

# Land Information Ontario

## **NRVIS/OLIW Data Management Model For Railway Segment (V.1) Fact Sheet Edition**

Issued: May 29, 2007

## Table of Contents

<i>1. Preface</i> .....	4
<i>2. Overview</i> .....	4
<i>3. Logical Data Model (Business View)</i> .....	5
<i>4. Data Dictionary</i> .....	6
<i>Appendix 1: Reading an Entity-Relationship Diagram</i> .....	7
<i>Appendix 2: Interpreting a Data Dictionary</i> .....	9

**Disclaimer**

This technical documentation has been prepared by Her Majesty the Queen in right of Ontario as represented by the Ministry of Natural Resources (the "Ministry"). No warranties or representations, express or implied, statutory or otherwise shall apply or are being made by the Ministry with respect to the documentation, its accuracy or its completeness. In no event will the Ministry be liable or responsible for any lost profits, loss of revenue or earnings, claims by third parties or for any economic, indirect, special, incidental, consequential or exemplary damage resulting from any errors, inaccuracies or omissions in this documentation; and in no event will the Ministry's liability for any such errors, inaccuracies or omissions on any particular claim, proceeding or action, exceed the actual consideration paid by the claimant involved to the Ministry for the materials to which this instructional documentation relates. Save and except for the liability expressly provided for above, the Ministry shall have no obligation, duty or liability whatsoever in contract, tort or otherwise, including any liability or negligence. The limitations, exclusions and disclaimers expressed above shall apply irrespective of the nature of any cause of action, demand or action, including but not limited to breach of contract, negligence, strict liability, tort or any other legal theory, and shall survive any fundamental breach or breaches.

**Additional Information**

For more information about this document, please contact Land Information Ontario at (705) 755-1858 or [lio@ontario.ca](mailto:lio@ontario.ca)

This document was prepared by: John Ernsting

Refer to the *DMM Users-Guide to the Fact Sheet Edition* for additional details about the context of information collected for a Data Management Model.

This document was generated using *DMM Edition Template Version: 2.2*

*Published May, 2007*  
© 2007, Queen's Printer for Ontario

## 1. Preface

Data modeling involves identifying the things of importance to an organization (entities), the properties of those things (attributes) and how they are related to one another (relationships). This document provides the logical view of the data model. Appendix 1 provides details on understanding data models.

## 2. Overview

### **Railway Segment (RAILWAY) version 1**

A Railway is a portion of a line of steel track providing a runway for trains and other wheeled vehicles. Railways are shown as linear features along their centre lines.

This is a NRVIS 1.0 and an OLIW 1.0 Data Class

#### **Abstract Class:**

SPMLINE -

Abstract Spatial Multi-Line User Object. One or more node to node arcs forms a single object. May be disjoint. May NOT share segments with each other. An example of this type of object is a River - from source to mouth, assuming the river is intersected by its own tributaries. No topological connectivity is assumed in this user object class.

#### **Custodian: (ESTABLISHED)**

Ministry of Natural Resources (MNR), Science and Information Resources Division (SIRD), Information Resources Management Branch (IRMB), Base Data Infrastructure (BDI)

#### **Geographic Unit Types:**

##### **Railway Segment (1208)**

This GUT is an Ontario Base Map feature. A Railway Segment is a portion of a line of steel track providing a runway for trains and other wheeled vehicles. Railways are shown as linear features along their centre lines.

For more information, see Digital Topographic Data Base Overview Version 2 OMNR Provincial Mapping Office, 1994.

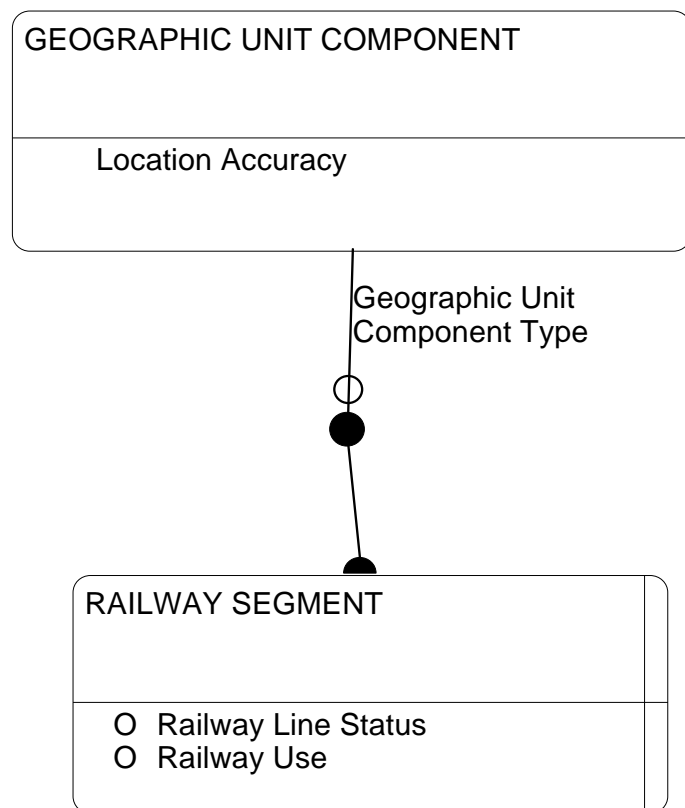
### 3. Logical Data Model (Business View)

Refer to the Appendix 1 guide on how to read an Entity Relationship Diagram (ERD).

