TASMANIAN ROAD INFORMATION POSITIONING SYSTEM

Tasmania

Nov 2015

RECORD OF REVISIONS		
Revision	**Revision Details**	**Date**
1	Initial version	January 1996
1.1	Insert new info re: WHEELPATHS	September 1996
2	New Version: changes to CWY codes for ramps	July 1997
3	Change to field names to coincide with RIMS New method for referencing lanes	May 1998
4	Revised method for distance references on ramps	November 2001
5	Format and layout of this manual	October 2012
6	Minor text changes	April 2013
7	Roundabouts	May 2013
8	State Growth	Nov 2015

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1. ACKNOWLEDGMENTS

Preparation of the TRIPS methodology has relied heavily on the ROADLOC system used by the RTA (NSW). Similarly preparation of this manual has been undertaken using the ROADLOC Manual where the systems are the same.

The help provided by the Asset Control Technology Section of the RTA (NSW) is acknowledged.

2. INTRODUCTION TO TRIPS

2.1 What is TRIPS

TRIPS, TASMANIAN ROAD INFORMATION POSITIONING SYSTEM, is a formalisation of the method of describing the location of any item of interest on the classified road network. This method has been used in the LINK MAPS, which have been published by the Asset Information Group of the Department of State Growth.

2.2 TRIPS and Link Maps

The LINK MAPS should be viewed in conjunction with this manual. They provide an excellent up-to-date sketch of each link in the classified road network as well as a small scale sketch of each road. They show major features, limits of the national highway, presence of dual carriageways as well as other information. Link Maps are available in three volumes as follows:

- North East Region
- North West Region
- Southern Region

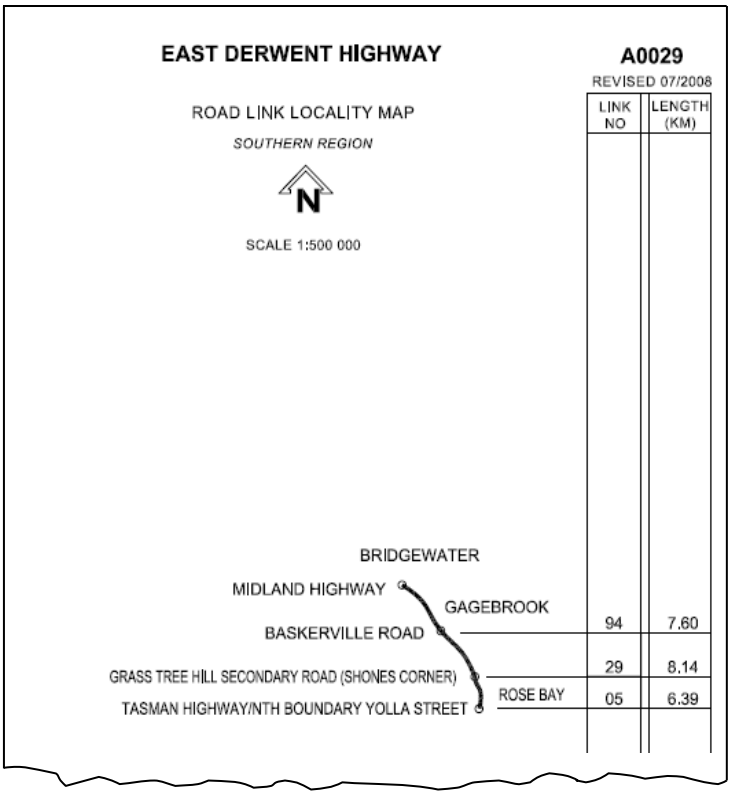
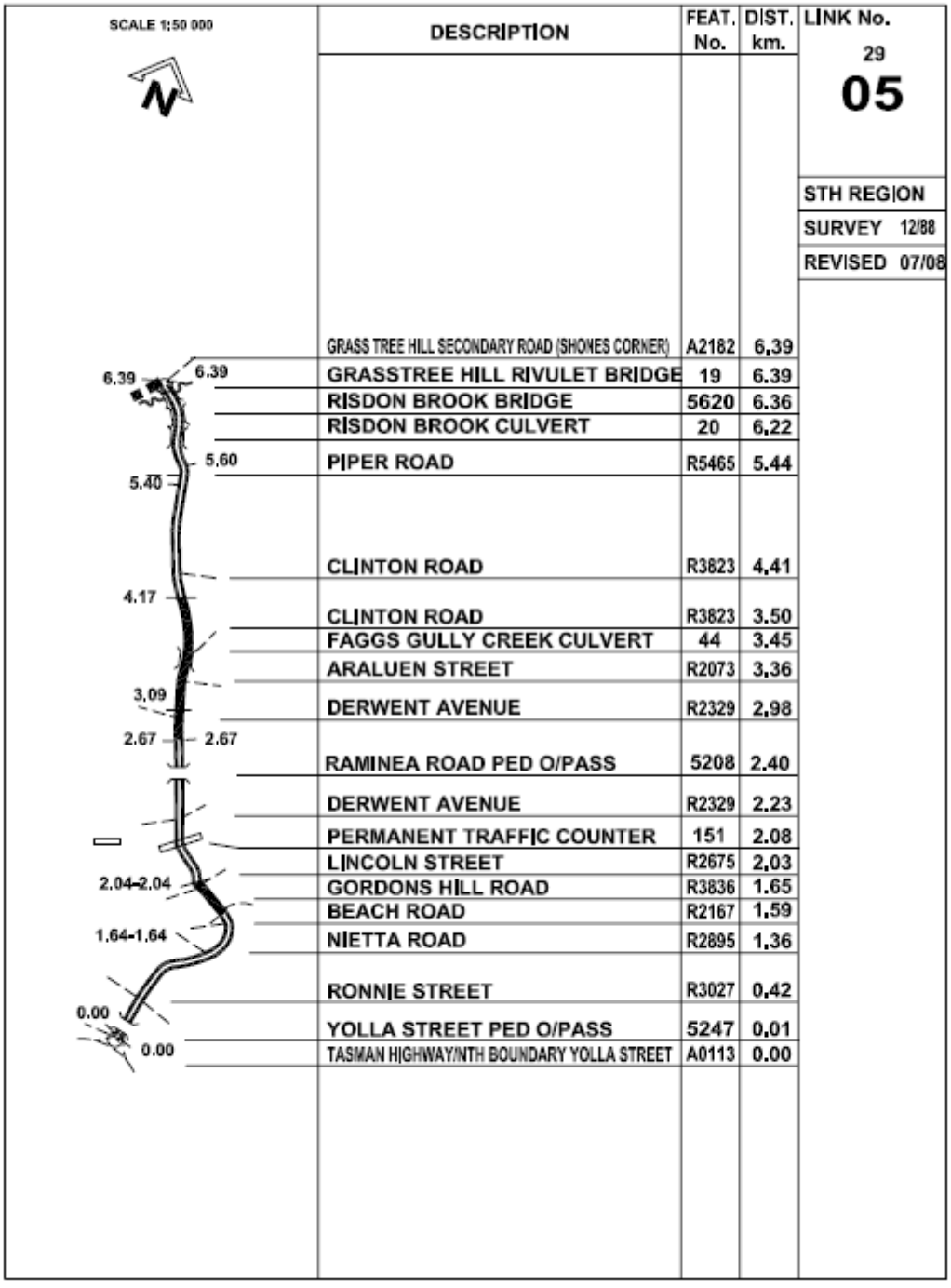


Fig. 1 Sample Locality Map showing the entire road in sketch format.
The LINK NUMBERS and their lengths are shown along with node numbers.

