UTMC-TS004.0061:2010

UTMC Objects Registry
Annex D.1: UML Data Model

15 October 2010

Cover + 202 pages

Foreword

This document is Annex D.1 of UTMC Technical Specification 004 version 006 (TS004.006:2010). It is an integral part of, and should be read in conjunction with, that document.

This version of TS004 Annex D.1 is identical to the corresponding annex in the previous issue, TS004.005:2009.

A source file is available on the UTMC website which presents the contents of this document, based on the proprietary MagicDraw™ application and developed by Mott Macdonald. Please note that the source file should be treated as informative; this published document is the normative UTMC UML Data Objects model.

List of Contents

1 Introduction

1.1 General

1.1.1 UTMC TS004 defines standards for UTMC "common data" (i.e. data communicated between applications of a UTMC system, or between a UTMC system and an external system).

1.1.2 UTMC interfaces may use various technologies as defined in the UTMC technical specification TS003. One of the most important is the UTMC Common Database interface. This Annex specifies the elements that may be available through a Common Database interface. The specification is in the form of a data model and is expressed using the ISO standard Unified Modelling Language (UML).

1.1.3 Section 2 describes exactly how the UML should be interpreted, then sections 3 onwards specify the various parts of the model.

2 Using Data Objects in a UTMC common database

2.1 Introduction

2.1.1 The UTMC Data Objects are expressed in this document using the Unified Modelling Language (UML). This section explains how the UML elements should be interpreted as a specification for a UTMC Common Database[1,2].

2.1.2 The interpretation of the UML is specified in a series of numbered rules, from R1 to R10. Examples of some of these rules are provided in Appendix I.

2.2 Tables and columns

R1. Each UML class that is not "abstract" represents a relational table (abstract classes are shown in diagrams with their name in Italics). The name of the table is the name of the class.

R2. Each table has the following columns:
- One for each attribute in the class
- One for each attribute of an abstract superclass
- Additional foreign keys as defined in the section below.

R3. The name and type of the UML attribute specify the name and type of the corresponding column.

R4. An attribute with UML multiplicity of 0..1 means the column may be NULL, whereas an attribute with no specified UML multiplicity defaults to 1 and therefore the column may not be NULL.

2.2.1 Multiplicities are also listed in the tabular listings of attributes, in the column headed "Mult".

2.2.2 UTMC defines maximum lengths for some string columns. These are included in the UML model as tagged values and are not shown on diagrams but are included in the tabular listings.

R5. The "Max" column in the tabular listing of attributes specifies the maximum length permitted for a string column in the database.

2.3 Primary keys

R6. A stereotype of <<PK>> on a UML attribute indicates a primary key column.

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1 Concrete UTMC interfaces may use various technologies as defined in the UTMC technical specification. While this section describes the relational common database interface, it should be noted that the UML model could be used as a specification for other kinds of UTMC interfaces (for example XML-based interfaces) if an appropriate mapping were to be defined.

2 The interfaces to the UTMC Common Database use the CORBA IDL "TabularResults" structure defined in Annex F of the Technical Specification TS004. In effect this TabularResults structure exposes a relational database. This section is therefore phrased in terms of the tables, columns and relationships of the relational database that is implied through the IDL.

2.4 Relationships and foreign keys

2.4.1 UML associations represent relationships between tables.

2.4.2 Physical foreign key columns are not shown as attributes on diagrams; instead they are implied from the relationships, as in a conceptual data model.

2.4.3 A UML association will result in a foreign key being included in one of the two classes involved in the relationship. In general the table at the "many" end of a one-to-many relationship imports a primary key from the table at the "one" end. But there are also one-to-one relationships to handle. Therefore the presence of a named association end is used to specify the foreign key.

R7. For each association end with a name, the class/table that has that association end as a property (i.e. the class at the opposite end of the association) includes a foreign key column. The name of the foreign key column is the name of the association end, and the type is the type of the primary key of the other table.

R8. A foreign key is considered part of the primary key for the importing table if the corresponding association end has a <<PFK>> stereotype.

R9. If the named association end has a multiplicity with minimum of 1 or more then the foreign key column cannot be NULL. If the multiplicity allows 0 then the column can be NULL.

2.4.4 The <<PK>> and <<PFK>> stereotypes are also included in the tabular listing of attributes for each class, in the column headed "Key?". The tabular listings for some classes may contain no entries in that column because the key is defined in a base class or subclass.

2.4.5 The presence of a UML composition (solid diamond) has no impact on the database implementation but may have an impact on other technology mappings in the future.

R10. If a concrete class inherits any associations from its abstract base classes, then the corresponding table also includes foreign key columns corresponding to these associations.

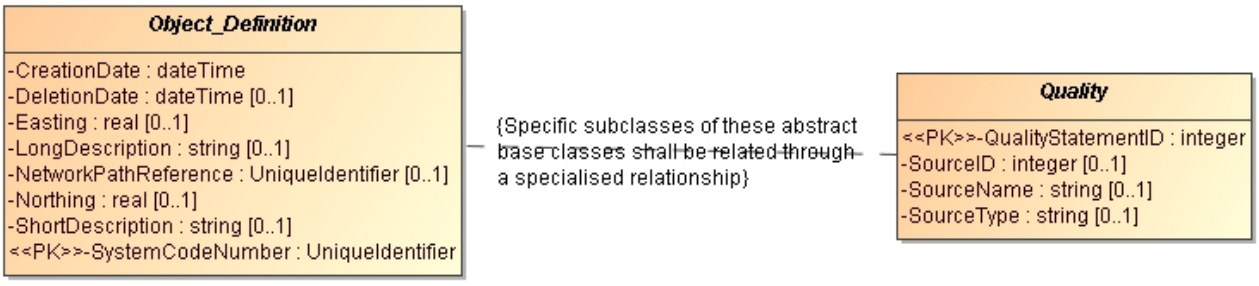
2.5 Mapping to UTMC TabularResults types

2.5.1 The following table specifies how each UML datatype is realised as a type from the UTMC TabularResults.idl and MJD.idl files (defined in UTMC TS004 Annex F). TabularResults features an IDL union named "Data" whose values can be one of a number of different types, each of which is a sequence of more primitive IDL types that are used for individual values.

UTMC UML model type	Tabular Results selection	Ultimate IDL type for each value
string	TYPE_CHAR, TYPE_LONGVARCHAR, or TYPE_VARCHAR	string
normalizedString		
boolean		string containing single character 'Y' for true or 'N' for false
AccessLocationType		string containing single character 'E' for entrance or 'X' for exit.
ObjectId		string (max 32 characters)
integer (and specializations of integer including WholeMetres, PlanNumber, positiveInteger, nonNegativeInteger, WholeDegrees)	TYPE_INTEGER	long
duration		long representing number of minutes
real (and specializations of real including Metres, Money, Percentage, VehiclesPerMinute, VehiclesPerHour, KilometresPerHour, Celsius, Millibars)	TYPE_REAL	float
dateTime	TYPE_DATE	MJD::Date
date	TYPE_DATE	MJD::Date
time	TYPE_TIME	MJD::Time

2.6 Constraints

2.6.1 At the abstract level defined in the Template package, there are UML constraints between pairs of abstract classes. For example *Object_Definition* and *Quality* have a constraint as shown in the figure below.



2.6.2 These constraints have no impact on the database implementation. Their purpose is to communicate the abstract patterns used in UTMC and to constrain the model itself to follow these patterns as it is extended in future. Following the constraint depicted in the example, the model always includes specific relationships between concrete *Object_Definition* subclasses and corresponding *Quality* subclasses (e.g. Access_Control_Definition has an association with Access_Control_Quality).

2.6.3 An alternative approach would have been to specify associations at this abstract level (e.g. an association between *Object_Definition* and *Quality*) instead of replicating them at the specific level, but that approach would also require further constraints at the specific level to ensure that pairs of classes were an appropriate match, for example to prevent an Access_Control_Definition instance having a relationship with a Car_Park_Quality instance. The UTMC supplier community has preferred to keep the relationships explicit and specific for each functional area.

2.6.4 Associations between two abstract classes are therefore not allowed and are replaced by informative constraints. Associations are allowed between an abstract class and a concrete class because no further constraint is required to narrow the corresponding concrete relationships. The realization is covered by rule R10 above. For example the association between *Object_Definition* and DataSource_TypeID specifies that every table derived from *Object_Definition* includes an inherited relationship with the DataSource_TypeID table.

3 Template Package

3.1 Introduction

General information

Qualified Name:	UTMC::Template
Comment:	The template package specifies the abstract patterns that should be implemented by all specific UTMC "data objects".

