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Traffic Calming Policy Revision 1

Effective from 1 March 2019

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1. INTRODUCTION, VISION AND OBJECTIVES

1.1 Introduction

1.1.1 Drakenstein receives numerous applications for traffic calming measures on a monthly basis. Experience within Drakenstein and elsewhere has shown that a traffic calming policy should:

- (a) Be sensitive to the needs and safety of pedestrians, including vulnerable groups within communities, such as children, the elderly and the disabled;
- (b) Be clear, practical and easy to apply;
- (c) Be accommodating to vehicular traffic;
- (d) Limit data requirements for application;
- (e) Facilitate prioritisation;
- (f) Facilitate the timely processing of traffic calming applications, setting out the process to be followed by the general public, officials and councillors.
- (g) Not be viewed as a primary Law enforcement action.

1.1.2 This revised traffic calming policy is therefore based on the above. The various guidelines that were referenced in its development are indicated in the list of references.

1.2 Context

1.2.1 With increasing vehicle ownership, traffic volumes are increasing steadily. Vehicle speeds have also increased with an associated decrease in the levels of tolerance shown by fellow road users, motorists to cyclists and pedestrians and vice versa.

1.2.2 The numerous applications received by Drakenstein for traffic calming measures demonstrate the perception of individuals that traffic calming is necessary. Drakenstein will be at risk, through litigation or otherwise, if the reported problems are not addressed responsibly by either law enforcement or traffic calming measures.

1.2.3 However, various objections have been raised against traffic calming. Whether proven or not these include reduced residential accessibility, impedance of emergency vehicles, servicing problems, impact on adjoining arterials, increase in accidents, additional operating costs and a possible increase in air pollution.

1.2.4 The implementation of a mandated traffic calming policy focussing on the safety of all road users to ensure safe environments, can mitigate these risk.

1.3 Definition, Vision and Objective

1.3.1 Definition

An apt definition for traffic calming is:

“Traffic control actions that serve to minimise the undesirable impacts of motor vehicles on local human activities, with specific reference to vehicle/pedestrian/cyclist conflict, whilst ensuring that accessibility and mobility for residents, shoppers, workers / emerging operators or visitors is not significantly reduced”¹.

1.3.2 Vision

The vision of traffic calming within Drakenstein is:

To endeavour to improve road safety in residential and other priority areas in the interest of all road users.

1.3.3 Objectives

In support of the vision, the objective of traffic calming within Drakenstein is to contribute to improving road safety in the urban environment, specifically in residential and sensitive areas by implementing appropriate measures to:

- (a) Reduce certain vehicle speeds to ruling speed limit;
- (b) Reduce vehicle / pedestrian / cyclist conflict;
- (c) Reduce through-trips (rat running) in residential areas.

(¹ AA Road Traffic Safety Foundation, Traffic Calming: Guidelines and Warrants, August 1994)

2 TYPICAL TRAFFIC CALMING MEASURES

2.1 Traffic calming measures may be divided into three categories, namely, hard, soft and special measures.

2.1.1 **Hard measures** are found at intersections, between intersections and in an area-wide application.

- (a) Measures at intersections are aimed at reducing vehicle speed, maintaining or limiting to various degrees the ruling speed limit, access movements, and include mini-circles, raised intersections, intersection diverters, street closures and intersection narrowing.
- (b) Measures between intersections are aimed at reducing vehicle speed, maintaining the ruling speed limit and include speed humps, chicanes, pinch points or chokers, rumble strips, roadway narrowing (including islands), pedestrian crossing tables and semi-spheres (hobbles).
- (c) Area-wide measures include one-way systems.

- 2.1.2 **Soft measures** are more cost-effective and should be considered before hard measures. They include road marking and signage (e.g. pedestrian warning signs, speed reduction signs, information signs), enforcement, education and temporary road closure. It is also the only option for higher classes of roads (see section 4).
- 2.1.3 **Special measures** include the “woon-erf” concept that would be implemented in residential priority areas. It is a specific concept with specific requirements. These requirements include, amongst others, that the area should be included in a traffic management plan, streets must have limited through traffic, and the environment has to be appropriately designed (including parking areas and play areas without division between traffic lanes and walkways). The urban street design should also support community activities.

More detail on typical traffic calming measures is provided in Appendix A and Appendix E.

3 LEGISLATION AND RISKS

3.1 Legislation

- 3.1.1 In terms of the Road Traffic Act, 1989, only signs contained in Schedule 3 of the Regulations may be displayed. Schedule 3 of the National road Traffic Regulations published under Act 93 of 1996 legalised most road traffic signs used to calm traffic.
- 3.1.2 A revised South African Road Traffic Signs Manual (SARTSM) was published in June 1999. Volume 2 Chapter 12 deals specifically with signs for traffic calming. This chapter discusses types of traffic calming measures and gives traffic calming sign applications for mini-circles, speed humps, chicanes or pinch points and raised junctions. The sign applications have been included in Appendix A of this policy.

The signs generally used for traffic calming are:

- (a) Traffic circle warning sign (W201);
- (b) Mini-circle yield sign (R2.2);
- (c) Mini-circle road marking (RM15);
- (d) Speed hump warning sign (W332);
- (e) Speed hump marking (WM10); and
- (f) Pedestrian crossing (W306).

- 3.1.3 Section 113 of the Road Traffic Act deals with hindrances to the free flow of traffic and is often misinterpreted to imply that traffic calming, specifically speed humps or traffic islands, are illegal. The purpose of section 113 is, however, to ensure that physical barriers are not placed within the roadway or vehicles do not obstruct the roadway.

3.1.4 According to the National Guidelines for Traffic Calming² existing legislation does not make specific provision for traffic calming measures in the roadway. It is therefore very important to provide road users with adequate and timeous warning ahead of traffic calming measures complying strictly with the road sign and marking standards in the SARTSM.

(² Department of Transport, National Guidelines for Traffic Calming, COD Report CR-96/036, Draft, March 1996.)

3.2 Risks

3.2.1 Drakenstein Municipality is the authority tasked with the responsibility of ensuring that the municipal road environment is safe for all road users in its area. The risk of having to deal with claims for damages, personal and otherwise, is minimised by not implementing traffic calming measures to “endanger or cause damage to traffic” (according to Section 113 of the Road Traffic Act, 1989). This is achieved by providing proper signage and ensuring proper design and construction.

4 ROAD CLASSIFICATION

4.1 Roads have two main characteristics: Mobility and Accessibility. According to the National Guidelines for Road Access Management ³ mobility is defined as the ease with which traffic can travel at relatively high speeds without interruptions on a road. Accessibility is the ability of vehicles to get to surrounding land uses such as shops, schools and residential areas. Certain roads must be designed for and allow high-speed travel while others must provide frequent access to properties.

4.2 A high level of mobility and accessibility cannot be provided on the same road. It is therefore necessary to achieve a balance between the two. This balance is achieved through the functional classification of roads and the resulting road hierarchy. For the purpose of this traffic calming policy the functional road classification as defined in the Guidelines for Engineering Services and Amenities in Residential Township Developments ⁴ is used and is shown in Table 1 (These road classes apply to both the urban and rural environments).

Table 1: Road Classification

Road classification	Class name	Basic function
Class 1	National and regional distributor	Mobility
Class 2	Primary distributor	Mobility
Class 3	District distributor	Mobility
Class 4	Local distributor	Access
Class 5	Access road	Access

Class 1 roads carry traffic over very long distances on a metropolitan or provincial scale at high speeds (typically 100 to 120 km/h). These roads are typically freeways.

Class 2 roads carry traffic between cities and towns at relatively high speed (typically 80 to 100 km/h), but could be as low as 60 km/h

Class 3 roads distribute traffic within an urban district consisting of a limited number of suburbs or between villages in rural areas. Vehicles travel relatively short distance at lower speeds (typically 60 to 80 km/h).

Class 4 roads collect vehicles from residential streets and agricultural settlements and distribute them to the higher order class 3 roads. Vehicles travel short distances at low speeds (typically 40 to 60 km/h).

Class 5 roads are access roads providing direct access to individual properties. Vehicles travel at low speeds (typically 30 to 50km/h).

