they had adequate shoulders and lane widths that allowed safe overtaking of cyclists, then heavy vehicle routes could be re-allocated to 'safer', more 'forgiving' roads, at least in built-up, urban areas.

The department does have guidelines that could be used to assess roads for bicycle safety:
http://www.tmr.qld.gov.au/~/media/Travelandtransport/Cycling/Bike%20user%20guide/Technical%20information/C7_Cycling_and_heavy_vehicles.pdf

Role of the Federal and Local Governments

Given the resource limitations of the state government it may be worthwhile considering the roles of the other levels of government.

Brisbane City Council (for example) has a very extensive bicycle safety and promotion program. It would be worthwhile researching what they are doing.

In the past the Federal government has played a role in bicycle safety. Given the growth of cycling and heavy vehicle freight, do they have a role in this also? I've also attached some historical bicycle safety promotional material.

Federal Office of Road Safety's Wear-A-Helmet campaign (1987)
http://www.youtube.com/watch?v=slQqJBdlDbU

Bicycle lockers at railway stations were originally federally funded:
http://www.atrf.info/papers/2002/2002_Parker_A.pdf

Markings on the side of a train station bike box

Queensland University of Technology

Queensland University of Technology (QUT) is one of Australia's largest universities. As a 'university for the real world', QUT has a particular focus-applied research to address real world problems.

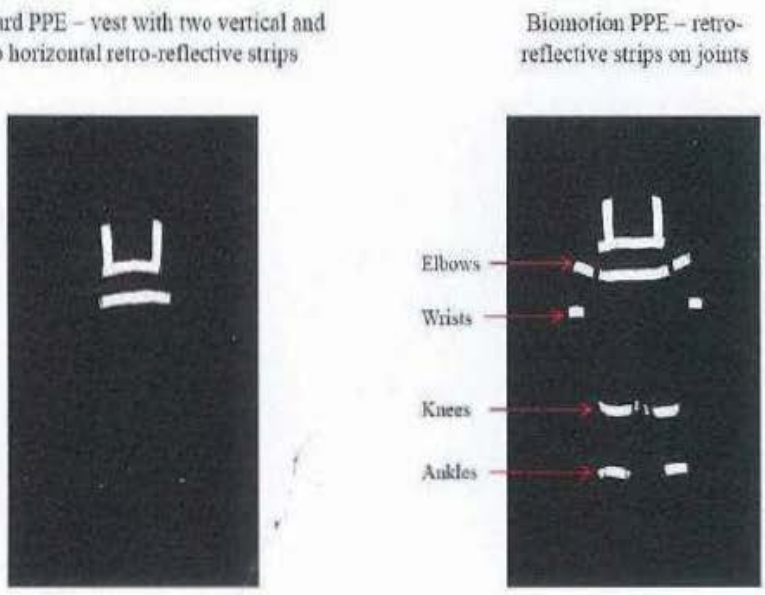
Through its research, QUT identified that pedestrians are up to seven times more likely to be involved in a fatal collision at night than in the day, putting night road workers in the high risk group. QUT also acknowledged that at night, drivers are often unable to recognise and respond to pedestrians, including road workers, from a safe distance.

Acknowledging that a lot had already been done to help identify night road workers, QUT noted that clothing with retro-reflective markers provided highly significant improvements in visibility. Also, retro-reflective markers positioned on the moveable joints created a sensation of 'biological motion' and were even more effective.

Most importantly, QUT revealed that adding retro-reflective strips in the full biomotion configuration to the standard road worker's vest consistently maximised the visibility of road workers.

QUT's research resulted in RoadTek and the Department of Transport and Main Roads adopting and incorporating the biomotion configuration into their standards.

In addition, the Australian/New Zealand Standards Committee 'Committee SF-004-03: Light reflective protective clothing' has incorporated the biomotion configuration into the draft AS/NZS 4602.1 2010 High visibility safety garments – Garments for general use. As a result, it is highly probable that QUT's research will lead to a new safety standard and be adopted nationally.

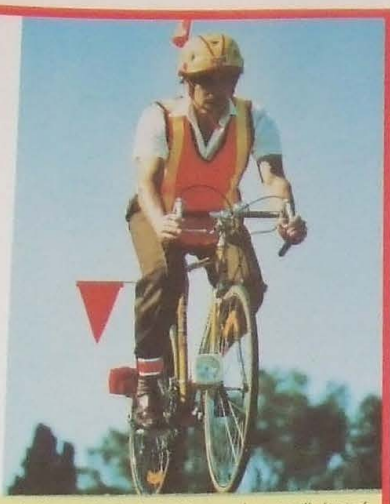


Adding retro-reflective strips to the standard road worker vest in the biomotion configuration had a highly significant impact on the ability of drivers to recognise road workers, increasing conspicuity distances by a factor of three times.

