Shire of Kalamunda

Planning Services Committee

AGENDA FOR 12 APRIL 2010

SHIRE OF KALAMUNDA
NOTICE OF MEETING
PLANNING SERVICES COMMITTEE

Councillors,

Notice is hereby given that the next meeting of the General Services Committee will be held in the Council Chambers, Administration Centre, 2 Railway Road, Kalamunda on:

12 APRIL 2010, COMMENCING AT 7.00 PM.

For the benefit of Committee Members, Staff and members of the Public, attention is drawn to the following requirements as adopted by Council.

Open Council Meetings - Procedures

1. Standing Committees are open to the public, except for Confidential Items listed on the Agenda.
2. Standing Committees have a membership of all Councillors (12 Councillors).
3. Unless otherwise advised a Committee makes recommendations only to Full Council (Held on the third Monday of each month at 7.00pm).
4. Members of the public are able to ask questions at a Committee Meeting, however the questions should be related to the functions of the Committee.
5. Members of the public wishing to make a comment on any Agenda item may request to do so by advising staff prior to commencement of the Committee Meeting.
6. Comment from members of the public on any item of the Agenda is usually limited to 3 minutes and should address the recommendations (at the conclusion of the report).
7. It would be appreciated if silence is observed in the gallery at all times except for Question Time.
8. All other arrangements are in general accordance with Council's Standing Orders, the Policies and decisions of the person Chairing the Committee or Council Meeting.
9. Members of the public who are unfamiliar with meeting proceedings are invited to seek advice at the meeting by signalling to a staff member.

James Trail
Chief Executive Officer

Wednesday 7 April 2010

***** Dinner will be served at 6.00pm *****

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Minutes of Planning Services Committee
Held in the Council Chambers
2 Railway Road, Kalamunda
12 April 2010

1. OFFICIAL OPENING

2. APOLOGIES AND LEAVE OF ABSENCE

3. PUBLIC QUESTION TIME

A period of not less than 15 minutes is provided to allow questions from the gallery on matters relating to the functions of this Committee. For the purposes of Minuting, these questions and answers are summarised.

4. PETITIONS

5. CONFIRMATION OF MINUTES OF PREVIOUS MEETING

5.1 That the Minutes of the Planning Committee Meeting held on 8 March 2010 be confirmed as a true and correct record of the proceedings.

Moved: **Seconded:**

Statement by Presiding Member

"On the basis of the above motion I now sign the Minutes as a true and accurate record of the meeting of 8 March 2010."

6. ANNOUNCEMENTS BY THE PERSON PRESIDING WITHOUT DISCUSSION

7. MATTERS FOR WHICH MEETING MAY BE CLOSED

8. DISCLOSURE OF INTERESTS

Disclosure of Financial and Proximity Interests

(a) Members must disclose the nature of their interest in matters to be discussed at the meeting. (Sections 5.60B and 5.65 of the Local Government Act 1995)

(b) Employees must disclose the nature of their interest in reports or advice when giving the report or advice to the meeting. (Sections 5.70 and 5.71 of the Local Government Act 1995).

Disclosure of Interest Affecting Impartiality

(a) Members and staff must disclose their interest in matters to be discussed at the meeting in respect of which the member or employee has given or will give advice.

9. REPORT TO COUNCIL

Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.20 Proposed Amended Policies for the Planning & Development Directorate

Previous Items:	N/A
Service Area:	Planning Development Services
File Reference:	OR-CMA-016
Applicant:	N/A
Owner:	N/A

PURPOSE

1. The purpose of this report is for Council to consider amendments to various Planning and Building Policies as contained in the Shire's Policy Register.
2. To consider whether to advertise draft amended local planning policies that seek to provide guidance on the assessment and determination of applications for Planning Approval for radio, television, transmission and communication facilities and requests for variations to the number of car parking bays.

BACKGROUND

3. Local Planning Scheme No. 3 (LPS 3) foreshadows the development of policies to guide decision-making.
4. The Policy Register is currently being reviewed and, where considered necessary, amendments and draft policies are being presented for Council consideration.
5. Amended and draft policies are being considered for a number of reasons including consistency with updated legislation and Shire functions, recognition of the changing needs of the community and potential ambiguity or interpretation issues.
6. When Council adopted Local Planning Policy DEV26 - Radio, Television, Transmission and Communication Facilities, there is no subsidiary legislation, however, this now exists (e.g. *Telecommunications Code of Practice 1997* and *Telecommunications (Low Impact Facilities) Determination 1997*).

DETAILS

7. Council is requested to consider amendments to the following policies:
    - DEV26 - Radio, Television, Transmission and Communication Facilities. ***(Refer to Attachment 1)***
    - DEV41 - Framework for Assessing Requests for Variations to the Number of Car Parking Bays. ***(Refer to Attachment 2)***

STATUTORY AND LEGAL IMPLICATIONS

8. LPS 3 allows the Shire to prepare policies in respect to any matter related to the planning and development of the Shire. Policies may apply to a particular case or matter and throughout the Scheme area or in one or more parts of the Scheme area. The Scheme allows Council to amend or rescind its Planning Policies.

9. Clause 5.8.2 of LPS 3 allows Council to apply at its discretion, a greater or lesser requirement for car parking than that stipulated as the minimum requirement in Table 3 of the Scheme if, in its opinion, the proposed use is likely to demand a greater or lesser need for car parking bays having due regard to the scale and nature of the intended uses.

10. A Local Planning Policy is not part of the Scheme and does not bind the Council in its decision making, however, Council is to have due regard to the policy when making a decision.

POLICY IMPLICATIONS

11. If Council adopts the local planning policies, they will be included in the Shire's Policy Register.

PUBLIC CONSULTATION/COMMUNICATION

12. LPS 3 prescribes the procedure for advertising a Local Planning Policy. It will be necessary to advertise the policies once a week for two consecutive weeks in a newspaper circulating in the Scheme area with a submission period of 21 days. The policies will also be on display at the Administration office and libraries.

13. Following the advertising period, the policies will be presented to Council for consideration of adoption, with or without modification.

FINANCIAL IMPLICATIONS

14. There will be a cost involved in the advertising of the proposed policies, however this is covered in the adopted budget.

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

15. **Strategic Planning Implications**
- The amended policies will assist in the procedural and governance aspects of the Shire's development control responsibilities.

16. **Sustainability Implications**

Social implications
- The amended policies stipulate Shire requirements which will be applied so that the amenity of an area is not significantly impacted by a proposed land use.

Economic Implications
- Nil

Environmental Implications

- Nil

OFFICER COMMENT

17. DEV26 - Radio, Television, Transmission and Communication Facilities

When Council adopted Local Planning Policy DEV26 - Radio, Television, Transmission and Communication Facilities – there was no subsidiary legislation, however, this now exists (e.g. *Telecommunications Code of Practice 1997* and *Telecommunications (Low Impact Facilities) Determination 1997*).

18. DEV41 - Framework for Assessing Requests for Variations to the Number of Car Parking Bays

LPS 3 allows Council to apply, at its discretion, a greater or lesser requirement for car parking than that stipulated as the minimum requirement in Table 3 of the Scheme. The proposed amended Local Planning Policy DEV41 - Framework for Assessing Requests for Variations to the Number of Car Parking Bays - provides guidance on when this will be applied.

19. The amended policies seek to provide a balance between the needs of residents, as well as the need to retain the prevailing character of an area, without unreasonable intrusion.

20. The amended policies will assist in the procedural and governance aspects of the Shire's development control responsibilities. It is therefore recommended that they be advertised for public comment.

MEETING COMMENT

21.

OFFICER RECOMMENDATION PS-20/2010

1. That Council agrees to advertise the following planning policies for public comment, in accordance with provision 2.4 of Local Planning Scheme No. 3:

    - DEV26 - Radio, Television, Transmission and Communication Facilities.
    - DEV41 - Framework for Assessing Requests for Variations to the Number of Car Parking Bays.

REGISTER OF COUNCIL POLICIES

Title:	**Radio, Television, Transmission and Communication Facilities – Local Planning Policy**		
Policy No.:	**DEV 26**		
Date Adopted:		Date Last Reviewed:	Unknown

Objective:	• To provide guidelines for the assessment of communication, receiver and transmission facilities including television, radio broadcasting, commercial communication, mobile telephone, not low impact and amateur radio facilities. • To protect the quality of the streetscape and the amenity of nearby residents by minimising the visual impact of television, radio broadcasting, commercial communication, mobile telephone, not low impact and amateur radio facilities.

SCOPE

This policy should be read in conjunction with the following:

1. Council's Local Planning Scheme;
2. WAMA Telecommunications Kit;
3. Telecommunications Code of Practice 1997 (as per Schedule 3 of the Telecommunications Act 1997); and
4. Telecommunications (Low-Impact Facilities) Determination 1997.

APPLICATION CRITERIA

In the Telecommunications (Low-Impact Facilities) Determination 1997, telecommunication facilities are categorised into classifications including 'Low Impact' facilities. Development approval from the Shire is not required for the installation of 'Low Impact' facilities under the Telecommunications Code of Practice, however applicants are encouraged to submit details to the Shire for its information.

Any application for any communication, receiver and transmission facilities (and associated facilities) deemed as 'Medium' or 'High' Impact, requires referral to the Shire for determination.

The Shire will not consider or determine any application until the applicant has submitted all of the required information as stipulated in the Telecommunication Code of Practice.

Applications for new facilities will only be considered where the applicant has provided adequate evidence and justification that all opportunities for co-location of the new facility with existing facilities have been investigated, and that co-location alternatives are not feasible for technical or aesthetic reasons.

This policy does not include:-

a) Mobile communication facilities temporarily located at any one specific place;

b) State Emergency Services communication equipment, and

c) Any other emergency service authority acting within the scope of its statutory responsibilities, and any mast or antenna used in association with a domestic television or radio.

ASSESSMENT OF APPLICATIONS

Satellite Dishes

An application for "Approval to Commence Development" is required prior to the issuing of a Building Licence for the erection of a satellite dish except when:

- The diameter of the dish is less than 1m;
- The dish is not located on the façade or roof of a building fronting a public street or place;
- The dish in not within the setback area to a street;
- The dish does not project above the ridgeline of the building to which it is attached;
- If mounted on the roof and visible from nearby properties the dish is painted a similar colour to the roof; and
- Subject to compliance with foregoing criteria there are no existing satellite dishes or microwave antennas on the property.

Antennas and Towers

An application for "Approval to Commence Development" is required prior to the issuing of a Building Licence for the erection of a microwave antenna except when:

- The circumference of the antenna is less than 500mm;
- The antenna does not project higher than 2m above the ridge line of the roof of the building to which it is attached;
- Subject to compliance with foregoing criteria there are no existing towers or antennas on the property.

<u>Design</u>

1. Free standing facilities (antennas) are to be constructed of a single slimline monopole with flush mounted antenna packs.

2. All communication, receiver and transmission facilities will be required to be painted a neutral non-reflective colour to blend with the immediate local surroundings and minimise the potential of visual intrusion.

3. The visual impact of all communication, receiver and transmission facilities including television, radio broadcasting, commercial communication, mobile telephone, not low impact and amateur radio facilities, is to be mitigated wherever possible by the retention of existing local trees. Where existing local trees do not exist, or their retention is not adequate, the planting of advanced specimens of trees approved by the Council shall be required.

4. Facilities wherever possible shall utilise existing commercial or industrial buildings/structures or replace an existing structure. New towers (or base stations) should not be located within 500m from sensitive areas (residential, child care centres, schools and similar uses determined by the Shire).

5. If existing structures are proposed to be upgraded or replaced by new structures, all obsolete telecommunication infrastructure is to be removed from the site within three (3) months of the cessation of use, and the land reinstated with vegetation endemic to the surrounding area.

COMMUNITY CONSULTATION

The Shire will consult with nearby landowners in regard to the impact of a proposal if:

Satellite Dishes

- The satellite dish exceeds 3m in diameter;
- The support height from the ground to the centre of a satellite dish exceeds 2m;
- The combined height of any support structure and the dish exceeds 3.5m;
- If the setback is exceeded by the combined height of the support structure and the dish; or
- Motorised systems are to be employed for the directional change of the dish.

If any of the above applies, the application will be advertised for comments from the adjoining landowners and those landowners whose view of the proposed dish will be unobstructed from their property.

Antennas and Towers

- The antenna exceeds 2m in diameter;
- The support height from the ground to the top of an antenna or tower exceeds 10m;
- If the setback is exceeded by the height of the antenna or tower; or
- The antenna or tower projects higher than 4m above the ridge line of the roof of the building to which it is attached.

If any of the above applies, the application will be advertised for comments from nearby landowners. For every metre the proposed antenna's or tower's height and/or diameter is in excess of the above, the application will be advertised to landowners within an additional 100m radius of the subject property (e.g. if the antenna projects 5m above the ridge line of the roof all landowners within 100m will be required to be consulted, antennas projecting 6m above the roof's ridge line requires a 200m advertisement radius etc.).

The Shire reserves the right to liaise or consult with other telecommunication carriers to establish whether similar facilities are proposed in the immediate area and whether opportunities exist for co-location.

CROSS REFERENCES (If any):

Admin Policy/Procedure:		Delegation:	

LEGAL REFERENCES

Legislation:	Local Planning Scheme No. 3
Local Law:	
Notes:	Previous policy PS 1.10

REGISTER OF COUNCIL POLICIES

Title:	**Framework for Assessing Requests for Variations to the Number of Car Parking Bays – Local Planning Policy**		
Policy No.:	**DEV 41**		
Date Adopted:		Date Last Reviewed:	Unknown

Objective:	To provide guidance to proponents and the Shire for considering requests for the reduction of the number of car bays prescribed under Local Planning Scheme No. 3.

POLICY

Local Planning Scheme No. 3 allows the Shire to apply, at its discretion, a greater or lesser requirement for car parking bays than that stipulated as the minimum in Table 3 for any zone (except Residential).

The Shire will consider variations to the car parking requirements under Local Planning Scheme No. 3 if:

a) The circumstances of a development justify such variation and there will not be any resultant lowering of safety, convenience and amenity standards, it may permit a reduction in the number of car parking spaces required by Table 3 of Local Planning Scheme No.3.

b) it is necessary to increase the required number of car parking spaces in order to maintain desirable standards of safety, convenience and amenity, such extra car parking spaces as the Shire considers necessary shall be provided. In imposing such extra car parking requirements, the Shire shall explain the reasons for the increase to the owner of the lot.

c) Where there are two separate and different developments with different hours of peak operation, but being located on the same lot or adjoining lots, the Shire may permit a reduction of the required number of car parking bays on either or both lots, provided it is satisfied there would be no resultant lowering of safety, convenience and amenity standards.

d) Where a proposed development is located adjacent to a constructed public car park, the Shire may, where it is satisfied there would be no lowering of safety, convenience and amenity standards, reduce the amount of required onsite car parking for that development by the amount which it considers the public car park serves the development.

Where a request for the reduction of the number of car parking bays is received, the following principles will also be applied:

- The Shire will not consider on-street and/or verge parking as part of the calculation of car parking bays for a development proposal.
- The proximity of public parking areas will only be considered within District Centre zoned land.
- Parking ratios under previous Planning Schemes are not relevant and are not a mitigating factor.
- A reduction in parking will only be determined by Council and not under delegation.
- A change in land use may invalidate the parking reduction.
- This Policy does not apply to developments considered under the Residential Design Codes.

CROSS REFERENCES (If any):

Admin Policy/Procedure:		Delegation:	

LEGAL REFERENCES

Legislation:	Local Planning Scheme No. 3
Local Law:	
Notes:	Previous policy PS 1.10

Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.21 Policies for the Planning and Development Directorate - Proposed Revocations

Previous Items:	N/A
Service Area:	Planning Development Services
File Reference:	OR-CMA-016
Applicant:	N/A
Owner:	N/A

PURPOSE

1. For Council to consider the revocation of various Planning Policies as contained in the Shire's Policy Register.

BACKGROUND

2. The Policy Register is currently being reviewed and, where considered necessary, amendments and revocations for Council consideration are being recommended.
3. Revocations are being considered for a number of reasons including potential ambiguity, requirements outlined in certain policies being the same as other documents (e.g. *2008 Residential Design Codes*) or interpretation issues, and therefore, are not adding value to the existing legislative position.

DETAILS

4. Council is requested to consider revoking the following policies:
    - DEV10 – Delegation of Authority – Determination of Development and Subdivision Applications ***(Attachment 1)***
    - DEV38 – Variation of Building Setbacks – Residential Design Codes ***(Attachment 2)***
    - DEV 39 – Walls on Boundaries – Local Planning Policy ***(Attachment 3)***

STATUTORY AND LEGAL IMPLICATIONS

5. Local Planning Scheme No. 3 (LPS 3) allows the Shire to prepare policies in respect to any matter related to the planning and development of the Shire. Policies may apply to a particular class or matter and throughout the Scheme relate to one or more parts of the Scheme area. The Scheme allows Council to amend or rescind its planning policies.
6. A Local Planning Policy is not part of the Scheme and does not bind the Council in its decision making, however, Council is to have due regard to the Policy when making a decision.

POLICY IMPLICATIONS

7. If Council revokes the Policies, they will be removed from the Shire's Policy Register.

PUBLIC CONSULTATION/COMMUNICATION

8. There is no Scheme requirement for the policies to be advertised prior to being revoked. Should Council revoke the policies, a notice of revocation will be published once a week for 2 consecutive weeks in a newspaper circulating in the Shire area, in accordance with clause 2.5(b) of Local Planning Scheme No.3.

FINANCIAL IMPLICATIONS

9. There will be a cost involved in publishing a notice of revocation, this is, however, covered in the adopted budget.

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

10. **Strategic Planning Implications**
    - The removal of the policies will assist with determining applications.

11. **Sustainability Implications**

Social implications
- Nil

Economic Implications
- Nil

Environmental Implications
- Nil

OFFICER COMMENT

12. Local Planning Policies DEV38 – Variation of Building Setbacks – Residential Design Codes and DEV 39 – Walls on Boundaries are redundant policies, due to the requirements being already stipulated in the *2008 Residential Design Codes*.

13. Local Planning Policy DEV10 – Delegation of Authority – Determination of Development and Subdivision Applications is regarding delegated authority already listed in the Delegated Authority Register (PDA1) adopted by Council in June 2009 ***(Attachment 4)***. This is, in effect, a duplication of the delegated authority.

14. Local Planning Policy DEV 10 is inconsistent with current legislation as it refers to District Planning Scheme No. 2 provisions.

MEETING COMMENT

15.

OFFICER RECOMMENDATION PS-21/2010

1. That Council revokes the following planning policies in accordance with clause 2.5 of Local Planning Scheme No 3:
    - DEV10 – Delegation of Authority – Determination of Development and Subdivision Applications
    - DEV38 – Variation of Building Setbacks – Residential Design Codes
    - DEV 39 – Walls on Boundaries – Local Planning Policy
2. A notice of revocation be published once a week for 2 consecutive weeks in a newspaper circulating in the Shire area.

POLICY REGISTER

shire of kalamunda

Title:	**Delegation of Authority – Determination of Development and Subdivision Applications**		
Policy No.:	**DEV10**		
Date Adopted:	unknown	Date Last Reviewed:	unknown

Objective:	To provide guidelines under which the Chief Executive Officer may exercise delegated authority to staff to: a) approve or refuse development applications; and b) formulate a recommendation of approval or refusal for subdivision and development applications that require referral to the Western Australian Planning Commission for determination.

1. Uses and Conditions

1.1 Uses

Staff may:

1.1.1 Approve all development applications where the proposed use is a 'P' use in the District Planning Scheme No 2.

1.1.2 Approve all development applications where the proposed use is an 'IP' use in the District Planning Scheme No 2.

1.1.3 Refuse all development applications where the proposed use is a 'X' use in the District Planning Scheme No 2.

1.1.4 Approve development applications where the proposed use is an 'AA' use in the District Planning Scheme No 2 where:

- The proposal complies with the relevant scheme provisions and policies as appropriate.
- No objections are received from contacted neighbours within the specified period of notification (should objections be received, the application shall be forwarded to Council for determination).
- The proposed use is one of the following "AA" uses:
  - Additional Accommodation
  - Family Day Care Centre & Child Care Centre
  - Commercial Vehicle Parking
  - Consulting Rooms and Consulting Rooms – Group
  - Display Homes
  - Grouped Dwellings
  - Home Occupation
  - Office
  - Panel Beating (Light Industrial zone only)
  - Professional Office
  - Rural Pursuit
  - Keeping of Animals
  - Spray Painting (Light Industrial zone only)

1.1.5 Approve development applications for the following 'AA' uses without referral to neighbours:

- Caretakers Dwelling
- Convenience Store (in a Shopping zone only)
- Residential Building (in a Private Clubs & Institutions zone only)
- Aged or Dependant Persons Dwelling Units including a density bonus as provided for

under the R Codes.

1.2 Conditions

Staff may impose conditions on development approval which relate to the orderly and proper planning, preservation of the amenity of the locality and other such conditions as deemed appropriate.

1.3 Referral to Council

In considering an application, staff shall take into consideration the impact of the proposal on the general amenity of the area and if any significant doubt exists, the proposal shall be referred to Council for a decision, through the Planning Services Committee.

2. Minor Extensions

Any application for minor extensions to an existing development may be approved by staff, providing the proposal complies with the provisions of Council's District Planning Scheme No 2 and relevant policies.

3. Variation to Setbacks - General

Setback variations to property boundaries for residential dwellings (single and grouped dwellings) and outbuildings may be approved by staff subject to no objections being submitted by the owner(s) of the adjoining affected property/properties within the specified period of notification.

4. Advertising of "AA" Uses - District Planning Scheme No 2

Staff may initiate advertising for an application made pursuant to Clause 5.8 of the Scheme and refer the application and submissions to Council (except where no submissions are received and staff have the delegated power to deal with the application under this policy).

5. Development Applications requiring referral to the Western Australian Planning Commission for determination

When dealing with development applications requiring referral to the Western Australian Planning Commission for determination, staff can refer the application and recommendation to the Commission except where, in accordance with policy, it is required that the application be referred to Council.

6. Subdivision Applications & Clearances

6.1 Staff may refer recommendations for subdivision/amalgamation applications to the Western Australian Planning Commission in accordance with the following:

a) Recommend approval of subdivision applications that are consistent with District Planning Scheme No 2, Council policy, the Residential Planning Codes, an approved Outline Development Plan or Structure Plan, guided development scheme or subdivision guide plan as applicable.

b) Recommend refusal of subdivision applications that are not consistent with District Planning Scheme No 2, Council policy, the Residential Planning Codes, an approved Outline Development Plan or Structure Plan, guided development scheme or subdivision guide plan as applicable.

c) Variation to the minimum lot sizes for residential subdivisions can be supported in accordance with the Western Australian Planning Commission Policy No. 2.2 (Residential Subdivision).

6.2 Recommend against the creation of lots smaller than 4 hectares in the Rural zones, unless specifically approved by Council.

6.3 Subdivision clearances

6.3.1 May be referred to the Western Australian Planning Commission once all relevant conditions of approval have been satisfied.

6.3.2 For the purpose of clearing a condition of subdivision, the existence of an outbuilding on an otherwise vacant new lot will not preclude the release of the subdivision, unless

(i) the outbuilding is located across a new lot boundary, or too close to the new lot boundary in terms of the setback provisions of DPS No 2; or

(ii) the subdivision condition clearly states that no outbuilding shall be allowed to remain on an otherwise vacant lot.

(iii) At such time as a new lot, which contains an outbuilding, is to be further developed, the existence of the outbuilding will not necessarily be sufficient grounds for Council agreeing to setback dispensation for the further development.

(OCM 21/9/92)

6.4 Compassionate grounds alone not be accepted as valid reasons for recommending approval for subdivision as they are not related to the long term cadastral pattern which results.

7. Development Control Unit

7.1 All development applications that require input from more than one other service area shall be referred to the Development Control Unit for consideration and comment.

7.2 All subdivision applications shall be referred to the Development Control Unit for consideration and comment.

8. Notification of Delegated Decisions

8.1 A list of all development applications determined under delegated authority and subdivision applications considered under delegated authority shall be forwarded to Councillors and incorporated into the Planning Services Committee agenda and minutes.

8.2 Every applicant who receives notification of a conditional approval or refusal of a development application that was determined by staff and is aggrieved by that decision, may within 28 days of the date of that decision request that the matter be reconsidered by Council.

9. Appeals

9.1 Staff have delegated authority to respond to appeals to defend the decision of Council or a delegated decision. If the appeal involves mediation and as part of that mediation variation to any standard provision contained in any policy or the Scheme is sought, then the matter shall be forwarded to Council for consideration as to whether to support that variation.

9.2 In instances whereby an appeal was referred to Council, the outcome of that appeal will be reported in the General Business Bulletin

9.3 Councillors will be advised by the General Business Bulletin of any appeal whereby staff responded to that appeal and the appeal was lost.

CROSS REFERENCES (If any):

Management Practice No.		Delegation No.:	

LEGAL REFERENCES

Legislation:	
Local Law:	

Notes:	Previously Policy PS 1.1

POLICY REGISTER

Title:	**Variation of Building Setback – Residential Design Codes**		
Policy No.:	**DEV38**		
Date Adopted:	17 May 2004	Date Last Reviewed:	unknown

Objective:	To outline the standard procedures for variation to the building setbacks required under the Scheme and the Residential Design Codes.

1. All applicants shall be required to provide an accurate site plan showing all existing improvements (including main building, outbuilding, septic tanks, leach drains), vehicular access, physical characteristics, vegetation, house layout (where relevant to the variation), contours (where relevant to the variation) - to support the application.

2. When dealing with an application for dispensation, staff may ask for the proposed siting of the house or outbuilding, the subject of the application to be clearly pegged out on the lot to facilitate inspection.

3. Physical characteristics shall be taken to include the following :
   Extreme slope
   Drainage and creekline
   Tree(s)
   Rock outcrop(s)
   Lot size and shape

   Consideration may also be given where permanent structures exist, the location of which was affected by natural physical characteristics of the lot thus limiting the area available for building.

4. Extensions or alterations to an existing residence which already contravenes the setback provisions of the Residential Design Codes may be approved provided that such extensions or alterations conform to the building line which has been set by that existing setback contravention.

5. Where a lot has boundaries to two or more streets, the setback from the less important street or streets may be reduced in accordance with Table 1 – GENERAL SITE REQUIREMENTS of the Residential Design Codes . This also applies to outbuildings which because of their construction material could affect an adjoining property; such applications to be referred to the neighbour for comment.

6. Pursuant to Part 3.2.1 of the Residential Design Codes staff may permit the front setback to be averaged. Where the subject lot adjoins a "battleaxe" lot access leg, right of way or a pedestrian accessway, the setback from that boundary may be reduced by up to half the width of the access leg, accessway or right of way to a maximum reduction of 2m, in accordance with Part 3.3.1. In such cases the resultant variation in setbacks shall be considered to be in the interests of visual amenity.

8. Where a lot exists in an R5 Density Code having an effective frontage of 21 metres or less and/or an area of 1500 sq.m. or less, Staff may apply the R10 side boundary setback standards because of the undersized nature of the lot as the setback provisions of the R5 Code in such circumstances are considered to be too excessive.

10. Where a carport attached to a dwelling is proposed in Residential or Urban Development zone, and where

    a) metal columns are proposed on the boundary, and

b) the carport is to be maximum 9.0 metres long, and

c) physical characteristics exist,

staff may approve the application without reference to neighbours.

12. In land zoned "Rural", "Rural Agriculture", "Rural Conservation" and "Rural Living" zones where a lot exists which is 4000 sqm. or less in area staff be permitted to agree to boundary setback variations where physical characteristics exist by applying the standards of the most appropriate Residential Design Code nearest to the size of the subject lot.
(OCM 20.7.92)

CROSS REFERENCES (If any):

Management Practice No.		Delegation No.:	

LEGAL REFERENCES

Legislation:	
Local Law:	

Notes:	Previously Policy PS 1.3

POLICY REGISTER

Title:	**Walls On Boundaries – Local Planning Policy**		
Policy No.:	**DEV39**		
Date Adopted:	18 August 2008	Date Last Reviewed:	

Objective:	To define what constitutes "acceptable development" in regard to walls built on, or close to, lot boundaries. This policy aims to protect the amenity of adjoining residents, by ensuring that overshadowing is limited, and that neighbours are consulted on the external finish of the wall.

Scope and Limitations

Applies throughout the Shire of Kalamunda.

This policy does not apply to Dividing Fences between adjoining properties.

Background

The Residential Design Codes ('the Codes') are standards for the control of residential development throughout Western Australia. The Codes are produced by the Western Australian Planning Commission, under section 26 of the *Planning and Development Act 2005*.

For various types of residential development, such as walls on boundaries, the Codes set out **performance criteria**, and examples of **acceptable development** that comply with these criteria. The performance criteria represent the aim or objective, against which a proposed development is to be assessed.

Under clause 5.3.1 of the Codes, local governments are permitted to adopt local planning policies which vary or replace certain provisions of the Codes. In the case of boundary walls, a local planning policy may vary what is defined as acceptable development, to require less or greater standards than those contained in the Codes, or to require consultation with adjoining neighbours.

The standards for walls on boundaries are contained in clause ('design element') 6.3.2 of the Codes. They are subject to provisions concerning overlooking (design element 6.8) and overshadowing (6.9). A copy of the Codes is available for inspection at the Shire Administration Centre, 2 Railway Road, Kalamunda.

This policy shall replace the acceptable development provisions contained in design element 6.3.2 of the Codes. The performance criteria are unaffected.

Definitions

'Up to a boundary'

- The term 'up to a boundary' means either on the boundary, or between the boundary and the setback provided by Table 1, Tables 2a and 2b, Figures 2a – 2e and Figure 3 of the Codes.
- Where the subject site and an affected adjoining site are subject to different density codes (eg zoned R15 and R25), the length and height of the boundary wall on either site is determined by reference to the lower density code.

Performance Criteria for Buildings on Boundary

(as set out in the Residential Design Codes, design element 6.3.2)

Buildings built up to boundaries other than the street boundary where it is desirable to do so in order to:

- make effective use of space; or
- enhance privacy; or
- otherwise enhance the amenity of the development; and
- not have any significant adverse effect on the amenity of the adjoining property; and
- ensure that direct sun to major openings to habitable rooms and outdoor living areas of adjoining properties is not restricted.

Policy

1. Acceptable Development

Acceptable Development for walls built up to a boundary shall be as follows -

- Walls are to be constructed behind the front setback line, as specified in Table 1 of the Codes.
- Where the wall abuts an existing or simultaneously constructed wall, of similar or greater dimension, the wall shall be no higher than 3.0m, with an average height of 2.7m, and up to 9m in length up to one side and/or rear boundary.
- In areas with a density code of R10, R12.5, R15, R17.5 or R20, the wall shall be no higher than 3.0m, with an average height of 2.7m, and up to 9m in length up to one side and/or rear boundary.
- In areas with a density code of R25 or higher, the wall shall be no higher than 3.5m, with an average height of 3.0m for 2/3 the length of the boundary behind the front setback, up to one side and/or rear boundary.
- No wall constructed within 0.9m of a lot boundary may contain any opening, unless that boundary abuts a public street or communal open space, driveway or parking area created as part of the development.

2. Requirement for Planning Approval

A Metropolitan Region Scheme Form 1 'Application to Commence Development' is required to be submitted, together with the applicable planning application fee, in the following circumstances. Such applications are determined by Council, following neighbour consultation.

- Where a Detailed Area Plan (DAP) applies to the land;
- Where both the subject site and the affected adjoining site are created in a plan of subdivision submitted concurrently with the development application; or
- In areas with a density code of R2.5 or R5.

3. Overshadowing

(Design element 6.9.1 of the Codes)

The boundary wall shall be designed to ensure that its shadow, cast at midday on 21 June, onto any other adjoining property does not exceed the following limits –

- on adjoining properties coded R25 and lower – 25% of the site area;
- on adjoining properties coded R30 to R40 inclusive – 35% of the site area.

Note: In this context 'site area' refers to the surface of the adjoining lot, and is measured without regard to any building on it, but taking into account its natural ground levels.

4. Neighbour Consultation

Unless otherwise required in conjunction with an Application to Commence Development (as outlined in Point 2 above) -

- Comment shall only be sought from the adjoining property owner with respect to the surface finish of the wall facing that neighbour, and the finish shall be to the satisfaction of that neighbour.
- In the event of an objection from the neighbour with respect to the surface finish of the wall, and where a compromise can not be reached, application may be made to Council for a determination.
- Should the matter need to be referred to Council for determination, a completed Application for Codes Approval form, together with the applicable fee, is required to be submitted, ensuring both sides of the form are completed.

CROSS REFERENCES (If any):

Management Practice No.		Delegation No.:	

LEGAL REFERENCES

Legislation:	Local Planning Scheme 3 (LPS3), clause 2.2 – "the local government may prepare a Local Planning Policy in respect of any matter related to the planning and development of the Scheme area ... and may amend or add to or rescind the Policy." Residential Design Codes, as amended 29 April 2008
Local Law:	

Notes:	LPS3 text - Local Planning Policies are guidelines used to assist the local government in making decisions under the Scheme.

DELEGATION REGISTER

Title:	**Planning Matters**		
Delegation No.:	**PDA1**		
Delegation from:	Council	Delegated to:	Chief Executive Officer
Date Adopted:	15 June 2009	Date Last Reviewed:	

Legislation:	Local Planning Scheme No 3; Planning & Development Act 2005
Power or Duty of the Local Government which is being delegated:	

Under the relevant provisions of the Shire of Kalamunda's Planning Schemes, the *Planning and Development Act 2005* and the *Local Government Act 1995*, the Chief Executive Officer is delegated to exercise the powers or discharge the duties of the Council in regard to the following –

1. Advertising

To advertise and provide notice of applications for planning approval or consent, and to refer an application and submissions to Council, where required.

2. Determination of Applications

To determine applications for planning approval, planning consent or special approval, including –

a) any conditions to be imposed; and

b) the period of validity of the approval or consent,

in accordance with Council policy.

3. Conditions

To impose conditions on development approval which relate to orderly and proper planning, preservation of the amenity of the locality, and other such conditions as deemed appropriate.

4. Cash In Lieu

To accept and determine cash in lieu payment.

5. Setback Variations

To approve setback variations to property boundaries for all buildings and outbuildings, subject to no valid objections in the opinion of the Director Planning and Development Services being submitted by the owner(s) of the adjoining affected property/properties within the specified period of notification.

6. Keeping of Animals

To approve the keeping of hoofed and/or large animals under clause 5.18 of the Local Planning Scheme No 3, where objections from adjoining owners/occupiers are either not received, or have been resolved, and where the keeping of such animals is permitted by the Scheme.

7. Commercial Vehicle Parking

As a land use class under Local Planning Scheme No 3, the approval of commercial vehicle parking applications is covered by clause 2 of this instrument of delegation.

To approve applications for commercial vehicle parking that entail variation to the standard vehicle movement times, where no objections have been received from affected residents.

To renew applications for commercial vehicle parking, where no legitimate complaints regarding non-compliance with conditions of approval have been received during the previous 12 months. Where a written complaint has been received, the renewal application is to be referred to affected landowners. If no objection is received, the Chief Executive Officer may approve the application. If an objection is received, the application is to be referred to Council for determination.

8. Subdivision Applications and Clearances

To refer recommendations for subdivision/amalgamation applications to the Western Australian Planning Commission, in accordance with the following –

a) Recommend approval of subdivision applications that are consistent with Local Planning Scheme No 3, Council policy, the Residential Design Codes, an approved Outline Development Plan or Structure Plan, guided development scheme or subdivision guide plan as applicable.

b) Recommend refusal of subdivision applications that are not consistent with Local Planning Scheme No 3, Council policy, the Residential Design Codes, an approved Outline Development Plan or Structure Plan, guided development scheme or subdivision guide plan as applicable.

c) Variation to the minimum lot sizes for residential subdivisions can be supported in accordance with the Western Australian Planning Commission Policy DC 2.2 (Residential Subdivision).

9. Appeals (Review)

To respond to appeals to defend the decision of Council or a delegated decision. If the appeal involves mediation, and as part of that mediation variation to any standard provision contained in any policy or the Scheme is sought, then the matter shall be forwarded to Council for consideration as to whether to support that variation.

To determine appropriate conditions to be recommended to be applied to applications the subject of a successful appeal to the State Administrative Tribunal (SAT), and enter into Minute of Consent Orders accordingly.

These delegations may only be exercised subject to compliance with the relevant legislation, and in accordance with Council policy.

RELATED DOCUMENTS:

Council Policy:	DEV1 — Additional Accommodation DEV2 — Amusement Machines and Amusement Centres DEV5 — Caravan Park Proposals - Guidelines for Assessment DEV6 — Cash in Lieu of Car Parking DEV7 — Child Care Centres – Guidelines DEV10 — Delegation of Authority - Determination of Development and Subdivision Applications DEV12 — Design Aesthetics – Guidelines DEV16 — Fuel Storage Applications – Guidelines for Assessment DEV17 — Igloo/Tunnel House Applications – Guidelines for Assessment DEV19 — Notification to Affected Landowners – Community Consultation – Advertising

	DEV20 — Outbuildings – Guidelines for Assessment DEV21 — Outbuildings in Subdivisions DEV22 — Parking of Commercial Vehicles on Private Property DEV23 — Pergolas – Guidelines for Assessment DEV25 — Public Open Space Contributions – Subdivision Applications DEV26 — Radio, Television and Communication Transmission Facilities/Masts DEV27 — Reduced Setbacks to Verandahs, Patios and Carports – Guidelines for Assessment DEV35 — Stormwater Drainage – Subdivision Applications DEV36 — Subdivision in Rural Zones DEV38 — Variation of Building Setback – Residential Design Codes DEV39 — Walls on Boundaries – Local Planning Policy DEV40 — Boundary Retaining Walls on Residential Land – Local Planning Policy DEV41 — Framework for Assessing Requests for Variation of the Number of Car Parking Bays – Local Planning Policy
Administration Policy/Procedure:	n/a

Notes:	**Local Planning Scheme No. 3.** **11.3 Delegation of Functions** 11.3.1 The local government may, in writing and either generally or as otherwise provided by the instrument of delegation, delegate to a committee or the Chief Executive Officer (CEO), within the meaning of those expressions under the *Local Government Act 1995*, the exercise of any of its powers or the discharge of any of its duties under the Scheme, other than this power of delegation. 11.3.2 The CEO may delegate to any employee of the local government the exercise of any of the Chief Executive Officer's powers or the discharge of any of the Chief Executive's duties under clause 11.3.1.

Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.22 Lot 5 (29) Courtney Place, Wattle Grove - Application for Parking of Commercial Vehicles

Previous Items:	146-09
Service Area:	Planning and Development Services
File Reference:	CR-16/029
Applicant:	Peter McHaffie
Owner:	Peter McHaffie

PURPOSE

1. For Council to reconsider an application for retrospective planning approval for the parking of two (2) commercial vehicles and trailers at Lot 5 (29) Courtney Place, Wattle Grove, at the invitation of the State Administrative Tribunal (SAT). Refer ***(Attachment 1)*** for Locality Plan.

BACKGROUND

2. The subject property has a lot area of 1.2 hectares and is zoned Special Rural under Local Planning Scheme No.3. Refer ***(Attachment 2)*** for Site Plan.

3. In August 2009, it was noted that two commercial vehicles and two trailers were being parked at the subject property, without planning approval having been obtained. A planning application was requested to be submitted for commercial vehicle parking and was received.

4. Two commercial vehicles and trailers (18m in length) are currently parked at the property, and operate between 7am to 7pm Weekdays and Saturdays, 9am to 6pm Sundays and Public Holidays.

5. Concerns were raised during the assessment phase of the planning application that the commercial vehicles were unable to enter and leave the property in one movement, due to the width of the adjoining road.

6. In November 2009 the application for retrospective planning approval for the parking of two commercial vehicles and trailers was refused by Council (Resolution 146-09) for the following reasons:

   "a) The proposal fails to comply with the Council policy on 'Parking of Commercial Vehicles on Private Property' with respect of the length of the vehicles and movement times."

7. In accordance with Council's resolution, a notice of refusal was forwarded to the applicant. An application to review Council's decision was lodged with the SAT and an on-site Mediation Hearing was held on 9 March 2010. At that hearing, the applicant was advised by the SAT member that a revised application could be presented to Council for reconsideration, subject to the application responding to Council's reasons for refusal.

8. To address matters relating to the length of the vehicle and movement times, the applicant has advised the following:

    - The commercial vehicles operated between 7am to 7pm Weekdays and Saturdays, 9am to 6pm Sundays and Public Holidays. So that the vehicle movements comply with Policy provisions, they are now to operate between 7am and 7pm Monday to Saturday and 9am to 5pm on Sundays and public holidays.

    - When initially assessed, the commercial vehicles and trailers were measured independently and confirmed as having a combined length of 19.7m. However, when attached both commercial vehicles and trailer will have a combined length of 18m.

9. In addition to the above, the applicant has also verbally advised that he intends to construct an outbuilding to house the vehicles and trailers on the property, details of which are not currently available. This does not form part of the subject application, and if an outbuilding application is received, it will be assessed on its own merits in accordance with the Local Planning Scheme No. 3 (LPS 3) and Policy provisions.

10. Subsequent to the site hearing the SAT ordered that:

    1. *"The applicant is to submit further and supporting information to the respondent by 31 March 2010.*

    2. *Pursuant to s 31 of the State Administrative Tribunal Act 2004 (WA), the Tribunal invites the respondent to reconsider the application, as supported by the further information lodged as order 1, on or before 19 April 2010.*

    3. *These proceedings are adjourned to mediation to resume at 10am, 27 April 2010 at State Administrative Tribunal, 12 St Georges Terrace, Perth.*

    4. *The applicant is at liberty and given leave to withdraw the application and apply to vacate these proceedings scheduled for 27 April 2010."*

INVITATION TO COUNCIL TO RECONSIDER ITS DECISION

11. The SAT has invited Council to reconsider its decision to refuse the application. The following options are available to Council:

    a. Not accept the SAT's invitation to reconsider the matter;

    b. Accept the SAT's invitation and affirm the decision to refuse the application; or

    c. Accept the SAT's invitation and set aside Council's previous refusal decision and substitute a new decision. The new decision could be the granting of planning approval subject to conditions relating to the modifications proposed by the applicant. Council could also impose other conditions of approval should it consider that it will bring the development into compliance with LPS 3 and/or Policy provisions.

STATUTORY AND LEGAL IMPLICATIONS

12. Under the provisions of LPS 3, the parking of a commercial vehicle on a private property is classified as a 'D' use and is not permitted, unless Council has granted planning approval.

13. Should Council decide not to accept the SAT's invitation or accept the invitation and affirm the decision to refuse the application, a further Mediation Hearing will be held at the SAT on 27 April 2010.

14. In considering an application for planning approval, clause 10.2 of LPS 3 requires Council to have due regard to the following matters:

    "The compatibility of a use or development within its setting.

    (n) The preservation of the amenity of the locality.

    (o) The relationship of the proposal to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the proposal.

    (p) Whether the proposed means of access to and egress from the site are adequate and whether adequate provision has been made for the loading, unloading, manoeuvring and parking of vehicles."

POLICY IMPLICATIONS

15. In assessing the application, Council is to give consideration to the 'Parking of Commercial Vehicles' policy. When previously considered by Council, the application was not consistent with the Council's policy with regard to the following provisions:

    e. i) "The commercial vehicle to be parked on the lot shall not exceed (articulated type) 17.5m in length."

viii) Standard vehicle movement and start up times of between 7.00am and 7.00pm Monday to Saturday and 9.00am to 5.00pm on Sundays and public holidays shall apply, unless otherwise approved by Council."

FINANCIAL IMPLICATIONS

16. Nil

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

17. **Strategic Planning Implications**

- The Draft Local Planning Strategy is considering options for locating multiple parking of commercial vehicles in appropriately located and zoned land.

- The Shire of Kalamunda is presently considering its planning options for the Special Rural area south west of Welshpool Road. The area is currently the subject of groundwater monitoring which is not due to be completed until early 2011. Once the monitoring has been finalised, the Shire will give further consideration to the future planning of the area.

18. **Sustainability Implications**

Social implications

- It is acknowledged that proposals such as this represent the primary income of their owners. As such, failure to secure the necessary planning approval can have a significant effect on their business.

Economic Implications

- Potential loss of income for the owner of the commercial vehicle.

Environmental Implications

- Nil

OFFICER COMMENT

19. With regard to the impact the commercial vehicles have on the amenity of surrounding Special Rural zoned properties, the following is noted:

- No loads are to be brought onto the subject property, which could otherwise have a negative impact on the visual amenity of the local area.

- The vehicle movements are proposed to be between 7.00am and 7.00pm Monday to Saturday and 9.00am to 5.00pm on public holidays in accordance with policy requirements. The Policy requires arrival times no later than 5.00pm on Sundays, however the applicant has requested that consideration be given to the occasional arrival time no later than 6.00pm, due to unforseen circumstances such as weather and road conditions (due to the long haul nature of the activity). There is no objection to this from a planning perspective as it would not be considered to unduly affect the amenity of the locality.

- The subject property is situated towards the end of a cul-de-sac, therefore vehicle and pedestrian volumes are low and the vehicles concerned will not have a significant impact on the flow of vehicular and pedestrian movement.

- When parked on the subject property, the commercial vehicles and trailers will be partially screened from public view due to the existence of mature landscaping which is approximately 2-6m tall and will be parked behind the front building line of the dwelling.

- When parked on the subject property, the commercial vehicles will be approximately 20m from the nearest dwelling on 33 Courtney Place.

- The driveway and crossover are proposed to be sealed for aesthetic reasons and to ensure that the generation of dust is minimised.

- Concerns have been raised regarding the ability of the drivers to manoeuvre the vehicles and trailers around the local area, due to the combined vehicles and trailers lengths and the width of the roads. It should be noted that no footpaths and kerbing exist within the locality, no damage to median strips and private property has been observed, and vehicle and pedestrian volumes are considered low in the area.

20. When initially assessed, the commercial vehicles and trailers were measured independently and confirmed as having a combined length of 19.7m. However, when attached, both commercial vehicles and trailer will have a combined length of 18m (500mm in excess of the maximum length permitted on Special Rural zoned properties).

21. The application does not comply with the Council's Policy 'Parking of Commercial Vehicles' in respect to the overall length of the vehicles, however, for the above reasons, they will not have an unacceptable impact on the amenity of the local area.

OFFICER RECOMMENDATION

1. That Council, pursuant to Section 31 of the State Administrative Tribunal Act 2005, sets aside its decision of 16 November 2009 (Resolution 146-09) to refuse the application for planning approval.

2. That Council advises the State Administrative Tribunal that the commercial vehicles parking at Lot 5 (29) Courtney Place, Wattle Grove (as described in the application dated 7 September 2009) do not comply with the provisions of Local Planning Policy DEV22 – Parking of Commercial Vehicles on Private Property in relation to vehicle lengths, but the degree of discretion required to allow the approval is considered to be marginal.

3. That Council advises the State Administrative Tribunal that Council approves the application for the parking of two commercial vehicles (registrations MTA 550 and MTA 908) and two trailers (registrations 1 TIV 570 and 1 TIV 572) at Lot 5 (29) Courtney Place, Wattle Grove, subject to the following conditions:

    a. *The vehicles and trailers must, at all times, be parked in the approved location as shown on plan annotated as diagram 65526.*

    b. *A sealed driveway and crossover is to be completed within 60 days from the date of this approval, and thereafter maintained to the satisfaction of the Shire's Manager Engineering.*

    c. *The commercial vehicles are only to be operated between the hours of 7.00am and 7.00pm Monday to Saturday and 9.00am to 5.00pm public holidays and 9.00am to 6.00pm Sundays.*

    d. *Approval of the parking activity does not include approval for the loading or unloading of the commercial vehicles and/or trailers, or the storage of goods in transit.*

    e. *Only maintenance of a minor nature, such as servicing or wheel changing, is to be carried out on the subject property. No panel beating, spray painting or the removal of major body or engine parts is permitted.*

    f. *Washing of the commercial vehicles and trailers on the subject lot is to be limited to the use of water and mild detergent, but not involve the use of any solvents, degreasing substances, steam cleaning and any other processes which may cause pollution or degradation of the environment.*

    g. *The approval is personal to the applicant and shall not be transferred or assigned to any other person, property or commercial vehicle (including trailers).*


WATTLE GROVE
Courtney Pl
Lot 5
Lot 6
Lot 9
Lot 10
Lot 11
Lot 12
Lot 13
Lot 21
Lot 22
Lot 23
Lot 24
Lot 17
Lot 200
Lot 302
Scale = 1:1329
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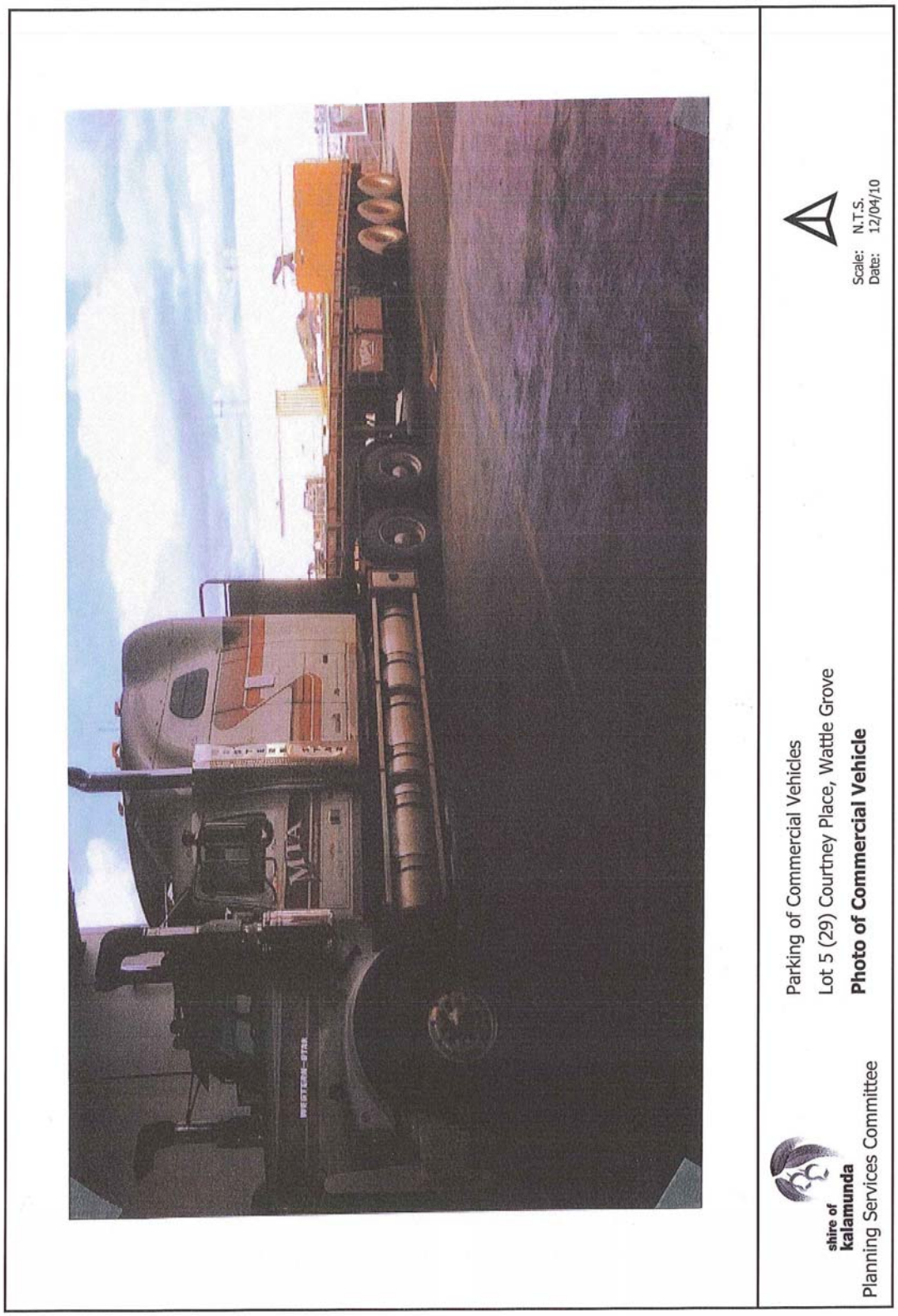
Scale: N.T.S.
Date: 12/04/10
shire of kalamunda
Planning Services Committee
Parking of Commercial Vehicles
Lot 5 (29) Courtney Place, Wattle Grove
Locality Plan



shire of kalamunda
Planning Services Committee

Parking of Commercial Vehicles
Lot 5 (29) Courtney Place, Wattle Grove
Photo of Commercial Vehicle

Scale: N.T.S.
Date: 12/04/10

shire of kalamunda
Planning Services Committee

Parking of Commercial Vehicles
Lot 5 (29) Courtney Place, Wattle Grove
Photo of Commercial Vehicle

Scale: N.T.S.
Date: 12/04/10

Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.23 Proposed Closure of Right of Way - Stanhope Road, Kalamunda

Previous Items:	GS 12/2005 and GS 35/2005
Service Area:	Planning Development Services
File Reference:	ST-07/GEN
Applicant:	K Bradley
Owner:	Crown

PURPOSE

1. For Council to consider the proposed closure of the Right of Way (ROW) abutting Lot 153 (107) and 154 (109) Canning Road, Lot 51 (11) Lyndhurst Road and Lot 19 (3) Stanhope Road which currently provides secondary access to the lots.

BACKGROUND

2. In December 2004 Council resolved to withdraw a request to close the ROW off Stanhope Road - refer to ***(Attachment 1.)*** for Locality Plan -, and that the proposal be referred back to Shire Officers for reassessment and then reconsidered at a future meeting (Resolution GS 12/2005).

3. In April 2005, Council resolved to not support a request to close the ROW off Stanhope Road on the grounds of it having the potential to provide secondary access to the abutting lots, and that a gate crossing the ROW be removed within three months of the decision (Resolution GS 35/2005).

4. In August 2008, a request was received by the Shire to close the ROW off Stanhope Road so that the rear portion could be amalgamated with Lot 153 Canning Road, and access still be maintained off the ROW to Lot 154 Canning Road and Lot 19 Stanhope Road.

Statutory and Legal Implications

ROW Closure requests are dealt with in accordance with the Land Administration Act 1997, supplemented by the Land Administration Regulations 1998.

PUBLIC CONSULTATION/COMMUNICATION

5. The proposed closure was advertised to the adjoining landowners and referred to the service authorities, during which time one objection and two non objections were received. Refer ***(Attachments 2 and 3)*** for the Submission Table and Consultation Plan.

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

6. **Strategic Planning Implications**
   - Closing the entire ROW would prevent access to Lot 51 (11) Lyndhurst Road and Lot 19 (3) Stanhope Road via the ROW.
   - The ROW is Crown land, and all abutting lots have legal access rights to it.

7. **Sustainability Implications**

   Social implications
   - Closing portion of the ROW would not remove the potential for anti-social behaviour to reoccur in the ROW.

   Economic Implications
   - Nil

   Environmental Implications
   - Nil

OFFICER COMMENT

8. The closure of the ROW has been requested by the owner of Lot 153 Canning Road. The owner has requested the closure for security reasons, as the ROW provides a gap between the boundary fence between Lot 153 and 154 Canning Road and the side of Lot 19 Stanhope Road. The owner has offered to purchase either the whole or a portion of the ROW if the closure proceeds.

9. If the ROW remains open, it will maintain the ability for it to be constructed in future to service current or future land uses. However, this will not address the current security issues.

10. If the ROW is not fenced on the common boundary of Lots 153 and 154 Canning Road, it will remain unmade which would detract from the rear yards of the existing and future residences.