More detail on road classification is provided in **Appendix B**.

³ COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003.

⁴ National Housing board, Guidelines for engineering services and amenities in residential township developments, 1994, as quoted in COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003

5 PRIORITY AREAS

5.1 To achieve the vision and objective of this traffic calming policy it is necessary to recognise special places and areas where vulnerable road users could be at risk. These areas and places are typically residential areas and places where large numbers of people are attracted to, such as public amenities.

5.1.1 Residential areas

The predominant land use is residential dwellings. Residential areas are typically where children play in streets. This occurs especially in low-income areas where streets and public open spaces become the recreational and social environment for communities. In residential areas children and other vulnerable road users are at risk from speeding traffic.

5.1.2 Public amenities

Special places where large numbers of people gather must also be considered to ensure the safety of vulnerable road users. Public amenities that qualify to be defined as traffic calming areas include the following:

- (a) Schools including pre-schools and places of higher education;
- (b) Churches and religious institutions;
- (c) Key public transport facilities;
- (d) Clinics and hospitals;

- (e) Housing for the aged;
- (f) Libraries;
- (g) Stadiums and sports grounds; and
- (h) Centres of commercial activity.

These places become priorities where pedestrian and cyclist safety becomes an issue.

6. TRAFFIC CALMING WARRANTS AND THEIR APPLICATION

6.1 Inappropriate traffic calming measures may have the opposite effect to what was originally intended. They may endanger motorists and/or cause damage to vehicles, encourage rat-running and give rise to negative driver behaviour. Furthermore, they may compromise the safety of pedestrians. A warrant system must, therefore, be applied to determine whether traffic calming is warranted. The following should be considered when defining a warrant system:

- 6.1.1 The policy vision and policy objectives should be achieved;
- 6.1.2 The warrants must be practical and easy to apply;
- 6.1.3 Data collection must be as limited as possible; and
- 6.1.4 The warrant system must enable prioritisation.

In total, six warrants are applied to determine whether a traffic calming measure is warranted.

Warrant 1 – road classification: Road classes 1, 2 and 3 do not qualify for hard traffic calming measures. Measures such as pedestrian overpasses, signalised pedestrian crossings, signage, provision of sidewalks/cycle facilities or other measures may be investigated at the discretion of the responsible municipal officials.

Warrant 2 – priority areas: Hard traffic calming measures may be implemented in priority areas. Priority areas are listed in section 4 above.

Warrant 3 – pedestrian crossing volumes: the higher the number of pedestrians crossing the road during the peak hour, the greater the warrant for a traffic calming measure.

Warrant 4 – vehicle volumes: the higher the vehicle volumes during the peak hour, the greater the warrant for a traffic calming measure.

Warrant 5 – average vehicle speeds: the higher the average vehicle speed during the peak hour, the greater the warrant for traffic calming measure.

Warrant 6 – frequency of occurrence: the higher the frequency of the problem, the greater the warrant for a traffic calming measure.

A scoring system attached to each warrant is used to determine whether a specific application qualifies for traffic calming measures. A minimum total score of 14 is required to outright justify traffic calming measures. The system is also used to prioritise between applications. Details on the scoring system and a flowchart illustrating the steps in applying the warrants are provided in **Appendix C**.

NOTES:

1. *If the road network layout suggests that the problem may be **transferred** to a parallel route an area-wide study may be performed to investigate traffic impact.*
2. **Accident statistics** play an important role in cases where the minimum score is not achieved, and it may provide the necessary justification.

7. PROCESSING APPLICATIONS

- 7.1 The success in dealing with requests effectively and the implementation of the most appropriate solution are determined by the following factors:
- 7.1.1 Continuous communication at all levels;
 - 7.1.2 Understanding the cause, the root of the problem, the underlying issues and the environment;
 - 7.1.3 Proper investigation and research;
 - 7.1.4 Teamwork between the public (residents), the municipal officials, local politicians and community representatives;
 - 7.1.5 Support from all relevant role players to implement the most appropriate solutions, given the availability of adequate resources;
 - 7.1.6 Commitment to make each project a success; and
 - 7.1.7 Municipal officials, Councillors and the general public should be involved in the traffic calming process. It is important that their specific roles and responsibilities in terms of communication, technical assessment and implementation are well defined. This will lay the foundation for successful implementation of the Drakenstein traffic calming policy to the benefit of all road users in Drakenstein.

8. FUNDING

- 8.1 Funding for the implementation of traffic calming measures may be limited. Where analysis indicates that the application can be approved, Drakenstein will fund the implementation subject to the availability of funds.
- 8.2 Scheduling for implementation will be dictated by priority (in terms of the warrant scoring system). Where the applicant(s) is willing to contribute to funding, implementation could be programmed earlier.

9. LIST OF REFERENCES:

Committee of Land Transport Officials, South African Road Safety Manual, 1999;

Department of Transport, South African Road Traffic Signs Manual, 1999;

AA Road Traffic Safety Foundation, Traffic Calming: Guidelines and Warrants, August 1994;

Department of Transport, National Guidelines for Traffic Calming, COD Report CR-96/036, Draft, March 1996;

COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003;

National Housing Board, Guidelines for engineering services and amenities in residential township developments, 1994, as quoted in COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003;

City of Johannesburg, Traffic Calming Policy, Revised Edition – September 2002;

City of Cape Town, Policy Document “Calming Residential Streets for Communities”, Draft, April 2003;

Department of Transport, Design and implementation of speed humps, COD Report CR-97/038; Africon Engineering International, Drakenstein Integrated Transport Master Plan, Final Report, August 2003.

APPENDIX A: TYPICAL TRAFFIC CALMING MEASURES

1. MEASURES

Traffic calming measures may be divided into three categories, namely, hard, soft and special measures.

1.1 Hard Measures

The *South African Road Safety Manual* (1999) classifies the various types of hard traffic calming measures as follows:

1.1.1 Measures at intersections:

Measures at intersections are aimed at reducing vehicle speed or removing access movement, and include:

- (a) Mini-circles;
- (b) Raised intersections;
- (c) Intersection diverters;
- (d) Street closures; and
- (e) Intersection narrowing.

1.1.2 Measures between intersections:

Measures between intersections are aimed at reducing vehicle speed, and may be used in conjunction with landscaping and trees to emphasise the site and improve street environment. These include:

- (a) Speed humps;
- (b) Chicanes, pinch points or chokers;
- (c) Rumble strips;
- (d) Roadway narrowing (including islands);
- (e) Pedestrian crossing table; and
- (f) Semi-spheres (hobbles).

1.1.3 Area-wide:

- (a) One-way systems.

Typical applications by measure are summarised in the table below.

Table 1: Traffic Calming Measures and Typical Applications

Measure	Objective	Typical Application
Mini-circle	Improve traffic control Reduce vehicle speeds	Class 4 and 5 roads At 4-way intersections only
Raised intersections	Reduce vehicle speeds Improve pedestrian safety	Class 4 and 5 roads, in extreme situations, also Class 3 At intersections with high pedestrian movements and in areas with high speeding incidents
Intersection diverter	Remove unwanted traffic (e.g. rat-running)	Class 4 and 5 roads At intersections to reduce rat-running
Street closure	Remove all vehicular traffic from the road	Class 5 roads
Intersection narrowing	Restrict access to minimise through traffic	Class 4 and 5 roads At intersections to reduce rat-running
Speed humps	Reduce vehicle speeds	Class 4 and 5 roads (Class 4 roads in special cases) Preferably for mid-block applications at very sensitive locations (e.g. school entrances) Should be accompanied by another speed reducing feature (e.g. another speed hump, road marking) Note: the use of speed bumps (humps of minimal length) directly before, after or in horizontal curves is not supported since they can result in drivers losing control of vehicles
Chicane, pinch points and chokers	Reduce speed by reducing carriageway width and creating a horizontal deviation	Class 4 and 5 roads Similar applications to a speed hump, but a less harsh measure
Roadway narrowing	Reduce speed by reducing carriageway width	Class 4 and 5 roads Similar applications to a speed hump and chicane, but an even less harsh measure
Pedestrian crossing table	Reduce vehicle speeds Improve pedestrian safety	Class 4 and 5 roads At mid-block location or at the entrance/access to public amenities
Semi-spheres (hobbles)	Reduce vehicle speeds	Private road / Class 5 Similar applications to a speed hump, but harsher. Not favoured on

		public streets, but can be considered in extreme situations.
One-way systems	Limit through-traffic volumes	Class 4 and 5 roads Applied where access and egress are limited, either totally or partially.

