

## Targeting Travel Speeds in the City of Stirling - A Holistic Approach

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### Abstract

The City of Stirling has developed a formalised process for targeting speeding on local roads through a holistic approach which focuses on a combination of education, enforcement and engineering. Through the City's traffic count program and resident correspondence the City is able to identify streets in which to apply this holistic approach.

### Education

The City's Speed Alert Mobile (SAM) is deployed to identified streets and proposed sites are forwarded to WA Police. Residents who contact the City regarding speeding in their street are encouraged to place bin stickers along their street and handout Community Safe Speed promise brochures in their street.

### Engineering

The City of Stirling evaluates identified streets through a "Traffic Management Warrants Policy." This policy uses a number of different factors; including recorded traffic count data, with speed and traffic volumes, crash history, road design and road users to assess the need for traffic management measures on local roads in a prioritised manner.

### Targeted Enforcement

The City provides WA Police with data to target dangerous and reckless driving when and where it happens. Through analysing traffic count data the City is able to provide the Police with traffic volumes and the 85th percentile but a key feature is providing specific information on the number of speeding motorists at various times of the day. The City also collects data on dangerous driving through an online hoon report form designed to be directly imported into the WA Police computer systems to help identify trends in hoon related behaviour.

**Keywords:** Local Government, Speed, Enforcement, Education, Engineering

## Introduction

### Speeding in Western Australia

Travel speeds are a concern for the community and all tiers of Government and remains the predominant factor for road trauma in Western Australia (WA). Inappropriate or excessive speed was a factor in nearly 30% of all WA road deaths in 2009. About a third of these deaths occurred on 60 km/h and 70 km/h roads and more than 60% of

speeding-related crashes where someone was hospitalised occurred in speed zones between 50 and 70 km/h (Office of Road Safety 2011). There are three commonly identified forms of speeding including low level speeding, intentionally driving above the posted speed limit and driving too fast for the prevailing conditions such as road surface and layout, visibility and weather conditions.

Safe speeds are identified in the WA Road Safety Strategy *Toward Zero* as one of the four key cornerstones for reducing road trauma. Evidence shows that a 5% decrease in mean speed leads to a 10% decrease in crashes and a 20% decrease in fatal crashes (Road Safety Council 2009) Reduced travel speeds on local streets will have an impact of reducing road trauma for motorists and vulnerable road users (Hoareau & Newstead 2004) and increase the amenity of local roads which will further compound the reduction of travel speeds (Engwicht 1993).

### Speeding in the City of Stirling

The City of Stirling has a rich and diverse natural and physical landscape covering an area of approximately 100 square kilometres from the coast to inner City Perth with over 1000 kilometres of road. The City is the largest local government by population in WA with over 200,000 residents.

The City receives numerous calls, emails and letters from residents regarding issues of speeding and dangerous driving. During 2010 the City's Officers responded to over 320 emails and letters relating to issues of speeding and dangerous driving. Each concern is investigated by the City's Officers forming the majority of traffic data collected in the City. Traffic data collected on the City's Roads from 2005 to 2010 was collated and summarised to evaluate the 85<sup>th</sup> percentile (85<sup>th</sup>%) travel speeds on the City's 50km/h and 60km/h streets.

*Table 1. 50km/h Roads in the City of Stirling*

<b>85<sup>th</sup>% (km/h)</b>	<b>Total</b>	<b>Percent</b>
<b>&lt;45</b>	192	14.7%
<b>45-49</b>	214	16.4%
<b>50-54</b>	327	25.0%
<b>55-59</b>	370	28.3%
<b>60-65</b>	178	13.6%
<b>&gt;65</b>	27	2.1%
<b>Total</b>	<b>1308</b>	<b>100%</b>

*Table 2. 60km/h Roads in the City of Stirling*

<b>85<sup>th</sup>% (km/h)</b>	<b>Total</b>	<b>Percent</b>
<b>&lt;55</b>	9	9.0%
<b>55-59</b>	21	21.0%
<b>60-64</b>	38	38.0%
<b>65-69</b>	30	30.0%
<b>70-74</b>	2	2.0%
<b>&gt;75</b>	0	0.0%
<b>Total</b>	<b>100</b>	<b>100.0%</b>

