

## **Guidelines for 40 km/h Strip Shopping Centres**

### **PURPOSE**

These guidelines specify the eligibility criteria, hours of operation, signing standards, project methodology and funding arrangements for 40 km/h speed zones in strip shopping centres.

### **OBJECTIVE**

The principal objective of the 40 km/h strip shopping centre program is to improve safety for pedestrians by reducing the risk of fatalities and injuries in strip shopping centres in both metropolitan Melbourne and country towns.

It should be noted that the application of 40 km/h speed zones in other circumstances remains covered by VicRoads Traffic Engineering Manual Volume 1.

### **BACKGROUND**

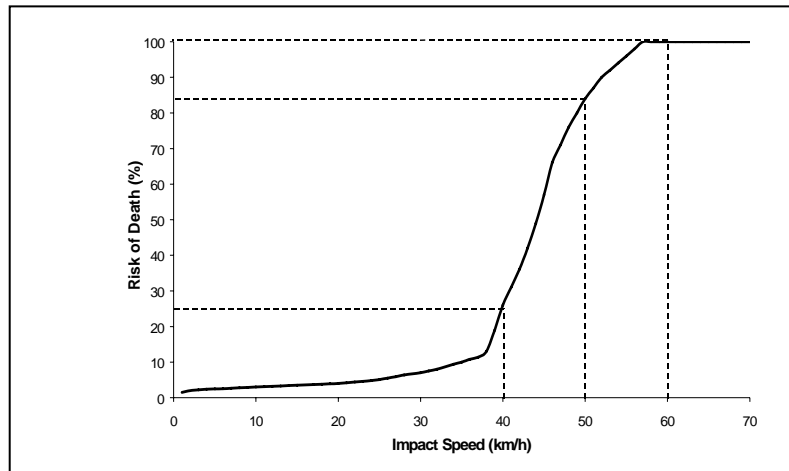
The strategic framework for this program is set by Victoria's road safety strategy *arrive alive 2008-2017*. The aim is to reduce deaths and serious injuries by 30% by the end of the strategy. The strategy includes an action to improve pedestrian safety by setting speed limits according to the safety standards of locations with high pedestrian activity.

The introduction of 40 km/h speed limits in strip shopping centres is an initiative to save lives and reduce pedestrian road trauma. For the purposes of the program, a strip shopping centre is defined as a location which has continuous development which is predominantly retail and commercial in nature, directly abuts both sides of the road over a distance of not less than approximately 400 metres and generates a significant level of pedestrian activity.

On average, in Victoria 40 pedestrians are killed and 700 seriously injured each year on our roads.

Research carried out by the Monash University Accident Research Centre (MUARC) indicates that, while engineering pedestrian treatments are all very important for pedestrian safety, further major gains can only be achieved by tackling the issue of traffic speed.

Other research shows that the risk of death for pedestrians increases rapidly as the impact speed increases. The figure below shows the risk of pedestrians dying for a given impact speed.



### **Relationship Between Risk of Death to Pedestrians & Impact Speed**

Source: Anderson, R., McLean, A., Farmer, M., Lee, B., & Brooks, C., (1997). *Vehicle travel speeds and the incidence of fatal pedestrian crashes. Accident Analysis and Prevention* 29(5), 667 – 674.

## **EVALUATION OF THE TRIAL PROGRAM**

A trial program comprising eighteen strip shopping centres in metropolitan Melbourne commenced in 2003. The trial sites were selected based on high pedestrian crash numbers. A detailed evaluation of the trial program, which was conducted by MUARC estimated that, overall implementation of the trial was associated with around 17% reduction in pedestrian casualty crashes and around 8% reduction in all casualty crashes. The estimated benefit/cost ratio for the trial program as a whole, based on the total casualty crash reduction of 8%, was 7.4.

## **ELIGIBILITY CRITERIA**

Locations that meet all the following criteria shall be eligible for consideration for this initiative:

- Continuous, predominantly retail and commercial development which directly abuts both sides of the road over a distance of generally not less than 400 metres;
- A high level of pedestrian activity characterised by frequent movements across the road;
- Generally with kerbside parking resulting in frequent parking manoeuvres; and
- Support of the local community and municipal council.