- 1.1.4 Guidelines for application and implementation are provided in the South African Road Safety Manual (1999), the Draft National Guidelines for Traffic Calming (DOT, COD Report CR-96/036) and the South African Road Traffic Signs Manual (1999), Volume 2, Chapter 12.
Typical examples of applications and their implementation are shown in Appendix E.

1.2 Soft measures

- 1.2.1 Before hard measures are implemented consideration must be given to implementing more cost-effective soft measures. These include:
- (a) Road marking and signage (e.g. pedestrian warning signs, speed reduction signs, information signs);
 - (b) Enforcement;
 - (c) Education; and
 - (d) Temporary road closure.

1.3 Special measures, e.g. the “Woon-erf” concept

- 1.3.1 The “woon-erf” is a traffic calming application that would be implemented in residential priority areas. It is a specific concept with specific requirements. These requirements include, amongst others:
- (a) The area should preferably be included in a traffic management plan;
 - (b) Only particular streets complying with specific traffic-engineering criteria (e.g. limited through traffic) qualify to be converted to a “woon-erf” area;
 - (c) The street area designated for “woon-erf” is a structured environment and specific urban street design requirements have to be incorporated, additional to any speed reduction measures. The environment has to be appropriately designed and should include parking areas and play areas without division between traffic lanes and walkways;
 - (d) The urban street design should also support community activities;
 - (e) The entrance to the “woon-erf” should be clearly marked through appropriate measures.

- 1.3.2 “Woon-erf” signage may only be erected when the specific “woon-erf” requirements have been adhered to. This signage reduces and mitigates the liabilities that local municipalities are exposed to when introducing traffic calming measures. Furthermore, the conversion of a street to a “woon-erf” area does not require a re-classification of the road. The “woon-erf” signage provides a particular legal status for the environment.
- 1.3.3 Accordingly, for the purposes of this policy a “woon-erf” should be a specific traffic calming measure to be introduced as part of a traffic management plan for an area.

2 “Traffic calming area”

- 2.1 Declaring a priority area a “traffic calming area” has no legal status. There is no legislated signage for traffic-calmed areas, other than the signage accompanying specific traffic calming measures. Information signage indicating that a specific area is a traffic-calming area only provides the road users with information and has no regulatory requirements.
- 2.2 A traffic calming area is an area where traffic calming measures are introduced. Users should be warned appropriately and the measures should still comply with sound technical traffic engineering guidelines. Declaring an area a traffic-calmed area does not bestow any legal status to the area and the municipality is still responsible for administering and managing the traffic calming process.

NOTE:

An application for traffic calming may request a specific measure, for example a speed hump. Where the analysis indicates that traffic calming is warranted, responsible officials will select the most appropriate measure, notwithstanding the request in the application.

APPENDIX B: ROAD CLASSIFICATION

1. DISCUSSION

- 1.1 When applying traffic calming techniques, local road authorities have a responsibility to ensure the road safety of all users of the roads, motorists, pedestrians and cyclists alike. According to the National Guidelines for Road Access Management⁵ **mobility** is defined as the ease with which traffic can travel at relatively high speeds without interruptions on a road. **Accessibility**, or access, refers to the ability of vehicles to get to surrounding land uses such as shops, schools and residential areas.
- 1.2 A high level of mobility and accessibility cannot be provided on the same road because the provision of access, with the accompanying braking and turning of vehicles, limits mobility and vice versa. As mobility and accessibility are both important needs of motorists and developers, a fine balance has to be achieved. This balance is achieved through the functional classification of roads and the resulting road hierarchy. Failure to adhere to the functional classifications of roads will result in a breakdown of the mobility function of Drakenstein's major roads, as well as allowing high-speed traffic in the activity areas and residential areas, thus impacting adversely on the safety of road users.
- 1.3 The balance between the mobility and accessibility needs of the road network and the surrounding land use, is one manner in which the road safety needs of pedestrians and cyclists are addressed. However, safety for pedestrians is compromised when the road classification and the surrounding land use are in conflict, for example a class 2 road traversing through a rural community with high pedestrian volumes.
- 1.4 Examples also exist where the road function is in conflict with its design. For example, when a class 3 or 4 road is constructed to dual carriageway standards. This allows for excessive speeding in an environment where pedestrian volumes are expected to be high.

1.5 Most planners and engineers in the Western Cape are familiar with the functional classification as defined in the Guidelines for engineering services and amenities in residential township developments⁶. For the purpose of this traffic calming policy the functional classification of the Guidelines for engineering services and amenities in residential township developments⁴, will be retained and is outlined in Table 1. However, land use and the road network within the area of the Drakenstein Municipality is of such a nature, that it serves a rural and an urban purpose. This requires that the road classification should take cognisance of this and the National Guidelines for Road Access Management³ does exactly that. The description that follows hereafter uses the classification of the Guidelines for engineering services and amenities in residential township developments⁴, however the description takes cognisance of an urban or rural setting.

Table 2: Road Classification

Road classification	Class name	Basic function
Class 1	National and regional distributor	Mobility
Class 2	Primary distributor	Mobility
Class 3	District distributor	Mobility
Class 4	Local distributor	Access
Class 5	Access road	Access

⁵ COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003.

⁶ National Housing board, Guidelines for engineering services and amenities in residential township developments, 1994, as quoted in COTO (Committee of Transportation Officials), National Guidelines for Road Access Management in South Africa, Revised Edition November 2003

2. DESCRIPTION OF ROAD CLASSES IN AN URBAN ENVIRONMENT

2.1 Class 1 – National and regional distributor

The function of this class of road is to distribute traffic over very long distances on a metropolitan scale. The roads are designed to provide mobility at high speed with few interruptions over long distances. Operating speeds are typically 100 to 120 km/h. These roads are typically freeways, for example the N1, and the only access is via interchanges.

2.1.1 Other characteristics are:

- (a) Strict access control, only through interchanges.
- (b) No pedestrians or cyclists are allowed on these roads.
- (c) Provision is not normally made for bus or mini-bus taxi stops, but this class of road can be used by express public transport services.

N1- Class 1



2.2 Class 2 – Primary distributor

The function of this class of road is to distribute traffic on a metropolitan or citywide scale, connecting major activity nodes. The routes are designed to provide urban mobility at relatively high speed with relatively few interruptions. Operating speeds are typically 80 to 100 km/h but could be 60 km/h in specific cases. Routes carrying high volumes of traffic can be designed to freeway (class 1) standard and on non-freeways, intersections are generally signal-controlled.

2.2.1 Other characteristics are:

- (a) Strict access control to ensure that the mobility function is not degraded. Intersections with large traffic volumes are signalised and non-signalised intersections are spaced far apart to allow for future signalisation.
- (b) Pedestrian access is limited to ensure that pedestrian volumes are restricted.
- (c) Public transport services may be provided on these roads and stops are located at isolated locations.

Berg River Boulevard – Class 2



2.3 Class 3 – District distributor

The function of this class of road is to distribute traffic within an urban district consisting of a limited number of suburbs. Travel distances on these roads are relatively short and a lower level of mobility can be expected. Operating speeds are typically 50 to 70 km/h. Intersections are generally signal-controlled, however traffic circles can also be considered.

2.3.1 Other characteristics are:

- (a) Access to properties may be provided to large developments at a limited number of locations, which are generally signalised. Property access can also be provided to smaller developments from frontage/service roads.
- (b) Pedestrians can use the road in large numbers and careful planning is required to manage and limit the conflict between pedestrians and vehicles
- (c) These roads can serve important public transport routes in urban areas.

Hoof Street North – Class 3



2.4 Class 4 – Local distributor

The function of this class of road is to collect traffic from residential streets and to distribute them to the higher order class 3 roads. The roads are designed to provide a higher degree of access at a lower level of mobility over relatively short distances. Operating speeds are typically 40 to 60 km/h. Intersections are priority-controlled, traffic circles or signalized.