Figure: Standard PPE vest and new Biomotion PPE retro-reflective vest with strips on joints

PROTECT YOURSELF
BY DAY AND BY NIGHT

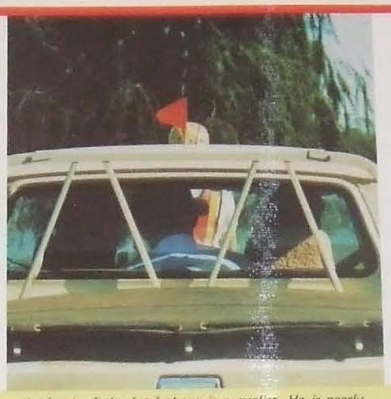
COMING OR GOING



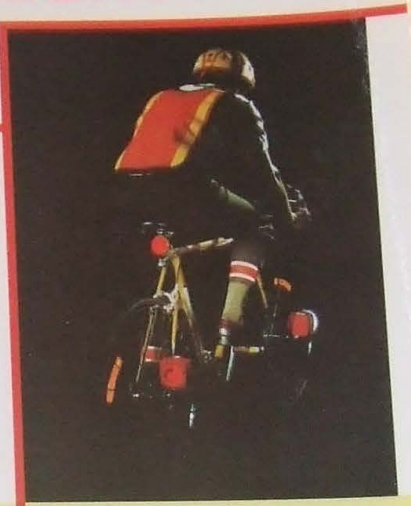
A rider on his bike is the lightest and most easily hurt of all road traffic. So for your own safety, protect yourself as far as possible. Make yourself conspicuous by day and by night. To be able to stop quickly and safely, fit brakes to both wheels and learn the correct way to use them.

AUSTRALIAN STANDARDS and bike riding.

To help keep you safe, bikes and fittings now have to comply with S.A.A. standards. The approval symbol is shown here. The standards apply to all new bikes (with only a few exceptions), and to reflectorised pedals, wheel reflectors and red rear reflectors. Also, of course, good cycling helmets are made to these standards.



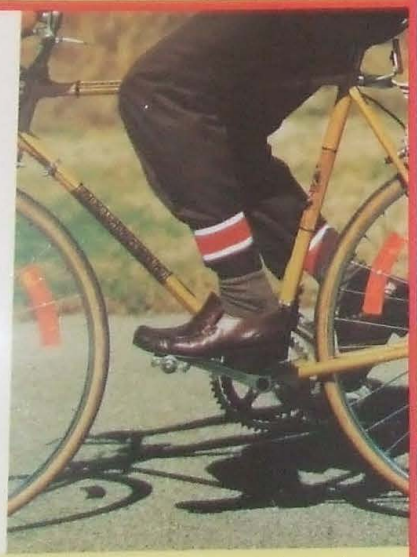
In front of the 'ute' above is a cyclist. He is nearly invisible from this angle. Only a glimpse of his helmet and pennant shows, and part of his special vest. If it were not for them, it would be almost impossible for traffic following the 'ute' to see him before they overtook, and he could be forced off the road or hit.



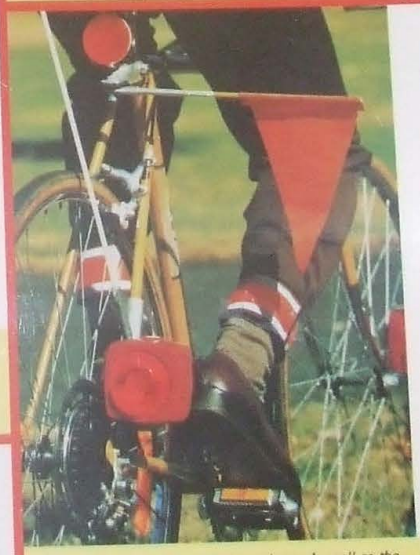
Here our rider shows up well in a car's headlights, not only because of his head and tail lights, (these must show for at least 200 metres), but also because his reflectors and pedals shine back for anything up to half a kilometre. His reflectorised anklets, special vest and helmet also show up well.