EAST DERWENT HIGHWAY **A0029**



DESCRIPTION	FEAT. No.	DIST. km.
GRASS TREE HILL SECONDARY ROAD (SHONES CORNER)	A2182	6,39
GRASSTREE HILL RIVULET BRIDGE	19	6.39
RISDON BROOK BRIDGE	5620	6.36
RISDON BROOK CULVERT	20	6,22
PIPER ROAD	R5465	5.44
CLINTON ROAD	R3823	4,41
CLINTON ROAD	R3823	3.50
FAGGS GULLY CREEK CULVERT	44	3.45
ARALUEN STREET	R2073	3,36
DERWENT AVENUE	R2329	2,98
RAMINEA ROAD PED O/PASS	5208	2.40
DERWENT AVENUE	R2329	2.23
PERMANENT TRAFFIC COUNTER	151	2.08
LINCOLN STREET	R2675	2,03
GORDONS HILL ROAD	R3836	1.65
BEACH ROAD	R2167	1.59
NIETTA ROAD	R2895	1,36
RONNIE STREET	R3027	0,42
YOLLA STREET PED O/PASS	5247	0,01
TASMAN HIGHWAY/NTH BOUNDARY YOLLA STREET	A0113	0.00

LINK No. 29 **05**

STH REGION

SURVEY 12/88

REVISED 07/08

Fig. 2 Sample LINK MAP indicating sections of dual carriageway and the chainage of some major features. The “29” above the link number is the number of the following link.

2.3 The Link - Node Referencing System

The link sub system of TRIPS is based on the segmentation of roads into manageable lengths called 'links'. These links vary in length around an average of 10 kilometres. Each link is uniquely numbered (unique to a road), increasing along the prescribed direction of the road.

2.4 Who should use TRIPS

Any officer having any dealings with the classified road network would find the referencing methodology useful and an efficient way to describe unambiguously the location of any item on the road network. It provides a common language for locations to be expressed and understood among officers. When used as described in this manual it is compatible with computerised data bases, facilitating the integration of various data sets which in turn enables the storage, retrieval and analysis of data to be done efficiently.

TRIPS referencing can be used when collecting data along or next to the road network or for referring to a section of road, for a maintenance project, for example.

3. DESCRIPTION OF TRIPS

3.1 Roads

At this stage TRIPS is only used for those roads under the jurisdiction of the Department of Infrastructure Energy and Resources, that is the State Classified Road Network. All of these roads have a five character **ROAD_NO** which is in the format A9999, i.e. the letter “A” followed by four digits. Although all of the department’s roads start with “A”, the department does have items of interest on other state or council roads (such as bridges and sign posts) that have road numbers starting with some other letter. To keep options open for any future expansion of TRIPS, the letter will be retained as part of the road number. The current list of road numbers can be found at the front of each volume of the Link Maps.

Each road has a **PRESCRIBED DIRECTION**. This indicates the nominated direction for measurement of all locations along that road. All locations are stated as a distance in kilometres from the start of a link in the prescribed direction, even items that may be on the reverse carriageway. This will be explained in more detail later. When referring to the opposite direction the term **COUNTER DIRECTION** is appropriate.

3.2 Links

Links are numbered in increasing values, which are not necessarily consecutive from the start point of a road towards its end. Links are generally structured such that they commence and end at prominent features, which are least likely to be moved over time. Examples are junctions with other roads, centre points of large culverts or overpasses, or railway crossings. In rural areas where major features are sparse, mile posts or kilometre posts may have been used. Link numbers are only unique to the road to which they refer so must be used in conjunction with a road number to identify any location. The current range for link numbers is from 01 to 99. This range may be expanded at a future date as numbers are used up. Use **LINK_NO** as a field name in databases or spreadsheets with a field type of *REAL*. with one place after the decimal. This format will allow future links to be created between two existing numbers thus

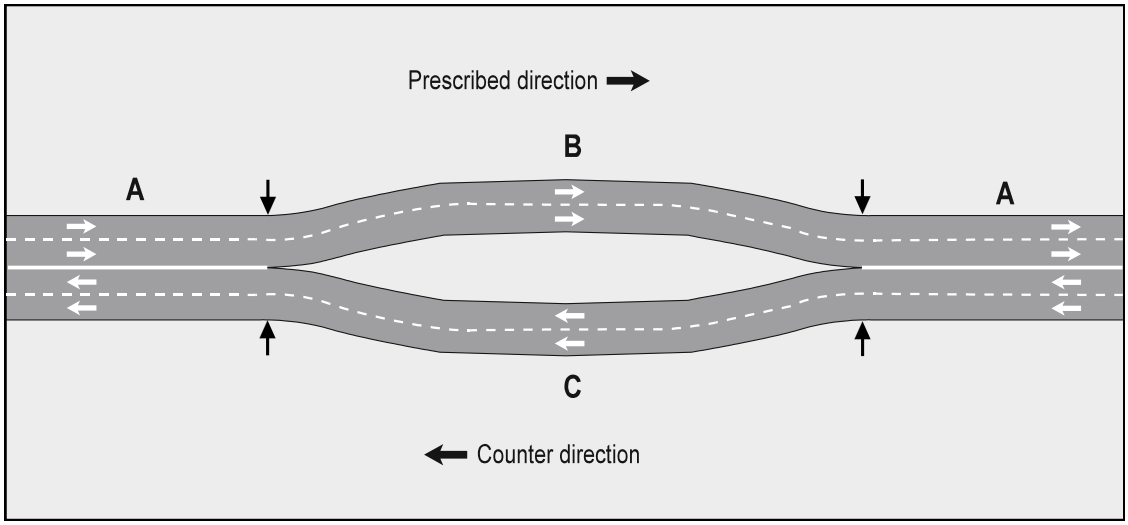
maintaining the increasing value property. For example link number 8.5 can be inserted between link 8 and link 9 if the need arises.

3.3 Carriageways (Cwy)

Some sections of road may be separated by a median strip or crash barriers such that the traffic flows in opposite directions on either side of the separation. This is a dual carriageway and to differentiate the location of points as to which section of the road they are on, the carriageways are labelled. For a typical road with no separation between the opposite flows of traffic, the label **"A"** is used. For the carriageway that carries traffic in the prescribed direction in a dual carriageway section the label **"B"** is used. For the carriageway that carries traffic in the counter direction in a dual carriageway section, the label **"C"** is required. Use the field name **CWAY_CODE** in databases and spreadsheets with a field type of *character* and a length of *three*. (See **RAMPS** later). Some short (<200m) sections of road that have a median strip may be deemed not to be dual carriageway. Check the link maps to determine the starts and ends of dual carriageways.

The transition from one type of carriageway to another is deemed to occur at the first encounter of the physical object that separates the opposite traffic flows, for example the bullnose of an island or the end of a guardrail, or where the road surface splits in two.

Fig 3 Carriageway Codes - A = undivided, B = divided with traffic in the prescribed direction and C = divided with traffic in the counter direction.