## Business View Logical Data Model

### Data Class: Railway Segment

### Subset: RAILWAY



## 4. Data Dictionary

Refer to the Appendix 2 for guide on how to interpret a data dictionary.

### Entity : GEOGRAPHIC UNIT COMPONENT

**Description :**

A Geographic Unit that may be included in a Geographic Unit Consolidation.

<u>Location Accuracy</u>	Character (variable length string)	25	Mandatory
The degree of conformity or closeness of a measurement within the database to its true value in the world.			

**Class :** Description

*Valid values in NRVIS\_LOCATION\_ACCURACY.*

**Subtype Of** GEOGRAPHIC UNIT

Each GEOGRAPHIC UNIT COMPONENT May be One and only one FIRE DETAIL(s). Exclusive :

Each GEOGRAPHIC UNIT COMPONENT May be One and only one GEOGRAPHIC UNIT SENSITIVITY(s). Exclusive :

Each GEOGRAPHIC UNIT COMPONENT May be Defined By One or more DRAWING SCALE(s). Exclusive :

### Entity : RAILWAY SEGMENT

**Description :**

A portion of a line of steel track providing a runway for wheeled vehicles.

<u>Railway Line Status</u>	Character (variable length string)	1	Optional
Status of Railway line. eg. active, non-active			

**Class :** Code

*Valid values in NRVIS\_RAILWAY\_LINE\_STATUS.*

<u>Railway Use</u>	Character (variable length string)	1	Optional
Current use of railway line. eg. abandoned, historical			

**Class :** Code

*NRVIS\_RAILWAY\_USE.*

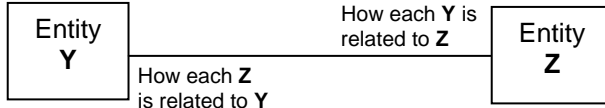
**Subtype Of** GEOGRAPHIC UNIT COMPONENT

## Appendix 1: Reading an Entity-Relationship Diagram

A modeler can define the data needs of a business using an **entity relationship diagram** (ERD). An ERD is a schematic representation showing entities and their relationship to other entities. An **entity** is a data object and a **relationship** is a model of the association between objects of one or more different entities. In an ERD, entities are rectangles connected to other entities by relationship lines. (official definition excerpt from the *Information Modeling Handbook for the OPS – Ontario Government Management Board Secretariat Corporate Architecture Branch*)

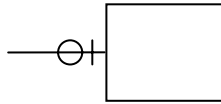
You will encounter the following symbology in an ERD.

**General Notation:** Text that describes a relationship between entities.

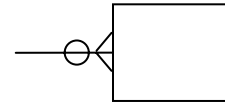


### Relationship Cardinality Symbols:

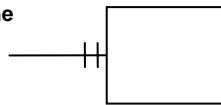
There *may* be **zero or one** occurrence of this entity. This means that the entity is optional.



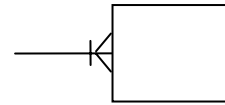
There *may* be **zero or more** occurrences of this entity. The relationship is optional.



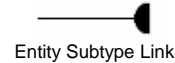
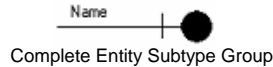
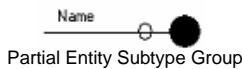
There *must* be **one and only one** occurrence of this entity. This means that the relationship is mandatory.



There *must* be **one or more** occurrences of this entity. The relationship is mandatory.

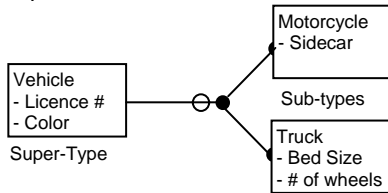


**Entity Sub-type Groups:** Entity subtype group icons link sub-type entities to the super-type entity. All subtype entities inherit the characteristics of the super-type entity. For example:



Group icons link subtype entities to the super-type entity. All subtype entities inherit the characteristics of the super-type entity. For example:

The circle indicates that the definition of subtypes for the super-type Vehicle is only partially complete. A line in this same location would indicate that all possible subtypes have been defined – indicating it as complete.



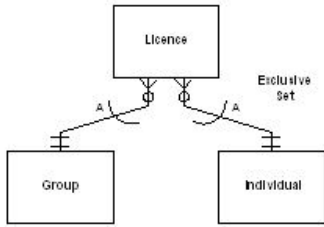
The attributes for Motorcycle include not only Sidecar, but also Licence # and Color.

The attributes for Truck include not only Bed Size and # of Wheels, but Licence # and Color.