Strip shopping centres on both arterial roads and local roads are eligible.

As the primary objective of reduced speed limits in strip shopping centres is to improve safety by reducing injuries sustained by pedestrians, priority for funding will be given to locations with a history of pedestrian casualty crashes.

## **GENERAL SELECTION CRITERIA**

Infrastructure improvements that are effective in reducing pedestrian crashes such as signalised crossings, pedestrian refuges, kerb outstands and pedestrian fencing, should be considered prior to lowering speed limits (refer to VicRoads Traffic Engineering Manual Volume 1 – Traffic Management, Chapter 4 – Pedestrian Facilities).

Divided roads and roads with service roads will generally not be suitable, unless there is a significant history of pedestrian crashes that cannot be addressed by other measures. These may be sites where the median is intermittent or where it does not provide, or is not capable of providing, refuge for right-turning traffic.

Reduced speed limits in residential and industrial areas or in the vicinity of facilities such as parks, sports arenas or other community facilities will not be considered under this initiative. However, land uses other than retail that generate high levels of pedestrian activity may influence the limits of a 40 km/h strip shopping centre zone.

When contemplating a reduced speed zone, consideration must be given to rationalising adjacent speed limits so as to minimise the overall number of speed zone changes along the route. No speed zone (including time variable zone) will have a length less than that specified in VicRoads Traffic Engineering Manual Volume 1 – Traffic Management, Chapter 7 – Speed Zoning Guidelines.

The guidelines do not cover all possible situations; therefore, it will be necessary to apply sound safety principles and engineering judgements in implementing the initiative.

## **TIMES OF OPERATION**

The times of operation of 40 km/h speed limits in strip shopping centres will be restricted to the following options so that they are consistent and likelihood of motorist confusion is minimised:

- 8:00am to 7:00pm Monday to Saturday;
- 8:00am to 12:00am Monday to Saturday; and
- 24 hours, 7 days a week.

The times of operation that are selected should be those that best suit the times of peak pedestrian activity. Part time operation shall typically be used in centres that have little pedestrian activity outside of normal shopping hours. In shopping strips in which restaurants and / or entertainment premises form a significant component of the land use (Chapel Street, South Yarra for example), longer part time hours or permanent operation should be considered.

If there is a significant number of pedestrian crashes outside normal shopping hours, consideration should be given to implementing a 24-hour zone regardless of observed pedestrian activity patterns in cases where other counter measures are not feasible.

## **SIGNING STANDARDS**

Electronic signs must be installed as specified in this guideline where 40 km/h strip shopping centre speeds are installed on the following roads:

- All arterial roads regardless of whether the lower speed limit is permanent or part-time operation; and
- Local roads along which part time strip shopping centre speed limits operate.

Electronic signs will generally be required, and are preferred, on local roads with permanent 40 km/h strip shopping centre speed limits. However, where signs can be located so that they are conspicuous, particularly at the commencement of the zone and near any major intersecting roads, static signs may be accepted. Where static signs are proposed, it is the council's responsibility to demonstrate to the satisfaction of VicRoads that they will be effective in lieu of electronic signs. Where static signs are proposed, it is highly recommended that gateway treatments or suitable local area traffic management devices are installed at appropriate locations.

The general signing arrangements which incorporate electronic signs are set out below and are illustrated by Figure 1. A similar arrangement of signs shall be used on local roads by replacing the electronic signs with static signs in shopping centres in which the use of static signs only has been approved.

These signing arrangements shall be the minimum required. Additional signs, either static or electronic should be installed where a higher level of conspicuity is required or if other site specific characteristics deem them necessary.

A single advance 40 km/h ahead warning sign shall be installed on the left of the road approximately 100 metres before the commencement of the 40 km/h strip shopping centre speed limit.

A pair of electronic speed signs, one located on each side of the road, will be used at the start of the strip shopping centre speed limit. These shall be variable signs in centres where part-time 40 km/h zones are to operate. A single static repeater sign is to be installed approximately 50 metres after the commencement of the zone. Single repeater electronic speed signs are to be located on the left of the road at 400m–500m intervals within the 40 km/h zone.