For riding after sunset, ensure that your bike has good bright head and tail lights, a bike is very hard to see in the half-light. You must also have pedal reflectors and wheel reflectors on your bike; and a red rear reflector at all times. If fitted with a back mudguard, it should be white or silver to help you be seen.

The cyclist and his safety equipment, i.e. high-visibility vest (red and reflectorised yellow), the bright red pennant and mast fitted to his back fork, and his bright yellow protective helmet with its blue approval sticker, (left rear). Get yourself an S.A.A. helmet, or one from a good manufacturer, to protect YOUR head in case of accidents.



This side view of the bike shows clearly the only protection that the rider has at night from cross-traffic. His amber wheel reflectors showing to both sides are fitted to his spokes. They are a 'must' now by law, and are very effective at night. His optional red anklets can help him be seen, they have reflective tape too for night riding.



Protection from the rear is shown here. As well as the clothing and helmet (shown in the lower centre picture) are the mast for his pennant on the right fork stay, the clearance marker out to his right from the top of the frame, and his red reflector just above it. He is prepared for night riding and has his tail light and pedal reflectors showing. You can also just see the wheel reflector.

Produced by
The National Safety Council of W.A. (Inc.)

For the
Federal Office of Road Safety
GPO Box 594, Civic, ACT 2601

Federal Department of Transport
Federal Office of Road Safety

DANGER!

BEWARE OF...

CYCLING HAZARDS

OVERTAKING TRAFFIC

TRAVELLING TOO CLOSE

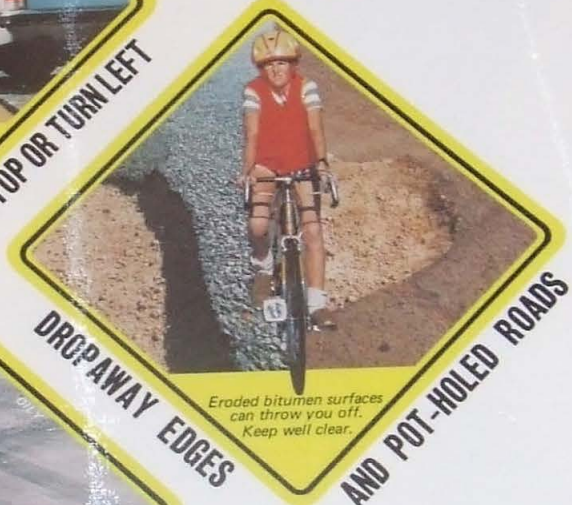
Leave enough space to your left to take evasive action.

TRAFFIC PULLING IN TO STOP OR TURN LEFT

Be ready for any overtaking vehicle to slow and pull in front of you.

STORMWATER GRATINGS AND SLIPPERY DRAIN COVERS

Keep well clear of these hazards, especially when wet.



DROP-AWAY EDGES AND POT-HOLED ROADS

Eroded bitumen surfaces can throw you off. Keep well clear.

SLIPPERY OR LOOSE ROAD SURFACES AND MARKINGS

These are bad surfaces to brake or turn sharply on.

RAILWAY LINES AND GUTTERS THAT CAN GRIP YOUR WHEELS

Try to cross almost at right angles. Walk across if necessary.

PARKED CARS PULLING OUT OR DOORS OPENING SUDDENLY

Keep at least a car door's width away from parked vehicles.

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Transport
Federal Office of Road Safety

RIDE TO THIS SYSTEM

LEFT TURNS ▼ RIGHT TURNS

THINK

Think about other traffic when sharing roads, don't just ride along in a little world of your own. Be sure that they see you and you see them in good time. Think about where you must turn and what your road position should be. Think out the safe approach speed for turns and hazards and brake on the straight before you get there.

CHECK

Check all round for traffic and pedestrians crossing your path. Check traffic behind especially, it will pass closest to you. Even if you do have a mirror, check over your right shoulder to be absolutely certain before signalling or moving across. Check again after signalling, even on a left turn, that it is safe to move.

SIGNAL

Signals tell others your intentions. Signal changes of direction, by holding the appropriate arm straight out from the shoulder, with the palm facing forwards Signal your intention to stop, with the right forearm straight up. Signal clearly for at least 30 metres before you move, to let other traffic react in time.

MOVE

Move only with the traffic flow, never against it. Make every move with care, watching the changing road surface and slow down where loose or slippery, and when turning corners. Keep close to the kerb for left turns, and move out to the centre line for right turns, only when the road is quiet. Move only when safe, never turn across traffic or cut the corner. On busy streets, walk your bike across.