Types of vehicles that have not be explicitly defined would inherit only the characteristics of the Vehicle entity e.g. Car, ATV.

**Exclusive Set:**

An Exclusive Set describes a relationship between entities where, at any one time, only one of the relationships can be true. For example:



A Group *may* be the holder of one or more Licences.

An Individual *may* be the holder of one or more Licences.

A Licence *must* be Issued to one and only one Group **or** One and only one Individual.

One licence cannot be issued to both a group and an individual.

**Additional Examples:**

*Interpreted as :*

**An Instructor *must* be teaching One or More Courses.**

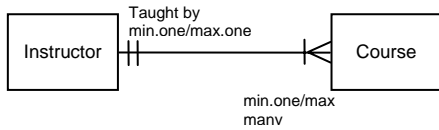
**A Course *must* be taught by One and Only One Instructor.**

An Instructor cannot exist unless they teach a course.

A Course cannot exist unless it has an Instructor. Tag-Team teaching by Instructors is not permitted.

A newly hired Instructor, not yet assigned to a course, may therefore not be part of this entity.

If the business rules dictate that this is not so, the relationship is incorrect. (See next example)



*Interpreted as :*

**An Instructor *may* be teaching One or More Courses.**

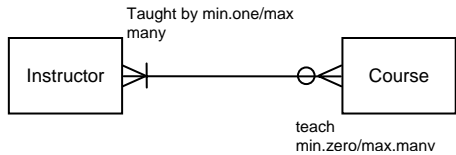
**A Course *must* be taught by One or More Instructors.**

A newly hired Instructor, not yet assigned to a course, can exist.

A new inexperienced Instructor, can be paired up with an experienced Instructor to teach a course until they are confident to teach solo.

A Course cannot exist unless it has an Instructor.

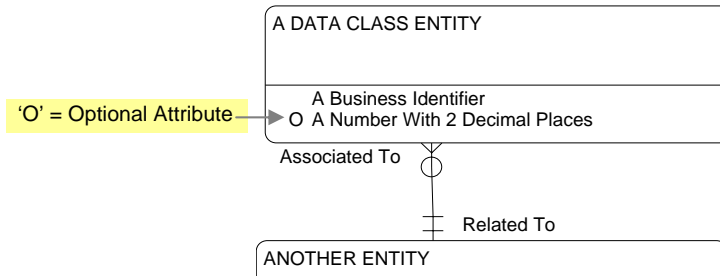
Once again, if the business rules dictate that this is not so, the relationship is incorrect.





## Appendix 2: Interpreting a Data Dictionary

General guidelines on how to interpret a Business View Logical Model Data Dictionary



**Entity : A DATA CLASS ENTITY**

**2 Description :**  
This is an example of a Entity Description

**4 A Business Identifier**  
This is the main Business Identifier.

**8 Class : Business Identifier**

**4 A Number With 2 Decimal Places**  
This is an example of a Data Item description.  
This is an example of an Attribute Description.

**8 Class : Measurement**

**9 This is an example of a Business Definition.**

**10 Each A DATA CLASS ENTITY Must be Associated To One and only one ANOTHER ENTITY(s). Exclusive :**

Character (variable length string) 25 Mandatory

Numeric 3 2 Optional

1. Entity Block
2. Entity Name and Description
3. Attribute Block
4. Attribute name (underlined) with item description (below). Sometimes, the item is also described at the attribute level to describe its specific usage within an entity.
5. Field Type. E.g.: Character, Numeric, Date etc...
6. Field Length and where applicable – number of decimal places. The maximum capacity for a field’s content is determined by the Item’s set length. With the examples above...
  - The 1st item, has been defined as a Character (Variable length string) field, with a maximum length of 25 characters.
  - The 2<sup>nd</sup> item has been defined a Numeric field with a width of 3 including 2 decimal places. (9.99)
 Other numeric definition examples: 99.99 would be defined as 4 2, 999.9 as 4 1, 999 as 3 0 etc...  
 Whenever numeric data items are defined, it is good practice to include an example in the item’s description.
7. Attribute Optionality within Entity. Optional attributes are prefixed with an ‘O’ within an Entity’s ERD.
8. Logical Class of the Data Item. Examples include:
  - Business Identifier: a field used by a business area as a reference to obtain more information.
  - Code: Where values are stored as a code – with the full value sometimes stored in a corresponding lookup table.
  - Date: For storing date information e.g.: Year, full or partial dates, character dates etc...
  - Description: For storing long descriptions.
  - Flag: Where the field is used to store a condition that may be used by the business area to trigger an event.
  - Identifier: Where field is used to store an identifier e.g.: a Licence Number.
  - Indicator: Usually Boolean e.g. Yes/No
  - Measurement: The unit of measure is also defined e.g.: mm, feet, kilograms etc...
  - Name: Where field is used to store a name. e.g.: Lake Rome
  - Quantity: Where a field stores a value that measures quantity. E.g.: Number of Moose Observed: 12
9. Business Definition. E.g.: *Valid Values in NRVIS\_2NUM Lookup Table*
10. Entity Relationship Description