3.4 Ramps

Ramps are differentiated from the main section of a road by giving them a carriageway code between **R01** and **R99**, that is they are treated as if they were another carriageway. The chainage on ramps is in the same direction of traffic flow and starts at Ch 0.00 Km. Ramps are deemed to start at the concrete bullnose or point where the two road surfaces meet rather than at paint marks or the start of the road taper. If a ramp is shorter than 30 metres then it is considered to be a turning lane and is not given a carriageway code. Items situated on turning lanes can be referenced as an

offset from the nearest carriageway (be it a normal carriageway or a ramp). It is planned to include diagrams of complicated interchanges in a future issue of the Link Maps to indicate the correct codes for ramps.

The start of a ramp (Ch 0.000 Km) is at the start of the physical object that divides the ramp from the main road. This may be a concrete bullnose, a crash barrier, a kerb or where the road surface (bitumen) separates.

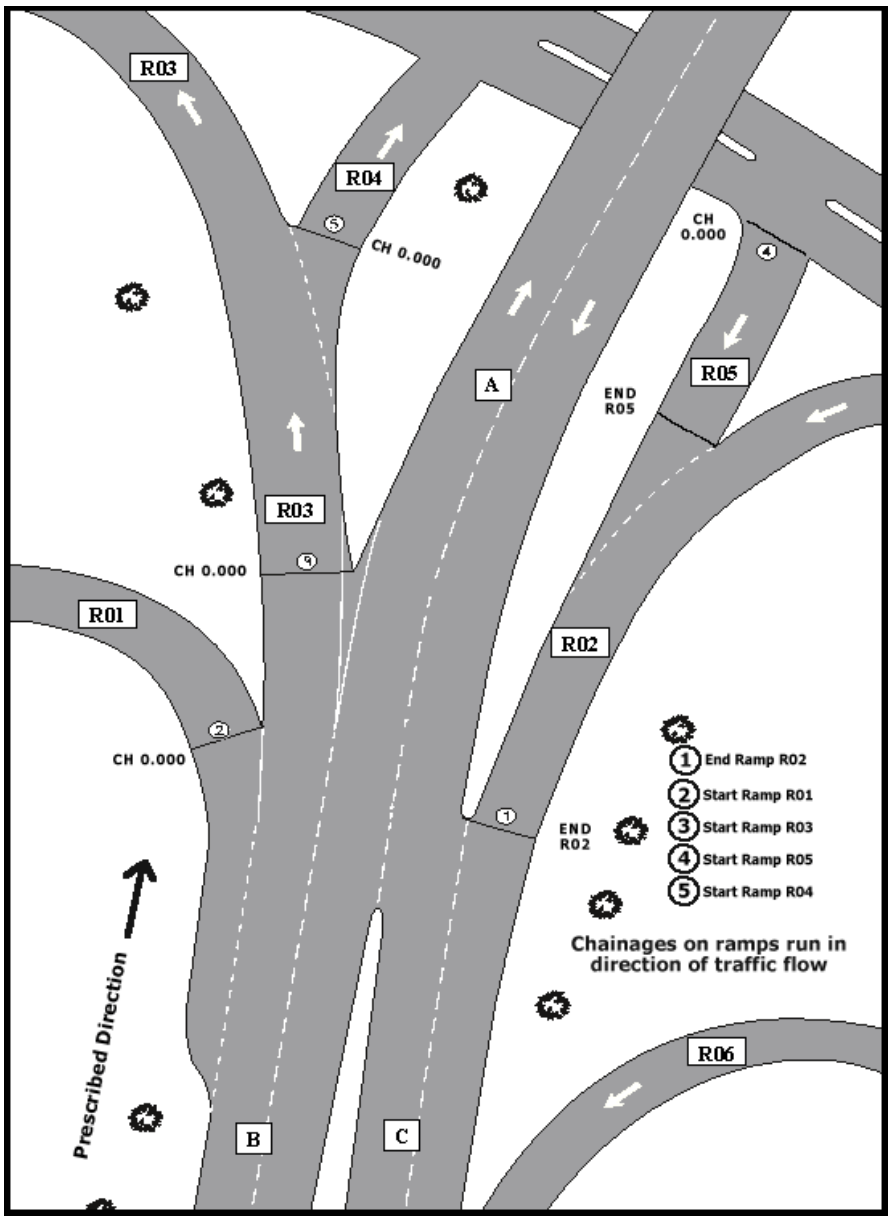


Fig. 4 Ramps - Each ramp has a carriageway code (**R01, R02,** etc.). The start chainage of a ramp is at the end where the traffic enters. Ramps are deemed to start at a solid physical feature such as a bullnose. All ramps start with a chainage of 0.000 Km.

3.5 Roundabouts

In 2010 roundabout codes were added to TRIPS. Up to then roundabouts were treated as part of B and C carriageways. In order to locate roundabouts and to distinguish them from other carriageway types separate roundabout codes have been defined as follows:

There are two types of roundabouts:

a) Roundabouts continuous with the carriageway

b) Roundabouts off the carriageway, e.g. roundabouts located at the end of ramps

Roundabouts continuous with the carriageway are treated similar to divided carriageways, i.e. they have a B or C added to the RB roundabout code (RBB / RBB). All other roundabout segments are given RR followed by a number (RR01, RR02 etc). Similar to ramps the numbers are grouped for each roundabout (RR01 – RR09, RR10 to RR19, etc.). For an example of a roundabout continuous with the carriageway see Fig. 5 below.

Roundabouts off the carriageway are given RB code followed by a number. RB codes are also grouped per roundabout. The first two numbers are used for the two main segments, e.g. RB01 prescribed and RB02 counter direction. For an example of a roundabout on a main State Road see Fig. 6 below.

For details on the Department's maintenance responsibilities for roundabouts off the carriageway refer to the relevant Boundary Maps.