Diagrams

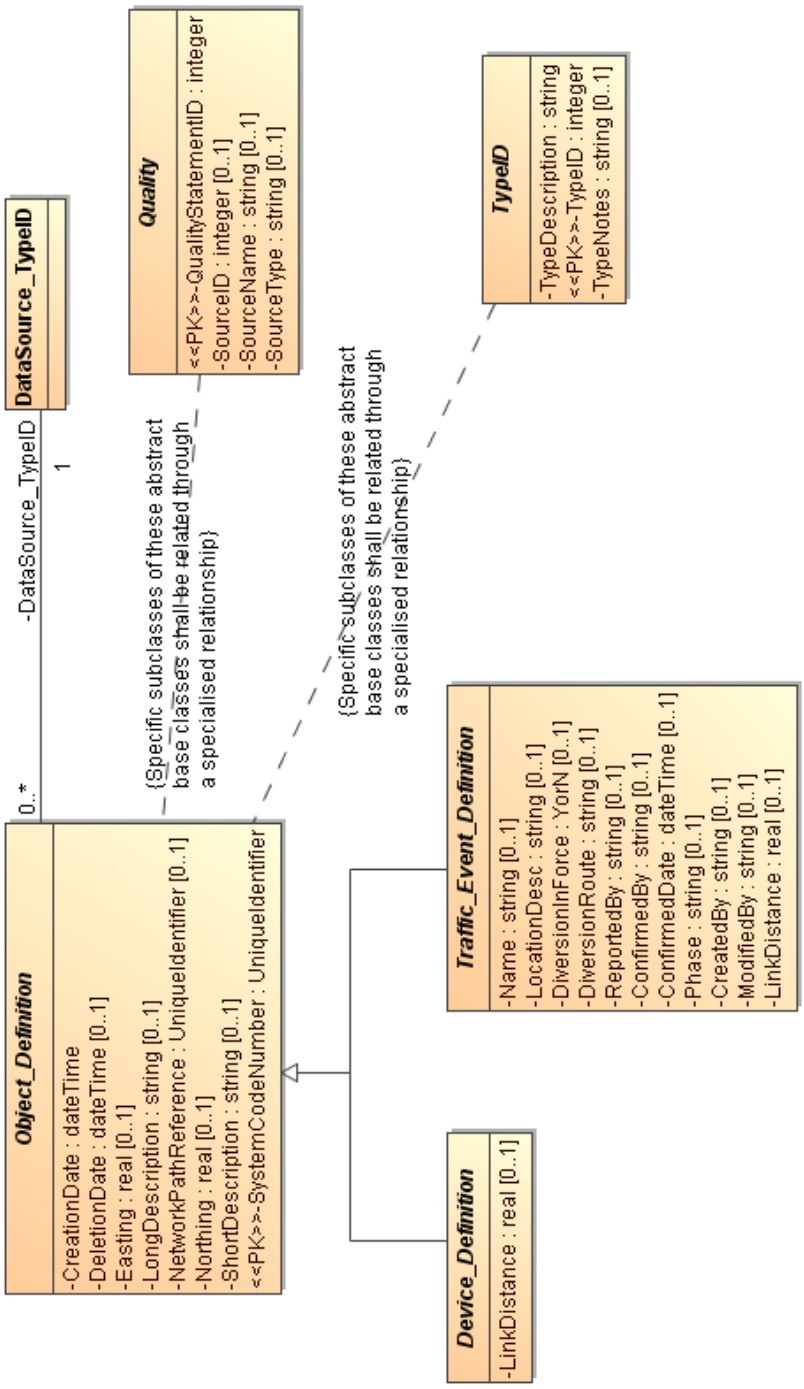


Figure 3-1: Abstract base classes diagram

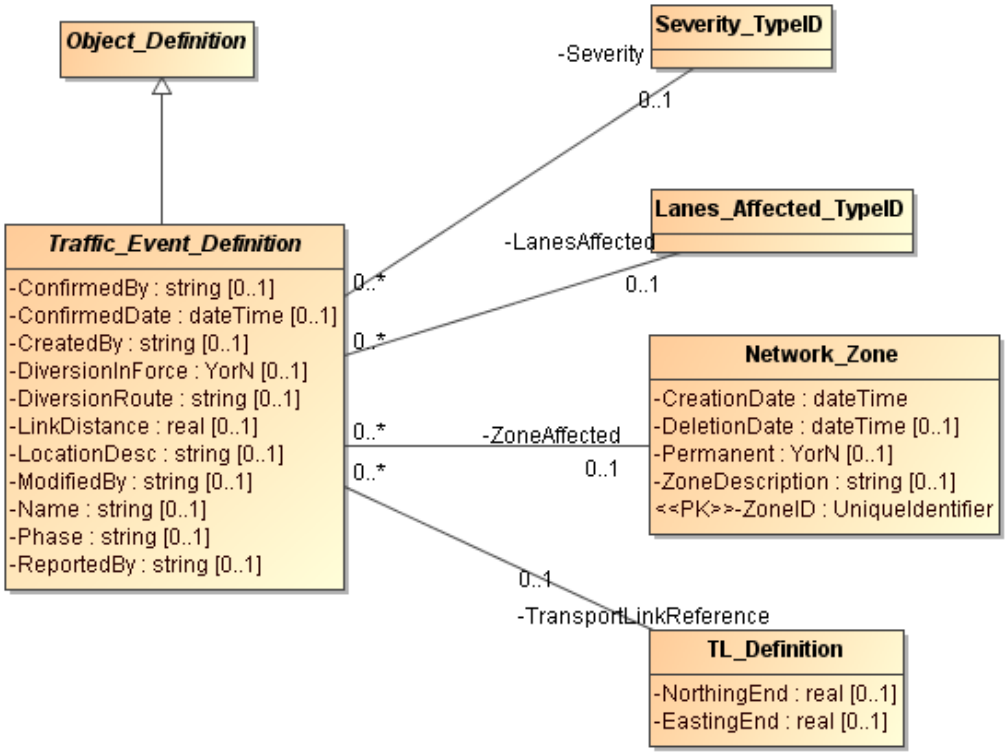


Figure 3-2: Abstract traffic event base class diagram

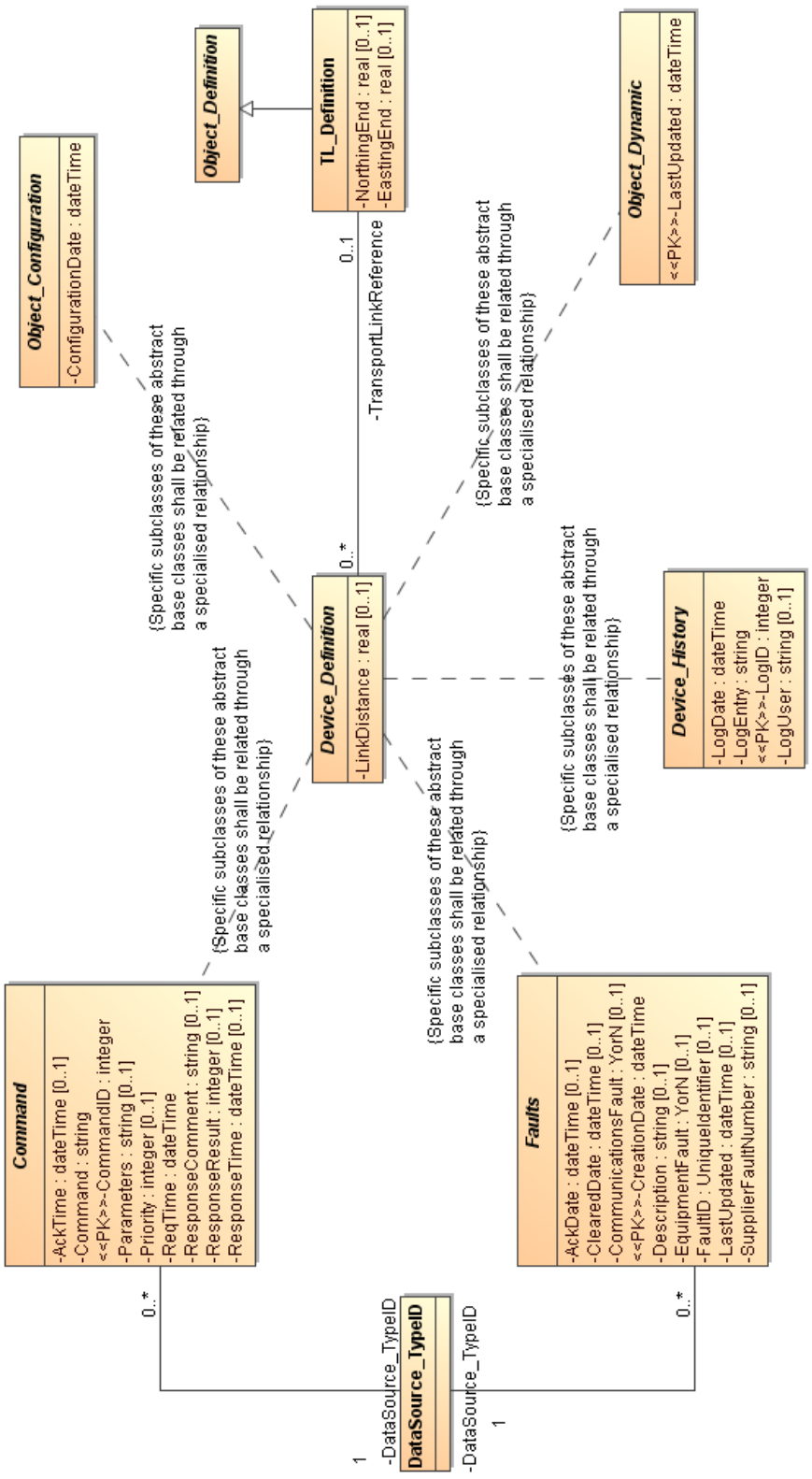


Figure 3-3: Abstract device base class diagram

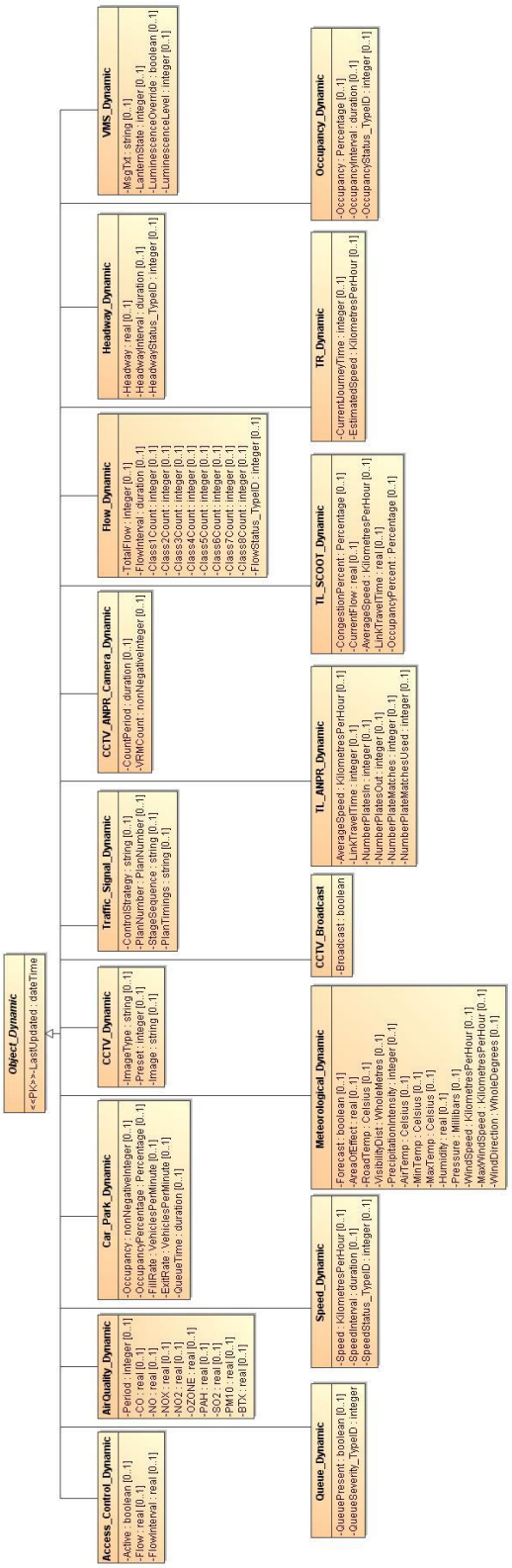


Figure 3-4: Dynamic diagram

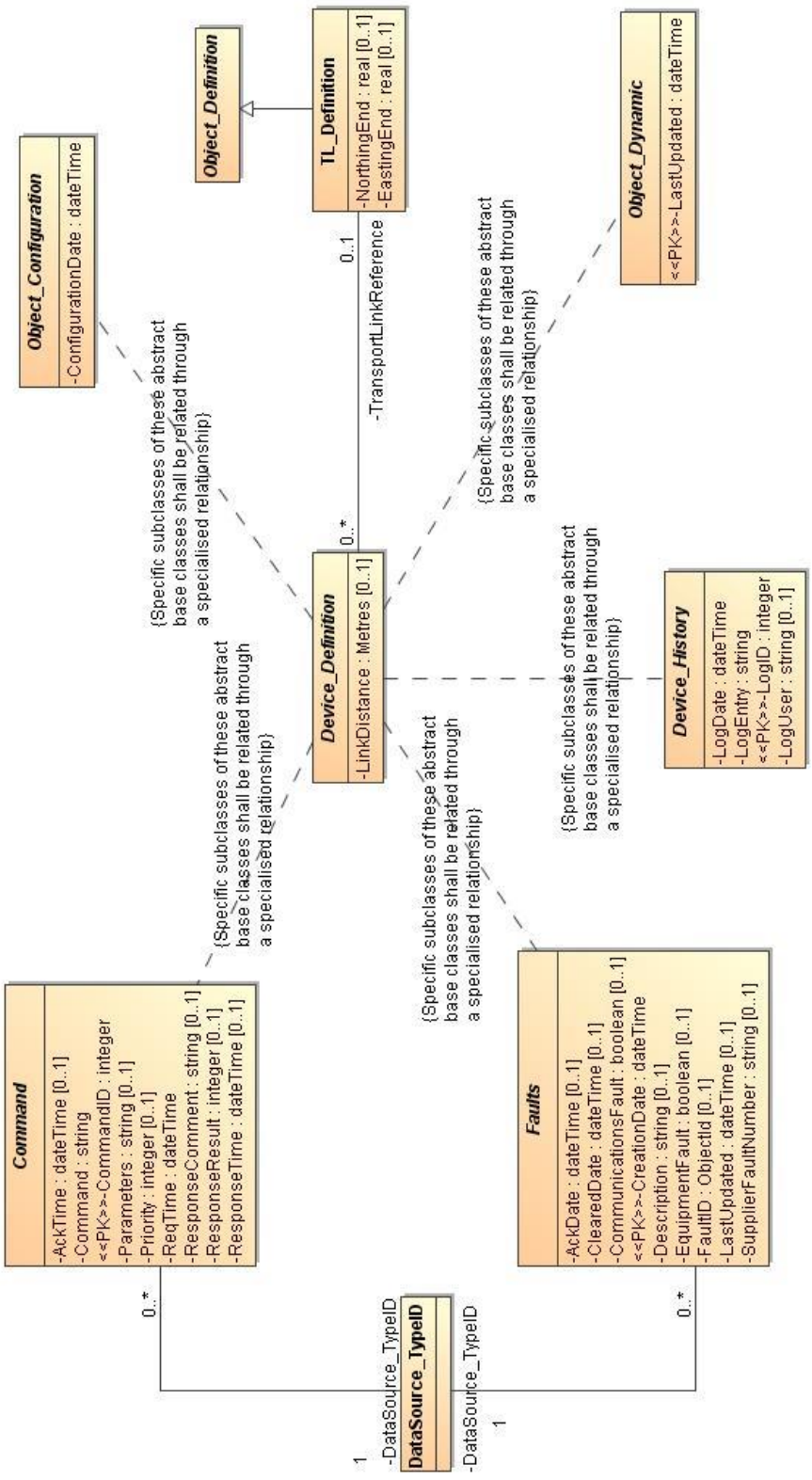


Figure 3-5: abstract device base class diagram

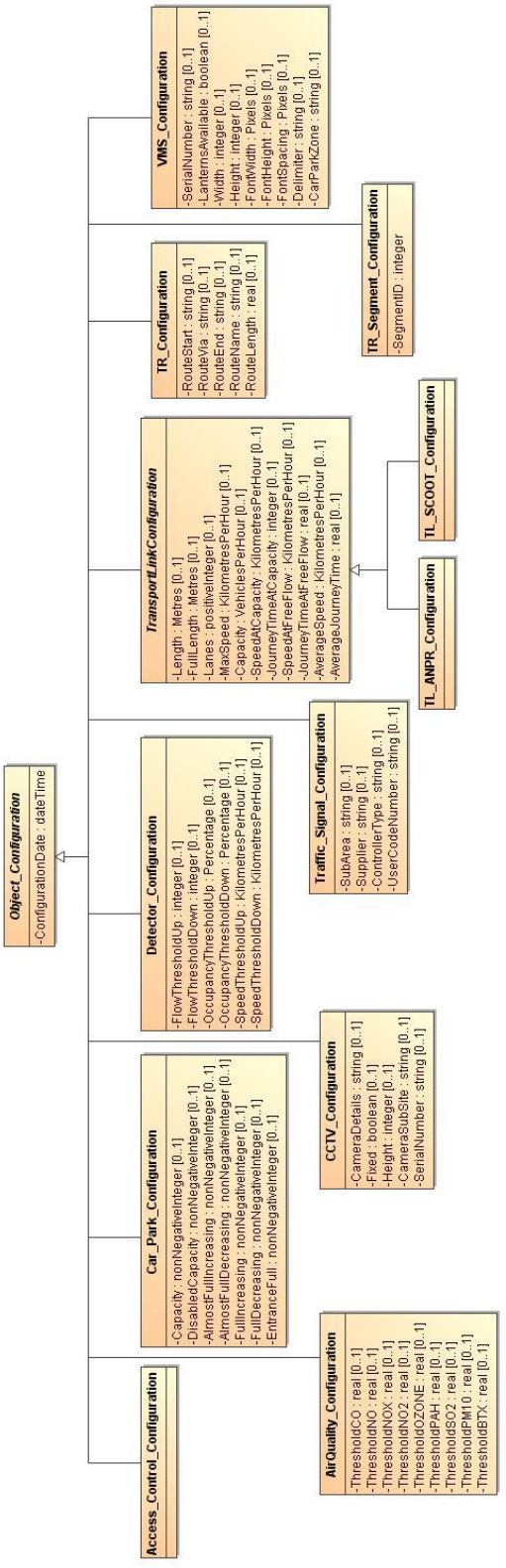


Figure 3-6: Configuration diagram

3.2 Device_Definition Class

General information

Base Classifier:	Object_Definition
Is Abstract:	true
Comment:	Abstract base class for device definitions

Attributes

Name	Type	Mult.	Key?	Max	Comments
LinkDistance	real	0..1			Distance of the "object" from the start of the link.
TransportLinkReference	TL_Definition	0..1			Reference to Transport Link

Relations

Type	Begin	End
generalization	Access_Control_Definition class	Device_Definition class
generalization	Device_Definition class	Object_Definition class
generalization	CCTV_Definition class	Device_Definition class
generalization	VMS_Definition class	Device_Definition class
generalization	Traffic_Signal_Definition class	Device_Definition class
generalization	AirQuality_Definition class	Device_Definition class
generalization	Detector_Definition class	Device_Definition class
generalization	Car_Park_Definition class	Device_Definition class
generalization	Meteorological_Definition class	Device_Definition class
association	Device_Definition class	TL_Definition class

3.3 Object_Basic_Data Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Basic Static Data - This is an extension to the generic definition class which defines Static Data for this specific object.

Relations

Type	Begin	End
generalization	AirQuality_Basic_Data class	Object_Basic_Data class
generalization	Car_Park_Basic_Data class	Object_Basic_Data class

4 Object_Configuration Class

4.1 Introduction

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for configuration. Represents the configuration of a single device or system.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ConfigurationDate	dateTime				Date of last change of configuration.

Relations

Type	Begin	End
generalization	TransportLinkConfiguration class	Object_Configuration class
generalization	Access_Control_Configuration class	Object_Configuration class
generalization	Detector_Configuration class	Object_Configuration class
generalization	TR_Configuration class	Object_Configuration class
generalization	Car_Park_Configuration class	Object_Configuration class
generalization	Traffic_Signal_Configuration class	Object_Configuration class
generalization	CCTV_Configuration class	Object_Configuration class
generalization	AirQuality_Configuration class	Object_Configuration class
generalization	TR_Segment_Configuration class	Object_Configuration class
generalization	VMS_Configuration class	Object_Configuration class

4.2 Object_Definition Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for all UTMC "object definitions".

Attributes

Name	Type	Mult.	Key?	Max	Comments
CreationDate	dateTime				Date/time at which the "object" was entered into the database.
DataSource_TypeID	DataSource_TypeID	1			Source of information, e.g. UTC.
DeletionDate	dateTime	0..1			Date of deletion.
Easting	real	0..1			Location of the "object" in OS grid coordinates.
LongDescription	string	0..1		2000	Long description of the "object".
NetworkPathReference	ObjectId	0..1		32	Reference to Network Link or (if the object location is a set of links) Network Path.
Northing	real	0..1			Location of the "object" in OS grid coordinates.
ShortDescription	string	0..1		32	Short description of the "object". Limited to 32 characters.
SystemCodeNumber	ObjectId		PK	32	Unique identifier for the "object".

Relations

Type	Begin	End
generalization	TR_Definition class	Object_Definition class
generalization	Device_Definition class	Object_Definition class
generalization	Traffic_Event_Definition class	Object_Definition class
association	Object_Definition class	DataSource_TypeID class
generalization	TL_Definition class	Object_Definition class

4.3 Object_Dynamic Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for data which changes frequently.

Attributes

Name	Type	Mult.	Key?	Max	Comments
LastUpdated	dateTime		PK		Time/date of last change of this data.

Relations

Type	Begin	End
generalization	Traffic_Signal_Dynamic class	Object_Dynamic class
generalization	Access_Control_Dynamic class	Object_Dynamic class
generalization	CCTV_Dynamic class	Object_Dynamic class
generalization	Flow_Dynamic class	Object_Dynamic class
generalization	Speed_Dynamic class	Object_Dynamic class
generalization	Car_Park_Dynamic class	Object_Dynamic class
generalization	Occupancy_Dynamic class	Object_Dynamic class
generalization	VMS_Dynamic class	Object_Dynamic class
generalization	TL_ANPR_Dynamic class	Object_Dynamic class
generalization	CCTV_ANPR_Camera_Dynamic class	Object_Dynamic class
generalization	CCTV_Broadcast class	Object_Dynamic class
generalization	Headway_Dynamic class	Object_Dynamic class
generalization	Meteorological_Dynamic class	Object_Dynamic class
generalization	AirQuality_Dynamic class	Object_Dynamic class
generalization	TL_SCOOT_Dynamic class	Object_Dynamic class
generalization	Queue_Dynamic class	Object_Dynamic class
generalization	TR_Dynamic class	Object_Dynamic class

4.4 Traffic_Event_Definition Class

General information

Base Classifier:	Object_Definition
Is Abstract:	true
Comment:	Abstract base class for traffic events

Attributes

Name	Type	Mult.	Key?	Max	Comments
ConfirmedBy	normalizedString	0..1			Who confirmed the accident. Authorisation block.
ConfirmedDate	dateTime	0..1			Date/time at which the accident was confirmed.
CreatedBy	normalizedString	0..1			Who created the accident record.
DiversionInForce	boolean	0..1			Indicates if a diversion is in force around the accident (Y/N).
DiversionRoute	string	0..1		32	Indicates the route a diversion is to take.
LanesAffected	Lanes_Affected_TypeID	0..1			Details of the lanes that are affected by the traffic event.
LinkDistance	Metres	0..1			Distance of the "object" from the start of the link.
LocationDesc	string	0..1			Description of the location. Some automatic reporting of incidents may not provide a geo-coding so a Gazeteer type description may be required.
ModifiedBy	normalizedString	0..1			Who modified the accident record.
Name	string	0..1			Human readable name for the object.
Phase	string	0..1			Indicates status of accident. The use of phase is intend to indicate the history of the accident. The precise values are a matter for those implementing the system.
ReportedBy	string	0..1			Who/how the accident was reported.
Severity	Severity_TypeID	0..1			The considered severity (in terms of traffic flow) of the traffic event at the update time.
TransportLinkReference	TL_Definition	0..1			Reference to Transport Link
ZoneAffected	Network_Zone	0..1			Reference to the network zone affected by the traffic event. (See network structure for details of a zone).

Relations

Type	Begin	End
generalization	Event_Definition class	Traffic_Event_Definition class
generalization	Accident_Definition class	Traffic_Event_Definition class
association	Traffic_Event_Definition class	Lanes_Affected_TypeID class
generalization	Traffic_Event_Definition class	Object_Definition class
generalization	Roadworks_Definition class	Traffic_Event_Definition class
association	Traffic_Event_Definition class	Network_Zone class
association	Traffic_Event_Definition class	TL_Definition class
association	Traffic_Event_Definition class	Severity_TypeID class
generalization	Incident_Definition class	Traffic_Event_Definition class

5 AccessControl Package

5.1 Introduction

General information

Qualified Name:	UTMC::AccessControl
Comment:	Package for classes representing access control equipment (such as rising bollards).

Diagrams

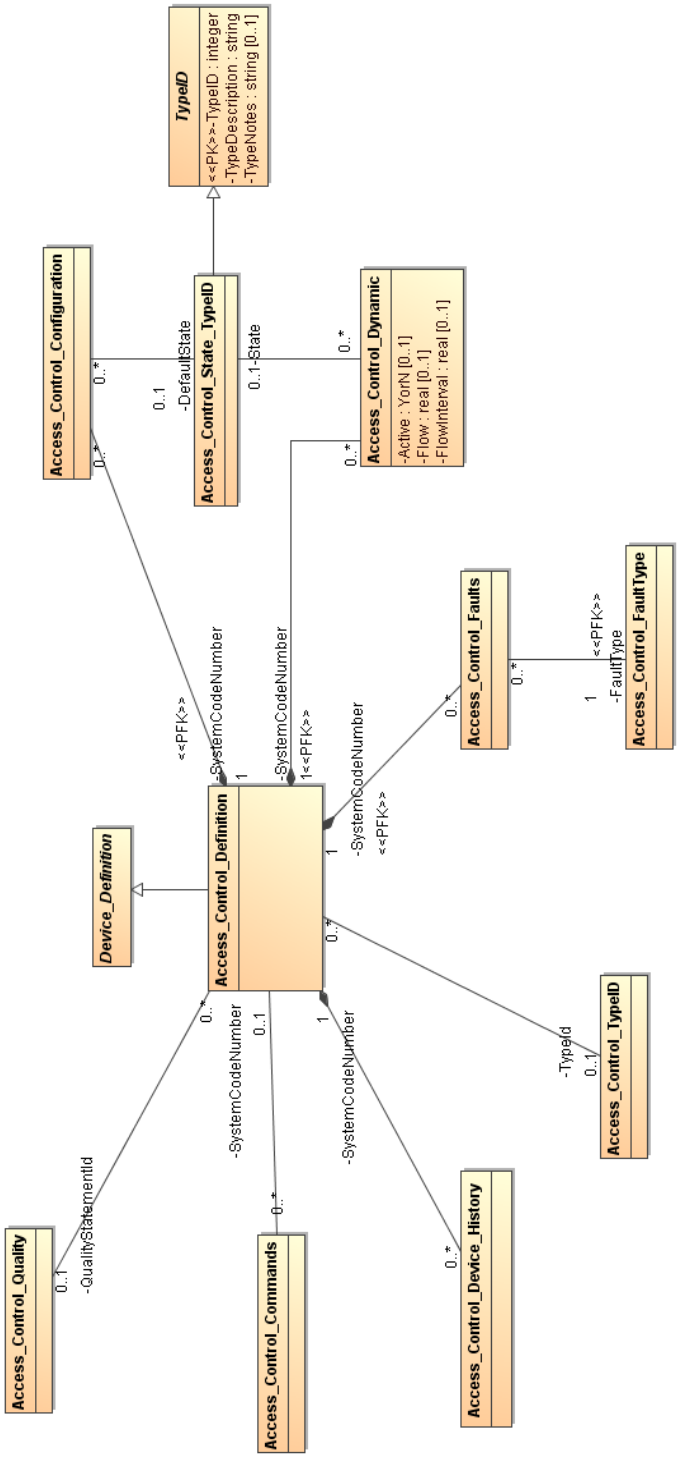


Figure 5-1: Access Control diagram

5.2 Access_Control_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to access control equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Access_Control_Definition	0..1			

Relations

Type	Begin	End
generalization	Access_Control_Commands class	Command class
association	Access_Control_Commands class	Access_Control_Definition class

5.3 Access_Control_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Details of the access control equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
DefaultState	Access_Control_State_TypeID	0..1			State that the Access Control System "sits-in" by default, e.g. Access enabled or Access disabled state.
SystemCodeNumber	Access_Control_Definition	1	PFK		

Relations

Type	Begin	End
Association	Access_Control_Configuration class	Access_Control_Definition class
generalization	Access_Control_Configuration class	Object_Configuration class
Association	Access_Control_Configuration class	Access_Control_State_TypeID class

5.4 Access_Control_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	Defines access control equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Access_Control_Quality	0..1			
TypeId	Access_Control_TypeID	0..1			

Relations

Type	Begin	End
association	Access_Control_Definition class	Access_Control_Configuration class
association	Access_Control_Definition class	Access_Control_Quality class
generalization	Access_Control_Definition class	Device_Definition class
association	Access_Control_Definition class	Access_Control_Dynamic class
association	Access_Control_Definition class	Access_Control_Commands class
association	Access_Control_Definition class	Access_Control_Device_History class
association	Access_Control_Definition class	Access_Control_TypeID class
association	Access_Control_Definition class	Access_Control_Faults class

5.5 Access_Control_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to access control equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Access_Control_Definition	1			

Relations

Type	Begin	End
generalization	Access_Control_Device_History class	Device_History class
association	Access_Control_Device_History class	Access_Control_Definition class

5.6 Access_Control_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Details of access_control status.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Active	boolean	0..1			Is the access_control active (Y or N).
Flow	real	0..1			Flow through the control point.
FlowInterval	real	0..1			Interval for flow measurement.
State	Access_Control_State_TypeID	0..1			Current active state, e.g. Access enabled or Access disabled state
SystemCodeNumber	Access_Control_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Access_Control_Dynamic class	Object_Dynamic class
association	Access_Control_Dynamic class	Access_Control_Definition class
association	Access_Control_Dynamic class	Access_Control_State_TypeID class

5.7 Access_Control_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with access control equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	Access_Control_FaultType	1	PFK		A reference to one of a set of fault types defined for the object in question - will be 999 if the sub-system does not supply a FaultType.
SystemCodeNumber	Access_Control_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Access_Control_Faults class	Faults class
association	Access_Control_Faults class	Access_Control_FaultType class
association	Access_Control_Faults class	Access_Control_Definition class

5.8 Access_Control_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with access control equipment.

Relations

Type	Begin	End
generalization	Access_Control_FaultType class	FaultType class
association	Access_Control_FaultType class	Access_Control_Faults class

5.9 Access_Control_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about access control data.

Relations

Type	Begin	End
generalization	Access_Control_FaultType class	FaultType class
association	Access_Control_FaultType class	Access_Control_Faults class

5.10 Access_Control_State_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of the various state values supported by the system. Relates the State_TypeID field in Access Control Data object to a particular description. Values are as follows: 1 = Access Enabled 2 = Access Disabled 999 = Other

Relations

Type	Begin	End
association	Access_Control_State_TypeID class	Access_Control_Dynamic class
generalization	Access_Control_State_TypeID class	TypeID class
association	Access_Control_State_TypeID class	Access_Control_Configuration class

5.11 Access_Control_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of Access Control equipment. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = Bollard 2 = Barrier 3 = Gate 4 = Sign 999 = Other

Relations

Type	Begin	End
generalization	Access_Control_TypeID class	TypeID class
association	Access_Control_TypeID class	Access_Control_Definition class

6 Accident Package

6.1 Introduction

General information

Qualified Name:	UTMC::Accident
Comment:	Package for classes representing road traffic accidents.

Diagrams

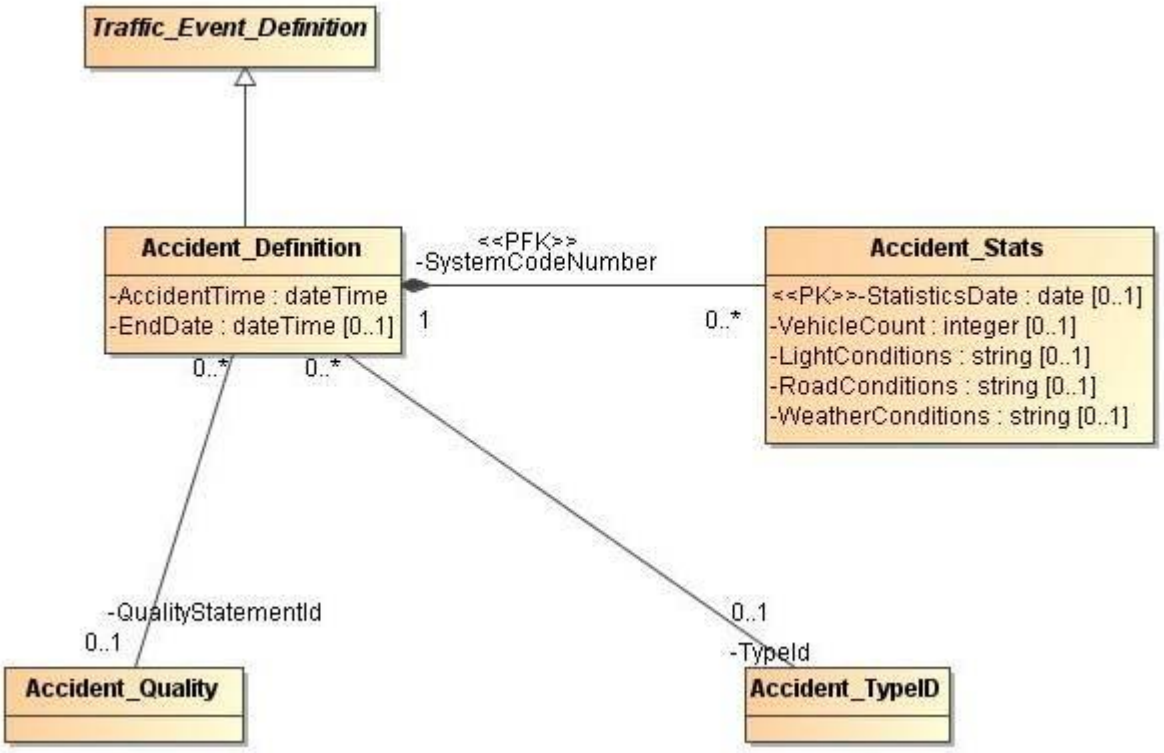


Figure 6-1: Accident diagram

6.2 Accident_Definition Class

General information

Base Classifier:	Traffic_Event_Definition
Is Abstract:	false
Comment:	An accident is an unplanned occurrence that may have a direct affect on the traffic flow in an area or may need to be recorded for other purposes even if it has no impact on the traffic flow. The default attributes for an accident (identification, description, location) are covered by the generic data attributes. Additionally details on the type of accident, the number of vehicles involved, and road and visibility conditions are provided. Accidents can be confirmed\authorised to ensure that unconfirmed accidents can be filtered out by external applications. (This is dependent on suitable operator procedures being available). By making the the systemcodenumber and creationdate, the key a history of changes can be kept for audit purposes etc.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AccidentTime	dateTime				Date/time when the accident occurred.
EndDate	dateTime	0..1			Date/time when the accident is expected to be or when it actually was cleared.
QualityStatementId	Accident_Quality	0..1			
TypeId	Accident_TypeID	0..1			

Relations

Type	Begin	End
generalization	Accident_Definition class	Traffic_Event_Definition class
association	Accident_Definition class	Accident_Quality class
association	Accident_Definition class	Accident_Stats class
association	Accident_Definition class	Accident_TypeID class

6.3 Accident_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about road traffic accident data.

Relations

Type	Begin	End
generalization	Accident_Quality class	Quality class
association	Accident_Quality class	Accident_Definition class

6.4 Accident_Stats Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Statistical information, which is likely to be added to the accident object at a later date.

Attributes

Name	Type	Mult.	Key?	Max	Comments
LightConditions	string	0..1			Lighting conditions at time of accident.
RoadConditions	string	0..1			Road surface conditions at time of accident.
StatisticsDate	date	0..1	PK		Date statistical information was added to the accident object.
SystemCodeNumber	Accident_Definition	1	PFK		Unique identifier for the object. Identifier needs to be unique only within an object type.
VehicleCount	integer	0..1			Number of vehicles involved.
WeatherConditions	string	0..1			Weather conditions at time of accident.

Relations

Type	Begin	End
association	Accident_Stats class	Accident_Definition class

6.5 Accident_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of accident. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = Accident 2 = Bus accident 3 = Collision 4 = Accident investigation work 5 = Accident History 6 = Chemical spillage accident 7 = Fuel spillage accident 8 = Hazardous materials Accident 9 = Heavy Lorry Accident 10 = Jack-knifed articulated lorry 11 = Jack-knifed caravan 12 = Jack-knifed trailer 13 = Multi-vehicle accident 14 = Oil spillage accident 15 = Overturned heavy lorry 16 = Overturned vehicle 17 = Secondary accident 18 = Serious accident 19 = Shed load 20 = Vehicle spun around 999 = Other

Relations

Type	Begin	End
generalization	Accident_TypeID class	TypeID class
association	Accident_TypeID class	Accident_Definition class

7 AirQuality Package

7.1 Introduction

General information

Qualified Name:	UTMC::AirQuality
Comment:	Package for classes representing air quality measurement equipment.

