



Tasmania

The LIST
Data Compilation
Specifications for Data Sets
Volume 2 The Road Theme

Draft Version 0.2

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1 Instruction manuals

2 Geography

Department of Primary Industries, Water and Environment

[Disclaimer]

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Acceptance and Release Notice

Version This is Draft Version 0.2 of *The LIST: Data Compilation: Specifications for Data Sets: Volume 2, The Road Theme*.

Document management *The LIST: Data Compilation: Specifications for Data Sets: Volume 2, The Road Theme* is a managed document.
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Amendment and Release Register

BUILD STATUS

This volume is the second of a set of volumes that are under development and that will constitute *The List: Data Compilation: Specifications for Data Sets*.

Version*	Date	Author	Reason	Chapters
Draft 0.2	13 Oct. 99	John Coombes	For demonstration and review.	1–3; Appendixes A, B, C
Draft 0.1	17 Dec. 98	John Coombes	For demonstration and review.	1–3; Appendixes A, B

*List the most recent version first.

AMENDMENTS IN THIS RELEASE

Chapter reference	Amendment summary
Chapters 1, 3	Definitions of <i>Bridge Node</i> and <i>Tunnel Segment</i> qualified.
Chapter 3	Code list TunnlPur changed.
pp 33, 37	Definition of Minimum Width revised.
Appendixes	C. Grade-separated Intersections added

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About this Draft

Release for user-testing

This draft version is released for trial purposes to enable users to test the document for validity and comprehensiveness.

Reporting errors etc.

Users are encouraged to report any errors, obscurity and omissions in the subject matter. Please make your comments and suggestions about this draft version to:

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Editorial notations

The query, i.e. ?, is used before and after text that is known to be uncertain, e.g. the egg ?comes before? the chicken.

A double query with no text, i.e. ??, means that subject matter may be required, e.g. integer(??).

Square brackets, i.e. [], are used to enclose editorial comment that will be deleted from following versions.

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Chapter 1

The Road Theme in General

Introduction

See Volume 1 For background information to this volume, refer to Volume 1 General.

Classification of theme The Road theme is within the sub-topic of Transport which is within the topic of Infrastructure.

Outline of user requirements The Road theme is intended to service the needs of users who:

- simply require the display or mapping of roads or related elements, or
- require a framework for recording detailed information such as road status, type, condition, common transport routes and vehicle locations, or
- may want to extend this framework to accommodate intelligent transport systems (ITS).

Definition of road An open way for the passage of vehicles, persons, or animals on land. (ICSM 1998, ~*Data Dictionary*)

Note:

1. The class of this theme named Road uses a slightly restricted interpretation of this definition.
 2. The Roads theme does not distinguish between public and private ways.
-

The Spatial Classes

Spatial Classes This table lists and defines the spatial classes of the Road theme.

Class Name	Definition
Built Area	An area larger than 0.5ha where 50% or more of the land area has been built upon.
Carriageway	<p>That portion of a road or bridge devoted particularly to the use of vehicles, including shoulders and auxiliary lanes. (AS1348.1)</p> <p><u>Note 1:</u> The function of this class is to enable instances that are referred to chainages on <i>Links</i> to be related to instances that are referred to vector data.</p> <p><u>Note 2:</u> The carriageways of a divided road (see Note 3) are represented separately when they are divided by:</p> <ul style="list-style-type: none"> • a median strip, such as a raised concrete or asphalt strip, or a planted, paved or sown area, or • a barrier such as a batter, wall, fence, kerb or ditch. <p><u>Note 3:</u> A divided road has a separate carriageway for each direction of travel. (AS1348.1)</p>
Road Accident Site	A site at which some form of traffic accident has occurred.
Road Node	<p>A point that represents one or more of the following:</p> <ul style="list-style-type: none"> • the end of a road; • a junction of two or more <i>Road Segments</i>; • a grade-separated intersection; • a place where the value of an attribute changes; • a small roundabout. • a permanent <i>Barrier</i>; • a <i>Bridge</i> or <i>Tunnel</i>, the length of which is less than: <ul style="list-style-type: none"> • 25 m in rural areas, or • 5 m in urban areas.
Road Segment	<p>A portion of a <i>Road</i>:</p> <ul style="list-style-type: none"> • between two <i>Road Nodes</i>, or • that starts and finishes at the same <i>Road Node</i>, and whose length is more than 25 m in rural areas or 5 m in urban areas.

The Aspatial Classes

Aspatial classes This table lists and defines the aspatial classes of the Road theme.

Class Name	Definition
Bridge	A structure erected over a depression or obstacle to carry traffic or some facility such as a pipeline. (ICSM 1998)
Bridge Node	A <i>Road Node</i> that represents all or a part of the span of a <i>Bridge</i> .
Bridge Segment	A <i>Road Segment</i> that represents all or a part of a <i>Bridge</i> .
Illegal Movements	An illegal vehicle movement at a junction or intersection that is represented by a <i>Road Node</i> . NB This class includes turns that are physically impossible as well as illegal.
Link	A section of a <i>Road</i> consisting of one or more <i>Carriageways</i> to which linear information can be related. <u>Note:</u> Link is a concept adopted from the Tasmanian road authority's system for recording road details by reference to running chainages. In this system, a road is divided at prominent features into stages called links. Links average about ten kilometres in length, depending on the density of detail.
Road	An open way for the passage of motor vehicles on land, which persons or animals might be permitted to share. NB The class may include any vehicular road or track whether: <ul style="list-style-type: none"> • publicly or privately owned; • publicly or privately maintained.
Road Barrier	An occasional obstruction to traffic on a <i>Road</i> .
Route	A sequence of <i>Road Segments</i> between nominated terminals that is regularly used for a particular purpose.