As illustrated by Figure 1 all roads that intersect the 40 km/h strip shopping centre zone must have advisory signs on the approach to the street in which the strip shopping centre is located. Static repeater signs are to be placed in the shopping strip within 20 to 50 metres of the intersection for both directions of travel, to give motorists entering the 40 km/h zone a clear indication of the applicable speed limit.

Where an intersecting road is an important traffic route, for example an arterial road, electronic repeater signs are to be used in the shopping strip instead of static signs shown in Figure 1. These are to be placed within 20 to 50 metres of the intersection for both directions of travel, to give motorists entering the 40 km/h zone a clear indication of the applicable speed limit.

The signing arrangements illustrated by Figure 1 should mean that the 40 km/h strip shopping centre speed zone is signed in such a way as to provide repeater signs (either electronic or static) at least every 150 metres for each direction of travel. If this is not the case, additional repeater signs may need to be erected to achieve spacing not exceeding 150 metres.

At the end of the strip shopping centre speed zone, a pair of static signs (generally “B” size), one located on each side of the road, will be used to reinstate the prevailing speed limit.

## **FUNDING**

The availability of funds for the implementation of strip shopping centres will generally be considered annually as part of VicRoads’ program planning with details provided in annual program guidelines. Funding of projects by VicRoads shall be in accordance with these guidelines.

Projects may also be eligible for funding under the Auslink Black Spot Program. Reference should be made to the Auslink Program Administration Guidelines for details of eligibility. Councils should note that provision exists for joint local government / Federal Government funded projects under the Auslink Program.

Councils may fully fund projects, however, the eligibility criteria must be met and signing must be in accordance with the standards specified in these guidelines.

## **PROJECT EVALUATION**

Candidate projects that meet the eligibility criteria will be evaluated based on their potential to reduce the number or severity of casualty crashes. As the objective of the initiative is primarily to reduce pedestrian deaths and injuries, greater weight is given to casualty crashes involving pedestrians.

Benefit-cost analysis should be the primary criterion to evaluate candidate projects. The following parameters are to be used to calculate the benefit / cost ratio:

Crash reduction factor (pedestrian crashes):	15%
Crash reduction factor (other crashes):	4%
Treatment Life:	15 years
Annual differential maintenance cost:	5% of the capital cost
Unit costs of crashes:	As per annual program guidelines
Discount rate:	As per annual program guidelines

The crash reduction factors shall be applied to all pedestrian and other crashes regardless of the proposed times of operation of the 40 km/h speed limit. The costs of serious casualty crashes (i.e. fatal and serious injury crashes) and other injury crashes shall be separately calculated using appropriate unit crash costs and then added to determine the total cost of crashes.

The benefit / cost ratio (BCR) shall be determined as follows:

$$\text{BCR} = \text{PV}_{\text{benefits}} / \text{PV}_{\text{costs}}$$

Where  $\text{PV}_{\text{benefits}} = \text{PV}_{\text{benefits}}(\text{pedestrian crashes}) + \text{PV}_{\text{benefits}}(\text{other crashes})$