Diagrams

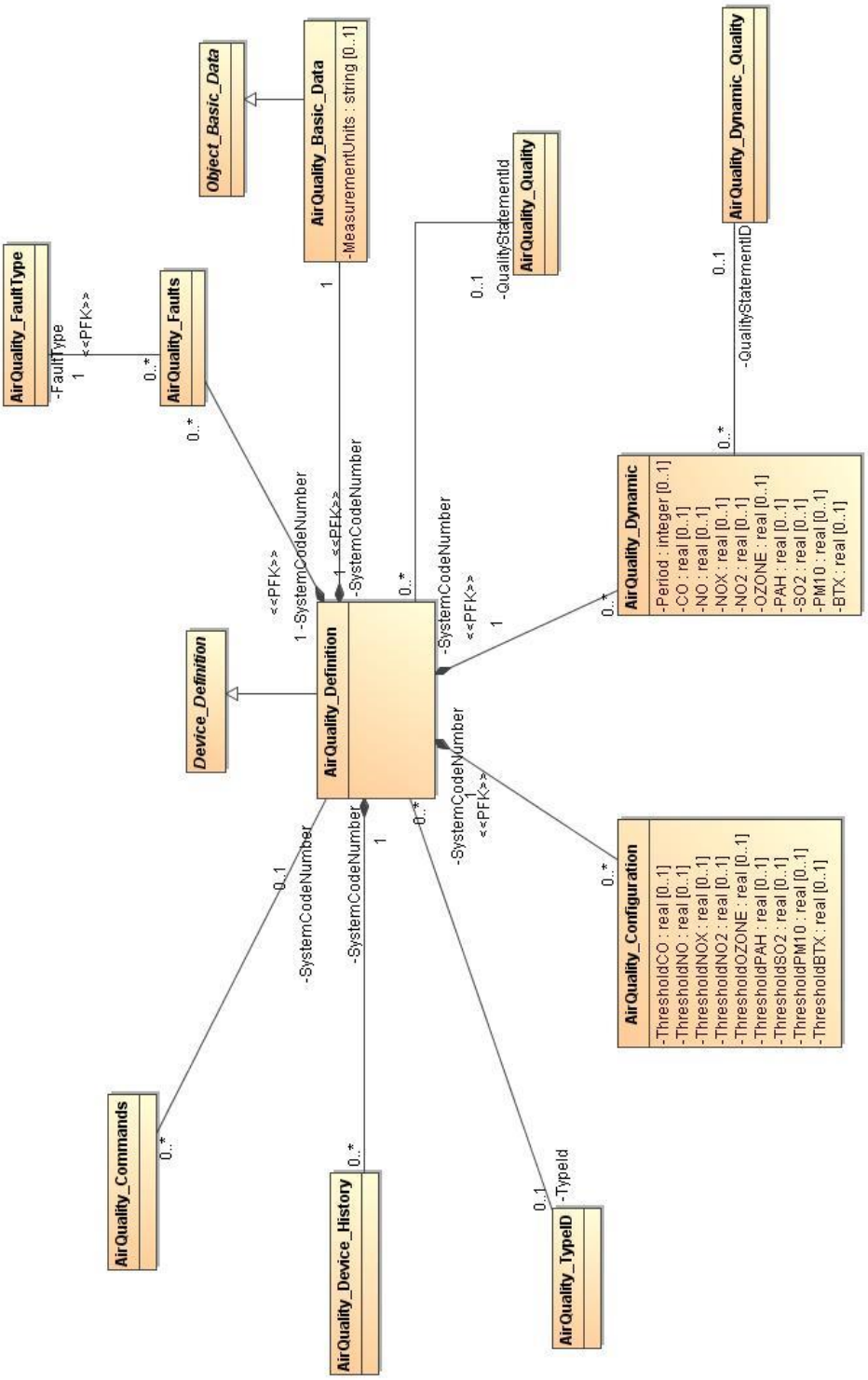


Figure 7-1: AirQuality diagram

7.2 AirQuality_Basic_Data Class

General information

Base Classifier:	Object_Basic_Data
Is Abstract:	false
Comment:	Extended static data on air quality equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
MeasurementUnits	string	0..1			Description of units of measurement. These must be consistent within the lifetime of the Data Object.
SystemCodeNumber	AirQuality_Definition	1	PFK		

Relations

Type	Begin	End
generalization	AirQuality_Basic_Data class	Object_Basic_Data class
association	AirQuality_Basic_Data class	AirQuality_Definition class

7.3 AirQuality_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to air quality measurement equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	AirQuality_Definition	0..1			

Relations

Type	Begin	End
association	AirQuality_Commands class	AirQuality_Definition class
generalization	AirQuality_Commands class	Command class

7.4 AirQuality_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Threshold levels above which pollutant concentrations are considered to be in an alarm status.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	AirQuality_Definition	1	PFK		
ThresholdBTX	real	0..1			concentration (e.g. ppb)
ThresholdCO	real	0..1			concentration (e.g. ppb)
ThresholdNO	real	0..1			concentration (e.g. ppb)
ThresholdNO2	real	0..1			concentration (e.g. ppb)
ThresholdNOX	real	0..1			concentration (e.g. ppb)
ThresholdOZONE	real	0..1			concentration (e.g. ppb)
ThresholdPAH	real	0..1			concentration (e.g. ppb)
ThresholdPM10	real	0..1			concentration (e.g. ug/m3)
ThresholdSO2	real	0..1			concentration (e.g. ppb)

Relations

Type	Begin	End
association	AirQuality_Configuration class	AirQuality_Definition class
generalization	AirQuality_Configuration class	Object_Configuration class

7.5 AirQuality_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	The Air Quality object provides a dynamic overview of the pollutant levels monitored by the on street device.The Air Quality object has descriptive, location and validity attributes provided by the generic data objects. Configuration information threshold levels for the object may also be provided. This will allow comparisons of current pollutant levels against thresholds for use in automatic problem detections. Fault information, based on the generic Fault Support Object, whether communications faults or equipment faults can also be associated Air Quality objects. Associated fault types may be used to determine the type of fault that has occurred, e.g. comms failure, sensor failure.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	AirQuality_Quality	0..1			
TypeId	AirQuality_TypeID	0..1			

Relations

Type	Begin	End
association	AirQuality_Definition class	AirQuality_Commands class
association	AirQuality_Definition class	AirQuality_Configuration class
association	AirQuality_Definition class	AirQuality_TypeID class
association	AirQuality_Definition class	AirQuality_Quality class
generalization	AirQuality_Definition class	Device_Definition class
association	AirQuality_Definition class	AirQuality_Faults class
association	AirQuality_Definition class	AirQuality_Dynamic class
association	AirQuality_Definition class	AirQuality_Device_History class
association	AirQuality_Definition class	AirQuality_Basic_Data class

7.6 AirQuality_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to air quality measurement equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	AirQuality_Definition	1			

Relations

Type	Begin	End
generalization	AirQuality_Device_History class	Device_History class
association	AirQuality_Device_History class	AirQuality_Definition class

7.7 AirQuality_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Average pollutant concentration values taken over the specified period.

Attributes

Name	Type	Mult.	Key?	Max	Comments
BTX	real	0..1			concentration (e.g. ppb)
CO	real	0..1			concentration (e.g. ppb)
NO	real	0..1			concentration (e.g. ppb)
NO2	real	0..1			concentration (e.g. ppb)
NOX	real	0..1			concentration (e.g. ppb)
OZONE	real	0..1			concentration (e.g. ppb)
PAH	real	0..1			concentration (e.g. ppb)
Period	integer	0..1			Period in minutes over which the data has been measured
PM10	real	0..1			concentration (e.g. ug/m3)
QualityStatementID	AirQuality_Dynamic_Quality	0..1			Reference to quality of information for the dynamic data.
SO2	real	0..1			concentration (e.g. ppb)
SystemCodeNumber	AirQuality_Definition	1	PFK		

Relations

Type	Begin	End
generalization	AirQuality_Dynamic class	Object_Dynamic class
association	AirQuality_Dynamic class	AirQuality_Dynamic_Quality class
association	AirQuality_Dynamic class	AirQuality_Definition class

7.8 AirQuality_Dynamic_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about air quality dynamic data.

Relations

Type	Begin	End
generalization	AirQuality_Dynamic_Quality class	Quality class
association	AirQuality_Dynamic_Quality class	AirQuality_Dynamic class

7.9 AirQuality_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with air quality measurement equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	AirQuality_FaultType	1	PFK		
SystemCodeNumber	AirQuality_Definition	1	PFK		

Relations

Type	Begin	End
generalization	AirQuality_Faults class	Faults class
association	AirQuality_Faults class	AirQuality_Definition class
association	AirQuality_Faults class	AirQuality_FaultType class

7.10 AirQuality_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with air quality measurement equipment.

Relations

Type	Begin	End
generalization	AirQuality_FaultType class	FaultType class
association	AirQuality_FaultType class	AirQuality_Faults class

7.11 AirQuality_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about data on air quality equipment.

Relations

Type	Begin	End
association	AirQuality_Quality class	AirQuality_Definition class
generalization	AirQuality_Quality class	Quality class

7.12 AirQuality_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of Air Quality equipment. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = AQ Reference Monitor 2 = AQ Indicative Monitor 3 = AQ/MET Reference Monitor 4 = AQ/MET Indicative Monitor 999 = Other

Relations

Type	Begin	End
association	AirQuality_TypeID class	AirQuality_Definition class
generalization	AirQuality_TypeID class	TypeID class

8 CarPark Package

8.1 Introduction

General information

Qualified Name:	UTMC::CarPark
Comment:	Package for classes representing Car Parks and their control and information systems.

Diagrams

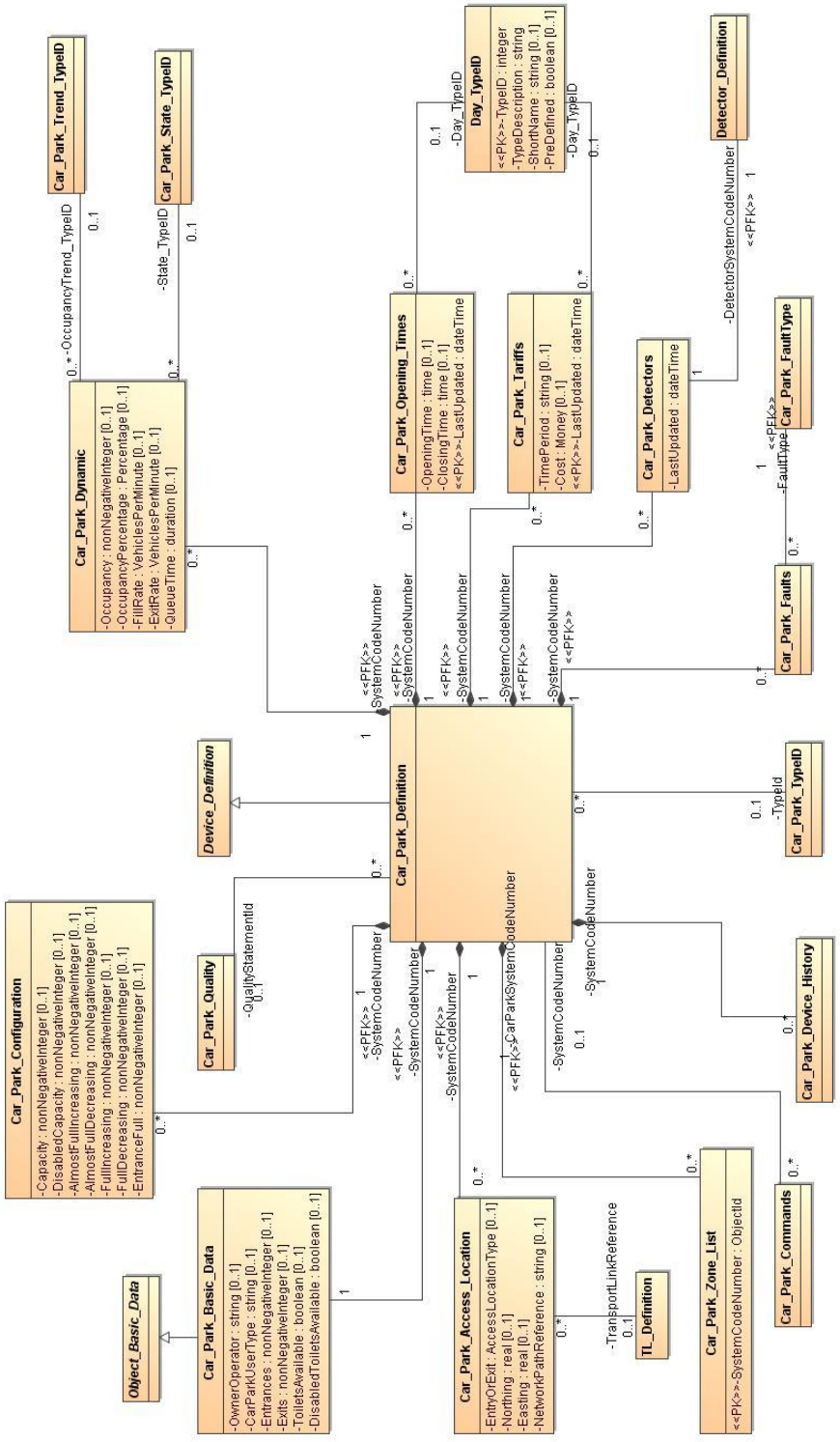


Figure 8-1: CarPark diagram

8.2 Car_Park_Access_Location Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Location of the entrances and exits to the car park.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Easting	real	0..1			Location of the entry/exit in OS grid coordinates.
EntryOrExit	AccessLocationType	0..1		1	Whether this access location is an entrance or an xit.
NetworkPathReference	string	0..1		32	Reference to the network link on which the car park resides.
Northing	real	0..1			Location of the entry/exit in OS grid coordinates.
SystemCodeNumber	Car_Park_Definition	1	PFK		Unique identifier for the car park.
TransportLinkReference	TL_Definition	0..1			Reference to the transport link on which the car park resides.

Relations

Type	Begin	End
association	Car_Park_Access_Location class	Car_Park_Definition class
association	Car_Park_Access_Location class	TL_Definition class

8.3 Car_Park_Basic_Data Class

General information

Base Classifier:	Object_Basic_Data
Is Abstract:	false
Comment:	Car park basic configuration data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CarParkUserType	string	0..1			Public representation of Car Park Type, e.g. Pay-on-Foot.
DisabledToiletsAvailable	boolean	0..1		1	Disabled Toilets available (Y/N).
Entrances	nonNegativeInteger	0..1			Number of entrances.
Exits	nonNegativeInteger	0..1			Number of exits.
OwnerOperator	string	0..1			Name of owner or operator.
SystemCodeNumber	Car_Park_Definition	1	PFK		
ToiletsAvailable	boolean	0..1		1	Toilets available (Y/N)

Relations

Type	Begin	End
generalization	Car_Park_Basic_Data class	Object_Basic_Data class
association	Car_Park_Basic_Data class	Car_Park_Definition class

8.4 Car_Park_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to car park systems.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Car_Park_Definition	0..1			

Relations

Type	Begin	End
generalization	Car_Park_Commands class	Command class
association	Car_Park_Commands class	Car_Park_Definition class

8.5 Car_Park_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Car Park configuration data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AlmostFullDecreasing	nonNegativeInteger	0..1			Value below which car park has spaces. Abbreviated to AFD. Must be less than AFI.
AlmostFullIncreasing	nonNegativeInteger	0..1			Value above which car park is almost full. Abbreviated to AFI.
Capacity	nonNegativeInteger	0..1			Total number of spaces.
DisabledCapacity	nonNegativeInteger	0..1			Number of disabled spaces.
EntranceFull	nonNegativeInteger	0..1			Value above which car park is full at its entrance.
FullDecreasing	nonNegativeInteger	0..1			Value below which car park becomes almost full from full. Abbreviated to FD. Must be less than FI and more than AFI.
FullIncreasing	nonNegativeInteger	0..1			Value above which car park is full. Abbreviated to FI. Must be greater than AFI.
SystemCodeNumber	Car_Park_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Car_Park_Configuration class	Object_Configuration class
association	Car_Park_Configuration class	Car_Park_Definition class

8.6 Car_Park_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	A car park

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Car_Park_Quality	0..1			
TypeId	Car_Park_TypeID	0..1			

Relations

Type	Begin	End
association	Car_Park_Definition class	Car_Park_Access_Location class
association	Car_Park_Definition class	Car_Park_Commands class
association	Car_Park_Definition class	Car_Park_Detectors class
association	Car_Park_Definition class	Car_Park_Device_History class
association	Car_Park_Definition class	VMS_Car_Park_List class
association	Car_Park_Definition class	Car_Park_Configuration class
generalization	Car_Park_Definition class	Device_Definition class
association	Car_Park_Definition class	Car_Park_Basic_Data class
association	Car_Park_Definition class	Car_Park_Dynamic class
association	Car_Park_Definition class	Car_Park_Prediction_Data class
association	Car_Park_Definition class	Car_Park_TypeID class
association	Car_Park_Definition class	Car_Park_Opening_Times class
association	Car_Park_Definition class	Car_Park_Tariffs class
association	Car_Park_Definition class	Car_Park_Zone_List class
association	Car_Park_Definition class	Car_Park_Quality class
association	Car_Park_Definition class	Car_Park_Profile_Data class
association	Car_Park_Definition class	Car_Park_Faults class

8.7 Car_Park_Detectors Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Associates a car park with its detectors

Attributes

Name	Type	Mult.	Key?	Max	Comments
DetectorSystemCodeNumber	Detector_Definition	1	PFK		Unique identifier for the detector.
LastUpdated	dateTime				Time/date of last change of this data.
SystemCodeNumber	Car_Park_Definition	1	PFK		Unique identifier for the car park.

Relations

Type	Begin	End
association	Car_Park_Detectors class	Car_Park_Definition class
association	Car_Park_Detectors class	Detector_Definition class

8.8 Car_Park_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to car park systems.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Car_Park_Definition	1			

Relations

Type	Begin	End
generalization	Car_Park_Device_History class	Device_History class
association	Car_Park_Device_History class	Car_Park_Definition class

8.9 Car_Park_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Car park dynamic data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ExitRate	VehiclesPerMinute	0..1			Rate in vehicles per minute.
FillRate	VehiclesPerMinute	0..1			Rate in vehicles per minute.
Occupancy	nonNegativeInteger	0..1			Number of occupied spaces.
OccupancyPercentage	Percentage	0..1			Occupancy*100/Capacity.
OccupancyTrend_TypeID	Car_Park_Trend_TypeID	0..1			Trend up, down or stay.
QueueTime	duration	0..1			Time to wait to gain entrance.
State_TypeID	Car_Park_State_TypeID	0..1			The state of the car park.
SystemCodeNumber	Car_Park_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Car_Park_Dynamic class	Object_Dynamic class
association	Car_Park_Dynamic class	Car_Park_Trend_TypeID class
association	Car_Park_Dynamic class	Car_Park_Definition class
association	Car_Park_Dynamic class	Car_Park_State_TypeID class

8.10 Car_Park_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with car park systems.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	Car_Park_FaultType	1	PFK		
SystemCodeNumber	Car_Park_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Car_Park_Faults class	Faults class
association	Car_Park_Faults class	Car_Park_FaultType class
association	Car_Park_Faults class	Car_Park_Definition class

8.11 Car_Park_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with car park system equipment.

Relations

Type	Begin	End
generalization	Car_Park_FaultType class	FaultType class
association	Car_Park_FaultType class	Car_Park_Faults class

8.12 Car_Park_Opening_Times Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Car park opening times.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ClosingTime	time	0..1			A time of day.
Day_TypeID	Day_TypeID	0..1			Day of the week.
LastUpdated	dateTime		PK		Time/date of last change of this data.
OpeningTime	time	0..1			A time of day.
SystemCodeNumber	Car_Park_Definition	1	PFK		Unique identifier for the car park.

Relations

Type	Begin	End
association	Car_Park_Opening_Times class	Car_Park_Definition class
association	Car_Park_Opening_Times class	Day_TypeID class

8.13 Car_Park_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about car park data.

Relations

Type	Begin	End
generalization	Car_Park_Quality class	Quality class
association	Car_Park_Quality class	Car_Park_Prediction class
association	Car_Park_Quality class	Car_Park_Definition class
association	Car_Park_Quality class	Car_Park_Profile class

8.14 Car_Park_State_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of car park state. Relates the State_TypeID field in Car Park Data object to a particular description. Values are as follows: 1: Faulty 2: Spaces 3: Almost Full 4: Full 5: Closed 6: Open 999: Other

Relations

Type	Begin	End
association	Car_Park_State_TypeID class	Car_Park_Dynamic class
Generalization	Car_Park_State_TypeID class	TypeID class

8.15 Car_Park_Tariffs Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Car park tariffs.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Cost	Money	0..1			Rate for this period.
Day_TypeID	Day_TypeID	0..1			Day of the week.
LastUpdated	dateTime		PK		Time/date of last change of this data.
SystemCodeNumber	Car_Park_Definition	1	PFK		Unique identifier for the car park.
TimePeriod	string	0..1			The range of times to which this tariff applies.

Relations

Type	Begin	End
association	Car_Park_Tariffs class	Car_Park_Definition class
association	Car_Park_Tariffs class	Day_TypeID class

8.16 Car_Park_Trend_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of car park occupancy trend. Relates the OccupancyTrend_TypeID field in Car Park Data object to a particular description. Values are as follows: 1: Down/Decreasing 2: Stay/Static 3: Up/Increasing 999: Other

Relations

Type	Begin	End
association	Car_Park_Trend_TypeID class	Car_Park_Dynamic class
generalization	Car_Park_Trend_TypeID class	TypeID class

8.17 Car_Park_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of car park system Values are as follows: 1: Intelligent (OTU) 2: Intelligent (OTU) with Closed Bit 3: Unintelligent 4: Unintelligent with Closed Bit 5: BCD with Closed Bit 6: Pay and Display 7: Pay on Foot 8: Intelligent (Serial) 999: Other

Relations

Type	Begin	End
generalization	Car_Park_TypeID class	TypeID class
association	Car_Park_TypeID class	Car_Park_Definition class

8.18 Car_Park_Zone_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	An instance identifies a specific zone related to a specific identified car park.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CarParkSystemCodeNumber	Car_Park_Definition	1	PFK		Unique identifier for a car park which is associated with the zone.
SystemCodeNumber	ObjectId		PK	32	id for the zone.

Relations

Type	Begin	End
association	Car_Park_Zone_List class	Car_Park_Definition class

9 CCTV Package

9.1 Introduction

General information

Qualified Name:	UTMC::CCTV
Comment:	Package for classes representing CCTV systems.