2.4.1 Other characteristics are:

- (a) Limited property access to schools, clinics, churches, shops and offices is allowed on these roads, but preferably not to individual residential properties.
- (b) Pedestrians and cyclists will be using these routes and sidewalks will be required.
- (c) Provision can also be made for on-street parking.
- (d) These roads serve as major public transport routes.
- (e) Traffic calming is an option to manage (i) traffic volumes and (ii) speeding, but should however be carefully applied to avoid divergence of traffic to residential streets, causing rat-running.

Market Street – Class 4



2.5 Class 5 – Access road

The function of this class of road is to provide direct vehicular and pedestrian access to individual properties. The roads are designed to provide access only, speeds are low and travel distances are short. Operating speeds are typically 30-50 km/h.

2.5.1 Other characteristics are:

- (a) Pedestrians and cyclists may also use these roads in large numbers.
- (b) Children may also be playing in the roads (although not legally allowed).
- (c) Traffic calming may be required on higher order Class 5 road (Classes 5a and 5b). Class 5 roads may be further categorised into six sub-classes, namely sub-classes 5a to 5f. The hierarchy of these roads is as follows:
- (d) Class 5a (residential access collector) - this sub-class provides a link between a local distributor and other access roads;
- (e) Class 5b (access loop) – this sub-class provides a short link for cul-de-sacs, access courts and private roads to a residential access collector;
- (f) Class 5c (access cul-de-sac) – this sub-class provides direct frontage access for a limited number of dwelling units;
- (g) Class 5d (access way) – this sub-class refers to closed road systems with an exit on one end only;
- (h) Class 5e (access court) – this sub-class gives access to up to a limited number of dwelling units with contrasting design to indicate shared use; and
- (i) Class 5f (access court) – this sub-class is known as a double panhandle with no turning circle being provided.

Koning Street – Class 5



3. DESCRIPTION OF ROAD CLASSES IN A RURAL ENVIRONMENT

3.1 Class 1 - National and Regional distributor

The function of this road is to facilitate traffic flow on a national scale. These roads may cross provincial boundaries. The road is designed to provide mobility at high speeds. Access to developments is strictly controlled. On freeways access can be in the form of interchanges and on non-freeways, the size of developments should not be so large to require signalised intersections.

3.1.1 Other characteristics:

- (a) Long distance bus and mini-bus facilities can be provided at a limited number of locations.
- (b) Pedestrians should not gain access to or cross these roads, except if appropriate provisions have been made to safe-guard them.

N1 – Class 1 National/Regional Distributer



3.2 Class 2 – Primary distributor

The function of these roads is to facilitate the distribution of traffic in rural areas, connecting towns, cities and major development centres. The roads are designed to provide mobility at high speeds. Operating speeds are typically 120 km/h. Access is strictly controlled. On freeways, access can be via interchanges, but on non-freeway roads developments should not be of such a nature to require traffic signals or to attract large number of pedestrians.

3.2.1 Other characteristics:

- (a) Long distance bus and mini-bus facilities can be provided at a limited number of locations.
- (b) Pedestrians should not gain access to or cross these roads, except if appropriate provisions have been made to safe-guard them. However, often high pedestrian movements are found within towns located along the route.

R45 – Class 2 Primary Distributer



3.3 Class 3 - District distributor

The function of this type of road is to distribute traffic within a rural setting between villages, residential settlements and agricultural land. Roads are designed to provide a reasonable level of mobility and operating speeds are typically 80-100 km/h. Access to developments is controlled, however, developments should not be so large as to warrant traffic signals on these roads or attract large number of pedestrians.

3.3.1 Other characteristics:

- (a) Long distance bus and mini-bus facilities can be provided at regular intervals.
- (b) Proper provision for pedestrians to safe-guard them.

Bo-Dal Road –Class 3 District Distributer



3.4 Class 4 – Local distributor

The function of this road is to link local roads to district distributors and to collect traffic within dense agricultural developments such as smallholding and rural agricultural settlements. These roads are designed to provide a relatively high degree of access at relatively low speeds over fairly short distances. Operating speeds are typically 60 km/h. Access is allowed, but preferably not to individual residential properties. Access would be provided to schools, clinics, churches, community halls, shops and other facilities.

The roads could be gravel or paved. Intersections are normally priority (stop or yield sign) controlled and traffic signals would seldom be warranted.

3.4.1 Other characteristics:

- (a) These roads may serve as major bus and mini-bus taxi routes and bus stops may be regularly required.
- (b) Pedestrians and cyclists may use the roads in large numbers.

Protea Street – Class 4 Local Distributer



3.5 Class 5 – Access road

The function of this road is to provide direct vehicular access to individual properties in rural agricultural settlements or villages. Roads are designed to provide a high level of access serving land uses such as residential, business and industrial developments and speeds are typically 40-50 km/h.

The roads could be gravel or paved and are often narrow. Intersections would normally be priority controlled (and in many instances uncontrolled). Pedestrians and cyclists will be using these roads and children could be playing in them.

Class 5 Access Road



Table 3: Summary of characteristics of various classes of roads

Road Class	Name	Characteristics in an urban environment	Examples	Characteristics in a rural environment	Examples
1	National and regional distributor	<ul style="list-style-type: none"> • Distribute traffic over very long distances. • Speeds are 100-120 km/h. • Pedestrians are not allowed 	N1	<ul style="list-style-type: none"> • Distribute traffic flow on a national scale • Speeds are 120 km/h. • Pedestrians are not allowed, unless appropriate facilities are provided. 	N1
2	Primary distributor	<ul style="list-style-type: none"> • Connects major activity nodes • Speeds between 80-100 km/h • Pedestrian access is limited. 	Jan Van Riebeeck Champagne	<ul style="list-style-type: none"> • Distribute traffic in rural areas, connecting towns. • Speeds are 120 km/h • Pedestrians are not allowed, unless appropriate facilities are provided 	Jan Van Riebeeck Road, Provincial Main Roads
3	District distributor	<ul style="list-style-type: none"> • Distribute traffic between suburbs. 	Lady Grey Piet Retief	<ul style="list-style-type: none"> • Distribute traffic between villages 	Mainly Provincial District Roads

		<ul style="list-style-type: none"> • Speeds are 50-70 km/h • Pedestrians can be present in large numbers 		<ul style="list-style-type: none"> • and residential settlements, • Speeds are 80-100 km/h • Proper provision for pedestrians 	
4	Local distributor	<ul style="list-style-type: none"> • Collect traffic from residential streets • Speeds are 40-50 km/h • Pedestrians and cyclists are present 	Orleans Bloulei Van der Stel Magnolia	<ul style="list-style-type: none"> • Link local roads and collect traffic within dense agricultural developments • Speeds are typically 60 km/h • Pedestrians and cyclists may use roads in large numbers 	Provincial Minor Roads
5	Access Road	<ul style="list-style-type: none"> • Provide direct access to residential property • Speeds are 30-50 km/h • Pedestrians, cyclists are present • Children are playing in road 	5a: Genl Hertzog 5b: Welvanpas 5c: Akasia	<ul style="list-style-type: none"> • Provide direct access to residential property • Speeds are 40-50 km/h • Pedestrians, cyclists are present • Children are playing in road 	Farm roads

APPENDIX C: TRAFFIC CALMING WARRANTS AND APPLICATION

1. DISCUSSION

1.1 Inappropriate traffic calming measures do not achieve the desired effect and tend to compromise the functionality of the road network. Inappropriate measures may endanger motorists and cause damage to vehicles, encourage rat-running and give rise to negative driver behaviour, further compromising the safety of pedestrians, learners and children. Consequently a warrant system must be applied to determine whether a traffic calming measure is warranted. The following should guide the definition of a warrant system:

1.1.1 **The policy vision and policy objectives should be achieved where possible;**

1.1.2 **The warrants must be practical and easy to apply;**

1.1.3 **Data requirements must be limited where possible; and**

1.1.4 **The warrant system must facilitate prioritization.**

1.2 To this end the warrants should focus on road network functionality, the built environment, and vulnerable users. Each of the proposed warrants is discussed below.