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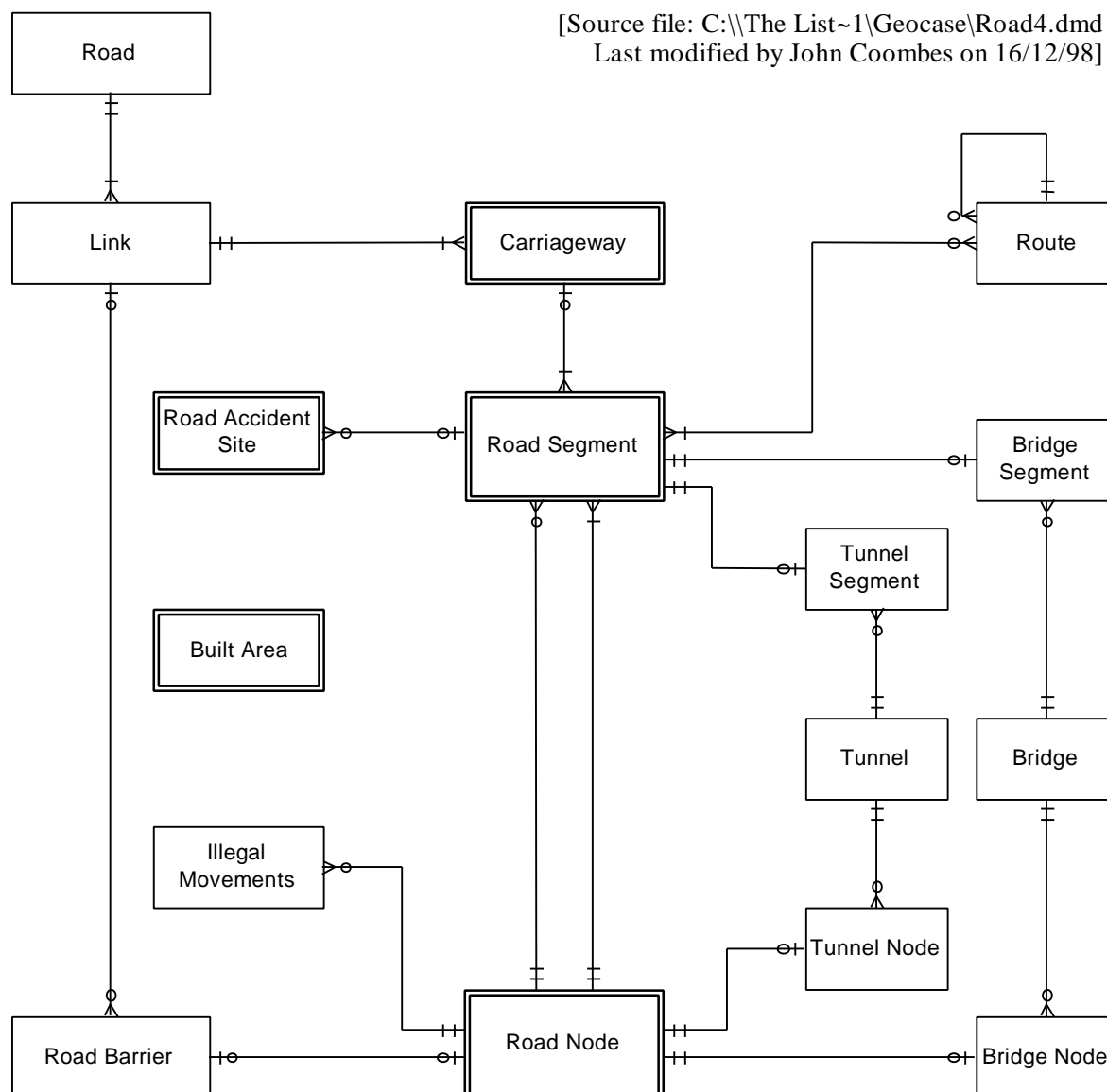
The Aspatial Classes, Continued

Class Name	Definition
Tunnel	(1) An underground or underwater passage (ICSM 1998); or (2) An overhead structure that restricts the clearance and width of a <i>Road</i> . Examples of (2) are: bridge, gantry, cableway.
Tunnel Node	A <i>Road Node</i> that represents all or a part of a <i>Tunnel</i> .
Tunnel Segment	A <i>Road Segment</i> that represents all or a part of a <i>Tunnel</i> that is an underground or underwater passage.

Class Relationships within the Theme

Model of relationships

This diagram represents a model of the Roads theme. It shows how the classes of road data relate to one another.



Note:

1. Classes in a double border are spatial.
2. Refer to 'Relationships between Classes' in Chapter 2 of Volume 1 for an explanation of the various symbols used in this diagram to depict the relationships between the classes.

Specification for Spatial Class: Built Area, Continued

Attributes

Built Area Type	bltarea_ty	varchar(2)	M
------------------------	------------	------------	---

DEFINITION: The main usage.