Diagrams

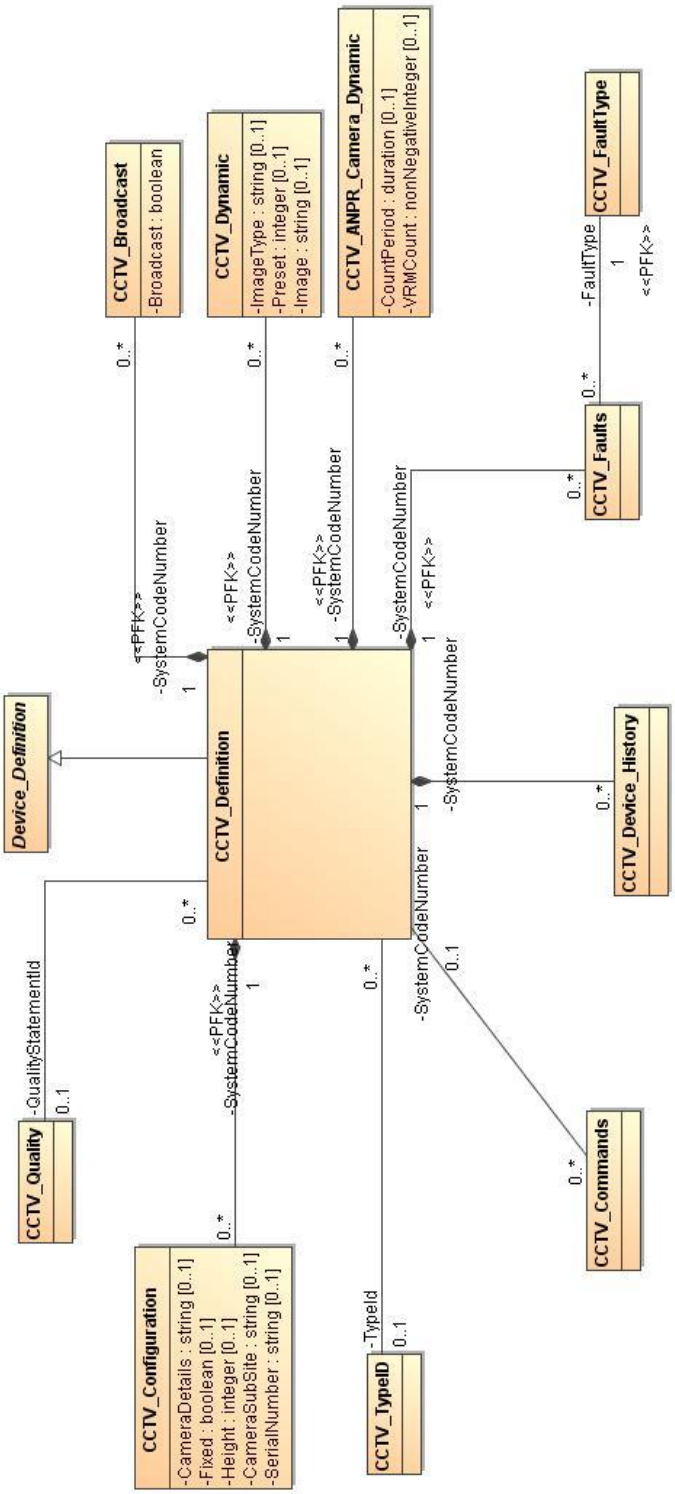


Figure 9-1: CCTV diagram

9.2 CCTV_ANPR_Camera_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Dynamic data collected by CCTV ANPR.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CountPeriod	duration	0..1			Period of sample. Typically 5 minute.
SystemCodeNumber	CCTV_Definition	1	PFK		
VRMCount	nonNegativeInteger	0..1			Vehicle Registration Marks counted in period.

Relations

Type	Begin	End
association	CCTV_ANPR_Camera_Dynamic class	CCTV_Definition class
generalization	CCTV_ANPR_Camera_Dynamic class	Object_Dynamic class

9.3 CCTV_Broadcast Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	CCTV broadcast status.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Broadcast	boolean			1	Image available for public Bx (Y/N).
SystemCodeNumber	CCTV_Definition	1	PFK		

Relations

Type	Begin	End
association	CCTV_Broadcast class	CCTV_Definition class
generalization	CCTV_Broadcast class	Object_Dynamic class

9.4 CCTV_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to CCTV equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	CCTV_Definition	0..1			

Relations

Type	Begin	End
association	CCTV_Commands class	CCTV_Definition class
generalization	CCTV_Commands class	Command class

9.5 CCTV_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Details of the camera installation.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CameraDetails	string	0..1			Description of the installation.
CameraSubSite	string	0..1		32	Reference to Camera Sub Site.
Fixed	boolean	0..1		1	Fixed (or Pan/Tilt/Zoom)? Y/N
Height	integer	0..1			Height (m) above ground level.
SerialNumber	string	0..1			Serial Number of Camera.
SystemCodeNumber	CCTV_Definition	1	PFK		

Relations

Type	Begin	End
generalization	CCTV_Configuration class	Object_Configuration class
association	CCTV_Configuration class	CCTV_Definition class

9.6 CCTV_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	A CCTV camera

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	CCTV_Quality	0..1			
TypeId	CCTV_TypeID	0..1			

Relations

Type	Begin	End
association	CCTV_Definition class	CCTV_TypeID class
association	CCTV_Definition class	CCTV_Commands class
association	CCTV_Definition class	CCTV_Broadcast class
association	CCTV_Definition class	CCTV_Quality class
generalization	CCTV_Definition class	Device_Definition class
association	CCTV_Definition class	CCTV_ANPR_Camera_Dynamic class
association	CCTV_Definition class	CCTV_Dynamic class
association	CCTV_Definition class	CCTV_Device_History class
association	CCTV_Definition class	CCTV_Faults class
association	CCTV_Definition class	CCTV_Configuration class

9.7 CCTV_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to CCTV equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	CCTV_Definition	1			

Relations

Type	Begin	End
generalization	CCTV_Device_History class	Device_History class
association	CCTV_Device_History class	CCTV_Definition class

9.8 CCTV_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	A CCTV image

Attributes

Name	Type	Mult.	Key?	Max	Comments
Image	string	0..1			Image in Hex character form. Note: CCTV Image: The current UTMC interface specification does not allow for the transfer of binary images. Therefore, two interim solutions are proposed: 1. The image file can be transferred within the CCTV_Dynamic record in the character field 'Image' using BASE64 encoding. Typical encoded image size is 40Kbytes. Note that where the local database implementation cannot handle large enough character fields the alternative solution (below) must be used. 2. The image file can be transferred outside the CCTV_Dynamic record, for example, by FTP. In this case the character field 'Image' contains the Filename.
ImageType	string	0..1			Description of the image format, e.g. jpg.
LastUpdated	dateTime	0..1			Time/date of last change of this data.
Preset	integer	0..1			Preset number if available.
SystemCodeNumber	CCTV_Definition	1	PFK		

Relations

Type	Begin	End
generalization	CCTV_Dynamic class	Object_Dynamic class
association	CCTV_Dynamic class	CCTV_Definition class

9.9 CCTV_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with CCTV equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	CCTV_FaultType	1	PFK		
SystemCodeNumber	CCTV_Definition	1	PFK		

Relations

Type	Begin	End
generalization	CCTV_Faults class	Faults class
association	CCTV_Faults class	CCTV_FaultType class
association	CCTV_Faults class	CCTV_Definition class

9.10 CCTV_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with CCTV equipment

Relations

Type	Begin	End
association	CCTV_FaultType class	CCTV_Faults class
generalization	CCTV_FaultType class	FaultType class

9.11 CCTV_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about CCTV data.

Relations

Type	Begin	End
generalization	CCTV_Quality class	Quality class
association	CCTV_Quality class	CCTV_Definition class

9.12 CCTV_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	TypeID values are as follows: 1 = Colour CCD camera 2 = B/W CCD camera 3 = Colour CCTV tube camera 4 = B/W CCTV tube camera 5 = ANPR camera 999 = Other

Relations

Type	Begin	End
association	CCTV_TypeID class	CCTV_Definition class
generalization	CCTV_TypeID class	TypeID class

10 CommonSubSystemSupport Package

10.1 Introduction

General information

Qualified Name:	UTMC::CommonSubSystemSupport
Comment:	Package for general classes defining UTMC sub-systems.

Diagrams

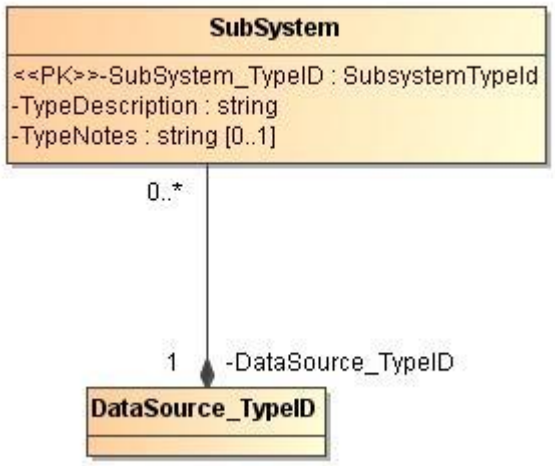


Figure 10-1: CommonSubSystemSupport diagram

10.2 SubSystem Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Subsystem that can supply UTMC information. The SubSystem_TypeID uniquely defines each of the subsytems that can supply information to the system. A subsystem belongs to a DataSource. Each DataSource can have zero, one or many subsystems that it supports. The subsystem object allows the system to manage and present a more accurate description of incoming fault information.

Attributes

Name	Type	Mult.	Key?	Max	Comments
DataSource_TypeID	DataSource_TypeID	1			Source of information, e.g. UTC
SubSystem_TypeID	SubsystemTypeId		PK		Identifier for equipment type. As agreed all authorised TypeIDs for each support object should be between 1 & 999. Private extensions to this would be in the following initial ranges: MOTTS 1000 - 1099 PEEK 1100 - 1199 TENET 1200 - 1299 THALES 1300 - 1399 SIEMENS 1400 - 1499 SERCO 1500-1599 SIEMENS 14000-14999
TypeDescription	string			64	Description of equipment type.
TypeNotes	string	0..1			Additional notes.

Relations

Type	Begin	End
association	SubSystem class	DataSource_TypeID class
association	SubSystem class	Faults class
association	SubSystem class	FaultType class

11 CommonSupport Package

11.1 Introduction

General information

Qualified Name:	UTMC::CommonSupport
Comment:	The classes in this package are supporting objects that are generically applicable to the major traffic objects. Each major traffic object should maintain an individual view/table of these support objects within its own domain rather than the objects being applied in a global domain.

Diagrams

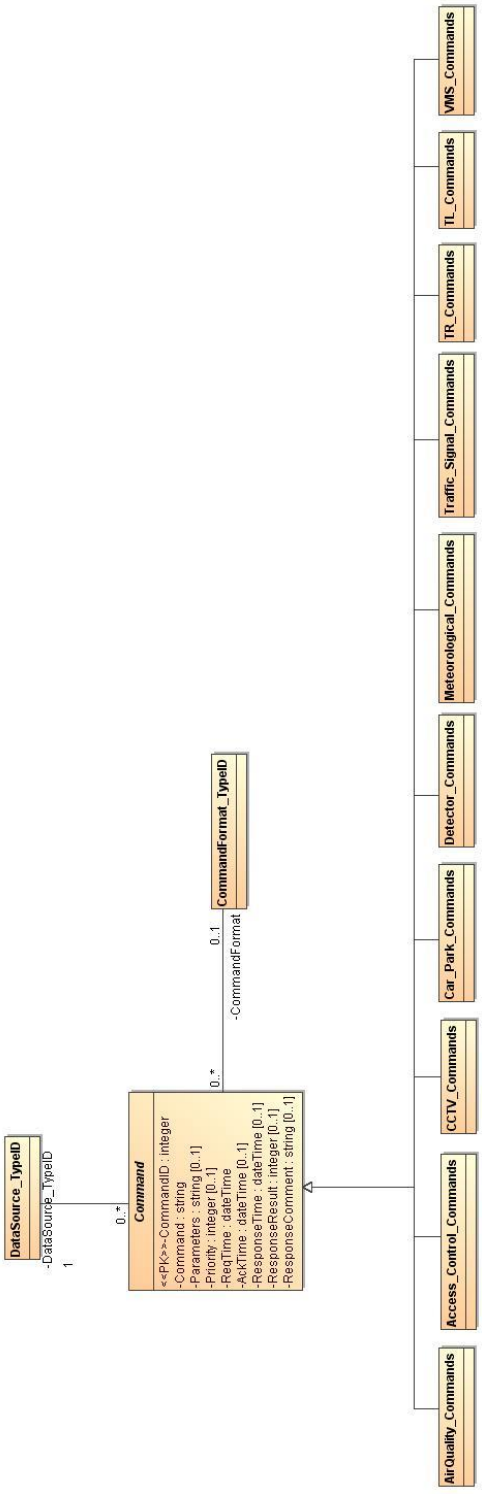


Figure 11-1: Commands diagram

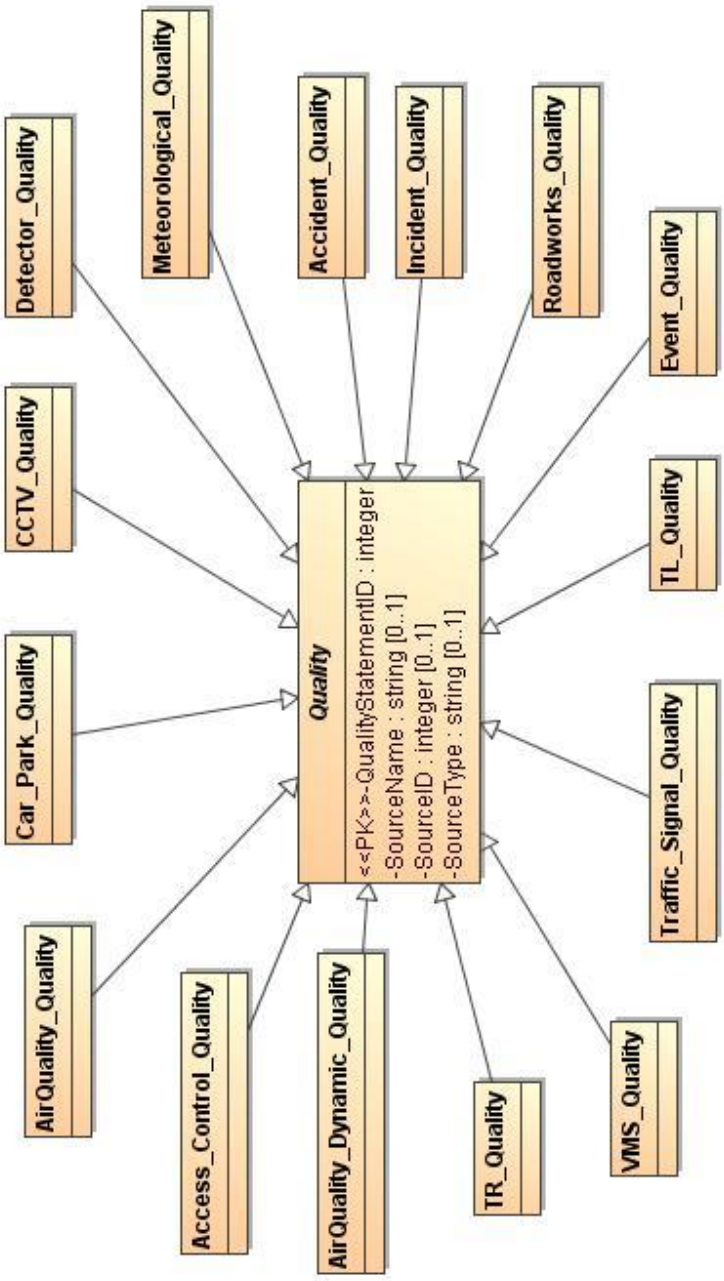


Figure 11-2: Quality diagram

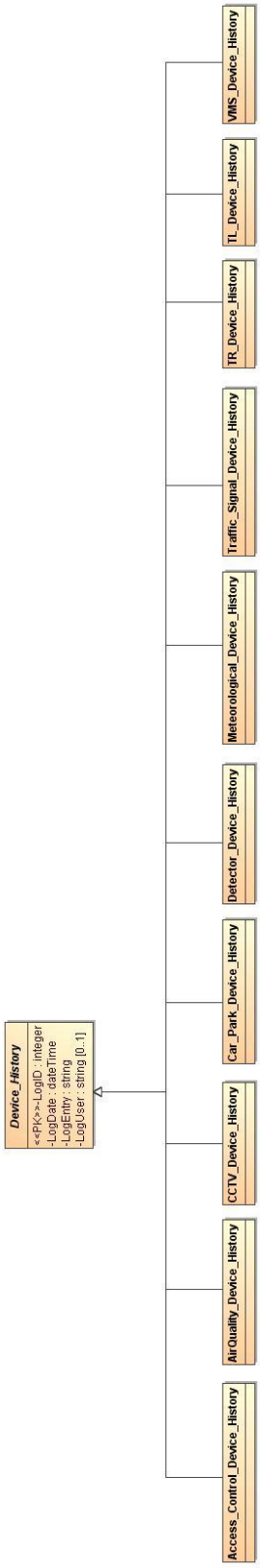


Figure 11-2: Device History diagram

11.2 Command Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Command block to allow requests to be sent to the CDB with field to allow acknowledgement and response. (Note all major objects which require a level of command input should have this block) This class should be subclassed for all major object types that are controllable. The class name will be appropriate for the object type e.g. VMS_COMMANDS for VMS, ACCESS_CONTROL_COMMANDS for access control. For intelligent in-station or out-station equipment it is possible for the CDB to act as a conduit for commands to be requested of the in-stations or out-stations. In these cases a block of attributes may be added to the object to manage the requests and feedback for any commands. The CDB has no execution rights for a command. The requesting application, such as the front end application, must have sufficient knowledge of the command to construct the request. Likewise the executor, in-station or out-station, must have sufficient knowledge to parse the command, execute it (if appropriate) and provide feedback. A generic approach has been developed for the efficient implementation of the high-level command needs of most data objects. Where this is not appropriate it does not preclude the potential addition of extra command structures for a specific data object. (This would of course require that the requestor and executor of the command are explicitly aware of these additional command structures. The CDB does not dictate the type of commands that may be used with a particular data type. Consider the example of a user at the front end application wanting to change a VMS sign to say “Use A999 for City Centre”. The front end application would allow the user to update the VMS object with the command structures of the form: COMMANDID=1024533 SYSTEMCODENUMBER='VMS01' COMMANDFORMAT=1 DATASOURCE_TYPEID=911 COMMAND='UPDATE' PARAMETERS=”Use A999 For City Centre”; PRIORITY=100; The CDB would then create the VMS Command Object with this request. It cannot do anything explicitly. The VMS sign is still in the state it was when the user made the request. A VMS adapter application would have a subscription to the VMS Command Object in the CDB. When the command attributes has been updated in the VMS command support object a notification would be pushed to the adapter application. The adapter application would examine the command attributes for the VMS optionally taking into account the command format and optionally the dataasource and update the acknowledge attribute in VMS Command Object to acknowledge receipt of the new command. At this stage the command to the VMS sign has been acknowledged but the actual sign on-street has not been changed. At an appropriate time the VMS adapter application would examine the command attributes and determine if the command should be executed. (The parameters may not be appropriate to the sign or the priority may not be sufficiently high). If the sign is updated on street the adapter application would then update the VMS sign dynamic attributes to reflect its true state and also update the command response and responsetype attributes to indicate that the command was

	successfully updated. Failed commands would be responded to but the VMS dynamic attributes would remain unchanged. At any stage the front end application can examine the VMS command object to determine if the command has been acknowledged and successfully or unsuccessfully completed.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AckTime	dateTime	0..1			Time at which the request was acknowledged.
Command	string			255	Actual command sent to equipment.
CommandFormat	CommandFormat_TypeID	0..1			Indicates the format of the command information.
CommandID	integer		PK		Unique identifier for the command object.
DataSource_TypeID	DataSource_TypeID	1			Reference to the data source of the object (SystemCodeNumber) that the command refers to.
Parameters	string	0..1		1024	Delimited list of parameters to be sent with the command.
Priority	integer	0..1			Level of priority associated with the request.
ReqTime	dateTime				Date/time at which request was made.
ResponseComment	string	0..1			Textual description of Reason For Failure.
ResponseResult	integer	0..1			Indicates if the request was executed or denied. Values have the following meanings: 1 Command Invalid 2 Command Valid 3 Command Implemented 4 Command Timed out
ResponseTime	dateTime	0..1			Time at which equipment responded.

Relations

Type	Begin	End
generalization	Detector_Commands class	Command class
generalization	Traffic_Signal_Commands class	Command class
generalization	TR_Commands class	Command class
generalization	AirQuality_Commands class	Command class
generalization	Car_Park_Commands class	Command class
generalization	Meteorological_Commands class	Command class
association	Command class	DataSource_TypeID class
generalization	TL_Commands class	Command class
association	Command class	CommandFormat_TypeID class
generalization	Access_Control_Commands class	Command class
generalization	VMS_Commands class	Command class
generalization	CCTV_Commands class	Command class

11.3 CommandFormat_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Indicates the format of the associated command information. 1 = discrete command information, 2 = combined command information

Relations

Type	Begin	End
generalization	CommandFormat_TypeID class	TypeID class
association	CommandFormat_TypeID class	Command class

11.4 Device_History Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	For some of the data objects it is useful to maintain a log of significant events that happen to the physical equipment on street. Where this appropriate the log data attributes will allow a user to add human readable descriptions of such a significant event. For instance, the on-street equipment for an Air Quality monitor may be replaced with a re-calibrated monitor. In system terms the Air Quality monitor is still the same as it was before but the re-calibration may result in better quality data being reported. This class should be subclassed for all major object types that have a logging requirement. The class name will be appropriate for the object type e.g. VMS_DEVICE_HISTORY for VMS.

Attributes

Name	Type	Mult.	Key?	Max	Comments
LogDate	dateTime				Date/time at which the log entry was made. Log data (Note all major objects should have this block if they wish to maintain a user input history of significant events)
LogEntry	string			200	Equipment log data. Log data (Note all major objects should have this block if they are to maintain a user input history of significant events)
LogID	integer		PK		Unique identifier for the log entry.
LogUser	string	0..1		200	User who entered the log entry. Log data (Note all major objects should have this block if they which to maintain a user input history of significant events)

Relations

Type	Begin	End
generalization	CCTV_Device_History class	Device_History class
generalization	Car_Park_Device_History class	Device_History class
generalization	Access_Control_Device_History class	Device_History class
generalization	VMS_Device_History class	Device_History class
generalization	Traffic_Signal_Device_History class	Device_History class
generalization	Detector_Device_History class	Device_History class
generalization	TR_Device_History class	Device_History class
generalization	TL_Device_History class	Device_History class
generalization	AirQuality_Device_History class	Device_History class
generalization	Meteorological_Device_History class	Device_History class

11.5 Quality Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	This class is provided for potential inclusion of the UTMC07/17 quality statements. The quality support object provides information about the source and (optionally) quality level of the data associated with a Traffic Object. In some cases the object may have a single constant quality source of information in which case a single quality object may be associated with the static definition of the object. In other cases an object may have variety of sources for included information in which case a number of quality objects may be associated with the each dynamic set of information. This class should will be subclassed for all major object types that have a quality requirement. The class name will be appropriate for the object type e.g. CAR_PARK_QUALITY for carparks.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementID	integer		PK		Unique identifier for the quality statement.
SourceID	integer	0..1			Identifier for the data.
SourceName	string	0..1		200	Source of the data
SourceType	string	0..1		200	Type of the source.

