INTERSECTING FORTUNES

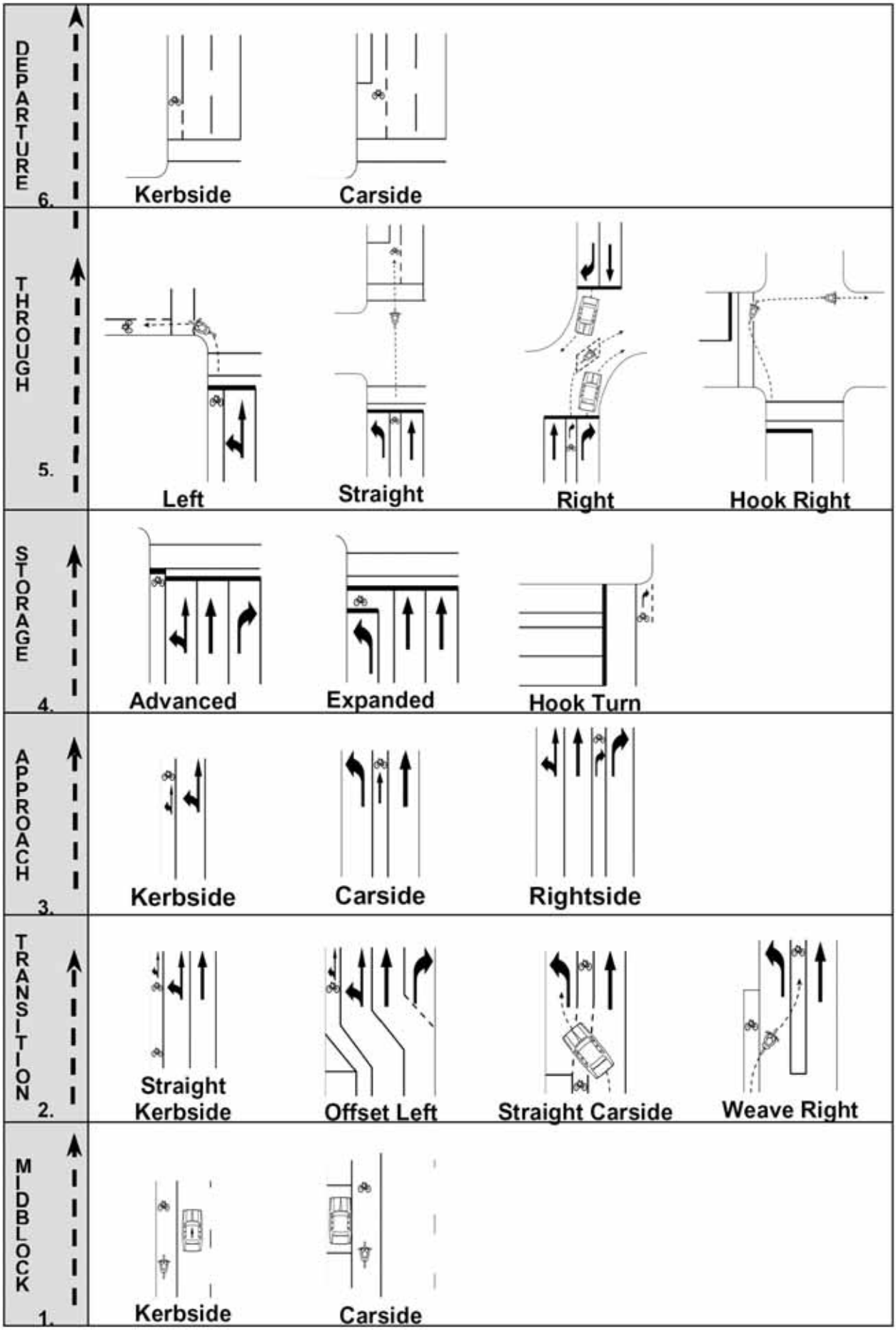
More than half of all reported cyclist road crashes in New Zealand occur at or very near to an intersection. Despite this, many roading authorities have only provided cycle-lanes along the "mid-block" (non-intersection) parts of their network; when you get to an intersection, they magically disappear.