WALK ACROSS ALL BUSY ROADS

WHETHER GOING STRAIGHT ON.. ...OR TURNING RIGHT

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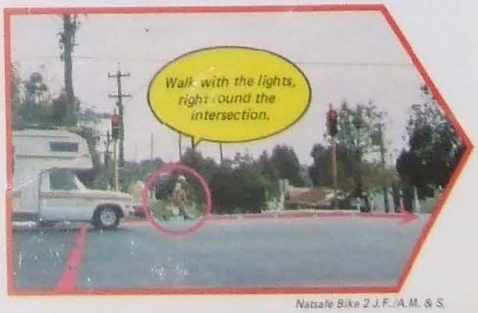

Natsafe Bike 2 J.F./A.M. & S.

Looking forward, **looking back**

Leon Hill reflects on mirrors for bikes and puts 12 to the test.

Let's face it - mirrors have never exactly been a must-have bit bike riding accessory. Never has a peloton of pro riders huddled excitedly around a bike, breathlessly poring over the elegant beauty and technical specifications of the latest bicycle mirror. But like every facet of cycling, mirrors have come a long way since those early models based awkwardly on motorbike mirrors. Modern bicycle mirrors are available in a range of practical and (dare I say it!) stylish designs to suit all possible uses.

"The main advantage of a mirror on a bicycle is to give the rider an idea of traffic approaching from behind."

The main advantage of a mirror on a bicycle is to give the rider an idea of traffic approaching from behind. A mirror becomes particularly effective out on quiet rural roads, allowing an approaching vehicle to be seen in the mirror long before it's heard. Mirrors are also handy for riding with children or friends, allowing riders to keep a casual eye on the rest of their party.

Most mirrors' surfaces are convex to some degree, offering a wide field of view to the rear of the bicycle. These convex mirrors are excellent for night riding, where the optics serve to reduce the savage glare of vehicle headlights to neat, non-blinding points of white light while the vehicle is still several hundred metres away.

Just as different bikes suit different needs, bicycle mirrors are designed to serve particular purposes based on the requirements of the rider. Mirrors come in a wide range of shapes, sizes, attachment styles, adjustment and mounting options. Bicycle mirrors are available in three broad categories: handlebar mounted, frame mounted and helmet / glasses mounted.

Handlebar mounted

These mirrors offer a wide field of vision, unobstructed by panniers, the rider's body or the bicycle itself. Most mirror manufacturers realise that handlebar real estate is a scarce commodity in the modern era of computers, lights, bells, and handlebar bags, and opt to mount the mirrors in the end of the handlebar using an expanding wedge that screws into place. Mounting in the bar end allows the mirrors to be installed on both flat and drop handlebars, except in the case of drop bar bikes with bar end shifters. The trade off for the wide field of view is that the mirrors can significantly increase the overall width of the bicycle, which becomes irritating when leaning the bike against a wall or riding through tight spaces.

Frame mounted

This style offers a much slimmer profile with the mirror attached discreetly on the top tube, down tube or even fork leg. Frame mounted mirrors are a neat option for cyclists who aren't going to be carrying panniers or luggage – the mounting position means the field of view is easily obstructed by panniers or even seat bags. Frame mirrors tend to show a lot of the rider's leg, particularly at the bottom of the pedal stroke.

Helmet and glasses mounted

These types of mirrors are ideal for those with multiple bikes, and offer a limitless field of view as the rider can scan in any direction. Head mounted mirrors take some getting used to at first, with the best location for the passport-photo sized mirror being at the very edge of the peripheral vision, close to the head. This position reduces distraction in the field of view, and reduces eye strain resulting from changes in focal distance while looking forward.

About the testing

The mirrors reviewed here were tested on a mountain bike, a road bike and a folding bike. Over the course of a couple of weeks, the bikes were ridden night and day across a variety of busy main thoroughfares, quiet rural roads, potholed suburban streets and sections of dirt roads. Destructive testing was conducted in the form of attaching the mirrors to my daughter's bike for her school commute – the bumps and knocks of a school bike rack are a trial by fire for any product. Each mirror was tested for field of vision, vibration, adjustment, and ease of installation and removal – with these factors considered in the function and quality scores for each mirror.

Despite the wide range of great products available, it's doubtful that mirrors are going to become the latest desirable bicycle component any time soon. At the completion of testing, I removed the mirrors from the bikes, and went out for my usual training ride. However, having grown accustomed to the mirrors, I felt naked and exposed without one so I turned around after a short while and popped one back on the bike before continuing. While they might't turn any heads, the modern crop of bicycle mirrors are definitely worth a look.