Relations

Type	Begin	End
generalization	CCTV_Quality class	Quality class
generalization	AirQuality_Dynamic_Quality class	Quality class
generalization	Incident_Quality class	Quality class
generalization	VMS_Quality class	Quality class
generalization	Event_Quality class	Quality class
generalization	Traffic_Signal_Quality class	Quality class
generalization	Access_Control_Quality class	Quality class
generalization	Roadworks_Quality class	Quality class
generalization	TR_Quality class	Quality class
generalization	TL_Quality class	Quality class
generalization	Car_Park_Quality class	Quality class
generalization	Accident_Quality class	Quality class
generalization	AirQuality_Quality class	Quality class
generalization	Meteorological_Quality class	Quality class
generalization	Detector_Quality class	Quality class

12 CommonTypeIDSupport Package

12.1 Introduction

General information

Qualified Name:	UTMC::CommonTypeIDSupport
Comment:	As agreed all authorised typeIDs for each support object should be between 1 & 999. Private extensions to this would be in the following initial ranges: MOTTS 1000 - 1099 PEEK 1100 - 1199 TENET 1200 - 1299 THALES 1300 - 1399 SIEMENS 1400 - 1499 SERCO 1500-1599 AMEY 1600-1699 SIEMENS 14000-14999

Diagrams

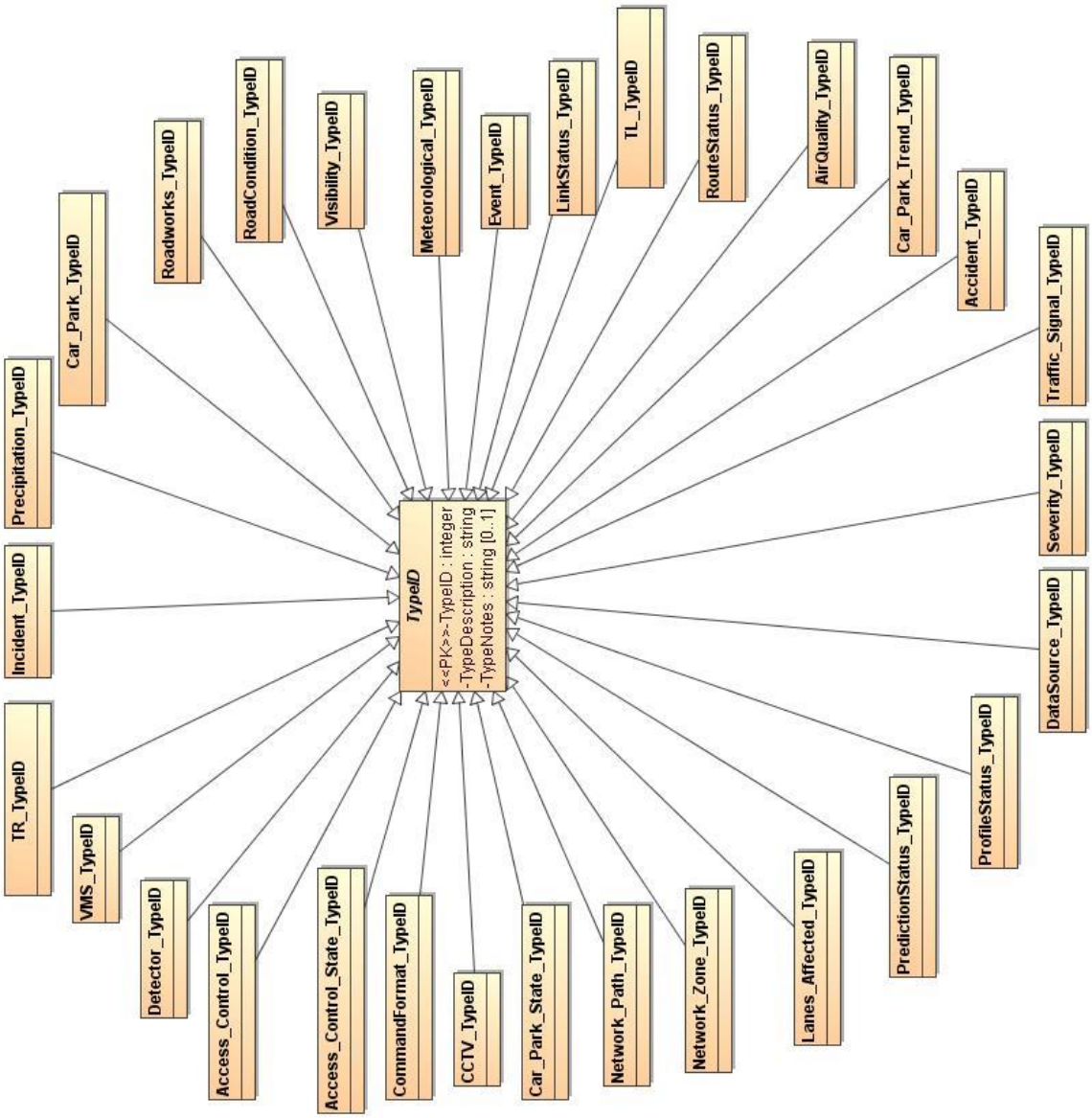


Figure 12-1: CommonTypeIDSupport diagram

12.2 TypeID Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	The TypeID Support Object provides a lookup field for type associations with each Data Object type.

Attributes

Name	Type	Mult.	Key?	Max	Comments
TypeDescription	string			64	Description of equipment type.
TypeID	integer		PK		Identifier for equipment type. As agreed all authorised typeIDs for each support object should be between 1 & 999. Private extensions to this would be in the following initial ranges MOTTS 1000 - 1099 PEEK 1100 - 1199 TENET 1200 - 1299 THALES 1300 - 1399 SIEMENS 1400 - 1499 SERCO 1500 - 1599 SIEMENS 14000 - 14999
TypeNotes	string	0..1		255	Additional notes.

Relations

Type	Begin	End
generalization	Network_Zone_TypeID class	TypeID class
generalization	Meteorological_TypeID class	TypeID class
generalization	Precipitation_TypeID class	TypeID class
generalization	VMS_TypeID class	TypeID class
generalization	Detector_TypeID class	TypeID class
generalization	CCTV_TypeID class	TypeID class
generalization	Roadworks_TypeID class	TypeID class
generalization	Event_TypeID class	TypeID class
generalization	Car_Park_TypeID class	TypeID class
generalization	Car_Park_Trend_TypeID class	TypeID class
generalization	DataSource_TypeID class	TypeID class
generalization	Car_Park_State_TypeID class	TypeID class
generalization	RouteStatus_TypeID class	TypeID class
generalization	Access_Control_State_TypeID class	TypeID class
generalization	ProfileStatus_TypeID class	TypeID class
generalization	Access_Control_TypeID class	TypeID class
generalization	AirQuality_TypeID class	TypeID class
generalization	Incident_TypeID class	TypeID class
generalization	Traffic_Signal_TypeID class	TypeID class
generalization	PredictionStatus_TypeID class	TypeID class
generalization	Visibility_TypeID class	TypeID class
generalization	Accident_TypeID class	TypeID class
generalization	Severity_TypeID class	TypeID class
generalization	Network_Path_TypeID class	TypeID class
generalization	RoadCondition_TypeID class	TypeID class
generalization	TL_TypeID class	TypeID class
generalization	CommandFormat_TypeID class	TypeID class
generalization	Lanes_Affected_TypeID class	TypeID class
generalization	TR_TypeID class	TypeID class
generalization	LinkStatus_TypeID class	TypeID class

13 DataTypes Package

13.1 Introduction

13.1.1 This section contains both UTMC-specific datatypes and more general datatypes selected for use in UTMC from the Highways Agency's Metadata Registry.

General information

Qualified Name:	UTMC::DataTypes
Comment:	Package for UTMC-specific primitive datatypes.

13.2 AccessLocationType Enumeration

General Information

Base Classifier:	
Owned Literal:	entrance exit
Visibility:	Public
Comment:	Type of access location e.g. an entrance or an exit.

13.3 Data types

General Information

Name:	boolean
Comment:	boolean has the value space required to support the mathematical concept of binary-valued logic: {true, false}.

Name:	duration
Comment:	duration represents a duration of time. The value space of duration is a six-dimensional space where the coordinates designate the Gregorian year, month, day, hour, minute, and second components defined in § 5.5.3.2 of [ISO 8601], respectively. The values of the year, month, day, hour and minutes components are not restricted but allow an arbitrary unsigned integer. The value of the seconds component allows an arbitrary unsigned decimal.

Name:	integer
Comment:	integer represents the standard mathematical concept of the integer numbers. The value space of integer is the infinite set {..., -2, -1, 0, 1, 2, ...}.

Name:	KilometresPerHour
Comment:	Specialised decimal number representing a value of speed in kilometres per hour.

Name:	Metres
Comment:	Specialised decimal number representing a dimension in metres.

Name:	Money
Comment:	Specialised decimal number representing an amount of money. The currency is unspecified and left to the implementation context to define.

Name:	nonNegativeInteger
Comment:	nonNegativeInteger represents the standard mathematical concept of the non-negative integers. The value space of nonNegativeInteger is the infinite set {0,1,2,...}.

Name:	normalizedString
Comment:	The value space of normalizedString is the set of strings that do not contain carriage return, line feed or tab characters.

Name:	ObjectId
Comment:	String with maximum size of 32 characters, used to uniquely identify an object.

Name:	Percentage
Comment:	The set of percentages may have a value domain equivalent to the value domain of decimals, but the semantics are more specific - the value of the percentage is to be understood as a numerator of a fraction where 100 is the denominator. For example a percentage with value of 70.0 is understood to mean the same thing as a ratio of 0.7 or 7/10. Note that percentages outside the value domain of 0.0 to 100.0 are legal and that more restricted types should be used if a more constrained value domain is required.

Name:	PlanNumber
Comment:	A specialised integer uniquely identifying a plan

Name:	positiveInteger
Comment:	positiveInteger represents the standard mathematical concept of the positive integers. The value space of positiveInteger is the infinite set {1,2,...}.

Name:	real
Comment:	A real number

Name:	string
Comment:	The string datatype represents character strings. The value space of string is the set of finite-length sequences of characters. A character is an atomic unit of communication. Every character has a corresponding Universal Character Set code point (as defined in ISO/IEC 10646), which is an integer.

Name:	VehiclesPerHour
Comment:	Specialised real number representing a traffic flow value expressed in units of vehicles per hour.

Name:	VehiclesPerMinute
Comment:	Specialised real number representing a value of traffic flow in vehicles per minute.

Name:	WholeDegrees
Comment:	Specialised integer number representing an angle expressed in degrees in the range 0 to 360.

Name:	WholeMetres
Comment:	Specialised integer number representing a dimension in metres.

14 DayTypeSupport Package

14.1 Introduction

General information

Qualified Name:	UTMC::DayTypeSupport
Comment:	Package for classes representing day types and their mapping to specific dates.

Diagrams

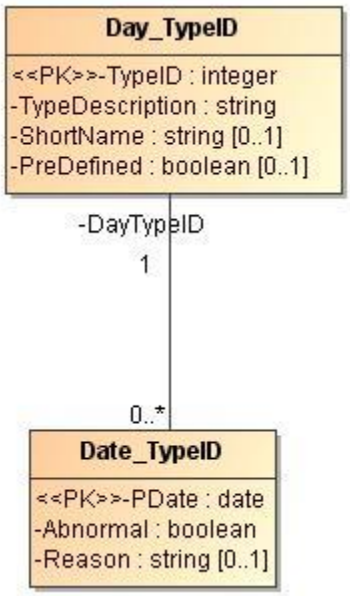


Figure 14-1: DayTypeSupport diagram

14.2 Date_TypeID Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A specific date and its mapping to a day category. Use to accomodate special dates such as Easter Bank Holidays (e.g. 28/04/2005).

Attributes

Name	Type	Mult.	Key?	Max	Comments
Abnormal	boolean			1	Abnormal date Y/N?
DayTypeID	Day_TypeID	1			Index to DayType support object
PDate	date		PK		Date being defined
Reason	string	0..1		100	Reason for abnormal date

Relations

Type	Begin	End
association	Date_TypeID class	Day_TypeID class

14.3 Day_TypeID Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	This object supports the definition of normal and specifc day types that can be accessed by other components such as Car_Park_Opening_Times , XXX_Profiles and XXX_Predictions. A series of predefined day type are provided for normal days of the week. Special day types can be defined to accomodate special days such as Race Days and special dates (through the relationship with Date_TypeID).

Attributes

Name	Type	Mult.	Key?	Max	Comments
PreDefined	boolean	0..1		1	Predefined Y/N
ShortName	string	0..1			Short name, e.g. Mon
TypeDescription	string				Name, e.g. Monday
TypeID	integer		PK		Identifier for DayTypeID List of Predefined Day Types: 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday 7 = Sunday The maximum value shall be 100

Relations

Type	Begin	End
association	Day_TypeID class	Car_Park_Opening_Times class
association	Day_TypeID class	Prediction class
association	Day_TypeID class	Profile class
association	Day_TypeID class	Car_Park_Tariffs class
association	Day_TypeID class	Date_TypeID class

15 Detector Package

15.1 Introduction

General information

Qualified Name:	UTMC::Detector
Comment:	Package for classes representing traffic detection devices.

Diagrams

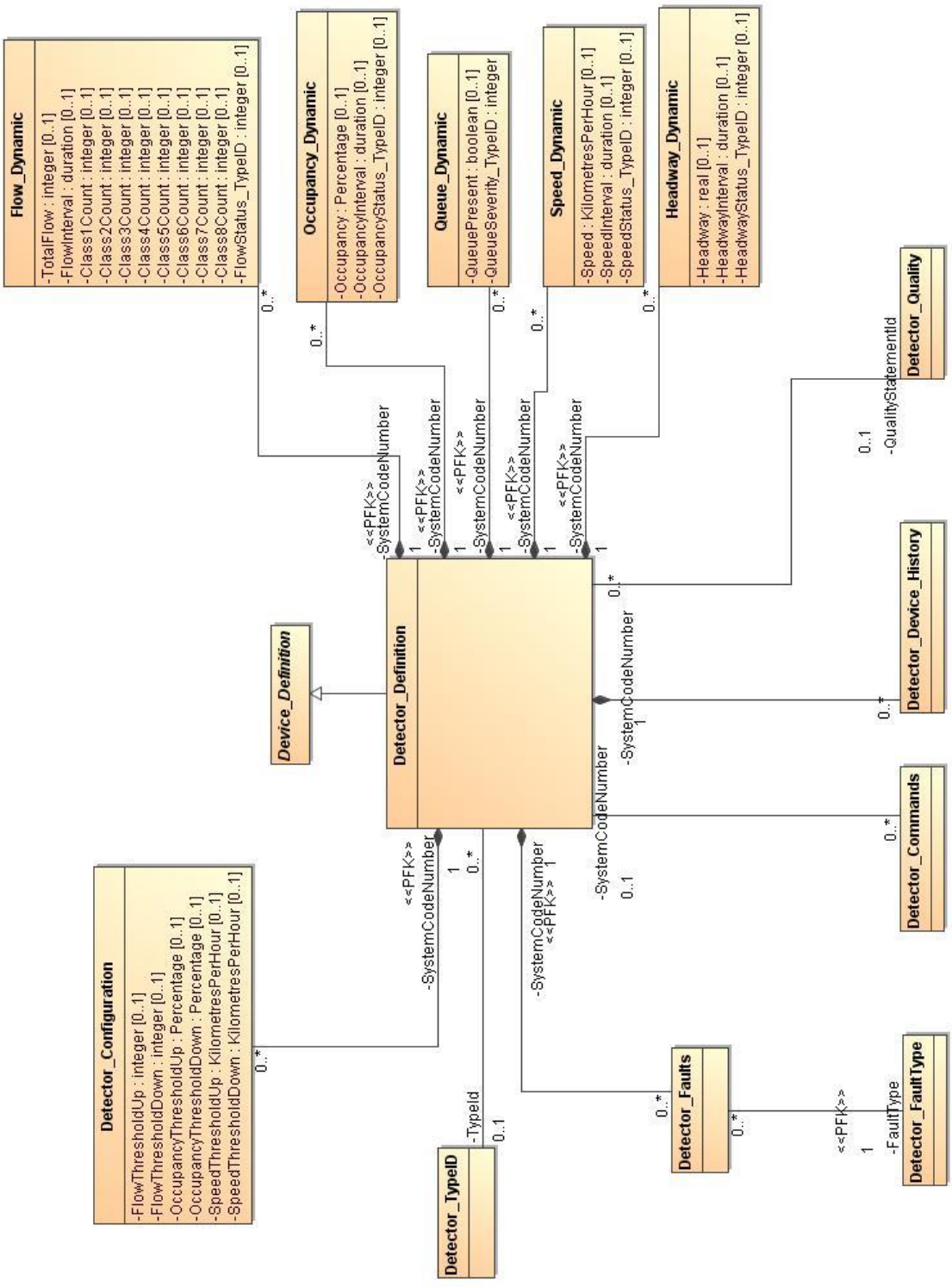


Figure 15-1: Detector diagram

15.2 Detector_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to traffic detection equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Detector_Definition	0..1			

Relations

Type	Begin	End
generalization	Detector_Commands class	Command class
association	Detector_Commands class	Detector_Definition class

15.3 Detector_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Details of the detector configuration.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FlowThresholdDown	integer	0..1			Value below which flow is considered normal.
FlowThresholdUp	integer	0..1			Value above which flow is "abnormal".
OccupancyThresholdDown	Percentage	0..1			Percentage below which occupancy is normal.
OccupancyThresholdUp	Percentage	0..1			Percentage above which occupancy is abnormal.
SpeedThresholdDown	KilometresPerHour	0..1			Value below which average speed is considered normal.
SpeedThresholdUp	KilometresPerHour	0..1			Value above which average speed is considered "abnormal".
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Detector_Configuration class	Object_Configuration class
association	Detector_Configuration class	Detector_Definition class

15.4 Detector_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	A traffic detector

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Detector_Quality	0..1			
TypeId	Detector_TypeID	0..1			

Relations

Type	Begin	End
association	Detector_Definition class	Speed_Dynamic class
association	Detector_Definition class	Detector_Device_History class
association	Detector_Definition class	Car_Park_Detectors class
association	Detector_Definition class	Detector_Commands class
association	Detector_Definition class	Detector_Prediction_Data class
association	Detector_Definition class	Detector_Profile_Data class
association	Detector_Definition class	Detector_Faults class
association	Detector_Definition class	Flow_Dynamic class
association	Detector_Definition class	Occupancy_Dynamic class
association	Detector_Definition class	Queue_Dynamic class
association	Detector_Definition class	Detector_Configuration class
generalization	Detector_Definition class	Device_Definition class
association	Detector_Definition class	Detector_TypeID class
association	Detector_Definition class	Headway_Dynamic class
association	Detector_Definition class	Detector_Quality class

15.5 Detector_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to traffic detection equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Detector_Definition	1			

Relations

Type	Begin	End
association	Detector_Device_History class	Detector_Definition class
generalization	Detector_Device_History class	Device_History class

15.6 Detector_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with traffic detection equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	Detector_FaultType	1	PFK		
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
association	Detector_Faults class	Detector_FaultType class
generalization	Detector_Faults class	Faults class
association	Detector_Faults class	Detector_Definition class

15.7 Detector_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with traffic detection equipment.

Relations

Type	Begin	End
association	Detector_FaultType class	Detector_Faults class
generalization	Detector_FaultType class	FaultType class

15.8 Detector_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about traffic detector data.

Relations

Type	Begin	End
generalization	Detector_Quality class	Quality class
association	Detector_Quality class	Detector_Profile class
association	Detector_Quality class	Detector_Definition class
association	Detector_Quality class	Detector_Prediction class

15.9 Detector_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Proposed typeIDs are: 1 = SCOOT Loops 2 = Count 3 = Occupancy 4 = Speed 5 = Queue 6 = Bus 999 = Undefined

Relations

Type	Begin	End
generalization	Detector_TypeID class	TypeID class
association	Detector_TypeID class	Detector_Definition class

15.10 Flow_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Details of the flow detector status. Flows are absolute values measured in the flow interval.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Class1Count	integer	0..1			Flow in FlowInterval minutes.
Class2Count	integer	0..1			Flow in FlowInterval minutes.
Class3Count	integer	0..1			Flow in FlowInterval minutes.
Class4Count	integer	0..1			Flow in FlowInterval minutes.
Class5Count	integer	0..1			Flow in FlowInterval minutes.
Class6Count	integer	0..1			Flow in FlowInterval minutes.
Class7Count	integer	0..1			Flow in FlowInterval minutes.
Class8Count	integer	0..1			Flow in FlowInterval minutes.
FlowInterval	duration	0..1			Period for flow data collection.
FlowStatus_TypeID	integer	0..1			Status value (validity of the dynamic value). Valid values for this attribute include: 0 = Normal 1 = Suspect (only Total Flow Supplied) 2 = Suspect
SystemCodeNumber	Detector_Definition	1	PFK		
TotalFlow	integer	0..1			Flow in FlowInterval minutes.

Relations

Type	Begin	End
association	Flow_Dynamic class	Detector_Definition class
generalization	Flow_Dynamic class	Object_Dynamic class

15.11 Headway_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Status of the headway detector

Attributes

Name	Type	Mult.	Key?	Max	Comments
Headway	real	0..1			Average headway value in seconds between each vehicle
HeadwayInterval	duration	0..1			Period for headway data collection
HeadwayStatus_TypeID	integer	0..1			Status value (validity of the dynamic value) Valid values for this attribute include: 0 = Normal 1 = Suspect
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Headway_Dynamic class	Object_Dynamic class
association	Headway_Dynamic class	Detector_Definition class

15.12 Occupancy_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Status of the occupancy detector.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Occupancy	Percentage	0..1			Occupancy percentage in OccupancyInterval minutes.
OccupancyInterval	duration	0..1			Period for occupancy data collection.
OccupancyStatus_TypeID	integer	0..1			Status value (validity of the dynamic value) Valid values for this attribute include: 0 = Normal 1 = Suspect
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Occupancy_Dynamic class	Object_Dynamic class
association	Occupancy_Dynamic class	Detector_Definition class

15.13 Queue_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Status of the queue detector.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QueuePresent	boolean	0..1		1	Queue present (Y/N).
QueueSeverity_TypeID	integer				Severity of Queue Valid values for this attribute include: 0 = Normal Traffic 1 = Dense Traffic 2 = Delayed Traffic 3 = Congested Traffic 4 = Stop and Go Traffic
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Queue_Dynamic class	Object_Dynamic class
association	Queue_Dynamic class	Detector_Definition class

15.14 Speed_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Status of the speed detector.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Speed	KilometresPerHour	0..1			Average speed in kph over Interval minutes.
SpeedInterval	duration	0..1			Period for speed data collection.
SpeedStatus_TypeID	integer	0..1			Status value (validity of the dynamic value) Valid values for this attribute include: 0 = Normal 1 = Suspect
SystemCodeNumber	Detector_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Speed_Dynamic class	Object_Dynamic class
association	Speed_Dynamic class	Detector_Definition class

16 Event Package

16.1 Introduction

General information

Qualified Name:	UTMC::Event
Comment:	Package for classes representing planned events that could have an impact on traffic.

Diagrams

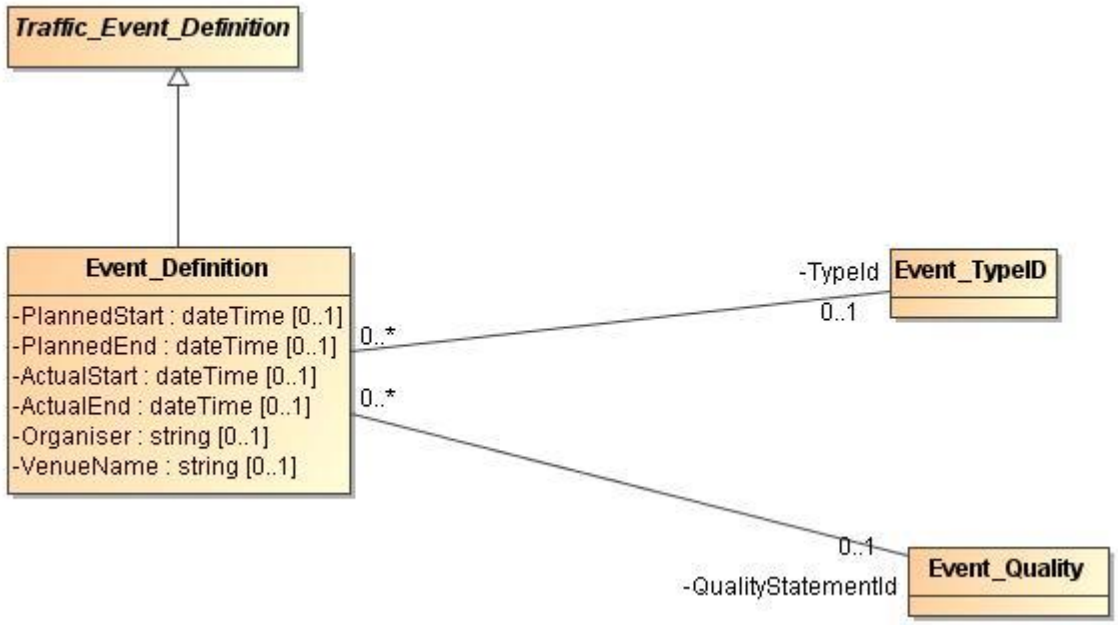


Figure 16-1: Event diagram

16.2 Event_Definition Class

General information

Base Classifier:	Traffic_Event_Definition
Is Abstract:	false
Comment:	An event is a planned occurrence that may have an incidental affect on the traffic flow in an area. Typically such event include race meetings, concerts etc. The default attributes for an event (identification, description, location) are covered by the Standard Data Attributes. Details on the type of event and the organiser of the event are provided. The planned dates for the event are available together with fields to indicate when the event actually starts and finishes. For planning purposes a zone describing an extended set of links over which the event may have an effect is available. A diversion, if appropriate, may also be associated with the event. Authorisation for the event, to determine if it should be included in any analysis or reported is provided. By making the systemcodenumber and creationdate the key a history of changes can be kept for audit purposes etc.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ActualEnd	dateTime	0..1			Actual duration of event.
ActualStart	dateTime	0..1			Actual duration of event.
Organiser	string	0..1			Name of the organiser.
PlannedEnd	dateTime	0..1			Planned duration of event.
PlannedStart	dateTime	0..1			Planned duration of event.
QualityStatementId	Event_Quality	0..1			
TypeId	Event_TypeID	0..1			
VenueName	string	0..1			Name of the venue.