The percentage of streets with 85<sup>th</sup>% speeds of more than 5km/h above the speed limit are 69% on the City's 50km/h roads and 70% on the City's 60km/h roads. This indicates a general social acceptance of low level speeding amongst motorists on local roads. Police crash data indicates that speeding was a contributing factor in 29.4% of people killed or seriously injured on roads in the City from 2000-2009. This data indicates a correlation between travel speeds and road trauma in the City and presents a challenge at the local level to achieve positive road safety outcomes.

#### City of Stirling Approach to Speeding

Road safety is increasingly being viewed as a public health issue rather than just one of transport (World Health Organisation 2004) thus it is necessary to look beyond the traditional use of engineering solutions alone to focusing on the determinants of health. The World Health Organisation states that the determinants of health include the social and economic environment, the physical environment and the person's individual characteristics and behaviours (World Health Organisation 2011).

In response to issues of speeding and dangerous driving on the City's roads, the City has developed a holistic approach that combines elements of education and community participation, enforcement and engineering measures. The City was the first and is only one of two local governments in WA to employ a full time Road Safety Officer to develop and implement this holistic approach to travel speeds. Along with the City's capital works program, the City seeks to foster and develop meaningful links with the community to promote community ownership over issues of travel speeds and develop key relationships with WA Police to share resources for targeted enforcement.

The City of Stirling was recognised for its holistic approach to reducing travel speeds by winning a 2009 Local Government Road Safety Award in the category of 'Safe Travel Speeds' which was awarded at the 2009 Roads and Transport Forum.

This paper seeks to highlight the processes and activities by which the City seeks to reduce travel speeds by the holistic combination of traditional and innovative measures at a local level.

## Education

### Community Participation in Road Safety

Community participation has for a long time been recognised as an integral part of a comprehensive approach to improving public health (Marschell 2004; Secker-Walker et al; McKenzie-Mohr 1999). Increasingly it has been acknowledged to be a significant contributor to improving road safety, (Howat et al 2001; Hingson et al 1996; Kinney 1998; Pettet et al 2003; Cairney 2002) and has been recognised as a strategy to ensure effective implementation in the Western Australian Road Safety Strategy: *Toward Zero* (Road Safety Council 2009).

Community participation is understood to influence and reinforce social norms and beliefs impacting upon the behaviour pattern of the community (McKenzie - Mohr 1999). This is affirmed in psychology research, which has found that people look to others to determine how they should behave in differing situations and behave similarly (Pittsburgh, Carnegie & Asch 1956; Cialdini & Goldstein 2004). In regards to travel speeds a study by Haglund and Aberg (2000), found that an individual driver's behaviour was closely related to the behaviour of other drivers, and those that perceived others to drive at excessive speed were also more likely to speed themselves.

### Drop 5 and Save Lives

The City employed a full time Road Safety Officer and established the City of Stirling Road Safety Advisory Committee in 2004. In response to resident concerns and its identification in the WA Road Safety Strategy the committee identified speed as an appropriate priority area for action. As a result, the City's Drop Five and Save Lives project (D5SL) was developed and funded through the Community Road Safety Grant Program. D5SL aims to encourage motorists using the City's roads to slow down through the implementation of community education strategies that foster community participation in road safety and reduce the social acceptability of speeding.

D5SL uses innovative strategies for addressing the issue of speeding that require the active participation of residents in their implementation. It is believed that the program provides a number of meaningful opportunities for participation at many levels. Whilst laying the foundation for the City to build a community culture that contributes to residents taking shared responsibility for improving road safety in their street or local area.

### Speed Alert Mobile

The City's Speed Alert Mobile (SAM) measures the speed of each vehicle and immediately displays this information as well as a "SLOW DOWN" or "WELL DONE"

message to the driver. Devices of this type have proven to be effective in slowing motorists down by increasing driver awareness of their speed.