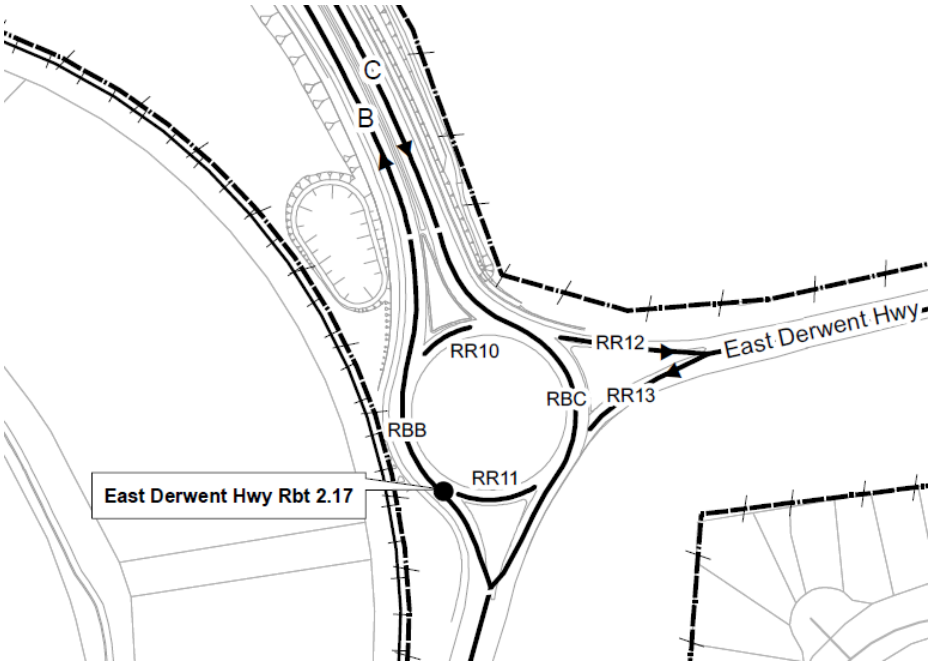


Fig. 5 Roundabout continuous with the carriageway

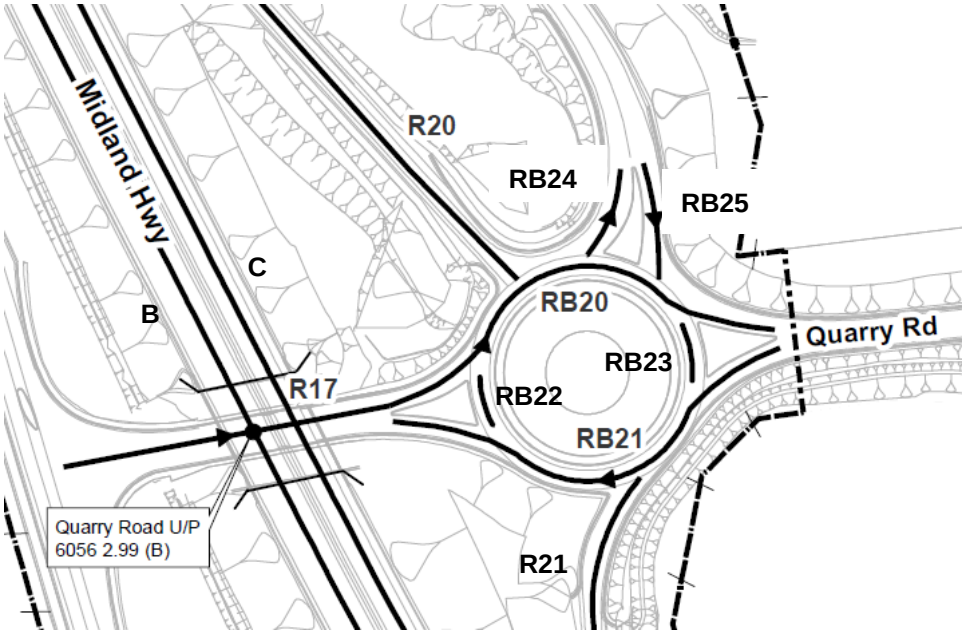


Fig. 6 Roundabout off the carriageway

4. USE OF TRIPS

4.1 Point Data

Items that occur at a point on the road network such as a sign post or a small culvert can be addressed by using the **ROAD_NO** - **LINK_NO** - **CHNG** - **CWAY_CODE** format where chainage (chng) is the distance in kilometres from the start of the link, as defined in the appropriate Link Map.

ROAD_NO	LINK_NO	CHNG	CWAY_CODE	Data Item
A1125	21	5.25	A	culvert

4.2 Linear Data

To refer to a section of road for instance the limits of a maintenance contract or the section of road covered by a particular speed zone, both a *FROM* location and a *TO* location will need to be specified.

ROAD_NO	START_LINK_NO	START_CHNG	END_LINK_NO	END_CHNG	CWAY_CODE	Data Item
A1125	21	8.46	47	4.26	A	Sealed Shoulders

Note that the reference for a linear feature in the above example relates to an “A” carriageway for the entire section. Depending on the type of data that is being described, a linear feature which traverses several different carriageway types may have to be split into one record for each. For example, if your feature starts in an “A” carriageway, passes through a “B” and ends in an “A”, then three separate linear references may be required. If this was not done there would be no indication as to which carriageway the feature passed through (B or C) along the way. This applies to data that is carriageway specific only. Many types of data are specific to the road reserve only and in these cases the carriageway code can be omitted from the location references. An example of this data type would be NATIONAL HIGHWAY classification that requires **ROAD_NO, START_LINK_NO, START_CHNG, END_LINK_NO, END_CHNG.**

The Road Information Management System (**RIMS**) stores data by link. This means that if an attribute, for example Road category, starts in the middle of one link and ends many links later down the road, a record is created for each link in between. Therefore for each record the end link = start link. In preparing data for importing into RIMS, this format will be required. This system is designed to facilitate the archiving of links, extracting reports and general data maintenance within RIMS.

In the above examples, there could be many fields for each record (other than just “Data Item”).

4.3 Changes to the Road Network Definition

If reconstruction of a section of road introduces major changes to a link such that the previous chainage references are affected, the link may be issued with a new number and a new link map produced. In RIMS some data may be copied to the new link and the old link archived. The latest information on the definition of the State Classified Road Network can be obtained from the Asset Information Group.

The archiving option suggested above would enable historical data to be available at a later date for answering questions relating to trends over the years. The historic record of the link definition will be retained on file thus maintaining the relationship to old link numbers. This will be useful for plotting old data on historic links.

The need to have accurate and timely completion reports on any activity, which may affect the link description or significant features, is crucial and field staff are requested to forward such reports as soon as practical to the Asset Information Group.

4.4 Using TRIPS in the field

4.4.1 Equipment

To collect field data using the TRIPS referencing method it is suggested that the vehicle used be fitted with a measuring (i.e. TRIPMETER) device which can measure distances to the nearest 0.01 km. It will also be useful if this device can be set to a value and have that value decrease on the display as the vehicle moves forward. Also a copy of the appropriate LINK MAPS will identify the correct start and end points of links along with other useful information. See Appendix B for details on calibrating TRIPMETERS.

4.4.2 Prescribed Direction

For all data that can be referenced from the “A” or “B” carriageways line the vehicle up with the start point of the link and set the measuring device to 0.00. This start point (start node) should be used rather than some of the features shown in the link maps along the link as there is less chance of errors being introduced. Errors can result from:

- Minor features are not as stable as Link Nodes
- Some feature names may occur several times in the one link, for example a side road may cross the main road more than once
- Some features are incorrectly signposted
- Entering the wrong starting distance if not commencing at the link start node

The features shown in the link maps along the link can be used as checks for distance. If your check distance is within 0.02 km of that shown on the link map, do not adjust the measuring device, continue on, collecting the data and checking at other features. If several features are found to be more than 0.02 Km out of position then return to the

start node and remeasure from 0.00. Record these discrepancies as found and report them to the Asset Information Group.

Before collecting location data the meter should be calibrated over one of the established baselines. The details of the current baselines can also be obtained from the AI Group.

4.4.3 Counter Direction

Links that contain dual carriageways may have a different travelling distance in the counter direction than in the prescribed direction. This information can be obtained from the AI Group and will be shown in future editions of the link maps. To survey data which is specific to the "C" carriageway only, it will be necessary to set the measuring device to the value of the counter direction distance while at the end of a link and set it to wind down the distance value while driving back towards the link start. The correct chainage can then be read directly from the meter. The meter should show a chainage of 00.00 when the start of the link is reached. Data that can be related to the "A" and or "B" carriageways should not be surveyed in this direction, only data on the "C" carriageway. The desired result is that all items of data have their location expressed as a distance from the start of the link.