Relations

Type	Begin	End
generalization	Event_Definition class	Traffic_Event_Definition class
association	Event_Definition class	Event_Quality class
association	Event_Definition class	Event_TypeID class

16.3 Event_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about planned event data.

Relations

Type	Begin	End
generalization	Event_Quality class	Quality class
association	Event_Quality class	Event_Definition class

16.4 Event_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of event. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = BALL GAME 2 = BOXING TOURNAMENT 3 = ATHLETICS MEETING 4 = CEREMONIAL EVENT 5 = CRICKET MATCH 6 = CYCLE RACE 7 = DEMONSTRATION 8 = EVENT 9 = EXHIBITION 10 = FAIR 11 = FESTIVAL 12 = FOOTBALL MATCH 13 = FUNFAIR 14 = GOLF TOURNAMENT 15 = INTERNATIONAL SPORTS MEETING 16 = MAJOR EVENT 17 = MARATHON 18 = MARCH 19 = MARKET 20 = MATCH 21 = PARADE 22 = PROCESSION 23 = RACE MEETING 24 = RUGBY MATCH 25 = SHOW 26 = SHOW JUMPING 27 = SPORTS EVENT 28 = SPORTS MEETING 29 = STATE OCCASION 30 = STRIKE 31 = TENNIS TOURNAMENT 32 = TOURNAMENT 33 = TRADE FAIR 34 = WATER SPORTS MEETING 35 = WINTER SPORTS MEETING 999 = OTHER

Relations

Type	Begin	End
generalization	Event_TypeID class	TypeID class
association	Event_TypeID class	Event_Definition class

17 FaultSupport Package

17.1 Introduction

General information

Qualified Name:	UTMC::FaultSupport
Comment:	Package for abstract and general classes related to faults of UTMC equipment.

Diagrams

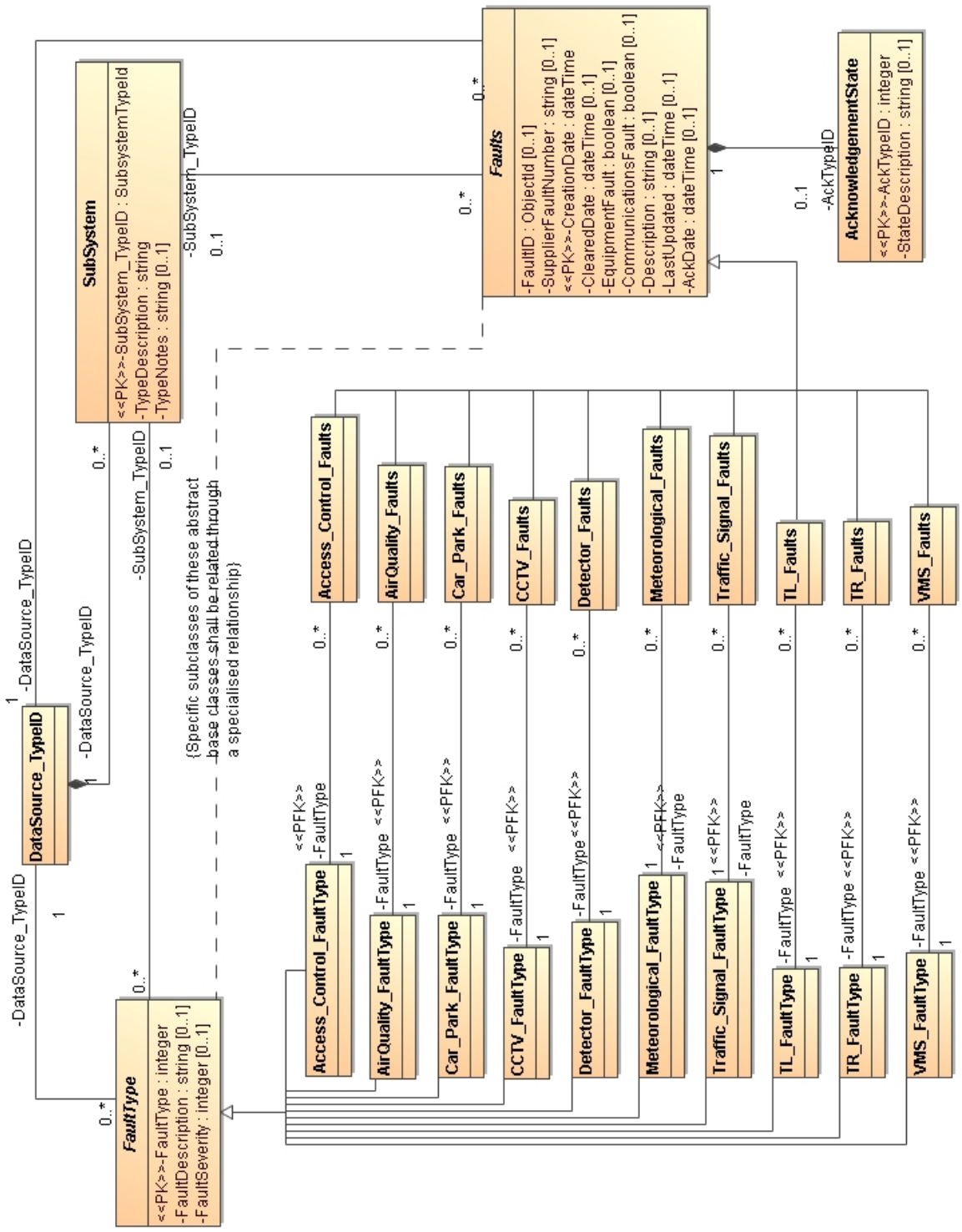


Figure 17-1: Faults and FaultTypes diagram

17.2 AcknowledgementState Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Global Support Object for all Fault Types. Acknowledgement state indicates how an operator has responded to fault information. This will allow operators to confirm that a fault has been explicitly dealt with, ignored , deferred etc. Predefined values are as follows: 0: not acknowledged 1: acknowledged 2: deferred 3: recorded for action

Attributes

Name	Type	Mult.	Key?	Max	Comments
AckTypeID	integer		PK		Identifier for the acknowledgement state.
StateDescription	string	0..1			Description of the acknowledgement state.

Relations

Type	Begin	End
association	AcknowledgementState class	Faults class

17.3 Faults Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for representing a fault associated with an object. The fault block allows for any fault information related to a particular object to be defined in a consistent manner. This block provides a mechanism for both predefined referenced faults (FaultType) or non defined faults (description etc.). A new fault object will be created for each unique fault instance that occurs. As the fault progresses through the various stages this fault object will be updated by setting the AckTypeID and AckDate when a new state is set and the ClearedDate field will be set when the fault instance is cleared. This class will be specialised for all major object types that have fault information. The class name will be appropriate for the object type e.g. VMS_Faults for VMS signs, Access_Control_Faults for access control.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AckDate	dateTime	0..1			Date on which the fault was acknowledged.
AckTypeID	AcknowledgementState	0..1			Status of the acknowledgement.
ClearedDate	dateTime	0..1			Date and time that the fault was cleared.
CommunicationsFault	boolean	0..1		1	Faulty Y/N?
CreationDate	dateTime		PK		Date and time that the fault record was created
DataSource_TypeID	DataSource_TypeID	1			
Description	string	0..1			Text describing the fault.
EquipmentFault	boolean	0..1		1	Faulty Y/N?
FaultID	ObjectId	0..1		32	Unique identifier for the fault
LastUpdated	dateTime	0..1			Time/date of last fault information
SubSystem_TypeID	SubSystem	0..1			
SupplierFaultNumber	string	0..1		32	Allocated by the supplier/configuration manager for maintenance purposes if required.

Relations

Type	Begin	End
generalization	TL_Faults class	Faults class
generalization	CCTV_Faults class	Faults class
generalization	VMS_Faults class	Faults class
generalization	Meteorological_Faults class	Faults class
association	Faults class	SubSystem class
association	Faults class	DataSource_TypeID class
generalization	Traffic_Signal_Faults class	Faults class
generalization	Car_Park_Faults class	Faults class
association	Faults class	AcknowledgementState class
generalization	TR_Faults class	Faults class
generalization	AirQuality_Faults class	Faults class
generalization	Access_Control_Faults class	Faults class
generalization	Detector_Faults class	Faults class

17.4 FaultType Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for classifying faults associated with an object. The fault type allows for description of known fault types and an associated severity. This allows , where it is possible, for some level of automated interpreation of the fault status of a Data Object. Predefined values are as follows: 0: No fault 999: Unknown type This class should be specialised for all major object types with fault information. The class name will be appropriate for the object type e.g. VMS_FaultType for VMS signs, Access_Control_FaultType for access control.

Attributes

Name	Type	Mult.	Key?	Max	Comments
DataSource_TypeID	DataSource_TypeID	1			
FaultDescription	string	0..1			Description of the fault.
FaultSeverity	integer	0..1			Severity of the fault.
FaultType	integer		PK		Identifier for the fault type.
SubSystem_TypeID	SubSystem	0..1			

Relations

Type	Begin	End
generalization	Car_Park_FaultType class	FaultType class
generalization	Access_Control_FaultType class	FaultType class
generalization	Meteorological_FaultType class	FaultType class
generalization	Traffic_Signal_FaultType class	FaultType class
generalization	TL_FaultType class	FaultType class
generalization	VMS_FaultType class	FaultType class
association	FaultType class	SubSystem class
generalization	TR_FaultType class	FaultType class
generalization	AirQuality_FaultType class	FaultType class
generalization	CCTV_FaultType class	FaultType class
generalization	Detector_FaultType class	FaultType class
association	FaultType class	DataSource_TypeID class

18 GlobalSupportObject Package

18.1 Introduction

General information

Qualified Name:	UTMC::GlobalSupportObject
Comment:	Package for enumerations that can be re-used by various specific functional packages.

18.2 DataSource_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Identifies a data source. Predefined values are: 1 QMISS 2 MIDAS 3 NTCC (National Traffic Control Centre) 901 RCC (1) (To be advised) 902 RCC (2) (To be advised) 903 RCC (3) (To be advised) 904 RCC (4) (To be advised) 905 RCC (5) (To be advised) 906 RCC (6) (To be advised)

Relations

Type	Begin	End
association	DataSource_TypeID class	Profile class
association	DataSource_TypeID class	SubSystem class
association	DataSource_TypeID class	Command class
association	DataSource_TypeID class	Object_Definition class
association	DataSource_TypeID class	Faults class
generalization	DataSource_TypeID class	TypeID class
association	DataSource_TypeID class	Prediction class
association	DataSource_TypeID class	FaultType class

18.3 Lanes_Affected_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of the lanes affected. Relates the ClosureCodes field in the object to a particular description. Values are as follows: T means the lane is closed I means the lane is open 0 = this means the road is fully open 1 = T 2 = I 3 = I T 4 = T I 5 = T T 6 = I I 7 = I I I 8 = I I T 9 = T I I 10 = I T T 11 = T T I 12 = T T T 13 = I I I I 14 = T I I I 15 = I I I T 16 = T T I I 17 = I I T T 18 = T T T I 19 = I T T T 20 = T T T T

Relations

Type	Begin	End
association	Lanes_Affected_TypeID class	Traffic_Event_Definition class
generalization	Lanes_Affected_TypeID class	TypeID class

18.4 Precipitation_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of precipitation. Defined Types: 0 D Dry 1 DZ Drizzle 2 R Persistent rain 3 SH Showers 4 SL Sleet 5 SN Snow 6 SLSH Sleet showers 7 SNSH Snow showers 8 TS Thunderstorms 9 H Hail

Relations

Type	Begin	End
generalization	Precipitation_TypeID class	TypeID class
association	Precipitation_TypeID class	Meteorological_Dynamic class

18.5 RoadCondition_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classifies the road condition Defined types: 1 Dry 2 Wet 3 Deep Water 4 Frost 5 Ice 6 Black Ice 7 Snow

Relations

Type	Begin	End
generalization	RoadCondition_TypeID class	TypeID class
association	RoadCondition_TypeID class	Meteorological_Dynamic class

18.6 Severity_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of severity. Relates the SeverityLevel field in the object to a particular description. Values are as follows: 1 = Unknown 2 = Low 3 = Medium 4 = High 999 = Other

Relations

Type	Begin	End
generalization	Severity_TypeID class	TypeID class
association	Severity_TypeID class	Traffic_Event_Definition class

18.7 Visibility_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classifies the visibility. Defined types: 1 Sunny - Sunshine for most of the day, usually more than 80% of possible daytime sun. 2 Sunny periods - More sunshine than cloud, the sun shining for periods of an hour or more at a time. 3 Sunny Intervals/Spells - Intermittent sunshine during the day, usually less than 50% of possible daytime sun. 4 Bright - Generally cloudy, but the cloud thin enough for weak shadows. There may be a few glimpses of the sun, but usually adding up to less than 1 hour. 5 Cloudy/Overcast - Cloud nearly or completely covering the sky, with no shadows. 6 Dull/Misty - Similar to cloudy/overcast but with poorer visibility, usually between 1500 and 5000 metres. 7 Hazy - Used when horizontal visibility is reduced by smoke particles or other pollutants with visibility between 2000 metres and 10km. It can be either sunny or cloudy when hazy. 8 Foggy - Used when horizontal visibility is below 1000 metres.

Relations

Type	Begin	End
generalization	Visibility_TypeID class	TypeID class
association	Visibility_TypeID class	Meteorological_Dynamic class

19 Incident Package

19.1 Introduction

General information

Qualified Name:	UTMC::Incident
Comment:	Package for classes representing unplanned incidents that are relevant to traffic management.

Diagrams

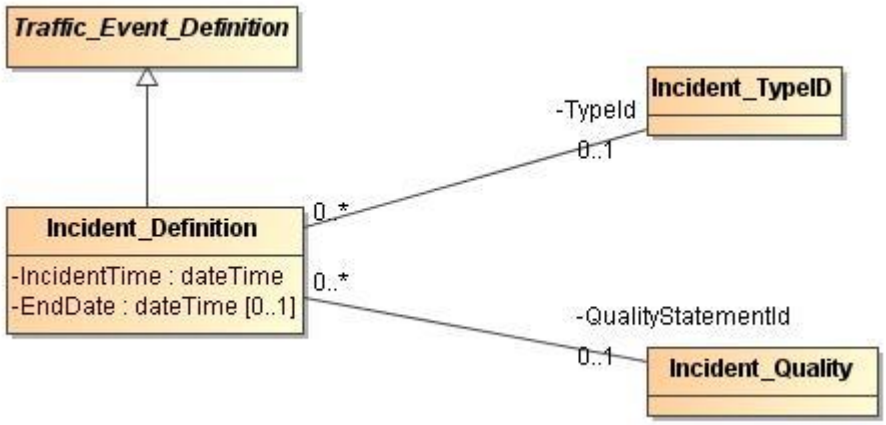


Figure 19-1: Incident diagram

19.2 Incident_Definition Class

General information

Base Classifier:	Traffic_Event_Definition
Is Abstract:	false
Comment:	An incident is an unplanned occurrence that may have a direct affect on the traffic flow in an area or may need to be recorded for other purposes even if it has no impact on the traffic flow. The default attributes for an incident (identification, description, location) are covered by the Standard Data Attributes. An incident differs from an accident in that it does not require information on vehicle numbers or conditions. Additional details on the type of incident are provided. Incidents can be confirmed\authorised to ensure that unconfirmed incidents can be filtered out by external applications. (This is dependent on suitable operator procedures being available). By making the the systemcodenumber and creationdate, the key a history of changes can be kept for audit purposes etc.

Attributes

Name	Type	Mult.	Key?	Max	Comments
EndDate	dateTime	0..1			Date/time when the incident is expected to be or when it actually was cleared.
IncidentTime	dateTime				Date/time when the incident occurred.
QualityStatementId	Incident_Quality	0..1			
TypeId	Incident_TypeID	0..1			

Relations

Type	Begin	End
association	Incident_Definition class	Incident_Quality class
association	Incident_Definition class	Incident_TypeID class
generalization	Incident_Definition class	Traffic_Event_Definition class

19.3 Incident_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about data on unplanned incidents.

Relations

Type	Begin	End
generalization	Incident_Quality class	Quality class
association	Incident_Quality class	Incident_Definition class

19.4 Incident_TypeID Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Type of incident. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = ABNORMAL LOAD(S) 2 = AIR CRASH 3 = AIR RAID 4 = ANIMALS ON THE ROAD 5 = ATTACK ON VEHICLE 6 = AVALANCHES 7 = BLASTING WORK 8 = BOMB ALERT 9 = BREAKDOWN 10 = BRIDGE BLOCKED 11 = BRIDGE CLOSED 12 = BRIDGE DEMOLITION WORK 13 = BRIDGE MAINTENANCE WORK 14 = BRIDGE OPENING 15 = BROKEN DOWN BUS(ES) 16 = BROKEN DOWN HEAVY LORRY(IES) 17 = BROKEN DOWN VEHICLE(S) 18 = BURST PIPE 19 = BURST WATER MAIN 20 = BUS DISRUPTION 21 = BUS LANE BLOCKED 22 = BUS LANE CLOSED 23 = CENTRE LANE(S) BLOCKED 24 = CENTRE LANE(S) CLOSED 25 = CHEMICAL SPILLAGE ACCIDENT(S) 26 = CHILDREN ON ROADWAY 27 = CIVIL EMERGENCY 28 = CIVIL EMERGENCY CANCELLED 29 = CLOSED DUE TO SMOG ALERT 30 = CONGESTION 31 = CONTRAFLOW 32 = CONVOY(S) 33 = CROWD 34 = CYCLISTS ON ROADWAY 35 = DIVERSION 36 = EMERGENCY ALERT (EXTRA GENERATED TRAFFIC) 37 = FACILITIES CLOSED 38 = FAULT 39 = FIRE 40 = FLOOD 41 = FLOW 42 = FOG 43 = GAWKING TRAFFIC - RUBBER NECKERS 44 = GUNFIRE ON ROADWAY 45 = HAIL 46 = HEAVY FLOW 47 = ICE 48 = LANE CLOSURE 49 = LIGHT FAULT 50 = OBSTRUCTION 51 = PEOPLE ON ROADWAY 52 = POLLUTION 53 = POWER FAILURE 54 = PUBLIC DISTURBANCE 55 = QUEUE 56 = RADIOACTIVE LEAK 57 = RAIN 58 = RIOT 59 = ROAD CLOSURE 60 = ROADSIDE FIRE 61 = SANDSTORMS 62 = SECURITY ALERT 63 = SECURITY INCIDENT 64 = SIGHTSEERS OBSTRUCTING ACCESS 65 = SNOW 66 = SPEED RESTRICTION 67 = SPILLAGE 68 = SPRAY HAZARD 69 = STRUCTURAL DAMAGE 70 = TELEPHONE FAULT 71 = TEMPORARY SIGNAL 72 = TERRORIST INCIDENT 73 = TORNADOES 74 = TRAFFIC SIGNAL FAULT 75 = TRAIN DISRUPTION 76 = UNEXPLAINED DAMAGE 77 = UNEXPLAINED EVENT 78 = WASHOUT 79 = WIND 999 = OTHER

Relations

Type	Begin	End
generalization	Incident_TypeID class	TypeID class
association	Incident_TypeID class	Incident_Definition class

20 Meteorological Package

20.1 Introduction

General information

Qualified Name:	UTMC::Meteorological
Comment:	Package for classes representing Car Parks and their control and information systems.

Diagrams

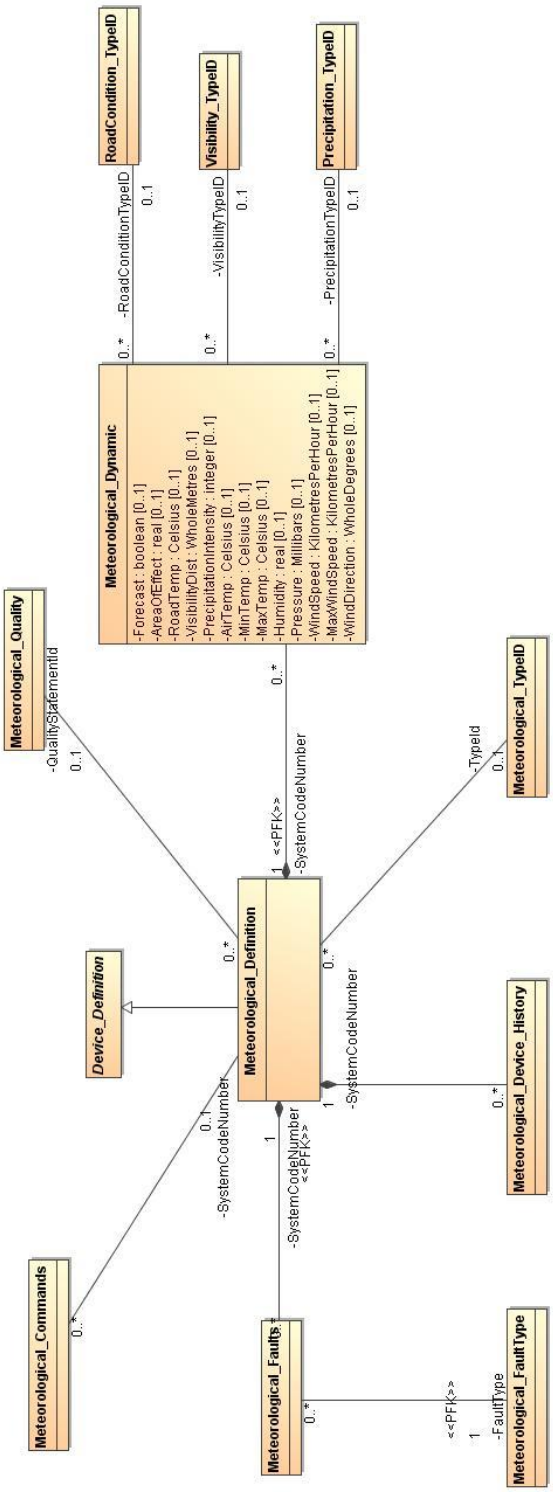


Figure 20-1: Meteorological diagram

20.2 Meteorological_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to meteorological equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Meteorological_Definition	0..1			

Relations

Type	Begin	End
generalization	Meteorological_Commands class	Command class
association	Meteorological_Commands class	Meteorological_Definition class

20.3 Meteorological_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	The meteorological object describes the weather conditions at a current point in time or the forecast conditions. Information about the device may be logged using a generic log table for the Meteorological data. Fault information,based on the generic Fault Support Object,may be stored for the meteorological object where appropriate.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Meteorological_Quality	0..1			
TypeId	Meteorological_TypeID	0..1			

Relations

Type	Begin	End
association	Meteorological_Definition class	Meteorological_Device_History class
association	Meteorological_Definition class	Meteorological_Commands class
generalization	Meteorological_Definition class	Device_Definition class
association	Meteorological_Definition class	Meteorological_Faults class
association	Meteorological_Definition class	Meteorological_Quality class
association	Meteorological_Definition class	Meteorological_Dynamic class
association	Meteorological_Definition class	Meteorological_TypeID class

20.4 Meteorological_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to meteorological equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Meteorological_Definition	1			

Relations

Type	Begin	End
association	Meteorological_Device_History class	Meteorological_Definition class
generalization	Meteorological_Device_History class	Device_History class

20.5 Meteorological_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Dynamic data on weather conditions at a current point in time or the forecast conditions.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AirTemp	Celsius	0..1			Current air temperature (degrees C).
AreaOfEffect	real	0..1			General area in kilometers radius from device centre.
Forecast	boolean	0..1		1	Indicates if the data is forecast or actual (Y/N). N is actual, Y is forecast.
Humidity	real	0..1			Current humidity level.
MaxTemp	Celsius	0..1			Maximum expected temperature (degrees C).
MaxWindSpeed	KilometresPerHour	0..1			Maximum expected wind speed (kph).
MinTemp	Celsius	0..1			Minimum expected temperature (degrees C).
PrecipitationIntensity	integer	0..1			Indication of precipitation intensity. Higher the value the more intense the precipitation is.
PrecipitationTypeID	Precipitation_TypeID	0..1			Type of precipitation. Id relates to a one of a number of standard types. (e.g. rain, hail, snow).
Pressure	Millibars	0..1			Atmospheric pressure (mB).
RoadConditionTypeID	RoadCondition_TypeID	0..1			Indication of road condition. Id relates to a one of a number of standard types. (Dry, wet, icy, snow covered).
RoadTemp	Celsius	0..1			Current road temperature (degrees C).
SystemCodeNumber	Meteorological_Definition	1	PFK		
VisibilityDist	WholeMetres	0..1			Visibility distance (metres).
VisibilityTypeID	Visibility_TypeID	0..1			Indication of visibility problems. Id relates to a one of a number of standard types. (e.g. clear, hazy, foggy).
WindDirection	WholeDegrees	0..1			Wind direction expressed in degrees from device Northing.
WindSpeed	KilometresPerHour	0..1			Average wind speed (kph).