DOMAIN: The code list *BlType* as follows:

Code	Value	Meaning
R	residential	residential
C	commercial	commercial

Computed Area	comp_area	numeric(11,1)	M
----------------------	-----------	---------------	---

DEFINITION: The computed area in square metres.

DOMAIN: The entire range.

EXAMPLE: 7358.620

Specification for Spatial Class: Carriageway

Class details

DATABASE CODENAME: Carriage SPATIAL OBJECT: Chain
 DEFINITION: That portion of a road or bridge devoted particularly to the use of vehicles, including shoulders and auxiliary lanes. (AS1348.1)

Note 1: The function of this class is to enable instances that are referred to chainages on *Links* to be related to instances that are referred to vector data.

Note 2: The carriageways of a divided road (see Note 3) are represented separately when they are divided by:

- a median strip, such as a raised concrete or asphalt strip, or a planted, paved or sown area, or
- a barrier such as a batter, wall, fence, kerb or ditch.

Note 3: A divided road has a separate carriageway for each direction of travel. (AS1348.1)

INCLUDED TERMS:

OTHER DETAILS: The related class, *Road Segment*, must lie along this class. Thus the relationship has more than one relational type.

Relationships

This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Link	Many to one	mandatory	--	--
Road Segment	One to many	optional	1-1	1100 0101 1101

Key to header

The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

*Degree of necessity: M = mandatory, C = conditional, O = optional..

Continued on next page

Specification for Spatial Class: **Carriageway**, Continued

The identifier The identifier for this class has three parts as follows:

Carriageway Number	carrig_no	smallint	M
---------------------------	-----------	----------	---

DEFINITION: The number of a *Carriageway*.

DOMAIN: A series generated by the LIST for the *Link* that the *Carriageway* belongs to

EXAMPLE: 56

Link Number	link_no	varchar(10)	M
--------------------	---------	-------------	---

DEFINITION: The *Link Number* for the *Link* of which a *Carriageway* is part.

DOMAIN: The set of *Link Numbers* used by the class *Link*.

EXAMPLE: 35 The *Road Number* of the *Road*

Road Number	road_no	varchar(10)	M
--------------------	---------	-------------	---

DEFINITION: The identifier of a *Road* that is listed in the state transport authority's Road Code Inventory and of which a *Carriageway* is part.

DOMAIN: The set of *Road Numbers* used by the class *Road*.

EXAMPLE: A4317

Attributes

Carriageway Type	carrig_ty	varchar(1)	M
-------------------------	-----------	------------	---

DEFINITION: The type of carriageway based on the state transport authority's Tasmanian Road Information Positioning System.

DOMAIN: The code list named *CarrigTy* as follows:

Code	Value	Meaning
A	Both directions	Traffic flows in both directions.
B	Chainage direction	Traffic flows in the direction of the chainage.
C	Reverse chainage direction	Traffic flows against the direction of the chainage.
R	Ramp	A ramp.

Continued on next page

Specification for Spatial Class: **Carriageway**, Continued

Attributes (continued)

Nomenclature Register Number	nom_reg_no	varchar(7)	
-------------------------------------	------------	------------	--

DEFINITION: The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.

DOMAIN: The set of identifiers used in the Nomenclature Register for all features definable as a *Carriageway*, consisting of a number in the range 1–999999 followed by a letter in the set: A–H,J,K,M,N,P–Z.

EXAMPLE: 54321H

Start Link Chainage	start_chg	numeric(4,2)	M
----------------------------	-----------	--------------	---

DEFINITION: The chainage on a *Link* at the start of a *Carriageway*, in kilometres.

DOMAIN: The range from 0 to the length of the link.

EXAMPLE: 18.43

End Link Chainage	end_chg	numeric(4,2)	M
--------------------------	---------	--------------	---

DEFINITION: The chainage on a *Link* at the end of a *Carriageway*, in kilometres.

DOMAIN: The range from 0 to the length of the link.

EXAMPLE: 18.87

Computed Length	comp_len	numeric(6,1)	M
------------------------	----------	--------------	---

DEFINITION: The computed length of the feature instance, in metres.

DOMAIN: The range from 0 to the length of the link.

EXAMPLE: 583.4

Specification for Spatial Class: Road Accident Site

Class details DATABASE CODENAME: Road_Acc SPATIAL OBJECT: Point
 DEFINITION: A site at which some form of traffic accident has occurred.
 INCLUDED TERMS:
 OTHER DETAILS:

Relationships This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Road Segment	Many to one	optional	0-1	0000 1000 0010

Key to header The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

*Degree of necessity: M = mandatory, C = conditional, O = optional.

The identifier

Accident Site ID	accsite_id	varchar(10)	M
------------------	------------	-------------	---

DEFINITION: The identifier of a *Road Accident Site*.

DOMAIN: The entire series.

EXAMPLE: 28402

Specification for Spatial Class: Road Node

Class details

DATABASE CODENAME: RoadNode SPATIAL OBJECT: Point

DEFINITION: A point that represents one or more of the following:

- the end of a road;
- a junction of two or more *Road Segments*;
- a grade-separated intersection;
- a place where the value of an attribute changes;
- a small roundabout.
- a permanent *Barrier*;
- a *Bridge* or *Tunnel*, the length of which is less than:
 - 25 m in rural areas, or
 - 5 m in urban areas.

INCLUDED TERMS:

OTHER DETAILS:

Relationships

This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Illegal Movement	One to many	optional	--	--
Bridge Node	One to one	optional	--	--
Road Segment	One to many	mandatory	0-1	1000

Key to header

The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

*Degree of necessity: M = mandatory, C = conditional, O = optional.