Take-a-look

Mount: helmet / glasses

$25

- Highest quality optics of products tested
- Simple, robust design, executed to a very high quality
- Odd to use at first – seems to work best in closer to glasses at very edge of peripheral vision
- Installed, adjusted and removed in a few seconds – can be removed and put in pocket easily when not in use
- Effective with panniers / touring
- Light weight with no vibration

RATING

95%

Function	40/40
Quality	40/40
Price	8/10
Appearance	7/10

Zefal Spin

Mount: bar-end

$24.99

- High quality convex mirror with no vertical distortion and wide field of view
- Discreet appearance on flat and drop handlebars
- Mirror adjustment remains secure with quality pivots and no vibration
- Folds away flat against handlebar for storage
- Works well with panniers

RATING

89%

Function	38/40
Quality	36/40
Price	8/10
Appearance	9/10

Blackburn multi mirror

Mount: bar-end

$24.95

- Well built pivots and mirror with high-quality optics
- Ingenious tool-free installation in bar-end
- A very wide mirror that adds significantly to the handlebar width of the bike
- Effective with panniers

RATING

82%

Function	36/40
Quality	32/40
Price	7/10
Appearance	7/10

Cat Eye BM-300G

Mount: bar-end

$19.95

- High quality, wide angle convex mirror
- Simple, circular design with limited adjustment
- Light weight

RATING

78%

Function	32/40
Quality	32/40
Price	8/10
Appearance	6/10

Mirrcycle mountain

Mount: bar-end

$34.99

- Complicated installation/design
- High-quality circular mirror
- Heaviest of the products tested – sturdy and withstands knocks and bumps

RATING

77%

Function	32/40
Quality	36/40
Price	5/10
Appearance	4/10

Zefal Cyclop

Mount: bar-end

$29.99

- Large, high quality convex mirror
- Large mirror protrudes from handlebar to significantly increase width of bike
- Works well with panniers
- Some vibration and need for adjustment while riding due to large size

RATING

74%

Function	32/40
Quality	32/40
Price	5/10
Appearance	5/10

▸▸▸

Bike Eye

Mount: frame

$30, including postage

- Innovative use of a little-used space on a bicycle
- High quality, flat mirror with narrow field of view compared to convex mirrors
- Zip tie mounting to frame
- Ineffective when used with panniers
- Available in small or large width

RATING

74%

Function	30/40
Quality	32/40
Price	6/10
Appearance	6/10

Zefal Spy

Mount: frame

$29.99

- Quick installation and removal with sturdy rubber strap
- Can be discreetly mounted on top tube, down tube, steerer, forks or handlebars
- Convex lens distorts image somewhat, and shows rider's legs and bike frame in field of view
- Ineffective when used with panniers

RATING

69%

Function	24/40
Quality	32/40
Price	6/10
Appearance	7/10

Tele-arm helmet mirror

Mount: helmet

$12.95

- Attached to helmet using double-sided tape
- Flimsy construction easy to break while adjusting
- Mirror moves and vibrates during a ride
- Ghosting of images in the mirror at times very distracting

RATING

41%

Function	16/40
Quality	16/40
Price	6/10
Appearance	3/10

3D-bike 2" mirror

Mount: frame

$12.95

- Quick installation and removal with rubber strap
- Can be mounted on top tube, down tube, steerer, forks or handlebars
- Convex lens is very domed, making detail in mirror very distorted
- Quality of pivots poor, requiring frequent tightening using tools
- Ineffective when used with panniers

RATING

38%

Function	12/40
Quality	16/40
Price	6/10
Appearance	4/10

3D-bike handlebar mounted circular mirror

Mount: handlebar

$14.95

- Convex lens is very domed, making detail in mirror very distorted
- Quality of pivots poor, requiring frequent tightening using tools
- Large mirror moves or even breaks off with minor bumps and hits

RATING

35%

Function	16/40
Quality	12/40
Price	5/10
Appearance	2/10

3D-bike bar-end oblong mirror

Mount: bar-end

$13.95

- Convex lens is very domed, making detail in mirror very distorted
- Quality of pivots poor, requiring frequent tightening using tools
- Large mirror moves or even breaks off with minor bumps and hits

RATING

32%

Function	16/40
Quality	8/40
Price	6/10
Appearance	2/10