4.4.4 Offsets

In addition to defining how far an object or a section of road is from the start of a link, the location code can be extended to indicate the lateral location with respect to the carriageway. The **OS_DIR_CODE** (Offset Direction) can be LEFT, RIGHT, BOTH, OVERHEAD or UNDERGROUND, with the codes being **L, R, B, O** and **U** respectively. BOTH might be used for instance where both kerbs start and end at the same chainages on a carriageway. This offset direction code may be accompanied by an **OS_DIST** (Offset Distance) which should be in metres (integer) from the nearest edge of the main traffic running lanes. Sealed shoulders, turning lanes, short passing bays or approach lanes for ramps are not included when determining the edge of the running lanes. Longer overtaking lanes should be included as a main running lane. The precision of the measurement will vary with the type of object being observed. This system allows offsets to be entered to the nearest metre only and if more precise figures are required it is suggested that these be catered for in the DATA ATTRIBUTES section of the data record by having a field which allows more decimal places. The intention here is to avoid the implication that all offset measurements are precise as some will be measured roughly.

ROAD_NO	LINK_NO	CHNG	CWAY_CODE	OS_DIR_CODE	OS_DIST	Data Item
A1125	21	5.25	A	L	6	sign

All offset directions are relative to the view of the road in the prescribed direction. Therefore items on the median side of a "C" carriageway will be stated as **"L"** even though they are on the driver's right hand side while driving. This is to be consistent with the idea that all chainages increase from the link start, regardless of carriageway.

Unless the objects being surveyed are specifically related to a “C” carriageway, such as a speed sign, they should be surveyed as offsets from the “A” or “B” carriageway. For example a drain located in a median between the carriageways should be shown as an offset from the “B” carriageway unless it specifically collects water run off from the “C” carriageway only.

4.4.5 Lanes

If the location of data needs to be described as to the lane on which it occurs the location reference can include the **LANE_NO.** This is defined as the direction of traffic (PD or CD) plus the number of the traffic lane. The number of the traffic lane is counted from the innermost lane outwards in the direction of travel. Climbing or overtaking lanes would be included but turning lanes, passing bays or merging lanes (<100m) would not.

The location reference for a lane or an object on a lane, such as a marker would appear as follows:

ROAD_NO	LINK_NO	CHNG	CWAY_CODE	LANE_NO	Data Item
A1125	21	5.25	A	PD2	White Arrow

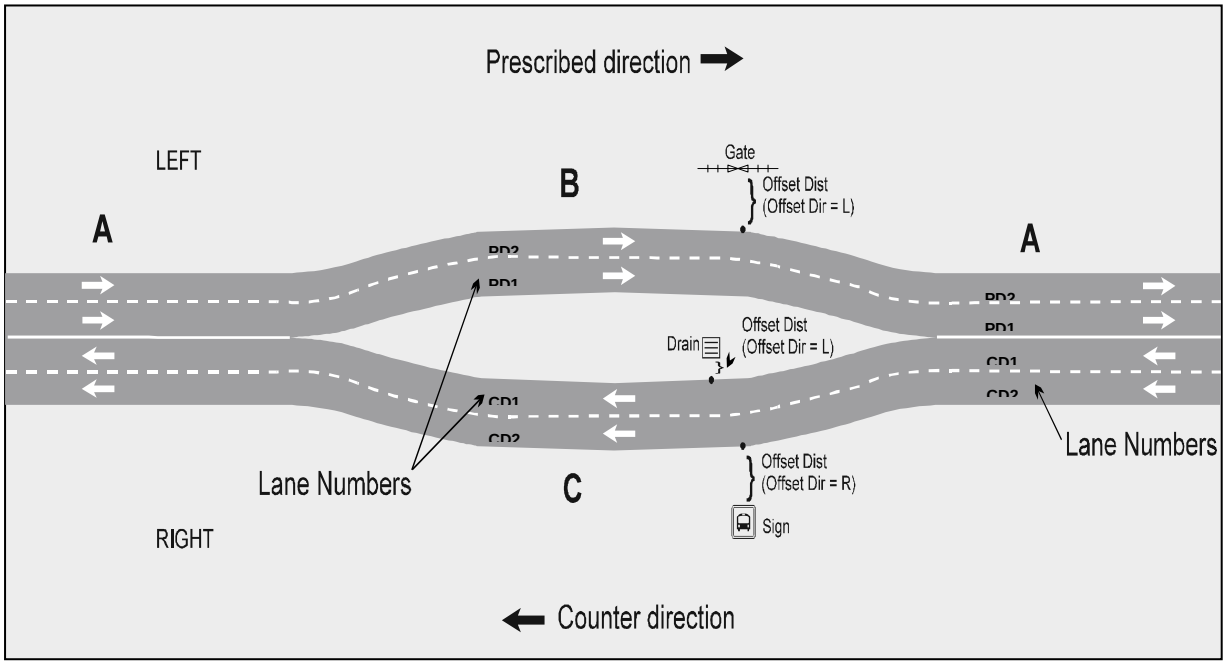


Fig. 7 Lane Numbers and Offsets - Lane numbers are counted from the inner lane when viewing the road in the direction of travel. Offset directions are determined by viewing the road in the prescribed direction. Offset distances are taken from the nearest edge of major traffic lanes.

4.4.6 Wheelpaths

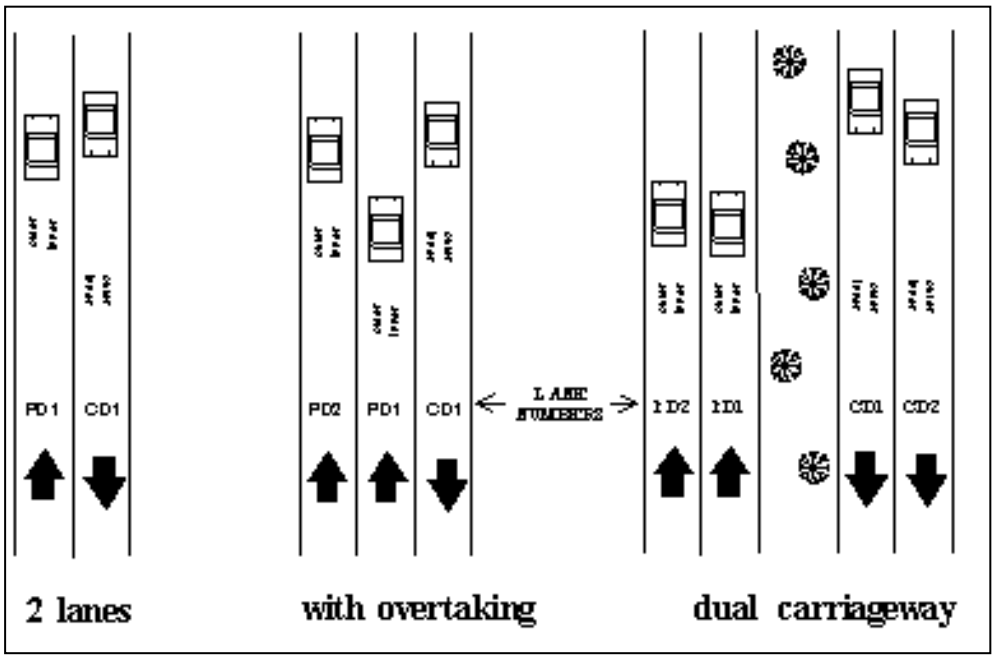


Fig. 8 Wheelpaths - the wheelpath closer to the centre of the road or the median in the case of dual carriageways is always the INNER WHEEL PATH (IWP) of any lane. Conversely for the OUTER WHEEL PATH (OWP). Carriageway codes and Lane Numbers need to be used with the wheelpath id to uniquely identify the particular wheelpath.