1.3 A scoring system is used to determine whether a specific application qualifies for traffic calming measures and is used to prioritise between applications. The scoring system is discussed below.

2. WARRANTS AND MEASUREMENT

2.1 Warrant 1 – Road classification

2.1.1 The road classification system to be applied in this traffic calming policy is detailed in Appendix A. It must be noted that this is a functional classification. In certain instances the road function may be in conflict with the design standard.

2.1.2 Road classes 1, 2 and 3 do **not** qualify for traffic calming measures. If it is deemed that action is required to calm traffic for whatever reason (for example to reduce vehicle / pedestrian conflict), alternative measures may be investigated at the discretion of the responsible officials at Drakenstein. These alternative measures may include pedestrian overpasses, signalised pedestrian crossings, signage, provision of sidewalks/cycle facilities, edge treatment or other Transportation Systems Management applications. The alternative measure may be presented in the form of a traffic management plan which could include all or some of the above. Engineering judgement will have to be applied.

2.1.3 Road classes 4 and 5 **potentially** qualify for traffic calming measures, provided that the total score obtained when applying the warrants is above the minimum value (discussed below). In the event that these roads serve as emergency or bus routes, at the discretion of the responsible officials at Drakenstein Municipality, they may be deemed not to qualify for traffic calming measures and alternative measures may be investigated.

2.2 Warrant 2 – Priority areas

- 2.2.1 Traffic calming measures **may** be implemented in priority areas, provided that the total score obtained when applying the warrants is above the minimum value (discussed below). Priority areas are listed in Section 4 of the main document and include residential area and specific public amenities (schools, churches and religious institutions, public transport facilities, clinics and hospitals, libraries, stadiums, sports grounds and centres of commercial activity in residential areas). Additional amenities may be added to this list at the discretion of the responsible officials at Drakenstein Municipality.
- 2.2.2 Areas other than priority areas do **not** qualify for traffic calming measures. If it is deemed that action is required to calm traffic for whatever reason, alternative measures may be investigated at the discretion of the responsible officials at Drakenstein Municipality. These alternative measures may include pedestrian overpasses, signalised pedestrian crossings, traffic management plans, provision of sidewalks/cycle facilities, edge treatment or other Transportation Systems Management applications. Engineering judgment will have to be applied.

2.3 Warrant 3 – Pedestrian crossing volumes

- 2.3.1 This warrant refers to pedestrian **crossing volumes** (both directions) during the peak hour of the amenity (the hour during which the perceived problem occurs) over a road length of 150m. The section of road where highest pedestrian crossing movements occur should be selected. The higher the pedestrian crossing volume, the higher the assigned score. The scoring system is discussed below.
- 2.3.2 High pedestrian through-volumes may result in linear pedestrian conflict. High pedestrian **through-volumes** that are perceived to be problematic should be addressed via the provision of sidewalks or alternative measures such as the implementation of one-way roadways or pedestrianizing sections of the roadway, at the discretion of the responsible officials at Drakenstein Municipality.

2.4 Warrant 4 – Vehicle volumes

- 2.4.1 This warrant refers to vehicle volumes (both directions during the peak hour of the amenity (the hour during which the perceived problem occurs) adjacent to the perceived problem area. The higher the vehicle volume, the higher the assigned score. It is recognized that, on average, class 4 roads do and should carry higher volumes than class 5 roads. If the same base were used, class 4 roads would automatically be given priority. The scoring system, which is discussed below, takes this into account.

2.5 Warrant 5 – Average vehicle speeds

2.5.1 This warrant refers to average vehicle speeds observed during the peak hour of the amenity (the hour during which the perceived problem occurs) adjacent to the perceived problem area. At least 10 random observations must be done. The higher the average vehicle speed, the higher the assigned score. It is recognized that, on average, Class 4 roads do and should carry higher volumes at higher speeds than Class 5 roads. Again, if the same base were used, Class 4 roads would automatically be given priority. The scoring system, which is discussed below, takes this into account.

2.6 Warrant 6 – Frequency of occurrence

2.6.1 The frequency of the perceived problem when prioritising implementation. The higher the frequency, the higher the score.

2.7 Warrant 7 – Transfer of problem

2.7.1 If the road network layout suggests a problem may be transferred to a parallel route an area-wide study may be performed to determine the traffic impact. The application may be rejected at the discretion of the responsible officials.

3. SCORING, SCORING SYSTEM AND APPLICATION

3.1 A scoring system is used to determine if a specific application qualifies for traffic calming measures. The system is also used to prioritise different applications. The scoring system is summarised in Table 1 below.

Table 1: Warrant system

	WARRANT	SCORE
1. Road classification Classes 1, 2 and 3 Classes 4 and 5	Alternative measures Traffic calming potentially warranted (Check for emergency, bus routes)	- 3
2. Priority Area Listed priority area (section 4 in report) Other sensitive area e.g. informal trading (Drakenstein discretion) Non-sensitive areas	Traffic calming potentially warranted Traffic calming potentially warranted Alternative measures	3 3 -
3. Pedestrian crossing volume (hour perceived problem) 0 to 99 100 to 249 >250		1 2 3
4. Average vehicle volume (hourly – perceived problem) <u>Class 4 road</u> 0 to 99 100 to 299 >299 <u>Class 5 road</u> 0 to 49 50 to 149 >149		1 2 3 1 2 3
5. Average vehicle speeds (during perceived problem) <u>Class 4 road</u> 0 to 39 km/h 40 to 59 km/h >59 km/h <u>Class 5 road</u> 0 to 29 km/h		1 2 3 1

30 to 49 km/h		2
49 km/h		3
6. Frequency		
Weekly or less frequent		1
Daily		2
At least twice a day (e.g. peak hours)		3

3.2 Scoring is not attached to warrant 7. The maximum **total score** attainable is **18**. Four scenarios are possible for road classes 4 and 5.

3.2.1 **Total score \geq 14, the road does not serve as an emergency or bus route, implementation would not have a negative impact on the road network (e.g. rat-running):** traffic calming measures are warranted and should be implemented, unless a better/more appropriate engineering or law enforcement solution exists;

3.2.2 **Total score \geq 14, the road does serve as an emergency / bus route, or implementation may have a negative impact on the road network:** traffic calming measures may be warranted at the discretion of the responsible officials at Drakenstein Municipality. A more detailed engineering investigation may be commissioned;

3.2.3 **Total score $<$ 14, special case:** in extreme cases (e.g. where a **high accident rate** has been recorded or safety analysis recommends remedial measures) applications achieving total scores lower than 14 may be considered. Additional data that is not used in the warrants may be used to inform the decision. Alternatively, where an application has been received for the implementation of a “woon-erf”, this may be considered provided that the specific requirements contained in Appendix C (Section 3) will be adhered to. Council approval will be required; and

3.2.4 **Total score $<$ 14, no special case:** where no special circumstances indicate that traffic calming measures may be warranted, measures should **not** be implemented.

A flowchart illustrating the steps in applying the warrants is shown in Figure 1 below.