The City hires a part-time SAM operator to deploy the SAM to 6 locations every week. Locations are chosen primarily on results obtained from traffic count data to ensure it is being used in streets with higher than acceptable travel speeds. Other locations chosen for the SAM are Primary Schools, particularly at the start of term and streets identified by WA Police and residents.

The SAM is also used as a display item at community event stalls as a valuable tool in attracting and engaging the community to talk about the issue of travel speeds. This allows the Road Safety Officer to promote other safe speed programs requiring community participation and disseminate educational materials.

The project is a valuable information tool for raising awareness of travel speeds and giving residents a sense of ownership over issues of speed when they request the SAM for their street. Primary Schools are particularly grateful for the SAM trailer as it is seen to further enhance the school road environment which has the perception of being highly dangerous. The City also provides WA Police with a list of SAM locations for the fortnight to encourage them to conduct enforcement at those locations following a SAM deployment to have a longer lasting effect on travel speeds.

#### Slow Down Consider our Kids Bin Stickers

As part of the D5SL grant, 15,000 "Please Slow Down Consider Our Kids" mobile garbage bin stickers were distributed throughout the City on roads where there had been a number of complaints. These roads commonly had high volumes with connectivity to district distributors and local distributors. A number of these sites also have schools and recreation facilities. When stickers were distributed, each household received a leaflet, with information about the stickers and the consequences of speeding. The intended target of 15,000 bin stickers and leaflets will reach approximately 20% of households in the City of Stirling.

In response to continued community requests, the City wished to build on the success of the 2005 D5SL initiative and applied for and received grant funding to purchase a further 9000 bin stickers. Phase II also saw a greater link with existing projects such as the Community Safe Speed Promise and deployment of the City's SAM. West Metropolitan Traffic Police have also committed to conducting speed enforcement operations on targeted street to increase impact of the bin stickers.

#### Community Safe Speed Promise

The Community Safe Speed Promise is based on an existing program known as the Neighbourhood Pace Car Pledge Program founded by David Engwicht and run in the City of Stirling as part of D5SL, Queensland and the United States.

During 2007, Officers from the Cities of Stirling, Joondalup and Melville discussed with the Western Australian Local Government Association (WALGA) - RoadWise Road Safety Officer (Metropolitan North) how the Neighbourhood Pace Car Pledge initiative could be improved. It was determined that the term 'Pace Car' was too ambiguous and likely to cause misconceptions as to what the initiative is about so the initiative was re-branded as the Community Safe Speed Promise.

The initiative asks residents to sign a 'Community Safe Speed Promise' and commit to driving within the speed limit and being a courteous driver. Committed drivers are provided with a bumper sticker and fridge magnet so they are easily identifiable and can set an example for other motorists to follow.

The 'Community Safe Speed Promise' can be linked to the Cognitive Dissonance Theory. This theory proposes that individuals have a need for coherence in their beliefs, attitudes and behaviours. If an inconsistency exists between a person's beliefs and behaviour, this creates a feeling of imbalance, which is psychologically uncomfortable, motivating the person to change their attitude or behaviour to regain balance (Harré 2003). By making the commitment by signing the 'Community Safe Speed Promise' and placing a sticker on their vehicle, a person is choosing to commit to driving within the speed limit. Use of this theory has enabled the initiative to be planned, implemented and evaluated in a logical theory based approach and has improved the chances of success (Nutbeam & Harris 2004).

The Cities of Joondalup and Stirling entered into a partnership agreement to jointly run the 'Community Safe Speed Promise' initiative. A grant application was submitted to the Community Road Safety Grants Program which was successful in December 2008. Since the launch in March 2009, the City of Stirling has enlisted 625 participants in the program and continues to explore cost effective means of promoting the program and encouraging membership.