When referring to wheelpaths the above standard method should be adopted. Regardless of the lane, the inner wheelpath is always the one closer to the centre of the road. As a memory jogger, think of the left side of your vehicle as the side of the outer wheelpath.

Where there are tidal flow lanes such as the centre lane of the Tasman Bridge, use the predominant direction of flow of traffic for the determination of the wheelpaths. For example, as the predominant flow of traffic on the middle lane of the Tasman Bridge is from west to east, that lane would be deemed to be PD1. Then a vehicle travelling in the predominant direction in lane PD1 would have the outer wheelpath on the left, i.e. on the northern side.

4.5 Defining Feature Locations

Features such as side roads and bridges can be large items and the actual point on the road where they occur can be unclear. To minimise any interpretation errors a standard method for determining feature location is required.

4.5.1 Side Roads:

The chainage on the main road at which a side road is located is determined as follows:

1. Determine the point where the centre of the side road intersects the edge of the main road.
2. A line from this point and perpendicular to the centre line of the main road will cross the main road centreline at the appropriate chainage.

If the side road contains turning lanes, adopt the extension of the white line that separates the two directions of traffic flow on that side road.

4.5.3 Bridges:

The chainage for bridges on the link maps refers to the centre of the structure, unless otherwise noted. As this has been difficult for field staff to pinpoint on the longer structures, consideration is being given to placing marks on the structures to identify the centre point. The centre of skewed bridges will be the mid point of the white line between the abutments.

4.5.4 Overpass:

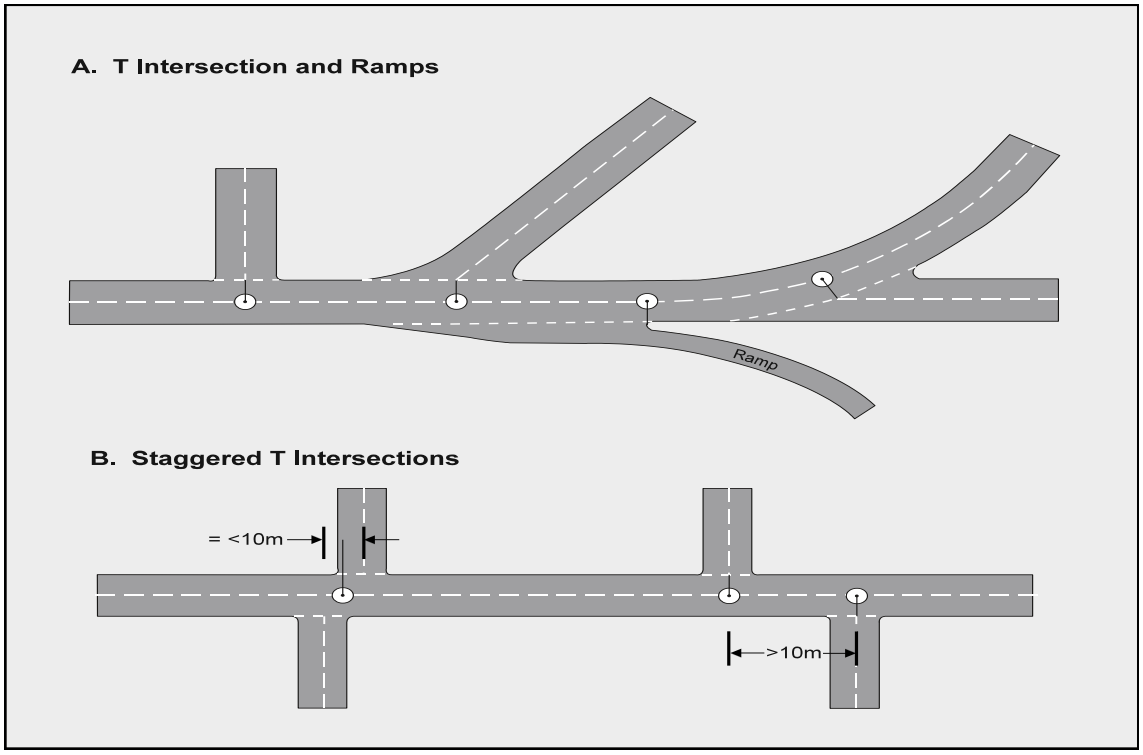


Fig. 9 Feature locations - The circles represent the location on the main road at which the chainage for the side road or ramp is determined.

Where a road or pedestrian crossing structure passes overhead of the main road, the reference point is at the centre of the structure. This can be difficult to estimate, especially where the structure is at a sharp angle to the main road, therefore these items should only be used as a rough check of distance travelled.

4.5.5 Underpass:

Structures under the road which permit stock or pedestrians to pass through also have the reference point at their centre. As with overpasses, the centre point can be difficult to judge from a vehicle.

4.6 Field Definitions for Databases

For point objects (e.g. a signpost or a lane arrow):

FIELD NAME	TYPE	LENGTH	UNITS	Example
ROAD_NO	Character	5	n/a	A0168
LINK_NO	Real	n/a	n/a	22
CHNG	Real	n/a	kms	1.48
CWAY_CODE *	Character	3	n/a	B
LANE_NO *	Character	3	n/a	PD3
OS_DIR_CODE *	Character	1	n/a	L
OS_DIST *	Integer	3	metres	24

For linear items (e.g. a double white line or a speed zone)

FIELD NAME	TYPE	LENGTH	UNITS	Example
ROAD_NO	Character	5	n/a	A0168
START_LINK_NO	Real	n/a	n/a	20
START_CHNG	Real	n/a	kms	1.48
END_LINK_NO	Real	n/a	n/a	22
END_CHNG	Real	n/a	kms	2.45
CWAY_CODE *	Character	3	n/a	B
LANE_NO *	Character	3	n/a	PD3
OS_DIR_CODE *	Character	1	n/a	L
OS_DIST *	Integer	3	metres	24

* these items are optional, depending on the data generalisation, for example, a traffic count section may extend for many links and carriageway codes would not be required. Lane No and Offset are mutually exclusive, the object is either in a lane or offset from the carriageway.

It is advisable to use carriageway codes wherever possible. For example if an audible edge line extended from an “A” carriageway into a “B” carriageway and the CWAY_CODE was not recorded in the database then questions such as: “What is the length of audible edge lines on divided carriageways?” could not be easily answered.

To overcome this the record should be split into two records, one for each of the carriageways.

5. MAPPING

The entire State Road Network was surveyed in 1996 and 1998 using global positioning technology giving a digital road centreline to an absolute accuracy of within 10 meters. This centreline has been attributed with Road Number, Link Number, Carriageway code and from and to chainages. MapInfo users can find the centreline in a layer named **ROADBASE.TAB** that is located in the department's data sharing directory on the department computer network.