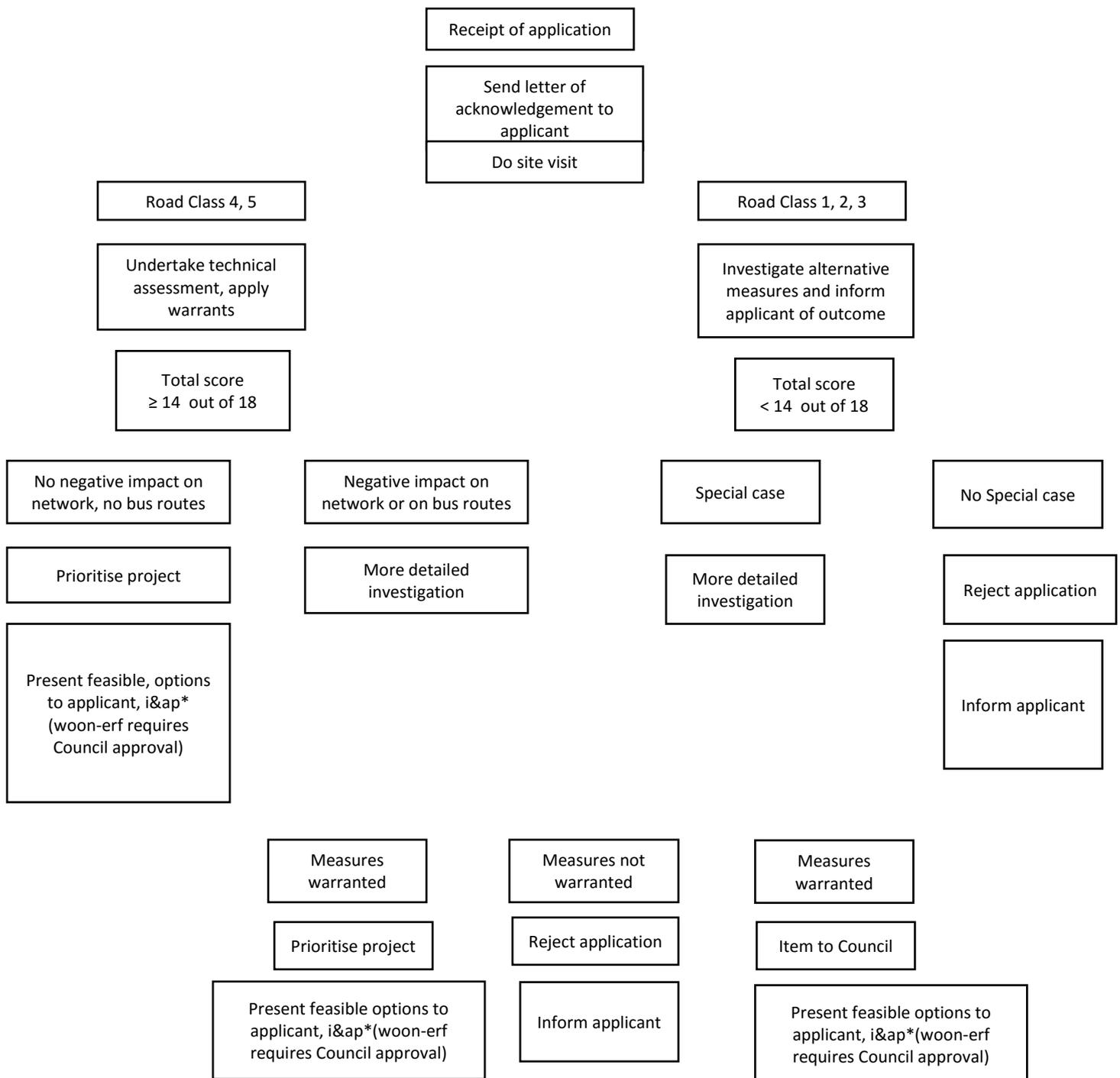
4. DETAILS ON DATA COLLECTION

4.1 Important considerations in data collection and applying the warrants are listed below.

4.1.1 **Road classification:** This is an important informant in the type of traffic calming measure to be applied, if traffic calming is deemed an appropriate solution for a particular section of road. Using the functional classification provided in this policy document applied to local conditions, determine the functional classification of the road in question. Collect additional data regarding physical road attributes (e.g. road alignment and condition, sidewalk provision and condition) on site.

- 4.1.2 **Environment and priority area:** The application should state the reason for the problem (e.g. high volumes generated by a public amenity or speeding in a residential area). Identify the exact location of the perceived problem, whether the information regarding public amenities in the application is correct and/or whether the environment is residential.
- 4.1.3 **Pedestrian crossing volumes, vehicle volumes, average vehicle speeds:** Endeavour to collect all on-site information on one day during the same peak hour. If this is not possible, collect information during the same time period on similar days. Average vehicle speeds may be measured over a 50m road section adjacent to the problem area using appropriate instruments.
- 4.1.4 **Transfer of problem:** The potential of transferring the problem to parallel route (i.e. rat-running) must be investigated on site. Traffic control measures on parallel routes must be recorded. As stated previously, the application may be rejected at the discretion of the responsible officials, or an area-wide study may be performed to investigate traffic impact. Aspects to consider could include functional classification of affected streets, volume of re-distributed traffic and impact on capacity of the affected road network.
- 4.1.5 **Other data:** Where accident statistics are available, this data will be useful in adjudicating marginal cases.

Figure 1: Flowchart of warrant investigation process.



*Interested and affected parties) to be identified for each application

APPENDIX D: PROCESSING APPLICATIONS

1. DISCUSSION

- 1.1 The process that should be adopted to manage traffic calming is illustrated in Figure 1. The success in dealing with requests effectively and the implementation of the most appropriate solution are determined by the following factors:
 - 1.1.1 Continuous communication at all levels;
 - 1.1.2 1.1.2 Understanding the cause, the root of the problem, the underlying issues and the environment;
 - 1.1.3 Proper investigation and research;
 - 1.1.4 Teamwork between the public (residents), the municipal officials, local politicians and community representatives;
 - 1.1.5 Support from all relevant role players to implement the most appropriate solutions, given the availability of adequate resources; and
 - 1.1.6 Commitment to make each project a success.
- 1.2 The various team members involved in the traffic calming process are the following and their role and responsibility are discussed thereafter. Where reference is made to interested and effected parties, these refer to those individuals or groups that are directly affected by the measure and either reside or have a business interest in the area.

2. MUNICIPAL OFFICIALS

- 2.1 Communication
 - 2.1.1 Acknowledge the receipt of a request for traffic calming to the source in writing.
 - 2.1.2 Provide preliminary indication on the process that will follow and key deliverable dates.
 - 2.1.3 Undertake a site visit at the identified location at the problematic times and communicate with community leaders and law enforcement officials regarding the extent of the problem.
 - 2.1.4 Communicate the outcome in writing and provide a time-line for implementation.
 - 2.1.5 Monitor implementation.
 - 2.1.6 Share lessons learned and successes with other officials in the municipality at regular meetings.
- 2.2 Technical Assessment and Implementation
 - 2.2.1 Use the guidelines as stipulated in the policy.
 - 2.2.2 Use good engineering judgement.
 - 2.2.3 Innovate and explore – stretch the boundaries.
 - 2.2.4 Provide the facts to the decision makers, give options and highlight the most appropriate solutions.

3. COUNCILLORS

3.1 Communication

- 3.1.1 Assist the public (residents) to formalize their requests.
- 3.1.2 Communicate the policy and assist them in understanding the issues and applicable route to follow.
- 3.1.3 Support the officials and technical experts in the application of the Policy.

3.2 Technical Assessment and Implementation

- 3.2.1 Support the outcome of the technical feasibility study based on the policy guidelines.
- 3.2.2 Assist with the implementation of the appropriate measures by funding resources if required.
- 3.2.3 Support the Policy.

4 PUBLIC

4.1 Communication

- 4.1.1 Use the various options to communicate their requests to Council. The request should be provided in writing and contain the following relevant information:
 - (a) Name of applicant and contact details
 - (b) Location of problem area
 - (c) Time and frequency of occurrence
 - (d) Detailed description of problem. Where the perceived problem is rat-running, provide details on routes used.

4.1.2 Assist the Council by sharing information with them and fellow residents.

4.1.3 Assist in monitoring and provide feedback on successes and failures.

4.2 Technical Assessment and Implementation

- 4.2.1 Provide as much information to the City officials as possible to understand the issues and problems
- 4.2.2 Assist in information gathering when applicable.
- 4.2.3 Support the initiatives.
- 4.2.4 Adhere to the road rules.