Relations

Type	Begin	End
generalization	Meteorological_Dynamic class	Object_Dynamic class
association	Meteorological_Dynamic class	Precipitation_TypeID class
association	Meteorological_Dynamic class	RoadCondition_TypeID class
association	Meteorological_Dynamic class	Visibility_TypeID class
association	Meteorological_Dynamic class	Meteorological_Definition class

20.6 Meteorological_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with meteorological equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	Meteorological_FaultType	1	PFK		
SystemCodeNumber	Meteorological_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Meteorological_Faults class	Faults class
association	Meteorological_Faults class	Meteorological_Definition class
association	Meteorological_Faults class	Meteorological_FaultType class

20.7 Meteorological_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with meteorogical equipment.

Relations

Type	Begin	End
generalization	Meteorological_FaultType class	FaultType class
association	Meteorological_FaultType class	Meteorological_Faults class

20.8 Meteorological_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about meteorological data.

Relations

Type	Begin	End
generalization	Meteorological_Quality class	Quality class
association	Meteorological_Quality class	Meteorological_Definition class

20.9 Meteorological_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Proposed typeIDs are 1 = Automated Station

Relations

Type	Begin	End
generalization	Meteorological_TypeID class	TypeID class
association	Meteorological_TypeID class	Meteorological_Definition class

21 NetworkSupport Package

21.1 Introduction

General information

Qualified Name:	UTMC::NetworkSupport
Comment:	Package for classes representing road network geometry, topology, routing, and zoning.

Diagrams

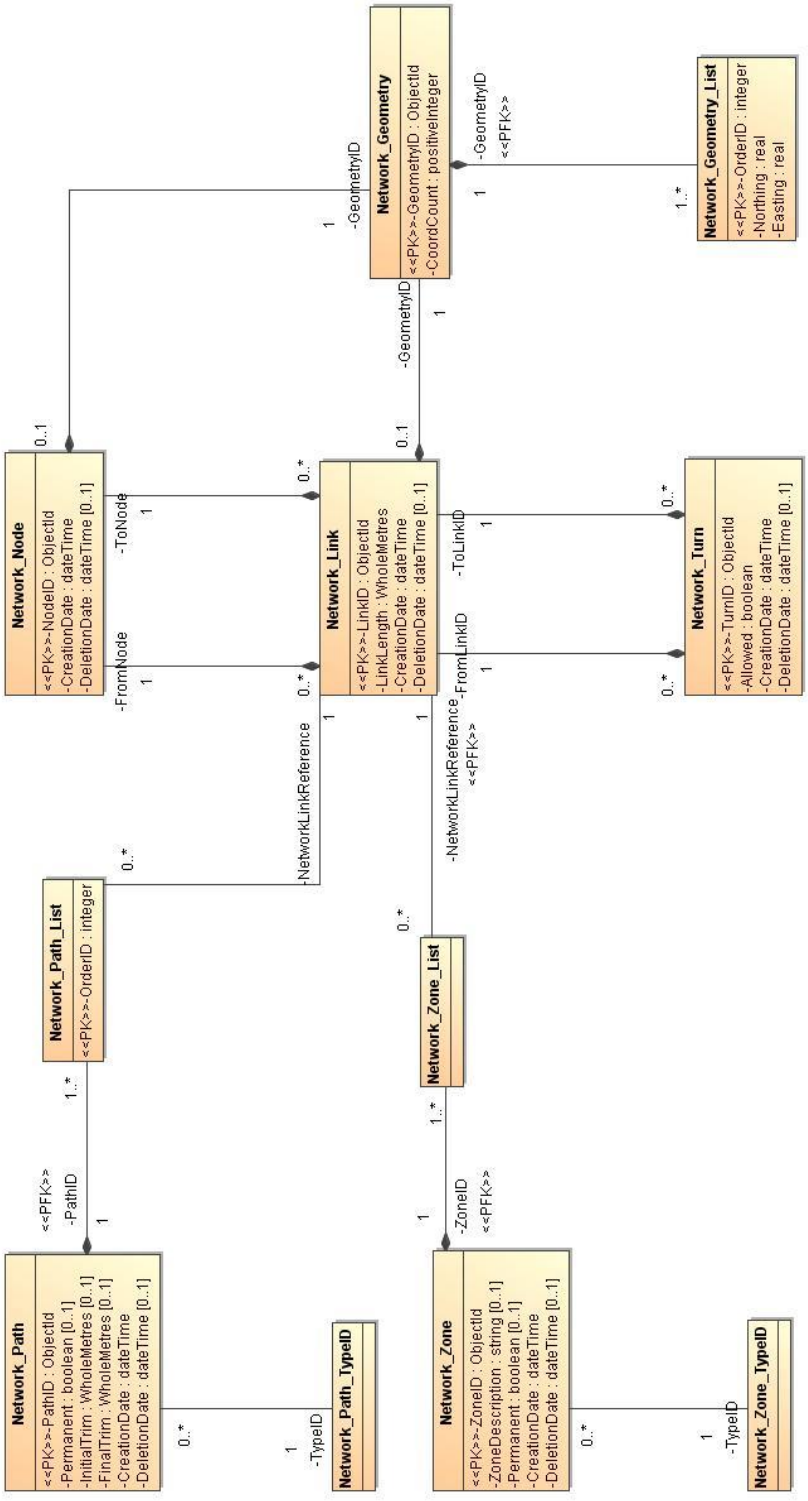


Figure 21-1: NetworkSupport diagram

21.2 Network_Geometry Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	The geometry object is used to represent any geographical context for a link or node. It consists of an ordered list of co-ordinates.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CoordCount	positiveInteger				Number of coordinates which describe the geometry.
GeometryID	ObjectId		PK	32	Unique identifier for the geometry.

Relations

Type	Begin	End
association	Network_Geometry class	Network_Node class
association	Network_Geometry class	Network_Geometry_List class
association	Network_Geometry class	Network_Link class

21.3 Network_Geometry_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Each instance is a pair of coordinates with an identifier

Attributes

Name	Type	Mult.	Key?	Max	Comments
Easting	real				http://www.bbc.co.uk/travelnews/xml/
GeometryID	Network_Geometry	1	PFK		Unique identifier for the geometry.
Northing	real				Attributes for an individual coordinate in the geometry.
OrderID	integer		PK		Attributes for an individual coordinate in the geometry.

Relations

Type	Begin	End
association	Network_Geometry_List class	Network_Geometry class

21.4 Network_Link Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A network link represents a one way connection between two network nodes. It is defined by a unique identifier (amongst links), the references to its source and destination node and a reference to the geometry that represents it geographical extent. The link length is also provided for convenience, though this can be derived from the geometry. The validity period for the link is represented by a creation and deletion date.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CreationDate	dateTime				Date/time at which the link was entered in the database. Creation and deletion dates represent the lifetime of the link in the system. Links should be maintained in the DB for historical purposes.
DeletionDate	dateTime	0..1			Date at which the link was deleted. Creation and deletion dates represent the lifetime of the link in the system. Links should be maintained in the DB for historical purposes.
FromNode	Network_Node	1			Identifier of the node from which the link emanates.
GeometryID	Network_Geometry	1			Identifier for the geometry which defines the geographical extent of the link.
LinkID	ObjectId		PK	32	Unique identifier for the link.
LinkLength	WholeMetres				Length of link (in metres).
ToNode	Network_Node	1			Identifier of the node at which the link arrives.

Relations

Type	Begin	End
association	Network_Link class	Network_Node class
association	Network_Link class	Network_Zone_List class
association	Network_Link class	Network_Turn class
association	Network_Link class	Network_Turn class
association	Network_Link class	Network_Node class
association	Network_Link class	Network_Path_List class
association	Network_Link class	Network_Geometry class

21.5 Network_Node Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A network node defines a point of connection between two or more network link objects. It is purely defined by a unique identifier (amongst nodes) and a reference to the geometry that represents its geographical location. The validity period for the node is represented by a creation and deletion date.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CreationDate	dateTime				Date/time at which the node was entered in the database. Creation and deletion dates represent the lifetime of the node in the system. Nodes should be maintained in the DB for historical purposes.
DeletionDate	dateTime	0..1			Date at which node was deleted. Creation and deletion dates represent the lifetime of the node in the system. Nodes should be maintained in the DB for historical purposes.
GeometryID	Network_Geometry	1			Identifier for the geometry which defines the geographical extent of the node.
NodeID	ObjectId		PK	32	Unique identifier for the node.

Relations

Type	Begin	End
association	Network_Node class	Network_Geometry class
association	Network_Node class	Network_Link class
association	Network_Node class	Network_Link class

21.6 Network_Path Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A network path is an ordered collection of links. This is used in association with Transport Route Object to support instances such as Journey Time and Bus Service. Each network route is uniquely identified and has an ordered list of network links that determine its direction and extent. The Network Path may be trimmed at both start an end for those paths which do not start or end at a node.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CreationDate	dateTime				Date/time at which the route was entered in the database. Creation and deletion dates represent the lifetime of the object in the system.
DeletionDate	dateTime	0..1			Date at which route was deleted. Creation and deletion dates represent the lifetime of the object in the system.
FinalTrim	WholeMetres	0..1			Distance in metres from the endnode that the path actually ends. Some routes such as bus services and journey times do not usually end at junctions and so this allows for trimming.
InitialTrim	WholeMetres	0..1			Distance in metres from the start node that the path actually starts. Some routes such as bus services and journey times do not usually end at junctions and so this allows for trimming.

Name	Type	Mult.	Key?	Max	Comments
PathID	ObjectId		PK	32	Unique identifier for the defined path.
Permanent	boolean	0..1		1	Is route permanent (Y) or transitory (N).
TypeID	Network_Path_TypeID	1			Type of the path.

Relations

Type	Begin	End
association	Network_Path class	Network_Path_List class
association	Network_Path class	Network_Path_TypeID class

21.7 Network_Path_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	This component repeats for every link in the path.

Attributes

Name	Type	Mult.	Key?	Max	Comments
NetworkLinkReference	Network_Link	1			LinkReference to be included in the path.
OrderID	integer		PK		Order of the link reference in the path.
PathID	Network_Path	1	PFK		Unique identifier for the defined path.

Relations

Type	Begin	End
association	Network_Path_List class	Network_Path class
association	Network_Path_List class	Network_Link class

21.8 Network_Path_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of network path.

Relations

Type	Begin	End
generalization	Network_Path_TypeID class	TypeID class
association	Network_Path_TypeID class	Network_Path class

21.9 Network_Turn Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A network turn object represents an allowed or disallowed movement between any two links via a node. This is represented by a unique identifier for the turn, a reference to the “from link” and a reference to the “to link” for the movement. A flag attribute is used to indicate if this turn is allowed or disallowed. The validity period for the turn is represented by a creation and deletion date.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Allowed	boolean			1	Indicates if the turn represents an allowed movement (Y) or a disallowed movement (N).
CreationDate	dateTime				Date/time at which the link was entered in the database. Creation and deletion dates represent the lifetime of the turn in the system.
DeletionDate	dateTime	0..1			Date at which link was deleted. Creation and deletion dates represent the lifetime of the turn in the system.
FromLinkID	Network_Link	1			Identifier for the link at the start of the turn.

Name	Type	Mult.	Key?	Max	Comments
ToLinkID	Network_Link	1			Identifier for link at the end of the turn.
TurnID	ObjectId		PK	32	Unique identifier for the turn. Association with the links that make up the turn.

Relations

Type	Begin	End
association	Network_Turn class	Network_Link class
association	Network_Turn class	Network_Link class

21.10 Network_Zone Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A zone is an unordered sequence of links and defines any group of links that can be treated in association with each other. Some zones may be permanent and represent, for example, all those links that make up an electoral ward in the zone. Other zones may be transitory and represent, for example, a collection of links that may be affected by a accident. Each zone is uniquely identified and has an associated description, type (e.g. permanent, transitory etc.) and has a validity period as well as the links that determine its coverage.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CreationDate	dateTime				Date/time at which the zone was entered in the database. Creation and deletion dates represent the lifetime of the object in the system.
DeletionDate	dateTime	0..1			Date at which zone was deleted. Creation and deletion dates represent the lifetime of the object in the system.
Permanent	boolean	0..1		1	Is zone permanent(Y) or transitory(N).
TypeID	Network_Zone_TypeID	1			Type of the zone.
ZoneDescription	string	0..1			Description information for the zone.

Name	Type	Mult.	Key?	Max	Comments
ZoneID	ObjectId		PK	32	Unique identifier for the defined zone.

Relations

Type	Begin	End
association	Network_Zone class	Network_Zone_List class
association	Network_Zone class	Roadworks_Definition class
association	Network_Zone class	Traffic_Event_Definition class
association	Network_Zone class	Network_Zone_TypeID class

21.11 Network_Zone_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Records the association between a zone and a link

Attributes

Name	Type	Mult.	Key?	Max	Comments
NetworkLinkReference	Network_Link	1	PFK		LinkReference to be included in the zone.
ZoneID	Network_Zone	1	PFK		Unique identifier for the defined zone.

Relations

Type	Begin	End
association	Network_Zone_List class	Network_Zone class
association	Network_Zone_List class	Network_Link class

21.12 Network_Zone_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false

Comment:	Type of network zone (e.g. permanent, transitory etc.).

Relations

Type	Begin	End
generalization	Network_Zone_TypeID class	TypeID class
association	Network_Zone_TypeID class	Network_Zone class

22 Prediction Package

22.1 Introduction

General information

Qualified Name:	UTMC::Prediction
Comment:	This package shows a general pattern and presents specific examples. The same abstract pattern may be instantiated for prediction of other UTMC dynamic data.

Diagrams

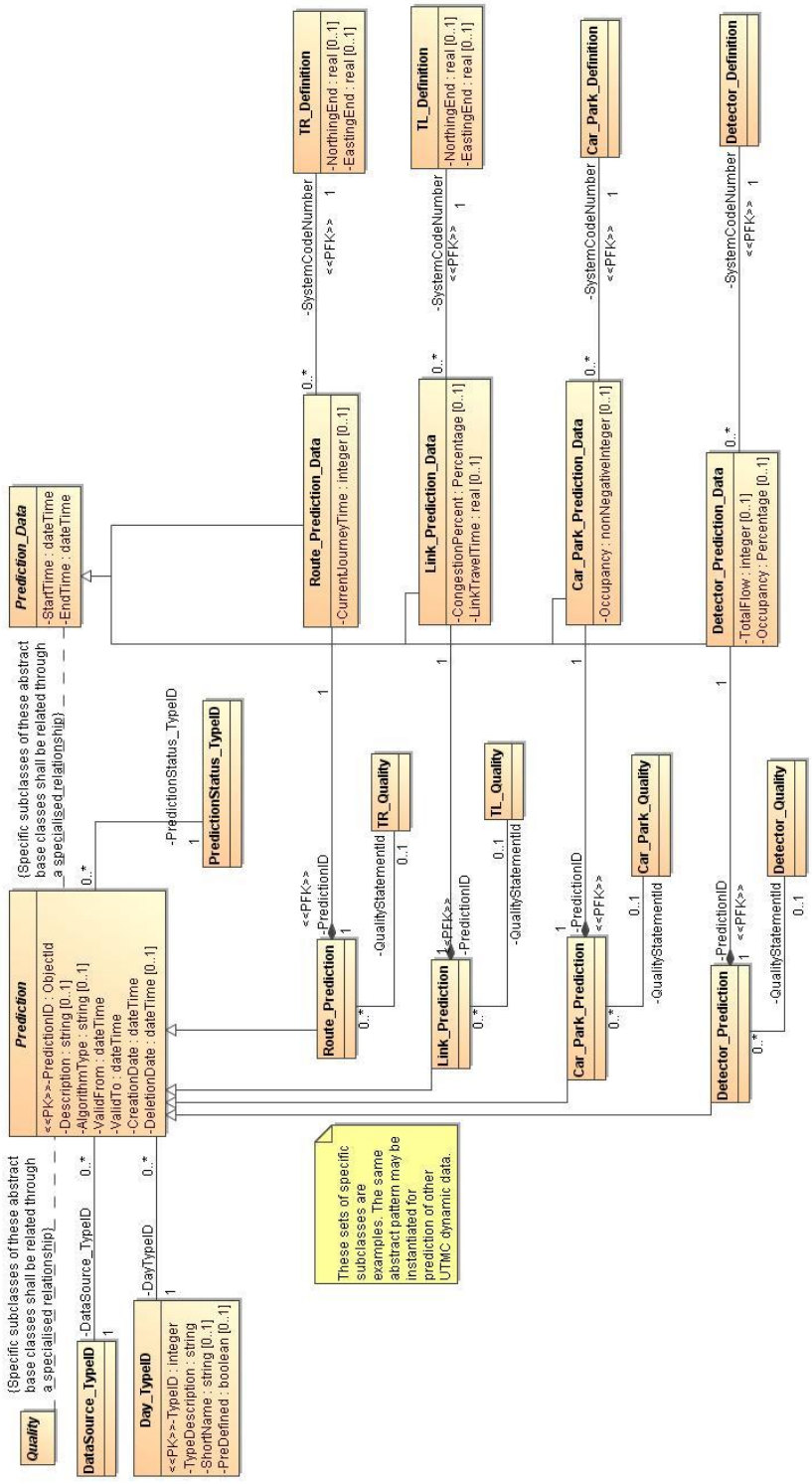


Figure 22-1: Prediction diagram

22.2 Car_Park_Prediction Class

General information

Base Classifier:	Prediction
Is Abstract:	false
Comment:	Static data describing characteristics of predicted values related to car parks.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Car_Park_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
association	Car_Park_Prediction class	Car_Park_Prediction_Data class
association	Car_Park_Prediction class	Car_Park_Quality class
generalization	Car_Park_Prediction class	Prediction class

22.3 Car_Park_Prediction_Data Class

General information

Base Classifier:	Prediction_Data
Is Abstract:	false
Comment:	Predicted values related to a car park.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Occupancy	nonNegativeInteger	0..1			Number of occupied spaces. A prediction of Car_Park_Dynamic::Occupancy.
PredictionID	Car_Park_Prediction	1	PFK		
SystemCodeNumber	Car_Park_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Car_Park_Prediction_Data class	Prediction_Data class
association	Car_Park_Prediction_Data class	Car_Park_Prediction class
association	Car_Park_Prediction_Data class	Car_Park_Definition class

22.4 Detector_Prediction Class

General information

Base Classifier:	Prediction
Is Abstract:	false
Comment:	Static data describing characteristics of predicted values related to detectors.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Detector_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
association	Detector_Prediction class	Detector_Prediction_Data class
generalization	Detector_Prediction class	Prediction class
association	Detector_Prediction class	Detector_Quality class

22.5 Detector_Prediction_Data Class

General information

Base Classifier:	Prediction_Data
Is Abstract:	false
Comment:	Predicted values related to a traffic detector.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Occupancy	Percentage	0..1		100	Occupancy percentage in OccupancyInterval minutes. A prediction of Occupancy_Dynamic::Occupancy.
PredictionID	Detector_Prediction	1	PFK		
SystemCodeNumber	Detector_Definition	1	PFK		
TotalFlow	integer	0..1			Flow in FlowInterval minutes. A prediction of Flow_Dynamic::TotalFlow.

Relations

Type	Begin	End
generalization	Detector_Prediction_Data class	Prediction_Data class
association	Detector_Prediction_Data class	Detector_Prediction class
association	Detector_Prediction_Data class	Detector_Definition class

22.6 Link_Prediction Class

General information

Base Classifier:	Prediction
Is Abstract:	false
Comment:	Static data describing characteristics of predicted values related to traffic on road links.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	TL_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Link_Prediction class	Prediction class
association	Link_Prediction class	TL_Quality class
association	Link_Prediction class	Link_Prediction_Data class

22.7 Link_Prediction_Data Class

General information

Base Classifier:	Prediction_Data
Is Abstract:	false
Comment:	Predicted values related to traffic on a road link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CongestionPercent	Percentage	0..1			Current percentage congestion. Prediction of CongestionPercent from transport link dynamic data.
LinkTravelTime	real	0..1			Travel time in seconds. Prediction of LinkTravelTime from transport link dynamic data.
PredictionID	Link_Prediction	1	PFK		
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
association	Link_Prediction_Data class	Link_Prediction class
generalization	Link_Prediction_Data class	Prediction_Data class
association	Link_Prediction_Data class	TL_Definition class

22.8 Prediction Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for defining a prediction and its characteristics, such as the algorithm used. Specific subclasses shall be named appropriate to the object type e.g. Car_Park_Prediction.

Attributes

Name	Type	Mult.	Key ?	Max	Comments
AlgorithmType	string	0..1		100	Method used to calculate predictions.
CreationDate	dateTime				Date/time at which the "object" was entered into the database.
DataSource_TypeID	DataSource_TypeID	1			TypeValue in Data_Source support object.
DayTypeID	Day_TypeID	1			Index to DayType support object.
DeletionDate	dateTime	0..1			Date of deletion.
Description	string	0..1			Description of the prediction.
PredictionID	ObjectId		PK	32	Unqiue identifier for the prediction.
PredictionStatus_TypeID	PredictionStatus_Type ID	1			Index to PredictionStatus support object.
ValidFrom	dateTime				Time when predictions were calculated.
ValidTo	dateTime				Time to which predictions are valid.