## **Engineering**

### Traffic Management Warrants Policy

The Traffic Management Warrants Policy is used to identify roads for consideration of traffic management to reduce travel speeds. When a letter of request is received by residents for engineering works, the City evaluates the street using a matrix developed as part of the 'Traffic Management Warrants Policy.' This matrix uses a number of different factors; including recorded traffic count data, with speed and traffic volumes, crash history, road design and road users in a points based system. Evaluated streets are identified as "Technical Problem", "Minor Technical Problem" or "No Action Required" and ranked according to their matrix score. Where a location meets a warrant criteria evaluation under this policy, then works may be listed for consideration of future funding.

The policy was adopted by the City's Council in December 2003 as best practice in regarding to capital works budgeting for local area traffic management. The policy is robust and has been accepted by the wider engineering community being used as a model in the Austroads' *Guide to Traffic Management Part 8: Local Area Traffic Management* (Austroads 2008).

### Reducing speed limits

Main Roads WA (MRWA) is the key authority for setting speed limits on all WA roads however support is also required in most cases from the City's Council to progress speed limit changes. The City is committed to applying to MRWA to reduce speed limits in areas suitable for speed reductions such as areas of high pedestrian activity and road environments conducive to a lowered speed limit.

In 2004 residents of Duke Street, Scarborough expressed concerns of traffic speed and lobbied the City to approach MRWA to reduce the speed limit from 60km/h to 50km/h. The proposal was accepted by the City's Council however MRWA rejected the request as Duke Street is classified as a District Distributor B. Duke Street residents through further lobbying the City, local Members and Ministers were successful in having the MRWA decision overturned and the speed limit on Duke Street reduced to 50km/h.

In 2009 MRWA proposed to implement a fully funded variable speed zone on a section of Beaufort Street, Mt Lawley within the City and the neighbouring Town of Vincent. The proposed initiative was a trial to lower vehicle speeds from 60km/h to 40km/h during peak pedestrian periods to improve safety for pedestrians and other vulnerable road users. Local Ward Councillors raised concerns that the variable speed zone would redistribute regional traffic from Beaufort Street to adjacent local roads, resulting in the Council deciding to reject the proposal and preventing the trial from going ahead in the City's section.

The above examples highlight the need for community support in reducing speed limits on local roads in that community concerns can act as a catalyst for overturning a decision not to lower the speed limit as well as a proposal to lower the speed limit. This provides a challenge at the local level in engaging the community when considering lowering the speed limit on identified streets in the future.

### Community Consultation in Local Area Traffic Management

The City undertook a Local Area Traffic Management (LATM) study of a precinct in Scarborough and Doubleview in 2009. The purpose of the study was to review the effectiveness of traffic management treatments already introduced to date and to identify locations where future traffic management treatments were considered necessary or feasible.

As part of the study, a major community consultation exercise was undertaken to ensure that residents within the study area had an opportunity to provide input into the operation of their local road network. This input was achieved by a questionnaire distributed to almost 3,600 homes and businesses, and the establishment of a community based Reference Group that met a number of occasions. Nominations for the Reference Group were invited at the time of the community survey and a total of 61 nominations were received. The 12 people chosen to be members of the group represented diversity in age, gender, road user type, and distribution across the study area.

Based on the information obtained from the questionnaire surveys and following detailed discussion and investigation by the Reference Group, a number of locations were identified for potential future traffic management treatments to address concerns regarding traffic and road safety issues. These locations were endorsed by Council in November 2009 and have been listed on the City's Forward Plans for consideration within future annual budgets subject to competing priorities and funding constraints.

### Specific Treatments

The City uses a range of engineering solutions to reduce travel speeds on local streets in line with the *Austrroads Guide to Traffic Management: Part 8 – Local Area Traffic Management (2008)* and *Main Roads WA Guide to Local Area Traffic Management*. Traffic management options utilised by the City include but are not limited to four types of treatment designed to reduce travel speeds.

#### Vertical displacement devices:

- Speed cushions
- Road humps
- Flat top road humps (raised speed plateaus)
- Raised intersection platforms.