Why is this so if intersections are so crucial to cycle safety? In many cases, providing intersection facilities is probably seen in the "too hard" basket; providing a cycle lane elsewhere is relatively easier. Intersections also tend to have additional demands placed on them by motor traffic, resulting in extra space taken up by traffic lanes. It doesn't help that local design guidelines in this area are woefully lacking (roll on the NZ Cycle Design Guide!).

Intersections of course come in various flavours: layouts, controls, turn lanes and so on. For particularly complex intersections, it might seem hard to know where to begin providing for cyclists. We're not going to start looking in detail just yet at various configurations. Rather we'll begin by looking at quite a useful way to break up an intersection into smaller components that can be more easily analysed.

Cumming *et al* (1999) suggested that there are six key elements of an intersection, in terms of providing for cyclists. The adjacent diagram summarises these elements (from bottom to top) and some typical treatments. The concept is broadly applicable whether the intersection is controlled by signals, priority (STOP / GIVE WAY) signs or a roundabout. The six elements are:

- **1. Mid-block cycle lanes**: Strictly speaking, this is not part of the intersection but of course, for continuity of cycle facilities between intersections, you will want to provide something. As mentioned before, however, often this is the only thing provided...
- **2. Transition area**: This is often where additional turning lanes are being introduced for motorists, making it difficult for cyclists to know where to go. Providing a continuous cycle lane through this area leads to more consistent behaviour by cyclists, making them more predictable for motorists. It is usually still a fairly stressful area, so the use of coloured surfacing is generally recommended.
- **3. Intersection approach**: After mid-block lanes, this is probably the most common cycle facility already seen around New Zealand, providing a safe place for cyclists next to other traffic lanes. The important thing is to determine what lanes are needed where, how wide they should be, and if coloured surfacing is required.
- **4. Storage area for cyclists at limit lines**: Cyclists like to be able to get in front of motorists so that they are more visible. This can be achieved using tools such as Advanced Stop Lines (having the cycle lane stop ahead of traffic lanes) or Advanced Stop Boxes (having a cycle storage area in front of traffic lanes). Again, colour is also useful to make them more visible, and to discourage motorists from encroaching upon them.
- **5. Guidance through intersection**: For relatively straight intersections this element is often unnecessary, but it may be useful where cyclists' paths are expected to curve (e.g. a roundabout or bend) or shift laterally. At priority-controlled intersections, continuity of the main road cycle lane is also very useful through the intersection, to remind side-road traffic to check for cyclists.
- **6. Intersection departure**: Having got cyclists across the intersection, don't just forget about them! In some oblique layouts, cyclists may need coloured cycle lane markings to help them find an offset path on the other side and to prevent motorists from squeezing them out. If there are any slip lanes on the other side, then a cycle lane (preferably coloured) will help to remind entering traffic to give way to any cyclists.



Using the simple breakdown as outlined above, good design can be benchmarked against the completeness of the six design elements (in some cases, it's not necessary to cater specifically for each element). You can apply the same technique for cyclists approaching from any leg and heading in any direction.

Some Relevant Reading

- Austroads, 1999. *Guide to Traffic Engineering Practice, Part 14: Bicycles*, Sections 5.2 (Issues at Intersections for Cyclists).
- Austroads, 2002. *Investigation of Cyclist Safety at Intersections* (Publication No. AP-R206/02), contains a good selection of intersection case studies from around Melbourne to learn from. Web:http://www.austroads.com.au/mall/austroads_v2/pdfs/447_AP-R206.pdf (1.3MB)
- Christchurch City Council has produced two useful reports, *Cycle Lane Delineation Treatments* and *Marking of Advanced Cycle Lanes and Advanced Stop Boxes At Signalised Intersections*, that provide good examples of treatments for intersections. Web:http://www.ccc.govt.nz/Recreation/Cycling/TechnicalResearch/
- Cumming, A., Barber, H. and Smithers, R., 1999. *The Model Bicycle Intersection*. Workshop Paper for VelOZity Cycling Conference, Adelaide, Aust., Feb 17-19 1999.
- VicRoads, 2001. *Providing for Cyclists At Signalised Intersections* (Cycle Note No. 8) explains how to use the 'six elements' approach for traffic signals. Web:http://www.vicroads.vic.gov.au/vrpdf/trum/tr2001103.pdf (270kB)

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