The identifier

Road Node ID	rdnd_id	integer(10)	M
--------------	---------	-------------	---

DEFINITION: The identifier of a *Road Node*.

DOMAIN: The entire series

EXAMPLE: 1234567890

Continued on next page

Specification for Spatial Class: Road Node, Continued

Attributes

Road Node Feature	rdnd_feat	smallint(6)	M
DEFINITION:	The type of feature represented by a <i>Road Node</i> .		
DOMAIN:	The code list named <i>RdNdFeat</i> as follows:		
	Code	Value	Meaning
	-1	Unknown	No data is available.
	0	Normal node	A node that is not associated with any particular feature
	1	Road end	The end of a <i>Road Segment</i> .
	2	--	--
	3	Small roundabout	A small roundabout depicted as a single point.
	4	Large roundabout	The centre of a large roundabout.
	5	Mountable roundabout	A small roundabout which a vehicle can drive over if required.
	6	Bridge	<i>A Bridge</i> .
	7	Tunnel	<i>A Tunnel</i> .
	8	Barrier	<i>A Road Barrier</i> .
	9	Bridge & tunnel	A point where a <i>Bridge</i> and <i>Tunnel</i> coincide, i.e. where two <i>Roads</i> cross at different levels.
	10	Bridge & barrier	A point where a <i>Bridge</i> and a <i>Road Barrier</i> coincide.
	11	Tunnel & barrier	A point where a <i>Tunnel</i> and a <i>Road Barrier</i> coincide.
	12	Bridge & tunnel & barrier	A point where a <i>Bridge</i> , a <i>Tunnel</i> and a <i>Road Barrier</i> coincide.

Continued on next page

Specification for Spatial Class: Road Node, Continued

Attributes (continued)

Nomenclature Register Number	nom_reg_no	varchar(7)	
-------------------------------------	------------	------------	--

DEFINITION: The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.

DOMAIN: The set of identifiers used in the Nomenclature Register, consisting of a number in the range 1–999999 followed by a letter in the set: A–H,J,K,M,N,P–Z.

EXAMPLE: 54321H.

Junction Movements	junc_move	char(1)	
---------------------------	-----------	---------	--

DEFINITION: A broad classification of the legal movements at a *Road Node*.

DOMAIN: The code list named *JuncMove* as follows:

Code	Value	Meaning
A	All movements	All movements are legal.
S	Some movements illegal	Some movements are illegal. (Refer to <i>Illegal Movements</i> class.)
U	Unknown	Data is incomplete.

Specification for Spatial Class: Road Segment

Class details

DATABASE CODENAME:	Road_Seg	SPATIAL OBJECT:	Chain
DEFINITION:	A portion of a <i>Road</i> : <ul style="list-style-type: none"> • between two <i>Road Nodes</i>, or • that starts and finishes at the same <i>Road Node</i>, and whose length is more than 25 m in rural areas or 5 m in urban areas. 		
INCLUDED TERMS:			
OTHER DETAILS:	In this theme, the term 'segment' is synonymous with 'a feature or part of a feature represented as a one-dimensional spatial object'.		

Relationships

This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Road Node (1)	Many to one	mandatory	0-1	1000
Road Node (2)	Many to one	mandatory	0-1	1000
Bridge Segment	One to one	optional	--	--
Tunnel Segment	One to one	optional	--	--
Route	Many to many	optional	--	--
Road Accident Site	One to many	optional	0-1	0000 1000 0010
Carriageway	Many to one	mandatory	1-1	0110 1100 1110

Key to header

The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

*Degree of necessity: M = mandatory, C = conditional, O = optional.

Continued on next page

Specification for Spatial Class: Road Segment, Continued

The identifier

Road Segment ID	roadseg_id	integer(10)	M
------------------------	------------	-------------	---

DEFINITION: The identifier of a *Road Segment*.

DOMAIN: The entire series.

EXAMPLE: 1234567890

Attributes

Road Segment Feature	rdsg_feat	smallint	M
-----------------------------	-----------	----------	---

DEFINITION: The type of feature represented by a *Road Segment*.

DOMAIN: The code list named *RdSgFeat* as follows:

Code	Value	Meaning
-1	Unknown	No data is available.
0	Normal road segment	No particular type of feature.
1	Bridge	<i>A Bridge.</i>
2	Tunnel	<i>A Tunnel.</i>
3	Road connector	A road connector. (This is a pseudo-feature; for an explanation, see Volume 1.)
4	Ferry Route	A route across a river, lake or sea used by a vessel for the regular transport of vehicles or passengers from one terminal point or another. (ICSM 1998)

Traffic Direction	traff_dir	smallint	
--------------------------	-----------	----------	--

DEFINITION: Whether or not traffic may travel in both directions.

DOMAIN: The code list named *TraffDir* as follows:

Code	Value	Meaning
-1	Unknown	No data is available.
0	Both	Traffic may travel in both directions simultaneously.
1	One	Traffic may travel in only one direction.
2	Alternating	Opposing traffic must alternate.