11. It is noted that the Department of Planning does not generally support partial ROW closures, however if the section of the ROW directly abutting Lot 153 Canning Road is closed, secondary access would still be possible to Lot 19 Stanhope Road, should the south-east corner of Lot 153 be truncated. Refer (***Attachment 4***) plan of partial ROW closure.

12. Council can either not support the closure so that access to the abutting lots is maintained, or support the proposal and forward its recommendation to the Department of Planning which will ultimately determine the request in accordance with the Land Administration Act 1997.

MEETING COMMENT

13.

OFFICER RECOMMENDATION PS-23/2010

1. That the owners of Lot 153 (107) Canning Road have a detailed plan prepared prior to the Shire forwarding its recommendation to the Department of Planning, which demonstrates that secondary access to Lot 154 (109) Canning Road and Lot 19 (3)

Stanhope Road will still be maintained when the portion of Right of Way abutting their lot is closed.

2. Subject to the plan being to the satisfaction of the Shire's Director of Engineering Services, the request for closing the section of the Right of Way abutting Lot 153 (107) Canning Road be supported and the Shire's recommendation be forwarded to the Department of Planning in accordance with the Land Administration Act 1997.


Lane Rd
Stanhope Rd
Canning Rd
Lyndhurst Rd
Phillip Gr
Sampson Ct
Lot 6
Lot 11
Lot 12
Lot 10
Lot 9
Lot 3
Lot 57
Lot 50
Lot 153
Lot 20
Lot 19
Lot 134
Lot 16
Lot 17
Lot 107
Lot 33
Lot 2
Lot 1
Lot 89
Lot 88
Lot 87
Lot 39
Lot 38
Lot 37
Lot 200
Lot 207
Lot 40
Lot 4
Lot 14
Lot 24
Lot 25
Lot 116
Lot 115
Lot 15
Lot 13
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Scale = 1:1087
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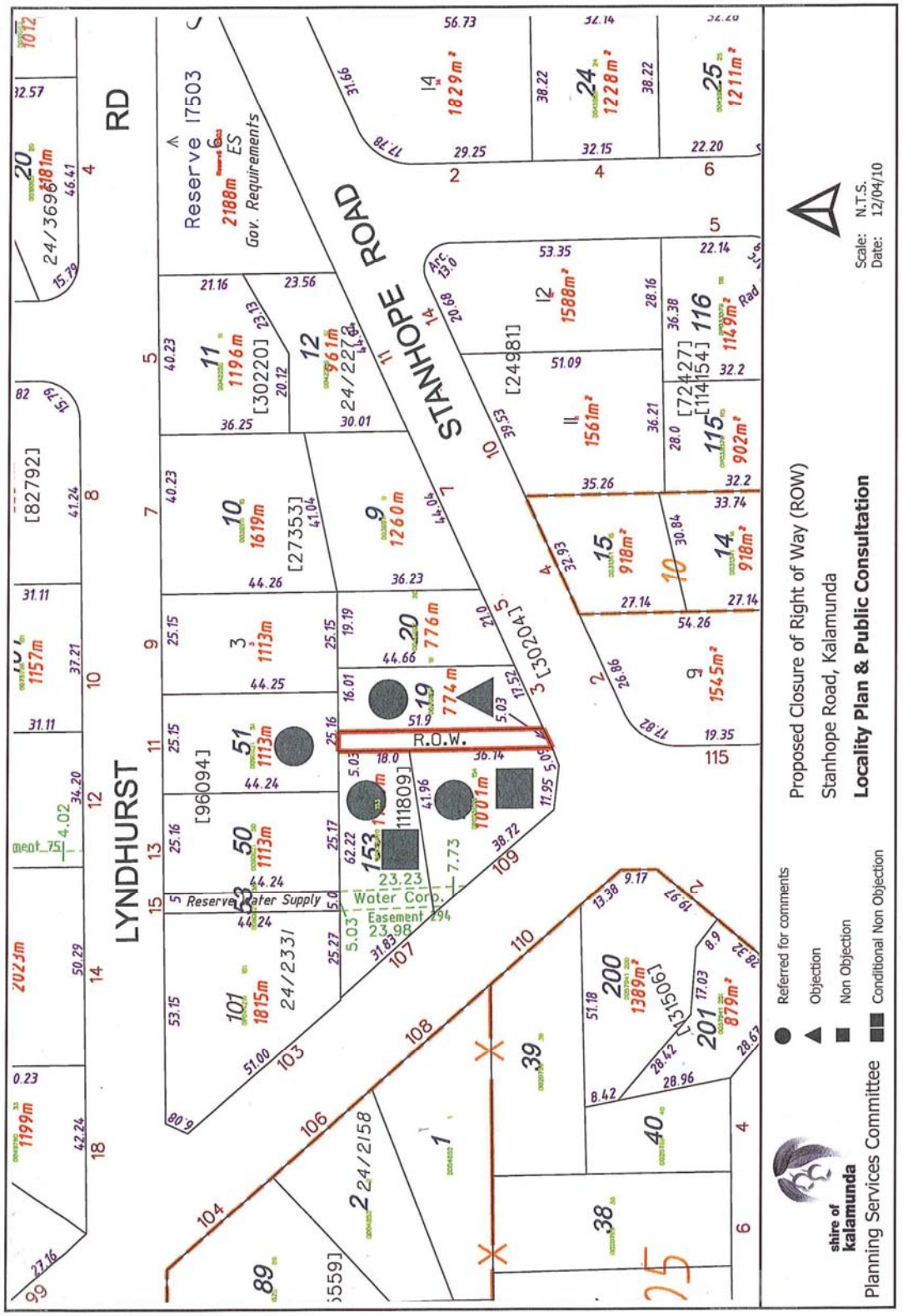
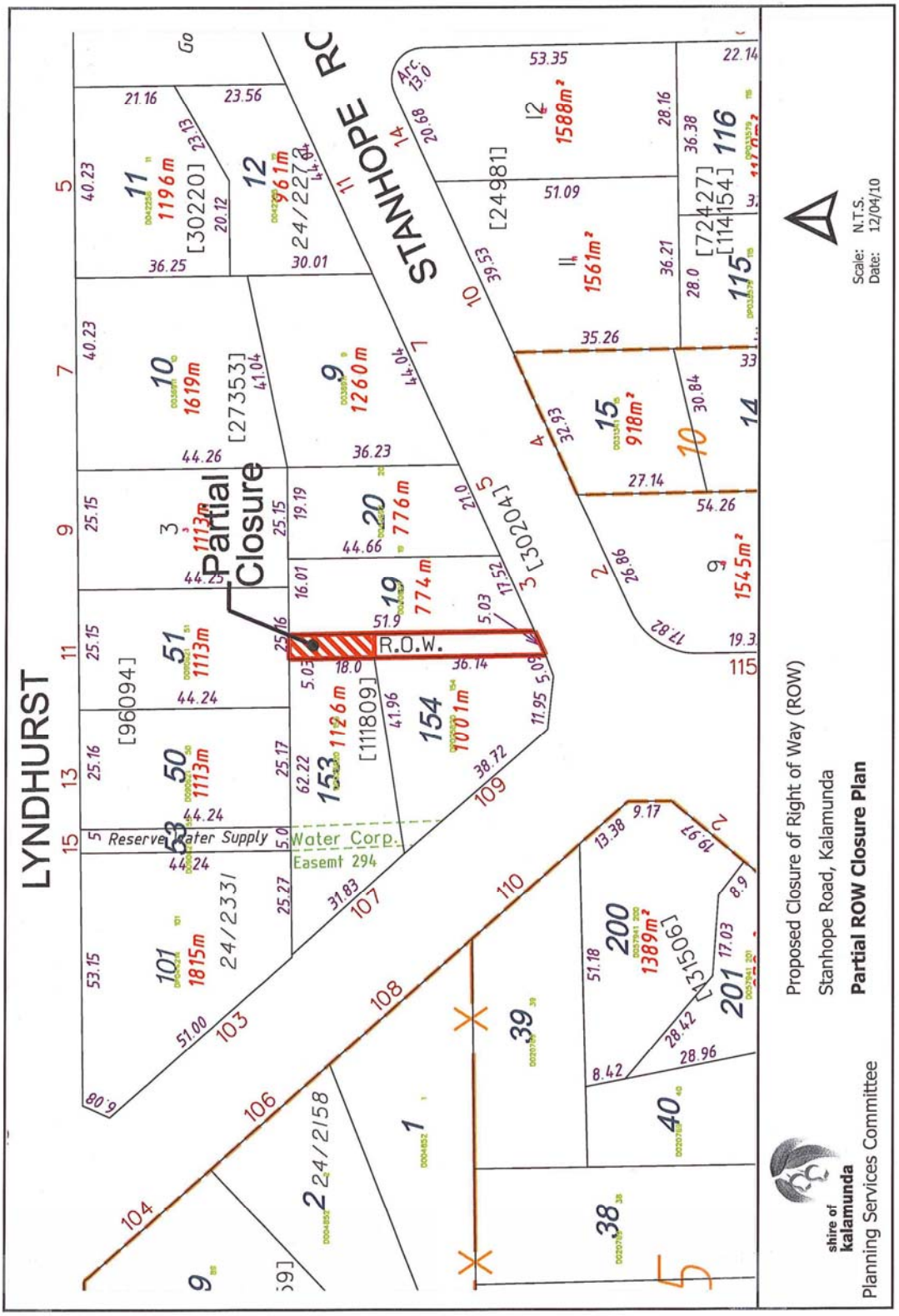
40
Proposed Closure of Right of Way (ROW)
Stanhope Road, Kalamunda
Locality Plan
Scale: N.T.S.
Date: 12/04/10
shire of kalamunda
Planning Services Committee

Proposed Closure of Right of Way - Stanhope Road, Kalamunda

	Submission	Details	Staff Comments
1.	M Longo 3 Stanhope Road KALAMUNDA WA 6076	Objection 1. Closure of the Right of Way would prevent access to the rear of our property. The Right of Way was created to allow for access to all the abutting lots.	Noted.
2.	N Panich 109 Canning Road KALAMUNDA WA 6076	No objection	Noted.
3.	K Bradley 107 Canning Road KALAMUNDA WA 6076	No objection	Noted.
4.	Telstra Locked Bag 2522 PERTH WA 6001	No objection	Noted.
5.	Western Power Locked Bag 2520 PERTH WA 6001	No objection	Noted.

Copies of submissions may be made available to Councillors.


LYNDHURST RD
STANHOPE ROAD
Reserve 17503
Gov. Requirements
R.O.W.
Water Corp. Easement
Reserve Water Supply
Proposed Closure of Right of Way (ROW)
Stanhope Road, Kalamunda
Locality Plan & Public Consultation
Scale: N.T.S.
Date: 12/04/10
Referred for comments
Objection
Non Objection
Conditional Non Objection
shire of kalamunda
Planning Services Committee


LYNDHURST
STANHOPE
Partial Closure
R.O.W.
Reserve Water Supply
Water Corp. Easemt 294
Proposed Closure of Right of Way (ROW)
Stanhope Road, Kalamunda
Partial ROW Closure Plan
Planning Services Committee
shire of kalamunda
Scale: N.T.S.
Date: 12/04/10

Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.24 Traffic Study Outcome- Kalamunda Road between Roe Highway and Abernethy Road, High Wycombe

Previous Items:	GS 86/2009
Service Area:	Engineering Services
File Reference:	
Applicant:	N/A
Owner:	N/A

PURPOSE

1. To consider the Kalamunda Road Traffic Study, between Roe Highway and Abernethy Road, High Wycombe.

BACKGROUND

2. Kalamunda Road is designated as an Important Regional Road (commonly known as a 'Blue Road') under the Metropolitan Regional Scheme.

3. In 2001 the Department of Planning and Infrastructure completed a review of the Kalamunda Road reservation. After an extensive consultation process, Council favoured a high standard, two lane road, between Roe Highway and Wittenoom Road, over a four lane dual carriageway.

4. Accordingly, a road reservation, ranging between 25.5m and 30m, was placed for the section between Roe Highway and Wittenoom Road and 32m for the section between Wittenoom Road and Abernethy Road.

5. In 2004 a roundabout was constructed at the intersection of Newburn Road with part funding under the State Black Spot Programme. In late 2007 public art work, was installed in the roundabout as part of the Village Improvement Programme.

6. In November/December 2008 the developers of the High Wycombe Centre carried out road improvements in front of the Shopping Centre.

7. In response to the traffic concerns in Kalamunda Road, in front of the Shopping Centre, a road safety audit was commissioned.

8. At the August 2009 round of meetings, Council considered the outcome of the Road Safety Audit and resolved as follows:

    1. That Road Safety Audit report be noted and referred to the Shopping Centre Owner to carry out necessary actions on their property.

2. That no further road works be undertaken by the Shire, in the section of Kalamunda Road, in front of the Shopping Centre in High Wycombe.

3. That Council request the CEO investigate and cost options for traffic flow and access on Kalamunda Road with particular reference to Kalamunda Road between Newburn Road and Wittenoom Road as Stage 1.

9. Accordingly, Transport and Traffic consultants, Cardno Eppell Olsen (Cardno) were engaged to conduct a traffic study in Kalamunda Road between Roe Highway and Abernethy Road, High Wycombe.

10. The consultants' brief required particular focus on the section of Kalamunda Road fronting the High Wycombe Shopping Centre.

DETAILS

11. Cardno has completed the traffic study, which involved collection and analysis of traffic data, historical crash data, the existing road geometry, traffic flows to and from the High Wycombe Shopping Centre, stakeholder consultations and traffic modelling. Cardno's report appears at ***(Attachment 1.)***

12. In respect to the improvements of traffic flow in front of the shopping centre, Cardno developed and investigated the following 7 options:

Option 1: Reconfigure Central Driveway
Option 2: Reconfigure Central Driveway and Remove Right-Turn In
Option 3: Relocate Central Driveway and Upgrade Roundabout
Option 4: Signalise Central Driveway
Option 5: Install Central Median with Roundabout at Foxton Boulevard
Option 6: Upgrade Kalamunda Road to Four Lanes
Option 7: Signalise Kalamunda Road/Newburn Road Intersection

13. Traffic simulations were generated with the use of sophisticated computer software, PARAMICS, to depict traffic flows for all seven options. Options 3, 6 and 7 showed improved traffic flows.

14. Option 3 is the Consultant's preferred option as it is relatively low in cost, maintains the amenity of the locality and improves traffic flow in front of the shopping centre.

STATUTORY AND LEGAL IMPLICATIONS

15. Compulsory land acquisitions, if required, and associated compensation will be subject to the provisions under the Land Administration Act.

POLICY IMPLICATIONS

16. Nil.

PUBLIC CONSULTATION/COMMUNICATION

17. As part of the process, a manned stand was created at the Shopping Centre to allow residents to provide input, comments and feedback about the existing situation in the area. Written comments and feedback were also solicited from the public at the same time and members of the public were invited to complete a feedback form and return it to Council.

FINANCIAL IMPLICATIONS

18. The cost to upgrade Kalamunda Road will depend upon the preferred option and scope of works, to be determined at a future date.

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

19. Outcome 2.2 – Development of urban design to meet community aspirations of history, heritage and lifestyle values.

    Outcome 2.3 – Long term viability of infrastructure and facilities.

OFFICER COMMENT

20. It would be prudent to carry out preliminary estimates for all the three options before making a decision on the preferred option. The cost of carrying out these estimates will be in the order of $29,400 ex GST, which could be accommodated within the current year's allocation.

21. Urban Design Consultants have been engaged to prepare plans for the section of Kalamunda Road between Abernethy Road and Roe Highway. The future road design of Kalamunda Road should take into account the outcome of the 'Kalamunda Road High Wycombe Streetscape Improvement Plan' and included in any future cost estimates.

22. It is anticipated that any of the three options will largely fit within the existing road reservation, between Kenneth Road and Wittenoom Road. Additional widening will be required in front of the old High Wycombe Shopping Centre (which house a hardware store, pizza shop and a Muzz Buzz outlet) beyond the existing reservation width of 25.5m to obtain a minimum 28m wide road reserve.

23. The existing road reservation is approximately 24.2m wide. The Shire will need to acquire a strip of land on the northern side of the Kalamunda Road varying between 1.3m and 10m, to achieve the required road reservation for widening the road, as indicated in the Metropolitan Regional Scheme.

MEETING COMMENT

24.

OFFICER RECOMMENDATION PS-24/2010

That Council:

1. Notes the attached report and recommendations.

2. Request CEO:

    i. Seek further information in relation to the urban design considerations for options 3, 6, and 7 with particular regard to the potential treatment of space for pedestrians, cyclists , landscaping and signage.
    ii. Obtain cost estimates for each of the three road treatment options plus the associated urban design treatments.

3. The cost estimates in 2. ii. above be pre-design desk top estimates and reported to Council.

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High Wycombe, Kalamunda Road Corridor Study

Prepared for Kalamunda Shire Council

January 2010

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B Traffic Count Data: Tube Counts
C Historic Crash Data: 2004 - 2008
D Community Consultation Feedback
E Concept Drawings: Upgrading Options
F Paramics Model Specification Note
G Paramics Base Model Calibration

Document Control High Wycombe, Kalamunda Road Corridor Study					
Version	**Date**	**Author**		**Reviewer**	
		Name	**Initials**	**Name**	**Initials**
Draft	29 January 2010	Kirsty Bilton	KB	Shane Healey	

EXECUTIVE SUMMARY

Cardno Eppell Olsen has been commissioned by Kalamunda Shire Council to undertake a corridor study of Kalamunda Road between Roe Highway and Abernethy Road in High Wycombe. This study has been stimulated by concerns regarding the capacity and safety of this road corridor as a result of increasing traffic demands and new development in the area.

This study has been divided into two sections being:

1) strategic assessment of capacity, safety and through-traffic movements along the Kalamunda Road corridor between the Roe Highway and Abernethy Road. This element of the study considers the current and future time horizons to determine infrastructure requirements and mitigating measures;
2) detailed assessment of the operation of Kalamunda Road in the vicinity of the High Wycombe shopping centre between Foxton Boulevard and Kenneth Road. In addition to modelling the existing road network situation, a number of alternate layout options have been developed and evaluated to determine their operational performance and impacts.

The objectives of this traffic study were to:

- model the Kalamunda Road corridor in the vicinity of the High Wycombe Shopping Centre to assess the existing traffic operations;
- evaluate a number of different configuration options to determine the impacts of potential upgrading in this area;
- consider the provision and configuration of pedestrian crossing facilities in the vicinity of the shopping centre;
- determine the current daily traffic volumes on Kalamunda Road and the composition of heavy vehicles. Use this information to estimate future traffic volumes and required infrastructure along the corridor;
- consider the role of Kalamunda Road from a strategic perspective based upon the future planning for the area to the north of the study area;
- undertake community consultation to understand the concerns of local residents.

To understand the existing traffic demand situation on Kalamunda Road within the study area, weekday peak hour intersection turning movement counts and 24-hour tube count data was obtained. In addition, the Main Roads Western Australia (MRWA) Regional Operations Model (ROM) for 2011 and 2021 was reviewed to understand the forecast traffic volumes in the area.

Historic crash data for the period 2004 to 2008 was reviewed and analysed to understand the crash history for Kalamunda Road. The majority of reported crashes on Kalamunda Road between Abernethy Road and the Roe Highway (excluding those intersections) were collisions between vehicles travelling in the same direction, i.e. rear-end events. At the intersection of Kalamunda Road and Newburn Road, the number of collisions has significantly reduced following the installation of a roundabout.

Community consultation was undertaken to allow the High Wycombe community to provide input into the current and future arrangements along Kalamunda Road. The consultation took place at the High Wycombe Shopping Centre on Wednesday 25 November 2009. An information stand was manned by Cardno and Council staff at the shopping centre and written comments were solicited from the public. A total of 86 written responses were received from the community relating to Kalamunda Road. The comments could generally be categorised into one of the following themes:

- issues with the shopping centre car parking and/or access;
- the closure of the Ashford Road access to the shopping centre;
- congestion problems on Kalamunda Road;
- problems entering and exiting minor streets and driveways along Kalamunda Road;
- high numbers of heavy vehicles and through-traffic on Kalamunda Road;
- speeds on Kalamunda Road being too high;
- pedestrian issues associated with poor crossing facilities and footpaths;
- requests to widen Kalamunda Road to four-lanes or to a dual carriageway.

For the purposes of evaluating the future capacity requirements of Kalamunda Road, the surveyed 2009 traffic demands have been used instead of the 2011 MRWA forecast volumes given they are based upon actual recorded data. The future traffic volumes along Kalamunda Road are not expected to vary significantly from the current daily volumes.

Based upon typical capacities for two-lane undivided roadways in urban areas, it is expected that Kalamunda Road will continue to operate in a similar manner to the current situation at the 2021 design horizon. At present, Kalamunda Road is operating near capacity, particularly during the peak periods. It is likely that the capacity of Kalamunda Road will become more constrained in coming years, particularly during the peak periods shoulders, i.e. peak hour spreading.

A number of mitigation options have been developed to provide the Shire with possible alternatives to address the existing and future capacity and amenity impacts on the Kalamunda Road corridor. There are a number of options available to Council that would address (partially or fully) the capacity and/or amenity issues on Kalamunda Road. It will be difficult to implement strategies that can improve both of these areas given their interdependence. Council will therefore need to determine what strategy it wishes to adopt for Kalamunda Road and proceed accordingly based upon a review of the benefits and costs of each scheme.

If Council wishes to improve the capacity and through-carrying function of Kalamunda Road, mitigations options would include:

- develop and implement access management strategies;
- widen Kalamunda Road to provide four lanes;
- install roundabouts at major Kalamunda Road intersections;
- provide auxiliary turn lanes at intersections and major driveways;
- ban right-turn movements at some intersections.

If improving the amenity of Kalamunda Road is a priority for Council, then some potential options include:

- improve pedestrian facilities;
- reduce through-vehicle movements;
- install roundabouts at major Kalamunda Road intersections;
- provide U-turn facilities on Abernethy Road and Stirling Crescent.

Micro-simulation of Kalamunda Road in the vicinity of the High Wycombe shopping centre has been undertaken using the PARAMICS software package. The 2009 base model has been developed based on aerial imagery of the study area along Kalamunda Road (between Foxton Boulevard and Kenneth Road) which shows the existing geometry of this area. Model volumes have been derived from the intersection turning movement counts undertaken at each intersection in the model network.

Two parameters were used to evaluate how well the base model (i.e. existing road network) operated compared to the existing operation. They were vehicle hours travelled (VHT) and average trip time. The parameter outputs for the base model for 2009 and 2021 years are summarised in Table 1.

Table 1 ***Base Model Outputs***

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
2009 AM Peak	31.41	1:13	1:03
2009 PM Peak	39.17	1:06	1:14
2021 AM Peak	60.65	2:51	1:03
2021 PM Peak	125.76	1:06	1:32

These parameters have been used when evaluating each of the options to determine which options resulted in improvements to Kalamunda Road.

Seven different options were developed and tested for the 2009 year to evaluate their possible impacts. The assessed options were:

- Option 1: Reconfigure Central Driveway;
- Option 2: Reconfigure Central Driveway and Remove Right-Turn In;
- Option 3: Relocate Central Driveway and Upgrade Roundabout;
- Option 4: Signalise Central Driveway;
- Option 5: Install Central Median with Roundabout at Foxton Boulevard;
- Option 6: Upgrade Kalamunda Road to Four Lanes;
- Option 7: Signalise Kalamunda Road/Newburn Road Intersection.

Following the analysis and comparison of these options, three were selected for further assessment at the 2021 design year. The mitigation options which showed significant increases in VHT or travel time were considered likely to worsen in the future and were therefore not assessed (i.e. Options 1, 2, 4 and 5). Options 3, 6 and 7 showed improvements over the base model in the 2009 year and therefore were selected for assessment at the 2021 design horizon.

Each of the options assessed for the 2021 design year has associated advantages and disadvantages. A summary of the key considerations for each of the options is as follows:

- <u>Option 3: Relocate Central Driveway and Upgrade Roundabout:</u>
  - improves the operation of Kalamunda Road;
  - may require some localised land resumptions;
  - relative low cost compared to other options;
  - no pedestrian provision.
- <u>Option 6: Upgrade Kalamunda Road to Four Lanes:</u>
  - improves operation of Kalamunda Road but at the cost of amenity along the corridor, i.e. higher induced volumes, speeds, and heavy vehicle demands;
  - high construction cost and significant land resumptions;

  - inconsistent with Cardno's interpretation of the local road hierarchy;
  - no dedicated pedestrian provision and upgrading would result in increased difficulty for pedestrians, particularly at Newburn Road intersection.
- Option 7: Signalise Kalamunda Road/Newburn Road Intersection:
  - improves the operation of Kalamunda Road;
  - may require some localised land resumptions;
  - relatively moderate costs compared to other scenarios;
  - pedestrian crossing facilities would be provided on all intersection legs.

It is recommended that Council undertake further detailed engineering design of the options assessed for 2021 prior to proceeding with any particular option. The suitability of the selected option should only be considered in conjunction with the desired outcome for the corridor and the cost to Council (social or actual construction costs). For example, it may not be appropriate to select Option 6 (upgrading to four lanes) if Council wishes to improve the amenity of Kalamunda Road and limit through-traffic movements.

In saying this, Options 3 and 7 will provide localised capacity improvements in the vicinity of the shopping centre. These works would improve local and corridor traffic operations and would address the community concerns raised in relation to capacity constraints and the shopping centre access. The duplication of Kalamunda Road would also serve to improve corridor operations, however, the modelling indicates that the construction of the link would not compare favourably from a cost/benefit perspective.

1.0 INTRODUCTION

Cardno Eppell Olsen has been commissioned by Kalamunda Shire Council to undertake a corridor study of Kalamunda Road between the Roe Highway and Abernethy Road in High Wycombe. This study has been stimulated by concerns regarding the capacity and safety of this road corridor as a result of increasing traffic and new development in the area.

The High Wycombe shopping centre was recently constructed and has resulted in changes in the access arrangements, traffic volumes and operation of Kalamunda Road, particularly between Wittenoom Road and Newburn Road.

Key concerns raised by Council include:

- the availability and design of pedestrian crossing facilities across Kalamunda Road;
- issues associated with the provision of right-turn movements from the shopping centre (currently exiting traffic is limited to left turns);
- potential impacts of high U-turning demand at the Kalamunda Road/Newburn Road roundabout;
- impacts upon residential amenity in Ashford Road due to an increase in vehicle trips travelling to and from the shopping centre via the rear access.

Another key area of concern for Council is the future role of Kalamunda Road from a strategic perspective. Future structure planning north of Kalamunda Road indicates that a significant amount of development is proposed and traffic volumes, particularly heavy vehicle numbers, are expected to increase on Kalamunda Road. This may result in detrimental impacts to the residential amenity of Kalamunda Road and surrounding areas.

This study has generally been divided into two sections:

1) strategic assessment of capacity, safety and through-traffic movements along the Kalamunda Road corridor between the Roe Highway and Abernethy Road for the current and future years to determine infrastructure requirements and mitigating measures;
2) detailed assessment of the operation of Kalamunda Road in the vicinity of the High Wycombe shopping centre between Foxton Boulevard and Kenneth Road. In addition to modelling the existing road network situation, a number of alternate layout options have been developed and evaluated to determine their likely operation and impacts.

The strategic study area and surrounds are shown on Figure 1.1, while Figure 1.2 shows the detailed study area.

Cardno Eppell Olsen
Shaping the Future

Strategic Study Area & Surrounds

Figure 1.1 | Job Number: CEP02014

01 | 12 |2009

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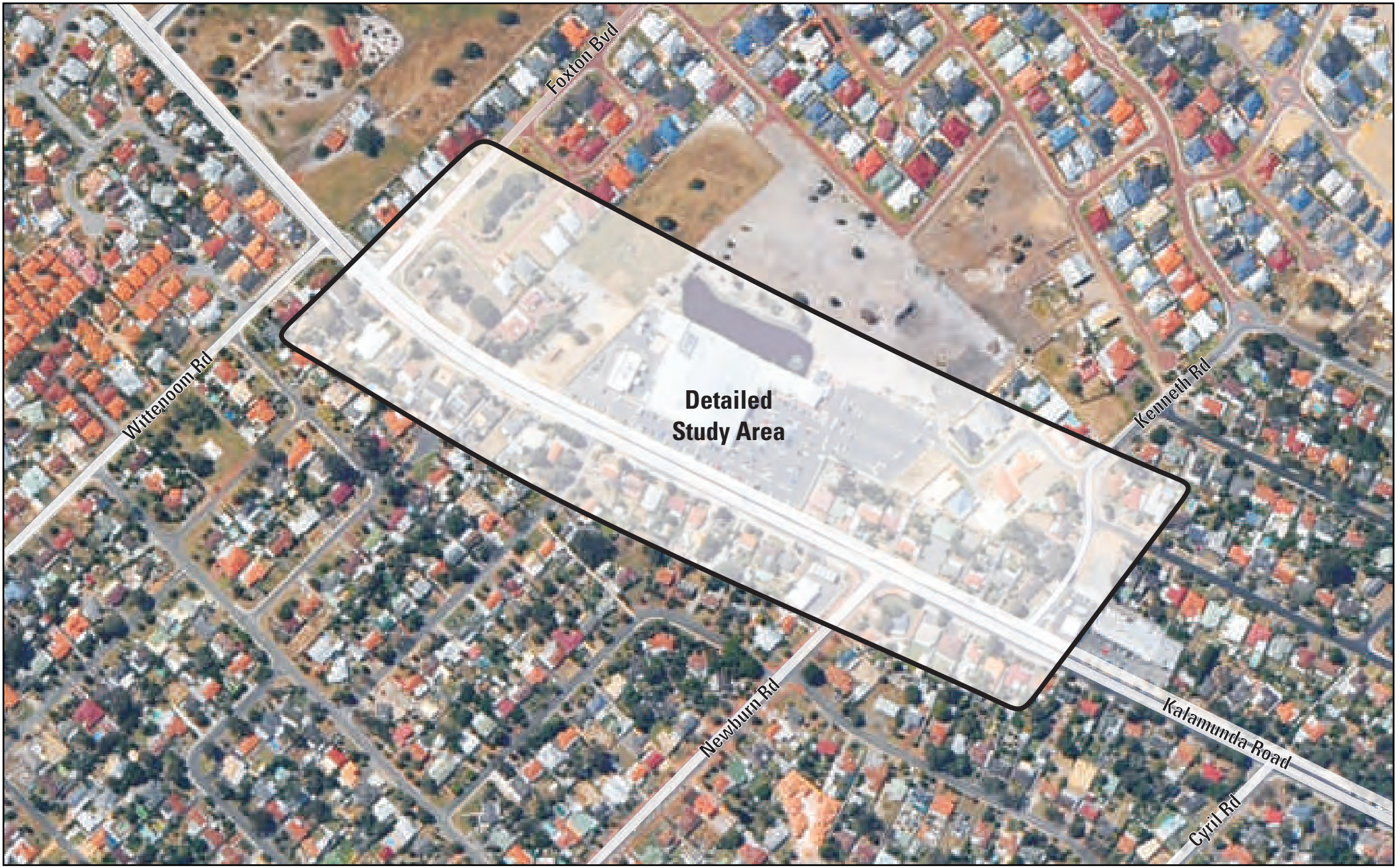

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Detailed Study Area & Surrounds

Figure 1.2 | Job Number: CEP02014

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2.0 PROJECT BACKGROUND

2.1 Study Area

Kalamunda Road has generally been constructed as a two way, two-lane undivided roadway in the High Wycombe area. A central median has been constructed in the vicinity of the High Wycombe shopping centre to control access. Kalamunda Road generally runs in a north-west to south-east alignment through the study area, which is defined as being between the Roe Highway to the east and Abernethy Road to the west.

Within the study area, Kalamunda Road primarily serves residential land uses as well as some commercial and retail uses. Kalamunda Road is a Council-controlled road and has a posted speed of 60km/h within the study area.

Kalamunda Road intersects with a number of streets/roads within the study area, however only the intersections with the Roe Highway and Abernethy Road are signalised. The intersection with Newburn Road is a single lane roundabout and all other intersections have been constructed with priority control.

Pedestrian footpaths are provided along both sides of Kalamunda Road for the majority of its length in the study area. However, there are no marked pedestrian crossings or refuge areas for pedestrians to cross Kalamunda Road. There are some on-street bicycle facilities in sections along Kalamunda Road, but there is no continuous facility in this area. Indented bus bays are provided on both sides of Kalamunda Road.

2.2 High Wycombe Shopping Centre

The High Wycombe shopping centre is located on the northern side of Kalamunda Road between Foxton Boulevard and Newburn Road. The centre commenced operation in June 2009 and consists of a McDonalds restaurant with a drive-through facility and a retail centre that includes a supermarket and specialty retail stores. The centre also includes a tavern.

The centre has four driveway crossovers onto Kalamunda Road and one driveway to Ashford Road from the eastern corner of the site. The access driveways onto Kalamunda Road have the following turning movement restrictions (from west to east):

- McDonalds Driveway: left-in, left-out only;
- Western Shopping Centre Driveway: right-in, left-in, left-out only;
- Central Shopping Centre Driveway: right-in, left-in only;
- Eastern Shopping Centre Driveway: left-out only.

The driveway from Ashford Road allows vehicles to enter and exit the shopping centre.

2.3 Previous Studies

Following the opening of the High Wycombe shopping centre, a post-construction road safety audit was commissioned by Council and was undertaken by Klyne Consultants. The audit focused on the section of Kalamunda Road from Newburn Road to west of Fernan Road and the findings were documented in a report dated June 2009.

Key findings of the road safety audit inspection relevant to this project included:

- drivers were observed turning right out of the shopping centre at the western shopping centre exit, despite it being signed as left-out only;
- the curve geometry of the left turn into the central driveway appeared to be restrictive as indicated by tyre marks on the kerb and footpath at the driveway;
- there were two poles that were identified as roadside hazards as they were too close to the roadway. The first is a concrete pole adjacent to the left-turn lane into the shopping centre on the north side of Kalamunda Road and the other is a wooden pole adjacent to a bus stop bay on the south side of Kalamunda Road, east of Fernan Road;
- there were no tactile ground surface indicators present at any of the kerb ramps across the shopping centre driveways which presents a hazard for visually impaired pedestrians;
- there is a difference in ground levels between the footpath and car parking area in the vicinity of the bus stop along the shopping centre frontage that is a hazard for pedestrians;
- the marked shoulders on both sides of Kalamunda Road vary between 1.0m and 1.5m. This is different to the design drawing which identifies a shoulder width of 1.5m for use by on-road cyclists. There are also inconsistencies between the new and existing line marking where they interface west of the Newburn Road intersection;
- the signage and line marking within the shopping centre car park are inconsistent with typical arrangements, do not comply with relevant standards and create uncertainty about vehicle right-of-way.

The following recommendations were identified during the road safety audit:

- installation of “one-way” signs on the central median and painted left-turn arrows at shopping centre exit driveways;
- modification of the geometry of the western driveway to physically restrict right-out movements onto Kalamunda Road. This could include extending the traffic island in the driveway and installing left-turn arrows on the pavement;
- review and modification of the central driveway geometry to better accommodate vehicles turning left into the shopping centre;

- installation of tactile ground surface indicators at footpath kerb ramps at all of the shopping centre driveways;
- removal or relocation of the concrete power pole adjacent to the left-turn lane at the central shopping centre driveway. Alternatively, impact attenuators could be installed (this was noted as being IMPORTANT in the report);
- removal of the timber power pole at the indented bus stop bay on the southern side of Kalamunda Road, east of Fernan Road;
- installation of fencing or railings along the shopping centre property line between the footpath and the car park where the level differences present a safety hazard for pedestrians;
- remark the edge lines on both side of Kalamunda Road to create a 1.5m shoulder from the kerb line as illustrated on the detailed design drawing. The new pavement markings need to interface with the existing line marking in accordance with Austroads Part 14;
- review and update the signage and line marking within the shopping centre as necessary to comply with appropriate standards and guidelines.

2.4 Traffic Study Objectives

The objectives of this traffic study were to:

- determine the current daily traffic volumes on Kalamunda Road and the composition of heavy vehicles. Use this information to estimate future traffic volumes and required infrastructure along the corridor;
- undertake community consultation to understand the concerns of local residents;
- consider the role of Kalamunda Road from a strategic perspective based upon the future planning for the area to the north of the study area;
- model the Kalamunda Road corridor in the vicinity of the High Wycombe Shopping Centre to assess the existing traffic operations;
- evaluate a number of different configuration options to determine the impacts of potential upgrading in this area;
- consider provision and configuration of pedestrian crossing facilities in the vicinity of the shopping centre.

3.0 EXISTING SITUATION

3.1 Current and Historic Traffic Volumes

To understand the existing traffic demand situation on Kalamunda Road within the study area, the following data was obtained:

- weekday peak hour intersection turning movement counts;
- 24-hour tube counts (typically one week duration).

3.1.1 Intersection Turning Movement Count Data

Intersection turning movement count data was collected by Austraffic on Thursday 29 October 2009 from 6:30am – 9:30am and 3:30pm – 6:30pm at the following locations:

- Kalamunda Road/Foxton Boulevard;
- Kalamunda Road/McDonalds Access Driveway;
- Kalamunda Road/Western Shopping Centre Driveway;
- Kalamunda Road/Central Shopping Centre Driveway;
- Kalamunda Road/Eastern Shopping Centre Driveway;
- Kalamunda Road/Newburn Road;
- Kalamunda Road/Kenneth Road;
- Kenneth Road/Ashford Road.

This data is included at Appendix A. This information confirms the turning movement volumes at each of these locations and also identifies the heavy vehicles for each movement. The peak hour turning movement volumes are illustrated on Figure 3.1. There are some discrepancies between the counts at adjacent intersections due to errors in the count data, largely relating to through-traffic volumes at the shopping centre driveways. These errors have been considered and the volumes balanced prior to use in analysis and modelling.

3.1.2 Tube Count Data

Kalamunda Shire Council provided tube count data for a number of locations on the road network within the study area. Information about the count location, duration, date and information collected is summarised in Table 3.1. Detailed data has been included at Appendix B.

LEGEND

000	AM peak
(000)	AM peak % heavy vehicle
000	PM peak
(000)	PM peak % heavy vehicle

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2009 Peak Hour Intersection Turning Movement Volumes

Figure 3.1 | Job Number: CEP2014

09 | 12 |2009

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Table 3.1 ***Council Tube Count Data Summary***

Count Road	Count Location	Count Date	Duration	Data Collected
Ashford Road	East of Shopping Centre	August 2009	One week	Volumes, Speeds, Traffic Composition
Abernethy Road	North of Kalamunda Road	February 2007	One week	Volumes, Speeds, Traffic Composition
Abernethy Road	South of Kalamunda Road	November 2009	One week	Volumes, Speeds, Traffic Composition
Kalamunda Road	East of Abernethy Road	November 2007	Five days	Volumes, Speeds, Traffic Composition
Kalamunda Road	West of Hawkevale Road	January 2008	Four days	Volumes, Speeds, Traffic Composition
Kalamunda Road	West of Newburn Road	March 2009	One week	Volumes, Speeds, Traffic Composition
Kalamunda Road	West of Fernan Road	March 2009	One week	Volumes, Speeds, Traffic Composition
Kalamunda Road	Eastbound at Shopping Centre	August 2009	One week	Volumes
Kalamunda Road	Westbound at Shopping Centre	August 2009	One week	Volumes
Kalamunda Road	East of Abernethy Road	November 2009	One week	Volumes, Speeds, Traffic Composition
Kalamunda Road	West of Wittenoom Road	November 2009	One week	Volumes, Speeds, Traffic Composition
Kalamunda Road	West of Roe Highway	November 2009	One week	Volumes, Speeds, Traffic Composition

The most recent tube count data was reviewed to determine the existing average daily two-way traffic volumes as well as the proportion of heavy vehicles within the study area. These volumes are illustrated on Figure 3.2.

The volumes shown on Figure 3.2 at the three locations between Wittenoom Road and Cyril Road are based upon the recorded turning movement counts at the adjacent intersections. These volumes were estimated by adding the morning and afternoon peak hour turning movement volumes and multiplying this number by five. This approach is typically adopted and has been based upon previously surveyed peak-to-daily demand factors.

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2009 Daily Two-Way Link Volumes

Figure 3.2 | Job Number: CEP02014

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The two-way daily link volumes shown on Figure 3.2 indicate that there is variation in the daily volumes and proportion of heavy vehicles along the Kalamunda Road corridor. There are noticeable differences in the reported volumes at the western end of Kalamunda Road which indicates that a high number of vehicles are using Kalamunda Road to travel between Stirling Crescent and Wittenoom Road. The proportion of heavy vehicles using this section of Kalamunda Road was also much higher than for other sections, indicating that a large number of vehicles travelling this route are heavy vehicles.

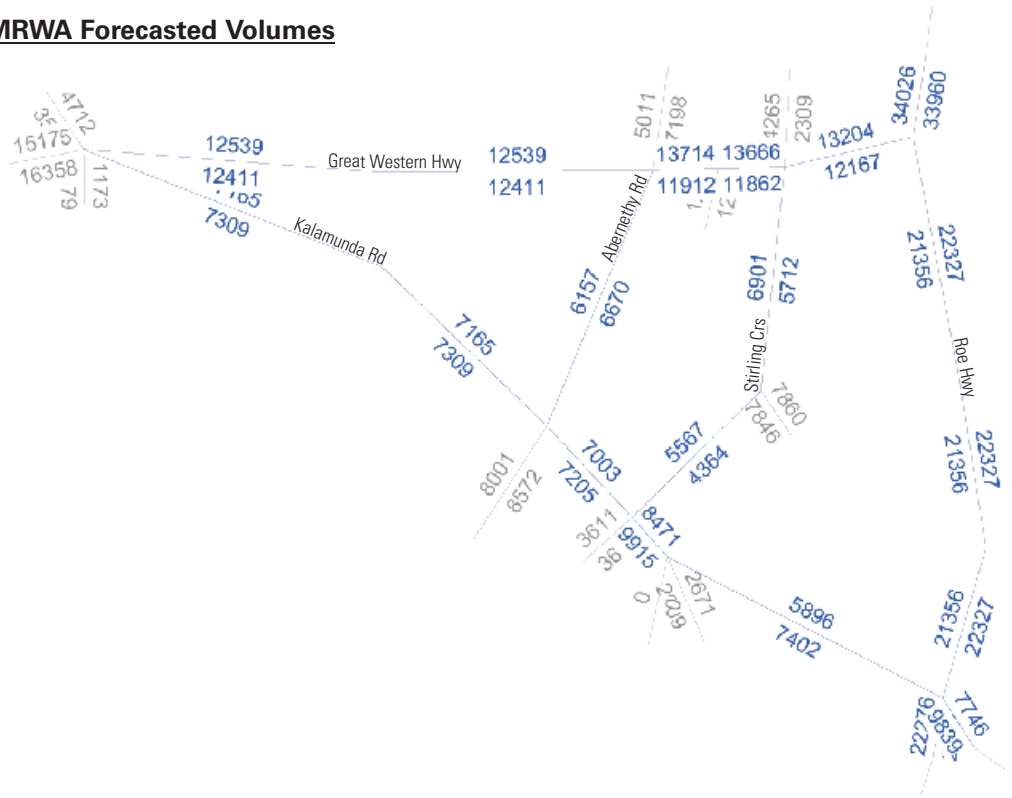
3.1.3 Forecast Traffic Volumes

Main Roads Western Australia (MRWA) has developed a strategic model using the CUBE modelling package to estimate future year traffic volumes on key roads within the area. Models have been developed for years 2011 and 2021 and the expected daily traffic volumes are shown on Figure 3.3.

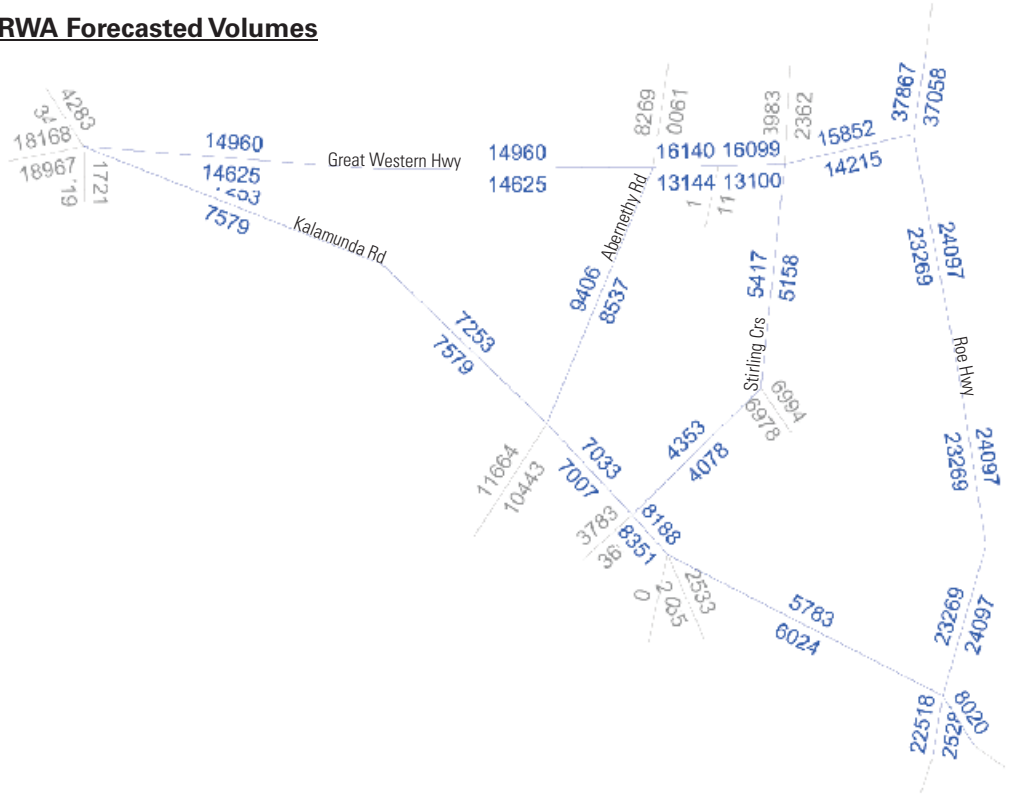
LEGEND

000	Minor road daily traffic volumes
000	Major road daily traffic volumes

2011 MRWA Forecasted Volumes



2021 MRWA Forecasted Volumes



The model outputs for Kalamunda Road, Roe Highway and Abernethy Road for 2011 and 2021 are summarised in Table 3.2. The annual linear growth for each link has been calculated from these volumes and is also included in the following table. The recently recorded daily two-way volumes for these road segments have also been included for comparison.

Table 3.2 ***Daily Two-Way Volume Comparison***

Link	Location	2009 Recorded Volume	MRWA Model Volumes		
			2011	2021	Annual Growth Rate
Kalamunda Road	Abernethy Road – Stirling Crescent	12,900	14,000	14,000	0%
	Stirling Crescent – Roe Highway	16,100	18,000	17,000	-0.6%
Abernethy Road	North of Kalamunda Road	-	13,000	18,000	3.8%
	South of Kalamunda Road	12,800	17,000	22,000	2.9%
Roe Highway	North of Kalamunda Road	-	44,000	47,000	0.6%

As shown in Table 3.2, there are some differences between the 2009 daily volumes and the 2011 forecast traffic volumes, particularly on Kalamunda Road, between Stirling Crescent and Roe Highway, and also on Abernethy Road, south of Kalamunda Road.

On Kalamunda Road, between Stirling Crescent and Roe Highway, the model forecasts traffic volumes of 18,000 for 2011; however current volumes are approximately 2,000vpd less than this. Based upon the MRWA model data, this section of road is expected to experience a negative growth rate between 2011 and 2021.

On Abernethy Road, south of Kalamunda Road, the current volumes are 4,200vpd less than the 2011 forecast volumes.

3.2 Historic Crash Data

Historic crash data was obtained from the MRWA for Kalamunda Road between the Roe Highway and Abernethy Road. Data was available for the period from January 2004 to December 2008. Therefore this data precedes the construction of the shopping centre and the associated changes to Kalamunda Road along the centre frontage. The review findings are still relevant to the strategic level review.

The crash data is included at Appendix C.

3.2.1 Kalamunda Road Corridor

A total of 245 vehicle crashes have been reported for this section of road during the five years (includes intersections with Roe Highway/Abernethy Road). The majority of recorded crashes were between vehicles travelling in the same direction and involving rear-end or similar type crashes. Table 3.3 shows the breakdown of traffic crashes along this section of road by crash category. “Intersection” incidents occur when the two or more cars that crash are approaching from different directions. Vehicles travelling in opposite directions are separated out from the intersection incidents. The majority of crashes between vehicles travelling in the same direction were rear-end crashes.

Table 3.3 Crash Summary by Crash Category (All Crashes)

Crash Category	Total Crashes	% of Total
10X (Intersection: Vehicles from Adjacent Approaches)	24	9.8%
20X (Vehicles from Opposing Directions)	11	4.5%
30X (Vehicles from One Direction)	183	74.7%
40X (Manoeuvring)	8	3.3%
70X (Loss of Control Off Path on Straight)	14	5.7%
Other	5	2.0%
TOTAL CRASHES	**245**	**100%**

Due to the high number of rear-end crashes they have been broken down into three additional categories; vehicle crashes into the back of a slower or stopped vehicle; vehicle crashes into a second vehicle turning left; and vehicle crashes into a second vehicle turning right. These have been illustrated in Table 3.4.

Table 3.4 Breakdown of 30X Category Crashes (All Crashes)

30X Category Crashes	Total Crashes	% of Total
301 (Same Lane Rear-End Collisions)	87	47.5%
302 (Same Lane Left-Rear Collisions)	57	31.2%
303 (Same Lane Right-Rear Collisions)	15	8.2%
Other	24	13.1%
TOTAL CRASHES	**183**	**100%**

Tables 3.5 and 3.6 summarises the crash data by category and a breakdown of 30X category crashes for the data set excluding crashes reported at the Abernethy Road/Kalamunda Road and Roe Highway/Kalamunda Road intersections. With these two intersections removed, the number of reported incidents is significantly reduced to 67, which is a reduction of 178 crashes. The summary of crashes when these intersections are excluded is shown in the following tables.

Table 3.5 Crash Summary by Crash Category (No Signalised Intersections)

Crash Category	Total Crashes	% of Total
10X (Intersection: Vehicles from Adjacent Approaches)	17	25.4%
20X (Vehicles from Opposing Directions)	6	9.0%
30X (Vehicles from One Direction)	33	49.3%
40X (Manoeuvring)	3	4.5%
70X (Loss of Control Off Path on Straight)	4	6.0%
Other	4	6.0%
TOTAL CRASHES	**67**	**100%**

Table 3.6 Breakdown of 30X Category Crashes (No Signalised Intersections)

30X Category Crashes	Total Crashes	% of Total
301 (Same Lane Rear-End Collisions)	14	42.4%
302 (Same Lane Left-Rear Collisions)	4	12.1%
303 (Same Lane Right-Rear Collisions)	7	21.2%
Other	8	24.2%
TOTAL CRASHES	**33**	**100%**

3.2.2 Kalamunda Road/Newburn Road Intersection

A total of fifteen crashes were reported at the intersection of Newburn Road and Kalamunda Road during the five year period to 2008. These crashes are generally split evenly between side impact and rear impact crashes, however, a more detailed breakdown is shown in Table 3.7.

Table 3.7 Kalamunda Road/Newburn Road Intersection Crash Summary by Crash Code

Crash Code	Total Crashes	% of Total
101 (Intersection Through-Through)	1	6.7%
102 (Intersection Right-Through)	2	13.3%
104 (Intersection Through-Right)	4	26.7%
107 (Intersection Through-Left)	1	6.7%
301 (Same Lane Rear-End Collisions)	5	33.3%
303 (Same Lane Right-Rear Collisions)	1	6.7%
704 (Right Off Carriageway)	1	6.7%
TOTAL CRASHES	**15**	**100%**

During this five year period, the intersection of Newburn Road and Kalamunda Road has been redesigned and upgraded to a roundabout. This change has resulted in a reduction in crash incidences from approximately five crashes per year to less than two per year. This is shown more clearly in Table 3.8 which illustrates the number of traffic crashes per year between 2004 and 2008.

Table 3.8 ***Kalamunda Road/Newburn Road Intersection Number of Crashes per Year (2004 – 2008)***

Crash Code	2004	2005	2006	2007	2008	TOTAL
101	1	0	0	0	0	**1**
102	0	1	0	1	0	**2**
104	1	2	1	0	0	**4**
107	1	0	0	0	0	**1**
301	1	2	1	0	1	**5**
303	0	1	0	0	0	**1**
704	1	0	0	0	0	**1**
TOTAL	**5**	**6**	**2**	**1**	**1**	**15**

During the 2004 – 2005 period the types of crashes that occurred at this intersection were generally divided into side impact and rear-end collisions. This proportion largely remained unchanged after the installation of the roundabout but with significant reduction in the number of incidents. Table 3.9 clearly shows the difference in crash types for the periods before and after the roundabout construction.

Table 3.9 ***Kalamunda Road/Newburn Road Intersection Comparison of Crashes with Intersection Upgrading***

Crash Code	Crashes in 2004-2005 (T-Intersection)		Crashes in 2004-2005 (Roundabout)	
	Total Crashes	% of Total	Total Crashes	% of Total
101	1	9.1%	0	0%
102	1	9.1%	1	25%
104	3	27.3%	1	25%
107	1	9.1%	0	0%
301	3	27.3%	2	50%
303	1	9.1%	0	0%
704	1	9.1%	0	0%
TOTAL	**11**	**100%**	**4**	**100%**

In summary, the majority of reported crashes on Kalamunda Road between Abernethy Road and Roe Highway (excluding those intersections) were collisions between vehicles travelling in the same direction. At the intersection of Kalamunda Road and Newburn Road the number of collisions has significantly reduced since the installation of the roundabout.

3.3 Site Inspections

In order to obtain a better understanding of the existing road network arrangements and operation within the study area, site inspections were undertaken in the morning and afternoon peak periods on Thursday 28 September 2009.

During the site inspection, notes were made in relation to the operation of the road network and intersections within the study area, location and scale of any queues or delays and travel time along the study corridor. The observations that were recorded during each of the site inspections are summarised in the following sections.

3.3.1 Morning Peak Period Observations

The site visit was conducted from 7:50am – 9:00am to understand how the road network operated during a typical morning peak period. The following observations were made:

- there appeared to be a relatively high proportion of trucks using Kalamunda Road. The majority of these appeared to be cement mixers and similar sized vehicles;
- there were a number of buses observed on Kalamunda Road during the site inspection. There appeared to be sufficient room for vehicles to pass buses at stops even when not stopped in dedicated bus bays;
- at the Kalamunda Road/Newburn Road intersection, the longest queues were noted on the eastern approach, with a maximum queue back to the Kenneth Road intersection (approximately 100m);
- on the Newburn Road approach to the Kalamunda Road intersection, the maximum queue was three cars (or approximately 20m).
- the presence of a school approximately 500m south of the Kalamunda Road/Newburn Road intersection did not appear to create any sharp peaks at the intersection;
- at the Kalamunda Road/Kenneth Road intersection the maximum observed queue was two cars (or approximately 15m). The majority of vehicles turning into and out of Kenneth Road at this intersection were from the service station on the north-east corner;
- three trips along Kalamunda Road between Kenneth Road and Foxton Boulevard in the westbound direction were completed to estimate the average travel time. The times recorded were 50 seconds, 46 seconds and 47 seconds;
- the average speed travelled during these trips was approximately 55km/h;

- there were a number of pedestrians seen crossing Kalamunda Road. The majority of these pedestrians appeared to be school students that were crossing at bus stops;
- crossing Kalamunda Road appears to be relatively difficult for pedestrians due to the volume and speed of the vehicles travelling through the area;
- the car parking area within the High Wycombe Shopping Centre was generally empty. There were some cars parked near the McDonalds and also near the main shopping centre entry adjacent to Kalamunda Road;
- the shopping centre access at Ashford Road is quite discreet and likely to be used only by local residents who know it exists. No one was observed using this access during the site visit.