#### Horizontal displacement devices:

- Roundabouts
- One-Way and Two-Way Slow Points
- Oval Slow Points (Centre Blister Islands)
- Driveway Links
- Midblock median treatments
- Lane Narrowings / Kerb Extensions

#### Diversion devices:

- Full Road Closures
- Half Road Closures
- Diagonal Road Closures
- Modified-T Intersection
- Left In / Left Out Islands



Other Treatments:

- Speed Limit Signs
- One-Way Streets
- Prohibited Traffic Movement Signs
- Shared Zones

There are advantages and disadvantages in implementing any of the above treatments and the City conducts a consultation survey with the residents most likely to be affected by a proposed treatment in order to ensure community support for the treatment. This is to ensure treatments will have the greatest possible road safety outcome whilst having the least effect on amenity for local residents.

## **Enforcement**

Hand held laser enforcement along with fixed speed cameras have been shown to have a significantly positive impact in some cases on casualty crash frequency, crash severity or driver speeding behaviour (Cameron & Delaney 2004).

WA Police are the sole organisation responsible for traffic speed enforcement in Western Australia. Whilst the City has no control over the deployment of speed cameras or use of hand held lasers on local roads, the City can play an important role in assisting Police in identifying streets where issues of speeding are most prevalent.

The City has established a good working relationship with the West Metropolitan Police's traffic section with the Senior Sergeant sitting on the City's Road Safety Working Group as well as having regular meetings with the City's Road Safety Officer.

## Traffic Data

The City conducts an extensive traffic count program to assess traffic data on over 600 of the City's roads per year. Traffic counts are conducted predominately in response to complaints from residents, as part of specific studies and to collect pre and post data for traffic management works.

Using the Metrocount traffic analysis software the City is able to identify the time of day when traffic speeds and volumes are highest which is helpful in identifying trends in speeding behaviour. This data is summarised and forwarded to the Senior Sergeant to assist Police in deploying their resources more effectively and conducting enforcement when it will have the most impact.

Streets targeted for in depth analysis and summary are those that have an 85<sup>th</sup> percentile speed 10km/h above the posted speed limit and a minimum average weekday traffic flow of 1000 vehicles per day.

## Street Safe Online Hoon Report Form

In 2004 the WA Government amended the Road Traffic Act to address concerns over dangerous driving practices commonly referred to as hooning. The Road Traffic Amendment (Impounding and Confiscation of Vehicles) Act 2004 and subsequent amendment legislation, commonly referred to as Hoon Legislation, empowers police to impound vehicles that are driven in a reckless manner, do a burnout; or are driven at a speed equal to or greater than 45km/h over the posted speed limit.

The City received numerous complaints regarding hooning each year and whilst complainants are referred to WA Police it was identified that the City could play a vital role in assisting to establish patterns or trends in hoon behaviour through data collection.

Prior to the establishment of the WA Police traffic intelligence unit, the City and Police sought to work together capture reports of dangerous driving at a local level. The aim of the initiative was to establish trends in hoon behaviour to allow Police to direct their resources more effectively in the Western Metropolitan Police district.

In 2007 the City developed the Street Safe online hoon report form which allows residents to report incidences of hooning through the City's website. The City is able to gather this data and provide it to Police in a user friendly spreadsheet format. Although WA Police have a similar report form on their website the aim is to capture as much data as possible and the City's report form may capture incidences they have otherwise gone unreported due to apprehension in reporting incidences to Police.

## **Conclusion**

Travel speeds on local roads is an issue affecting the community, local governments and WA Police. All road safety stakeholders have a shared responsibility to ensure a reduction in road trauma and the City works toward maintaining a holistic travel speed ideal to bring the stakeholders together to work toward a common goal.

The City through the establishment of a road safety program seeks to reduce travel speeds through a combination of education, travel speed awareness and community participation, engineering solutions that have the least effect on surrounding residents and intelligence based enforcement.

The City is of the opinion that the broad approach of using a combination of engineering, education and enforcement initiatives are proactive and will have the most effective long term solution to the anti-social activity from a minority of drivers.

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