Continued on next page

Specification for Spatial Class: Road Segment, Continued

Attributes (continued)

Road Class	rd_class	smallint	M
DEFINITION:	A general classification for roads developed from a variety of local classifications.		
DOMAIN:	The code list named <i>RdClass</i> as follows:		
	Code	Value	Meaning
	-1	Unknown	No data is available.
	1	National/state highway	An all-weather, formed road connecting major regions or significant towns.
	2	Major arterial road	An all-weather, formed road connecting national and/or state highways.
	3	Arterial road	A road providing access to local communities or a high-volume residential road.
	4	Access road	A road providing access to properties, either suburban or rural.
	5	Single-lane access road	A generally all-weather road of reduced width capable of carrying heavy vehicles.
	6	2WD track	An unformed road trafficable most of the time.
	7	4WD track	An unformed road trafficable generally by four-wheel-drive vehicles.
	8	2-wheel track	An unformed road trafficable by motorcycles or bicycles.
	9	Unclassified	A road that has not been classified.
	10	Proposed	A proposed road.
	11	Under construction	A road under construction.

Continued on next page

Specification for Spatial Class: Road Segment, Continued

Attributes (continued)

User Type	user_type	smallint	
DEFINITION:	Category of users of the feature. (ICSM 1998)		
DOMAIN:	The code list named <i>UserType</i> as follows:		
	Code	Value	Meaning
	-1	Unknown	No data is available.
	0	Public	The road is open to the public.
	1	Authorised	The road is restricted to authorised users.
Tourist Route Class	tour_class	varchar(4)	
DEFINITION:	The class and number under the tourist route classification managed by the State's transport authority.		
DOMAIN:	Prefix: the range A–C; suffix: the range 1–999.		
EXAMPLE:	A9, B24, C32		
Nomenclature Register No	nom_reg_no	varchar(7)	O
DEFINITION:	The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.		
DOMAIN:	The set of identifiers used in the Nomenclature Register, consisting of a number in the range 1–999999 followed by a letter in the set: A–H,J,K,M,N,P–Z.		
EXAMPLE:	54321H		
Computed Length	comp_len	numeric(6,1)	M
DEFINITION:	The computed length of the feature instance, in metres.		
DOMAIN:	The range 5.0–99999.9		
EXAMPLE:	423.6		

Chapter 3

Aspatial Classes

Specification for Class: Bridge

Class details

DATABASE CODENAME: Bridge SPATIAL OBJECT: --
 DEFINITION: A structure erected over a depression or obstacle to carry traffic or some facility such as a pipeline. (ICSM 1998)
 INCLUDED TERMS:
 OTHER DETAILS:

Relationships

This table specifies the relationship of this class to other classes (B).

Related class (B)	Degree	Relationship to B is...	Dimensional pair	Relational type
Bridge Node	One to many	optional*	--	--
Bridge Segment	One to many	optional*		

*A *Bridge* must relate to at least one *Road Node* or *Road Segment*.

Key to header

The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

***Degree of necessity:** M = mandatory, C = conditional, O = optional.

The identifier

Bridge ID	bridge_id	integer(10)	M
-----------	-----------	-------------	---

DEFINITION: The identifier, unique to the LIST, of a *Bridge*.
 DOMAIN: The entire series
 EXAMPLE: 1234567890

Attributes

Load Limit	load_limit	smallint	
------------	------------	----------	--

DEFINITION: The constructed load limit, in tonnes.
 DOMAIN: The range...to...?
 EXAMPLE: 50

Continued on next page

Specification for Class: **Bridge**, Continued

Attributes, continued

Width	width	numeric(3,1)	
--------------	-------	--------------	--

DEFINITION: The maximum horizontal measurement: either taken at right angles to the length, or of the extent from side to side; breadth; (ICSM 1998). (For a road bridge, the minimum measurement across the formation, in metres).

DOMAIN: The range...to...?

EXAMPLE: 6.3

Length	meas_len	numeric(4,1)	
---------------	----------	--------------	--

DEFINITION: The length in metres.

DOMAIN: The range 25 to 999.9 (rural areas) or 5 to 999.9 (urban areas).

EXAMPLE: 56.3

Nomenclature Register Number	nom_reg_no	varchar(7)	
-------------------------------------	------------	------------	--

DEFINITION: The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.

DOMAIN: The set of identifiers in the Nomenclature Register for all features definable as a *Bridge*.

EXAMPLE: 54321H

Clearance	clearance	numeric(2,1)	
------------------	-----------	--------------	--

DEFINITION: The vertical distance from a (road) surface to the nearest overhead obstruction, in metres. (ICSM 1998)

DOMAIN: The range...to...?

EXAMPLE: 12.9

Bridge Purpose	bridge_pur	smallint	M
-----------------------	------------	----------	---

DEFINITION: The primary purpose of a *Bridge*.

DOMAIN: The code list named *BrdgPur*

Code	Value	Meaning
-1	Unknown	No data is available.
1	Road	The bridge carries a road.
2	Railway	The bridge carries a railway.
3	Water	The bridge is an aqueduct.
4	Disused	The bridge is disused.

Specification for Class: **Bridge Node**, Continued

Attributes, continued

Road Segment 2	rdseg_id2	integer(10)	M
-----------------------	-----------	-------------	---

DEFINITION: The identifier of the second of two *Road Segments* that join to a *Bridge Node*.

DOMAIN: The identifiers of all *Road Segments* that join to a *Bridge Node*.

EXAMPLE: 1234567890

Specification for Class: **Link**, Continued

Attributes

Link Number	link_no	varchar(10)	M
--------------------	---------	-------------	---

DEFINITION: The identifier of a *Link* within a *Road* in the records of the State's transport authority.