3.3.2 Afternoon Peak Period Observations

In the afternoon, the site visit was undertaken between 5:00pm and 6:00pm. Thursday was selected because of late night trading at the shopping centre on this day. The observations recorded during the site inspection are as follows:

- at the Kalamunda Road/Newburn Road intersection, the maximum observed queue was on the western approach and extended to around Wittenoom Road. This appeared to be partially due to drivers on Kalamunda Road letting vehicles turn into or out of the shopping centre and partially due to the volume of traffic;
- there were large queues recorded at the eastern right turn lane into the shopping centre car park. At times the queues exceeded the available storage capacity. The western right turn lane is not as heavily used, probably because the majority of parking is to the east of the site;
- three trips along Kalamunda Road between Foxton Boulevard and Kenneth Road eastbound were undertaken to estimate travel time. The recorded travel times were 54 seconds, 46 seconds and 52 seconds which were slightly slower than the times recorded in the morning peak period;
- only three pedestrians were observed crossing Kalamunda Road during the afternoon peak period. During the morning peak, the majority of pedestrians were students, who are not as likely to be travelling by bus between 5:00pm and 6:00pm;
- in general, it appeared to be difficult for pedestrians to cross Kalamunda Road due to the volume of cars in the afternoon peak period.
- there appeared to be plenty of available car spaces within the shopping centre, especially to the east near the Ashford Road entrance;
- vehicles using the Ashford Road shopping centre access appeared to travel above the posted speed when using the local road network;

3.3.3 General Observations

- the sight distance looking west from the McDonalds access driveway along Kalamunda Road is approximately 160m. This is considered acceptable for the posted 60km/h speed limit;
- the configuration (width and angle) of the entry and exit lanes from Kalamunda Road to the shopping centre do not provide for efficient entry and exit movements. When exiting the shopping centre, this increases the time required to enter the traffic stream and the average gap being chosen. The configuration of the shopping centre driveways may require further investigation to ensure the geometry is appropriate.

4.0 COMMUNITY CONSULTATION

In order to allow the High Wycombe community to provide input into the current and future arrangements along Kalamunda Road, limited community consultation was undertaken as requested by Council. The consultation took place at the High Wycombe Shopping Centre on Wednesday 25 November 2009. A manned stand was created at the shopping centre to allow residents to provide their input, comments and feedback about the existing situation in the area. Written comments and feedback was also solicited from the public on this day and members of the public were invited to complete a feedback form and return it to Council.

4.1 Verbal Responses

During the consultation at the shopping centre, a number of concerned residents and citizens provided verbal feedback and comments. Some of the concerns that were raised by the community included:

- noise and disturbances are created by people doing burn outs when leaving the tavern;
- people speed out of the shopping centre when leaving the eastern-most driveway;
- the left-turn out of the centre at the western driveway does not get used by a great deal of traffic;
- car wash access on the south-western corner of Kalamunda Road/Newburn Road intersection creates problems with traffic flow;
- a majority of residents are opposed to the closure of the Ashford Road access to the shopping centre – they do not want to travel via Kalamunda Road if not needed;
- Ashford Road is only 6.5m wide – not wide enough to carry significant traffic volumes (i.e. more than 100vpd);
- it is difficult to turn right out of the retirement village located at the western end of Kalamunda Road. There is also no protected right turn into the village which is a safety concern for residents;
- residents reported delays exiting side streets onto Kalamunda Road. Stirling Road and Hawkevale Road were noted as having significant delays. Foxton Boulevard, Kenneth Road and Chullwyne Mews were also mentioned;
- there were concerns raised about the roundabout at the Kalamunda Road/Newburn Road intersection as drivers tend to speed through the roundabout. This could indicate that the geometry of the approaches has not been designed to adequately slow vehicles;
- pedestrians noted that it takes a long time to cross Kalamunda Road;
- residents from the retirement village who walk to the shopping centre have to cross Kalamunda Road;

- many vehicles were reported as using Stirling Crescent and Kalamunda Road to access Roe Highway;

4.2 Written Responses

A total of 86 written responses were received from the community relating to Kalamunda Road. Copies of these written comments have been included at Appendix D.

The comments that were received could typically be categorised into one of the following themes:

- issues with the shopping centre car parking and/or access;
- the closure of the Ashford Road access to the shopping centre;
- congestion problems on Kalamunda Road;
- problems entering and exiting minor streets and driveways along Kalamunda Road;
- high numbers of heavy vehicles and through-traffic on Kalamunda Road;
- speeds on Kalamunda Road being too high;
- pedestrian issues associated with poor crossing facilities and footpaths;
- requests to widen Kalamunda Road to four-lanes or to a dual carriageway.

A summary of the frequency of each of these comments is provided in Table 4.1. It should be noted that some comments included more than one of these general themes, therefore the total is higher than the number of responses.

Table 4.1 Key Community Feedback Comments

Comment	Frequency
Shopping Centre Car Parking and Access	36
Ashford Road Shopping Centre Access Closure	21
Congestion of Kalamunda Road	27
Minor Road and Driveway Access from Kalamunda Road	33
Heavy Vehicles and Through-Traffic on Kalamunda Road	15
Speeds on Kalamunda Road	10
Pedestrian Concerns	18
Widening of Kalamunda Road	11
Other	12

The majority of concerns relate to the shopping centre access, the recent closure of Ashford Road and congestion on Kalamunda Road. Comments classed as “other” included requests to relocate the bus stop near the Lifestyle Village, create a no-parking zone on Kalamunda Road, and concerns about increased traffic movements and safety for children in the residential area north of Kalamunda Road. There were also some responses that there were no problems with Kalamunda Road and that there should be no changes, however these were in the minority.

5.0 KALAMUNDA ROAD CORRIDOR ASSESSMENT

5.1 Existing and Future Traffic Volumes

As noted in Section 3.1 of this report, there are differences between the surveyed 2009 traffic demands and volumes forecast on Kalamunda Road in the MRWA model for the 2011 and 2021 design years. The model indicates that growth on Kalamunda Road will be insignificant with forecast growth rates up to -0.6% expected.

It should be noted that the MRWA model is an analytical tool used to understand the general scale and location of growth within the greater road network. The model indicates that some demands will reduce between 2011 and 2021; however, the scale of the error is within that expected for a sub-regional strategic model. The model volumes for 2011 and 2021 indicate that there is no significant change in traffic volumes along the Kalamunda Road corridor. Future traffic demands will therefore approximate those being experienced now.

The MRWA model has also been tested with four lanes on Kalamunda Road to determine how the traffic demands are likely to change in the 2011 design year. The model indicated that the volumes on Kalamunda Road were likely to increase by approximately 4,000 vehicles per day if Kalamunda Road was duplicated. If Kalamunda Road is widened, there is a risk that the reported traffic volumes will increase as a result of the available spare capacity on the road and the actual demand will be higher than that forecast by the model.

5.2 Corridor Capacity

Kalamunda Road is a two lane road with some turn-lane facilities at locations along the study corridor. Kalamunda Road is largely undivided, with the exception of some median treatments along the shopping centre frontage and near intersections.

Austroads' *Guide to Traffic Management Part 3: Traffic Studies and Analysis* indicates that the typical one-way capacity per lane for an undivided urban arterial road with interrupted flow, such as Kalamunda Road is 900 vehicles per hour (vph). It also goes on to say that the peak period capacity may increase to 1,200 – 1,400vph/lane if there are a number of factors present including the control of entering traffic by major road priority control. This could apply in some respects to Kalamunda Road; therefore a peak hour capacity of 1,200vph/lane has been adopted for this study. Therefore the following capacities have been adopted for Kalamunda Road:

- Peak hour capacity: 2,400vph;
- Daily capacity: 18,000 – 20,000vpd.

Based upon these capacities and the forecast daily traffic volumes of between 14,000 and 18,000 along the Kalamunda Road corridor, it is expected that the current road configuration will operate in a similar manner to current operation at the 2021 design horizon. At present, Kalamunda Road is operating near capacity, particularly during the peak periods. It is likely that the capacity of Kalamunda Road will become more constrained in coming years given some minor traffic demand growth.

5.3 Strategic Context

The local structure area has been defined as being between Kalamunda Road and the Great Eastern Highway. Current planning shows that the majority of this area will be developed for commercial and industrial land uses with some in-fill residential development planned near the High Wycombe Shopping Centre.

It is understood that as part of this planning, central medians will be constructed on Abernethy Road and Stirling Road restricting vehicle movements at driveways to left-in/left-out only. U-turn facilities are also expected to be provided along these roads; however vehicle movements (particularly heavy vehicle numbers) are expected to increase on Kalamunda Road between Abernethy Road and the Roe Highway. This increase in traffic volumes is likely to adversely impact upon the local-road function of Kalamunda Road.

It is our understanding that Council is concerned about the potential change in function of Kalamunda Road as a result of this planned development. The MRWA Regional Operations Model (ROM) is based on land use predictions undertaken by the Department for Planning's land use forecasting model. Interestingly, the forecast traffic within the area bound by Kalamunda, Stirling Crescent, Great Eastern Highway and Roe Highway is predicted to generate between 8,000-9,000vpd, which would suggest that the land forecast would be around 900-1,000 residential dwelling units. This would be almost four times the level of current development.

5.4 Strategic Options

A number of different options have been developed to provide the Shire with possible options to address the future capacity and amenity impacts on the Kalamunda Road corridor. It is noted that these options are largely conceptual and detailed analysis has not been undertaken. It is recommended that Council analyse in detail the potential impacts of these strategic options upon the road network prior to progressing any given option.

The options have been split into two categories based upon the overall goal of the option. In many cases, the options to increase the capacity of Kalamunda Road will likely reduce the amenity for residents due to increased traffic volumes. The reverse is also true, where improved local amenity results in a reduction in capacity along the corridor.

An important consideration with any of the options is to ensure that heavy vehicle traffic is discouraged from using Kalamunda Road by providing higher speed options on Great Eastern Highway and Roe Highway.

5.4.1 Capacity Options

Potential options that could be implemented to increase the capacity of the Kalamunda Road corridor include:

- develop and implement access management strategies: The capacity of Kalamunda Road could be increased by reducing the number of access locations (i.e. driveways and minor roads) along the corridor. This could be achieved by creating shared driveways or easements between adjacent properties. This strategy may be difficult to implement for the residential properties due to the arrangement of buildings on each lot, however, as redevelopment proceeds along the corridor, Council could encourage this to occur. Another way to reduce the number of conflict points along Kalamunda Road is to consolidate driveways to single lots such that each property only has one access to/from Kalamunda Road. For properties that have access to more than one street, it may be possible to close the access onto Kalamunda Road as a way to reduce access points;
- widen Kalamunda Road: a direct way to increase the capacity of Kalamunda Road is to widen the roadway to four lanes. While this option will increase capacity, it will also have significant impacts upon the properties fronting the roadway as land will need to be resumed to accommodate the extra width. This option has been assessed in detail and is discussed in Section 6.0;
- provide turn lanes at intersections: another method to increase capacity on Kalamunda Road is to provide turn lanes at intersections. This reduces the impact of turning vehicles upon the passage of through-traffic. This may require some land resumptions in the vicinity of intersections. Analysis will also be required to determine the required length of any turn lanes;
- ban right-turn movements: at locations where insufficient width is available or low turning volumes exist, it may be beneficial to ban right-turn movements. This will result in fewer interruptions to the flow of through-traffic at these locations. It is recommended that the right-turn bans are enforced by physical restrictions such as medians or barriers rather than through the use of signage.

5.4.2 Amenity Options

The following options are proposed to improve the amenity along the Kalamunda Road corridor:

- improve pedestrian facilities: dedicated pedestrian crossings facilities and central pedestrian refuge islands would be a desirable addition to the corridor. Warrants should be assessed to determine whether dedicated pedestrian crossings such as mid-block signals or zebra crossings are appropriate along the Kalamunda Road corridor. If it is found that the current pedestrian demands are too low to warrant a dedicated crossing, an alternative would be to provide pedestrian refuge islands in the centre of Kalamunda Road at key locations. Kerb build-outs could also be constructed along Kalamunda Road to reduce the crossing time for pedestrians and slow through-traffic movements;
- reduce through-vehicle movements: the amenity of Kalamunda Road could be improved by reducing the number of through-traffic movements, especially heavy vehicles. This could be done through the use of signage restricting movements to local traffic only or showing alternate routes to destinations such as Abernethy Road or the Roe Highway. Through-vehicles can also be reduced passively by slowing traffic and thus making the corridor a less desirable travel route. Installing traffic calming measures such as kerb build-outs could assist with slowing traffic;
- install roundabouts on Kalamunda Road: feedback received from the community consultation process indicated that entering Kalamunda Road from some minor streets was problematic and resulted in some lengthy delays during peak periods. To address this issue and to slow vehicles along Kalamunda Road, it is suggested that roundabouts are investigated at the intersections with Stirling Crescent, Kenneth Road and/or Hawkevale Road. The impact of installing roundabouts at these locations has not been analysed or evaluated in detail, however, it is expected that the roundabouts would significantly reduce delays for vehicles entering Kalamunda Road from the minor streets and slow through movements on Kalamunda Road. A concept plan has been prepared to illustrate how a single lane roundabout could be accommodated within the existing road reserve and this is included at Appendix E;
- provide U-turn facilities on Abernethy Road and Stirling Crescent: as part of the planned industrial development north of Kalamunda Road it is recommended that right-turn and U-turn provisions are provided for vehicles along both Abernethy Road and Stirling Crescent to allow vehicles to readily access the Great Eastern Highway. This will reduce the reliance of traffic generated by these developments on Kalamunda Road and limit their impact upon the amenity of this area.

5.5 Recommendations

As presented in Section 5.4, there are a number of options available to Council that could address the capacity and/or the amenity issues on Kalamunda Road. It will be difficult to implement strategies that can improve both of these areas given their interdependence. Council will therefore need to determine what strategy it wishes to develop for Kalamunda Road and proceed accordingly.

If Council wishes to improve the capacity and through-carrying function of Kalamunda Road, then options available include:

- develop and implement access management strategies;
- widen Kalamunda Road to provide four lanes;
- install roundabouts at major Kalamunda Road intersections;
- provide auxiliary turn lanes at intersections and major driveways;
- ban right-turn movements at some intersections.

If improving the amenity of Kalamunda Road is a priority of Council, then some potential options include:

- improve pedestrian facilities;
- reduce through-vehicle movements;
- install roundabouts at major Kalamunda Road intersections;
- provide U-turn facilities on Abernethy Road and Stirling Crescent.

All of these options will require further investigation and consideration as part of a corridor-wide approach for Kalamunda Road. The final strategy will depend upon Council's desired function for Kalamunda Road in the future.

6.0 KALAMUNDA ROAD MICRO-SIMULATION MODELLING

Micro-simulation of Kalamunda Road has been undertaken using the PARAMICS software package. Micro-simulation of the study corridor allows for the interaction of adjacent intersections to be fully understood, whereas modelling and analysis of discrete intersections using programs such as Sidra Intersection, do not account for the interaction of adjacent intersections. The need to account for interactions between intersections is increased where intersections are closely spaced and congestion levels are high. This is the case on Kalamunda Road in the vicinity of the High Wycombe shopping centre.

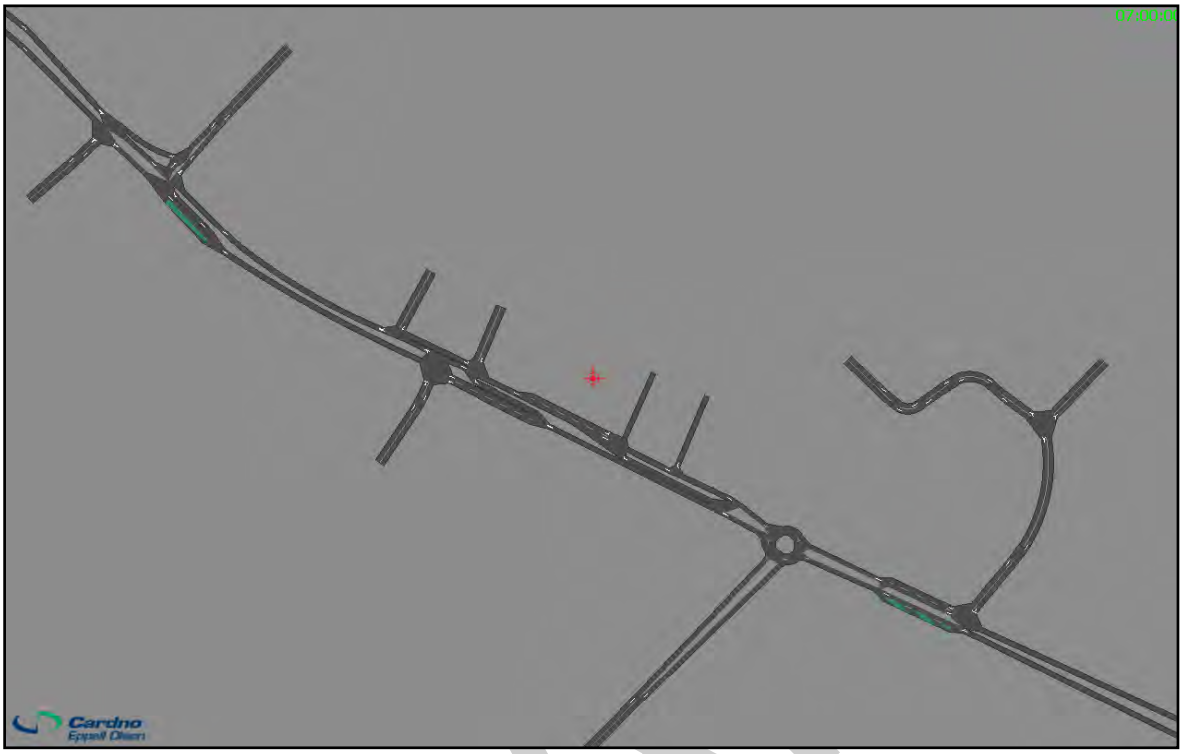
6.1 Existing (Base) Scenario/Model

The 2009 base model has been developed based on aerial imagery of the study area along Kalamunda Road (between Foxton Boulevard and Kenneth Road) which shows the existing geometry of the study corridor. The model extents are shown on Figure 6.1.

Figure 6.1 ***Aerial Photo of Modelled Corridor***

Bus routes within the study area have also been included based upon information obtained from the Transperth website. The model network developed is shown on Figure 6.2.

Figure 6.2 ***Overview of Modelled Corridor***



6.1.1 Calibration/Validation

Model volumes have been derived from the intersection turning movement counts undertaken at each intersection in the model network. The modelled volumes compared to the observed volumes for the AM and PM base networks are shown on figures included at Appendix G.

The 2009 base case traffic demands were determined using a matrix estimation technique. Traffic demands were calibrated for the 2009 base case such that the modelled demand values were consistent with observed count data provided by the Shire and MRWA. The quality of the model calibration can be quantified using the GEH statistic which is defined mathematically as:

$$\text{GEH} = \left(\frac{(Observed - Expected)^2}{0.5(\text{Observed} + \text{Expected})} \right)^{\frac{1}{2}}$$

The GEH statistic is a formula used in traffic engineering and modelling to compare two sets of traffic volumes. A GEH value of 5 or less is considered a good match between modelled and observed traffic demands. GEH values of ten or greater indicate poor correlation between the modelled and observed volumes. The GEH values for the modelled corridor are included at Appendix G.

Discrepancies between the volumes at some of the shopping centre driveways were observed in the vehicle counts. There is therefore some differences between the modelled volumes and the count data at these locations. A review of the count data shows that the modelled volumes more closely correlate with the underlying traffic patterns between intersections and as such the modelled volumes are considered acceptable.

6.1.2 Base Model Outputs

Two parameters were used to evaluate how the base model (i.e. existing road network) operation compared to the existing operation. These were vehicle hours travelled (VHT) and average trip time. Vehicle hours travelled is the sum of the travel time of all vehicles in the network during the peak hour. This parameter considers vehicles entering and exiting Kalamunda Road from side streets and driveways, as well as through-traffic movements.

The average travel time is the time taken to travel the length of Kalamunda Road between the intersections of Foxton Boulevard and Kenneth Road. The average travel time has been reported for vehicles travelling to and from the west for both of the peak hours and therefore only relates to the travel time of vehicles travelling through the corridor and not the time taken to enter or exit Kalamunda Road from the side streets or driveways.

The parameter outputs for the base model for 2009 and 2021 years are summarised in Table 6.1.

Table 6.1 ***Base Model Outputs***

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
2009 AM Peak	31.41	1:13	1:03
2009 PM Peak	39.17	1:06	1:14
2021 AM Peak	60.65	2:51	1:03
2021 PM Peak	125.76	1:06	1:32

It should be noted that the 2021 PM peak VHT value is considerably higher than the other values. This is a result of relatively high levels of congestion within the network, particularly on the side streets, that is likely to be experienced during 2021 if there are no changes to the network.

These parameters have also been used when evaluating each of the options to determine which options resulted in improvements to Kalamunda Road.

6.2 Year 2009 Options Testing

Seven different upgrading options for the detailed study area have been developed and modelled for the morning and afternoon peak hours for 2009. The assessed options were:

- Option 1: Reconfigure Central Driveway;
- Option 2: Reconfigure Central Driveway and Remove Right-Turn In;
- Option 3: Relocate Central Driveway and Upgrade Roundabout;
- Option 4: Signalise Central Driveway;
- Option 5: Install Central Median with Roundabout at Foxton Boulevard;
- Option 6: Upgrade Kalamunda Road to Four Lanes;
- Option 7: Signalise Kalamunda Road/Newburn Road Intersection.

All of these options have been assessed with the Ashford Road shopping centre access closed, as requested by Council staff. If Council decides to retain or reinstate this access at a later date, the modelled results will still remain valid and will represent a conservative scenario.

Following the initial year 2009 assessment, three of the proposed options were selected to assess during the 2021 design year. The results of this future year assessment are discussed in Section 6.3.

6.2.1 Option 1: Reconfigure Central Driveway

This option involves relocating the left-out movements from the eastern shopping centre driveway to the central shopping centre driveway. The eastern driveway will be closed. This option is shown on Figure 6.1, below.

One benefit of this option is the resultant increase in distance between the shopping centre driveway and queues from the roundabout at the Kalamunda Road/Newburn Road intersection.

Figure 6.1 *Option 1: Reconfigure Central Driveway*

Table 6.2 *Option 1: 2009 Model Outputs*

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 1 AM Peak	32.23	1:15	1:02
Option 1 PM Peak	101.98	1:07	1:25

The results of this option show that the vehicle hours travelled are higher than the existing model, particularly in the afternoon peak where the VHT increased by 63 hours. The average reported travel times were generally the same as the base model except for the eastbound direction in the PM peak which was approximately 10 seconds longer.

If implemented, this option will not result in any improvements to congestion within the corridor and will result in increased queues and blocking of shopping centre driveways and side streets, particularly in the PM peak hour.

6.2.2 Option 2: Reconfigure Central Driveway and Remove Right-Turn In

This option is similar to Option 1 in that the eastern exit driveway is closed and the left-out exit is provided at the central shopping centre driveway. In addition, the right-turn in at the central driveway is removed resulting in all right-turning vehicles into the shopping centre being required to use the western shopping centre driveway. If necessary, the right turn lane into the site at the western driveway could be extended. This option is illustrated on Figure 6.2.

This option also results in improved separation between the shopping centre driveways and the Newburn Road intersection. The circulation of vehicles within the shopping centre would be impacted as the right-turning vehicles would enter the site and have to circulate east through the site to access the majority of car parks. This option is unfavourable from an internal car park design perspective.

Figure 6.2 Option 2: Reconfigure Central Driveway and Remove Right-Turn In

Table 6.3 ***Option 2: 2009 Model Outputs***

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 2 AM Peak	31.94	1:11	1:02
Option 2 PM Peak	111.79	1:06	1:26

The results for Option 2 are similar to those reported for Option 1 with differences seen between the VHT in the PM peak and for the eastbound travel time also during the PM peak. The PM peak VHT was approximately 75 hours higher for this option and the eastbound travel time was 12 seconds longer than for the base model.

This option will result in increased congestion on Kalamunda Road and increased queues at the Newburn Road roundabout, shopping centre driveways and side streets. The conditions will significantly worsen during the PM peak with this option in place.

6.2.3 Option 3: Relocate Central Driveway and Upgrade Roundabout

For Option 3, the eastern left-out exit is closed and relocated such that the central driveway allows ingress and egress as for Options 1 and 2. In this option however, the central driveway is shifted such that it enters the car park at the parking aisle to the west of the current location. The Kalamunda Road/Newburn Road roundabout will also be upgraded by adding a short right-turn lane to the western Kalamunda Road approach and a second circulating lane on the northern part of the roundabout to accommodate the extra lane, as shown on Figure 6.3. This modification will provide significant localised capacity benefits at the roundabout.

The advantage of this option over Option 2 is that it increases the separation between the shopping centre driveway and the roundabout, but also allows vehicles to directly access the main car parking area without increasing internal circulation. It also increases capacity at the roundabout; however this may require land resumptions to the north of the roundabout. Detailed civil design of this option will be required to confirm any land resumptions.

Figure 6.3 *Option 3: Relocate Central Driveway and Upgrade Roundabout*

Table 6.4 *Option 3: 2009 Model Outputs*

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 3 AM Peak	31.62	1:13	1:02
Option 3 PM Peak	34.37	1:04	1:06

All of the Option 3 parameters show improvements over the base model outputs. The only exception to this is the minor increase in VHT during the AM peak equivalent to 0.2 of an hour or 12 minutes. This result is not significant in the context of the entire study area network. During the PM peak, the reported VHT decreases by approximately five hours. This reduction was also seen in the eastbound travel time that was eight seconds faster than in the base model.

This option represents an improvement to the current situation. It is expected that the queues, delays and general congestion along the corridor will improve during the critical PM peak period with this option in place. Access and egress from the shopping centre driveways is also expected to improve with this option.

6.2.4 Option 4: Signalise Central Driveway

Option 4 has the same shopping centre driveway configuration as Option 3, with the central and eastern driveways relocated to the west. In addition, a signalised pedestrian facility is proposed across Kalamunda Road to provide a dedicated pedestrian crossing at the shopping centre. This option also stops the eastbound traffic movements on Kalamunda Road to allow vehicles to turn into and out of the shopping centre at the central driveway. The model has been developed under the assumption that the pedestrian crossing will be actuated once every five minutes. The option is illustrated on Figure 6.4.

Figure 6.4 ***Option 4: Signalise Central Driveway***

Table 6.5 ***Option 4: 2009 Model Outputs***

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 4 AM Peak	32.18	1:14	1:04
Option 4 PM Peak	100.35	1:07	1:35

There was an increase in VHT of approximately 61 hours during the PM peak hour, however some of this delay could be attributed to delays caused by the addition of the traffic signals. The reported average travel times were largely the same except for the PM peak hour which had an increase of approximately 20 seconds.

This option will result in increased congestion and delays on Kalamunda Road in the AM and PM peak hours. Queues on Kalamunda Road are also expected to increase and result in additional blocking across the shopping centre access driveways and side streets.

6.2.5 Option 5: Install Central Median with Roundabout at Foxton Boulevard

In order to improve traffic flow, access to and from the properties along Kalamunda Road were investigated as being restricted to left-in/left-out in this option. This was achieved via the installation of a raised central median between Newburn Road and Foxton Boulevard. To accommodate U-turning vehicles at the western end of the median, a single lane roundabout has been tested at the Foxton Boulevard intersection. This option is shown on Figure 6.5.

Figure 6.5 Option 5: Install Central Median with Roundabout at Foxton Boulevard

Table 6.6 Option 5: 2009 Model Outputs

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 5 AM Peak	36.31	1:22	1:08
Option 5 PM Peak	92.87	1:11	1:36

This option reported increases in VHT and travel times in both directions for both the AM and PM peak hours. The highest increase in VHT was seen during the PM peak with an increase of 54 hours. The eastbound travel time increased the most during the PM peak with an increase of 22 seconds.

Queues, congestion and delays are expected to increase with this option in place. The most significant increases will be experienced in the PM peak where delays at driveways and side streets are expected to be more than double what is currently experienced. Once again, the queues on Kalamunda Road are expected to increase from the Newburn Road roundabout and will create blockages at the shopping centre driveways.

6.2.6 Option 6: Upgrade Kalamunda Road to Four Lanes

This option investigates the widening of Kalamunda Road for the length of the study area such that it has two travel lanes in each direction. There are no changes to the turn lane arrangements or shopping centre driveways under this option. It has been assumed that buses will stop in the kerbside lane rather than in indented bays to minimise the potential land resumptions required. The roundabout at the Newburn Road intersection will also be upgraded to have two circulating lanes. This option is illustrated on Figure 6.6.

This option provides an increase in capacity on Kalamunda Road; however, it has a substantial land resumption requirement that would likely be expensive and difficult to achieve. Safety and amenity for pedestrians would also decrease as a result of wider roads and a likely increase in traffic volumes and travel speeds.

Figure 6.6 *Option 6: Upgrade Kalamunda Road to Four Lanes*

Table 6.7 *Option 6: 2009 Model Outputs*

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 6 AM Peak	28.01	1:04	1:00
Option 6 PM Peak	31.59	1:02	1:02

Unsurprisingly, this option resulted in reduced travel times and reported VHT values for the morning and afternoon peak hours. The VHT decreased by approximately three hours and eight hours during the morning and afternoon peaks, respectively. The greatest travel time reduction was reported for the eastbound direction during the PM peak, which was 12 seconds less than the base model.

There will be shorter queues with this option and therefore fewer occurrences of the traffic blocking the shopping centre driveways and side streets. While there will be less congestion with this option, the resultant decrease in travel times (and therefore delays) does not appear to be proportional to the impact upon the surrounding area, resulting from land resumptions and reduced amenity.

6.2.7 Option 7: Signalise Kalamunda Road/Newburn Road Intersection

In this option, the Kalamunda Road/Newburn Road intersection has been assessed with signals in place of the existing single-lane roundabout. The intersection has been assessed with separate turn lanes on both Kalamunda Road approaches. Pedestrian crossing facilities have been provided across all legs. The proposed signalised intersection configuration is shown on Figure 6.7. It is expected that this option can be implemented in conjunction with changes to the shopping centre driveways.

It is expected that the signalised intersection will not require any additional land from the properties in this area, however the location of driveways will require further consideration by Council if this option is progressed. In addition, detailed design of the signalised intersection including the ideal signal phasing, turn-lane length and hardware placement will be required.

Figure 6.7 Option 7: Signalise Kalamunda Road/Newburn Road Intersection

Table 6.8 Option 7: 2009 Model Outputs

Scenario	Vehicle Hours Travelled	Average Travel Time (min:sec)	
		Westbound	Eastbound
Base Model AM Peak	31.41	1:13	1:03
Base Model PM Peak	39.17	1:06	1:14
Option 7 AM Peak	32.85	1:04	1:03
Option 7 PM Peak	38.19	1:01	1:06

The results for this option were mixed with an increase in VHT reported for the AM peak and a decrease in the PM peak. The reported travel times either decreased or remained unchanged when compared to the base model.

The decreases in travel time indicate that there will be fewer delays during the peak periods, however the VHT values indicate that there will be similar levels of congestion and queuing at driveways and side streets within the network.

6.3 Year 2021 Options Assessment

Following the completion and comparison of the options assessed for the 2009 year, three options were selected for assessment during the 2021 design year. The options that showed significant increases in VHT or travel time at the 2009 year were not assessed (i.e. Options 1, 2, 4 and 5) given that they did not provide a clear operational benefit to the existing case. The following options showed improvements over the base model in the 2009 year and therefore were selected for assessment at the 2021 design horizon:

- Option 3: Relocate Central Driveway and Upgrade Roundabout;
- Option 6: Upgrade Kalamunda Road to Four Lanes;
- Option 7: Signalise Kalamunda Road/Newburn Road Intersection.

Concept drawings of each of these options have been prepared to illustrate how these options could be accommodated within the road network. The drawings are conceptual in nature and will require detailed civil refinement. The location of services has not been considered when developing these concepts. The drawings are included at Appendix E for reference.

The modelling results for each of these options during the 2021 design year are summarised in Table 6.9. The base model outputs have also been reproduced here for ease of comparison.

Table 6.9 ***2021 Model Outputs***

Option Modelled	Peak Hour	Vehicle Hours Travelled	Average Travel Time (min:sec)	
			Westbound	Eastbound
Base Model	AM Peak	60.65	2:51	1:03
	PM Peak	125.76	1:06	1:32
Option 3: Relocate Central Driveway & Upgrade Roundabout	AM Peak	66.09	2:28	1:02
	PM Peak	44.14	1:08	1:11
Option 6: Upgrade to Four Lanes	AM Peak	32.46	1:05	1:00
	PM Peak	37.58	0:56	0:56
Option 7: Signalise Kalamunda Road/ Newburn Road Intersection	AM Peak	38.22	1:06	1:06
	PM Peak	47.00	1:03	1:08

As shown in Table 6.9, Option 6 provides the greatest improvement in VHT and travel time for both peak hours. This option however, does require significant land resumption along the corridor and would be the most expensive to construct. There are significant strategic issues with regard to this option as it would result in improving the attractiveness of Kalamunda Road to through-traffic and increase the number of heavy vehicles travelling between Abernethy Road and Roe Highway.

The results for Option 3 are mixed with both increases and decreases in VHT and travel time. Significant decreases in VHT were reported during the PM peak (approximately 82 hours). It is expected that these upgrades could largely be accommodated within the existing road reserve; however, some localised resumptions may be required.

Option 7 reported results that were generally an improvement over the base model. The only exception was a slight increase in travel time for eastbound traffic during the AM peak. The reported reductions in VHT were approximately 22 hours and 79 hours during the AM and PM peaks, respectively. This option could be constructed without significant resumptions as it can be accommodated within the existing road reserve. Further, installing signals at this intersection will provide pedestrians with a dedicated crossing facility in relatively close proximity to the school.

6.4 Recommendations

Each of the options assessed for the 2021 design year has advantages and disadvantages associated with it. A summary of the key considerations for each of the options is as follows:

- Option 3: Relocate Central Driveway and Upgrade Roundabout:
  - improves the operation of Kalamunda Road;
  - may require some localised land resumptions;
  - relative low cost compared to other options;
  - no pedestrian provision.
- Option 6: Upgrade Kalamunda Road to Four Lanes:
  - improves operation of Kalamunda Road but at the cost of amenity along the corridor, i.e. higher induced volumes, speeds, and heavy vehicle demands;
  - high construction cost and significant land resumptions;
  - inconsistent with Cardno's interpretation of the local road hierarchy;
  - no dedicated pedestrian provision and upgrading would result in increased difficulty for pedestrians, particularly at Newburn Road intersection.
- Option 7: Signalise Kalamunda Road/Newburn Road Intersection:
  - improves the operation of Kalamunda Road;
  - may require some localised land resumptions;
  - relatively moderate costs compared to other scenarios;
  - pedestrian crossing facilities would be provided on all intersection legs.

It is recommended that Council undertake further detailed engineering design of the options assessed for 2021 prior to proceeding with any particular option. The suitability of the selected option should only be considered in conjunction with the desired outcome for the corridor and the cost to Council (social or actual construction costs). For example, it would be unreasonable to select Option 6 (upgrading to four lanes) if Council wishes to improve the amenity of Kalamunda Road and limit through-traffic movements.

In saying this, Options 3 and 7 will provide localised capacity improvements in the vicinity of the shopping centre. These works would improve local and corridor traffic operations and would address the community concerns raised in relation to capacity constraints and the shopping centre access. The duplication of Kalamunda Road would also serve to improve corridor operations, however, the modelling indicates that the construction of the link would not compare favourably from a cost/benefit perspective.

7.0 HIGH WYCOMBE SHOPPING CENTRE CAR PARK

In addition to improvements along Kalamunda Road and surrounding area, it is also recommended that improvements to the layout of the High Wycombe shopping centre be investigated. The current car parking layout has a number of areas that do not meet Australian Standards and this creates numerous conflict points and safety risks within the car park.

Australian Standard AS2890.1 *Parking Facilities Part 1: Off-Street Car Parking* notes that a car park should be designed such that it has separation between the car parking areas and the access driveways to allow for improved circulation throughout the site and ensure sufficient queuing distance is provided at the driveways. This queuing area must remain clear of vehicles entering or exiting car parking spaces as well as internal intersections.

The current design of the shopping centre does not provide any separation between the driveways and the first car parking space or intersection. This reduces the efficiency of the car parking access driveways and creates undesirable conflict points. In order to comply with the Australian Standards changes to the car parking layout are recommended. Due to the proximity of the buildings to Kalamunda Road, it will be difficult to make changes to the two westernmost driveways without requiring significant changes. Changes to the car parking layout and driveways at the eastern side of the centre will be easier as there is more room available to accommodate these changes without significant loss of car parking spaces.

One possible way to provide a circulation roadway at the eastern end of the site is illustrated on Figure 7.1 below. It should be noted that this sketch is preliminary and will require further design and refinement by Council and/or the owner of the shopping centre. The queuing distance shown on the plan is indicative only and this will also need to be assessed as part of the design stage to ensure that the relevant standards are met.

Figure 7.1 ***Preliminary Car Parking Reconfiguration Option***

This option could be located at the end of any of the parking aisles in this section of the car park, depending upon the preferred access location on Kalamunda Road. By implementing these changes, the operation of the driveways and the car park as a whole would likely improve. This would also reduce the number of accidents or near-misses as a result of the current proximity of the car parking spaces and intersections to the driveways. Any vehicles queued internally would also be separated from vehicles undertaking parking manoeuvres which would further improve the operation of the car park. Improving the access arrangements would also reduce the queues entering the site and result in fewer vehicles blocking the access driveways and spilling back onto the external road network.

We recommend that upgrading the car parking layout is further investigated by Council in conjunction with the owner of the shopping centre, irrespective of other works undertaken on the road network. These works should be undertaken as a priority as this is an existing deficiency.

8.0 CONCLUSIONS

A number of options have been evaluated as part of this study based upon consideration of both strategic and detailed operational aspects.

In order to determine if the proposed options are feasible, it is recommended that Council undertake further detailed engineering design of the options assessed for 2021 prior to proceeding with any particular option. The suitability of the selected option should only be considered in conjunction with the desired outcome for the corridor and the cost to Council (social or actual construction costs). For example, it may not be appropriate to select Option 6 (upgrading to four lanes) if Council wishes to improve the amenity of Kalamunda Road and limit through-traffic movements.

Cardno Eppell Olsen has not been party to any costing discussions regarding the duplication of Kalamunda Road, however, it is understood that this option would only be possible at significant social and construction cost. The magnitude of operational benefits is not considered to suitably justify this likely cost. The duplication of Kalamunda Road would also serve to improve corridor operations, however, the modelling indicates that the construction of the link would not compare favourably from a cost/benefit perspective.

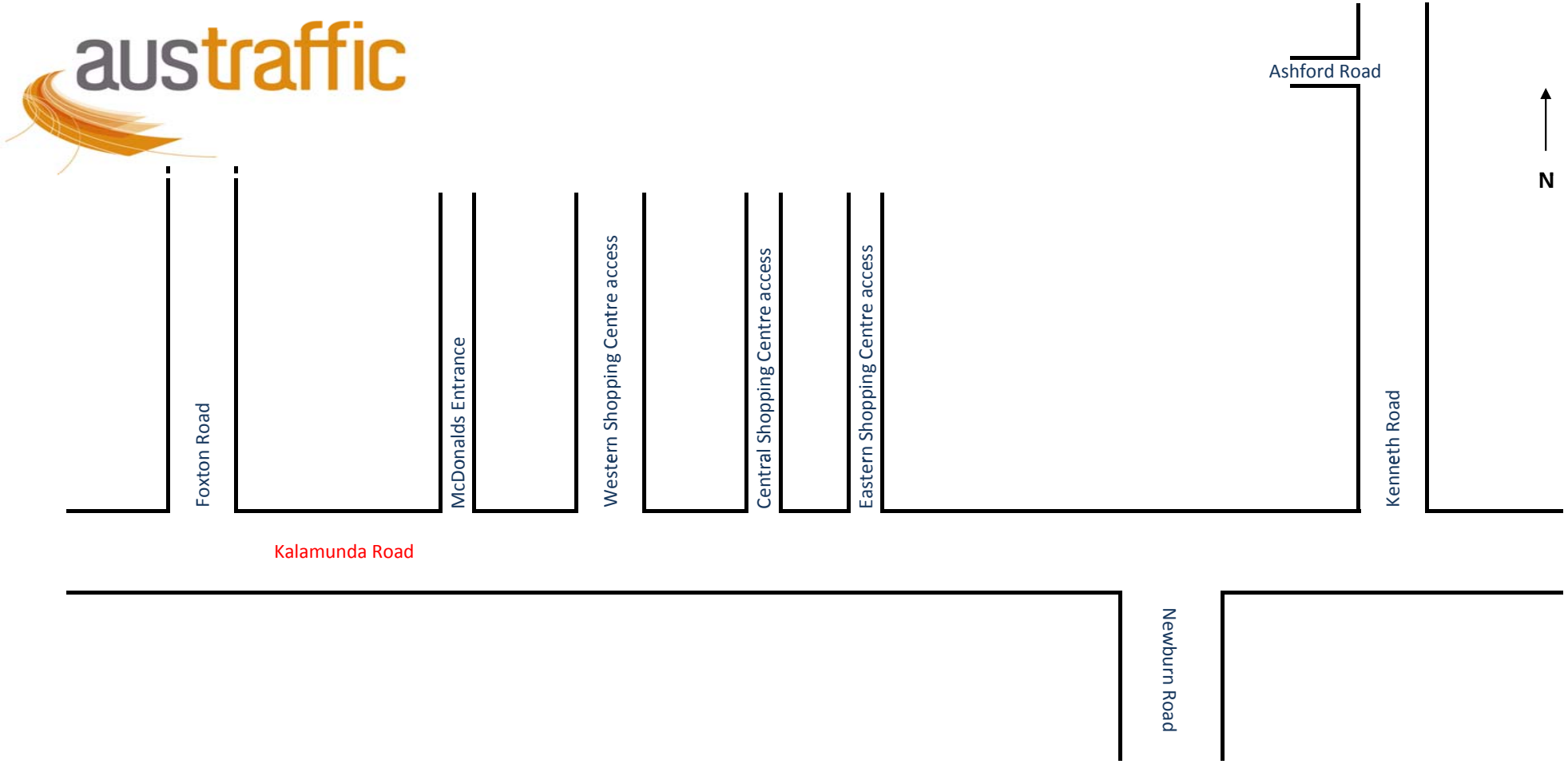
Amelioration Options 3 and 7 will provide localised capacity improvements in the vicinity of the shopping centre. These works would improve local and corridor traffic operations and would address the community concerns raised in relation to capacity constraints and the shopping centre access. Cardno understands that these works could be undertaken subject to further detailed design and land resumption reviews.

The installation of intersection controls is also suggested at major intersections. These works will improve localised capacity constraints as well as address safety concerns related to the high number of rear end incidents involving turning traffic.

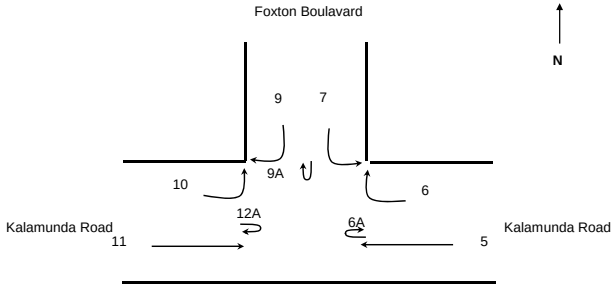
Appendix A

Traffic Count Data:

Intersection Turning Movement Counts


Ashford Road
N
Foxton Road
McDonalds Entrance
Western Shopping Centre access
Central Shopping Centre access
Eastern Shopping Centre access
Kenneth Road
Kalamunda Road
Newburn Road

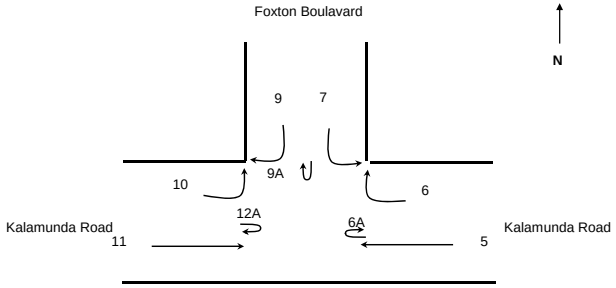
Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Foxton Boulavard
Weather :



Click here to go back to the diagram sheet

Time Period	Movement 5			Movement 6			Movement 6A			Movement 7			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	211	7	**218**	1	0	**1**	0	0	**0**	5	3	**8**	30	0	**30**	0	0	**0**	3	0	**3**	42	4	**46**	0	0	**0**	**306**	6:30-7:30	**1289**
6:45 - 7:00	199	9	**208**	0	0	**0**	0	0	**0**	8	3	**11**	23	0	**23**	0	0	**0**	1	0	**1**	50	9	**59**	0	0	**0**	**302**	6:45-7:45	**1355**
7:00 - 7:15	234	13	**247**	2	1	**3**	0	0	**0**	16	2	**18**	11	0	**11**	0	0	**0**	2	1	**3**	26	6	**32**	0	0	**0**	**314**	7:00-8:00	**1432**
7:15 - 7:30	255	15	**270**	0	0	**0**	0	0	**0**	15	1	**16**	14	0	**14**	0	0	**0**	5	0	**5**	49	13	**62**	0	0	**0**	**367**	7:15-8:15	**1422**
7:30 - 7:45	251	17	**268**	0	0	**0**	0	0	**0**	24	3	**27**	11	0	**11**	0	0	**0**	1	0	**1**	53	12	**65**	0	0	**0**	**372**	7:30-8:30	**1384**
7:45 - 8:00	221	12	**233**	7	0	**7**	0	0	**0**	26	1	**27**	16	0	**16**	0	0	**0**	3	0	**3**	77	16	**93**	0	0	**0**	**379**	7:45-8:45	**1325**
8:00 - 8:15	190	13	**203**	6	0	**6**	0	0	**0**	5	3	**8**	15	0	**15**	0	0	**0**	3	0	**3**	59	10	**69**	0	0	**0**	**304**	8:00-9:00	**1217**
8:15 - 8:30	150	9	**159**	8	1	**9**	0	0	**0**	13	2	**15**	16	0	**16**	0	0	**0**	5	0	**5**	107	18	**125**	0	0	**0**	**329**	8:15-9:15	**1149**
8:30 - 8:45	175	6	**181**	6	0	**6**	0	0	**0**	6	1	**7**	16	0	**16**	0	0	**0**	3	0	**3**	90	10	**100**	0	0	**0**	**313**	8:30-9:30	**1000**
8:45 - 9:00	127	4	**131**	11	1	**12**	0	0	**0**	18	2	**20**	11	5	**16**	0	0	**0**	3	0	**3**	80	9	**89**	0	0	**0**	**271**	**AM Peak**	**1432**
9:00 - 9:15	105	4	**109**	9	0	**9**	0	0	**0**	4	1	**5**	19	0	**19**	0	0	**0**	5	0	**5**	82	7	**89**	0	0	**0**	**236**		
9:15 - 9:30	45	11	**56**	6	0	**6**	0	0	**0**	2	2	**4**	8	0	**8**	0	0	**0**	3	1	**4**	87	15	**102**	0	0	**0**	**180**		
Total	**2163**	**120**	**2283**	**56**	**3**	**59**	**0**	**0**	**0**	**142**	**24**	**166**	**190**	**5**	**195**	**0**	**0**	**0**	**37**	**2**	**39**	**802**	**129**	**931**	**0**	**0**	**0**			
AM Peak	**961**	**57**	**1018**	**9**	**1**	**10**	**0**	**0**	**0**	**81**	**7**	**88**	**52**	**0**	**52**	**0**	**0**	**0**	**11**	**1**	**12**	**205**	**47**	**252**	**0**	**0**	**0**			

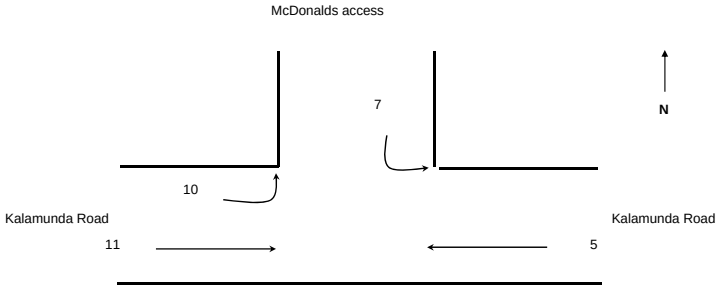
Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Foxton Boulavard
Weather :



Click here to go back to the diagram sheet

Time Period	Movement 5			Movement 6			Movement 6A			Movement 7			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	115	7	**122**	17	0	**17**	0	0	**0**	7	1	**8**	14	0	**14**	0	0	**0**	7	1	**8**	180	5	**185**	0	0	**0**	**354**	15:30-16:30	**1480**
15:45 - 16:00	109	6	**115**	7	0	**7**	0	0	**0**	1	0	**1**	15	0	**15**	0	0	**0**	16	1	**17**	187	5	**192**	0	0	**0**	**347**	15:45-16:45	**1513**
16:00 - 16:15	97	12	**109**	16	0	**16**	0	0	**0**	3	0	**3**	13	0	**13**	0	0	**0**	9	1	**10**	248	10	**258**	0	0	**0**	**409**	16:00-17:00	**1502**
16:15 - 16:30	116	8	**124**	11	0	**11**	0	0	**0**	0	0	**0**	13	0	**13**	0	0	**0**	9	0	**9**	206	7	**213**	0	0	**0**	**370**	16:15-17:15	**1512**
16:30 - 16:45	108	3	**111**	9	0	**9**	0	0	**0**	1	0	**1**	12	0	**12**	0	0	**0**	17	0	**17**	225	12	**237**	0	0	**0**	**387**	16:30-17:30	**1547**
16:45 - 17:00	67	2	**69**	18	0	**18**	0	0	**0**	0	0	**0**	11	0	**11**	0	0	**0**	20	0	**20**	215	3	**218**	0	0	**0**	**336**	16:45-17:45	**1508**
17:00 - 17:15	127	6	**133**	19	0	**19**	0	0	**0**	1	0	**1**	23	0	**23**	0	0	**0**	16	1	**17**	221	5	**226**	0	0	**0**	**419**	17:00-18:00	**1503**
17:15 - 17:30	108	1	**109**	14	0	**14**	0	0	**0**	2	0	**2**	14	0	**14**	0	0	**0**	21	0	**21**	241	4	**245**	0	0	**0**	**405**	17:15-18:15	**1412**
17:30 - 17:45	89	1	**90**	11	0	**11**	0	0	**0**	1	0	**1**	23	0	**23**	0	0	**0**	11	0	**11**	209	3	**212**	0	0	**0**	**348**	17:30-18:30	**1306**
17:45 - 18:00	108	1	**109**	10	0	**10**	0	0	**0**	2	0	**2**	12	0	**12**	0	0	**0**	12	0	**12**	184	2	**186**	0	0	**0**	**331**	**PM Peak**	**1547**
18:00 - 18:15	107	1	**108**	12	0	**12**	0	0	**0**	6	0	**6**	18	0	**18**	0	0	**0**	10	0	**10**	173	1	**174**	0	0	**0**	**328**		
18:15 - 18:30	97	1	**98**	8	0	**8**	0	0	**0**	2	0	**2**	6	0	**6**	0	0	**0**	10	0	**10**	173	2	**175**	0	0	**0**	**299**		
Total	**1248**	**49**	**1297**	**152**	**0**	**152**	**0**	**0**	**0**	**26**	**1**	**27**	**174**	**0**	**174**	**0**	**0**	**0**	**158**	**4**	**162**	**2462**	**59**	**2521**	**0**	**0**	**0**			
PM Peak	**410**	**12**	**422**	**60**	**0**	**60**	**0**	**0**	**0**	**4**	**0**	**4**	**60**	**0**	**60**	**0**	**0**	**0**	**74**	**1**	**75**	**902**	**24**	**926**	**0**	**0**	**0**			

Client : **Cardno**
Job : **Classified Turning Movements**
Day/Date : **Thursday 29th October**
Survey Location : **Kalamunda Road & Eastern Shopping Centre access**
Weather :



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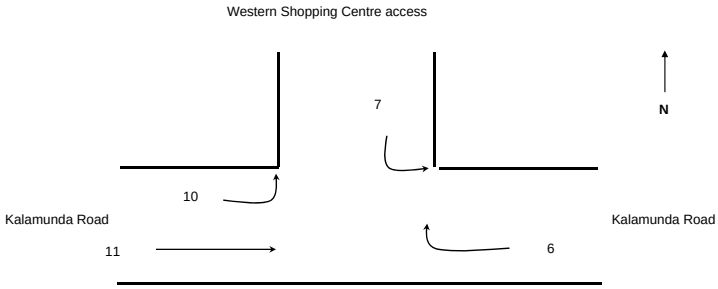
Time Period	Movement 5			Movement 7			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	211	7	**218**	1	0	**1**	1	0	**1**	52	17	**69**	**289**	6:30-7:30	**1395**
6:45 - 7:00	199	9	**208**	2	0	**2**	1	0	**1**	86	14	**100**	**311**	6:45-7:45	**1615**
7:00 - 7:15	234	13	**247**	4	0	**4**	0	0	**0**	94	23	**117**	**368**	7:00-8:00	**1741**
7:15 - 7:30	255	15	**270**	4	0	**4**	1	0	**1**	130	22	**152**	**427**	7:15-8:15	**1834**
7:30 - 7:45	251	17	**268**	3	2	**5**	1	0	**1**	209	26	**235**	**509**	7:30-8:30	**1806**
7:45 - 8:00	221	12	**233**	5	0	**5**	1	0	**1**	168	30	**198**	**437**	7:45-8:45	**1610**
8:00 - 8:15	190	13	**203**	5	0	**5**	2	0	**2**	219	32	**251**	**461**	8:00-9:00	**1439**
8:15 - 8:30	150	9	**159**	6	0	**6**	0	0	**0**	193	41	**234**	**399**	8:15-9:15	**1217**
8:30 - 8:45	175	6	**181**	2	0	**2**	4	0	**4**	85	41	**126**	**313**	8:30-9:30	**1012**
8:45 - 9:00	127	4	**131**	8	0	**8**	1	0	**1**	77	49	**126**	**266**	**AM Peak**	**1834**
9:00 - 9:15	105	4	**109**	7	0	**7**	1	0	**1**	97	25	**122**	**239**		
9:15 - 9:30	45	11	**56**	4	0	**4**	2	0	**2**	95	37	**132**	**194**		
Total	**2163**	**120**	**2283**	**51**	**2**	**53**	**15**	**0**	**15**	**1505**	**357**	**1862**			
AM Peak	**917**	**57**	**974**	**17**	**2**	**19**	**5**	**0**	**5**	**726**	**110**	**836**			