APPENDIX E: TYPICAL APPLICATIONS – PHOTOGRAPHS AND LAYOUTS

Signs for Traffic Calming Measures – 1 and 2

Traffic Calming Measures at Intersections

Traffic Calming Measures between Intersections

Traffic Circles and Mini-circles

Chicanes

Neckdowns

Chokers

Centre Island Narrowings

Full Road Closures

Half Road Closures

Speed Humps

Raised Intersections

Signs for Traffic Calming Measures – 1

12.1.2

Introduction



R2.1 YIELD TO PEDESTRIANS

Ref. Vol 1 2-2-7 Vol 4 2-2-6
3



R2.2 YIELD AT TRAFFIC CIRCLE

Ref. Vol 1 2-2-8 Vol 4 2-2-7



R403 WOONERF

Ref. Vol 1 2-6-3 Vol 4 2-6-3



**W201 TRAFFIC CIRCLE
PEDESTRIANS**

Ref. Vol 1 3-3-1 Vol 4 3-3-1
7



W306 PEDESTRIAN CROSSING

Ref. Vol 1 3-4-3 Vol 4 3-4-7



W307

Ref. Vol 1 3-4-4 Vol 4 3-4-7



W308 CHILDREN

Ref. Vol 1 3-4-4 Vol 4 3-4-8



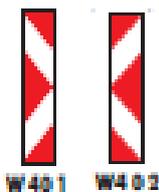
W332 SPEED HUMPS

Ref. Vol 1 3-4-14 Vol 4 3-4-7



W339 GENERAL WARNING

Ref. Vol 1 3-4-18 Vol 4 3-4-39



**W401 W402
DANGER PLATES**

Ref. Vol 1 3-5-1 Vol 4 3-5-1



WM10 SPEED HUMP

Ref. Vol 1 7-3-9 Vol 4 12-2-16

Signs and Markings used for Traffic Calming Measures – 2

INTRODUCTION

12.1.3



R6

R6 YIELD TO ONCOMING TRAFFIC

Ref. Vol 1 2-2-12 Vol 4 2-2-11



R403-600 WOONERF DE-RESTRICTION

Ref. Vol 1 2-9-1 Vol 2-8-9



W327

W327 ONE VEHICLE WIDTH RESTRICTION

Ref. Vol 1 3-4-12 Vol 4 3-4-27



W328



W329



W330

W328 W329 W330 ROAD NARROWS

Ref. Vol 1 3-4-13 Vol 4 3-4-28 to 3-4-30



W302

W302 W303 TRAFFIC CONTROL HEAD

Ref. Vol 1 3-4-1/3-4-2 Vol 4 3-4-2/2-4-3



W303



RM15

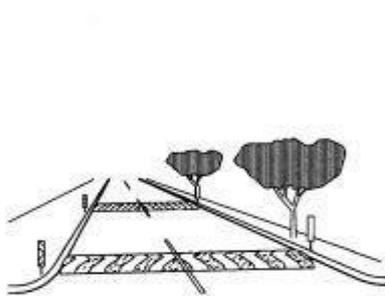
RM15 TRAFFIC CIRCLE MANDATORY DIRECTION ARROWS

Ref. Vol 1 7-2-29 Vol 4 12-3-5/6

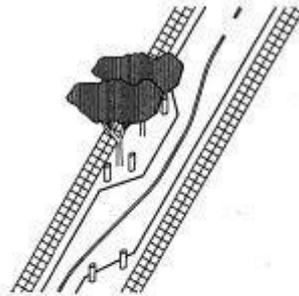


W201

MEASURES BETWEEN INTERSECTIONS



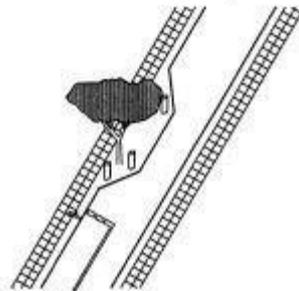
Detail 12.4.1 Speed Humps



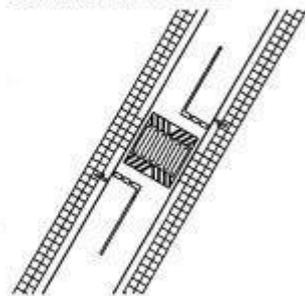
Detail 12.4.2 Chicanes (Two-Way)



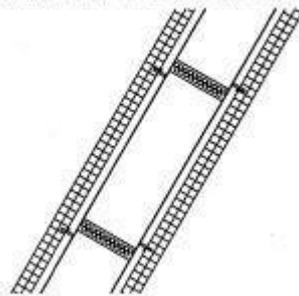
Detail 12.4.3 Rubble Strips



Detail 12.4.4 Pinch Point/Choker (One-Way)