DOMAIN: The set of *Link Numbers* used by the *Road* to which a *Link* belongs.

EXAMPLE: 63, 63.5.

Chainage Length	ch_length	numeric(5,2)	M
------------------------	-----------	--------------	---

DEFINITION: The length of a *Link* computed from chainage data, in kilometres.

DOMAIN: The entire range.

EXAMPLE: 123.45

Specification for Class: Road Barrier

Class details DATABASE CODENAME: Road_Bar SPATIAL OBJECT: --
 DEFINITION: An occasional obstruction to traffic on a *Road*.
 INCLUDED TERMS:
 OTHER DETAILS:

Relationships This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Link	Many to one	optional*	--	--
Road Node	One to one	optional*	--	--

* An instance of *Road Barrier* must be related either to a chainage on a *Link* or to a *Road Node*. To select the correct relationship, follow this procedure:

Step	Question	Action
1	Does a <i>Road Node</i> exist?	YES: Go to step 3. NO: Go to step 2.
2	Does a <i>Link</i> exist?	YES: Populate <i>Road Number</i> , <i>Link Number</i> and <i>Chainage</i> . NO: Create a <i>Road Node</i> and go to step 3.
3	--	Populate <i>Road Node ID</i> .

Key to header The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

***Degree of necessity:** M = mandatory, C = conditional, O = optional.

The identifier

Road Barrier ID	rd_bar_id	integer(10)	M
-----------------	-----------	-------------	---

DEFINITION: The identifier of a *Road Barrier*.

DOMAIN: The entire series

EXAMPLE: 1234567890

Continued on next page

Specification for Class: Road Barrier, Continued

Attributes

Minimum Width	min_width	numeric(3,1)	
----------------------	-----------	--------------	--

DEFINITION: The width of a feature at its narrowest point, in metres.
(For this class, it refers to the road formation rather than the sides of the feature.)

DOMAIN: The entire range

EXAMPLE: 13.8

Clearance	clearance	numeric(3,1)	
------------------	-----------	--------------	--

DEFINITION: The vertical distance from a (road) surface to the nearest overhead obstruction, in metres. (ICSM 1998)

DOMAIN: The range...to...?

EXAMPLE: 17.5

Road Barrier Type	rd_bar_ty	smallint	M
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DEFINITION: The type of *Road Barrier*.

DOMAIN: The code list named *BarType* as follows.

Code	Value	Meaning
-1	Unknown	No data is available.
1	Gate	A structure that can be swung horizontally across a road.
2	Boom gate	A structure that can be swung vertically across a road.
3	Signalled level crossing	A railway level crossing controlled by signals.
4	Non-signalled level crossing	A railway level crossing not controlled by signals.
5	Ford	A shallow or flat portion of the bed of a watercourse where a crossing may be effected. (ICSM 1998)
6	Traffic lights present	Road signals that beam a red or green light or an amber warning light to direct traffic to stop or proceed. (ICSM 1998)
7	Non-signalled pedestrian crossing	A pedestrian crossing not controlled by signals.
8	Alternating traffic flow	A point, not being another type of <i>Road Barrier</i> , where the road is too narrow for opposing traffic to pass

Continued on next page

Specification for Class: Road Barrier, Continued

Attributes, continued

Nomenclature Register Number	nom_reg_no	varchar(7)	
-------------------------------------	------------	------------	--

DEFINITION: The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.

DOMAIN: The set of identifiers used in the Nomenclature Register, consisting of a number in the range 1–999999 followed by a letter in the set: A–H,J,K,M,N,P–Z.

EXAMPLE: 54321H

EITHER

Road Number	road_no	varchar(10)	C
--------------------	---------	-------------	---

DEFINITION: The identifier of a *Road* that is listed in the state transport authority's Road Code Inventory.

CONDITION Does a *Road Node* not exist?

DOMAIN: The set of identifiers used in the Road Code Inventory, consisting of a letter in the set A, C–H, J–N, P–X, Z followed by a number in the range 0001–9999.

EXAMPLE: A1046

and

Link Number	link_no	varchar(10)	C
--------------------	---------	-------------	---

DEFINITION: The *Link Number* of the *Link* in which a *Barrier* is situated.

CONDITION Does a *Road Node* not exist?

DOMAIN: The set of *Link Numbers* used by the class *Link*.

EXAMPLE: 35

and

Chainage	chainage	numeric(4,2)	C
-----------------	----------	--------------	---

DEFINITION: The chainage of a *Barrier* on the *Link* in which it is situated, in kilometres.

CONDITION Does a *Road Node* not exist?

DOMAIN: The range from 0 to the length of the *Link*.

EXAMPLE: 52.73

OR

Road Node ID	rdnd_id	integer(10)	C
---------------------	---------	-------------	---

DEFINITION: The identifier of a *Road Node* that represents a *Road Barrier*.

CONDITION Does *Road Node* exist?

DOMAIN: All values of *Road Node ID*.

EXAMPLE: 1234567890

Specification for Class: Route

Class details

DATABASE CODENAME: Route SPATIAL OBJECT: --
 DEFINITION: A sequence of *Road Segments* between nominated terminals that is regularly used for the passage of vehicles.
 INCLUDED TERMS:
 OTHER DETAILS: This class is not functional yet and its specifications are still being developed. The following specifications are provided only to illustrate their current state of development. Potential users of this class who have suggestions concerning its development are invited to contact the LIST's data administrators

Relationships

This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Road Segment	Many to many	mandatory	--	--

Key to header

The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	*
------------------------------	------------	--------	---

*Degree of necessity: M = mandatory, C = conditional, O = optional.