Time Period	Movement 5			Movement 7			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	115	7	**122**	7	0	**7**	3	0	**3**	184	6	**190**	**322**	15:30-16:30	**1355**
15:45 - 16:00	109	6	**115**	5	0	**5**	3	0	**3**	185	5	**190**	**313**	15:45-16:45	**1389**
16:00 - 16:15	97	12	**109**	5	0	**5**	5	0	**5**	246	10	**256**	**375**	16:00-17:00	**1371**
16:15 - 16:30	116	8	**124**	8	0	**8**	3	0	**3**	203	7	**210**	**345**	16:15-17:15	**1360**
16:30 - 16:45	108	3	**111**	7	0	**7**	3	0	**3**	223	12	**235**	**356**	16:30-17:30	**1380**
16:45 - 17:00	67	2	**69**	8	0	**8**	3	0	**3**	212	3	**215**	**295**	16:45-17:45	**1336**
17:00 - 17:15	127	6	**133**	4	0	**4**	4	0	**4**	218	5	**223**	**364**	17:00-18:00	**1347**
17:15 - 17:30	108	1	**109**	9	0	**9**	4	0	**4**	239	4	**243**	**365**	17:15-18:15	**1280**
17:30 - 17:45	89	1	**90**	9	0	**9**	5	0	**5**	205	3	**208**	**312**	17:30-18:30	**1196**
17:45 - 18:00	108	1	**109**	9	0	**9**	5	0	**5**	181	2	**183**	**306**	**PM Peak**	**1389**
18:00 - 18:15	107	1	**108**	9	0	**9**	2	0	**2**	177	1	**178**	**297**		
18:15 - 18:30	97	1	**98**	6	0	**6**	4	0	**4**	171	2	**173**	**281**		
Total	**1248**	**49**	**1297**	**86**	**0**	**86**	**44**	**0**	**44**	**2444**	**60**	**2504**			
PM Peak	**430**	**29**	**459**	**25**	**0**	**25**	**14**	**0**	**14**	**857**	**34**	**891**			

Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Western Shopping Centre access
Weather :



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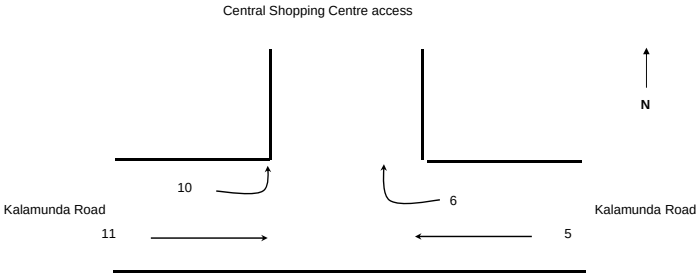
Time Period	Movement 6			Movement 7			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	7	0	7	8	0	8	3	0	3	53	17	70	88	6:30-7:30	602
6:45 - 7:00	11	0	11	25	0	25	15	0	15	87	14	101	152	6:45-7:45	811
7:00 - 7:15	6	0	6	20	0	20	5	0	5	94	23	117	148	7:00-8:00	943
7:15 - 7:30	14	0	14	30	0	30	17	0	17	131	22	153	214	7:15-8:15	1125
7:30 - 7:45	8	0	8	31	0	31	22	0	22	210	26	236	297	7:30-8:30	1269
7:45 - 8:00	40	2	42	39	0	39	4	0	4	169	30	199	284	7:45-8:45	1184
8:00 - 8:15	22	1	23	31	1	32	22	0	22	221	32	253	330	8:00-9:00	1201
8:15 - 8:30	51	4	55	56	2	58	10	1	11	193	41	234	358	8:15-9:15	1124
8:30 - 8:45	34	3	37	42	0	42	3	0	3	89	41	130	212	8:30-9:30	982
8:45 - 9:00	77	6	83	78	0	78	13	0	13	78	49	127	301	AM Peak	1269
9:00 - 9:15	33	3	36	44	1	45	49	0	49	98	25	123	253		
9:15 - 9:30	24	2	26	22	0	22	34	0	34	97	37	134	216		
Total	327	21	348	426	4	430	197	1	198	1520	357	1877			
AM Peak	121	7	128	157	3	160	58	1	59	793	129	922			

Time Period	Movement 6			Movement 7			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	13	0	13	27	0	27	28	0	28	184	3	187	255	15:30-16:30	1222
15:45 - 16:00	32	2	34	38	0	38	31	0	31	178	10	188	291	15:45-16:45	1247
16:00 - 16:15	12	2	14	43	0	43	48	0	48	212	10	222	327	16:00-17:00	1227
16:15 - 16:30	41	2	43	27	0	27	32	0	32	220	27	247	349	16:15-17:15	1151
16:30 - 16:45	7	0	7	23	0	23	40	0	40	179	31	210	280	16:30-17:30	1077
16:45 - 17:00	10	5	15	18	0	18	35	0	35	199	4	203	271	16:45-17:45	1116
17:00 - 17:15	10	3	13	10	0	10	17	0	17	211	0	211	251	17:00-18:00	1099
17:15 - 17:30	1	6	7	30	0	30	16	0	16	208	14	222	275	17:15-18:15	1107
17:30 - 17:45	28	5	33	21	0	21	74	0	74	180	11	191	319	17:30-18:30	1081
17:45 - 18:00	20	5	25	29	1	30	17	0	17	181	1	182	254	PM Peak	1247
18:00 - 18:15	32	2	34	21	0	21	22	0	22	164	18	182	259		
18:15 - 18:30	9	2	11	50	1	51	19	0	19	155	13	168	249		
Total	215	34	249	337	2	339	379	0	379	2271	142	2413			
PM Peak	92	6	98	131	0	131	151	0	151	789	78	867			

Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Central Shopping Centre access
Weather :



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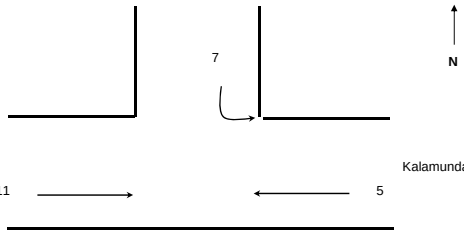
Time Period	Movement 5			Movement 6			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	218	7	225	5	0	5	0	0	0	43	7	50	280	6:30-7:30	1247
6:45 - 7:00	210	9	219	13	0	13	2	0	2	56	9	65	299	6:45-7:45	1312
7:00 - 7:15	240	13	253	8	0	8	4	0	4	40	6	46	311	7:00-8:00	1358
7:15 - 7:30	269	15	284	8	0	8	3	0	3	51	11	62	357	7:15-8:15	1372
7:30 - 7:45	259	17	276	5	0	5	2	0	2	53	9	62	345	7:30-8:30	1257
7:45 - 8:00	261	14	275	10	0	10	5	0	5	43	12	55	345	7:45-8:45	1260
8:00 - 8:15	212	14	226	17	0	17	7	0	7	68	7	75	325	8:00-9:00	1257
8:15 - 8:30	201	13	214	6	0	6	3	0	3	16	3	19	242	8:15-9:15	1206
8:30 - 8:45	209	9	218	18	0	18	5	0	5	93	14	107	348	8:30-9:30	1284
8:45 - 9:00	204	10	214	29	0	29	6	0	6	85	8	93	342	AM Peak	1372
9:00 - 9:15	138	7	145	28	0	28	8	0	8	80	13	93	274		
9:15 - 9:30	69	13	82	55	0	55	15	0	15	146	22	168	320		
Total	2490	141	2631	202	0	202	60	0	60	774	121	895			
AM Peak	1001	60	1061	40	0	40	17	0	17	215	39	254			

Time Period	Movement 5			Movement 6			Movement 10			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	133	10	143	34	0	34	13	0	13	181	12	193	383	15:30-16:30	1384
15:45 - 16:00	126	3	129	41	0	41	22	0	22	187	7	194	386	15:45-16:45	1346
16:00 - 16:15	80	7	87	39	0	39	26	0	26	166	8	174	326	16:00-17:00	1287
16:15 - 16:30	101	8	109	33	0	33	12	0	12	128	7	135	289	16:15-17:15	1314
16:30 - 16:45	96	4	100	36	0	36	11	0	11	179	19	198	345	16:30-17:30	1360
16:45 - 17:00	95	0	95	49	0	49	14	0	14	162	7	169	327	16:45-17:45	1310
17:00 - 17:15	99	4	103	28	0	28	15	0	15	200	7	207	353	17:00-18:00	1365
17:15 - 17:30	95	2	97	35	0	35	11	0	11	188	4	192	335	17:15-18:15	1203
17:30 - 17:45	75	1	76	31	0	31	22	0	22	160	6	166	295	17:30-18:30	1096
17:45 - 18:00	123	4	127	49	0	49	21	0	21	181	4	185	382	PM Peak	1384
18:00 - 18:15	72	1	73	19	0	19	6	0	6	92	1	93	191		
18:15 - 18:30	84	1	85	20	0	20	3	0	3	119	1	120	228		
Total	1179	45	1224	414	0	414	176	0	176	1943	83	2026			
PM Peak	440	28	468	147	0	147	73	0	73	662	34	696			

austraffic

Eastern Shopping Centre access



Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Eastern Shopping Centre access
Weather :

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Time Period	Movement 5			Movement 7			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	223	7	230	6	1	7	45	8	53	290	6:30-7:30	1303
6:45 - 7:00	223	9	232	9	0	9	58	11	69	310	6:45-7:45	1372
7:00 - 7:15	248	13	261	8	0	8	57	7	64	333	7:00-8:00	1441
7:15 - 7:30	277	15	292	11	1	12	55	11	66	370	7:15-8:15	1460
7:30 - 7:45	264	17	281	5	0	5	66	7	73	359	7:30-8:30	1475
7:45 - 8:00	271	14	285	16	0	16	66	12	78	379	7:45-8:45	1501
8:00 - 8:15	229	14	243	20	0	20	76	13	89	352	8:00-9:00	1495
8:15 - 8:30	207	13	220	32	1	33	117	15	132	385	8:15-9:15	1436
8:30 - 8:45	227	9	236	21	1	22	114	13	127	385	8:30-9:30	1307
8:45 - 9:00	233	10	243	26	1	27	93	10	103	373	AM Peak	1501
9:00 - 9:15	166	7	173	35	0	35	79	6	85	293		
9:15 - 9:30	124	13	137	25	0	25	83	11	94	256		
Total	2692	141	2833	214	5	219	909	124	1033			
AM Peak	934	50	984	89	2	91	373	53	426			

Time Period	Movement 5			Movement 7			Movement 11			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	167	10	177	47	0	47	151	6	157	381	15:30-16:30	1658
15:45 - 16:00	174	7	181	50	0	50	180	7	187	418	15:45-16:45	1706
16:00 - 16:15	163	9	172	51	0	51	221	9	230	453	16:00-17:00	1703
16:15 - 16:30	166	9	175	63	2	65	161	5	166	406	16:15-17:15	1685
16:30 - 16:45	157	7	164	48	1	49	208	8	216	429	16:30-17:30	1722
16:45 - 17:00	176	6	182	59	0	59	169	5	174	415	16:45-17:45	1704
17:00 - 17:15	161	5	166	48	0	48	215	6	221	435	17:00-18:00	1694
17:15 - 17:30	150	4	154	62	2	64	222	3	225	443	17:15-18:15	1675
17:30 - 17:45	150	2	152	61	0	61	195	3	198	411	17:30-18:30	1596
17:45 - 18:00	166	1	167	54	1	55	181	2	183	405	PM Peak	1722
18:00 - 18:15	157	1	158	79	0	79	177	2	179	416		
18:15 - 18:30	142	4	146	49	0	49	167	2	169	364		
Total	1929	65	1994	671	6	677	2247	58	2305			
PM Peak	644	22	666	217	3	220	814	22	836			

Client : Cardno
Job : Classified Turning Movements
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Survey Location : Kalamunda Road & Newburn Road
Weather :

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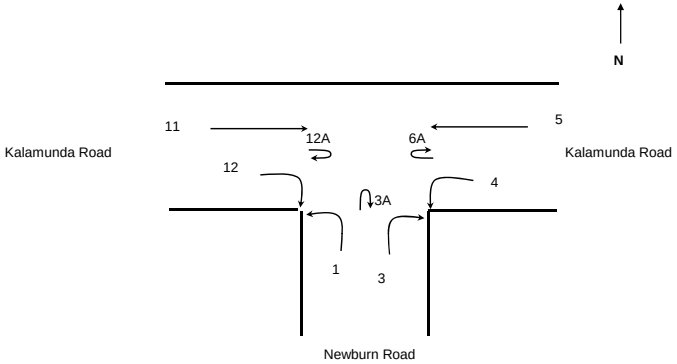

Time Period	Movement 1			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6A			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	36	0	**36**	14	0	**14**	0	0	**0**	5	1	**6**	179	7	**186**	0	0	**0**	39	11	**50**	10	0	**10**	8	0	**8**	**310**	6:30-7:30	**1364**
6:45 - 7:00	26	1	**27**	11	3	**14**	0	0	**0**	2	0	**2**	192	8	**200**	0	0	**0**	58	7	**65**	7	2	**9**	5	0	**5**	**322**	6:45-7:45	**1453**
7:00 - 7:15	11	2	**13**	16	4	**20**	0	0	**0**	4	0	**4**	230	11	**241**	0	0	**0**	49	7	**56**	8	1	**9**	7	0	**7**	**350**	7:00-8:00	**1534**
7:15 - 7:30	25	4	**29**	13	1	**14**	0	0	**0**	6	1	**7**	242	11	**253**	0	0	**0**	47	9	**56**	11	2	**13**	10	0	**10**	**382**	7:15-8:15	**1581**
7:30 - 7:45	30	1	**31**	29	1	**30**	0	0	**0**	6	3	**9**	226	16	**242**	0	0	**0**	59	10	**69**	10	0	**10**	8	0	**8**	**399**	7:30-8:30	**1614**
7:45 - 8:00	33	1	**34**	15	3	**18**	0	0	**0**	11	1	**12**	222	12	**234**	1	0	**1**	66	10	**76**	10	1	**11**	16	1	**17**	**403**	7:45-8:45	**1636**
8:00 - 8:15	27	3	**30**	25	3	**28**	0	0	**0**	9	0	**9**	194	10	**204**	0	0	**0**	88	11	**99**	18	0	**18**	8	1	**9**	**397**	8:00-9:00	**1643**
8:15 - 8:30	27	1	**28**	22	1	**23**	0	0	**0**	16	1	**17**	167	11	**178**	0	0	**0**	105	14	**119**	34	2	**36**	13	1	**14**	**415**	8:15-9:15	**1576**
8:30 - 8:45	39	3	**42**	30	3	**33**	0	0	**0**	19	1	**20**	176	6	**182**	1	0	**1**	93	7	**100**	28	3	**31**	12	0	**12**	**421**	8:30-9:30	**1443**
8:45 - 9:00	44	1	**45**	33	2	**35**	0	0	**0**	16	1	**17**	175	9	**184**	0	0	**0**	82	10	**92**	23	0	**23**	14	0	**14**	**410**	**AM Peak**	**1643**
9:00 - 9:15	28	0	**28**	28	0	**28**	0	0	**0**	16	1	**17**	123	7	**130**	0	0	**0**	92	8	**100**	11	1	**12**	15	0	**15**	**330**		
9:15 - 9:30	22	1	**23**	23	1	**24**	0	0	**0**	9	2	**11**	92	11	**103**	1	0	**1**	81	14	**95**	14	0	**14**	10	1	**11**	**282**		
Total	**348**	**18**	**366**	**259**	**22**	**281**	**0**	**0**	**0**	**119**	**12**	**131**	**2218**	**119**	**2337**	**3**	**0**	**3**	**859**	**118**	**977**	**184**	**12**	**196**	**126**	**4**	**130**			
AM Peak	**137**	**8**	**145**	**110**	**9**	**119**	**0**	**0**	**0**	**60**	**3**	**63**	**712**	**36**	**748**	**1**	**0**	**1**	**368**	**42**	**410**	**103**	**5**	**108**	**47**	**2**	**49**			

Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
Survey Location : Kalamunda Road & Newburn Road
Weather :

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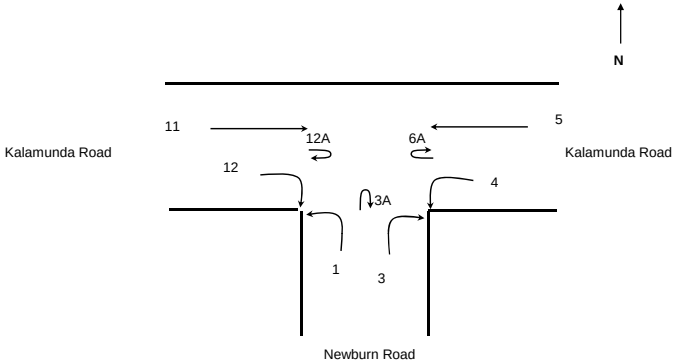

Time Period	Movement 1			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6A			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	32	2	**34**	30	0	**30**	1	0	**1**	13	0	**13**	118	8	**126**	0	0	**0**	142	3	**145**	38	0	**38**	17	0	**17**	**404**	15:30-16:30	**1770**
15:45 - 16:00	39	3	**42**	26	2	**28**	0	0	**0**	8	3	**11**	119	4	**123**	0	0	**0**	186	4	**190**	35	2	**37**	16	0	**16**	**447**	15:45-16:45	**1868**
16:00 - 16:15	32	1	**33**	19	3	**22**	0	0	**0**	15	1	**16**	115	8	**123**	0	0	**0**	203	3	**206**	50	1	**51**	16	0	**16**	**467**	16:00-17:00	**1901**
16:15 - 16:30	36	2	**38**	22	3	**25**	0	0	**0**	15	3	**18**	111	7	**118**	1	0	**1**	183	2	**185**	48	0	**48**	19	0	**19**	**452**	16:15-17:15	**1928**
16:30 - 16:45	32	1	**33**	36	1	**37**	0	0	**0**	17	0	**17**	114	5	**119**	2	0	**2**	222	9	**231**	51	0	**51**	11	1	**12**	**502**	16:30-17:30	**1966**
16:45 - 17:00	38	3	**41**	33	2	**35**	1	0	**1**	25	0	**25**	121	3	**124**	0	0	**0**	181	5	**186**	51	0	**51**	17	0	**17**	**480**	16:45-17:45	**1921**
17:00 - 17:15	32	2	**34**	24	1	**25**	0	0	**0**	9	3	**12**	121	3	**124**	2	0	**2**	243	5	**248**	40	1	**41**	8	0	**8**	**494**	17:00-18:00	**1900**
17:15 - 17:30	36	0	**36**	29	0	**29**	0	0	**0**	14	1	**15**	107	4	**111**	1	0	**1**	239	7	**246**	45	0	**45**	7	0	**7**	**490**	17:15-18:15	**1838**
17:30 - 17:45	26	0	**26**	25	1	**26**	0	0	**0**	19	0	**19**	111	2	**113**	1	0	**1**	201	7	**208**	50	1	**51**	13	0	**13**	**457**	17:30-18:30	**1739**
17:45 - 18:00	36	0	**36**	29	1	**30**	0	0	**0**	16	0	**16**	119	1	**120**	0	0	**0**	187	3	**190**	53	3	**56**	11	0	**11**	**459**	**PM Peak**	**1966**
18:00 - 18:15	48	0	**48**	25	1	**26**	0	0	**0**	14	0	**14**	92	1	**93**	0	0	**0**	185	2	**187**	45	2	**47**	17	0	**17**	**432**		
18:15 - 18:30	24	0	**24**	25	0	**25**	0	0	**0**	13	1	**14**	110	4	**114**	1	0	**1**	172	1	**173**	32	0	**32**	8	0	**8**	**391**		
Total	**411**	**14**	**425**	**323**	**15**	**338**	**2**	**0**	**2**	**178**	**12**	**190**	**1358**	**50**	**1408**	**8**	**0**	**8**	**2344**	**51**	**2395**	**538**	**10**	**548**	**160**	**1**	**161**			
PM Peak	**138**	**6**	**144**	**122**	**4**	**126**	**1**	**0**	**1**	**65**	**4**	**69**	**463**	**15**	**478**	**5**	**0**	**5**	**885**	**26**	**911**	**187**	**1**	**188**	**43**	**1**	**44**			

Client : Cardno
Job : Classified Turning Movements
Day/Date : Thursday 29th October
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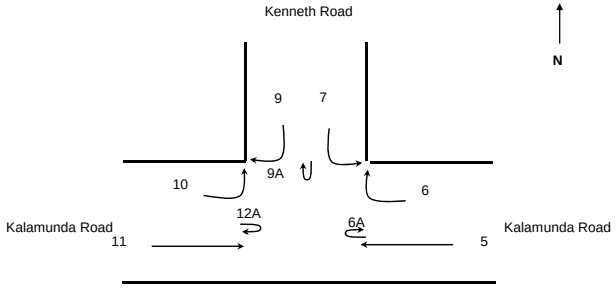
Weather :



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Time Period	Movement 5			Movement 6			Movement 6A			Movement 7			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	179	6	**185**	3	3	**6**	0	0	**0**	15	0	**15**	22	1	**23**	0	0	**0**	8	0	**8**	31	8	**39**	0	0	**0**	**276**	6:30-7:30	**1233**
6:45 - 7:00	182	6	**188**	5	1	**6**	0	0	**0**	7	0	**7**	16	0	**16**	0	0	**0**	5	2	**7**	54	11	**65**	0	0	**0**	**289**	6:45-7:45	**1310**
7:00 - 7:15	213	12	**225**	2	1	**3**	0	0	**0**	8	0	**8**	6	0	**6**	0	0	**0**	7	2	**9**	57	8	**65**	0	0	**0**	**316**	7:00-8:00	**1367**
7:15 - 7:30	235	12	**247**	7	0	**7**	0	0	**0**	14	0	**14**	15	0	**15**	1	0	**1**	8	0	**8**	52	8	**60**	0	0	**0**	**352**	7:15-8:15	**1366**
7:30 - 7:45	216	22	**238**	8	1	**9**	0	0	**0**	6	1	**7**	9	1	**10**	0	0	**0**	13	0	**13**	70	6	**76**	0	0	**0**	**353**	7:30-8:30	**1397**
7:45 - 8:00	211	11	**222**	3	0	**3**	0	0	**0**	6	1	**7**	10	1	**11**	1	0	**1**	6	0	**6**	80	16	**96**	0	0	**0**	**346**	7:45-8:45	**1403**
8:00 - 8:15	174	10	**184**	3	0	**3**	0	0	**0**	9	1	**10**	8	0	**8**	0	0	**0**	13	3	**16**	84	10	**94**	0	0	**0**	**315**	8:00-9:00	**1418**
8:15 - 8:30	195	10	**205**	10	0	**10**	0	0	**0**	19	0	**19**	8	1	**9**	0	0	**0**	12	1	**13**	117	10	**127**	0	0	**0**	**383**	8:15-9:15	**1385**
8:30 - 8:45	171	8	**179**	6	0	**6**	0	0	**0**	13	0	**13**	16	1	**17**	0	0	**0**	13	2	**15**	115	14	**129**	0	0	**0**	**359**	8:30-9:30	**1238**
8:45 - 9:00	184	11	**195**	8	0	**8**	0	0	**0**	16	0	**16**	14	1	**15**	0	0	**0**	12	1	**13**	101	13	**114**	0	0	**0**	**361**	**AM Peak**	**1418**
9:00 - 9:15	122	8	**130**	11	0	**11**	0	0	**0**	10	0	**10**	13	0	**13**	0	0	**0**	15	0	**15**	96	7	**103**	0	0	**0**	**282**		
9:15 - 9:30	88	11	**99**	4	0	**4**	0	0	**0**	4	0	**4**	10	0	**10**	0	0	**0**	12	0	**12**	94	13	**107**	0	0	**0**	**236**		
Total	**2170**	**127**	**2297**	**70**	**6**	**76**	**0**	**0**	**0**	**127**	**3**	**130**	**147**	**6**	**153**	**2**	**0**	**2**	**124**	**11**	**135**	**951**	**124**	**1075**	**0**	**0**	**0**			
AM Peak	**724**	**39**	**763**	**27**	**0**	**27**	**0**	**0**	**0**	**57**	**1**	**58**	**46**	**3**	**49**	**0**	**0**	**0**	**50**	**7**	**57**	**417**	**47**	**464**	**0**	**0**	**0**			

Client : Cardno
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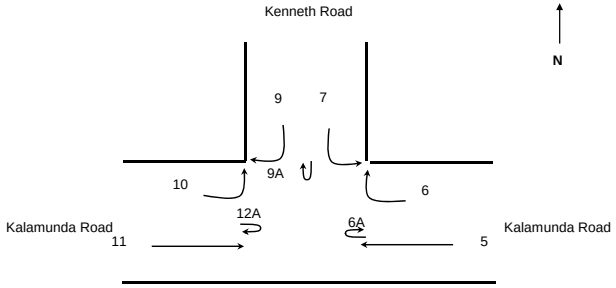

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Time Period	Movement 5			Movement 6			Movement 6A			Movement 7			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	129	6	**135**	9	0	**9**	0	0	**0**	13	0	**13**	6	0	**6**	0	0	**0**	13	0	**13**	177	4	**181**	0	0	**0**	**357**	15:30-16:30	**1464**
15:45 - 16:00	123	8	**131**	7	0	**7**	0	0	**0**	10	1	**11**	2	0	**2**	0	0	**0**	14	1	**15**	224	7	**231**	0	0	**0**	**397**	15:45-16:45	**1517**
16:00 - 16:15	111	10	**121**	14	1	**15**	0	0	**0**	18	0	**18**	6	1	**7**	0	0	**0**	11	2	**13**	175	10	**185**	0	0	**0**	**359**	16:00-17:00	**1499**
16:15 - 16:30	119	8	**127**	6	0	**6**	0	0	**0**	12	0	**12**	4	2	**6**	0	0	**0**	15	0	**15**	178	7	**185**	0	0	**0**	**351**	16:15-17:15	**1592**
16:30 - 16:45	121	3	**124**	7	0	**7**	0	0	**0**	17	1	**18**	4	0	**4**	0	0	**0**	21	0	**21**	228	8	**236**	0	0	**0**	**410**	16:30-17:30	**1639**
16:45 - 17:00	132	2	**134**	6	0	**6**	0	0	**0**	14	1	**15**	6	0	**6**	0	0	**0**	15	0	**15**	198	5	**203**	0	0	**0**	**379**	16:45-17:45	**1611**
17:00 - 17:15	124	4	**128**	15	1	**16**	0	0	**0**	15	0	**15**	3	0	**3**	0	0	**0**	19	1	**20**	265	5	**270**	0	0	**0**	**452**	17:00-18:00	**1595**
17:15 - 17:30	117	4	**121**	11	0	**11**	0	0	**0**	18	0	**18**	11	0	**11**	0	0	**0**	14	0	**14**	218	5	**223**	0	0	**0**	**398**	17:15-18:15	**1490**
17:30 - 17:45	122	2	**124**	12	0	**12**	0	0	**0**	8	0	**8**	3	0	**3**	0	0	**0**	21	1	**22**	208	5	**213**	0	0	**0**	**382**	17:30-18:30	**1438**
17:45 - 18:00	122	2	**124**	6	0	**6**	0	0	**0**	12	0	**12**	6	0	**6**	0	0	**0**	8	0	**8**	203	4	**207**	0	0	**0**	**363**	**PM Peak**	**1639**
18:00 - 18:15	109	2	**111**	5	0	**5**	0	0	**0**	12	0	**12**	6	0	**6**	0	0	**0**	15	0	**15**	196	2	**198**	0	0	**0**	**347**		
18:15 - 18:30	111	3	**114**	15	0	**15**	0	0	**0**	9	0	**9**	4	0	**4**	0	0	**0**	15	0	**15**	188	1	**189**	0	0	**0**	**346**		
Total	**1440**	**54**	**1494**	**113**	**2**	**115**	**0**	**0**	**0**	**158**	**3**	**161**	**61**	**3**	**64**	**0**	**0**	**0**	**181**	**5**	**186**	**2458**	**63**	**2521**	**0**	**0**	**0**			
PM Peak	**494**	**13**	**507**	**39**	**1**	**40**	**0**	**0**	**0**	**64**	**2**	**66**	**24**	**0**	**24**	**0**	**0**	**0**	**69**	**1**	**70**	**909**	**23**	**932**	**0**	**0**	**0**			

Client : Cardno
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Weather :

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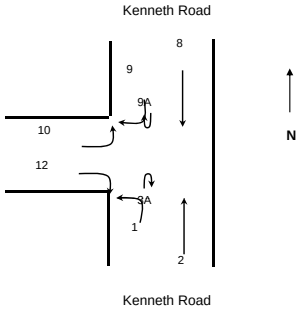

Time Period	Movement 1			Movement 2			Movement 2A			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 12			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
6:30 - 6:45	2	0	**2**	3	0	**3**	0	0	**0**	5	0	**5**	0	0	**0**	0	0	**0**	2	0	**2**	2	0	**2**	**14**	6:30-7:30	**71**
6:45 - 7:00	1	0	**1**	0	0	**0**	0	0	**0**	12	0	**12**	0	0	**0**	0	0	**0**	0	0	**0**	2	0	**2**	**15**	6:45-7:45	**86**
7:00 - 7:15	0	0	**0**	3	0	**3**	0	0	**0**	13	0	**13**	1	0	**1**	0	0	**0**	1	0	**1**	2	0	**2**	**20**	7:00-8:00	**93**
7:15 - 7:30	0	0	**0**	3	0	**3**	0	0	**0**	18	0	**18**	1	0	**1**	0	0	**0**	0	0	**0**	0	0	**0**	**22**	7:15-8:15	**109**
7:30 - 7:45	1	0	**1**	7	1	**8**	0	0	**0**	19	0	**19**	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**	**29**	7:30-8:30	**114**
7:45 - 8:00	0	1	**1**	8	0	**8**	0	0	**0**	11	0	**11**	1	0	**1**	0	0	**0**	0	0	**0**	1	0	**1**	**22**	7:45-8:45	**107**
8:00 - 8:15	1	0	**1**	7	0	**7**	0	0	**0**	23	1	**24**	2	0	**2**	0	0	**0**	1	0	**1**	1	0	**1**	**36**	8:00-9:00	**120**
8:15 - 8:30	1	0	**1**	7	0	**7**	0	0	**0**	13	0	**13**	5	0	**5**	0	0	**0**	0	0	**0**	1	0	**1**	**27**	8:15-9:15	**127**
8:30 - 8:45	0	0	**0**	4	0	**4**	0	0	**0**	11	0	**11**	5	0	**5**	0	0	**0**	1	0	**1**	1	0	**1**	**22**	8:30-9:30	**128**
8:45 - 9:00	0	0	**0**	11	0	**11**	0	0	**0**	17	0	**17**	3	0	**3**	0	0	**0**	4	0	**4**	0	0	**0**	**35**	**AM Peak**	**128**
9:00 - 9:15	3	0	**3**	12	0	**12**	0	0	**0**	22	0	**22**	3	0	**3**	0	0	**0**	1	0	**1**	2	0	**2**	**43**		
9:15 - 9:30	1	0	**1**	4	0	**4**	0	0	**0**	16	0	**16**	4	0	**4**	0	0	**0**	3	0	**3**	0	0	**0**	**28**		
Total	**10**	**1**	**11**	**69**	**1**	**70**	**0**	**0**	**0**	**180**	**1**	**181**	**25**	**0**	**25**	**0**	**0**	**0**	**14**	**0**	**14**	**12**	**0**	**12**			
AM Peak	**4**	**0**	**4**	**31**	**0**	**31**	**0**	**0**	**0**	**66**	**0**	**66**	**15**	**0**	**15**	**0**	**0**	**0**	**9**	**0**	**9**	**3**	**0**	**3**			

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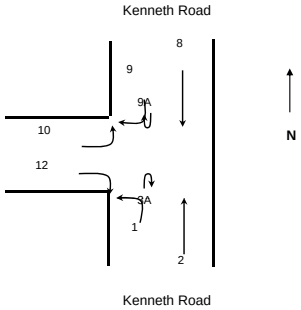


Time Period	Movement 1			Movement 2			Movement 2A			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 12			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
15:30 - 15:45	1	0	**1**	19	0	**19**	0	0	**0**	11	0	**11**	10	0	**10**	0	0	**0**	7	0	**7**	0	0	**0**	**48**	15:30-16:30	**210**
15:45 - 16:00	5	0	**5**	11	0	**11**	0	0	**0**	13	0	**13**	3	0	**3**	0	0	**0**	9	0	**9**	3	0	**3**	**44**	15:45-16:45	**220**
16:00 - 16:15	5	0	**5**	19	1	**20**	0	0	**0**	12	0	**12**	7	0	**7**	0	0	**0**	12	0	**12**	7	0	**7**	**63**	16:00-17:00	**241**
16:15 - 16:30	3	0	**3**	13	0	**13**	0	0	**0**	14	1	**15**	7	0	**7**	0	0	**0**	15	0	**15**	2	0	**2**	**55**	16:15-17:15	**241**
16:30 - 16:45	4	0	**4**	17	0	**17**	0	0	**0**	10	0	**10**	4	0	**4**	0	0	**0**	12	0	**12**	11	0	**11**	**58**	16:30-17:30	**253**
16:45 - 17:00	3	0	**3**	15	0	**15**	0	0	**0**	12	0	**12**	10	0	**10**	0	0	**0**	19	0	**19**	6	0	**6**	**65**	16:45-17:45	**258**
17:00 - 17:15	2	0	**2**	21	0	**21**	0	0	**0**	9	0	**9**	10	0	**10**	0	0	**0**	12	0	**12**	9	0	**9**	**63**	17:00-18:00	**245**
17:15 - 17:30	3	0	**3**	17	0	**17**	0	0	**0**	13	0	**13**	1	0	**1**	0	0	**0**	20	0	**20**	13	0	**13**	**67**	17:15-18:15	**246**
17:30 - 17:45	1	0	**1**	29	0	**29**	0	0	**0**	10	0	**10**	8	0	**8**	0	0	**0**	11	0	**11**	4	0	**4**	**63**	17:30-18:30	**238**
17:45 - 18:00	2	0	**2**	12	0	**12**	0	0	**0**	8	0	**8**	12	0	**12**	0	0	**0**	13	0	**13**	5	0	**5**	**52**	**PM Peak**	**258**
18:00 - 18:15	3	0	**3**	16	0	**16**	0	0	**0**	12	0	**12**	7	0	**7**	0	0	**0**	19	0	**19**	7	0	**7**	**64**		
18:15 - 18:30	3	0	**3**	23	0	**23**	0	0	**0**	3	0	**3**	4	0	**4**	0	0	**0**	23	0	**23**	3	0	**3**	**59**		
Total	**35**	**0**	**35**	**212**	**1**	**213**	**0**	**0**	**0**	**127**	**1**	**128**	**83**	**0**	**83**	**0**	**0**	**0**	**172**	**0**	**172**	**70**	**0**	**70**			
PM Peak	**9**	**0**	**9**	**82**	**0**	**82**	**0**	**0**	**0**	**44**	**0**	**44**	**29**	**0**	**29**	**0**	**0**	**0**	**62**	**0**	**62**	**32**	**0**	**32**			

Appendix B

Traffic Count Data:

Tube Counts

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-277 -- English (ENU)

Datasets:

Site:	**[AshfordRdnearCarPark] 20 m East of High Wycombe Car Park**
Direction:	8 - East bound A>B, West bound B>A. **Lane:** 0
Survey Duration:	13:00 Tuesday, August 18, 2009 => 8:08 Tuesday, August 25, 2009
File:	AshfordRdnearCarPark25AUG2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 4210 / 4237 (99.36%)

Weekly Vehicle Counts

WeeklyVehicle-277
Site: AshfordRdnearCarPark.0EW
Description: **20 m East of High Wycombe Car Park**
Filter time: **13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	17 Aug	18 Aug	19 Aug	20 Aug	21 Aug	22 Aug	23 Aug	1 - 5	1 - 7
Hour									
0000-0100	*	*	1	0	2	8	2	1.0	2.6
0100-0200	*	*	0	0	0	1	6	0.0	1.4
0200-0300	*	*	0	0	0	0	0	0.0	0.0
0300-0400	*	*	0	0	0	0	0	0.0	0.0
0400-0500	*	*	1	0	0	1	0	0.3	0.4
0500-0600	*	*	2	3	2	2	0	2.3	1.8
0600-0700	*	*	5	8	11	1	2	8.0	5.4
0700-0800	*	*	18	10	15	13	6	14.3	12.4
0800-0900	*	*	26	38	25	39	16	29.7	28.8
0900-1000	*	*	23	**48<**	**47<**	104	28	**39.3<**	50.0
1000-1100	*	*	**34<**	36	31	86	32	33.7	43.8
1100-1200	*	*	27	37	36	**120<**	**39<**	33.3	**51.8<**
1200-1300	*	*	40	48	41	**102<**	26	43.0	51.4
1300-1400	*	26	35	45	58	50	15	41.0	38.2
1400-1500	*	54	38	62	38	58	23	48.0	45.5
1500-1600	*	58	62	87	71	64	16	69.5	59.7
1600-1700	*	107	85	110	**97<**	82	**26<**	99.8	84.5
1700-1800	*	120	**104<**	**125<**	92	54	25	**110.3<**	**86.7<**
1800-1900	*	61	35	96	40	29	18	58.0	46.5
1900-2000	*	23	20	57	31	19	11	32.8	26.8
2000-2100	*	9	13	31	15	15	8	17.0	15.2
2100-2200	*	8	8	12	14	5	6	10.5	8.8
2200-2300	*	5	3	12	13	7	3	8.3	7.2
2300-2400	*	1	5	2	7	2	0	3.8	2.8
Totals									
0700-1900	*	*	527	742	591	801	270	619.8	599.2
0600-2200	*	*	573	850	662	841	297	688.1	655.4
0600-0000	*	*	581	864	682	850	300	700.1	665.4
0000-0000	*	*	585	867	686	862	308	703.8	671.6
AM Peak	*	*	1000	0900	0900	1100	1100		
	*	*	34	48	47	120	39		
PM Peak	*	*	1700	1700	1600	1200	1600		
	*	*	104	125	97	102	26		

* - No data.

Weekly Vehicle Counts

WeeklyVehicle-277
Site: AshfordRdnearCarPark.0EW
Description: **20 m East of High Wycombe Car Park**
Filter time: **13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon 24 Aug	Tue 25 Aug	Wed 26 Aug	Thu 27 Aug	Fri 28 Aug	Sat 29 Aug	Sun 30 Aug	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	1	0	*	*	*	*	*	0.5	0.5
0100-0200	0	0	*	*	*	*	*	0.0	0.0
0200-0300	0	0	*	*	*	*	*	0.0	0.0
0300-0400	0	0	*	*	*	*	*	0.0	0.0
0400-0500	0	0	*	*	*	*	*	0.0	0.0
0500-0600	2	1	*	*	*	*	*	1.5	1.5
0600-0700	6	5	*	*	*	*	*	5.5	5.5
0700-0800	13	3	*	*	*	*	*	8.0	8.0
0800-0900	23	*	*	*	*	*	*	23.0	23.0
0900-1000	20	*	*	*	*	*	*	20.0	20.0
1000-1100	25	*	*	*	*	*	*	25.0	25.0
1100-1200	**29<**	*	*	*	*	*	*	**29.0<**	**29.0<**
1200-1300	23	*	*	*	*	*	*	23.0	23.0
1300-1400	29	*	*	*	*	*	*	29.0	29.0
1400-1500	30	*	*	*	*	*	*	30.0	30.0
1500-1600	35	*	*	*	*	*	*	35.0	35.0
1600-1700	68	*	*	*	*	*	*	68.0	68.0
1700-1800	**68<**	*	*	*	*	*	*	**68.0<**	**68.0<**
1800-1900	24	*	*	*	*	*	*	24.0	24.0
1900-2000	10	*	*	*	*	*	*	10.0	10.0
2000-2100	8	*	*	*	*	*	*	8.0	8.0
2100-2200	5	*	*	*	*	*	*	5.0	5.0
2200-2300	2	*	*	*	*	*	*	2.0	2.0
2300-2400	0	*	*	*	*	*	*	0.0	0.0
Totals									
0700-1900	387	*	*	*	*	*	*	382.0	382.0
0600-2200	416	*	*	*	*	*	*	410.5	410.5
0600-0000	418	*	*	*	*	*	*	412.5	412.5
0000-0000	421	*	*	*	*	*	*	414.5	414.5
AM Peak	1100	*	*	*	*	*	*		
	29	*	*	*	*	*	*		
PM Peak	1700	*	*	*	*	*	*		
	68	*	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-274 -- English (ENU)

Datasets:

Site:	**[AshfordRdnearCarPark] 20 m East of High Wycombe Car Park**
Direction:	8 - East bound A>B, West bound B>A. **Lane:** 0
Survey Duration:	13:00 Tuesday, August 18, 2009 => 8:08 Tuesday, August 25, 2009
File:	AshfordRdnearCarPark25AUG2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 4210 / 4237 (99.36%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-274
Site: AshfordRdnearCarPark.0EW
Description: **20 m East of High Wycombe Car Park**
Filter time: **13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	1.0	0.0	1.0	0.0	2.0	8.0	2.0	0.8	2.0
0100-0200	0.0	0.0	0.0	0.0	0.0	1.0	6.0	0.0	1.0
0200-0300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0300-0400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0400-0500	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.2	0.3
0500-0600	2.0	1.0	2.0	3.0	2.0	2.0	0.0	2.0	1.7
0600-0700	6.0	5.0	5.0	8.0	11.0	1.0	2.0	7.0	5.4
0700-0800	13.0	3.0	18.0	10.0	15.0	13.0	6.0	11.8	11.1
0800-0900	23.0	*	26.0	38.0	25.0	39.0	16.0	28.0	27.8
0900-1000	20.0	*	23.0	**48.0<**	**47.0<**	104.0	28.0	**34.5<**	45.0
1000-1100	25.0	*	**34.0<**	36.0	31.0	86.0	32.0	31.5	40.7
1100-1200	**29.0<**	*	27.0	37.0	36.0	**120.0<**	**39.0<**	32.3	**48.0<**
1200-1300	23.0	*	40.0	48.0	41.0	**102.0<**	26.0	38.0	46.7
1300-1400	29.0	26.0	35.0	45.0	58.0	50.0	15.0	38.6	36.9
1400-1500	30.0	54.0	38.0	62.0	38.0	58.0	23.0	44.4	43.3
1500-1600	35.0	58.0	62.0	87.0	71.0	64.0	16.0	62.6	56.1
1600-1700	68.0	107.0	85.0	110.0	**97.0<**	82.0	**26.0<**	93.4	82.1
1700-1800	**68.0<**	120.0	**104.0<**	**125.0<**	92.0	54.0	25.0	**101.8<**	**84.0<**
1800-1900	24.0	61.0	35.0	96.0	40.0	29.0	18.0	51.2	43.3
1900-2000	10.0	23.0	20.0	57.0	31.0	19.0	11.0	28.2	24.4
2000-2100	8.0	9.0	13.0	31.0	15.0	15.0	8.0	15.2	14.1
2100-2200	5.0	8.0	8.0	12.0	14.0	5.0	6.0	9.4	8.3
2200-2300	2.0	5.0	3.0	12.0	13.0	7.0	3.0	7.0	6.4
2300-2400	0.0	1.0	5.0	2.0	7.0	2.0	0.0	3.0	2.4
Totals									
0700-1900	387.0	*	527.0	742.0	591.0	801.0	270.0	568.1	565.0
0600-2200	416.0	*	573.0	850.0	662.0	841.0	297.0	627.9	617.3
0600-0000	418.0	*	581.0	864.0	682.0	850.0	300.0	637.9	626.2
0000-0000	421.0	*	585.0	867.0	686.0	862.0	308.0	640.9	631.2
AM Peak	1100	*	1000	0900	0900	1100	1100		
	29.0	*	34.0	48.0	47.0	120.0	39.0		
PM Peak	1700	*	1700	1700	1600	1200	1600		
	68.0	*	104.0	125.0	97.0	102.0	26.0		

* - No data.

MetroCount Traffic Executive
Daily Classes by Direction

DayClassSplit-275 -- English (ENU)

Datasets:

Site:	**[AshfordRdnearCarPark] 20 m East of High Wycombe Car Park**
Direction:	8 - East bound A>B, West bound B>A. **Lane:** 0
Survey Duration:	13:00 Tuesday, August 18, 2009 => 8:08 Tuesday, August 25, 2009
File:	AshfordRdnearCarPark25AUG2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 4210 / 4237 (99.36%)

Daily Classes by Direction

DayClassSplit-275
Site: AshfordRdnearCarPark.0EW
Description: **20 m East of High Wycombe Car Park**
Filter time: **13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Monday, August 17, 2009

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tue*	457	4	9	2	0	0	0	0	0	0	0	0	472
(%)	96.8	0.8	1.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	306	2	7	0	0	0	0	0	0	0	0	0	315
AB%	67.0	50.0	77.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7
BA	151	2	2	2	0	0	0	0	0	0	0	0	157
BA%	33.0	50.0	22.2	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3
Wed	564	1	16	4	0	0	0	0	0	0	0	0	585
(%)	96.4	0.2	2.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	328	1	12	3	0	0	0	0	0	0	0	0	344
AB%	58.2	100.0	75.0	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8
BA	236	0	4	1	0	0	0	0	0	0	0	0	241
BA%	41.8	0.0	25.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.2
Thu	842	2	19	3	0	1	0	0	0	0	0	0	867
(%)	97.1	0.2	2.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
AB	499	1	15	0	0	0	0	0	0	0	0	0	515
AB%	59.3	50.0	78.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.4
BA	343	1	4	3	0	1	0	0	0	0	0	0	352
BA%	40.7	50.0	21.1	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	40.6
Fri	639	0	38	9	0	0	0	0	0	0	0	0	686
(%)	93.1	0.0	5.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	334	0	15	5	0	0	0	0	0	0	0	0	354
AB%	52.3	0.0	39.5	55.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.6
BA	305	0	23	4	0	0	0	0	0	0	0	0	332
BA%	47.7	0.0	60.5	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4
Sat	834	1	14	12	0	0	0	0	1	0	0	0	862
(%)	96.8	0.1	1.6	1.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
AB	449	0	4	1	0	0	0	0	0	0	0	0	454
AB%	53.8	0.0	28.6	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.7
BA	385	1	10	11	0	0	0	0	1	0	0	0	408
BA%	46.2	100.0	71.4	91.7	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	47.3
Sun	304	0	1	3	0	0	0	0	0	0	0	0	308
(%)	98.7	0.0	0.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	155	0	0	0	0	0	0	0	0	0	0	0	155
AB%	51.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3
BA	149	0	1	3	0	0	0	0	0	0	0	0	153
BA%	49.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.7

Average daily volume

Entire week													
	636	0	17	5	0	0	0	0	0	0	0	0	661
(%)	96.2	0.0	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	353	0	9	1	0	0	0	0	0	0	0	0	364
AB%	55.5	0.0	52.9	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.1
BA	283	0	8	4	0	0	0	0	0	0	0	0	297
BA%	44.5	0.0	47.1	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.9
Weekdays													
	681	0	24	4	0	0	0	0	0	0	0	0	712
(%)	95.6	0.0	3.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	387	0	14	2	0	0	0	0	0	0	0	0	404
AB%	56.8	0.0	58.3	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.7
BA	294	0	10	2	0	0	0	0	0	0	0	0	308
BA%	43.2	0.0	41.7	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.3
Weekend													
	569	0	7	7	0	0	0	0	0	0	0	0	584
(%)	97.4	0.0	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	302	0	2	0	0	0	0	0	0	0	0	0	304
AB%	53.1	0.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.1
BA	267	0	5	7	0	0	0	0	0	0	0	0	280
BA%	46.9	0.0	71.4	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.9

* - Incomplete

Daily Classes by Direction

DayClassSplit-275
Site: AshfordRdnearCarPark.0EW
Description: **20 m East of High Wycombe Car Park**
Filter time: **13:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Monday, August 24, 2009

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	405	1	10	5	0	0	0	0	0	0	0	0	421
(%)	96.2	0.2	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	196	0	5	3	0	0	0	0	0	0	0	0	204
AB%	48.4	0.0	50.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5
BA	209	1	5	2	0	0	0	0	0	0	0	0	217
BA%	51.6	100.0	50.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5
Tue*	9	0	0	0	0	0	0	0	0	0	0	0	9
(%)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	3	0	0	0	0	0	0	0	0	0	0	0	3
AB%	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3
BA	6	0	0	0	0	0	0	0	0	0	0	0	6
BA%	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0	0	0	0	0	0	0	0	0	0	0	0	0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average daily volume

Entire week

	405	1	10	5	0	0	0	0	0	0	0	0	421
(%)	96.2	0.2	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	196	0	5	3	0	0	0	0	0	0	0	0	204
AB%	48.4	0.0	50.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5
BA	209	1	5	2	0	0	0	0	0	0	0	0	217
BA%	51.6	100.0	50.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5

Weekdays

	405	1	10	5	0	0	0	0	0	0	0	0	421
(%)	96.2	0.2	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	196	0	5	3	0	0	0	0	0	0	0	0	204
AB%	48.4	0.0	50.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5
BA	209	1	5	2	0	0	0	0	0	0	0	0	217
BA%	51.6	100.0	50.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5

Weekend No complete days.