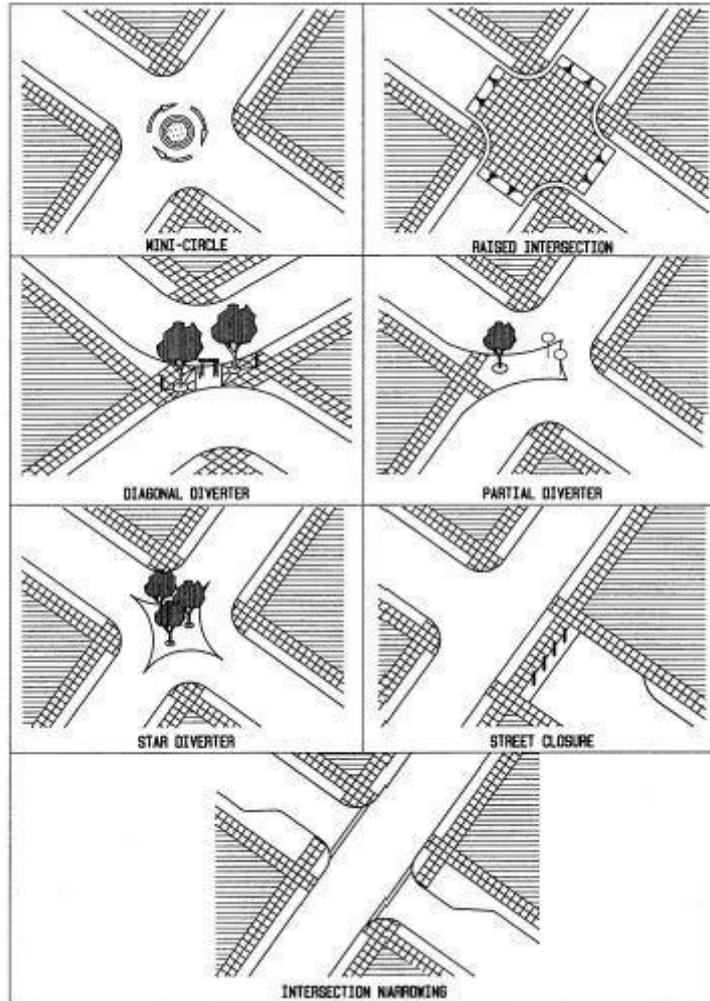


Detail 12.4.5 Pedestrian Table

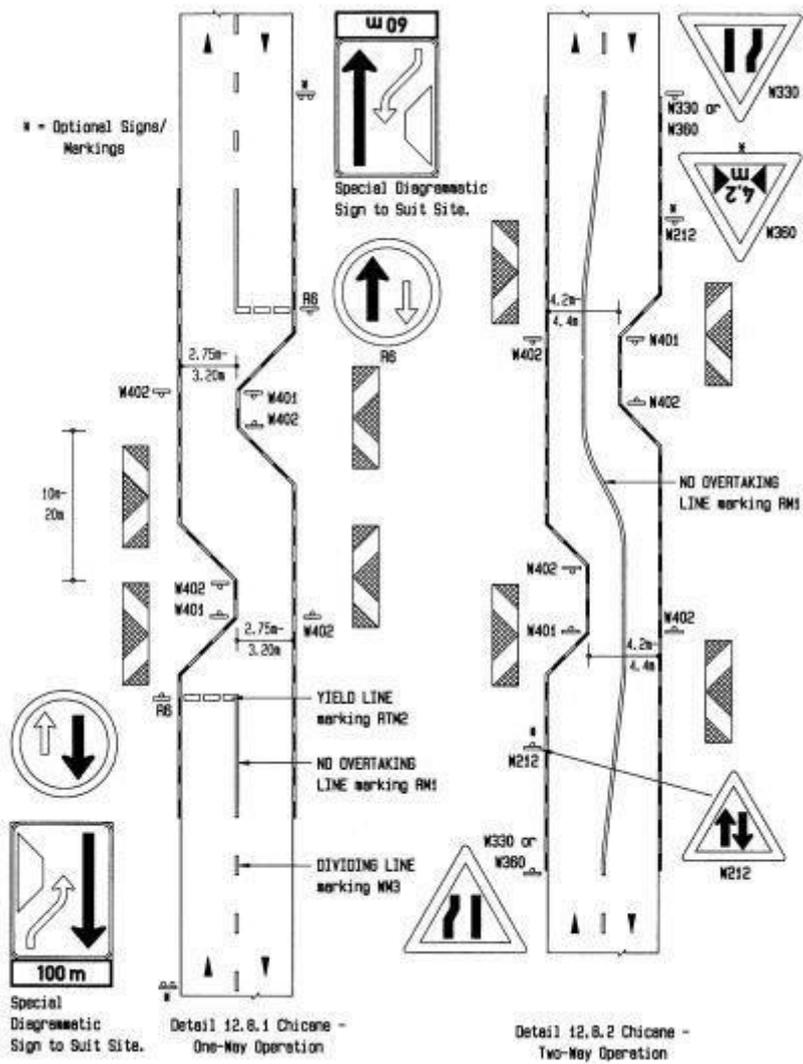


Detail 12.4.6 Semi-Spheres

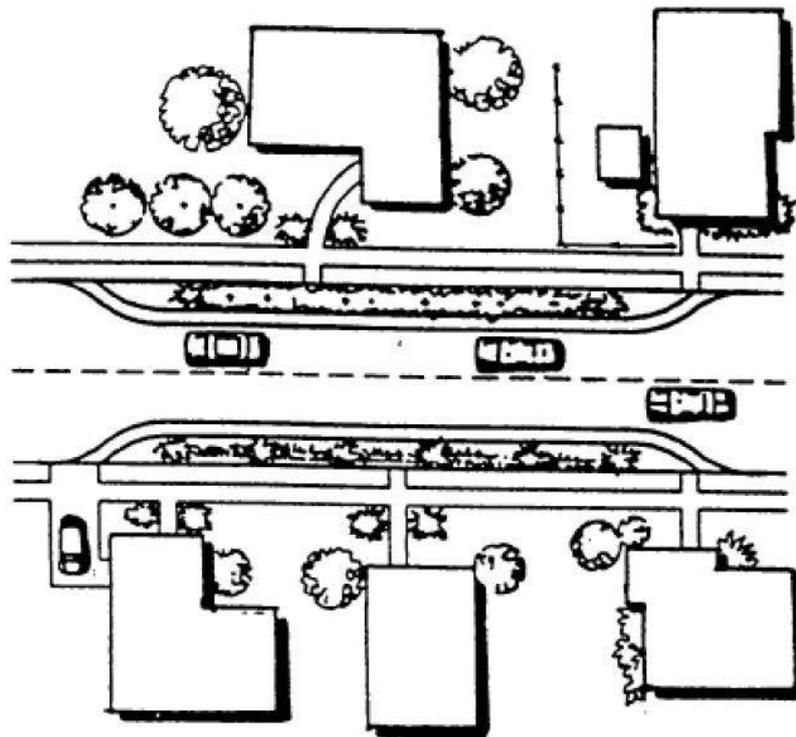
MEASURES USED AT INTERSECTIONS



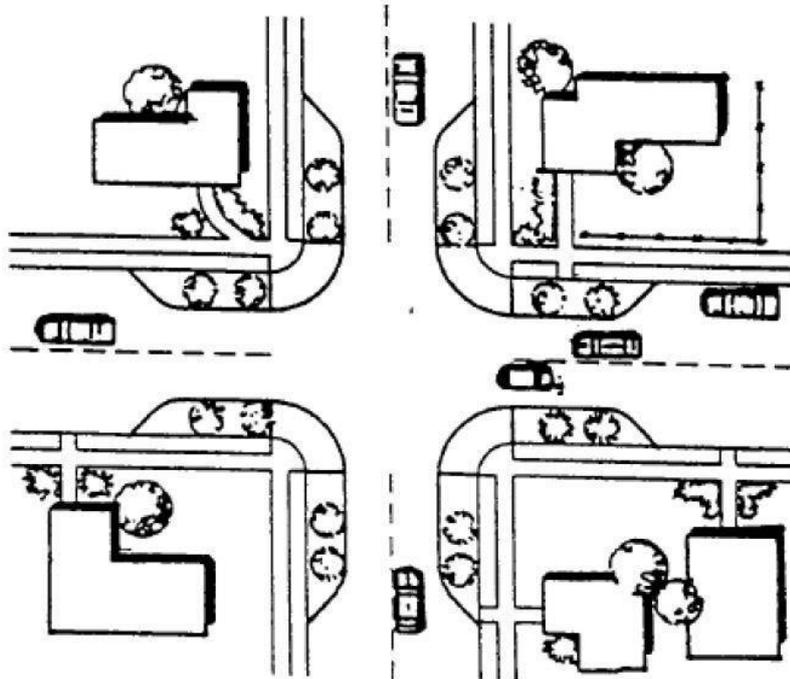
CHICANES



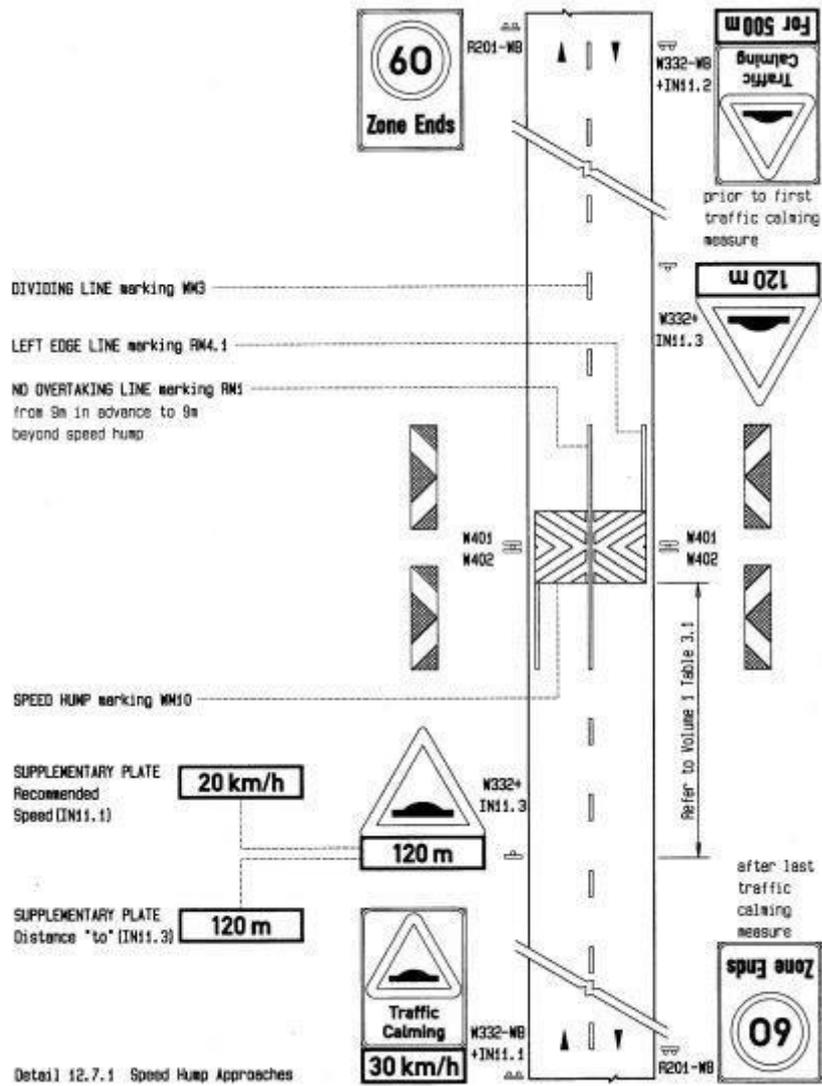
LANE NARROWING



NECKDOWN



SPEED HUMPS



CENTRE ISLAND NARROWING



CENTRE ISLAND WITH NECKDOWN



CHOKER



FULL ROAD CLOSURE



HALF ROAD CLOSURE



RAISED INTERSECTION WITH NECKDOWN



TRAFFIC CHOKERS