Also, the Asset Information Group has developed some software to enable any TRIPS referenced data to be plotted over this centreline. Excel spreadsheets, text files or Access tables can be imported into MapInfo and plotted. This applies to linear data as well as point type data. Records that contain invalid road referencing will be listed and the user given an opportunity to make corrections and replot them. For more details run the MapBasic file dynseg.mbx

6. CONCLUSION

The use of this system by departmental staff for any data that can be related to a section of, or point on the State Classified Road Network will greatly assist in the development of an integrated road information system. In addition, the use of TRIPS referencing will allow data to be represented on thematic maps of the network.

Queries relating to this road referencing system or to the definition of the road network should be directed to the staff in the Asset Information Group.

APPENDIX A

GLOSSARY OF TERMS

Carriageway - this is the physical roadway used by vehicular traffic including sealed or unsealed shoulders. It is the part of the road between guide posts or kerbs. Divided carriageways are separated by well defined medians. A carriageway may have any number of lanes in it, usually two or three. See DIVIDED CARRIAGEWAYS below. Use **CWAY_CODE** as a field name.

Counter Direction (CD) - this is the direction of the road opposite to the PRESCRIBED DIRECTION.

Counter Direction Length - this is the distance covered by travelling the link in the COUNTER DIRECTION. This may be different to the length of the PRESCRIBED DIRECTION if the link contains sections of divided carriageways. This occurs where a “C” (reverse) carriageway is of different length to the corresponding “B” carriageway.

Divided Carriageways - (or DUAL carriageways) these carriageways are physically separated by median strips, New Jersey barriers or other barrier. The part of the dual carriageway which carries traffic in the PRESCRIBED DIRECTION is labelled the “B” carriageway and the carriageway that carries traffic in the COUNTER DIRECTION is labelled the “C” carriageway. The undivided carriageways, which carry traffic in both directions, are labelled “A” carriageways.

Features - features are prominent items of a permanent nature that can be found along a link, some of which are shown on the link maps. Some examples are:

intersections with classified roads
intersections with major connecting roads
intersections with ramps over 30 m length
intersections with roundabouts
changes of carriageway (single to divided or divided to single)
changes to carriageway (no. of lanes)
changes of road names
bridges, overpasses or underpasses
kilometre and mile posts
railway crossings
some named side streets or roads
bridge abutments or deck ends
centres of bridges or structures
signalised pedestrian crossings
post offices
starts and ends of ramps
culverts
in remote areas, any well defined and durable feature (e.g. stock grid or gate).

Feature Numbers - these numbers shown on the Link Maps are the bridge numbers where the feature is a bridge and the road number in case the feature is a road. For mileposts and kilometre posts the code is the text on the post.

Link - a link is a section of road (including all carriageways in it) between two specifically chosen, well-defined FEATURES or landmarks (node points). Links have an average length of 10 kilometres and items of interest along a link are referenced using the distance in kilometres from the start of the link. Links are numbered in ascending order (but are not always consecutive) in the PRESCRIBED DIRECTION of each road. Use **LINK_NO** as a field name.

Link Map - Link Maps are sketches of each LINK in the state classified road network maintained by the Department of Infrastructure Energy and Resources. These maps assist field staff in establishing a location on the road network. Some major FEATURES are shown on the maps along with their distance from the start of each link.

Node Points - when the link map system was first designed the start and end points of each link were assigned a node number. These numbers are not used at present but are shown on the locality page (first page) of the link maps.

OS_DIR_CODE (offset direction) The offset can be LEFT, RIGHT, BOTH, OVERHEAD, or UNDERGROUND. Use the codes **L, R, B, O, U.** The direction is always determined by viewing the road in the prescribed direction, irrespective of traffic direction. Use **OS_DIR_CODE** as a field name.

OS_DIS (offset distance) - this is the distance in metres from the nearest **edge** of the main traffic lanes to the data item. Short (30 metres or less) turning, merging or passing lanes are excluded while longer overtaking lanes would be included when determining the main traffic lanes. Use **OS_DIST** as a field name.

Prescribed Direction (PD) - the prescribed direction of a road is the nominated direction of the road for the purposes of listing TRIPS based data, for stating distances along links and for determining the order of the link numbers. The prescribed direction can be found by referring to the printed link maps.

Prescribed Direction Length - the length of the link when measured while travelling in the prescribed direction via the “A” and or “B” carriageways. May be different to the length when measured along the reverse carriageway (see Counter Direction Length above).

Ramp - a ramp is an off or on-loading roadway, generally at an intersection or grade-separated interchange. These are greater than 30 metres in length while those equal to or smaller than 30m should be treated as turning lanes.

Turning Lane - a short (up to 30m) lane or short feeder to or from a side road.

APPENDIX B

CALIBRATION OF TRIPMETERS

CALIBRATION OF TRIPMETERS OVER LONG BASELINES

INTRODUCTION

Two long baselines have been surveyed/established for the purpose of calibrating measuring devices to a higher accuracy than has been possible in the past. In the Southern Region the baseline is located on the Tasman Highway, Road Number A0113, Link 07. and in the Northern Region on the Bass Highway, Road Number A0249 over Links 03 and 06. Each site has a baseline in the prescribed direction and another in the reverse direction that can be used as a check on the setting used.

As the procedure for calibration of the TripMeters over longer baselines is more complicated than that over a 1 Km line, one method is outlined here.

1. If the Tripmeter has been calibrated previously and has a calibration number set already go to step 2.

   If the calibration has never been set or the number has been lost, use the odometer in the vehicle and drive 1 Km. to derive an initial number as per the TripMeter manual. Set the meter to this initial number as a rough starting point that can be refined by using the long baseline as described below.

2. For the purpose of this calculation call the units of the calibration number **CLICKS**.

3. Make a note of the present calibration setting (say 6260 for example).

4. Go to start of the baseline, set the display on the TripMeter to 0.000 (or 0.00 depending on the model) and measure the baseline.

5. Perform the following calculation:

Correct length of baseline	9.864	as supplied
Distance measured by TripMeter	9.897	
Difference	0.033	

   Then the error over 9.864 Km is 0.033 Km.

   Calculate the error over 1.000 Km:

$$0.033 / 9.864 = 0.0033 \quad \text{(i.e. 3.3 metres)}$$

   Now 1000 m equates to 6260 clicks (as per step 3. above) approximately

   so 3.3 m equates to :

$$6.260 \times 3.3 = 20.7 \text{ clicks}$$

6. Adopt 21 clicks and apply it to the original calibration as follows:

If the Tripmeter measured LONGER than the true length of the baseline ADD the adjustment calculated in 5. to the calibration figure.

If the TripMeter measured SHORTER than the true length of the baseline SUBTRACT the adjustment from the calibration figure.

In the above example the 21 clicks should be added to the original figure of 6260 to give a new calibration figure of 6281.