* - Incomplete

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-372

DATASETS:

Site:	**[] Abernethy rd 300m nth of kalamunda rd**
Direction:	1 - North bound, A hit first., **Lane:** 0
Survey Duration:	10:39 Mon 05 Feb 2007 to 11:37 Mon 12 Feb 2007
File:	J:\Traffic Counts\2007\13FEBA2007.EC0 (Plus)
Identifier:	H238Q0GM MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	**10:39 Mon 05 Feb 2007 to 11:37 Mon 12 Feb 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	10 - 160 km/hr.
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	Scheme F
Name:	Factory default profile
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
In profile:	43827 Vehicles

Weekly Vehicle Counts

Report Id: WeeklyVehicle-372
Site ID: .0N
Location: **Abernethy rd 300m nth of kalamunda rd**
Filter time: **10:39 Mon 05 Feb 2007 to 11:37 Mon 12 Feb 2007**
Scheme: Scheme F
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12 13) DR(NESW) SP(10,160) HW(all)

Date	MON 05 Feb 07	TUE 06 Feb	WED 07 Feb	THU 08 Feb	FRI 09 Feb	SAT 10 Feb	SUN 11 Feb	AVERAGES 5-DAY	AVERAGES 7-DAY
Hour period									
0000-0100	*	58	24	30	43	49	32	38.8	39.3
0100-0200	*	32	23	25	30	32	23	27.5	27.5
0200-0300	*	39	40	38	42	20	24	39.8	33.8
0300-0400	*	81	78	69	89	45	42	79.3	67.3
0400-0500	*	240	217	214	242	88	43	228.3	174.0
0500-0600	*	488	485	455	491	173	65	479.8	359.5
0600-0700	*	**631<**	**622<**	**646<**	**677<**	163	98	**644.0<**	**472.8<**
0700-0800	*	518	507	531	564	207	91	530.0	403.0
0800-0900	*	420	379	409	461	240	129	417.3	339.7
0900-1000	*	358	382	357	383	280	132	370.0	315.3
1000-1100	142	398	350	394	421	291	178	341.0	310.6
1100-1200	411	403	381	384	446	**353<**	**188<**	405.0	366.6
1200-1300	434	430	389	427	492	228	152	434.4	364.6
1300-1400	470	448	437	477	509	**228<**	135	468.2	386.3
1400-1500	572	557	558	610	595	183	176	578.4	464.4
1500-1600	697	683	681	669	638	179	169	673.6	530.9
1600-1700	**754<**	**698<**	**704<**	**743<**	**691<**	184	**195<**	**718.0<**	**567.0<**
1700-1800	351	373	327	372	391	150	142	362.8	300.9
1800-1900	180	195	169	216	224	87	93	196.8	166.3
1900-2000	118	117	124	136	149	78	86	128.8	115.4
2000-2100	127	96	108	107	111	69	52	109.8	95.7
2100-2200	73	51	72	83	77	53	65	71.2	67.7
2200-2300	54	66	52	60	66	66	39	59.6	57.6
2300-2400	51	59	56	57	48	38	31	54.2	48.6
TOTALS									
12Hr 7-19	*	5481	5264	5589	5815	2610	1780	5537.3	4423.2
16Hr 6-22	*	6376	6190	6561	6829	2973	2081	6489.0	5168.3
18Hr 6-24	*	6501	6298	6678	6943	3077	2151	6605.0	5274.7
24Hr 0-24	*	7439	7165	7509	7880	3484	2380	7498.3	5976.2
AM HR	*	0600	0600	0600	0600	1100	1100		
PEAK	*	631	622	646	677	353	188		
PM HR	1600	1600	1600	1600	1600	1300	1600		
PEAK	754	698	704	743	691	228	195		

*** - No data.**

Weekly Vehicle Counts

Report Id: WeeklyVehicle-372
Site ID: .0N
Location: **Abernethy rd 300m nth of kalamunda rd**
Filter time: **10:39 Mon 05 Feb 2007 to 11:37 Mon 12 Feb 2007**
Scheme: Scheme F
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12 13) DR(NESW) SP(10,160) HW(all)

Date	MON 12 Feb 07	TUE 13 Feb	WED 14 Feb	THU 15 Feb	FRI 16 Feb	SAT 17 Feb	SUN 18 Feb	AVERAGES 5-DAY	AVERAGES 7-DAY
Hour period									
0000-0100	21	*	*	*	*	*	*	21.0	21.0
0100-0200	32	*	*	*	*	*	*	32.0	32.0
0200-0300	44	*	*	*	*	*	*	44.0	44.0
0300-0400	84	*	*	*	*	*	*	84.0	84.0
0400-0500	221	*	*	*	*	*	*	221.0	221.0
0500-0600	430	*	*	*	*	*	*	430.0	430.0
0600-0700	**618<**	*	*	*	*	*	*	**618.0<**	**618.0<**
0700-0800	590	*	*	*	*	*	*	590.0	590.0
0800-0900	437	*	*	*	*	*	*	437.0	437.0
0900-1000	405	*	*	*	*	*	*	405.0	405.0
1000-1100	385	*	*	*	*	*	*	385.0	385.0
1100-1200	269	*	*	*	*	*	*	269.0	269.0
1200-1300	*	*	*	*	*	*	*	*	*
1300-1400	*	*	*	*	*	*	*	*	*
1400-1500	*	*	*	*	*	*	*	*	*
1500-1600	*	*	*	*	*	*	*	*	*
1600-1700	*	*	*	*	*	*	*	*	*
1700-1800	*	*	*	*	*	*	*	*	*
1800-1900	*	*	*	*	*	*	*	*	*
1900-2000	*	*	*	*	*	*	*	*	*
2000-2100	*	*	*	*	*	*	*	*	*
2100-2200	*	*	*	*	*	*	*	*	*
2200-2300	*	*	*	*	*	*	*	*	*
2300-2400	*	*	*	*	*	*	*	*	*
TOTALS									
12Hr 7-19	*	*	*	*	*	*	*	*	*
16Hr 6-22	*	*	*	*	*	*	*	*	*
18Hr 6-24	*	*	*	*	*	*	*	*	*
24Hr 0-24	*	*	*	*	*	*	*	*	*
AM HR	0600	*	*	*	*	*	*		
PEAK	618	*	*	*	*	*	*		
PM HR	*	*	*	*	*	*	*		
PEAK	*	*	*	*	*	*	*		

***** - No data.

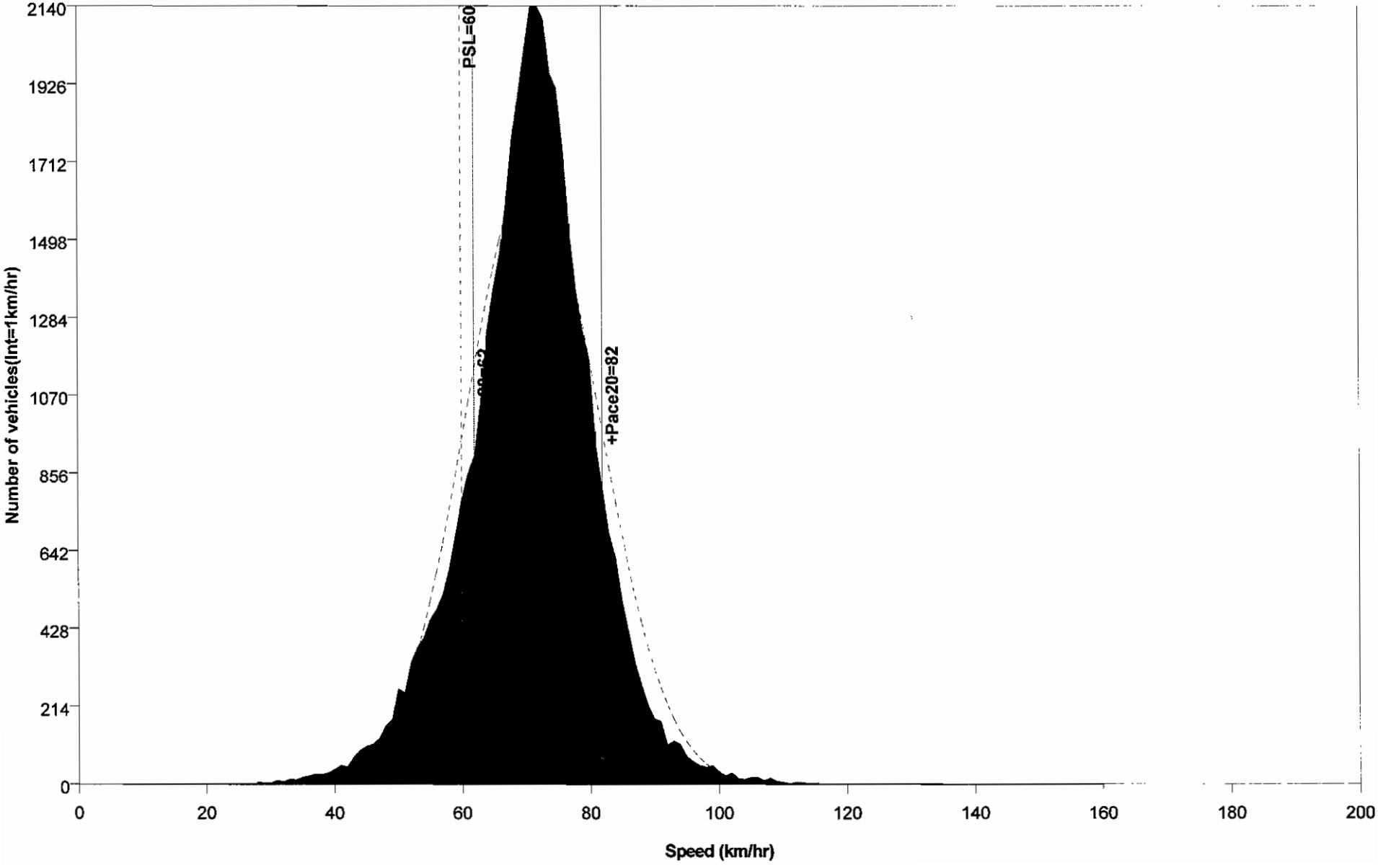
Class Speed Matrix

Report Id: ClassMatrix-373
Site ID: .0N
Location: **Abernethy rd 300m nth of kalamunda rd**
Filter time: **10:39 Mon 05 Feb 2007 to 11:37 Mon 12 Feb 2007**
Scheme: Scheme F
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12 13) DR(NESW) SP(10,160) HW(all)

Speed Bin (km/hr)	Class 1	2	3	4	5	6	7	8	9	10	11	12	13	Speed Total	
10 - 20	2	4	.	.	1	2	.	.	.	.	.	.	.	**9**	**0.0%**
20 - 30	5	15	2	.	1	3	.	.	.	2	.	.	2	**30**	**0.1%**
30 - 40	6	76	19	7	4	17	1	4	4	36	.	.	10	**184**	**0.4%**
40 - 50	19	465	109	45	69	76	.	19	11	105	1	.	78	**997**	**2.3%**
50 - 60	45	2281	467	73	151	224	3	84	60	317	4	1	652	**4362**	**10.0%**
60 - 70	101	8147	1493	159	386	461	8	158	95	720	26	5	1123	**12882**	**29.4%**
70 - 80	160	13003	2418	178	301	545	2	169	94	583	8	.	668	**18129**	**41.4%**
80 - 90	99	4453	837	45	56	184	1	45	20	115	1	.	124	**5980**	**13.6%**
90 - 100	47	740	149	2	6	18	.	4	3	9	.	.	7	**985**	**2.2%**
100 - 110	27	145	26	1	.	3	.	1	.	.	.	.	2	**205**	**0.5%**
110 - 120	9	26	3	.	1	1	.	.	.	.	.	.	.	**40**	**0.1%**
120 - 130	3	8	3	.	.	.	.	.	.	.	.	.	.	**14**	**0.0%**
130 - 140	1	2	.	.	.	.	.	.	.	.	.	.	.	**3**	**0.0%**
140 - 150	1	4	1	.	.	.	.	.	.	.	.	.	.	**6**	**0.0%**
150 - 160	.	1	.	.	.	.	.	.	.	.	.	.	.	**1**	**0.0%**
Class Total	**525** **1.2%**	**29370** **67.0%**	**5527** **12.6%**	**510** **1.2%**	**976** **2.2%**	**1534** **3.5%**	**15** **0.0%**	**484** **1.1%**	**287** **0.7%**	**1887** **4.3%**	**40** **0.1%**	**6** **0.0%**	**2666** **6.1%**	**43827**	

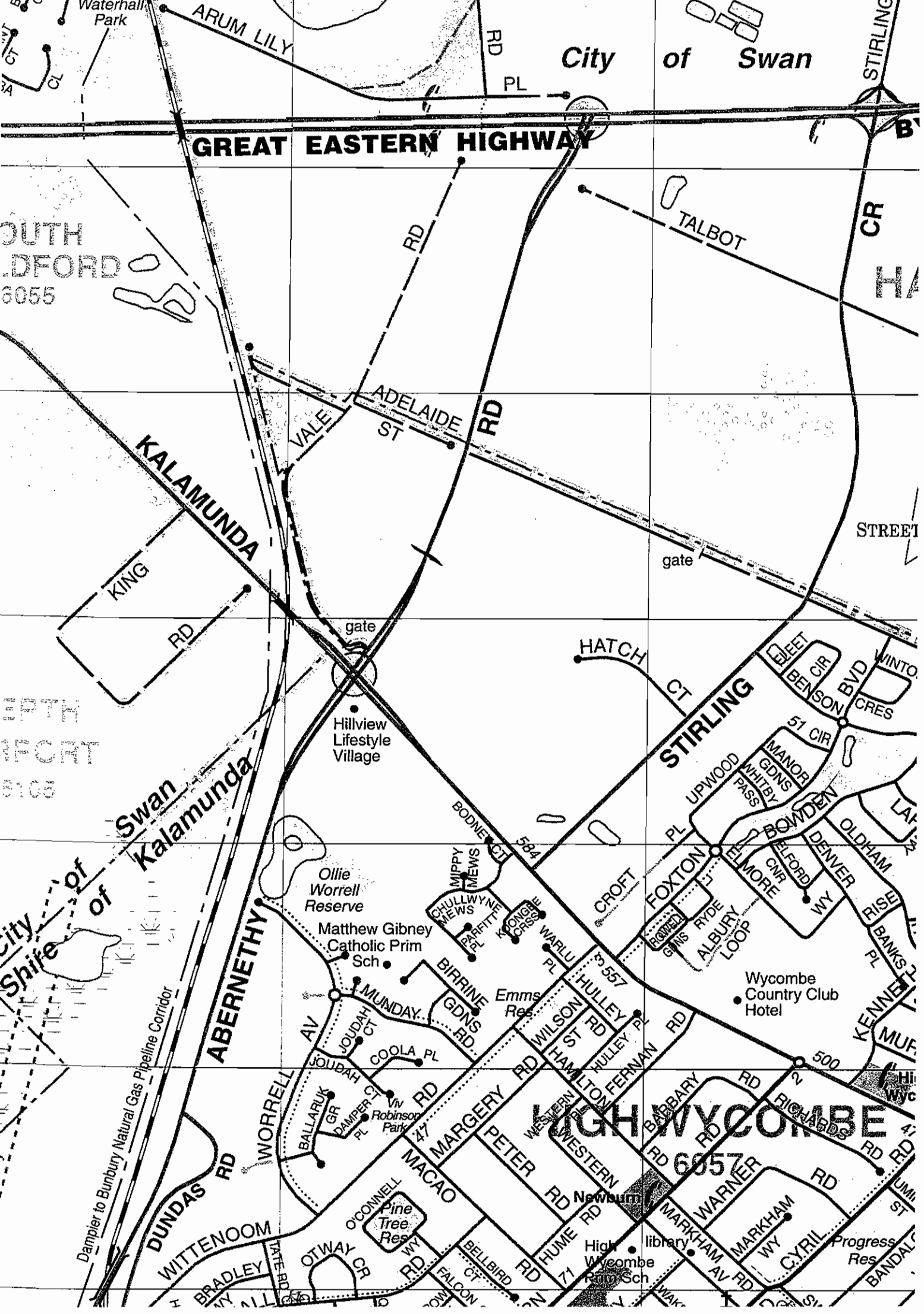
Speed Histogram

Report Id : SpeedHist-374 (Units: Metric (m, km, m/s, km/hr, kg, tonne))
Site ID: .0N
Location: Abernethy rd 300m nth of kalamunda rd
Time range : [10:39 Mon 05 Feb 2007] to [11:37 Mon 12 Feb 2007]
Scheme : Scheme F
Profile : CL(1 2 3 4 5 6 7 8 9 10 11 12 13) DR(NESW) SP(10,160) HW(all)
Method : Classified vehicles



Speed Statistics (Bin size = 1km/hr)

Total vehicles in profile= 43827
Posted speed limit = 60 km/hr
Number speeding = 38249 (87.27%)
Maximum speed = 157 km/hr
Minimum speed = 10 km/hr
Mean speed = 71.14 km/hr
85% speed = 80 km/hr
20 km/hr pace = 62 to 82
Number in 20 km/hr pace = 31477 (71.82%)
Variance = 106.87
Standard deviation = 10.34 km/hr


Waterhall Park
ARUM LILY
RD
PL
City of Swan
STIRLING
GREAT EASTERN HIGHWAY
TALBOT
CR
RD
ADELAIDE
ST
VALE
KALAMUNDA
RD
KING
RD
gate
gate
STREET
HATCH
CT
STIRLING
BENSON
CIR
BVD
CRES
WINTON
51 CIR
UPWOOD
MANOR
GDNS
WHITBY
PASS
BOWDEN
PL
OLDHAM
RISE
FOXTON
ELMORE
CNR
ELFORD
DENVER
WY
CROFT
RYDE
ALBURY
LOOP
BANKS
PL
KENNE
Hillview Lifestyle Village
BODNEY CT
584
MIPPY MEWS
CHULLWYNE MEWS
BARFITT PL
KOONGIE CRSS
WARILU PL
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
ABERNETHY
BIRRINE
GDNS
RD
MUNDAY
AV
JOUDAH CT
JOUDAH
COOLA PL
Emms Res
HULLEY
RD
557
WILSON
ST
HAMILTON
HULLEY PL
FERNAN
RD
Wycombe Country Club Hotel
500
BARBARY
RD
RICHARDS
RD
HIGH WYCOMBE
6057
WESTERN
RD
WESTERN
PL
MARGERY
RD
PETER
RD
MACAO
47
BALLARUK
GR
DAMPER CT
PL
Robinson Park
WORRELL
RD
DUNDAS RD
Dampier to Bunbury Natural Gas Pipeline Corridor
O'CONNELL
Pine Tree Res
WY
WITTENOOM
RD
TATE RD
BRADLEY
OTWAY CR
BELLBIRD
CT
FALCON
HUME
RD
Newburn
High Wycombe Rem Sch
library
WARNER
RD
MARKHAM
AV
RD
MARKHAM
WY
CYRIL
Progress Res
BANDALO
71
Swan
Kalamunda
City of
Shire of

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-349 -- English (ENU)

Datasets:

Site:	**[ABERNETHY RD 997] 300 M South of KALAMUNDA Rd**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009
File:	ABERNETHY RD 99718NOV2009.EC0 (Plus)
Identifier:	AE733504 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 95746 / 95911 (99.83%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-349
Site: ABERNETHY RD 997.0NS
Description: **300 M South of KALAMUNDA Rd**
Filter time: **14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	93.0	62.0	64.0	115.0	79.0	91.5	102.0	82.6	87.3
0100-0200	36.0	50.0	51.0	81.0	95.0	79.0	52.0	62.6	65.4
0200-0300	77.0	87.0	77.0	65.0	59.0	56.0	44.0	73.0	65.1
0300-0400	68.0	99.0	106.0	63.0	94.0	52.5	44.0	86.0	72.4
0400-0500	170.0	162.0	155.0	136.0	159.0	81.5	58.0	156.4	125.4
0500-0600	454.0	558.0	502.0	530.0	536.0	119.5	90.0	516.0	363.6
0600-0700	1028.0	1094.0	997.0	1045.0	986.0	288.0	134.0	1030.0	796.0
0700-0800	**1432.0<**	**1529.0<**	**1373.0<**	**1356.0<**	**1340.0<**	310.0	167.0	**1406.0<**	**1072.4<**
0800-0900	1103.0	1206.0	1178.0	1166.0	1101.0	401.0	225.0	1150.8	911.4
0900-1000	949.0	937.0	891.0	870.0	880.0	462.0	246.0	905.4	747.9
1000-1100	851.0	885.0	820.0	853.0	873.0	**516.0<**	335.0	856.4	733.3
1100-1200	808.0	879.0	854.0	927.0	885.0	450.0	**386.0<**	870.6	741.3
1200-1300	867.0	965.0	923.0	912.0	1030.0	**476.0<**	365.0	939.4	791.1
1300-1400	954.0	934.0	964.0	856.0	986.0	444.0	**389.0<**	938.8	789.6
1400-1500	1003.0	1033.0	1023.0	1089.0	933.5	416.0	375.0	1002.5	850.8
1500-1600	1207.0	1259.0	1088.0	1117.0	1204.0	412.0	297.0	1179.8	973.5
1600-1700	**1401.0<**	**1430.0<**	**1484.0<**	**1470.0<**	**1337.0<**	312.0	372.0	**1409.8<**	**1142.9<**
1700-1800	1179.0	1283.0	1249.0	1211.0	1139.0	340.0	351.0	1200.0	986.4
1800-1900	578.0	589.0	586.0	531.0	597.5	275.0	272.0	579.8	503.3
1900-2000	383.0	329.0	349.0	326.0	331.0	169.0	225.0	341.5	305.4
2000-2100	217.0	257.0	237.0	261.0	274.5	98.0	131.0	253.5	218.8
2100-2200	188.0	231.0	223.0	232.0	187.5	108.0	146.0	208.2	187.9
2200-2300	124.0	173.0	175.0	162.0	168.5	122.0	87.0	161.8	147.5
2300-2400	85.0	112.0	106.0	111.0	138.5	139.0	72.0	115.2	112.8
Totals									
0700-1900	12332.0	12929.0	12433.0	12358.0	12306.0	4814.0	3780.0	12439.4	10243.8
0600-2200	14148.0	14840.0	14239.0	14222.0	14085.0	5477.0	4416.0	14272.6	11751.8
0600-0000	14357.0	15125.0	14520.0	14495.0	14392.0	5738.0	4575.0	14549.6	12012.0
0000-0000	15255.0	16143.0	15475.0	15485.0	15414.0	6218.0	4965.0	15526.2	12791.1
AM Peak	0700	0700	0700	0700	0700	1000	1100		
	1432.0	1529.0	1373.0	1356.0	1340.0	516.0	386.0		
PM Peak	1600	1600	1600	1600	1600	1200	1300		
	1401.0	1430.0	1484.0	1470.0	1337.0	476.0	389.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-352 -- English (ENU)

Datasets:

Site:	**[ABERNETHY RD 997] 300 M South of KALAMUNDA Rd**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009
File:	ABERNETHY RD 99718NOV2009.EC0 (Plus)
Identifier:	AE733504 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 95746 / 95911 (99.83%)

Class Speed Matrix

ClassMatrix-352
Site: ABERNETHY RD 997.0NS
Description: **300 M South of KALAMUNDA Rd**
Filter time: **14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	20	.	.	.	.	.	.	.	.	.	.	.	20	0.0%
20 - 30	35	.	2	1	.	.	.	.	.	.	1	.	39	0.0%
30 - 40	189	6	18	8	4	.	1	1	6	4	5	.	242	0.3%
40 - 50	705	12	53	19	19	1	1	8	39	18	55	3	933	1.0%
50 - 60	3006	52	206	200	88	6	8	20	231	104	266	9	4196	4.4%
60 - 70	20175	309	2077	991	286	63	81	157	1254	465	865	37	26760	27.9%
70 - 80	40968	518	2972	1208	297	129	118	178	1193	428	511	19	48539	50.7%
80 - 90	11487	123	677	247	40	16	13	41	103	69	33	.	12849	13.4%
90 - 100	1628	12	64	33	6	4	.	1	13	4	4	.	1769	1.8%
100 - 110	288	1	13	5	1	.	.	.	1	1	.	.	310	0.3%
110 - 120	46	.	2	.	.	.	.	.	.	.	.	.	48	0.1%
120 - 130	25	.	.	.	.	.	.	.	.	.	.	.	25	0.0%
130 - 140	12	.	.	.	.	.	.	.	.	.	.	.	12	0.0%
140 - 150	3	.	.	.	.	.	.	.	.	.	.	.	3	0.0%
150 - 160	1	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
	78588	1033	6084	2712	741	219	222	406	2840	1093	1740	68	95746	
	82.1%	1.1%	6.4%	2.8%	0.8%	0.2%	0.2%	0.4%	3.0%	1.1%	1.8%	0.1%		
	Class Totals													

33.2

MetroCount Traffic Executive
Speed Histogram

SpeedHist-351 -- English (ENU)

Datasets:

Site:	**[ABERNETHY RD 997] 300 M South of KALAMUNDA Rd**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009
File:	ABERNETHY RD 99718NOV2009.EC0 (Plus)
Identifier:	AE733504 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

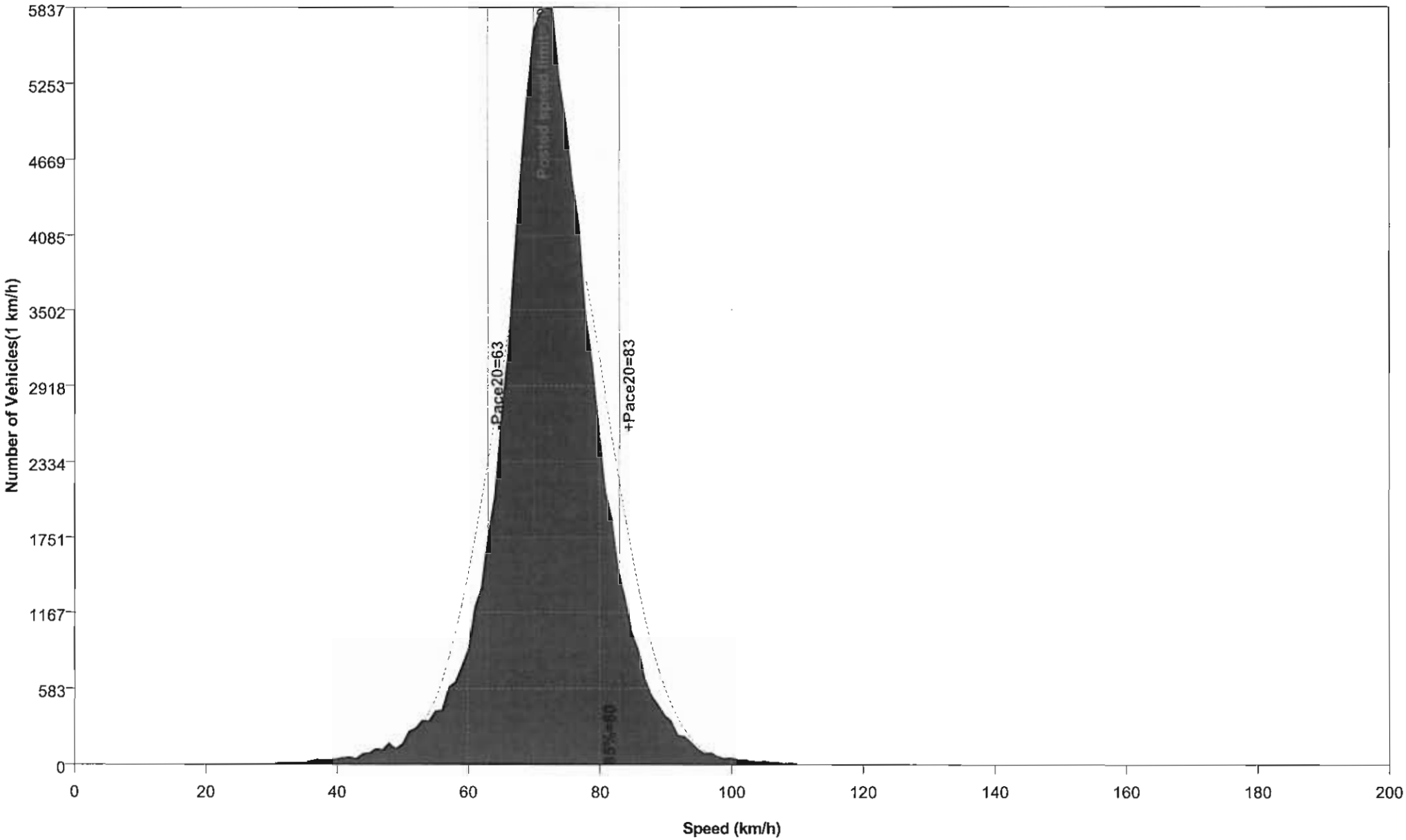
Filter time:	**14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 95746 / 95911 (99.83%)

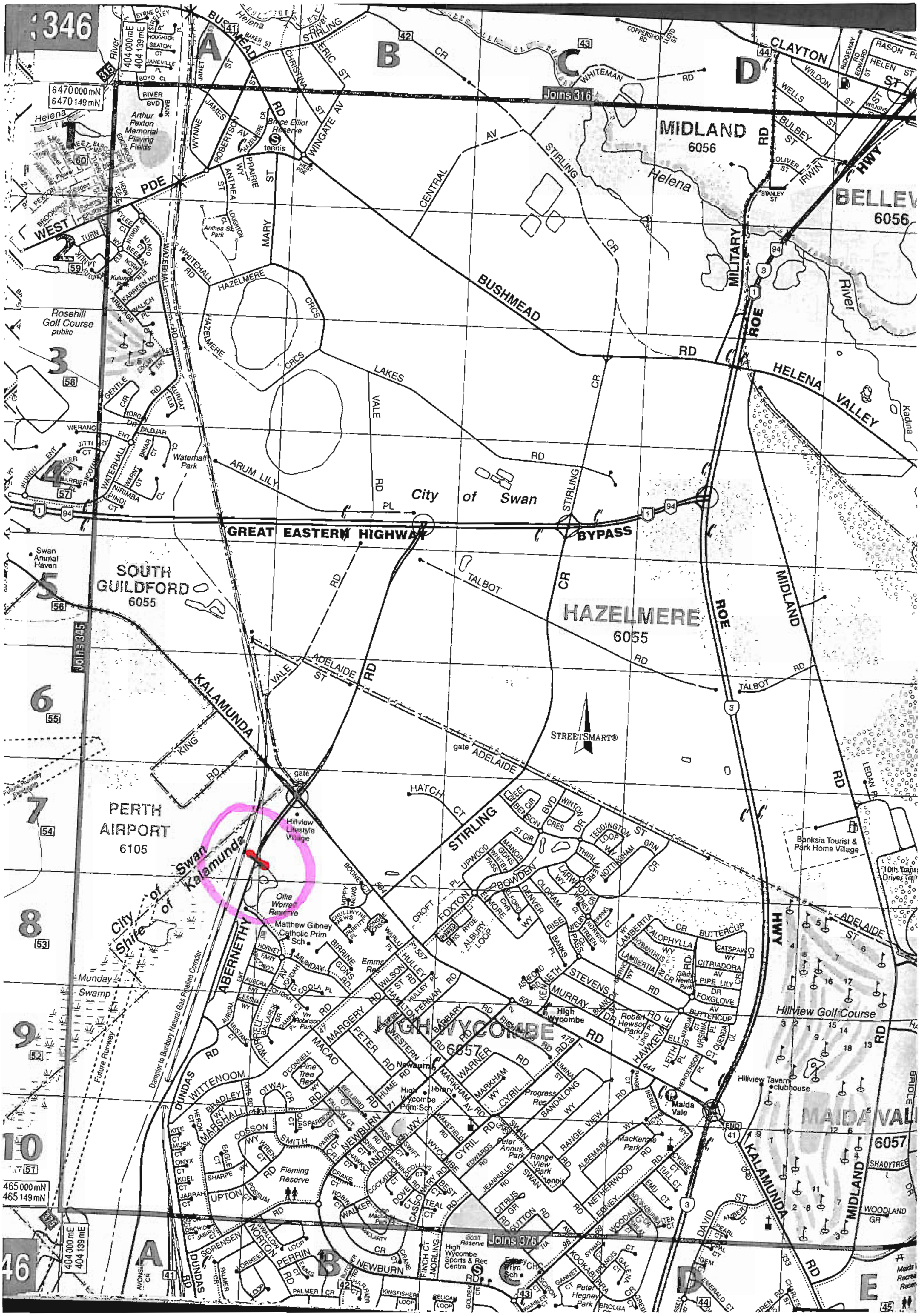
Speed Statistics

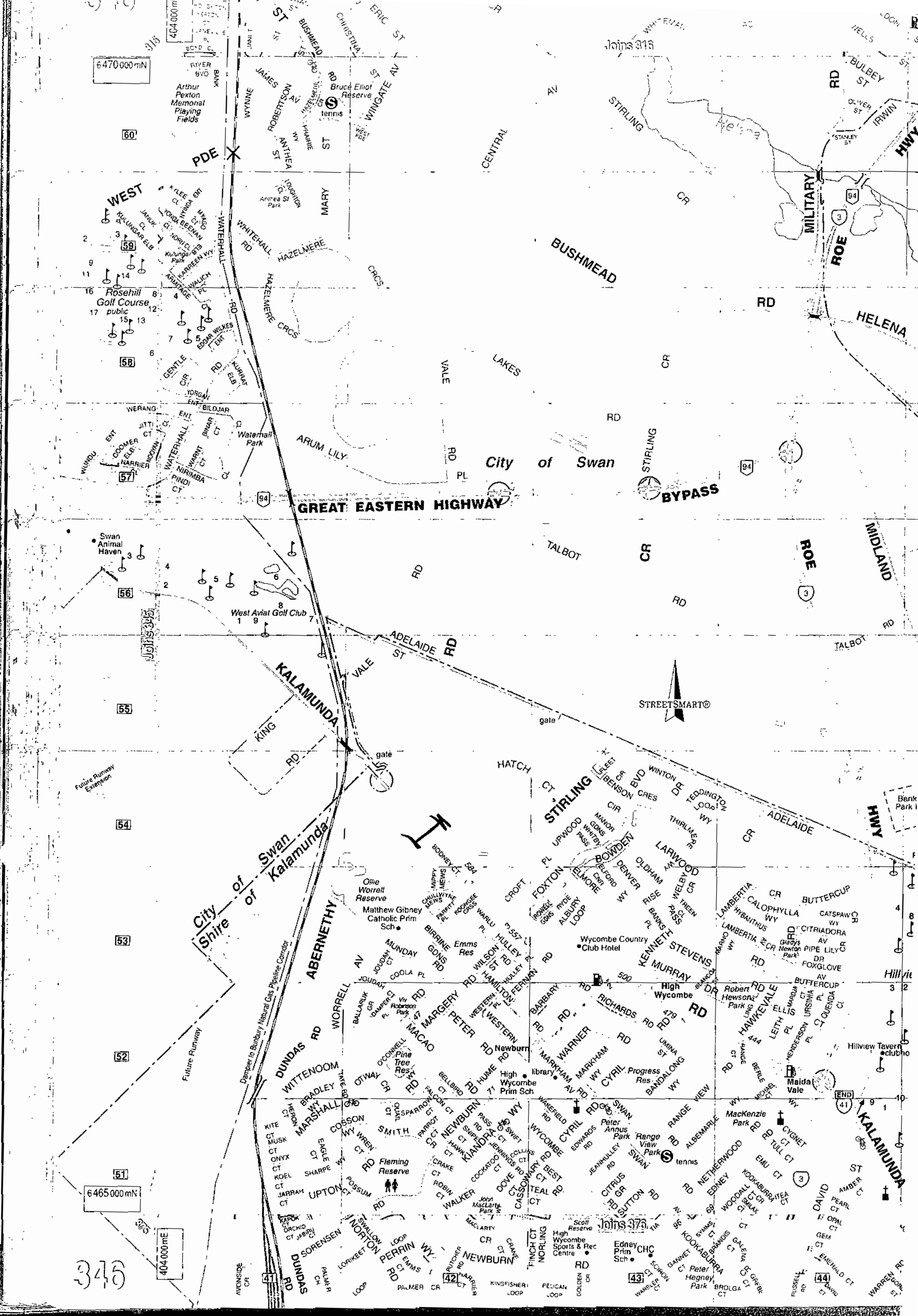
Vehicles = 95746
Posted speed limit = 70 km/h, Exceeding = 63556 (66.38%), Mean Exceeding = 77.01 km/h
Maximum = 158.1 km/h, **Minimum** = 10.9 km/h, **Mean** = 72.7 km/h
85% Speed = 79.9 km/h, **95% Speed** = 85.7 km/h, **Median** = 72.4 km/h
20 km/h Pace = 63 - 83, **Number in Pace** = 78675 (82.17%)
Variance = 72.20, **Standard Deviation** = 8.50 km/h

Speed Histogram

SpeedHist-351 (Metric) **Site:**ABERNETHY RD {997}.0NS
Description: 300 M South of KALAMUNDA Rd
Filter time: 14:00 Friday, November 06, 2009 => 5:26 Saturday, November 14, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)




MIDLAND
6056
BELLEVUE
6056
SOUTH GUILDFORD
6055
HAZELMERE
6055
PERTH AIRPORT
6105
HIGH WYCOMBE
6057
MAIDA VALE
6057
City of Swan
City of Swan
Shire of Kalamunda
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
HELENA VALLEY RD
ROE HWY
MIDLAND RD
KALAMUNDA RD
ABERNETHY RD
ADELAIDE ST
TALBOT RD
STIRLING CR
LAKES RD
ARUM LILY PL
WEST PDE
Joins 316
Joins 345
Joins 376
Rosehill Golf Course public
Arthur Pexton Memorial Playing Fields
Bruce Elliot Reserve
Waterhall Park
Swan Animal Haven
Hillview Lifestyle Village
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Banksia Tourist & Park Home Village
Hillview Golf Course
Hillview Tavern clubhouse
Fleming Reserve
Pine Tree Res
Peter Annus Park
Range View Park
Progress Res
MacKenzie Park
Robert Hewson Park
High Wycombe Prim Sch
High Wycombe Sports & Rec Centre
Peter Hegney Park
Munday Swamp
Future Runway
Dampier to Bunbury Natural Gas Pipeline Corridor
STREETSMART®
6470 000mN
6470 149mN
6465 000mN
6465 149mN
404 000mE
404 139mE



6470 000mN
404 000mE
Joins 316
Arthur Pexton Memorial Playing Fields
Bruce Elliot Reserve
tennis
WEST PDE
CENTRAL AV
STIRLING CR
MILITARY RD
ROE HWY
BUSHMEAD RD
HELENA
Rosehill Golf Course public
WATERHALL RD
HAZELMERE CRCS
Waterhall Park
ARUM LILY
LAKES
VALE RD
City of Swan
STIRLING BYPASS
GREAT EASTERN HIGHWAY
Swan Animal Haven
TALBOT RD
ROE
MIDLAND
West Aviat Golf Club
ADELAIDE ST
KALAMUNDA RD
VALE
KING RD
STREETSMART®
gate
HATCH CT
STIRLING CR
ADELAIDE
Future Runway Extension
City of Swan
Shire of Kalamunda
ABERNETHY
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Emms Res
Wycombe Country Club Hotel
High Wycombe
HIGH WYCOMBE RD
Robert Hewson Park
Hillview Tavern
Future Runway
Dampier to Bunbury Natural Gas Pipeline Corridor
DUNDAS RD
WORRELL
WITTENOOM
MARSHALL
Pine Tree Res
High Wycombe Prim Sch
Newburn
library
Progress Res
Maida Vale
MacKenzie Park
Peter Annus Park
Range View Park
Fleming Reserve
John MacLarty Park
Scott Reserve
Joins 376
High Wycombe Sports & Rec Centre
Edney Prim Sch
Peter Hegney Park
6465 000mN
346

MetroCount Traffic Executive
Empty Report

Empty-500

DATASETS:

Site:	**[001900] 40m west of lifestyle village on Kalamunda Rd**
Direction:	2 - East bound, A hit first., **Lane:** 0
Survey Duration:	07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007
File:	C:\Program Files\MetroCount v225\User\Data\00190006DEC2007.EC0 (Plus)
Identifier:	H361TG60 MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Name:	Filter is disabled
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
In profile:	0 Vehicles

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-498

DATASETS:

Site:	**[001900] 40m west of lifestyle village on Kalamunda Rd**
Direction:	2 - East bound, A hit first., **Lane:** 0
Survey Duration:	07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007
File:	C:\Program Files\MetroCount v225\User\Data\00190006DEC2007.EC0 (Plus)
Identifier:	H361TG60 MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	**07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr.
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
profile:	59187 Vehicles

Weekly Vehicle Counts (Virtual Week)

Report Id: VirtWeeklyVehicle-498
Site ID: 001900.0E
Location: **40m west of lifestyle village on Kalamunda Rd**
Filter time: **07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007**
Scheme: ARX
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10,160) HW(all)

	MON	TUE	WED	THU	FRI	SAT	SUN	AVERAGES 5-DAY	AVERAGES 7-DAY
Hour period									
0000-0100	25.0	35.0	*	*	55.0	116.0	120.0	38.3	70.2
0100-0200	19.0	27.0	*	*	33.0	74.0	105.0	26.3	51.6
0200-0300	48.0	36.0	*	*	49.0	72.0	91.0	44.3	59.2
0300-0400	84.0	96.0	*	*	91.0	61.0	77.0	90.3	81.8
0400-0500	277.0	268.0	*	*	266.0	146.0	94.0	270.3	210.2
0500-0600	804.0	869.0	*	*	843.0	285.0	156.0	838.7	591.4
0600-0700	**1227.0<**	904.0	*	*	**1206.0<**	378.0	187.0	**1112.3<**	**780.4<**
0700-0800	1086.0	*	*	216.0	1084.0	513.0	338.0	795.3	647.4
0800-0900	675.0	*	*	716.0	725.0	628.0	442.0	705.3	637.2
0900-1000	571.0	*	*	578.0	673.0	669.0	488.0	607.3	595.8
1000-1100	553.0	*	*	638.0	658.0	**761.0<**	656.0	616.3	653.2
1100-1200	579.0	*	*	632.0	689.0	748.0	**738.0<**	633.3	677.2
1200-1300	584.0	*	*	615.0	717.0	717.0	648.0	638.7	656.2
1300-1400	718.0	*	*	777.0	809.0	669.0	603.0	768.0	715.2
1400-1500	873.0	*	*	990.0	965.0	660.0	**680.0<**	942.7	833.6
1500-1600	1097.0	*	*	1130.0	1216.0	665.0	676.0	1147.7	956.8
1600-1700	**1241.0<**	*	*	**1275.0<**	**1287.0<**	734.0	674.0	**1267.7<**	**1042.2<**
1700-1800	812.0	*	*	852.0	930.0	**742.0<**	494.0	864.7	766.0
1800-1900	457.0	*	*	544.0	604.0	519.0	368.0	535.0	498.4
1900-2000	331.0	*	*	390.0	418.0	386.0	299.0	379.7	364.8
2000-2100	254.0	*	*	390.0	351.0	333.0	262.0	331.7	318.0
2100-2200	194.0	*	*	316.0	389.0	371.0	192.0	299.7	292.4
2200-2300	135.0	*	*	153.0	319.0	330.0	115.0	202.3	210.4
2300-2400	65.0	*	*	74.0	163.0	278.0	59.0	100.7	127.8
TOTALS									
12Hr 7-19	9246	*	*	8963	10357	8025	6805	9522.0	8679.2
16Hr 6-22	11252	*	*	*	12721	9493	7745	11986.5	10302.8
18Hr 6-24	11452	*	*	*	13203	10101	7919	12327.5	10668.8
24Hr 0-24	12709	*	*	*	14540	10855	8562	13624.5	11666.5
AM HR	0600	*	*	*	0600	1000	1100		
PEAK	1227	*	*	*	1206	761	738		
PM HR	1600	*	*	1600	1600	1700	1400		
PEAK	1241	*	*	1275	1287	742	680		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-499

DATASETS:

Site:	**[001900] 40m west of lifestyle village on Kalamunda Rd**
Direction:	2 - East bound, A hit first., **Lane:** 0
Survey Duration:	07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007
File:	C:\Program Files\MetroCount v225\User\Data\00190006DEC2007.EC0 (Plus)
Identifier:	H361TG60 MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	**07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr.
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
In profile:	59187 Vehicles

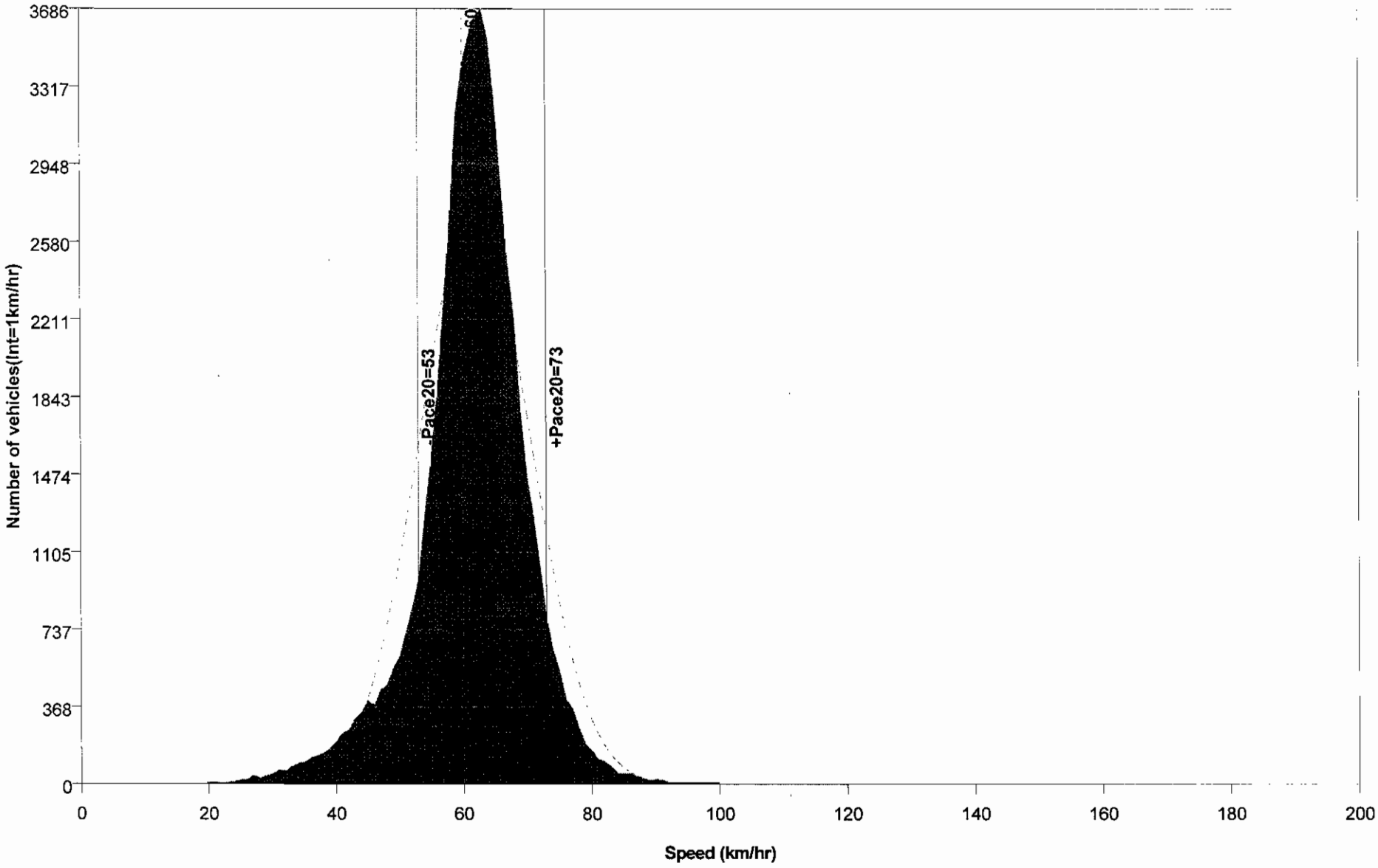
Class Speed Matrix

Report Id: ClassMatrix-499
Site ID: 001900.0E
Location: **40m west of lifestyle village on Kalamunda Rd**
Filter time: **07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007**
Scheme: ARX
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10,160) HW(all)

Speed Bin (km/hr)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Total	
10 - 20	3	15	.	.	3	.	.	.	.	.	.	.	21	0.0%
20 - 30	12	158	4	6	4	1	.	.	.	1	.	.	186	0.3%
30 - 40	6	939	33	29	6	7	.	1	.	13	.	.	1034	1.7%
40 - 50	23	3231	86	165	17	15	5	5	3	38	8	4	3600	6.1%
50 - 60	115	14669	259	668	130	29	15	30	24	109	9	16	16073	27.2%
60 - 70	188	28560	446	922	127	30	22	17	23	89	12	10	30446	51.4%
70 - 80	112	6581	65	189	15	4	1	2	2	9	.	.	6980	11.8%
80 - 90	41	638	3	18	2	.	.	.	.	1	.	.	703	1.2%
90 - 100	6	92	1	5	.	.	.	.	.	.	.	.	104	0.2%
100 - 110	4	23	.	.	.	.	.	.	.	.	.	.	27	0.0%
110 - 120	3	6	.	.	.	.	.	.	.	.	.	.	9	0.0%
120 - 130	1	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	2	.	.	.	.	.	.	.	.	.	.	2	0.0%
150 - 160	1	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
Class Total	515	54914	897	2002	304	86	43	55	52	260	29	30	59187	
	0.9%	92.8%	1.5%	3.4%	0.5%	0.1%	0.1%	0.1%	0.1%	0.4%	0.0%	0.1%		

Speed Histogram

Report Id : SpeedHist-501 (Units: Metric (m, km, m/s, km/hr, kg, tonne))
Site ID: 001900.0E
Location: 40m west of lifestyle village on Kalamunda Rd
Time range : [07:42 Thu 22 Nov 2007] to [06:44 Tue 27 Nov 2007]
Scheme : ARX
Profile : CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10,160) HW(all)
Method : Classified vehicles



MetroCount Traffic Executive
Speed Histogram

SpeedHist-501

DATASETS:

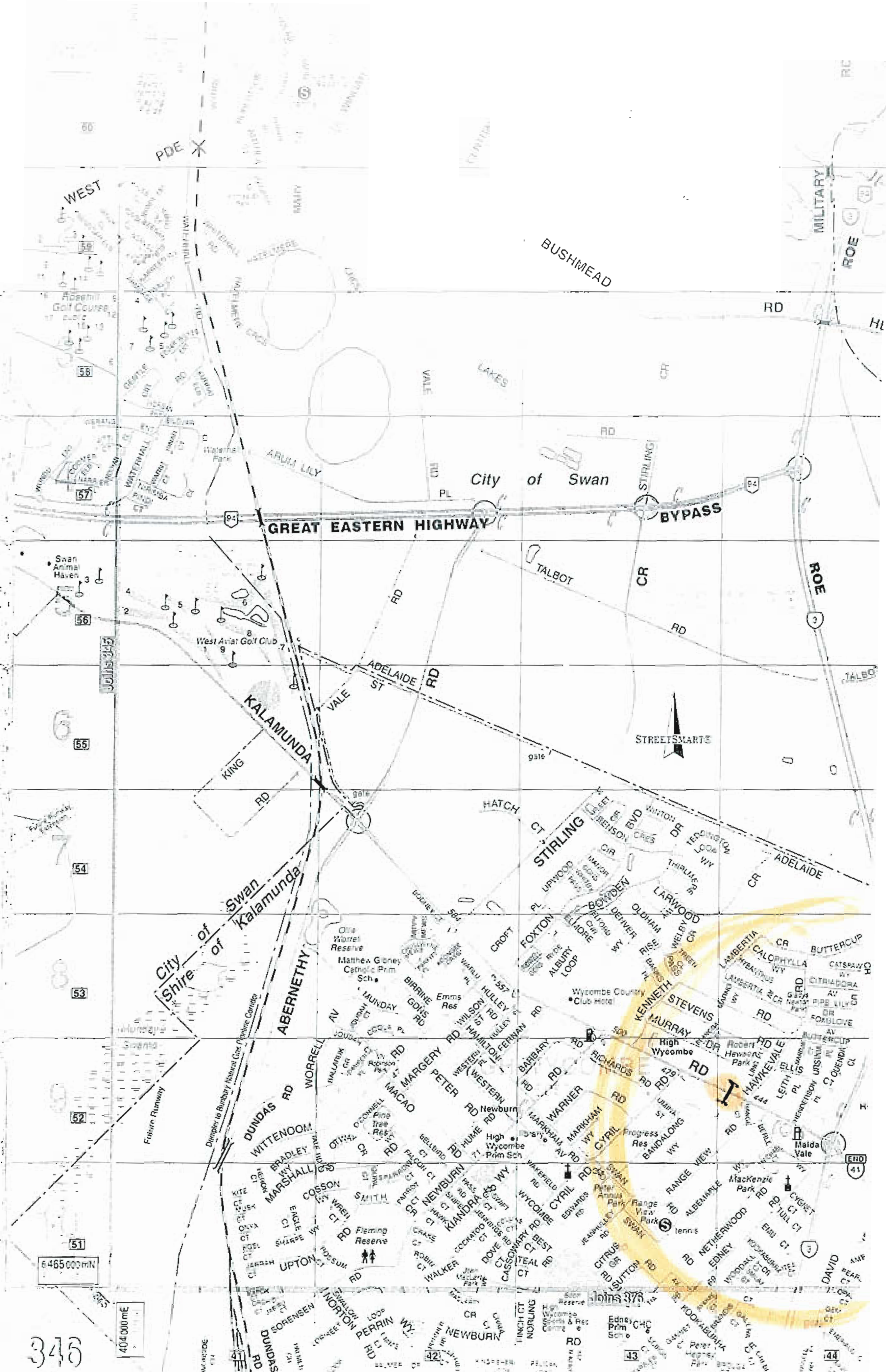
Site:	**[001900] 40m west of lifestyle village on Kalamunda Rd**
Direction:	2 - East bound, A hit first., **Lane:** 0
Survey Duration:	07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007
File:	C:\Program Files\MetroCount v225\User\Data\00190006DEC2007.EC0 (Plus)
Identifier:	H361TG60 MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	**07:42 Thu 22 Nov 2007 to 06:44 Tue 27 Nov 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr.
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
...nits:	Metric (m, km, m/s, km/hr, kg, tonne)
... profile:	59187 Vehicles

Speed Statistics (Bin size = 1km/hr)

Total vehicles in profile= 59187
Posted speed limit = 60 km/hr
Number speeding = 38298 (64.71%)
Maximum speed = 154 km/hr
Minimum speed = 11 km/hr
Mean speed = 61.89 km/hr
85% speed = 69 km/hr
20 km/hr pace = 53 to 73
Number in 20 km/hr pace = 48130 (81.32%)
Variance = 75.03
Standard deviation = 8.66 km/hr


GREAT EASTERN HIGHWAY
City of Swan
BYPASS
BUSHMEAD
RD
MILITARY
ROE
WEST
PDE
Rosehill Golf Course
ARUM LILY
Swan Animal Haven
West Aviat Golf Club
TALBOT
RD
ADELAIDE ST
RD
KALAMUNDA
KING
RD
VALE
HATCH
CT
STIRLING
CR
ADELAIDE
STREETSMART®
City of Swan
Shire of Kalamunda
ABERNETHY
Future Runway
Dampier to Bunbury Natural Gas Pipeline Corridor
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Emms Res
Wycombe Country Club Hotel
High Wycombe
KENNETH
STEVENS
MURRAY
RD
HAWKEVALE
Maida Vale
DUNDAS RD
WORRELL
MARGERY
PETER
WESTERN
Newburn
High Wycombe Prim Sch
CYRIL
Progress Res
RANGE VIEW
MacKenzie Park
NEWBURN
KIANDRA
WYCOMBE
CASSOWARY RD
Range View Park
tennis
NETHERWOOD
Fleming Reserve
UPTON
SMITH
WITTENOOM
BRADLEY
MARSHALL
COSSON
SORENSEN
NORTON
PERRIN
NEWBURN
Edney Prim Sch
Joins 375
Joins 345
6465000mN
404000mE
DAVID
KOOKABURRA
SUTTON
DUNDAS RD

MetroCount Traffic Executive
Empty Report

Empty-536

DATASETS:

Site:	[001750] 60m west of Hawkevale Rd on Kalamunda Rd
Direction:	2 - East bound. A hit first., Lane: 0
Survey Duration:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
File:	C:\Program Files\MetroCount v225\User\Data\00175029JAN2008.EC0 (Plus)
Identifier:	H238Q0GM MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Name:	Filter is disabled
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
In profile:	0 Vehicles

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-537

DATASETS:

Site:	[001750] 60m west of Hawkevale Rd on Kalamunda Rd
Direction:	2 - East bound, A hit first., Lane: 0
Survey Duration:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
File:	C:\Program Files\MetroCount v225\User\Data\00175029JAN2008.EC0 (Plus)
Identifier:	H238Q0GM MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
its:	Metric (m, km, m/s, km/hr, kg, tonne)
profile:	59194 Vehicles

Weekly Vehicle Counts (Virtual Week)

Report Id: VirtWeeklyVehicle-537
Site ID: 001750.0E
Location: 60m west of Hawkevale Rd on Kalamunda Rd
Filter time: 13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
Scheme: ARX
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10 160) HW(all)

	MON	TUE	WED	THU	FRI	SAT	SUN	AVERAGES 5-DAY	AVERAGES 7-DAY
Hour period									
0000-0100	53.0	72.0	*	*	*	201.0	234.0	62.5	140.0
0100-0200	23.0	28.0	*	*	*	103.0	156.0	25.5	77.5
0200-0300	16.0	24.0	*	*	*	65.0	100.0	20.0	61.3
0300-0400	33.0	35.0	*	*	*	74.0	61.0	34.0	50.8
0400-0500	67.0	84.0	*	*	*	49.0	72.0	75.5	68.0
0500-0600	265.0	256.0	*	*	*	143.0	71.0	260.5	183.8
0600-0700	687.0	701.0	*	*	*	265.0	106.0	694.0	439.8
0700-0800	1072.0<	1117.0<	*	*	*	341.0	187.0	1094.5<	679.3
0800-0900	983.0	1049.0	*	*	*	531.0	275.0	1016.0	709.5
0900-1000	751.0	793.0	*	*	*	701.0	521.0	772.0	691.5
1000-1100	771.0	746.0	*	*	*	883.0<	639.0	758.5	759.8
1100-1200	705.0	753.0	*	*	*	871.0	842.0<	729.0	792.8<
1200-1300	751.0	735.0	*	*	*	995.0<	863.0<	743.0	836.0
1300-1400	713.0	747.0	*	*	759.0	982.0	821.0	739.7	804.4
1400-1500	757.0	820.0	*	*	935.0	786.0	765.0	837.3	812.6
1500-1600	898.0	1010.0	*	*	1015.0	779.0	708.0	974.3	882.0
1600-1700	1266.0	1268.0	*	*	1285.0	775.0	789.0	1273.0	1076.6
1700-1800	1333.0<	1418.0	*	*	1418.0	810.0	776.0	1389.7<	1151.0<
1800-1900	954.0	1027.0	*	*	1130.0	840.0	674.0	1037.0	925.0
1900-2000	505.0	628.0	*	*	757.0	640.0	486.0	630.0	603.2
2000-2100	358.0	418.0	*	*	541.0	483.0	395.0	439.0	439.0
2100-2200	333.0	281.0	*	*	425.0	365.0	396.0	346.3	360.0
2200-2300	204.0	*	*	*	350.0	359.0	243.0	277.0	289.0
2300-2400	143.0	*	*	*	276.0	306.0	125.0	209.5	212.5
TOTALS									
12Hr 7-19	10954	11483	*	*	*	9294	7860	11218.5	9897.8
16Hr 6-22	12837	13511	*	*	*	11047	9243	13174.0	11659.5
18Hr 6-24	13184	*	*	*	*	11712	9611	13184.0	11502.3
24Hr 0-24	13641	*	*	*	*	12347	10305	13641.0	12097.7
AM HR	0700	0700	*	*	*	1000	1100		
PEAK	1072	1117	*	*	*	883	842		
PM HR	1700	*	*	*	*	1200	1200		
PEAK	1333	*	*	*	*	995	863		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-538

DATASETS:

Site:	**[001750] 60m west of Hawkevale Rd on Kalamunda Rd**
Direction:	2 - East bound, A hit first., **Lane:** 0
Survey Duration:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
File:	C:\Program Files\MetroCount v225\User\Data\00175029JAN2008.EC0 (Plus)
Identifier:	H238Q0GM MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	**13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr.
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
Units:	Metric (m, km, m/s, km/hr, kg, tonne)
In profile:	59194 Vehicles