The identifier

Route ID	route_id	integer(10)	M
----------	----------	-------------	---

DEFINITION: The identifier for a *Route*.

DOMAIN: The entire series.

EXAMPLE: 1234567890

Attributes

Route Purpose	route_pur	smallint	M
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DEFINITION: The purpose for a particular *Route*.

DOMAIN: The code list named *RoutePur*, as follows:

Code	Value	Meaning
-1	Unknown	No data is available.
1	Tourist	Tourist route
2	Metro bus	Metro bus route
3	Tiger Line bus	Tiger Line bus route

Continued on next page

Specification for Class: **Route**, Continued

Attributes (continued)

Route Level	route_lev	smallint	M
--------------------	-----------	----------	---

DEFINITION: Whether a *Route* is a part of another *Route*.

DOMAIN: The code list named *RouteLev* as follows:

Code	Value	Meaning
0	Is not part	The <i>Route</i> is not part of another <i>Route</i> .
1	Is part	The <i>Route</i> is part of another <i>Route</i> .

Parent Route ID	parrou_id	integer(11)	
------------------------	-----------	-------------	--

DEFINITION: The identifier of the parent *Route*.

DOMAIN: The identifiers of all *Routes* whose *Route Level* is 0.

EXAMPLE: 12345678901

Specification for Class: Tunnel, Continued

Attributes, continued

Length	meas_len	numeric(4,1)	
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DEFINITION: The length in metres. (Either the length of a passage or the secant width of an overhead structure.)

DOMAIN: The range 25 to 999.9 (rural areas) or 5 to 999.9 (urban areas).

EXAMPLE: 234.6

Nomenclature Register Number	nom_reg_no	varchar(7)	
-------------------------------------	------------	------------	--

DEFINITION: The unique identifier in the State's Nomenclature Register for a named feature represented by an instance.

DOMAIN: The set of identifiers used in the Nomenclature Register for all features definable as a *Tunnel*, consisting of a number in the range 1–999999 followed by a letter in the set: A–H,J,K,M,N,P–Z.

EXAMPLE: 54321H

Clearance	clearance	numeric(2,1)	
------------------	-----------	--------------	--

DEFINITION: The vertical distance from a (road) surface to the nearest overhead obstruction, in metres. (ICSM 1998)

DOMAIN: The range...to...?

EXAMPLE: 17.5

Tunnel Type	tunnel_ty	smallint	M
--------------------	-----------	----------	---

DEFINITION: The structure and form of a *Tunnel*.

DOMAIN: The code list named *TunnelTy*

Code	Value	Meaning
-1	Unknown	No data is available.
1	Circular	A <i>Tunnel</i> with a circular profile.
2	Box	A <i>Tunnel</i> with a rectangular profile.
3	Gantry	A supporting framework, that spans a road.
4	Overhead Line	Some form of overhead line for power or other purpose.

Continued on next page

Specification for Class: Tunnel, Continued

Attributes, continued

Tunnel Purpose	tunnel_pur	smallint	M
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DEFINITION: The primary purpose of an underground or underwater tunnel.

DOMAIN: The code list named *TnnlPur*

Code	Value	Meaning
-1	Unknown	No data is available.
1	Road	The tunnel takes a road.
2	Railway	The tunnel takes a railway.
3		
4	Disused	The tunnel is disused.

Specification for Class: Tunnel Node, Continued

Attributes

Tunnel ID	tunnel_id	integer(10)	M
------------------	-----------	-------------	---

DEFINITION: The identifier, unique to the LIST, of a *Tunnel*.

DOMAIN: All values of *Tunnel ID*.

EXAMPLE: 1234567890

Road Segment 1	rdseg_id1	integer	M
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DEFINITION: The identifier of the first of two *Road Segments* that join to a *Tunnel Node*.

DOMAIN: The identifiers of all *Road Segments* that join to a *Tunnel Node*.

EXAMPLE: 1234567890

Road Segment 2	rdseg_id2	integer	M
-----------------------	-----------	---------	---

DEFINITION: The identifier of the second of two *Road Segments* that join to a *Tunnel Node*.

DOMAIN: The identifiers of all *Road Segments* that join to a *Tunnel Node*.

EXAMPLE: 1234567890

Specification for Class: Tunnel Segment

Class details DATABASE CODENAME: Tnnl_Seg SPATIAL OBJECT: --
 DEFINITION: *A Road Segment that represents all or a part of a Tunnel that is an underground or underwater passage.*
 INCLUDED TERMS:
 OTHER DETAILS:

Relationships This table specifies the relationship of this class (A) to other classes (B).

Class B	Degree of A to B	Relationship to B is...	Dimensional pair	Relational type
Road Segment	One to one	mandatory	--	--
Tunnel	Many to one	mandatory	--	--

Key to header The key to the header for the identifier and attributes is:

Name of identifier/attribute	Field name	Format	M
------------------------------	------------	--------	---

***Degree of necessity:** M = mandatory, C = conditional, O = optional.

The identifier

Road Segment ID	roadseg_id	integer	M
-----------------	------------	---------	---

DEFINITION: The identifier of a *Road Segment*.