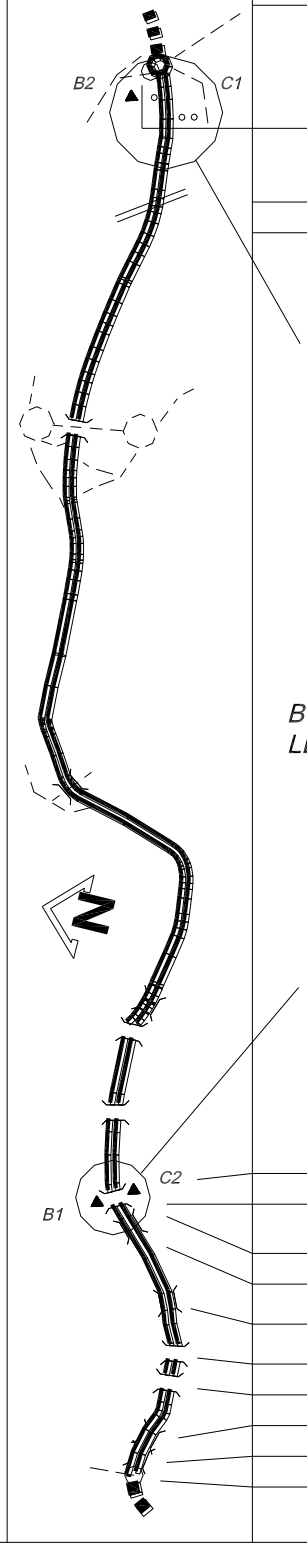
7. Set the new calibration figure into the meter and check by rerunning the baseline or running on another baseline (i.e. on the reverse carriageway).

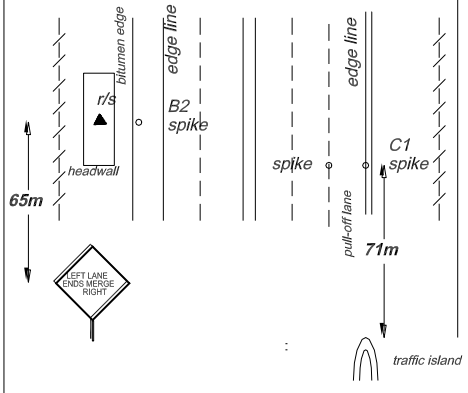
APPENDIX C

LINK MAPS OF BASELINES

TRIPMETER CALIBRATION BASELINE - South

TASMAN HIGHWAY — A0113

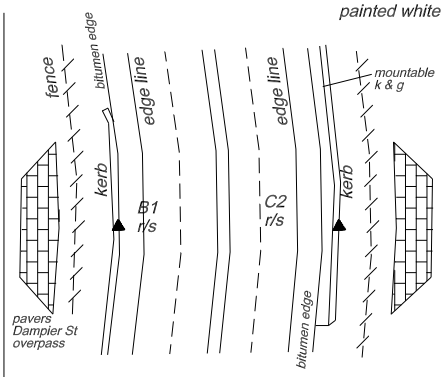




C BASELINE
LENGTH = 9.841km

B BASELINE
LENGTH = 9.864km

All marks are painted white



DESCRIPTION	FEAT. No.	DIST. km.
OFF RAMP TO KENNEDY DRIVE		12.83
(HOLYMAN AVENUE ROUNDABOUT)		
START C CARRIAGEWAY BASELINE	*C1*	*12.47*
END B CARRIAGEWAY BASELINE	*B2*	*12.49*
START B CARRIAGEWAY BASELINE	*B1*	*2.63*
END C CARRIAGEWAY BASELINE	*C2*	*2.63*
DAMPIER STREET OVERPASS	5571	2.63
KANGAROO BAY RIVULET CULVERT	5572	2.51
GORDONS HILL ROAD UNDERPASS	5562	1.67
ROSNY HILL OVERPASS	5594	0.94
PEDESTRIAN OVERPASS	4857	0.64
MONTAGU BAY INTERCHANGE (UPPER)	5037	0.25
MONTAGU BAY INTERCHANGE (LOWER)	5036	0.24
TASMAN BRIDGE - EAST END	5512	0.00

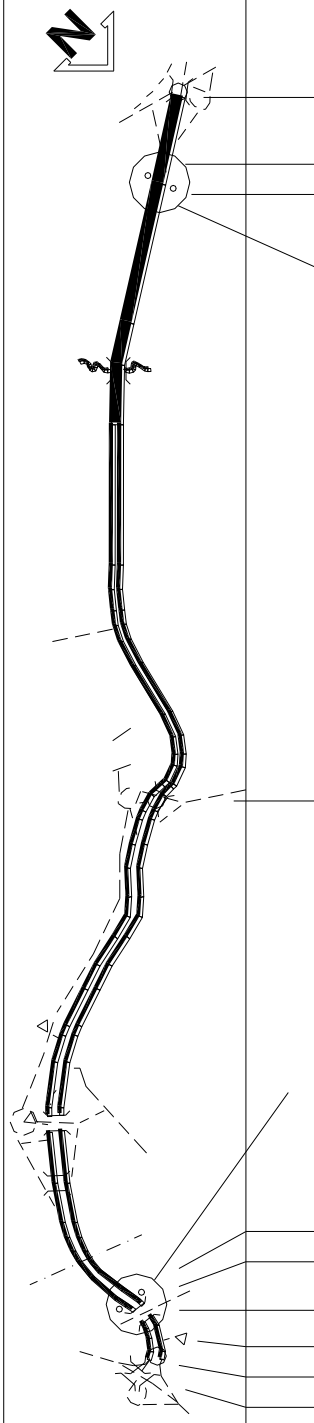
LINK No.
11
07
06

STH REGION
SURVEY 0794
REVISED 1294

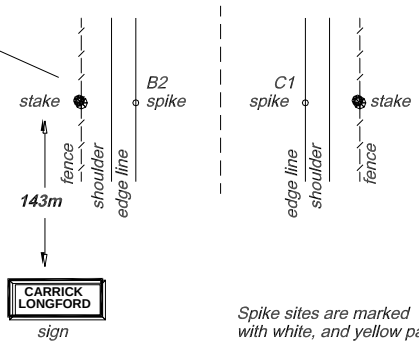
TRIPMETER CALIBRATION BASELINE - North

BASS HIGHWAY — A0249

SCALE 1:50 000

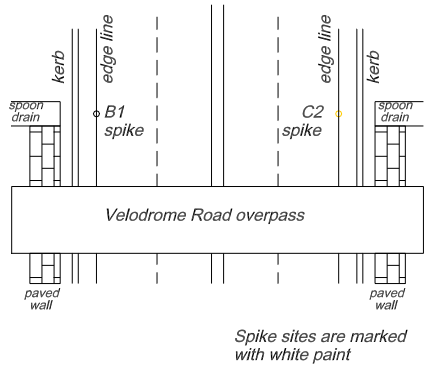


DESCRIPTION	FEAT. No.	DIST. km.	LINK No.
			09 **06** 03
ILLAWARRA MAIN ROAD UNDERPASS	394	6.13	
END WESTBOUND BASELINE	*B2*	*5.29*	NTH REGION
START EASTBOUND BASELINE	*C1*	*5.29*	SURVEY 0694
			REVISED 1294



EACH BASELINE IS EXACTLY 10.00 km LONG

MEANDER VALLEY SR U/PASS	389	0.00	
		4.99	06 **03**



END EASTBOUND BASELINE	*C2*	*0.28*	NTH REGION
START WESTBOUND BASELINE	*B1*	*0.28*	SURVEY 0694
			REVISED 1294
VELODROME ROAD OVERPASS	5731	0.28	
KILOMETRE POST	L5	0.14	
MOUNT PLEASANT INTERCHANGE RESERVE BDY		0.00	
CENTRE OF MIDLAND HIGHWAY OVERPASS	5685	-0.19	