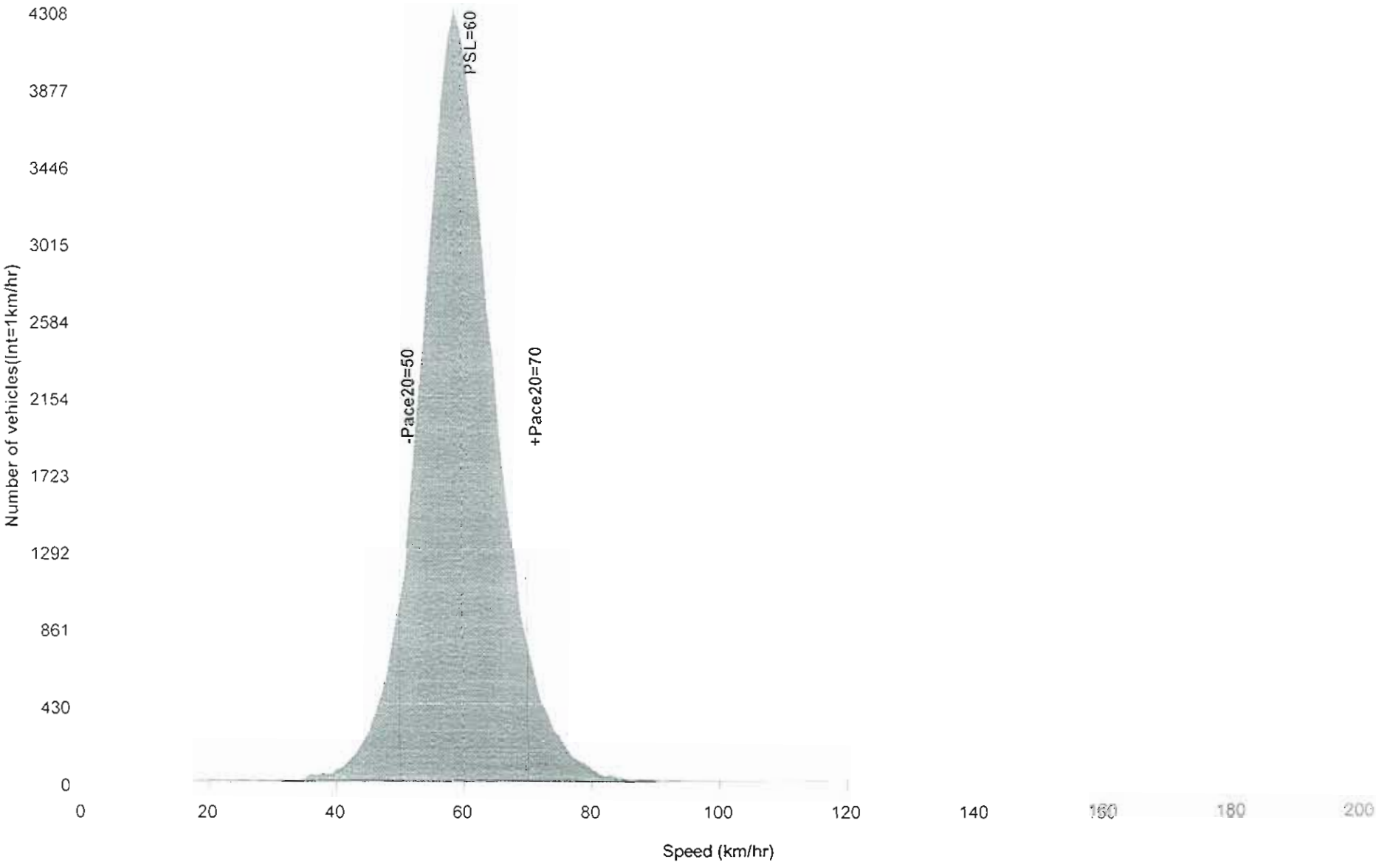
Class Speed Matrix

Report Id: ClassMatrix-538
Site ID: 001750.0E
Location: **60m west of Hawkevale Rd on Kalamunda Rd**
Filter time: **13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008**
Scheme: ARX
Filter: CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10,160) HW(all)

Speed Bin (km/hr)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Total	
10 - 20	3	8	1	.	.	2	.	.	.	.	.	.	14	0.0%
20 - 30	12	30	1	3	.	1	.	.	.	.	.	.	47	0.1%
30 - 40	1	153	8	45	5	2	.	2	.	2	.	.	218	0.4%
40 - 50	16	2768	80	143	27	8	5	3	5	17	6	4	3082	5.2%
50 - 60	163	24937	451	903	142	49	22	33	35	106	13	13	26867	45.4%
60 - 70	214	23706	325	866	106	29	15	28	15	87	15	2	25408	42.9%
70 - 80	83	3007	32	106	11	1	1	3	1	8	.	1	3254	5.5%
80 - 90	15	236	3	9	2	.	.	2	1	.	.	.	268	0.5%
90 - 100	5	24	.	1	.	.	.	.	.	.	.	.	30	0.1%
100 - 110	1	5	.	.	.	.	.	.	.	.	.	.	6	0.0%
110 - 120	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class	513	54874	901	2076	293	92	43	71	57	220	34	20	59194	
Total	0.9%	92.7%	1.5%	3.5%	0.5%	0.2%	0.1%	0.1%	0.1%	0.4%	0.1%	0.0%		

Speed Histogram

Report Id : SpeedHist-539 (Units: Metric (m, km, m/s, km/hr, kg, tonne))
Site ID: 001750.0E
Location: 60m west of Hawkevale Rd on Kalamunda Rd
Time range : [13:05 Fri 18 Jan 2008] to [21:44 Tue 22 Jan 2008]
Scheme : ARX
Profile : CL(1 2 3 4 5 6 7 8 9 10 11 12) DR(NESW) SP(10,160) HW(all)
Method : Classified vehicles



MetroCount Traffic Executive
Speed Histogram

SpeedHist-539

DATASETS:

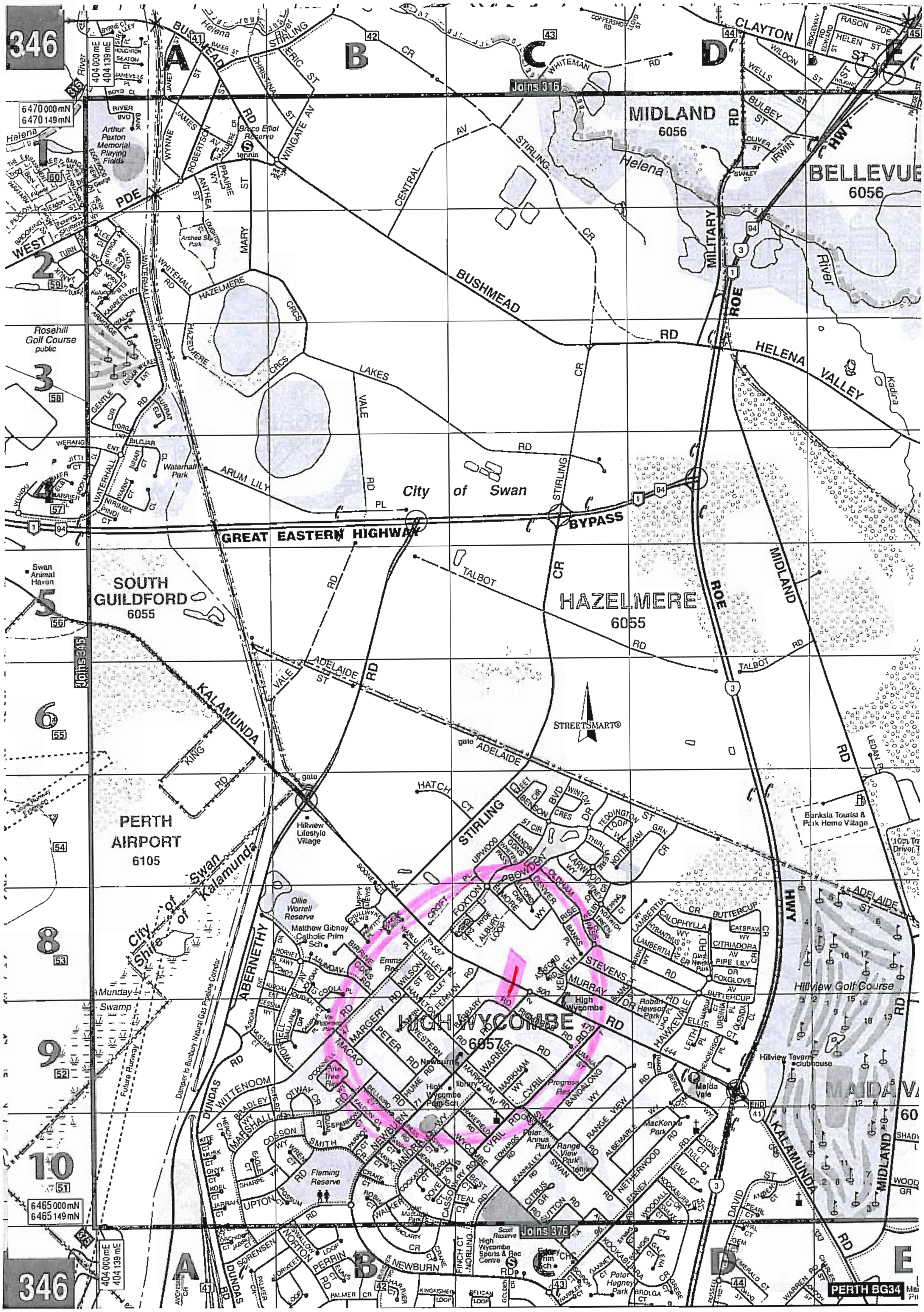
Site:	[001750] 60m west of Hawkevale Rd on Kalamunda Rd
Direction:	2 - East bound, A hit first . Lane: 0
Survey Duration:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
File:	C:\Program Files\MetroCount v225\User\Data\00175029JAN2008.EC0 (Plus)
Identifier:	H238Q0GM MC55-2 [MC50] (c)Microcom 6/05/98
Algorithm:	Factory default

PROFILE:

Filter time:	13:05 Fri 18 Jan 2008 to 21:44 Tue 22 Jan 2008
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/hr
Direction:	North, East, South, West (bound)
Headway:	All
Scheme:	ARX
Name:	Factory default profile
Method:	Vehicle classification
·its:	Metric (m, km, m/s, km/hr, kg, tonne)
... profile:	59194 Vehicles

Speed Statistics Bin size = 1km/h

Total vehicles in profile= 59194
Posted speed limit = 60 km/hr
Number speeding = 28985 (48.97%)
Maximum speed = 104 km/hr
Minimum speed = 12 km/hr
Mean speed = 59.97 km/hr
85% speed = 66 km/hr
20 km/hr pace = 50 to 70
Number in 20 km/hr pace = 52275 (88.31%)
Variance = 44.48
Standard deviation = 6.67 km/hr



346
MIDLAND
6056
BELLEVUE
6056
Helena
River
Rosehill
Golf Course
public
Arthur
Pexton
Memorial
Playing
Fields
Bruce Elliot
Reserve
Waterhall
Park
City of Swan
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
HELENA VALLEY
LAKES
ARUM LILY
STIRLING CR
ROE HWY
MIDLAND RD
HAZELMERE
6055
SOUTH
GUILDFORD
6055
Swan
Animal
Haven
KALAMUNDA
ADELAIDE ST
TALBOT RD
STREETSMART®
PERTH
AIRPORT
6105
Hillview
Lifestyle
Village
City of Swan
Shire of Kalamunda
Ollie
Worrell
Reserve
Matthew Gibney
Catholic Prim
Sch
Munday
Swamp
Future Runway
ABERNETHY
HIGH WYCOMBE
6057
High
Wycombe
Prim Sch
Fleming
Reserve
MacKenzie
Park
Hillview Golf Course
Hillview Tavern
clubhouse
MAIDA VALE
Banksia Tourist &
Park Home Village
High
Wycombe
Sports & Rec
Centre
Peter
Hogney
Park
Joins 316
Joins 345
Joins 376
6470 000mN
6470 149mN
6465 000mN
6465 149mN
404 000mE
404 139mE
PERTH BG34

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-112 -- English (ENU)

Datasets:

Site:	**[0016600] 80m west of Newburn Rd on Kalamunda Rd**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009
File:	001660013MAR2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 106669 / 107177 (99.53%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-112
Site: 0016600.0W
Description: **80m west of Newburn Rd on Kalamunda Rd**
Filter time: **12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	77.0	58.0	76.0	85.0	*	250.0	278.0	74.0	137.3
0100-0200	37.0	24.0	43.0	43.0	*	123.0	169.0	36.8	73.2
0200-0300	30.0	18.0	34.0	33.0	*	72.0	96.0	28.8	47.2
0300-0400	30.0	46.0	42.0	45.0	*	63.0	102.0	40.8	54.7
0400-0500	94.0	109.0	130.0	117.0	*	95.0	49.0	112.5	99.0
0500-0600	355.0	345.0	368.0	325.0	*	182.0	80.0	348.3	275.8
0600-0700	916.0	988.0	923.0	1009.0	*	303.0	119.0	959.0	709.7
0700-0800	1466.0	**1477.0<**	**1590.0<**	1436.0	*	486.0	292.0	**1492.3<**	1124.5
0800-0900	**1503.0<**	1445.0	1579.0	437.0	*	850.0	456.0	1241.0	1045.0
0900-1000	1233.0	1132.0	1202.0	*	*	1301.0	709.0	1189.0	1115.4
1000-1100	946.0	994.0	1060.0	*	*	1365.0	872.0	1000.0	1047.4
1100-1200	1004.0	1071.0	1092.0	*	*	**1518.0<**	**1019.0<**	1055.7	**1140.8<**
1200-1300	1147.0	1143.0	1093.0	*	1246.0	**1544.0<**	**1062.0<**	1157.3	1205.8
1300-1400	1023.0	1008.0	1088.0	*	1199.0	1438.0	1041.0	1079.5	1132.8
1400-1500	1205.0	1136.0	1209.0	*	1344.0	1341.0	1020.0	1223.5	1209.2
1500-1600	1584.0	1560.0	1541.0	*	1679.0	1366.0	952.0	1591.0	1447.0
1600-1700	1710.0	**1704.0<**	**1791.0<**	*	**1730.0<**	1311.0	1021.0	**1733.8<**	**1544.5<**
1700-1800	**1734.0<**	1663.0	1734.0	*	1700.0	1209.0	966.0	1707.8	1501.0
1800-1900	1122.0	1193.0	1314.0	*	1402.0	1038.0	755.0	1257.8	1137.3
1900-2000	637.0	739.0	817.0	*	1033.0	775.0	554.0	806.5	759.2
2000-2100	461.0	593.0	482.0	*	669.0	599.0	475.0	551.3	546.5
2100-2200	333.0	437.0	466.0	*	520.0	494.0	355.0	439.0	434.2
2200-2300	265.0	254.0	313.0	*	472.0	444.0	226.0	326.0	329.0
2300-2400	116.0	140.0	151.0	*	315.0	391.0	161.0	180.5	212.3
Totals									
0700-1900	15677.0	15526.0	16293.0	*	*	14767.0	10165.0	15728.4	14650.8
0600-2200	18024.0	18283.0	18981.0	*	*	16938.0	11668.0	18484.2	17100.3
0600-0000	18405.0	18677.0	19445.0	*	*	17773.0	12055.0	18990.7	17641.6
0000-0000	19028.0	19277.0	20138.0	*	*	18558.0	12829.0	19631.7	18328.8
AM Peak	0800	0700	0700	*	*	1100	1100		
	1503.0	1477.0	1590.0	*	*	1518.0	1019.0		
PM Peak	1700	1600	1600	*	1600	1200	1200		
	1734.0	1704.0	1791.0	*	1730.0	1544.0	1062.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-113 -- English (ENU)

Datasets:

Site:	**[0016600] 80m west of Newburn Rd on Kalamunda Rd**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009
File:	001660013MAR2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 106669 / 107177 (99.53%)

Class Speed Matrix

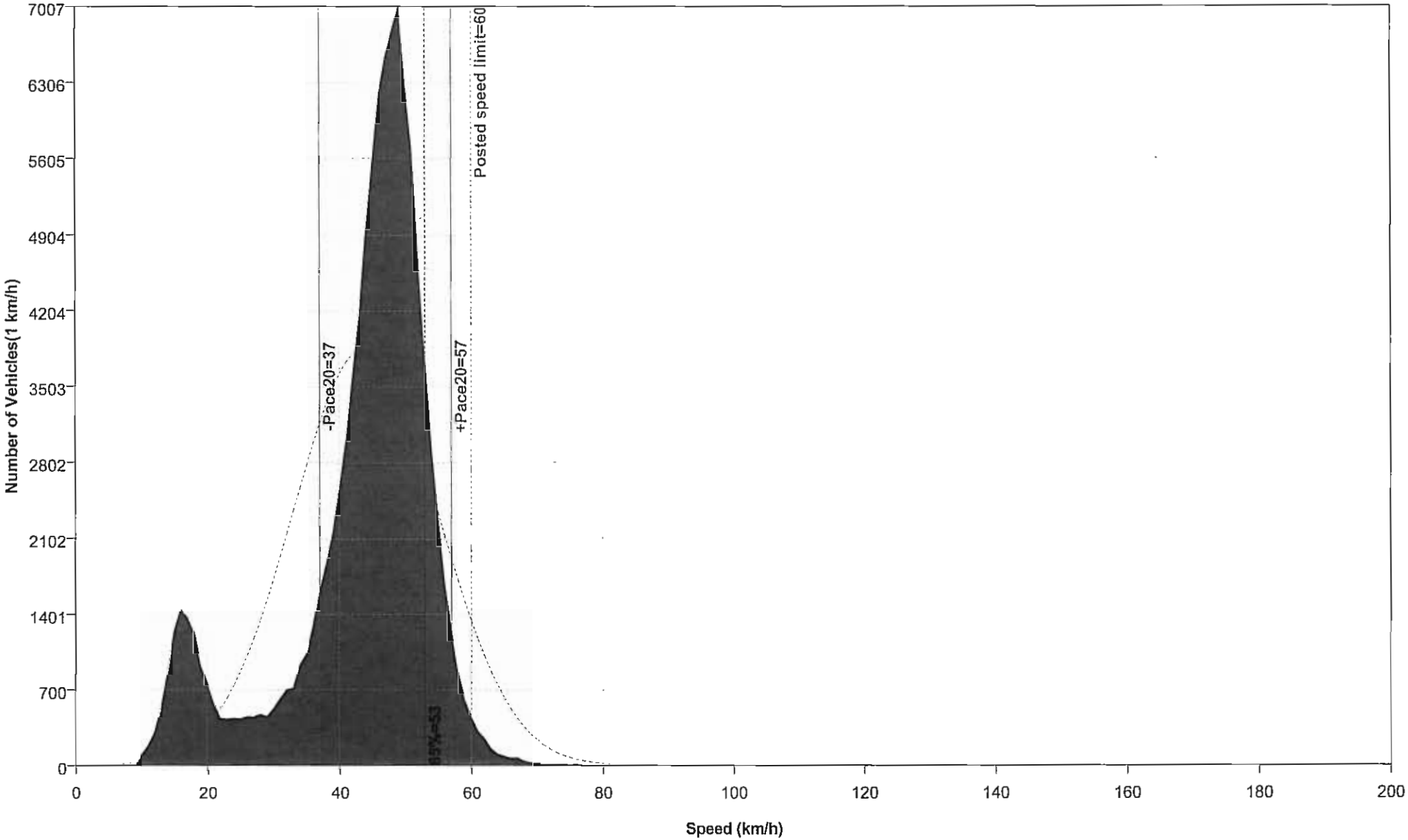
ClassMatrix-113
Site: 0016600.0W
Description: **80m west of Newburn Rd on Kalamunda Rd**
Filter time: **12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	7965	35	49	55	94	18	.	2	4	.	.	.	8222	7.7%
20 - 30	4586	85	110	49	60	2	.	4	14	2	3	.	4915	4.6%
30 - 40	10294	195	408	284	87	8	30	34	101	14	11	2	11468	10.8%
40 - 50	47984	533	1228	338	55	15	35	41	105	17	11	1	50363	47.2%
50 - 60	29429	134	350	40	5	3	5	2	1	1	.	1	29971	28.1%
60 - 70	1556	2	20	6	.	.	.	.	.	.	.	.	1584	1.5%
70 - 80	101	.	4	1	.	.	.	.	.	.	.	.	106	0.1%
80 - 90	24	.	1	.	.	.	.	.	.	.	.	.	25	0.0%
90 - 100	5	.	.	.	.	.	.	.	.	.	.	.	5	0.0%
100 - 110	4	.	.	.	.	.	.	.	.	.	.	.	4	0.0%
110 - 120	3	.	.	.	.	.	.	.	.	.	.	.	3	0.0%
120 - 130	.	.	1	.	.	.	.	.	.	.	.	.	1	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	1	.	.	.	.	.	.	.	.	.	1	0.0%
150 - 160	.	.	1	.	.	.	.	.	.	.	.	.	1	0.0%
	101951	984	2173	773	301	46	70	83	225	34	25	4	106669	
	95.6%	0.9%	2.0%	0.7%	0.3%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%		
	Class Totals													

5.96

Speed Histogram

SpeedHist-114 (Metric) **Site:**0016600.0W
Description: 80m west of Newburn Rd on Kalamunda Rd
Filter time: 12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)



MetroCount Traffic Executive
Speed Histogram

SpeedHist-114 -- English (ENU)

Datasets:

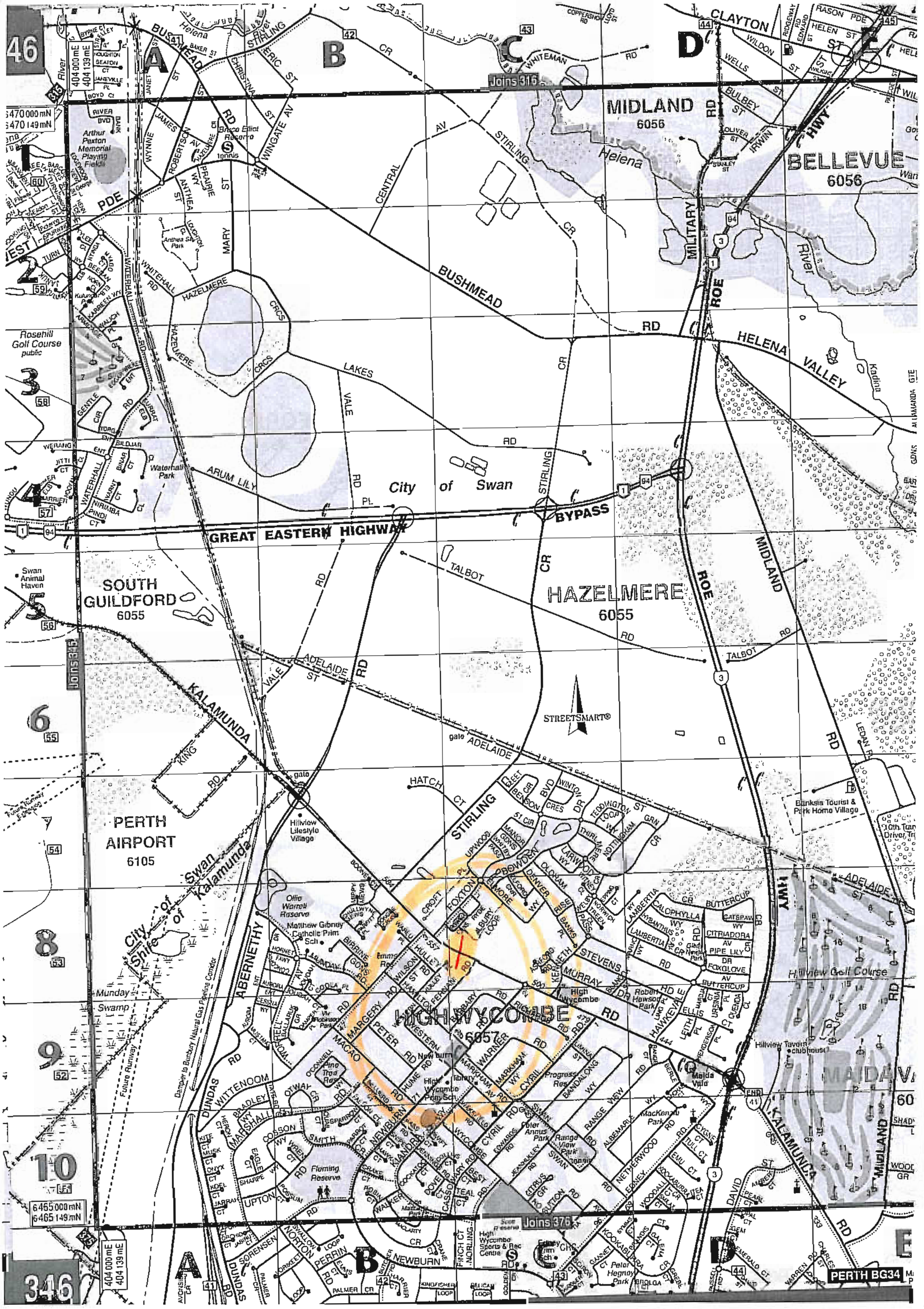
Site:	**[0016600] 80m west of Newburn Rd on Kalamunda Rd**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009
File:	001660013MAR2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Friday, March 06, 2009 => 8:16 Thursday, March 12, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
'nits:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
.n profile:	Vehicles = 106669 / 107177 (99.53%)

Speed Statistics

Vehicles = 106669
Posted speed limit = 60 km/h, Exceeding = 1730 (1.62%), Mean Exceeding = 64.13 km/h
Maximum = 150.8 km/h, **Minimum** = 10.0 km/h, **Mean** = 43.9 km/h
85% Speed = 52.6 km/h, **95% Speed** = 56.2 km/h, **Median** = 46.4 km/h
20 km/h Pace = 37 - 57, **Number in Pace** = 83488 (78.27%)
Variance = 121.43, **Standard Deviation** = 11.02 km/h



46
346
MIDLAND
6056
BELLEVUE
6056
HAZELMERE
6055
SOUTH GUILDFORD
6055
PERTH AIRPORT
6105
HIGH WYCOMBE
6057
City of Swan
Shire of Kalamunda
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
HELENA VALLEY RD
ROE HWY
MIDLAND RD
KALAMUNDA RD
STIRLING CR
ABERNETHY RD
ADELAIDE ST
TALBOT RD
CLAYTON ST
Rosehill Golf Course public
Hillview Golf Course
Hillview Lifestyle Village
Banksia Tourist & Park Home Village
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Fleming Reserve
Peter Hegney Park
MacKenzie Park
Progress Res
Arthur Paxton Memorial Playing Fields
Swan Animal Haven
Waterhall Park
Joins 316
Joins 345
Joins 376
STREETSMART®
PERTH BG34

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-103 -- English (ENU)

Datasets:

Site:	**[0016900] 50 m west of fernan road on kalamunda roadh**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009
File:	001690011MAR2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
cheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 105654 / 105805 (99.86%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-103
Site: 0016900.0WE
Description: **50 m west of fernan road on kalamunda roadh**
Filter time: **10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	68.0	52.0	67.0	92.0	78.0	210.0	255.0	71.4	117.4
0100-0200	34.0	20.0	38.0	37.0	44.0	98.0	145.0	34.6	59.4
0200-0300	28.0	23.0	28.0	35.0	54.0	65.0	77.0	33.6	44.3
0300-0400	28.0	46.0	40.0	47.0	44.0	59.0	83.0	41.0	49.6
0400-0500	85.0	93.0	115.0	96.0	71.0	77.0	48.0	92.0	83.6
0500-0600	339.0	333.0	341.0	319.0	326.0	143.0	75.0	331.6	268.0
0600-0700	861.0	924.0	865.0	930.0	893.0	265.0	113.0	894.6	693.0
0700-0800	**1379.0<**	**1329.0<**	**1406.0<**	**1353.0<**	1270.0	427.0	265.0	**1347.4<**	1061.3
0800-0900	1277.0	1251.0	1370.0	1294.0	**1297.0<**	656.0	373.0	1297.8	**1074.0<**
0900-1000	911.0	871.0	670.0	928.0	966.0	915.0	583.0	869.2	834.9
1000-1100	682.0	737.0	0.0	790.0	885.0	1012.0	719.0	515.7	603.1
1100-1200	748.0	829.0	734.0	870.0	892.0	**1106.0<**	**853.0<**	814.6	861.7
1200-1300	858.0	882.0	880.0	905.0	986.0	**1110.0<**	**887.0<**	902.2	929.7
1300-1400	814.0	782.0	868.0	875.0	923.0	1063.0	832.0	852.4	879.6
1400-1500	882.0	860.0	943.0	997.0	1070.0	963.0	846.0	950.4	937.3
1500-1600	1201.0	1186.0	1226.0	1221.0	1350.0	979.0	768.0	1236.8	1133.0
1600-1700	1348.0	1376.0	1416.0	1419.0	1396.0	918.0	858.0	1391.0	1247.3
1700-1800	**1455.0<**	**1412.0<**	**1444.0<**	**1459.0<**	**1464.0<**	908.0	818.0	**1446.8<**	**1280.0<**
1800-1900	907.0	957.0	1078.0	1035.0	1138.0	835.0	589.0	1023.0	934.1
1900-2000	509.0	561.0	615.0	714.0	806.0	618.0	437.0	641.0	608.6
2000-2100	393.0	469.0	502.0	584.0	528.0	507.0	402.0	495.2	483.6
2100-2200	287.0	352.0	409.0	407.0	406.0	382.0	283.0	372.2	360.9
2200-2300	217.0	220.0	266.0	270.0	391.0	361.0	202.0	272.8	275.3
2300-2400	93.0	132.0	154.0	169.0	280.0	335.0	151.0	165.6	187.7
Totals									
0700-1900	12462.0	12472.0	12035.0	13146.0	13637.0	10892.0	8391.0	12647.3	11776.0
0600-2200	14512.0	14778.0	14426.0	15781.0	16270.0	12664.0	9626.0	15050.3	13922.0
0600-0000	14822.0	15130.0	14846.0	16220.0	16941.0	13360.0	9979.0	15488.7	14385.0
0000-0000	15404.0	15697.0	15475.0	16846.0	17558.0	14012.0	10662.0	16092.9	15007.3
AM Peak	0700	0700	0700	0700	0800	1100	1100		
	1379.0	1329.0	1406.0	1353.0	1297.0	1106.0	853.0		
PM Peak	1700	1700	1700	1700	1700	1200	1200		
	1455.0	1412.0	1444.0	1459.0	1464.0	1110.0	887.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-104 -- English (ENU)

Datasets:

Site:	**[0016900] 50 m west of fernan road on kalamunda roadh**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009
File:	001690011MAR2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 105654 / 105805 (99.86%)

Class Speed Matrix

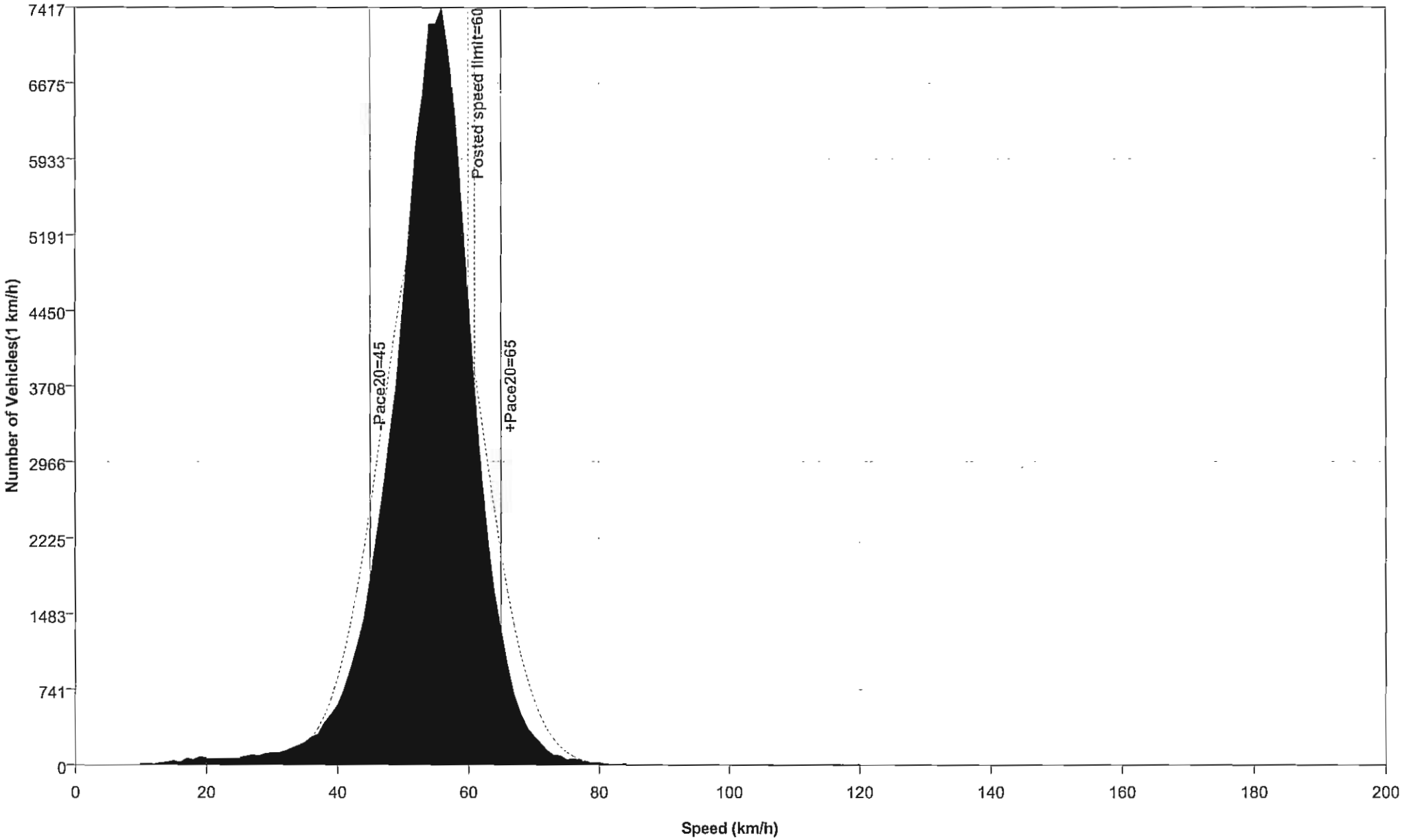
ClassMatrix-104
Site: 0016900.0WE
Description: **50 m west of fernan road on kalamunda roadh**
Filter time: **10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)

	Class												Speed Totals	
	1	2	3	4	5	6	7	8	9	10	11	12		
10 - 20	346	2	7	4	2	3	.	1	.	.	.	.	365	0.3%
20 - 30	739	14	20	11	11	1	1	.	.	.	1	.	798	0.8%
30 - 40	2147	55	109	67	32	3	10	10	13	4	2	1	2453	2.3%
40 - 50	17036	346	729	176	92	13	29	45	155	33	15	1	18670	17.7%
50 - 60	60126	804	1523	296	71	35	59	48	213	35	14	.	63224	59.8%
60 - 70	18297	181	349	54	11	4	10	6	32	7	3	.	18954	17.9%
70 - 80	1034	2	21	1	1	.	1	.	.	.	.	.	1060	1.0%
80 - 90	88	.	.	.	.	.	.	.	.	.	.	.	88	0.1%
90 - 100	24	.	1	.	.	.	.	.	.	.	.	.	25	0.0%
100 - 110	7	.	.	.	.	.	.	.	.	.	.	.	7	0.0%
110 - 120	7	.	.	.	.	.	.	.	.	.	.	.	7	0.0%
120 - 130	3	.	.	.	.	.	.	.	.	.	.	.	3	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
	99854	1404	2759	609	220	59	110	110	413	79	35	2	105654	
	94.5%	1.3%	2.6%	0.6%	0.2%	0.1%	0.1%	0.1%	0.4%	0.1%	0.0%	0.0%		
	Class Totals													

Speed Histogram

SpeedHist-105 (Metric) **Site:**0016900.0WE
Description: 50 m west of fernan road on kalamunda roadh
Filter time: 10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)



MetroCount Traffic Executive
Speed Histogram

SpeedHist-105 -- English (ENU)

Datasets:

Site:	**[0016900] 50 m west of fernan road on kalamunda roadh**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009
File:	001690011MAR2009.EC0 (Plus)
Identifier:	AE63J0TT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**10:42 Wednesday, March 04, 2009 => 10:46 Wednesday, March 11, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
cheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 105654 / 105805 (99.86%)

Speed Statistics

Vehicles = 105654
Posted speed limit = 60 km/h, Exceeding = 20144 (19.07%), Mean Exceeding = 63.69 km/h
Maximum = 124.7 km/h, **Minimum** = 10.0 km/h, **Mean** = 54.5 km/h
85% Speed = 60.8 km/h, **95% Speed** = 64.8 km/h, **Median** = 55.1 km/h
20 km/h Pace = 45 - 65, **Number in Pace** = 92329 (87.39%)
Variance = 55.19, **Standard Deviation** = 7.43 km/h

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-280 -- English (ENU)

Datasets:

Site:	**[KalamundaRdEastBound] Opp. High Wycombe Shopping Centre**
Direction:	2 - East bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Tuesday, August 18, 2009 => 7:59 Tuesday, August 25, 2009
File:	KalamundaRdEastBound24AUG2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48778 / 48912 (99.73%)

Weekly Vehicle Counts

WeeklyVehicle-280
Site: KalamundaRdEastBound.0E
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon 17 Aug	Tue 18 Aug	Wed 19 Aug	Thu 20 Aug	Fri 21 Aug	Sat 22 Aug	Sun 23 Aug	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	*	*	46	51	51	93	93	49.3	66.8
0100-0200	*	*	18	36	26	51	76	26.7	41.4
0200-0300	*	*	19	21	23	31	52	21.0	29.2
0300-0400	*	*	18	23	18	25	39	19.7	24.6
0400-0500	*	*	42	31	30	29	20	34.3	30.4
0500-0600	*	*	86	90	85	38	43	87.0	68.4
0600-0700	*	*	207	242	218	88	57	222.3	162.4
0700-0800	*	*	292	335	267	169	123	298.0	237.2
0800-0900	*	*	407	**389<**	443	275	220	**413.0<**	346.8
0900-1000	*	*	345	359	380	382	346	361.3	362.4
1000-1100	*	*	339	355	**470<**	483	421	388.0	413.6
1100-1200	*	*	**414<**	360	437	**531<**	**464<**	403.7	**441.2<**
1200-1300	*	436	445	412	517	**575<**	**535<**	452.5	486.7
1300-1400	*	418	411	408	515	469	459	438.0	446.7
1400-1500	*	545	523	531	603	449	442	550.5	515.5
1500-1600	*	676	714	693	718	450	426	700.3	612.8
1600-1700	*	894	904	863	866	513	469	881.8	751.5
1700-1800	*	**899<**	**916<**	**866<**	**924<**	494	443	**901.3<**	**757.0<**
1800-1900	*	564	573	573	614	366	383	581.0	512.2
1900-2000	*	299	288	299	339	267	246	306.3	289.7
2000-2100	*	200	209	245	256	189	158	227.5	209.5
2100-2200	*	183	202	210	209	157	136	201.0	182.8
2200-2300	*	125	135	150	182	180	87	148.0	143.2
2300-2400	*	71	100	93	178	166	44	110.5	108.7
Totals									
0700-1900	*	*	6283	6144	6754	5156	4731	6369.3	5883.5
0600-2200	*	*	7189	7140	7776	5857	5328	7326.3	6727.9
0600-0000	*	*	7424	7383	8136	6203	5459	7584.8	6979.8
0000-0000	*	*	7653	7635	8369	6470	5782	7822.8	7240.6
AM Peak	*	*	1100	0800	1000	1100	1100		
	*	*	414	389	470	531	464		
PM Peak	*	1700	1700	1700	1700	1200	1200		
	*	899	916	866	924	575	535		

* - No data.

Weekly Vehicle Counts

WeeklyVehicle-280
Site: KalamundaRdEastBound.0E
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	24 Aug	25 Aug	26 Aug	27 Aug	28 Aug	29 Aug	30 Aug	1 - 5	1 - 7
Hour									
0000-0100	39	37	*	*	*	*	*	38.0	38.0
0100-0200	16	32	*	*	*	*	*	24.0	24.0
0200-0300	17	12	*	*	*	*	*	14.5	14.5
0300-0400	14	9	*	*	*	*	*	11.5	11.5
0400-0500	38	28	*	*	*	*	*	33.0	33.0
0500-0600	89	84	*	*	*	*	*	86.5	86.5
0600-0700	220	212	*	*	*	*	*	216.0	216.0
0700-0800	286	59	*	*	*	*	*	172.5	172.5
0800-0900	**378<**	*	*	*	*	*	*	**378.0<**	**378.0<**
0900-1000	321	*	*	*	*	*	*	321.0	321.0
1000-1100	350	*	*	*	*	*	*	350.0	350.0
1100-1200	352	*	*	*	*	*	*	352.0	352.0
1200-1300	393	*	*	*	*	*	*	393.0	393.0
1300-1400	407	*	*	*	*	*	*	407.0	407.0
1400-1500	503	*	*	*	*	*	*	503.0	503.0
1500-1600	702	*	*	*	*	*	*	702.0	702.0
1600-1700	847	*	*	*	*	*	*	847.0	847.0
1700-1800	**895<**	*	*	*	*	*	*	**895.0<**	**895.0<**
1800-1900	470	*	*	*	*	*	*	470.0	470.0
1900-2000	255	*	*	*	*	*	*	255.0	255.0
2000-2100	183	*	*	*	*	*	*	183.0	183.0
2100-2200	155	*	*	*	*	*	*	155.0	155.0
2200-2300	99	*	*	*	*	*	*	99.0	99.0
2300-2400	57	*	*	*	*	*	*	57.0	57.0
Totals									
0700-1900	5904	*	*	*	*	*	*	5790.5	5790.5
0600-2200	6717	*	*	*	*	*	*	6599.5	6599.5
0600-0000	6873	*	*	*	*	*	*	6755.5	6755.5
0000-0000	7086	*	*	*	*	*	*	6963.0	6963.0
AM Peak	0800	*	*	*	*	*	*		
	378	*	*	*	*	*	*		
PM Peak	1700	*	*	*	*	*	*		
	895	*	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-281 -- English (ENU)

Datasets:

Site:	**[KalamundaRdEastBound] Opp. High Wycombe Shopping Centre**
Direction:	2 - East bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Tuesday, August 18, 2009 => 7:59 Tuesday, August 25, 2009
File:	KalamundaRdEastBound24AUG2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48778 / 48912 (99.73%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-281
Site: KalamundaRdEastBound.0E
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	39.0	37.0	46.0	51.0	51.0	93.0	93.0	44.8	58.6
0100-0200	16.0	32.0	18.0	36.0	26.0	51.0	76.0	25.6	36.4
0200-0300	17.0	12.0	19.0	21.0	23.0	31.0	52.0	18.4	25.0
0300-0400	14.0	9.0	18.0	23.0	18.0	25.0	39.0	16.4	20.9
0400-0500	38.0	28.0	42.0	31.0	30.0	29.0	20.0	33.8	31.1
0500-0600	89.0	84.0	86.0	90.0	85.0	38.0	43.0	86.8	73.6
0600-0700	220.0	212.0	207.0	242.0	218.0	88.0	57.0	219.8	177.7
0700-0800	286.0	59.0	292.0	335.0	267.0	169.0	123.0	247.8	218.7
0800-0900	**378.0<**	*	407.0	**389.0<**	443.0	275.0	220.0	**404.3<**	352.0
0900-1000	321.0	*	345.0	359.0	380.0	382.0	346.0	351.3	355.5
1000-1100	350.0	*	339.0	355.0	**470.0<**	483.0	421.0	378.5	403.0
1100-1200	352.0	*	**414.0<**	360.0	437.0	**531.0<**	**464.0<**	390.8	**426.3<**
1200-1300	393.0	436.0	445.0	412.0	517.0	**575.0<**	**535.0<**	440.6	473.3
1300-1400	407.0	418.0	411.0	408.0	515.0	469.0	459.0	431.8	441.0
1400-1500	503.0	545.0	523.0	531.0	603.0	449.0	442.0	541.0	513.7
1500-1600	702.0	676.0	714.0	693.0	718.0	450.0	426.0	700.6	625.6
1600-1700	847.0	894.0	904.0	863.0	866.0	513.0	469.0	874.8	765.1
1700-1800	**895.0<**	**899.0<**	**916.0<**	**866.0<**	**924.0<**	494.0	443.0	**900.0<**	**776.7<**
1800-1900	470.0	564.0	573.0	573.0	614.0	366.0	383.0	558.8	506.1
1900-2000	255.0	299.0	288.0	299.0	339.0	267.0	246.0	296.0	284.7
2000-2100	183.0	200.0	209.0	245.0	256.0	189.0	158.0	218.6	205.7
2100-2200	155.0	183.0	202.0	210.0	209.0	157.0	136.0	191.8	178.9
2200-2300	99.0	125.0	135.0	150.0	182.0	180.0	87.0	138.2	136.9
2300-2400	57.0	71.0	100.0	93.0	178.0	166.0	44.0	99.8	101.3
Totals									
0700-1900	5904.0	*	6283.0	6144.0	6754.0	5156.0	4731.0	6220.2	5857.1
0600-2200	6717.0	*	7189.0	7140.0	7776.0	5857.0	5328.0	7146.4	6704.1
0600-0000	6873.0	*	7424.0	7383.0	8136.0	6203.0	5459.0	7384.4	6942.3
0000-0000	7086.0	*	7653.0	7635.0	8369.0	6470.0	5782.0	7610.2	7187.8
AM Peak	0800	*	1100	0800	1000	1100	1100		
	378.0	*	414.0	389.0	470.0	531.0	464.0		
PM Peak	1700	1700	1700	1700	1700	1200	1200		
	895.0	899.0	916.0	866.0	924.0	575.0	535.0		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-276 -- English (ENU)

Datasets:

Site:	**[KalamundaRdWestBound] Opp. High Wycombe Shopping Centre**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Tuesday, August 18, 2009 => 8:03 Tuesday, August 25, 2009
File:	KalamundaRdWestBound25AUG2009.EC0 (Plus)
Identifier:	AC73KEVC MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 49025 / 49126 (99.79%)

Weekly Vehicle Counts

WeeklyVehicle-276
Site: KalamundaRdWestBound.0W
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon 17 Aug	Tue 18 Aug	Wed 19 Aug	Thu 20 Aug	Fri 21 Aug	Sat 22 Aug	Sun 23 Aug	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	*	*	38	16	32	80	58	28.7	44.8
0100-0200	*	*	13	9	13	27	64	11.7	25.2
0200-0300	*	*	13	13	13	30	31	13.0	20.0
0300-0400	*	*	23	23	26	20	18	24.0	22.0
0400-0500	*	*	76	72	61	37	22	69.7	53.6
0500-0600	*	*	244	220	215	86	52	226.3	163.4
0600-0700	*	*	806	708	672	144	70	728.7	480.0
0700-0800	*	*	**1048<**	**1057<**	**967<**	256	133	**1024.0<**	**692.2<**
0800-0900	*	*	856	837	787	393	249	826.7	624.4
0900-1000	*	*	470	525	545	472	331	513.3	468.6
1000-1100	*	*	425	404	437	**516<**	465	422.0	449.4
1100-1200	*	*	443	399	410	470	**481<**	417.3	440.6
1200-1300	*	421	455	446	483	**501<**	**536<**	451.3	**473.7<**
1300-1400	*	403	441	403	492	458	516	434.8	452.2
1400-1500	*	412	394	422	502	410	457	432.5	432.8
1500-1600	*	**482<**	**482<**	**491<**	**600<**	386	375	**513.8<**	469.3
1600-1700	*	433	404	479	503	411	400	454.8	438.3
1700-1800	*	415	453	473	505	428	413	461.5	447.8
1800-1900	*	361	406	354	479	377	298	400.0	379.2
1900-2000	*	252	243	222	274	269	191	247.8	241.8
2000-2100	*	162	181	190	216	194	154	187.3	182.8
2100-2200	*	136	136	126	175	139	112	143.3	137.3
2200-2300	*	92	79	104	141	153	57	104.0	104.3
2300-2400	*	31	47	43	104	106	25	56.3	59.3
Totals									
0700-1900	*	*	6277	6290	6710	5078	4654	6351.8	5768.5
0600-2200	*	*	7643	7536	8047	5824	5181	7658.8	6810.5
0600-0000	*	*	7769	7683	8292	6083	5263	7819.0	6974.2
0000-0000	*	*	8176	8036	8652	6363	5508	8192.3	7303.2
AM Peak	*	*	0700	0700	0700	1000	1100		
	*	*	1048	1057	967	516	481		
PM Peak	*	1500	1500	1500	1500	1200	1200		
	*	482	482	491	600	501	536		

* - No data.

Weekly Vehicle Counts

WeeklyVehicle-276
Site: KalamundaRdWestBound.0W
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	24 Aug	25 Aug	26 Aug	27 Aug	28 Aug	29 Aug	30 Aug	1 - 5	1 - 7
Hour									
0000-0100	20	20	*	*	*	*	*	20.0	20.0
0100-0200	9	9	*	*	*	*	*	9.0	9.0
0200-0300	13	12	*	*	*	*	*	12.5	12.5
0300-0400	19	20	*	*	*	*	*	19.5	19.5
0400-0500	64	65	*	*	*	*	*	64.5	64.5
0500-0600	241	210	*	*	*	*	*	225.5	225.5
0600-0700	657	680	*	*	*	*	*	668.5	668.5
0700-0800	**977<**	231	*	*	*	*	*	604.0	604.0
0800-0900	825	*	*	*	*	*	*	**825.0<**	**825.0<**
0900-1000	476	*	*	*	*	*	*	476.0	476.0
1000-1100	426	*	*	*	*	*	*	426.0	426.0
1100-1200	395	*	*	*	*	*	*	395.0	395.0
1200-1300	402	*	*	*	*	*	*	402.0	402.0
1300-1400	380	*	*	*	*	*	*	380.0	380.0
1400-1500	384	*	*	*	*	*	*	384.0	384.0
1500-1600	**530<**	*	*	*	*	*	*	**530.0<**	**530.0<**
1600-1700	415	*	*	*	*	*	*	415.0	415.0
1700-1800	411	*	*	*	*	*	*	411.0	411.0
1800-1900	327	*	*	*	*	*	*	327.0	327.0
1900-2000	162	*	*	*	*	*	*	162.0	162.0
2000-2100	124	*	*	*	*	*	*	124.0	124.0
2100-2200	110	*	*	*	*	*	*	110.0	110.0
2200-2300	52	*	*	*	*	*	*	52.0	52.0
2300-2400	24	*	*	*	*	*	*	24.0	24.0
Totals									
0700-1900	5948	*	*	*	*	*	*	5575.0	5575.0
0600-2200	7001	*	*	*	*	*	*	6639.5	6639.5
0600-0000	7077	*	*	*	*	*	*	6715.5	6715.5
0000-0000	7443	*	*	*	*	*	*	7066.5	7066.5
AM Peak	0700	*	*	*	*	*	*		
	977	*	*	*	*	*	*		
PM Peak	1500	*	*	*	*	*	*		
	530	*	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-278 -- English (ENU)

Datasets:

Site:	**[KalamundaRdWestBound] Opp. High Wycombe Shopping Centre**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	12:00 Tuesday, August 18, 2009 => 8:03 Tuesday, August 25, 2009
File:	KalamundaRdWestBound25AUG2009.EC0 (Plus)
Identifier:	AC73KEVC MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 49025 / 49126 (99.79%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-278
Site: KalamundaRdWestBound.0W
Description: **Opp. High Wycombe Shopping Centre**
Filter time: **12:00 Tuesday, August 18, 2009 => 7:15 Tuesday, August 25, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	20.0	20.0	38.0	16.0	32.0	80.0	58.0	25.2	37.7
0100-0200	9.0	9.0	13.0	9.0	13.0	27.0	64.0	10.6	20.6
0200-0300	13.0	12.0	13.0	13.0	13.0	30.0	31.0	12.8	17.9
0300-0400	19.0	20.0	23.0	23.0	26.0	20.0	18.0	22.2	21.3
0400-0500	64.0	65.0	76.0	72.0	61.0	37.0	22.0	67.6	56.7
0500-0600	241.0	210.0	244.0	220.0	215.0	86.0	52.0	226.0	181.1
0600-0700	657.0	680.0	806.0	708.0	672.0	144.0	70.0	704.6	533.9
0700-0800	**977.0<**	231.0	**1048.0<**	**1057.0<**	**967.0<**	256.0	133.0	**856.0<**	**667.0<**
0800-0900	825.0	*	856.0	837.0	787.0	393.0	249.0	826.3	657.8
0900-1000	476.0	*	470.0	525.0	545.0	472.0	331.0	504.0	469.8
1000-1100	426.0	*	425.0	404.0	437.0	**516.0<**	465.0	423.0	445.5
1100-1200	395.0	*	443.0	399.0	410.0	470.0	**481.0<**	411.8	433.0
1200-1300	402.0	421.0	455.0	446.0	483.0	**501.0<**	**536.0<**	441.4	463.4
1300-1400	380.0	403.0	441.0	403.0	492.0	458.0	516.0	423.8	441.9
1400-1500	384.0	412.0	394.0	422.0	502.0	410.0	457.0	422.8	425.9
1500-1600	**530.0<**	**482.0<**	**482.0<**	**491.0<**	**600.0<**	386.0	375.0	**517.0<**	**478.0<**
1600-1700	415.0	433.0	404.0	479.0	503.0	411.0	400.0	446.8	435.0
1700-1800	411.0	415.0	453.0	473.0	505.0	428.0	413.0	451.4	442.6
1800-1900	327.0	361.0	406.0	354.0	479.0	377.0	298.0	385.4	371.7
1900-2000	162.0	252.0	243.0	222.0	274.0	269.0	191.0	230.6	230.4
2000-2100	124.0	162.0	181.0	190.0	216.0	194.0	154.0	174.6	174.4
2100-2200	110.0	136.0	136.0	126.0	175.0	139.0	112.0	136.6	133.4
2200-2300	52.0	92.0	79.0	104.0	141.0	153.0	57.0	93.6	96.9
2300-2400	24.0	31.0	47.0	43.0	104.0	106.0	25.0	49.8	54.3
Totals									
0700-1900	5948.0	*	6277.0	6290.0	6710.0	5078.0	4654.0	6109.6	5731.6
0600-2200	7001.0	*	7643.0	7536.0	8047.0	5824.0	5181.0	7356.0	6803.7
0600-0000	7077.0	*	7769.0	7683.0	8292.0	6083.0	5263.0	7499.4	6954.9
0000-0000	7443.0	*	8176.0	8036.0	8652.0	6363.0	5508.0	7863.8	7290.2
AM Peak	0700	*	0700	0700	0700	1000	1100		
	977.0	*	1048.0	1057.0	967.0	516.0	481.0		
PM Peak	1500	1500	1500	1500	1500	1200	1200		
	530.0	482.0	482.0	491.0	600.0	501.0	536.0		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-337 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD (1)] 200 M East of ABERNETHY Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009
File:	KALAMUNDA RD (1)17NOV2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113681 / 113814 (99.88%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-337
Site: KALAMUNDA RD (1).0WE
Description: **200 M East of ABERNETHY Rd**
Filter time: **14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	40.0	47.0	46.0	65.0	80.0	178.0	211.5	55.6	117.4
0100-0200	26.0	24.0	26.0	40.0	41.0	87.5	101.5	31.4	59.4
0200-0300	24.0	30.0	38.0	28.0	41.0	62.5	84.5	32.2	50.6
0300-0400	32.0	39.0	50.0	43.0	47.0	56.0	70.0	42.2	51.4
0400-0500	126.0	126.0	139.0	148.0	93.0	62.0	72.0	126.4	100.0
0500-0600	362.0	358.0	399.0	360.0	369.0	162.0	103.0	369.6	264.2
0600-0700	947.0	1003.0	994.0	962.0	964.0	301.5	170.0	974.0	645.9
0700-0800	**1375.0<**	**1374.0<**	**1304.0<**	**1322.0<**	**1252.0<**	424.5	235.0	**1325.4<**	**882.9<**
0800-0900	1075.0	1048.0	1059.0	1084.0	1042.0	591.0	394.0	1061.6	808.7
0900-1000	761.0	773.0	797.0	804.0	755.0	723.0	555.5	778.0	716.3
1000-1100	607.0	643.0	717.0	701.0	726.0	761.0	618.5	678.8	683.7
1100-1200	679.0	663.0	685.0	672.0	736.0	**844.5<**	**759.0<**	687.0	735.4
1200-1300	748.0	771.0	808.0	762.0	837.0	**898.5<**	701.0	785.2	803.0
1300-1400	724.0	736.0	785.0	740.0	904.0	741.0	675.0	777.8	755.8
1400-1500	811.0	792.0	859.0	810.0	900.0	722.0	667.0	845.3	798.1
1500-1600	1022.0	1087.0	1069.0	1037.0	1144.5	700.5	647.0	1084.0	950.2
1600-1700	1216.0	1244.0	1250.0	1234.0	1270.0	686.0	**734.0<**	1247.3	1065.6
1700-1800	**1234.0<**	**1327.0<**	**1257.0<**	**1256.0<**	**1298.0<**	742.5	693.0	**1278.3<**	**1094.2<**
1800-1900	724.0	792.0	843.0	780.0	930.5	661.0	535.0	833.3	761.9
1900-2000	398.0	436.0	498.0	489.0	549.5	481.0	366.0	486.7	472.0
2000-2100	291.0	347.0	381.0	341.0	379.5	284.5	290.0	353.2	330.9
2100-2200	243.0	285.0	360.0	310.0	324.0	276.5	253.0	307.7	294.7
2200-2300	148.0	221.0	224.0	216.0	329.0	319.0	162.0	244.5	251.9
2300-2400	63.0	101.0	114.0	139.0	275.5	336.5	87.0	161.3	192.0
Totals									
0700-1900	10976.0	11250.0	11433.0	11202.0	11795.0	8495.5	7214.0	11382.1	10055.7
0600-2200	12855.0	13321.0	13666.0	13304.0	14012.0	9839.0	8293.0	13503.6	11799.1
0600-0000	13066.0	13643.0	14004.0	13659.0	14616.5	10494.5	8542.0	13909.5	12243.0
0000-0000	13676.0	14267.0	14702.0	14343.0	15287.5	11102.5	9184.5	14566.9	12886.1
AM Peak	0700	0700	0700	0700	0700	1100	1100		
	1375.0	1374.0	1304.0	1322.0	1252.0	844.5	759.0		
PM Peak	1700	1700	1700	1700	1700	1200	1600		
	1234.0	1327.0	1257.0	1256.0	1298.0	898.5	734.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-338 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD (1)] 200 M East of ABERNETHY Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009
File:	KALAMUNDA RD (1)17NOV2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113681 / 113814 (99.88%)