DOMAIN: The identifiers of all *Road Segments* that represent a *Tunnel*.

EXAMPLE: 1234567890

Attributes

Tunnel ID	tunnel_id	integer	M
-----------	-----------	---------	---

DEFINITION: The identifier, unique to the LIST, of a *Tunnel*.

DOMAIN: All values of *Tunnel ID*.

EXAMPLE: 123

Appendixes

A. Road Engineering Definitions

Source The following list of terms and definitions is derived from AS1348.1—1986 *Road and Traffic Engineering—Glossary of Terms, Part 1*. It includes some terms that are given different meanings within these specifications. They are listed here to raise awareness of their usage and particular meanings within the national road and traffic engineering industry.

Term	Definition
Auxiliary lane	A portion of the carriageway adjoining through traffic lanes, used for speed change or for other purposes supplementary to through traffic movement.
Carriageway	That portion of a road or bridge devoted particularly to the use of vehicles, including shoulders and auxiliary lanes.
Divided road	A road having a separate carriageway for each direction of travel. (Synonyms: divided highway, dual carriageway)
Interchange	A grade separation of two or more roads with one or more connecting carriageways.
Interchange ramp	A carriageway within an interchange connecting two of the intersecting roads.
Intersection	A place at which two or more roads cross at grade or with grade separation.
Junction	A place where two or more roads meet.
Road	A route trafficable by motor vehicles; in law, the public right-of-way between the boundaries of adjoining property.
Slip lane	A lane provided for left-turning vehicles allowing them to avoid stopping at an intersection.
Slip road	A carriageway ... between adjacent carriageways having the same direction of travel.
Turning lane	A lane reserved for turning. A storage and/or speed-change lane reserved for turning traffic.
Turning roadway	A carriageway, usually one-way, for turning vehicles at an intersection or interchange.

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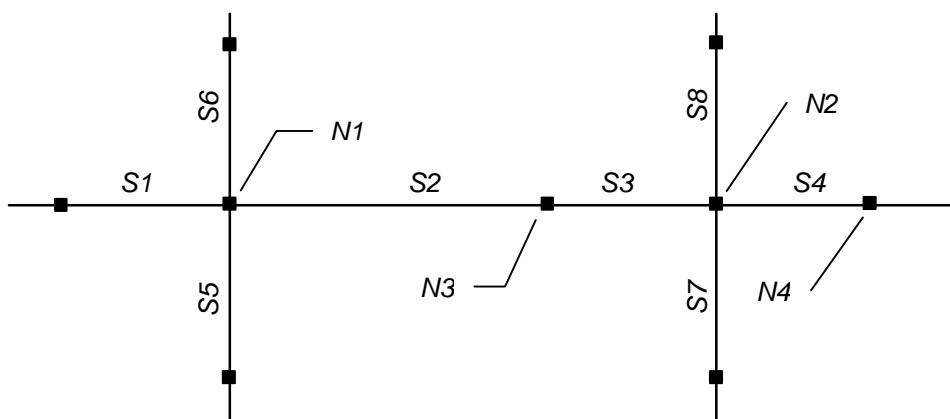
ICSM Topographic Data Dictionary 1998.

C. Grade-separated Intersections

Representation A grade-separated intersection is represented as a *Road Node*. It is a type of feature classified as a bridge and tunnel. Because a grade-separated intersection is a form of overhead structure, the associated *Tunnel* must always be represented as a *Tunnel Node*, not as a *Tunnel Segment*.

Examples Two grade-separated intersections are shown in the following diagram, in which:

- N1, N2 are *Road Nodes* representing the intersections. They are each a *Bridge Node* and a *Tunnel Node*.
- S1–S8 are *Road Segments*.
- N3, N4 are *Road Nodes* at the ends of a bridge represented by *Road Segments* S3, S4
- The road containing S5, S6 passes over the road containing S1–S4.
- The road containing S7, S8 passes under the road containing S1–S4.



Continued on next page

C. Grade-separated Intersections, Continued

Recording the nodes

N1 and N2 are recorded as *Road Nodes*, *Bridge Nodes* and *Tunnel Nodes* as follows

Class: Road Node

Road Node ID	Road Node Feature
N1	Bridge and Tunnel
N2	Bridge and Tunnel

Class: Bridge Node

Road Node ID	Bridge ID	Road Segment 1	Road Segment 2
N1	B21	S5	S6
N2	B17	S3	S4

Notes:

1. *Bridge ID* is a key that relates a *Bridge Node*, and therefore a *Road Node*, to a *Bridge*.
2. *Road Segment 1* and *Road Segment 2* are portions of the road that uses the *Bridge*.

Class: Tunnel Node

Road Node ID	Tunnel ID	Road Segment 1	Road Segment 2
N1	T65	S1	S2
N2	T89	S7	S8

Notes:

1. *Tunnel ID* is a key that relates a *Tunnel Node*, and therefore a *Road Node*, to a *Tunnel*.
2. *Road Segment 1* and *Road Segment 2* are portions of the road that uses the *Tunnel*.

Bridge Segments

As well as recording *Road Nodes* N1 and N2 as *Bridge Nodes* and *Tunnel Nodes*, *Road Segments* S3 and S4 are recorded as *Bridge Segments* with the attribute of *Bridge ID*.

Class: Bridge Segment

Road Segment ID	Bridge ID
S3	nnn
S4	nnn