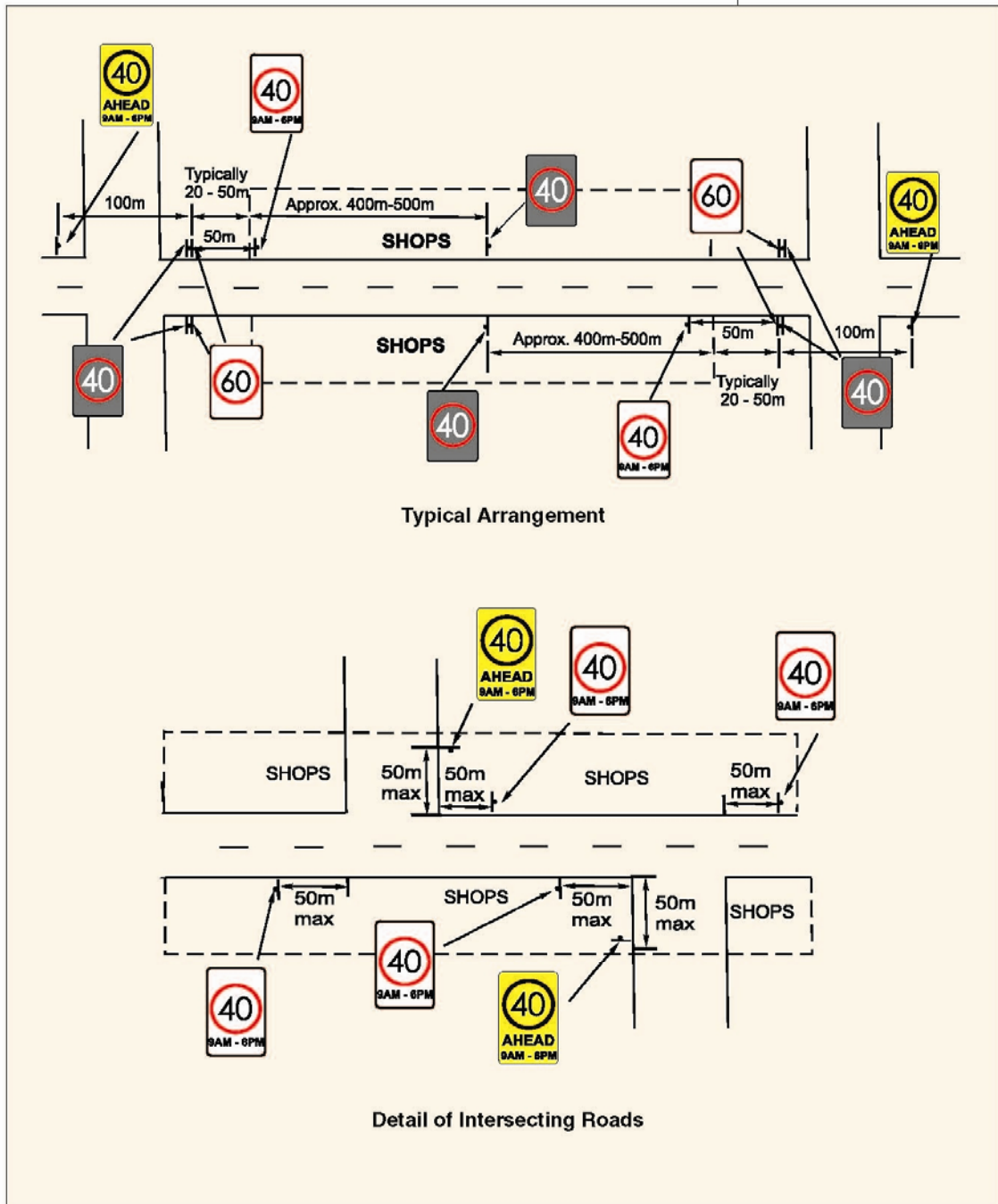
To determine whether project evaluation based strictly on BCRs should be adjusted to take account of future needs, consideration should also be given to factors such as:

- Future growth;
- New development; and
- Community demand.

## **MAINTENANCE**

The normal maintenance arrangement will apply. For all equipment installed:

- Local municipal roads – the municipal council will be responsible for the static signs and for all electrical equipment. Electronic signs will be monitored centrally by VicRoads but municipal councils will be responsible for the maintenance costs.
- Arterial roads – VicRoads will be responsible for the static signs and all electrical equipment.



Notes:

1. Times vary to suit site requirements
2. At cross intersections where the layout may cause confusion with respect to the "40 Ahead" warning sign, the strip shopping centre street name may be included below the sign (black on yellow) to clarify the road to which the limit applies.
3. Where the intersecting street is another important traffic route (e.g. arterial road) an electronic repeater sign should be used.

**Figure 1: SIGN LAYOUT – 40 KM/H METROPOLITAN STRIP SHOPPING CENTRES**