Class Speed Matrix

ClassMatrix-338
Site: KALAMUNDA RD (1).0WE
Description: **200 M East of ABERNETHY Rd**
Filter time: **14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	116	.	1	1	.	.	1	1	.	.	.	.	120	0.1%
20 - 30	575	9	17	14	6	2	.	3	8	.	1	.	635	0.6%
30 - 40	3343	84	100	38	53	3	4	6	29	2	5	.	3667	3.2%
40 - 50	10191	283	410	121	62	13	14	24	147	25	7	1	11298	9.9%
50 - 60	41948	720	1517	354	86	37	45	69	389	44	12	3	45224	39.8%
60 - 70	44420	532	889	174	33	19	25	30	111	18	10	.	46261	40.7%
70 - 80	5653	53	103	13	2	3	2	1	8	1	2	.	5841	5.1%
80 - 90	501	3	11	2	1	.	.	.	.	.	.	.	518	0.5%
90 - 100	78	.	2	.	.	.	.	.	.	.	.	.	80	0.1%
100 - 110	14	.	.	.	.	.	.	.	.	.	.	.	14	0.0%
110 - 120	13	.	.	.	.	.	.	.	.	.	.	.	13	0.0%
120 - 130	4	.	.	.	.	.	.	.	.	.	.	.	4	0.0%
130 - 140	5	.	.	.	.	.	.	.	.	.	.	.	5	0.0%
140 - 150	1	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
	106862	1684	3050	717	243	77	91	134	692	90	37	4	113681	
	94.0%	1.5%	2.7%	0.6%	0.2%	0.1%	0.1%	0.1%	0.6%	0.1%	0.0%	0.0%		
	Class Totals													

95.5

MetroCount Traffic Executive
Speed Histogram

SpeedHist-339 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD (1)] 200 M East of ABERNETHY Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009
File:	KALAMUNDA RD (1)17NOV2009.EC0 (Plus)
Identifier:	M41667B2 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

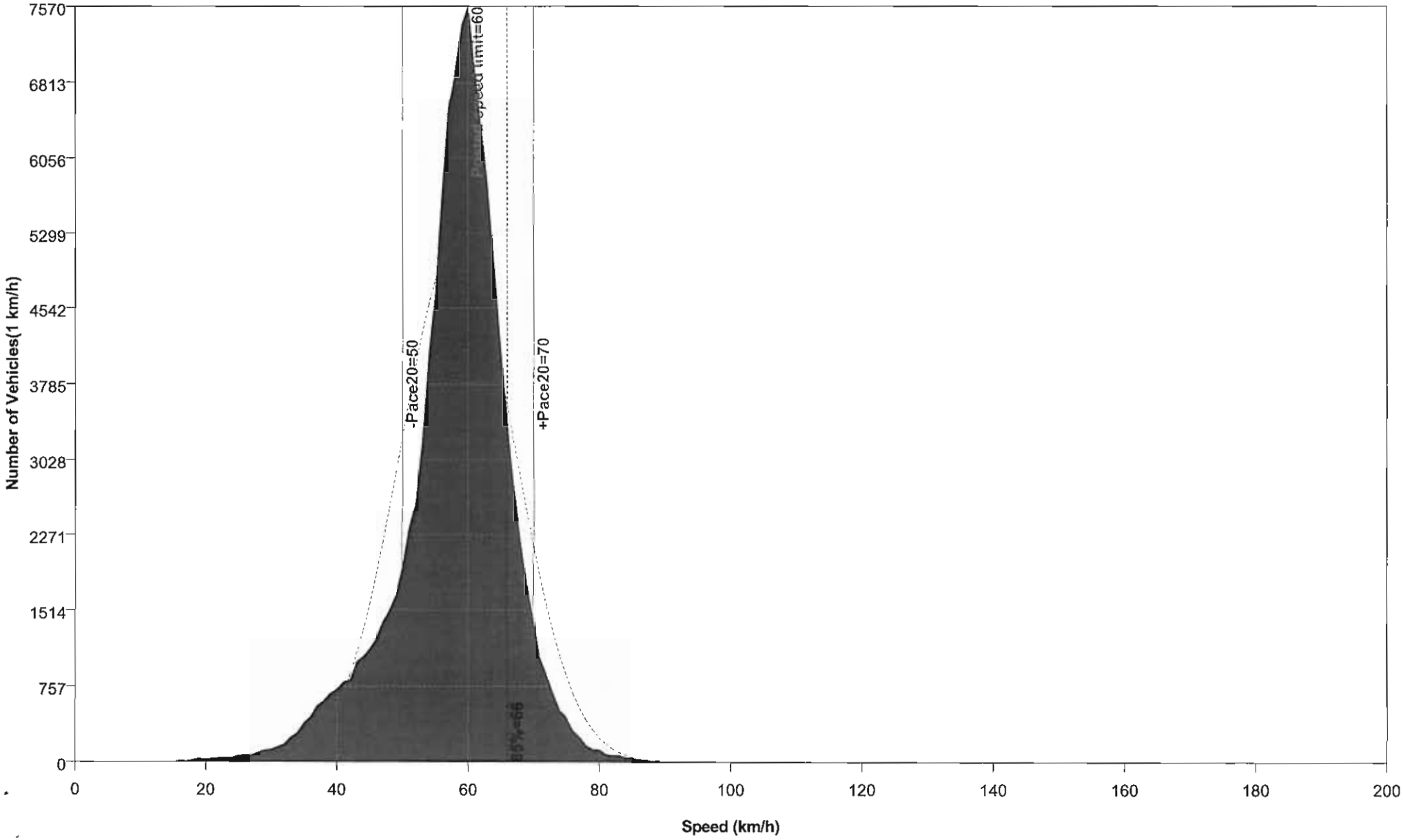
Filter time:	**14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113681 / 113814 (99.88%)

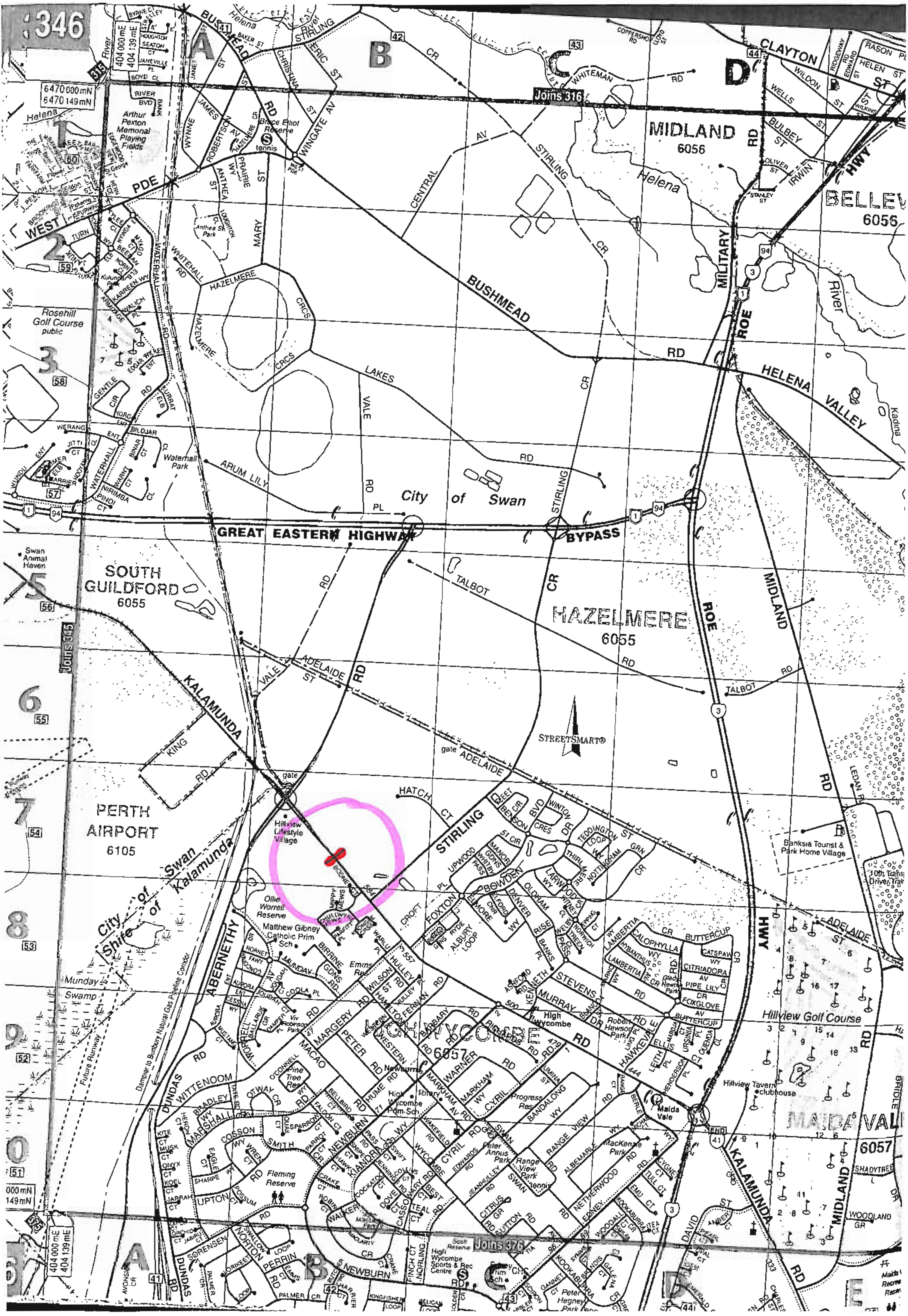
Speed Statistics

Vehicles = 113681
Posted speed limit = 60 km/h, Exceeding = 52737 (46.39%), Mean Exceeding = 65.10 km/h
Maximum = 141.8 km/h, **Minimum** = 10.2 km/h, **Mean** = 58.5 km/h
85% Speed = 65.9 km/h, **95% Speed** = 70.2 km/h, **Median** = 59.4 km/h
20 km/h Pace = 50 - 70, **Number in Pace** = 91783 (80.74%)
Variance = 75.65, **Standard Deviation** = 8.70 km/h

Speed Histogram

SpeedHist-339 (Metric) **Site:**KALAMUNDA RD (1).0WE
Description: 200 M East of ABERNETHY Rd
Filter time: 14:00 Friday, November 06, 2009 => 10:55 Sunday, November 15, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)




346
Joins 316
Joins 345
Joins 376
MIDLAND 6056
BELLEVUE 6056
SOUTH GUILDFORD 6055
HAZELMERE 6055
PERTH AIRPORT 6105
HIGH WYCOMBE 6057
MAIDA VALE 6057
City of Swan
City of Swan
Shire of Kalamunda
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
HELENA VALLEY RD
ROE HWY
MIDLAND RD
KALAMUNDA RD
ABERNETHY RD
STIRLING CR
ADELAIDE ST
TALBOT RD
LAKES RD
ARUM LILY RD
VALE RD
CENTRAL AV
CLAYTON ST
MILITARY RD
WEST PDE
Rosehill Golf Course public
Arthur Pexton Memorial Playing Fields
Waterhall Park
Swan Animal Haven
Hillview Lifestyle Village
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Hillview Golf Course
Hillview Tavern clubhouse
Banksia Tourist & Park Home Village
Fleming Reserve
Munday Swamp
Future Runway
Dampier to Bunbury Natural Gas Pipeline Corridor
High Wycombe Prim Sch
High Wycombe Sports & Rec Centre
MacKenzie Park
Range View Park
Progress Res
STREETSMART®

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-343 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 100 M West of WITTENOOM Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009
File:	KALAMUNDA RD(1)18NOV2009.EC0 (Plus)
Identifier:	AE58WZY1 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 112744 / 112962 (99.81%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-343
Site: KALAMUNDA RD(1).0WE
Description: **100 M West of WITTENOOM Rd**
Filter time: **14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	42.0	47.0	50.0	68.0	89.0	199.0	216.0	59.2	101.6
0100-0200	28.0	28.0	30.0	45.0	45.0	86.0	101.0	35.2	51.9
0200-0300	25.0	29.0	40.0	29.0	43.0	65.0	77.0	33.2	44.0
0300-0400	36.0	43.0	53.0	49.0	49.0	65.0	65.0	46.0	51.4
0400-0500	131.0	132.0	148.0	154.0	106.0	57.0	69.0	134.2	113.9
0500-0600	431.0	436.0	468.0	412.0	420.0	191.0	116.0	433.4	353.4
0600-0700	1055.0	1107.0	1092.0	1046.0	1048.0	337.0	200.0	1069.6	840.7
0700-0800	**1495.0<**	**1516.0<**	**1463.0<**	**1503.0<**	**1404.0<**	542.0	285.0	**1476.2<**	**1172.6<**
0800-0900	1319.0	1294.0	1277.0	1300.0	1258.0	839.0	442.0	1289.6	1104.1
0900-1000	933.0	961.0	983.0	979.0	937.0	1033.0	688.0	958.6	930.6
1000-1100	789.0	824.0	914.0	874.0	881.0	1056.0	796.0	856.4	876.3
1100-1200	871.0	848.0	865.0	879.0	951.0	**1255.0<**	**968.0<**	882.8	948.1
1200-1300	998.0	977.0	1004.0	989.0	1048.0	**1167.0<**	866.0	1003.2	1007.0
1300-1400	893.0	887.0	1006.0	942.0	1058.0	1041.0	868.0	957.2	956.4
1400-1500	1050.0	1018.0	1056.0	1005.0	1120.0	986.0	856.0	1049.8	1013.0
1500-1600	1318.0	1366.0	1375.0	1327.0	1494.0	969.0	785.0	1376.0	1233.4
1600-1700	1486.0	**1587.0<**	1497.0	1527.0	1544.0	931.0	**889.0<**	1528.2	**1351.6<**
1700-1800	**1502.0<**	1584.0	**1517.0<**	**1535.0<**	**1583.0<**	888.0	832.0	**1544.2<**	1348.7
1800-1900	851.0	942.0	1027.0	981.0	1066.0	758.0	666.0	973.4	898.7
1900-2000	471.0	532.0	616.0	657.0	651.0	586.0	457.0	585.4	567.1
2000-2100	332.0	397.0	442.0	450.0	451.0	336.0	339.0	414.4	392.4
2100-2200	272.0	322.0	384.0	378.0	356.0	316.0	287.0	342.4	330.7
2200-2300	159.0	237.0	244.0	230.0	344.0	358.0	170.0	242.8	248.9
2300-2400	74.0	106.0	131.0	150.0	301.0	331.0	95.0	152.4	169.7
Totals									
0700-1900	13505.0	13804.0	13984.0	13841.0	14344.0	11465.0	8941.0	13895.6	12840.6
0600-2200	15635.0	16162.0	16518.0	16372.0	16850.0	13040.0	10224.0	16307.4	14971.6
0600-0000	15868.0	16505.0	16893.0	16752.0	17495.0	13729.0	10489.0	16702.6	15390.1
0000-0000	16561.0	17220.0	17682.0	17509.0	18247.0	14392.0	11133.0	17443.8	16106.3
AM Peak	0700	0700	0700	0700	0700	1100	1100		
	1495.0	1516.0	1463.0	1503.0	1404.0	1255.0	968.0		
PM Peak	1700	1600	1700	1700	1700	1200	1600		
	1502.0	1587.0	1517.0	1535.0	1583.0	1167.0	889.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-344 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 100 M West of WITTENOOM Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009
File:	KALAMUNDA RD(1)18NOV2009.EC0 (Plus)
Identifier:	AE58WZY1 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 112744 / 112962 (99.81%)

Class Speed Matrix

ClassMatrix-344
Site: KALAMUNDA RD(1).0WE
Description: **100 M West of WITTENOOM Rd**
Filter time: **14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	75	1	1	2	.	.	.	.	.	.	.	.	79	0.1%
20 - 30	169	3	18	18	13	.	3	4	8	2	.	.	238	0.2%
30 - 40	745	48	148	90	55	3	9	6	24	12	3	.	1143	1.0%
40 - 50	7510	160	642	91	56	7	25	16	51	12	5	.	8575	7.6%
50 - 60	30483	339	2731	258	63	58	69	45	247	36	17	1	34347	30.5%
60 - 70	46198	395	5920	244	37	109	108	56	247	38	22	3	53377	47.3%
70 - 80	11347	94	2038	64	10	34	33	13	41	10	1	.	13685	12.1%
80 - 90	970	2	161	3	1	2	2	.	3	.	.	.	1144	1.0%
90 - 100	99	.	13	3	.	.	.	.	.	.	.	.	115	0.1%
100 - 110	20	.	1	.	.	.	.	.	.	.	.	.	21	0.0%
110 - 120	6	.	.	.	.	.	.	.	.	.	.	.	6	0.0%
120 - 130	7	.	1	.	.	.	.	.	.	.	.	.	8	0.0%
130 - 140	6	.	.	.	.	.	.	.	.	.	.	.	6	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
	97635	1042	11674	773	235	213	249	140	621	110	48	4	112744	
	86.6%	0.9%	10.4%	0.7%	0.2%	0.2%	0.2%	0.1%	0.6%	0.1%	0.0%	0.0%		
	Class Totals													

87.5

MetroCount Traffic Executive
Speed Histogram

SpeedHist-345 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 100 M West of WITTENOOM Rd**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009
File:	KALAMUNDA RD(1)18NOV2009.EC0 (Plus)
Identifier:	AE58WZY1 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

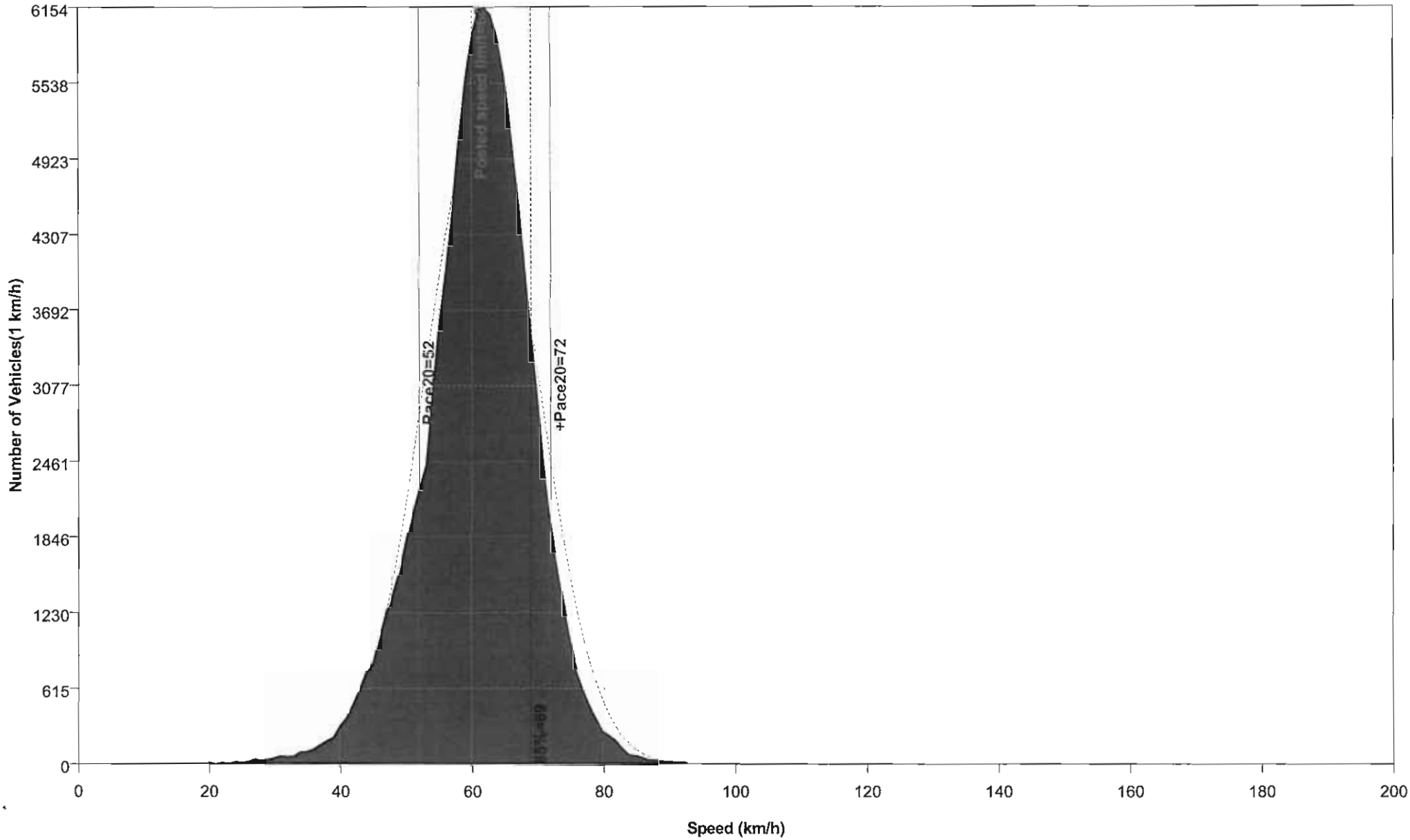
Filter time:	**14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 112744 / 112962 (99.81%)

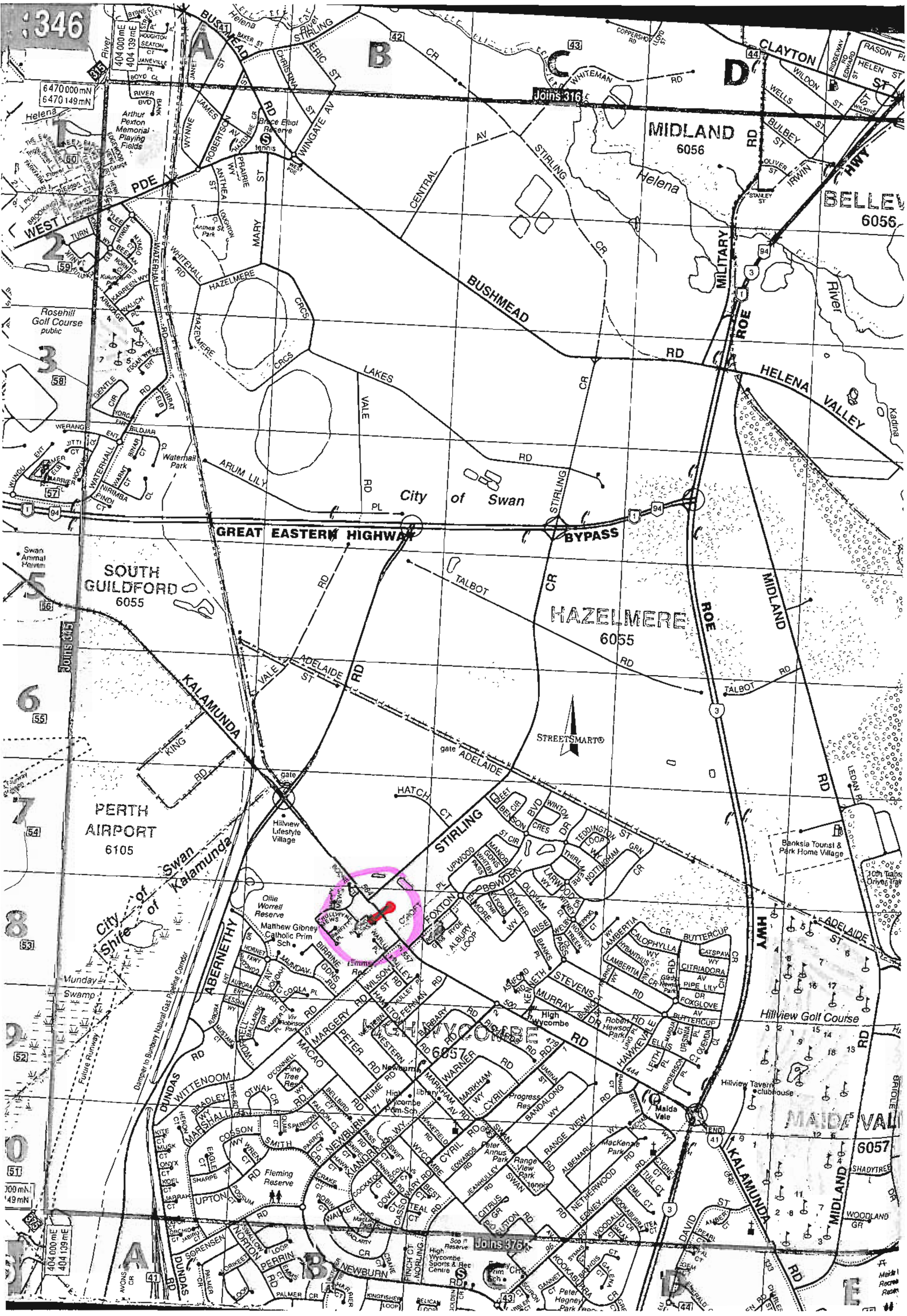
Speed Statistics

Vehicles = 112744
Posted speed limit = 60 km/h, Exceeding = 68362 (60.63%), Mean Exceeding = 66.69 km/h
Maximum = 134.7 km/h, **Minimum** = 10.0 km/h, **Mean** = 61.5 km/h
85% Speed = 69.1 km/h, **95% Speed** = 74.2 km/h, **Median** = 61.9 km/h
20 km/h Pace = 52 - 72, **Number in Pace** = 89698 (79.56%)
Variance = 72.35, **Standard Deviation** = 8.51 km/h

Speed Histogram

SpeedHist-345 (Metric) **Site:**KALAMUNDA RD(1).0WE
Description: 100 M West of WITTENOOM Rd
Filter time: 14:00 Friday, November 06, 2009 => 13:57 Friday, November 13, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)




346
Joins 316
Joins 345
Joins 376
MIDLAND
6056
BELLEVUE
6056
SOUTH GUILDFORD
6055
HAZELMERE
6055
PERTH AIRPORT
6105
HIGH WYCOMBE
6057
MAIDA VALE
6057
City of Swan
City of Swan
Shire of Kalamunda
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
ROE HWY
MIDLAND RD
HELENA VALLEY RD
KALAMUNDA RD
STIRLING CR
ADELAIDE ST
TALBOT RD
ABERNETHY RD
WEST PDE
Rosehill Golf Course public
Hillview Golf Course
Perth Airport
Hillview Lifestyle Village
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
High Wycombe Prim Sch
Fleming Reserve
Waterhall Park
Swan Animal Haven
Banksia Tourist & Park Home Village
Arthur Pexton Memorial Playing Fields
Bruce Elliot Reserve
Range View Park
MacKenzie Park
Progress Res
Pine Tree Res
Hillview Tavern clubhouse
High Wycombe Sports & Rec Centre
Munday Swamp
Future Runway
Danger to Bunbury Natural Gas Pipeline Corridor
STREETSMART®

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-340 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 70 M West of ROE H/Wy**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009
File:	KALAMUNDA RD(1)17NOV2009.EC0 (Plus)
Identifier:	AC73KEVC MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113390 / 113838 (99.61%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-340
Site: KALAMUNDA RD(1).0WE
Description: **70 M West of ROE H/Wy**
Filter time: **14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	34.0	43.0	40.0	41.0	98.0	173.0	236.0	51.2	95.0
0100-0200	23.0	27.0	23.0	29.0	36.0	86.0	122.0	27.6	49.4
0200-0300	13.0	33.0	33.0	32.0	31.0	57.0	79.0	28.4	39.7
0300-0400	28.0	35.0	43.0	41.0	36.0	52.0	69.0	36.6	43.4
0400-0500	100.0	97.0	115.0	111.0	90.0	55.0	62.0	102.6	90.0
0500-0600	375.0	366.0	355.0	350.0	361.0	170.0	113.0	361.4	298.6
0600-0700	885.0	959.0	926.0	887.0	916.0	304.0	190.0	914.6	723.9
0700-0800	1313.0	**1282.0<**	1196.0	1208.0	1182.0	549.0	358.0	1236.2	1012.6
0800-0900	**1328.0<**	1274.0	**1324.0<**	**1335.0<**	**1280.0<**	924.0	486.0	**1308.2<**	**1135.9<**
0900-1000	977.0	965.0	967.0	994.0	1052.0	1243.0	814.0	991.0	1001.7
1000-1100	839.0	879.0	893.0	873.0	941.0	1339.0	871.0	885.0	947.9
1100-1200	885.0	874.0	889.0	924.0	978.0	**1444.0<**	**993.0<**	910.0	998.1
1200-1300	870.0	887.0	979.0	941.0	892.0	**1253.0<**	**1000.0<**	913.8	974.6
1300-1400	889.0	823.0	890.0	903.0	995.0	1086.0	903.0	900.0	927.0
1400-1500	1049.0	1031.0	1015.0	1024.0	1109.0	999.0	954.0	1056.2	1036.3
1500-1600	1302.0	1389.0	1333.0	1323.0	829.0	1068.0	890.0	1167.5	1120.4
1600-1700	**1372.0<**	1432.0	1392.0	1395.0	**1480.0<**	968.0	970.0	1414.2	1287.0
1700-1800	1332.0	**1518.0<**	**1458.0<**	**1473.0<**	1441.0	1019.0	925.0	**1444.4<**	**1309.4<**
1800-1900	939.0	967.0	1038.0	1036.0	1160.0	921.0	796.0	1028.0	979.6
1900-2000	549.0	600.0	669.0	666.0	719.0	647.0	535.0	640.6	626.4
2000-2100	351.0	458.0	468.0	500.0	469.0	363.0	395.0	449.2	429.1
2100-2200	328.0	361.0	394.0	414.0	373.0	334.0	269.0	374.0	353.3
2200-2300	166.0	213.0	233.0	250.0	344.0	338.0	160.0	241.2	243.4
2300-2400	73.0	102.0	129.0	147.0	294.0	345.0	85.0	149.0	167.9
Totals									
0700-1900	13095.0	13321.0	13374.0	13429.0	13339.0	12813.0	9960.0	13254.5	12730.3
0600-2200	15208.0	15699.0	15831.0	15896.0	15816.0	14461.0	11349.0	15632.9	14863.1
0600-0000	15447.0	16014.0	16193.0	16293.0	16454.0	15144.0	11594.0	16023.1	15274.3
0000-0000	16020.0	16615.0	16802.0	16897.0	17106.0	15737.0	12275.0	16630.9	15890.5
AM Peak	0800	0700	0800	0800	0800	1100	1100		
	1328.0	1282.0	1324.0	1335.0	1280.0	1444.0	993.0		
PM Peak	1600	1700	1700	1700	1600	1200	1200		
	1372.0	1518.0	1458.0	1473.0	1480.0	1253.0	1000.0		

* - No data.

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-341 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 70 M West of ROE H/Wy**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009
File:	KALAMUNDA RD(1)17NOV2009.EC0 (Plus)
Identifier:	AC73KEVC MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113390 / 113838 (99.61%)

Class Speed Matrix

ClassMatrix-341
Site: KALAMUNDA RD(1).0WE
Description: **70 M West of ROE H/Wy**
Filter time: **14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	719	7	47	14	3	8	.	.	.	1	.	.	799	0.7%
20 - 30	3552	96	232	56	42	9	13	5	32	1	2	5	4045	3.6%
30 - 40	10406	315	587	126	88	21	40	24	134	11	9	9	11770	10.4%
40 - 50	27654	595	1406	288	87	37	44	64	326	48	22	15	30586	27.0%
50 - 60	45421	603	1576	226	58	34	60	42	187	33	17	11	48268	42.6%
60 - 70	15672	129	490	34	8	4	9	4	24	.	3	.	16377	14.4%
70 - 80	1339	7	50	2	.	2	1	.	.	.	.	.	1401	1.2%
80 - 90	103	.	4	.	.	.	.	.	.	.	.	.	107	0.1%
90 - 100	24	.	.	.	.	.	.	.	.	.	.	.	24	0.0%
100 - 110	8	.	.	.	.	.	.	.	.	.	.	.	8	0.0%
110 - 120	2	.	.	.	.	.	.	.	.	.	.	.	2	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	1	.	.	.	.	.	.	.	.	.	1	0.0%
150 - 160	2	.	.	.	.	.	.	.	.	.	.	.	2	0.0%
	104902	1752	4393	746	286	115	167	139	703	94	53	40	113390	
	92.5%	1.5%	3.9%	0.7%	0.3%	0.1%	0.1%	0.1%	0.6%	0.1%	0.0%	0.0%		
	Class Totals													

94%

MetroCount Traffic Executive
Speed Histogram

SpeedHist-342 -- English (ENU)

Datasets:

Site:	**[KALAMUNDA RD(1)] 70 M West of ROE H/Wy**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 0
Survey Duration:	14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009
File:	KALAMUNDA RD(1)17NOV2009.EC0 (Plus)
Identifier:	AC73KEVC MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

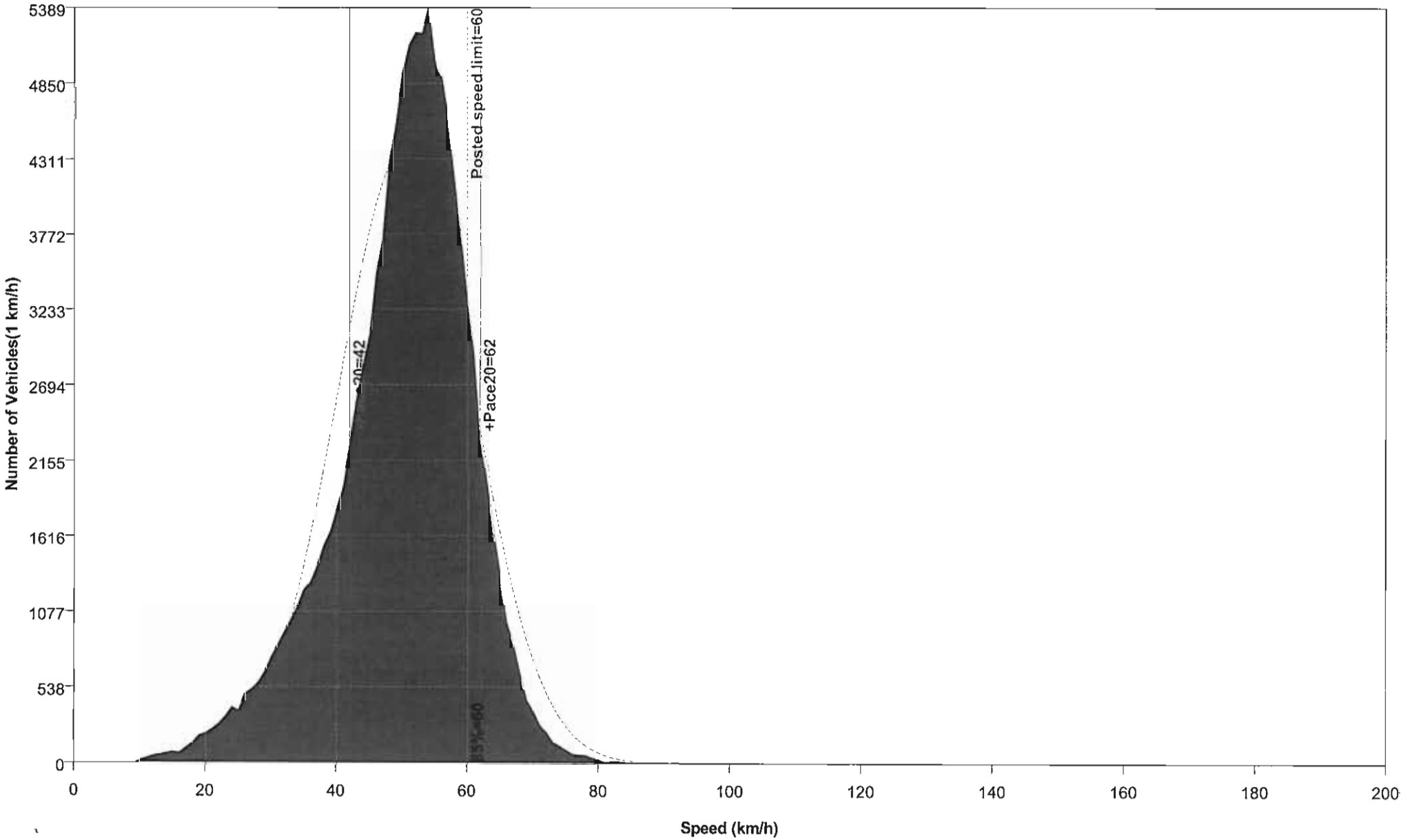
Filter time:	**14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 113390 / 113838 (99.61%)

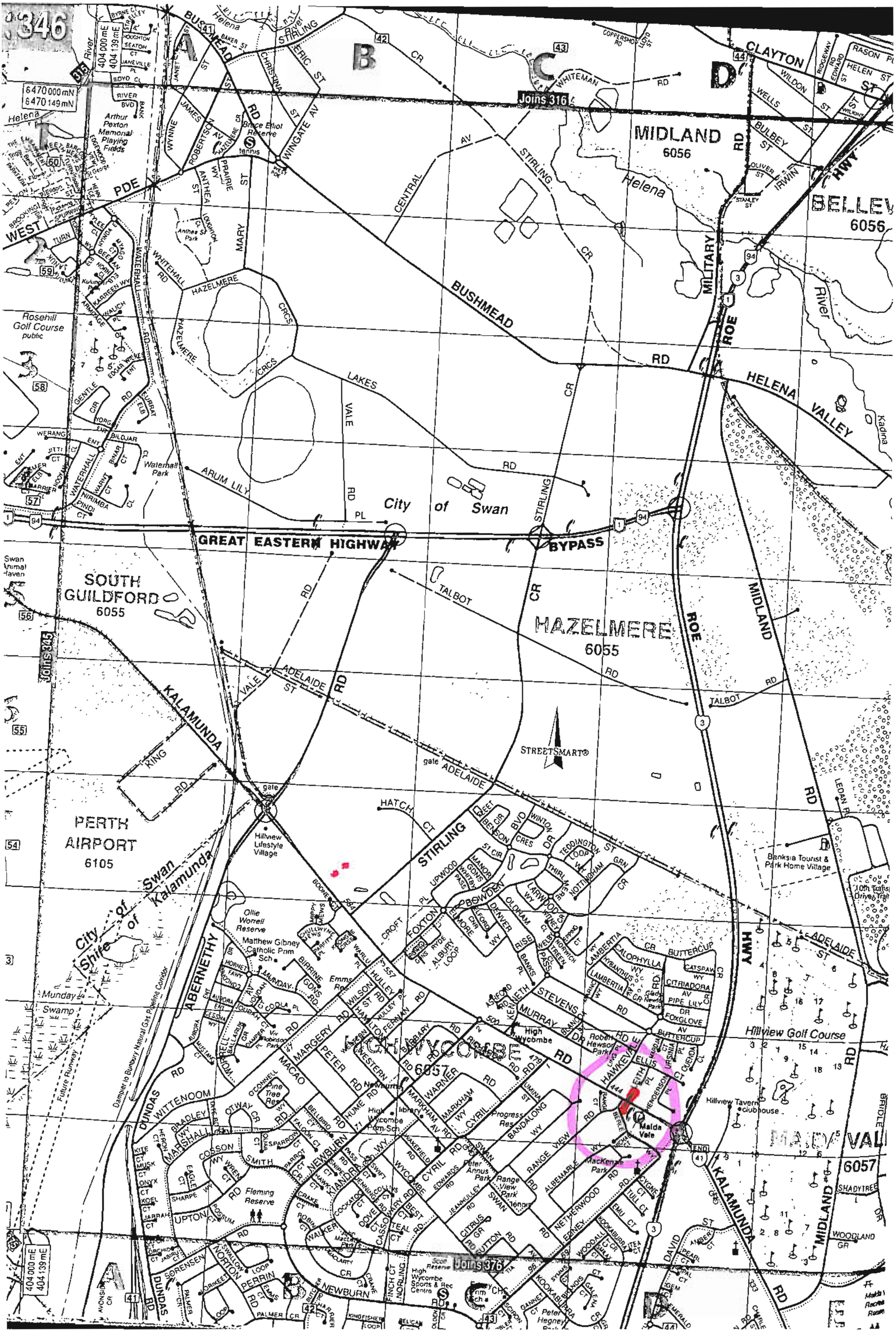
Speed Statistics

Vehicles = 113390
Posted speed limit = 60 km/h, Exceeding = 17922 (15.81%), Mean Exceeding = 64.34 km/h
Maximum = 156.4 km/h, **Minimum** = 10.0 km/h, **Mean** = 50.6 km/h
85% Speed = 60.1 km/h, **95% Speed** = 64.8 km/h, **Median** = 51.8 km/h
20 km/h Pace = 42 - 62, **Number in Pace** = 81778 (72.12%)
Variance = 105.65, **Standard Deviation** = 10.28 km/h

Speed Histogram

SpeedHist-342 (Metric) **Site:**KALAMUNDA RD(1).0WE
Description: 70 M West of ROE H/Wy
Filter time: 14:00 Friday, November 06, 2009 => 15:11 Friday, November 13, 2009
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (AustRoads94)





346
MIDLAND
6056
BELLEV
6056
HAZELMERE
6055
SOUTH GUILDFORD
6055
PERTH AIRPORT
6105
HIGH WYCOMBE
6057
MAIDA VALE
6057
City of Swan
City of Swan
Shire of Kalamunda
GREAT EASTERN HIGHWAY
BYPASS
BUSHMEAD RD
HELENA VALLEY RD
ROE HWY
MIDLAND RD
KALAMUNDA RD
ADELAIDE ST
TALBOT RD
STIRLING CR
LAKES RD
MILITARY RD
CLAYTON ST
WEST PDE
Joins 316
Joins 345
Joins 376
Rosehill Golf Course public
Hillview Golf Course
Hillview Lifestyle Village
Banksia Tourist & Park Home Village
Ollie Worrell Reserve
Matthew Gibney Catholic Prim Sch
Fleming Reserve
Range View Park
Peter Annus Park
Progress Res
MacKenzie Park
Hillview Tavern clubhouse
Waterhall Park
Arthur Pexton Memorial Playing Fields
Swan Animal Haven
Munday Swamp
Future Runway
Dampier to Bunbury Natural Gas Pipeline Corridor
STREETSMART®
6470 000 mN
6470 149 mN
404 000 mE
404 139 mE

Appendix C

Historic Crash Data:

2004 – 2008

Summary Crash History (fax)

Report Criteria

Road	SLK	CWY
1020001 - Kalamunda Rd	5.41 to 7.74	All

Parameter	Value	Description
From Date	01/01/2004	
To Date	31/12/2008	
Crash Type	All	
Severity	All	
Summarise By Intx	Yes	

Summary Crash History (fax)

Selection Criteria	Value
Road	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Road SLK	5.41 to 7.74

Severity	Count	Percentage
Fatal	1	0.4%
Hospital	18	7.3%
Medical	32	13.1%
PDO Major	146	59.6%
PDO Minor	48	19.6%
Other / Unknown	0	0.0%
Total:	**245**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	12	4.9%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	1	0.4%
Entering / Leaving Driveway	7	2.9%
Other / Unknown	225	91.8%
Total:	**245**	**100.0%**

Light Conditions	Count	Percentage
Daylight	182	74.3%
Dawn Or Dusk	19	7.8%
Dark - Street Lights On	37	15.1%
Dark - Street Lights Off	1	0.4%
Dark - Street Lights Not Provided	1	0.4%
Other / Unknown	5	2.0%
Total:	**245**	**100.0%**

Object Hit	Count	Percentage
SEC Pole	5	21.7%
Traffic Light Post	4	17.4%
Traffic Sign	0	0.0%
Commercial Sign Post	0	0.0%
Tree	1	4.3%
Other	13	56.5%
Total:	**23**	**100.0%**

Road Grade	Count	Percentage
Level	205	83.7%
Crest Of Hill	0	0.0%
Slope	22	9.0%
Other / Unknown	18	7.3%
Total:	**245**	**100.0%**

Road Alignment	Count	Percentage
Curve	58	23.7%
Straight	165	67.3%
Other / Unknown	22	9.0%
Total:	**245**	**100.0%**

Speed a Factor	Count	Percentage
Yes	4	1.6%
No	22	9.0%
Other / Unknown	219	89.4%
Total:	**245**	**100.0%**

Road Condition	Count	Percentage
Wet	48	19.6%
Dry	193	78.8%
Other / Unknown	4	1.6%
Total:	**245**	**100.0%**

MR Nature	Count	Percentage
Rear End	160	65.3%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	22	9.0%
Right Angle	25	10.2%
Right Turn Thru	11	4.5%
Hit Pedestrian	1	0.4%
Hit Animal	0	0.0%
Hit Object	14	5.7%
Non Collision	1	0.4%
Other / Unknown	11	4.5%
Total:	**245**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	ROE HWY (004552)
Intersection SLK	5.41

Severity	Count	Percentage
Fatal	1	0.6%
Hospital	5	3.2%
Medical	24	15.5%
PDO Major	97	62.6%
PDO Minor	28	18.1%
Other / Unknown	0	0.0%
Total:	**155**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	8	5.2%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	147	94.8%
Total:	**155**	**100.0%**

Light Conditions	Count	Percentage
Daylight	119	76.8%
Dawn Or Dusk	13	8.4%
Dark - Street Lights On	19	12.3%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	4	2.6%
Total:	**155**	**100.0%**

Object Hit	Count	Percentage
SEC Pole	1	7.7%
Traffic Light Post	4	30.8%
Traffic Sign	0	0.0%
Commercial Sign Post	0	0.0%
Tree	1	7.7%
Other	7	53.8%
Total:	**13**	**100.0%**

Road Grade	Count	Percentage
Level	133	85.8%
Crest Of Hill	0	0.0%
Slope	9	5.8%
Other / Unknown	13	8.4%
Total:	**155**	**100.0%**

Road Alignment	Count	Percentage
Curve	47	30.3%
Straight	94	60.6%
Other / Unknown	14	9.0%
Total:	**155**	**100.0%**

Speed a Factor	Count	Percentage
Yes	1	0.6%
No	10	6.5%
Other / Unknown	144	92.9%
Total:	**155**	**100.0%**

Road Condition	Count	Percentage
Wet	32	20.6%
Dry	121	78.1%
Other / Unknown	2	1.3%
Total:	**155**	**100.0%**

MR Nature	Count	Percentage
Rear End	124	80.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	10	6.5%
Right Angle	3	1.9%
Right Turn Thru	5	3.2%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	7	4.5%
Non Collision	1	0.6%
Other / Unknown	5	3.2%
Total:	**155**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	RANGEVIEW RD (045273)
Intersection SLK	5.71

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	1	20.0%
Medical	0	0.0%
PDO Major	3	60.0%
PDO Minor	1	20.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	5	100.0%
Total:	**5**	**100.0%**

Light Conditions	Count	Percentage
Daylight	3	60.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	2	40.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	5	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	4	80.0%
Other / Unknown	1	20.0%
Total:	**5**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	1	20.0%
Other / Unknown	4	80.0%
Total:	**5**	**100.0%**

Road Condition	Count	Percentage
Wet	1	20.0%
Dry	4	80.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

MR Nature	Count	Percentage
Rear End	1	20.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	1	20.0%
Right Turn Thru	3	60.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	HAWKEVALE RD (045274)
Intersection SLK	5.80

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	0	0.0%
Medical	0	0.0%
PDO Major	3	75.0%
PDO Minor	1	25.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	4	100.0%
Total:	**4**	**100.0%**

Light Conditions	Count	Percentage
Daylight	2	50.0%
Dawn Or Dusk	1	25.0%
Dark - Street Lights On	1	25.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Object Hit	Count	Percentage
SEC Pole	0	0.0%
Traffic Light Post	0	0.0%
Traffic Sign	0	0.0%
Commercial Sign Post	0	0.0%
Tree	0	0.0%
Other	1	100.0%
Total:	**1**	**100.0%**

Road Grade	Count	Percentage
Level	4	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	3	75.0%
Other / Unknown	1	25.0%
Total:	**4**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	4	100.0%
Total:	**4**	**100.0%**

Road Condition	Count	Percentage
Wet	1	25.0%
Dry	2	50.0%
Other / Unknown	1	25.0%
Total:	**4**	**100.0%**

MR Nature	Count	Percentage
Rear End	2	50.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	1	25.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	1	25.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	CYRIL RD (045275)
Intersection SLK	6.09

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	2	50.0%
Medical	0	0.0%
PDO Major	2	50.0%
PDO Minor	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	4	100.0%
Total:	**4**	**100.0%**

Light Conditions	Count	Percentage
Daylight	2	50.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	2	50.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	3	75.0%
Crest Of Hill	0	0.0%
Slope	1	25.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	4	100.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	3	75.0%
Other / Unknown	1	25.0%
Total:	**4**	**100.0%**

Road Condition	Count	Percentage
Wet	1	25.0%
Dry	3	75.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

MR Nature	Count	Percentage
Rear End	0	0.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	2	50.0%
Right Turn Thru	2	50.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	KENNETH RD (045276)
Intersection SLK	6.31

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	0	0.0%
Medical	0	0.0%
PDO Major	2	50.0%
PDO Minor	2	50.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	4	100.0%
Total:	**4**	**100.0%**

Light Conditions	Count	Percentage
Daylight	4	100.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	0	0.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	2	50.0%
Crest Of Hill	0	0.0%
Slope	1	25.0%
Other / Unknown	1	25.0%
Total:	**4**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	3	75.0%
Other / Unknown	1	25.0%
Total:	**4**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	4	100.0%
Total:	**4**	**100.0%**

Road Condition	Count	Percentage
Wet	0	0.0%
Dry	4	100.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

MR Nature	Count	Percentage
Rear End	1	25.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	1	25.0%
Right Angle	2	50.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**4**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	NEWBURN RD (045277)
Intersection SLK	6.43

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	1	6.7%
Medical	3	20.0%
PDO Major	8	53.3%
PDO Minor	3	20.0%
Other / Unknown	0	0.0%
Total:	**15**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	15	100.0%
Total:	**15**	**100.0%**

Light Conditions	Count	Percentage
Daylight	11	73.3%
Dawn Or Dusk	1	6.7%
Dark - Street Lights On	3	20.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**15**	**100.0%**

Object Hit	Count	Percentage
SEC Pole	1	33.3%
Traffic Light Post	0	0.0%
Traffic Sign	0	0.0%
Commercial Sign Post	0	0.0%
Tree	0	0.0%
Other	2	66.7%
Total:	**3**	**100.0%**

Road Grade	Count	Percentage
Level	12	80.0%
Crest Of Hill	0	0.0%
Slope	2	13.3%
Other / Unknown	1	6.7%
Total:	**15**	**100.0%**

Road Alignment	Count	Percentage
Curve	6	40.0%
Straight	7	46.7%
Other / Unknown	2	13.3%
Total:	**15**	**100.0%**

Speed a Factor	Count	Percentage
Yes	1	6.7%
No	0	0.0%
Other / Unknown	14	93.3%
Total:	**15**	**100.0%**

Road Condition	Count	Percentage
Wet	2	13.3%
Dry	13	86.7%
Other / Unknown	0	0.0%
Total:	**15**	**100.0%**

MR Nature	Count	Percentage
Rear End	6	40.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	8	53.3%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	1	6.7%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**15**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	FOXTON BVD (139056)
Intersection SLK	6.90

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	0	0.0%
Medical	0	0.0%
PDO Major	1	100.0%
PDO Minor	0	0.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	1	100.0%
Total:	**1**	**100.0%**

Light Conditions	Count	Percentage
Daylight	0	0.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	0	0.0%
Dark - Street Lights Off	1	100.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	1	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	1	100.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	1	100.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

Road Condition	Count	Percentage
Wet	0	0.0%
Dry	1	100.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

MR Nature	Count	Percentage
Rear End	0	0.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	1	100.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**1**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	WITTENOOM RD (045279)
Intersection SLK	6.95

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	2	66.7%
Medical	0	0.0%
PDO Major	0	0.0%
PDO Minor	1	33.3%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	3	100.0%
Total:	**3**	**100.0%**

Light Conditions	Count	Percentage
Daylight	1	33.3%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	2	66.7%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	3	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	3	100.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	1	33.3%
Other / Unknown	2	66.7%
Total:	**3**	**100.0%**

Road Condition	Count	Percentage
Wet	2	66.7%
Dry	1	33.3%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

MR Nature	Count	Percentage
Rear End	0	0.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	2	66.7%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	1	33.3%
Total:	**3**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	STIRLING CR (045280)
Intersection SLK	7.17

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	0	0.0%
Medical	0	0.0%
PDO Major	3	100.0%
PDO Minor	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	3	100.0%
Total:	**3**	**100.0%**

Light Conditions	Count	Percentage
Daylight	3	100.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	0	0.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	3	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	3	100.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	3	100.0%
Total:	**3**	**100.0%**

Road Condition	Count	Percentage
Wet	0	0.0%
Dry	3	100.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

MR Nature	Count	Percentage
Rear End	2	66.7%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	1	33.3%
Right Angle	0	0.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**3**	**100.0%**

Summary Crash History (fax)

Selection Criteria	Value
Intersection	KALAMUNDA RD (1020001)
Date	01/01/2004 to 31/12/2008
Intersection SLK	5.41 to 7.74
Intersection	ABERNETHY RD (121423)
Intersection SLK	7.74

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	2	9.5%
Medical	3	14.3%
PDO Major	13	61.9%
PDO Minor	3	14.3%
Other / Unknown	0	0.0%
Total:	**21**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	2	9.5%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	19	90.5%
Total:	**21**	**100.0%**

Light Conditions	Count	Percentage
Daylight	17	81.0%
Dawn Or Dusk	3	14.3%
Dark - Street Lights On	1	4.8%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**21**	**100.0%**

Object Hit	Count	Percentage
SEC Pole	1	50.0%
Traffic Light Post	0	0.0%
Traffic Sign	0	0.0%
Commercial Sign Post	0	0.0%
Tree	0	0.0%
Other	1	50.0%
Total:	**2**	**100.0%**

Road Grade	Count	Percentage
Level	13	61.9%
Crest Of Hill	0	0.0%
Slope	7	33.3%
Other / Unknown	1	4.8%
Total:	**21**	**100.0%**

Road Alignment	Count	Percentage
Curve	4	19.0%
Straight	16	76.2%
Other / Unknown	1	4.8%
Total:	**21**	**100.0%**

Speed a Factor	Count	Percentage
Yes	1	4.8%
No	3	14.3%
Other / Unknown	17	81.0%
Total:	**21**	**100.0%**

Road Condition	Count	Percentage
Wet	3	14.3%
Dry	18	85.7%
Other / Unknown	0	0.0%
Total:	**21**	**100.0%**

MR Nature	Count	Percentage
Rear End	10	47.6%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	2	9.5%
Right Angle	4	19.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	2	9.5%
Non Collision	0	0.0%
Other / Unknown	3	14.3%
Total:	**21**	**100.0%**

Crash Factor Matrix

Report Criteria

Road	SLK	CWY
1020001 - Kalamunda Rd	5.41 to 7.74	All

Parameter	Value	Description
From Date	01/01/2004	
To Date	31/12/2008	
Crash Type	All	
Severity	All	
RUM Series	All	
Display RUM colour coding?	Yes	

ROAD USE MOVEMENT (RUM) CODES

	0	1	2	3	4	5	6	7	8	9
	PEDESTRIAN on foot, in toy/pram	INTERSECTION vehicles from adjacent approaches	VEHICLES FROM OPPOSING DIRECTIONS	VEHICLES FROM ONE DIRECTION	MANOEUVRING	OVERTAKING	ON PATH	OFF STRAIGHT, ON STRAIGHT	OFF PATH, ON CURVE	PASSENGERS AND MISCELLANEOUS
1	NEAR SIDE 1	THRU-THRU 11	SIDE SWIPE HEAD ON 21	Vehicles in same lanes REAR END 31		HEAD ON 51	PARKED 61	OFF CARRIAGEWAY TO LEFT 71	OFF CARRIAGEWAY RIGHT BEND 81	FELL IN/FROM VEHICLE 91
2	EMERGING 2	RIGHT-THRU 12	THRU-RIGHT 22	LEFT REAR 32	LEAVING PARKING 42	OUT OF CONTROL 52	DOUBLE PARKED 62	LEFT OFF CARRIAGEWAY INTO OBJECT/VEHICLE 72	OFF RIGHT BEND INTO OBJECT/VEHICLE 82	LOAD STRUCK VEHICLE 92
3	FAR SIDE 3	LEFT-THRU 13	RIGHT LEFT 23	RIGHT REAR 33	PARKING 43	PULLING OUT 53	ACCIDENT OR BROKEN DOWN 63	OFF CARRIAGEWAY TO RIGHT 73	OFF CARRIAGEWAY LEFT BEND 83	STRUCK TRAIN 93
4	PLAYING, WORKING LYING, STANDING ON CARRIAGEWAY 4	THRU-RIGHT 14	RIGHT RIGHT 24	U TURN 34	PARKING VEHICLES ONLY 44	CUTTING IN 54	CAR DOOR 64	RIGHT OFF CARRIAGEWAY INTO OBJECT/VEHICLE 74	OFF LEFT BEND INTO OBJECT/VEHICLE 84	STRUCK RAILWAY XING FURNITURE 94
5	WALKING WITH TRAFFIC 5	RIGHT-RIGHT 15	THRU LEFT 25	Vehicles in parallel lanes LANE SIDE SWIPE 35	REVERSING 45	PULLING OUT REAR END 55	PERMANENT OBSTRUCTION 65	OUT OF CONTROL ON CARRIAGEWAY 75	OUT OF CONTROL ON CARRIAGEWAY 85	ANIMAL OFF CARRIAGEWAY 95
6	FACING TRAFFIC 6	LEFT-RIGHT 16	LEFT LEFT 26	LANE CHANGE RIGHT 36	REVERSING INTO FIXED OBJECT 46	O.T.-RT 56	TEMPORARY ROADWORKS 66	LEFT TURN 76		PARKED CAR RAN AWAY 96
7	DRIVEWAY 7	THRU-LEFT 17	U TURN 27	LANE CHANGE LEFT 37	LEAVING DRIVEWAY 47		TEMPORARY OBJECT ON CARRIAGEWAY 67	RIGHT TURN 77		VEHICLE MOVEMENTS NOT KNOWN 97
8	ON FOOTWAY 8	RIGHT-LEFT 18		RIGHT TURN S/S 38	LOADING BAY 48					
9	STRUCK WHILE BOARDING OR ALIGHTING 9	LEFT-LEFT 19		LEFT TURN S/S 39	FROM FOOTWAY 49		ON CARRIAGEWAY 69			
	OTHER 98	OTHER 10	OTHER 20	OTHER 30	OTHER 40	OTHER 50	OTHER 60 (MISSILE/ FLYING OBJECT)	OTHER 70	OTHER 80	OTHER 90

Crash Factor Matrix

ROAD USER MOVEMENT CODE	NUMBER OF CRASHES BY YEAR						SEVERITY					SURFACE			LIGHT CONDITION						DAY OF WEEK							TIME OF DAY								
	2004	2005	2006	2007	2008	**Total**	Fatal	Hospital	Medical	PDO Major	PDO Minor	Dry	Wet	Not Specified	Day	Dusk/Dawn	Dark lights On	Dark lights off	Dark no lights	Not Specified	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Not Specified
00 Series : PEDESTRIAN																																			
03 - Pedest: Far Side	1					1		1				1			1											1						1			
00 Series Total	1					1		1				1			1											1						1			
10 Series : INTERSECTION																																			
11 - Intx: Thru - Thru	1	3		1		5		2		3		4	1		4	1					1	1			1	1	1			1	1		3			
12 - Intx: Right - Thru	1	1		1		3		1		2		3			3									3							1		1	1		
14 - Intx: Thru - Right	2	3	2	1	3	11		2	1	6	2	8	2	1	8	1	2				1		2	3	3	2		1		1	2	1	5		1	
17 - Intx: Thru - Left	1	1	2		1	5			1	4		4	1		4			1			1	1		1	1		1				2	1	2			
10 Series Total	5	8	4	3	4	24		5	2	15	2	19	4	1	19	2	2	1			3	2	2	7	5	3	2	1		2	6	2	11	1	1	
20 Series : VEHICLES FROM OPPOSING DIRECTIONS																																			
22 - Opposite Dirn: Thru - Right	1	2	2	3	3	11		4	2	5		10	1		2		8			1	4		1	1	1	3	1						2	3	6	
20 Series Total	1	2	2	3	3	11		4	2	5		10	1		2		8			1	4		1	1	1	3	1						2	3	6	
30 Series : VEHICLES FROM ONE DIRECTION																																			
30 - Same Dirn: Other				1	2	3				1	2	2	1		3									2	1				1			2			
31 - Same Dirn: Same Lane Rear End	14	15	17	24	17	87		3	14	56	14	65	21	1	73	7	5			2	8	16	16	12	16	11	8			22	14	16	26	8	1	
32 - Same Dirn: Same Lane Left Rear	11	9	13	14	10	57			10	34	13	50	6	1	46	6	4			1	10	12	8	3	15	4	5			6	13	6	23	8	1	
33 - Same Dirn: Same Lane Right Rear	2	4	3	2	4	15			4	7	4	12	3		10	1	4				1	3		3	2	4	2			1	1	3	4	5	1	
34 - Same Dirn: Same Lane U - Turn			1		1	2				2		2			2								2						1	1					
35 - Same Dirn: Parallel Lanes - S/swipe	2		2	2		6		1		3	2	5	1		4		2						1	2	3				1	2	2		1		
36 - Same Dirn: Change Lanes - Right	2	1	1	3	2	9				4	5	6	3		7	1	1				2	4	2		1					4	3		1	1		
37 - Same Dirn: Change Lanes - Left			1			1				1		1			1											1						1			

Crash Factor Matrix

ROAD USER MOVEMENT CODE	NUMBER OF CRASHES BY YEAR						SEVERITY					SURFACE			LIGHT CONDITION						DAY OF WEEK							TIME OF DAY								
	2004	2005	2006	2007	2008	**Total**	Fatal	Hospital	Medical	PDO Major	PDO Minor	Dry	Wet	Not Specified	Day	Dusk/Dawn	Dark lights On	Dark lights off	Dark no lights	Not Specified	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Not Specified
38 - Same Dirn: Parallel Lanes - Turn Right S/swipe				2		2				2		2			2										1	1								1	1	
39 - Same Dirn: Parallel Lanes - Turn Left S/swipe				1		1					1	1			1						1											1				
30 Series Total	31	29	38	49	36	183		4	28	110	41	146	35	2	149	15	16			3	22	35	29	22	39	20	16			36	34	28	58	24	3	
40 Series : MANOEUVRING																																				
45 - Manoeuv: Reversing In Traffic	1	1	5			7				5	2	5	2		6		1				2		1			3	1			2	2	2	1			
47 - Manoeuv: Leaving Driveway	1					1					1	1			1												1				1					
40 Series Total	2	1	5			8				5	3	6	2		7		1				2		1			3	2			2	3	2	1			
50 Series : OVERTAKING																																				
54 - Overtaking: Cutting In					1	1				1			1						1				1												1	
50 Series Total					1	1				1			1						1				1												1	
60 Series : ON PATH																																				
61 - On Path: Parked		1				1					1		1				1									1									1	
60 Series Total		1				1					1		1				1									1									1	
70 Series : OFF PATH ON STRAIGHT																																				
71 - Off Path On Straight: Off Left Cway			1			1				1		1					1									1			1							
72 - Off Path On Straight: Off Left Cway Obj	2	1		1		4		1		2	1	1	2	1	1		2			1	1			1	1		1		1		1				2
74 - Off Path On Straight: Off Right Cway Obj	1	1		1	3	6	1	1		4		4	2		2		4				1	2		1	1	1			2		1	1			2
76 - Loss Of Control: Left Turn - Intx		1		1		2				2		2				1	1									1	1						1	1	
77 - Loss Of Control: Right Turn - Intx					1	1				1		1				1							1											1		
70 Series Total	3	3	1	3	4	14	1	2		10	1	9	4	1	3	2	8			1	2	2	1	2	2	3	2		4		2	1		2	5	
80 Series : OFF PATH ON CURVE																																				
84 - Off Path On Curve: Off Left Bend In Obj		1				1		1				1			1						1											1			

Crash Factor Matrix

ROAD USER MOVEMENT CODE	NUMBER OF CRASHES BY YEAR						SEVERITY					SURFACE			LIGHT CONDITION						DAY OF WEEK							TIME OF DAY									
	2004	2005	2006	2007	2008	**Total**	Fatal	Hospital	Medical	PDO Major	PDO Minor	Dry	Wet	Not Specified	Day	Dusk/Dawn	Dark lights On	Dark lights off	Dark no lights	Not Specified	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Not Specified
80 Series Total		1				1		1				1			1						1											1				
90 Series : PASSENGERS & MISCELLANEOUS																																				
91 - Misc: Passenger Fell In / From Veh					1	1		1				1					1							1											1	
90 Series Total					1	1		1				1					1							1											1	
All RUM Codes	43	45	50	58	49	245	1	18	32	146	48	193	48	4	182	19	37	1	1	5	34	39	35	33	47	34	23	1	4	40	45	34	73	30	18	0

Crash Behaviour Matrix

Report Criteria

Road	SLK	CWY
1020001 - Kalamunda Rd	5.41 to 7.74	All

Parameter	Value	Description
From Date	01/01/2004	
To Date	31/12/2008	
Crash Type	All	
Severity	All	
RUM Series	All	
Display RUM colour coding?	Yes	

ROAD USE MOVEMENT (RUM) CODES

	0	1	2	3	4	5	6	7	8	9
	PEDESTRIAN on foot, in toy/pram	INTERSECTION vehicles from adjacent approaches	VEHICLES FROM OPPOSING DIRECTIONS	VEHICLES FROM ONE DIRECTION	MANOEUVRING	OVERTAKING	ON PATH	OFF STRAIGHT, ON STRAIGHT	OFF PATH, ON CURVE	PASSENGERS AND MISCELLANEOUS
1	NEAR SIDE 1	THRU-THRU 11	SIDE SWIPE HEAD ON 21	Vehicles in same lanes REAR END 31		HEAD ON 51	PARKED 61	OFF CARRIAGEWAY TO LEFT 71	OFF CARRIAGEWAY RIGHT BEND 81	FELL IN/FROM VEHICLE 91
2	EMERGING 2	RIGHT-THRU 12	THRU-RIGHT 22	LEFT REAR 32	LEAVING PARKING 42	OUT OF CONTROL 52	DOUBLE PARKED 62	LEFT OFF CARRIAGEWAY INTO OBJECT/VEHICLE 72	OFF RIGHT BEND INTO OBJECT/VEHICLE 82	LOAD STRUCK VEHICLE 92
3	FAR SIDE 3	LEFT-THRU 13	RIGHT LEFT 23	RIGHT REAR 33	PARKING 43	PULLING OUT 53	ACCIDENT OR BROKEN DOWN 63	OFF CARRIAGEWAY TO RIGHT 73	OFF CARRIAGEWAY LEFT BEND 83	STRUCK TRAIN 93
4	PLAYING, WORKING LYING, STANDING ON CARRIAGEWAY 4	THRU-RIGHT 14	RIGHT RIGHT 24	U TURN 34	PARKING VEHICLES ONLY 44	CUTTING IN 54	CAR DOOR 64	RIGHT OFF CARRIAGEWAY INTO OBJECT/VEHICLE 74	OFF LEFT BEND INTO OBJECT/VEHICLE 84	STRUCK RAILWAY XING FURNITURE 94
5	WALKING WITH TRAFFIC 5	RIGHT-RIGHT 15	THRU LEFT 25	Vehicles in parallel lanes LANE SIDE SWIPE 35	REVERSING 45	PULLING OUT REAR END 55	PERMANENT OBSTRUCTION 65	OUT OF CONTROL ON CARRIAGEWAY 75	OUT OF CONTROL ON CARRIAGEWAY 85	ANIMAL OFF CARRIAGEWAY 95
6	FACING TRAFFIC 6	LEFT-RIGHT 16	LEFT LEFT 26	LANE CHANGE RIGHT 36	REVERSING INTO FIXED OBJECT 46	O.T.-RT 56	TEMPORARY ROADWORKS 66	LEFT TURN 76		PARKED CAR RAN AWAY 96
7	DRIVEWAY 7	THRU-LEFT 17	U TURN 27	LANE CHANGE LEFT 37	LEAVING DRIVEWAY 47		TEMPORARY OBJECT ON CARRIAGEWAY 67	RIGHT TURN 77		VEHICLE MOVEMENTS NOT KNOWN 97
8	ON FOOTWAY 8	RIGHT-LEFT 18		RIGHT TURN S/S 38	LOADING BAY 48					
9	STRUCK WHILE BOARDING OR ALIGHTING 9	LEFT-LEFT 19		LEFT TURN S/S 39	FROM FOOTWAY 49		ON CARRIAGEWAY 69			
	OTHER 98	OTHER 10	OTHER 20	OTHER 30	OTHER 40	OTHER 50	OTHER 60 (MISSILE/ FLYING OBJECT)	OTHER 70	OTHER 80	OTHER 90

Crash Behaviour Matrix

	CRASH FACTORS																																		DRIVER DETAILS																			
	MONTH												DAY							TIME									SEVERITY						AGE GROUPS						GENDER			VEHICLE TYPE										
ROAD USER MOVEMENT CODE	January	February	March	April	May	June	July	August	September	October	November	December	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	0000 - 0259	0300 - 0559	0600 - 0859	0900 - 1159	1200 - 1459	1500 - 1759	1800 - 2059	2100 - 2359	Not Specified	Fatal	Hospital	Medical	PDO Major	PDO Minor	Crash Total	0 - 16	17 - 24	25 - 39	40 - 59	60+	Not Specified	Male	Female	Not Specified	Pedestrian	Bicycle	Motocycle	Car	Van	Bus	Truck	Heavy Truck	Other	Not Specified	Driver Total
00 Series : PEDESTRIAN																																																						
03 - Pedest: Far Side			1																1						1					1				1		1					1			1			1							1
00 Series Total			1																1						1					1				1		1					1			1			1							1
10 Series : INTERSECTION																																																						
11 - Intx: Thru - Thru		1	2	1		1							1	1	1			1	1			1	1		3					2		3		5		2	4	2	1	1	7	3				1	8			1		1		10
12 - Intx: Right - Thru				1				1				1					3						1		1	1				1		2		3			1	3	2		4	2				1	5							6
14 - Intx: Thru - Right	1				4	2		1	1	1	1			1		2	3	3	2	1		1	2	1	5		1			2	1	6	2	11		6	6	3	4	3	9	13			1	1	19			1				22
17 - Intx: Thru - Left			2				1	1			1		1	1	1		1	1					2	1	2						1	4		5		2	2	2	2	2	3	6	1				8				1		1	10
10 Series Total	1	1	4	2	4	3	1	3	1	1	2	1	2	3	2	2	7	5	3	1		2	6	2	11	1	1			5	2	15	2	24		10	13	10	9	6	23	24	1		1	3	40			2	1	1	1	48
20 Series : VEHICLES FROM OPPOSING DIRECTIONS																																																						
22 - Opposite Dirn: Thru - Right		1		3	1			1		4	1		1	4		1	1	1	3						2	3	6			4	2	5		11		10	4	2	2	4	12	9	1			2	19						1	22
20 Series Total		1		3	1			1		4	1		1	4		1	1	1	3						2	3	6			4	2	5		11		10	4	2	2	4	12	9	1			2	19						1	22
30 Series : VEHICLES FROM ONE DIRECTION																																																						
30 - Same Dirn: Other		1									1	1					2	1				1			2							1	2	3			1	1	1	3	2	3	1				5			1		1		6
31 - Same Dirn: Same Lane Rear End	4	5	8	7	8	8	10	9	7	5	11	5	8	8	16	16	12	16	11			22	14	16	26	8	1			3	14	56	14	87		30	42	53	15	56	128	58	10				177			8	2	6	9	196
32 - Same Dirn: Same Lane Left Rear	1	8	4	4	7	5	4	7	5	6	4	2	5	10	12	8	3	15	4			6	13	6	23	8	1				10	34	13	57		16	28	21	14	35	63	48	3			1	104					1	9	114
33 - Same Dirn: Same Lane Right Rear	3		1	1		1	2	2	1	2	1	1	2	1	3		3	2	4			1	1	3	4	5	1				4	7	4	15		6	6	8	4	11	25	5	5				32			1		2	2	35
34 - Same Dirn: Same Lane U - Turn			1									1				2						1	1									2		2		1		1	2		3	1					4							4
35 - Same Dirn: Parallel Lanes - S/swipe	1						2		1		1	1				1	2	3				1	2	2		1				1		3	2	6		1	3	4	1	4	11	1	1		1		9			3		1		13
36 - Same Dirn: Change Lanes - Right	1	1			1		1	2	1	1		1		2	4	2		1				4	3		1	1						4	5	9		3	3	4		8	10	5	3				15			1	1		1	18
37 - Same Dirn: Change Lanes - Left	1												1												1							1		1		1				1	2						2					1		2

Crash Behaviour Matrix

ROAD USER MOVEMENT CODE	CRASH FACTORS																																		DRIVER DETAILS																			
	MONTH												DAY							TIME									SEVERITY					Crash Total	AGE GROUPS						GENDER			VEHICLE TYPE										Driver Total
	January	February	March	April	May	June	July	August	September	October	November	December	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	0000 - 0259	0300 - 0559	0600 - 0859	0900 - 1159	1200 - 1459	1500 - 1759	1800 - 2059	2100 - 2359	Not Specified	Fatal	Hospital	Medical	PDO Major	PDO Minor		0 - 16	17 - 24	25 - 39	40 - 59	60+	Not Specified	Male	Female	Not Specified	Pedestrian	Bicycle	Motocycle	Car	Van	Bus	Truck	Heavy Truck	Other	Not Specified	
38 - Same Dirn: Parallel Lanes - Turn Right					1						1							1	1						1	1						2		2		1	1			2	2	2					4							4
39 - Same Dirn: Parallel Lanes - Turn Left										1				1										1									1	1				1		1	1		1				1			1				2
30 Series Total	11	15	14	12	17	14	19	20	15	15	19	12	16	22	35	29	22	39	20			36	34	28	58	24	3			4	28	110	41	183		59	84	93	37	121	247	123	24		1	1	353			15	3	12	21	394
40 Series : MANOEUVRING																																																						
45 - Manoeuv: Reversing In Traffic		1				1	1	3	1				1	2		1			3			2	2	2	1							5	2	7		2	4	3	1	4	9	4	1				11			2			1	14
47 - Manoeuv: Leaving Driveway										1			1										1										1	1			1			1	1	1					2							2
40 Series Total		1				1	1	3	1	1			2	2		1			3			2	3	2	1							5	3	8		2	5	3	1	5	10	5	1				13			2			1	16
50 Series : OVERTAKING																																																						
54 - Overtaking: Cutting In											1					1											1					1		1		1				1	1	1					2							2
50 Series Total											1					1											1					1		1		1				1	1	1					2							2
60 Series : ON PATH																																																					
61 - On Path: Parked					1														1								1						1	1				1	1		2						2							2
60 Series Total					1														1								1						1	1				1	1		2						2							2
70 Series : OFF PATH ON STRAIGHT																																																					
71 - Off Path On Straight: Off Left Cway		1																	1		1											1		1			1			1	2						1			1				2
72 - Off Path On Straight: Off Left Cway Obj			1					2	1				1	1			1	1			1		1				2			1		2	1	4			2	1		2	3		2				5							5
74 - Off Path On Straight: Off Right Cway Obj	1	1				1			2			1		1	2		1	1	1		2		1	1			2		1	1		4		6		3	1	3			7						7					1		7
76 - Loss Of Control: Left Turn - Intx		1							1				1						1							1	1					2		2		1				1	2						2							2
77 - Loss Of Control: Right Turn - Intx	1															1										1						1		1		1						1					1							1
70 Series Total	2	3	1			1		2	4			1	2	2	2	1	2	2	3		4		2	1		2	5		1	2		10	1	14		5	4	4		4	14	1	2				16			1		1		17

Crash Behaviour Matrix

	CRASH FACTORS																																		DRIVER DETAILS																			
	MONTH												DAY							TIME									SEVERITY						AGE GROUPS						GENDER			VEHICLE TYPE										
ROAD USER MOVEMENT CODE	January	February	March	April	May	June	July	August	September	October	November	December	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	0000 - 0259	0300 - 0559	0600 - 0859	0900 - 1159	1200 - 1459	1500 - 1759	1800 - 2059	2100 - 2359	Not Specified	Fatal	Hospital	Medical	PDO Major	PDO Minor	Crash Total	0 - 16	17 - 24	25 - 39	40 - 59	60+	Not Specified	Male	Female	Not Specified	Pedestrian	Bicycle	Motocycle	Car	Van	Bus	Truck	Heavy Truck	Other	Not Specified	Driver Total
80 Series : OFF PATH ON CURVE																																																						
84 - Off Path On Curve: Off Left Bend In Obj								1						1										1						1				1		1					1						1							1
80 Series Total								1						1										1						1				1		1					1						1							1
90 Series : PASSENGERS & MISCELLANEOUS																																																					
91 - Misc: Passenger Fell In / From Veh											1						1										1			1				1		1						1					1							1
90 Series Total											1						1										1			1				1		1						1					1							1
All RUM Codes	14	21	20	17	23	19	21	30	21	21	24	14	23	34	39	35	33	47	34	1	4	40	45	34	73	30	18	0	1	18	32	146	48	245	0	90	110	113	50	141	311	164	29	1	2	6	448	0	0	20	4	14	24	504

Appendix D

Community Consultation Feedback

Appendix E

Concept Drawings:

Upgrading Options

CONCEPT ONLY

Cardno Eppell Olsen

BRISBANE ..... (07) 3310 2401
Level 11 Green Square North Tower
515 St Paul's Terrace
Locked Bag 4006
Fortitude Valley Qld 4006
transportqld@cardno.com.au www.cardno.com.au/eo

GOLD COAST (07) 5502 1585
PERTH (08) 9273 3888
SYDNEY (02) 8496 7700

Issue	Description	Date	By
A	ISSUE FOR COMMENT	7.12.09	JMM

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

10 0 10 20 30 40 60 METRES
SCALE 1 : 500 @ A1 SCALE 1 : 1000 @ A3
50 0 50 100 150 200 250 METRES
SCALE 1 : 2500 @ A1 SCALE 1 : 5000 @ A3

North

Base Information Supplied By

Design	Drawn	Checked
JMM	JMM	SRH

Certified .....
RPEQ No. .....

Project Title
HIGH WYCOMBE
KALAMUNDA RD STUDY

Client
SHIRE OF KALAMUNDA

Drawing Title
KALAMUNDA ROAD
ROUNDABOUT
CONCEPTS

Drawing No. 2014-101
Sheet 1 of 1
Issue A
Scale AS SHOWN
Project CEP02014
Xref NIL
ACAD file 2014_Base.dwg

Cardno Isen

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Issue	Description	Date	By
A	ISSUE FOR COMMENT	9.12.09	JMM

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

10 0 10 20 30 40 50 METRES
SCALE 1 : 500 @ A1 SCALE 1 : 1000 @ A3

North

Base Information Supplied By

Design	Drawn	Checked
JMM	JMM	SRH

Certified .....
RPEQ No. .....

Project Title
HIGH WYCOMBE
KALAMUNDA RD STUDY

Client
SHIRE OF KALAMUNDA

Drawing Title
KALAMUNDA ROAD
OPTION 3

Drawing No. 2014-102
Sheet 1 of 1
Issue A
Scale AS SHOWN
Project CEP02014
Xref NIL
ACAD file 2014_Base.dwg

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Issue	Description	Date	By
A	ISSUE FOR COMMENT	9.12.09	JMM

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

10 0 10 20 30 40 50 METRES
SCALE 1 : 500 @ A1 SCALE 1 : 1000 @ A3

North

Base Information Supplied By

Design	Drawn	Checked
JMM	JMM	SRH

Certified .....
RPEQ No. .....

Project Title
HIGH WYCOMBE
KALAMUNDA RD STUDY

Client
SHIRE OF KALAMUNDA

Drawing Title
KALAMUNDA ROAD
OPTION 6

Drawing No. 2014-103
Sheet 1 of 1
Issue A
Scale AS SHOWN
Project CEP02014
Xref NIL
ACAD file 2014_Base.dwg

Cardno Eppell Olsen

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PERTH (08) 9273 3888
SYDNEY (02) 9496 7700

Issue	Description	Date	By
A	ISSUE FOR COMMENT	9.12.09	JMM

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

10 0 10 20 30 40 50 METRES
SCALE 1 : 500 @ A1 SCALE 1 : 1000 @ A3

North

Base Information Supplied By

Design	Drawn	Checked
JMM	JMM	SRH

Certified .....
RPEQ No. .....

Project Title
HIGH WYCOMBE
KALAMUNDA RD STUDY

Client
SHIRE OF KALAMUNDA

Drawing Title
KALAMUNDA ROAD
OPTION 7

Drawing No. 2014-104
Sheet 1 of 1
Issue A
Scale AS SHOWN
Project CEP02014
Xref NIL
ACAD file 2014_Base.dwg

Appendix F

Paramics Model Specification Note

Title of Study	
Author of Report	William Lee
Date of Report	December 2009
Study Location	Kalamunda Road, High Wycombe WA
Microsimulation software used	Paramics 6.6.1
Model developed by:	William Lee - Cardno Eppell Olsen (Brisbane)
Purpose of modelling and project description	Establish impact of traffic redistribution as a result of changes to access arrangements for the existing High Wycombe shopping centre, and test improvement options.
General conclusions from applying the model. Comments on: • Results of investigating different scenarios • Sensitivity tests undertaken • Extent of the variation from default parameters • Difficulties encountered and ways to overcome modelling issues; • Comments on the general robustness of model output.	Refer High Wycombe, Kalamunda Road Study – Cardno Eppell Olsen, December 2009 Modelling undertaken utilised the default model parameters, in combination with standard RTA configuration, categories and vehicles files.
Reference	Refer High Wycombe, Kalamunda Road Study – Cardno Eppell Olsen, December 2009

General Model Scope	
Location / route / area	Kalamunda Road – High Wycombe (Between Foxton Boulevard and Kenneth Road)
Years modelled	2009, 2021
Time periods modelled	AM Peak Hour (8:00-9:00), PM Peak Hour (5:00-6:00)
Time periodic variations (profiles) on: • Traffic demand • Links • Junction control	15 minute Traffic Demand
Number of zones	10
Number of links	77
Number of nodes	47
Number of junctions	9
Number of traffic signals: • Fixed time • Vehicle-actuated • Area traffic control system	No existing signalised intersections within model extents

Network	
Base Network	No precursor networks
Base Geometry	Developed based upon recent aerial imagery obtained from www.nearmap.com
Intersection layouts	As per aerial imagery obtained from www.nearmap.com
Traffic signal controls	N/A
Other network features eg: • Signposting • Ramp metering • Adjacent lane interaction • Lane restrictions	No special network features
Time Dependent Features	Bus routes incorporated into model based on information obtained from transperth.
Other variations from base network	N/A

Vehicle and driver data	
Data type	
Default vehicle data used	RTA Standard Vehicle File – Dec 2005
Additional or non-standard vehicle used?	N/A
Vehicle proportions	As per RTA Standard Vehicle File – Dec 2005
Headway	Default (Except on eastern approach to Kalamunda Road/Newburn Road intersection, changed to 2.51 as suggested by Austroads Guidelines)
Reaction time	Default
Driver behaviour parameters, e.g. • Familiarity; • Aggression; • Awareness	Default

Base Travel Demand	
Source of raw data	N/A
Automatic vehicle counts	-
Manual vehicle Counts	-
Classified counts	-
Manual turning counts	Undertaken by Austraffic on Thursday 29th October 2009
Counts from signal control systems	-
Counts from freeway management system	-
Number plate survey	-
Roadside interviews	-
Mail-back questionnaire	-
Home interview	-
Commercial vehicles survey	-
Other sources	N/A

Base trip table estimation	
Method	Excel Spreadsheet Estimation – Least Squares Method
Counts only	-
Synthesised from counts: • Observed • Modelled • Other	Synthesised from observed traffic counts undertaken on Kalamunda Road
Details of time dependent demand profiles used	Flat AM and PM Peak Hour Profile Adopted – 90% Warm Up Demand for AM Peak - 100% Warm Up Demand for PM Peak
Commercial vehicle survey	-
Other sources	N/A

Future trip table estimation	
Method	Linear Growth for Through Trips – 1.67% p.a
Growth factor	N/A
Modelled	AM and PM
Other	N/A
Adequately defined in the brief?	N/A
Work complies with the brief?	N/A
Work adequately documented?	N/A

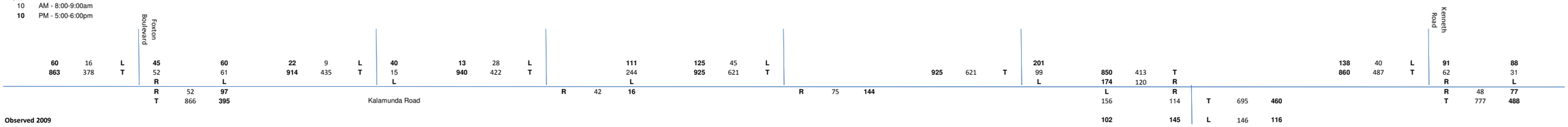
Assignment details	
Algorithm	All or Nothing
Cost coefficients	Default
Incidents	N/A
Signposting	N/A
Strategic Routes	N/A

Appendix G

Paramics Base Model Calibration Summary

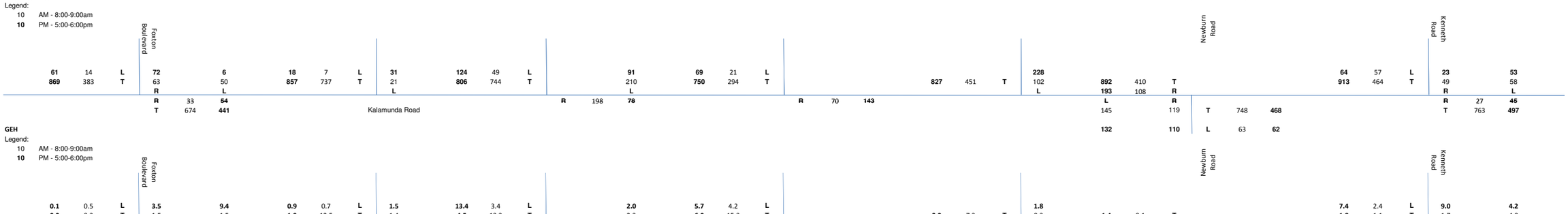
Modelled Base 2009

Legend:
10 AM - 8:00-9:00am
10 PM - 5:00-6:00pm



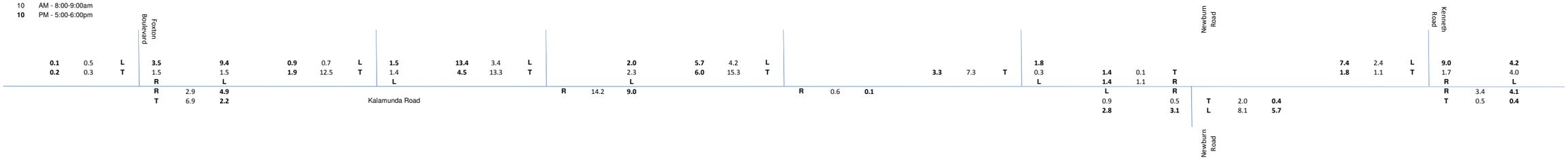
Observed 2009

Legend:
10 AM - 8:00-9:00am
10 PM - 5:00-6:00pm



GEH

Legend:
10 AM - 8:00-9:00am
10 PM - 5:00-6:00pm



Declaration of financial/conflict of interests to be recorded prior to dealing with each item.

9.25 Lots 23, 50 and 9001 Kalamunda Roads, High Wycombe - Cash-in-lieu for Public Open Space and Progress of Subdivision and Developments Associated with the High Wycombe Town Centre

Previous Items:	OCM September 2004, September 2006, February 2008, March 2008 and December 2009
Service Area:	Planning Development Services
File Reference:	KL-02/530
Applicant:	N/A
Owner:	P Cinnani

PURPOSE

1. To note the payment of cash-in-lieu of Public Open Space (POS) progress of subdivision works and to consider an extension to the substantial commencement period for the lifestyle retirement village.

BACKGROUND

2. The above sites form part of a "Town Centre Concept" endorsed by Council. The concept included a shopping centre, a tavern, two fast food outlets, village centre incorporating uses such as a medical centre, health and fitness centre and community toilets and car parking associated with the above. Refer ***(Attachment 1a and 1b)*** Town Centre Concept. To date, the shopping centre, tavern and the majority of the car parking has been developed.
3. The Town Centre Concept was subject to a Deed of Agreement between the Shire and the developer which included amongst other matters dates by which development was to have been finalised, expenditure of cash-in-lieu funds for POS and the ability for Council to draw on a bank guarantee for non compliance with aspects of the Deed.

DETAILS

4. The Shire's Solicitors have provided the following advice on matters currently outstanding:

1. ISSUES

There are two sets of issues:

1.1.1. ISSUES FOR NOTING BY COUNCIL:

Mr Cinanni's payment of cash-in-lieu of providing land for public open space; and

Progress to date with respect to the subdivision approved on 20 February

2008.

1.1.2. ISSUES WHICH REQUIRE A DECISION BY COUNCIL:

Mr Cinanni's request for the extension of the dates specified in the 2005 agreement between himself and the Shire (**Shire Agreement**) for completion of the village centre, lifestyle retirement village and public open space works;

the Shire's entitlement to draw on the bank guarantee provided by Mr Cinanni under the Shire Agreement, as a consequence of his failure to complete the village centre, lifestyle retirement village and public open space works before the stipulated dates; and

Mr Cinanni's application under Local Planning Scheme No. 3 for an extension of the substantial commencement period for the lifestyle retirement village.

2. ISSUES FOR NOTING BY COUNCIL

2.1. PAYMENT OF CASH-IN-LIEU OF PROVIDING PUBLIC OPEN SPACE

Two subdivision approvals have been granted in relation to Mr Cinanni's property, the first on 14 January 2004 and the second on 20 February 2008. Both were granted with a condition requiring 5,305 m^2 of public open space to be vested in the Crown for the purpose of a recreation reserve free of cost and without payment of compensation.

At the time of the 2004 subdivision approval, section 20C of the *Town Planning and Development Act 1928* (since replaced by the *Planning and Development Act 2005*) allowed a cash-in-lieu payment to be made to the Shire for public open space as an alternative to providing land. This payment could only be made with the prior approval of the Shire and the Western Australian Planning Commission.

The possibility of a cash-in-lieu payment was acknowledged in the Shire Agreement and in a separate written agreement entered into by Mr Cinanni and others with the West Australian Planning Commission in 2005 (**WAPC Agreement**). Under the WAPC Agreement the payment of cash-in-lieu was dependent on a revised outline development plan for the site being adopted by the Shire and endorsed by the WAPC and each then approving the payment. A revised outline development plan was subsequently approved by the Shire and endorsed by the WAPC. The revised outline development plan contains a condition requiring the cash-in-lieu payment to be made in accordance with the WAPC Agreement. By approving the revised outline development plan with this condition, the Shire effectively approved the cash-in-lieu payment. Similarly, the WAPC's endorsement of the revised outline development plan provided its approval for the cash-in-lieu payment. The WAPC has subsequently confirmed that the cash-in-lieu payment is required to be

made by Mr Cinanni.

As required by the applicable legislation, a valuation has been undertaken to determine the amount of the cash-in-lieu payment which must be made by Mr Cinanni. The amount is $278,988. Mr Cinanni has paid this to the Shire.

Under the Shire Agreement, once the cash-in-lieu payment is received, the Shire is required to support an application to the Minister for Planning for approval to use the payment for the improvement or development of public open space and a water feature on the nearby Reserve 47766. Under the Shire Agreement, Mr Cinanni is required to plant and landscape the Reserve and develop the water feature. The estimated cost of these works is approximately $1.1M. Consequently, while Mr Cinanni's cash-in-lieu payment will be used for some of these works (if approved by the Minister), Mr Cinanni will still have to expend a further $830,000 (or thereabouts) to satisfy his obligation under the Shire Agreement with respect to public open space works and the water feature.

The application to the Minister for the use of Mr Cinanni's cash-in-lieu payment in the manner described above has yet to be made to the Minister, but will be made shortly.

3. ISSUES WHICH REQUIRE A DECISION BY COUNCIL

3.1. EXTENSION OF COMPLETION DATES UNDER THE SHIRE AGREEMENT

Under the Shire Agreement, Mr Cinanni was required to undertake and complete various developments within specified timeframes. The particular developments are as follows:

3.1.1.1. Lifestyle Retirement Village

A lifestyle retirement village was required to be completed by 24 October 2009. Development of this village has not been commenced. A planning approval was issued on 7 February 2008 for a 64 aged persons' dwelling. However, this expired on 6 February 2010. Mr Cinanni has sought an extension of the substantial commencement period of this approval to 6 February 2011, a matter separately addressed below.

With respect to the lifestyle retirement village (which will comprise 64 aged persons dwellings), Mr Cinanni has sought an extension of the completion date to:

24 October 2011, for half of the dwellings (a 24 month extension from the stipulated completion date of 24 October 2009); and

24 October 2012, for the other half of the dwellings (a 36 month extension of the stipulated completion date of 24 October 2009).

3.1.1.2. The town centre concept

The 'town centre concept' comprises:

3.1.1.2.a.1. a shopping centre;

3.1.1.2.a.2 a tavern;

3.1.1.2.a.3 two fast food outlets;

3.1.1.2.a.4 a village centre incorporating uses such as a medical centre, health and fitness centre and community toilets; and

3.1.1.2.a.5 car parking and road works associated with the above.

These developments were required to be completed by 24 October 2008.

The shopping centre, tavern and fast food outlets were completed in December 2008. A planning approval for part of the village centre (including a medical centre) was granted in August 2008. However, that approval was never implemented. Consequently, no aspect of the village centre has been commenced. Mr Cinanni has recently provided a qualified commitment to providing the village centre.

Although the Shire Agreement describes the village centre as incorporating uses such as a medical centre, health and fitness centre and community toilets, the revised outline development plan refers to the village centre as comprising uses such as a medical centre, health and fitness centre, restaurants, cafés, community facility and amenities and car parking.

Mr Cinanni has proposed that the completion date for the village centre be extended to 24 April 2012. In effect, this is an extension of 42 months from the stipulated completion date of 24 October 2008. Mr Cinanni's proposed extension is expressed to be subject to at least 50% of the tenancies within the proposed village centre being let prior to the commencement of construction If this is not achieved, Mr Cinanni proposes that he will then seek a further extension of the completion date or the Shire's approval to proceed with an alternative form or mix of uses within the village centre.

3.1.1.3. Public open space and water feature

The upgrading/creation of a water feature and public open space on Lot 49 and Reserve 47766 was required to be completed by 24 October 2008. The Shire has recently approved a landscaping plan and reticulation design for the public open space works. Mr Cinanni has advised that the landscaping works can be commenced and completed by 30 June 2010, subject to any delays caused by inclement weather. After the landscaping is complete, the public will be excluded from the public open space for an 8-10 week period, while the landscaping becomes established.

3.1.1.4. Grounds for extending completion dates under the Shire Agreement

Under clause 8 of the Shire Agreement the stipulated completion dates:

> '*may be extended only if, following receipt of a written request by Cinanni, the Shire agrees in writing that a stipulated date cannot be met through no fault of Cinanni*'.

Mr Cinanni has identified the following reasons for not being able to meet the completion dates stipulated by the Shire Agreement:

3.1.1.4.a.1 Mr Cinanni adopted a staged approach to the development of the separate components of the town centre concept;

3.1.1.4.a.2 the earlier stages comprising the shopping centre, tavern, liquor store and one fast food restaurant were delayed by disputes with the Shire about conditions of planning approvals and a building licence. While these were ultimately resolved by agreement following the commencement of a number of proceedings in the State Administrative Tribunal, there were consequential delays in development proceeding;

3.1.1.4.a.3 the amalgamation and subdivision of Lot 9001 has also been delayed by a dispute between Mr Cinanni and the Western Australian Planning Commission over conditions. This dispute has also been resolved following the initiation of proceedings in the State Administrative Tribunal. Again, this has led to delays in development proceeding;

3.1.1.4.a.4 the delays associated with these disputes, had the flow-on effect of delaying later stages of the town centre concept (e.g. the village centre);

3.1.1.4.a.5 the financing of the development has been impacted by the global financial crisis (no details provided);

3.1.1.4.a.6 at the time the medical centre was approved in August 2008, Mr Cinanni had firm expressions of interest from a number of potential tenants. A change to Federal health policy (unspecified) and the effect of the global financial crisis lead to these expressions of interest being withdrawn. Despite subsequent advertising, it has not been possible to secure a tenant for the medical centre;

3.1.1.4.a.7 with respect to the public open space and water feature, a landscaping plan and reticulation design has only recently been approved by the Shire. In addition, issues concerning the payment of cash-in-lieu, which is to be used to fund some of these works (if approved by the Minister) have only recently been resolved.

For the purpose of clause 8 of the Shire Agreement, if Council is satisfied that the delay in completion of the village centre, lifestyle village and works for the public open space and water feature has occurred through no fault of Mr Cinanni's, then the completion dates for these works and development can be extended.

3.2. SHIRE'S RIGHT TO DRAW ON THE BANK GUARANTEE PROVIDED BY MR CINANNI

Under clause 6.1 of the Shire Agreement, Mr Cinanni provided the Shire with an irrevocable bank guarantee in the sum of $150,000. The Shire Agreement provided that where Mr Cinanni failed to complete certain works or development by the stipulated completion dates, the Shire was entitled to draw on the bank guarantee at the rate of $1,000 for each subsequent week during which the works or development remained incomplete. The periods of delay between the stipulated completion dates and Council's meeting on 19 April 2010 will be as follows –

- town centre concept – 78 weeks; and
- lifestyle retirement village – 26 weeks.

The total delay is, therefore, 104 weeks for which the Shire would be entitled to draw $104,000 from the bank guarantee. Under clause 6.4 of the Shire Agreement, the money may be applied to the Shire's general municipal fund and used for any purpose the Shire sees fit.

A question arises under the Shire Agreement whether the Shire is entitled to draw on the bank guarantee where it first extends the stipulated dates for completion of works and development. Although the issue is not beyond argument, the better view is that where Council extends the completion dates it cannot draw on the bank guarantee for the delays in completing works and development by reference to the initial completion dates. It would only be where there was a failure to

complete development by the extended completion dates that the bank guarantee could then be drawn on. Consequently, should Council determine to extend the completion dates for the lifestyle retirement village, village centre and public open space and water feature, it will not be able to draw upon the bank guarantee unless in the future there is a failure to complete the works and development by the extended dates.

3.3. EXTENSION OF THE SUBSTANTIAL COMMENCEMENT PERIOD FOR THE LIFESTYLE RETIREMENT VILLAGE

On 27 January 2010 Mr Cinanni's planning consultants requested an extension of the substantial commencement period for the development approval issued for the lifestyle retirement village on 7 February 2008. Their requested extension is to 6 February 2011.

The Shire's approval required substantial commencement of the lifestyle retirement village within 2 years, failing which the approval would lapse. As substantial commencement did not occur by 6 February 2010, the approval has now lapsed.

Clause 10.5.2 of the Shire's *Local Planning Scheme No. 3* permits a request to be made for an extension of the term of an approval, where this request is made prior to the expiry of the approval. In this instance, the request was made by letter dated 27 January 2010. Consequently, the request has been validly made and must be determined by the Shire.

The Scheme does not identify any particular considerations which Council must take into account when considering such an application. However, factors relevant to a consideration of a requested extension would include:

- whether the planning framework had changed in any material way;
- whether the locality has changed so that the lifestyle retirement village is no longer an appropriate development;
- whether the proposed lifestyle retirement village would be approved today; and
- the reasons why the approval has not been implemented to date.
- the upgrading and creation of a water feature and public open space on Lot 49 and Reserve 47766 to be completed by 30 June 2010

STATUTORY AND LEGAL IMPLICATIONS

5. As Above.

POLICY IMPLICATIONS

6. Nil.

PUBLIC CONSULTATION/COMMUNICATION

7. Nil.

FINANCIAL IMPLICATIONS

8. It is recommended that at this stage Council not draw down on the funds available in the bank guarantee. Payment of the cash-in-lieu for POS may be expended in the High Wycombe locality subject to approval by the Minister for Planning.

STRATEGIC AND SUSTAINABILITY IMPLICATIONS

9. **Strategic Planning Implications**
   - Finalisation of these matters will move towards the completion of the High Wycombe Town Centre.

10. **Sustainability Implications**

Social implications
- Provision of cash-in-lieu funds will be expended on POS in the High Wycombe locality (subject to approval by the Minister for Planning) thus enhancing the amenity of the area.

Economic Implications
- Continued development of the High Wycombe Town Centre will provide employment opportunities.

Environmental Implications
- Nil.

OFFICER COMMENT

11. Proceeding with the matter as described above will allow the development to continue and achieve the outcomes proposed in the "Town Centre Concept".

MEETING COMMENT

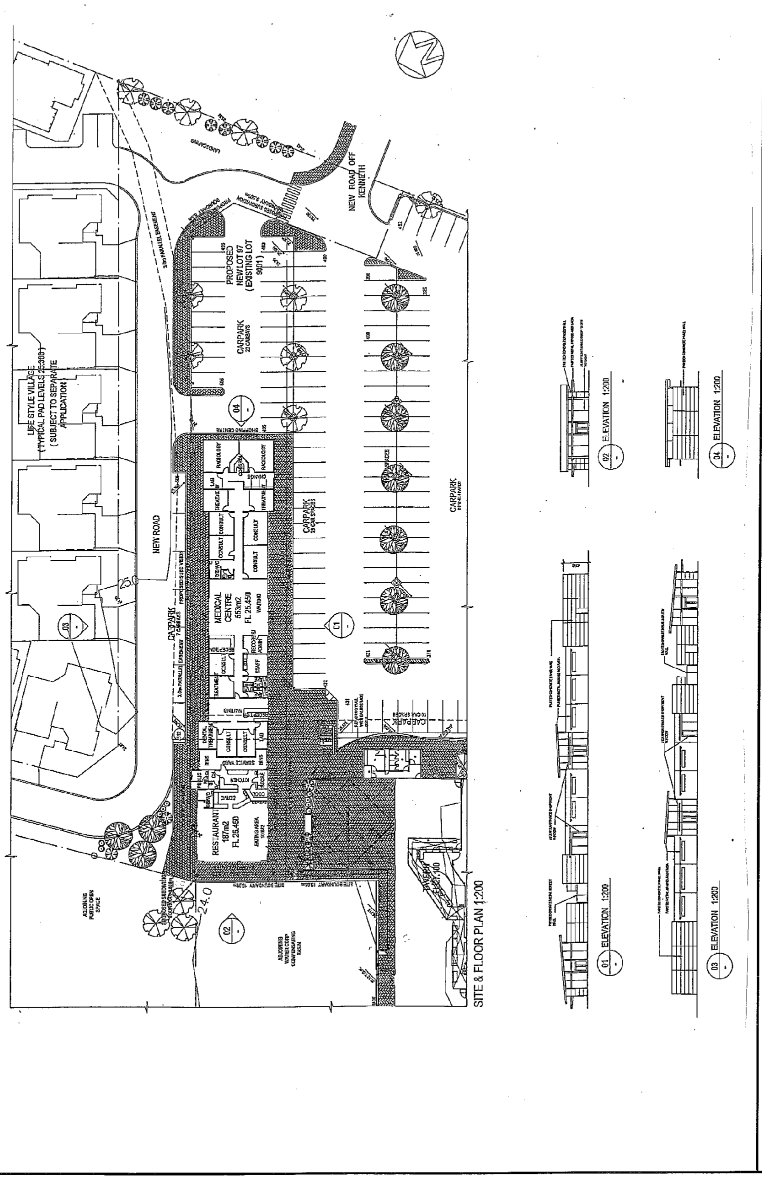
12.

OFFICER RECOMMENDATION PS-25/2010

1. That Council:

   1. Notes the reported position with respect to the cash-in-lieu payment and the implementation of the 2008 subdivision approval;

2. Extends the time stipulated in clause 2.3.4 (a) of the Shire agreement for completion of the following works and development forming part of the town centre concept:
    - The following components of the village centre, namely the medical centre, one restaurant and public toilets are to be completed by 24 April 2012; and
    - The upgrading and creation of a water feature and public open space on lot 49 and reserve 47766 is to be completed by 30 June 2010;
3. Extending the time in clause 2.3.4(b) of the Shire agreement for completion of the following works and development involved in the lifestyle retirement village:
    - 32 aged persons' dwellings for which planning approval was granted on 7 February 2008, are to be completed by 24 October 2011; and
    - A further 32 aged person's dwellings, for which planning approval was granted on 7 February 2008, are to be completed by 24 October 2012;
4. Under clause 10.5.2 of the Local Planning Scheme No. 3, Council extends the last day of the period stipulated in the planning approval granted on 7 February 2008 within which the lifestyle retirement village is to be substantially commenced by 6 February 2011;
5. Reserves all of its rights to draw on the bank guarantee provided under the Shire agreement, both in respect of the failure to complete works and development by the dates stipulated in the shire agreement and the extended dates provided above.



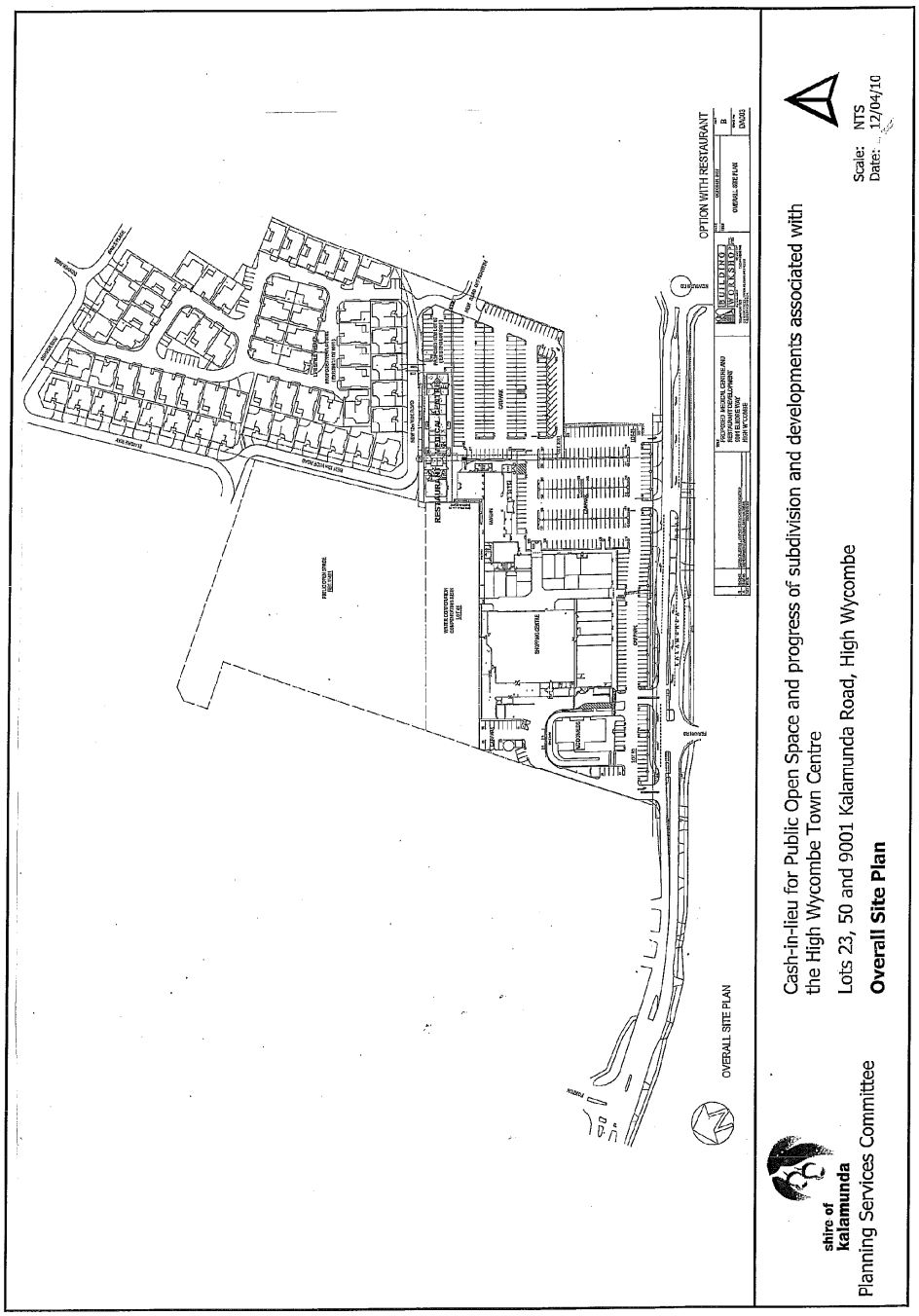
Cash-in-lieu for Public Open Space and progress of subdivision and developments associated with the High Wycombe Town Centre

Lots 23, 50 and 9001 Kalamunda Road, High Wycombe

Site Plan, Floor Plan and Elevation Plan

Shire of Kalamunda
Planning Services Committee

Scale: NTS
Date: 12/04/10


OPTION WITH RESTAURANT
OVERALL SITE PLAN
shire of kalamunda
Planning Services Committee
Cash-in-lieu for Public Open Space and progress of subdivision and developments associated with the High Wycombe Town Centre
Lots 23, 50 and 9001 Kalamunda Road, High Wycombe
Overall Site Plan
Scale: NTS
Date: 12/04/10

10. QUESTIONS BY MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN

11. QUESTIONS BY MEMBERS WITHOUT NOTICE

12. URGENT BUSINESS APPROVED BY THE PERSON PRESIDING OR BY DECISION

13. MATTERS CLOSED TO THE PUBLIC

14. CLOSURE