Relations

Type	Begin	End
association	Prediction class	PredictionStatus_TypeID class
generalization	Route_Prediction class	Prediction class
generalization	Detector_Prediction class	Prediction class
generalization	Link_Prediction class	Prediction class
association	Prediction class	Day_TypeID class
generalization	Car_Park_Prediction class	Prediction class
association	Prediction class	DataSource_TypeID class

22.9 Prediction_Data Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for prediction data. Specific subclasses shall be named appropriate to the object type e.g. Car_Park_Prediction_Data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
EndTime	dateTime				End time of prediction.
StartTime	dateTime				Start time of prediction.

Relations

Type	Begin	End
generalization	Detector_Prediction_Data class	Prediction_Data class
generalization	Car_Park_Prediction_Data class	Prediction_Data class
generalization	Route_Prediction_Data class	Prediction_Data class
generalization	Link_Prediction_Data class	Prediction_Data class

22.10 PredictionStatus_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of status of a prediction. Predefined values are: 1 = Valid (using current value and profile) 2 = Profile (no current value available using profile value) 3 = Unknown (no current or profile value available)

Relations

Type	Begin	End
association	PredictionStatus_TypeID class	Prediction class
generalization	PredictionStatus_TypeID class	TypeID class

22.11 Route_Prediction Class

General information

Base Classifier:	Prediction
Is Abstract:	false
Comment:	Static data describing characteristics of predicted values related to traffic on routes.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	TR_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Route_Prediction class	Prediction class
association	Route_Prediction class	TR_Quality class
association	Route_Prediction class	Route_Prediction_Data class

22.12 Route_Prediction_Data Class

General information

Base Classifier:	Prediction_Data
Is Abstract:	false
Comment:	Predicted values related to traffic on a route.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CurrentJourneyTime	integer	0..1			Current journey time in seconds. A prediction of TR_Dynamic::CurrentJourneyTime
PredictionID	Route_Prediction	1	PFK		Unique identifier for the prediction.
SystemCodeNumber	TR_Definition	1	PFK		Unique identifier for the "object".

Relations

Type	Begin	End
association	Route_Prediction_Data class	TR_Definition class
association	Route_Prediction_Data class	Route_Prediction class
generalization	Route_Prediction_Data class	Prediction_Data class

23 Profile Package

23.1 Introduction

General information

Qualified Name:	UTMC::Profile
Comment:	This package shows a general pattern and presents specific examples. The same abstract pattern may be instantiated for profiling of other UTMC dynamic data.

Diagrams

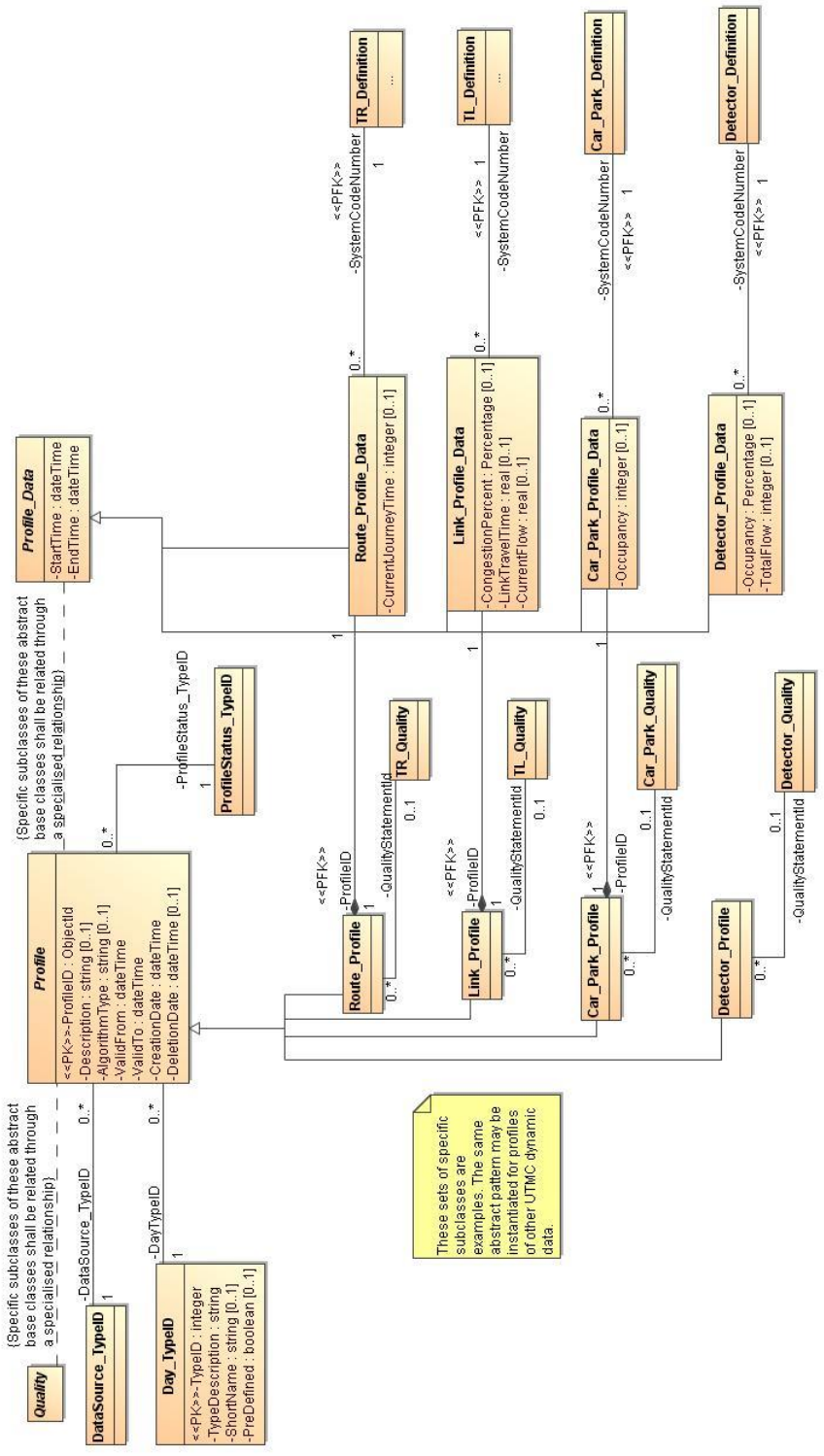


Figure 23-1: Profile diagram

23.2 Car_Park_Profile Class

General information

Base Classifier:	Profile
Is Abstract:	false
Comment:	Static data describing characteristics of a profile of car park data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Car_Park_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Car_Park_Profile class	Profile class
association	Car_Park_Profile class	Car_Park_Profile_Data class
association	Car_Park_Profile class	Car_Park_Quality class

23.3 Car_Park_Profile_Data Class

General information

Base Classifier:	Profile_Data
Is Abstract:	false
Comment:	Single entry within a profile of data related to a car park.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Occupancy	integer	0..1			Number of occupied spaces. A profile of Car_Park_Dynamic::Occupancy.
ProfileID	Car_Park_Profile	1	PFK		
SystemCodeNumber	Car_Park_Definition	1	PFK		

Relations

Type	Begin	End
association	Car_Park_Profile_Data class	Car_Park_Profile class
generalization	Car_Park_Profile_Data class	Profile_Data class
association	Car_Park_Profile_Data class	Car_Park_Definition class

23.4 Detector_Profile Class

General information

Base Classifier:	Profile
Is Abstract:	false
Comment:	Static data describing characteristics of a profile of traffic detector data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Detector_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Detector_Profile class	Profile class
association	Detector_Profile class	Detector_Quality class

23.5 Detector_Profile_Data Class

General information

Base Classifier:	Profile_Data
Is Abstract:	false
Comment:	Single entry within a profile of data related to a traffic detector.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Occupancy	Percentage	0..1		100	Occupancy percentage in OccupancyInterval minutes. A profile of Occupancy_Dynamic::Occupancy.
SystemCodeNumber	Detector_Definition	1	PFK		
TotalFlow	integer	0..1			Flow in FlowInterval minutes. A profile of Flow_Dynamic::TotalFlow.

Relations

Type	Begin	End
generalization	Detector_Profile_Data class	Profile_Data class
association	Detector_Profile_Data class	Detector_Definition class

23.6 Link_Profile Class

General information

Base Classifier:	Profile
Is Abstract:	false
Comment:	Static data describing characteristics of a profile of data related to traffic on a road link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	TL_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Link_Profile class	Profile class
association	Link_Profile class	Link_Profile_Data class
association	Link_Profile class	TL_Quality class

23.7 Link_Profile_Data Class

General information

Base Classifier:	Profile_Data
Is Abstract:	false
Comment:	Single entry within a profile of data related to traffic on a link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CongestionPercent	Percentage	0..1			Current percentage congestion. Profile of CongestionPercent from transport link dynamic data.
CurrentFlow	real	0..1			Profile of CurrentFlow from transport link dynamic data.
LinkTravelTime	real	0..1			Travel time in seconds. Profile of LinkTravelTime from transport link dynamic data.
ProfileID	Link_Profile	1	PFK		
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
association	Link_Profile_Data class	TL_Definition class
association	Link_Profile_Data class	Link_Profile class
generalization	Link_Profile_Data class	Profile_Data class

23.8 Profile Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for defining a profile and its characteristics, such as the algorithm used. Specific subclasses shall be named appropriate to the object type e.g. Car_Park_Profile.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AlgorithmType	string	0..1		100	Method used to calculate Profiles.
CreationDate	dateTime				Date/time at which the "object" was entered into the database.
DataSource_TypeID	DataSource_TypeID	1			TypeValue in Data_Source support object.
DayTypeID	Day_TypeID	1			Index to DayType support object.
DeletionDate	dateTime	0..1			Date of deletion.
Description	string	0..1			Description of the profile.
ProfileID	ObjectId		PK	32	Unique identifier for the Profile.
ProfileStatus_TypeID	ProfileStatus_TypeID	1			
ValidFrom	dateTime				Time when Profiles were calculated.
ValidTo	dateTime				Time to which Profiles are valid.

Relations

Type	Begin	End
generalization	Car_Park_Profile class	Profile class
association	Profile class	DataSource_TypeID class
generalization	Detector_Profile class	Profile class
generalization	Route_Profile class	Profile class
association	Profile class	ProfileStatus_TypeID class
generalization	Link_Profile class	Profile class
association	Profile class	Day_TypeID class

23.9 Profile_Data Class

General information

Base Classifier:	
Is Abstract:	true
Comment:	Abstract base class for profile data. Specific subclasses shall be named appropriate to the object type e.g. Car_Park_Profile_Data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
EndTime	dateTime				End Time of Profile.
StartTime	dateTime				Start time of Profile.

Relations

Type	Begin	End
generalization	Route_Profile_Data class	Profile_Data class
generalization	Detector_Profile_Data class	Profile_Data class
generalization	Link_Profile_Data class	Profile_Data class
generalization	Car_Park_Profile_Data class	Profile_Data class

23.10 ProfileStatus_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Classification of status of a profile. Predefined values are: 0 = Normal 1 = Suspect

Relations

Type	Begin	End
generalization	ProfileStatus_TypeID class	TypeID class
association	ProfileStatus_TypeID class	Profile class

23.11 Route_Profile Class

General information

Base Classifier:	Profile
Is Abstract:	false
Comment:	Static data describing characteristics of a profile of data related to traffic on routes.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	TR_Quality	0..1			Reference to quality model.

Relations

Type	Begin	End
generalization	Route_Profile class	Profile class
association	Route_Profile class	TR_Quality class
association	Route_Profile class	Route_Profile_Data class

23.12 Route_Profile_Data Class

General information

Base Classifier:	Profile_Data
Is Abstract:	false
Comment:	Single entry within a profile of data related to traffic on a route.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CurrentJourneyTime	integer	0..1			Current journey time in seconds. A profile of TR_Dynamic::CurrentJourneyTime
ProfileID	Route_Profile	1	PFK		Unique identifier for the Profile.
SystemCodeNumber	TR_Definition	1	PFK		Unique identifier for the "object".

Relations

Type	Begin	End
generalization	Route_Profile_Data class	Profile_Data class
association	Route_Profile_Data class	TR_Definition class
association	Route_Profile_Data class	Route_Profile class

24 Roadworks Package

24.1 Introduction

General information

Qualified Name:	UTMC::Roadworks
Comment:	Package for classes representing roadworks.

Diagrams

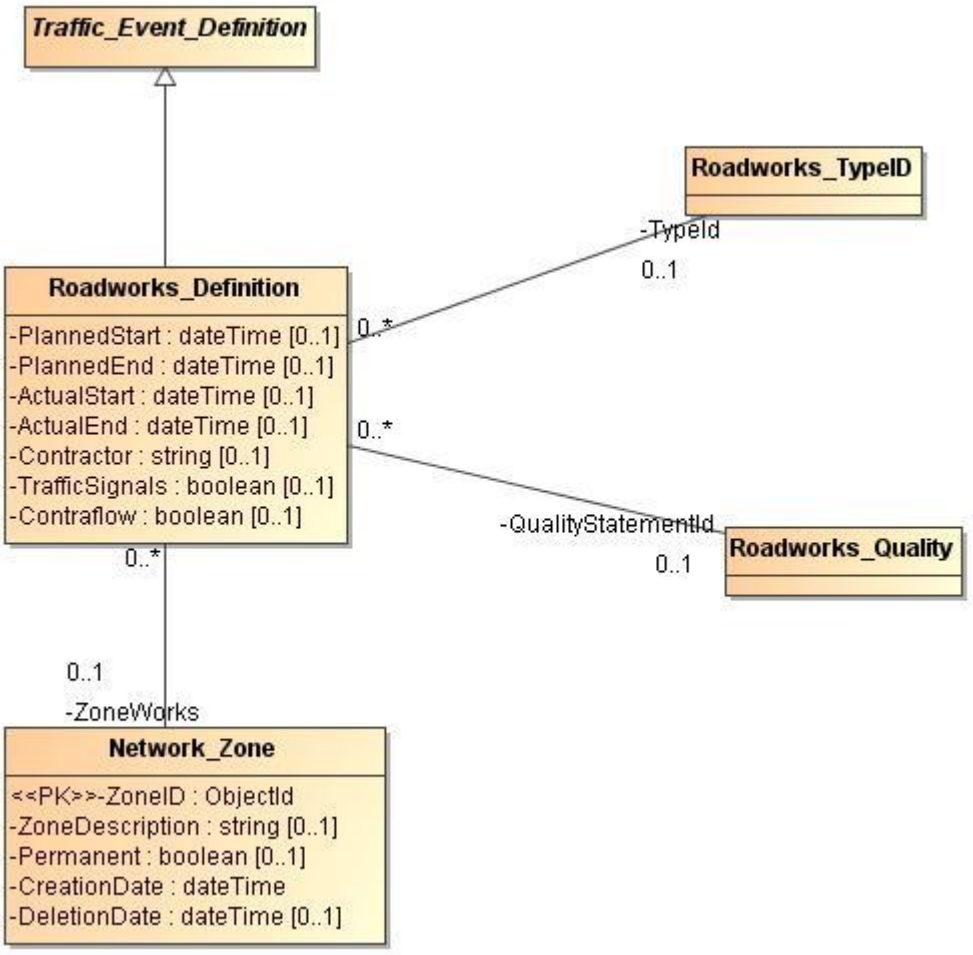


Figure 24-1: Roadworks diagram

24.2 Roadworks_Definition Class

General information

Base Classifier:	Traffic_Event_Definition
Is Abstract:	false
Comment:	A roadwork is a planned occurrence that may have a direct affect on the traffic flow in an area. The default attributes for a roadwork (identification, description, location) are covered by the generic data attributes. Details on the types of roadworks and the contractor for the roadworks are provided. The planned dates for the roadwork are available together with fields to indicate when the roadworks actually start and finish. For planning purposes, as well as the point and link location for the main roadworks, zones describing an extended set of links over which the roadworks are operating and an extended set of links over which the roadworks may have an effect are available. A diversion associated with the roadworks may also be referenced. Authorisation for the roadworks, to determine if it should be included in any analysis or reported is provided. By making the the systemcodenumber and creationdate, the key a history of changes can be kept for audit purposes etc.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ActualEnd	dateTime	0..1			Actual date and time that the roadworks ended.
ActualStart	dateTime	0..1			Actual duration of the roadworks.
Contractor	string	0..1			Name of the contractor carrying out the work.
Contraflow	boolean	0..1			Contraflow in operation (Y/N).
PlannedEnd	dateTime	0..1			Planned duration of the roadworks.
PlannedStart	dateTime	0..1			Planned duration of the roadworks.
QualityStatementId	Roadworks_Quality	0..1			
TrafficSignals	boolean	0..1			TrafficSignals in operation (Y/N).
TypeId	Roadworks_TypeID	0..1			
ZoneWorks	Network_Zone	0..1			Reference to the network zone which defines the roadworks extent. If a roadworks covers a number of road elements this zone defines those elements.

Relations

Type	Begin	End
association	Roadworks_Definition class	Network_Zone class
generalization	Roadworks_Definition class	Traffic_Event_Definition class
association	Roadworks_Definition class	Roadworks_TypeID class
association	Roadworks_Definition class	Roadworks_Quality class

24.3 Roadworks_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about roadworks data.

Relations

Type	Begin	End
generalization	Roadworks_Quality class	Quality class
association	Roadworks_Quality class	Roadworks_Definition class

24.4 Roadworks_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of roadworks. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = CENTRAL RESERVATION WORK 4 = GENERAL 5 = OVERHEAD 6 = SURFACE 7 = VERGE 8 = WATER MAIN WORK 999 = OTHER

Relations

Type	Begin	End
generalization	Roadworks_TypeID class	TypeID class
association	Roadworks_TypeID class	Roadworks_Definition class

25 TrafficSignal Package

25.1 Introduction

General information

Qualified Name:	UTMC::TrafficSignal
Comment:	Package for classes representing traffic signals, their status and configuration.

Diagrams

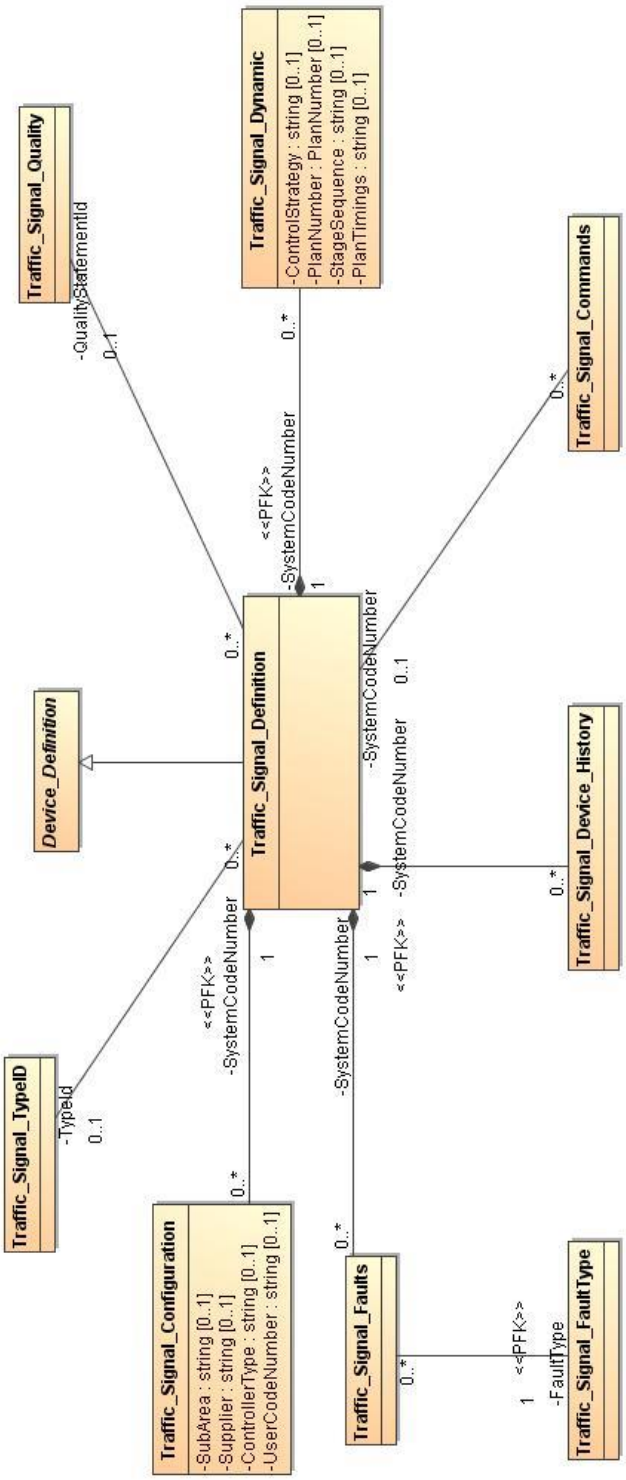


Figure 25-1: TrafficSignal diagram

25.2 Traffic_Signal_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to traffic signal systems.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Traffic_Signal_Definition	0..1			

Relations

Type	Begin	End
generalization	Traffic_Signal_Commands class	Command class
association	Traffic_Signal_Commands class	Traffic_Signal_Definition class

25.3 Traffic_Signal_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Details of the traffic signal equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ControllerType	string	0..1			Type/Make of traffic signal equipment
SubArea	string	0..1			Name for the group of signals to which the associated traffic signal equipment belongs.
Supplier	string	0..1			Name of the supplier.
SystemCodeNumber	Traffic_Signal_Definition	1	PFK		
UserCodeNumber	string	0..1			User's own reference.

Relations

Type	Begin	End
generalization	Traffic_Signal_Configuration class	Object_Configuration class
association	Traffic_Signal_Configuration class	Traffic_Signal_Definition class

25.4 Traffic_Signal_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	Traffic signal equipment details.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	Traffic_Signal_Quality	0..1			
TypeId	Traffic_Signal_TypeID	0..1			

Relations

Type	Begin	End
association	Traffic_Signal_Definition class	Traffic_Signal_TypeID class
generalization	Traffic_Signal_Definition class	Device_Definition class
association	Traffic_Signal_Definition class	Traffic_Signal_Quality class
association	Traffic_Signal_Definition class	Traffic_Signal_Device_History class
association	Traffic_Signal_Definition class	Traffic_Signal_Commands class
association	Traffic_Signal_Definition class	Traffic_Signal_Faults class
association	Traffic_Signal_Definition class	Traffic_Signal_Dynamic class
association	Traffic_Signal_Definition class	Traffic_Signal_Configuration class

25.5 Traffic_Signal_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to traffic signals.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	Traffic_Signal_Definition	1			

Relations

Type	Begin	End
association	Traffic_Signal_Device_History class	Traffic_Signal_Definition class
generalization	Traffic_Signal_Device_History class	Device_History class

25.6 Traffic_Signal_Dynamic Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Details of traffic signal status.

Attributes

Name	Type	Mult.	Key?	Max	Comments
ControlStrategy	string	0..1			Mode of control, e.g. SCOOT.
PlanNumber	PlanNumber	0..1			Currently active plan.
PlanTimings	string	0..1			The duration of each stage in the plan.
StageSequence	string	0..1			The order of stages in the plan.
SystemCodeNumber	Traffic_Signal_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Traffic_Signal_Dynamic class	Object_Dynamic class
association	Traffic_Signal_Dynamic class	Traffic_Signal_Definition class

25.7 Traffic_Signal_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with traffic signals.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	Traffic_Signal_FaultType	1	PFK		
SystemCodeNumber	Traffic_Signal_Definition	1	PFK		

Relations

Type	Begin	End
generalization	Traffic_Signal_Faults class	Faults class
association	Traffic_Signal_Faults class	Traffic_Signal_FaultType class
association	Traffic_Signal_Faults class	Traffic_Signal_Definition class

25.8 Traffic_Signal_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with traffic signals.

Relations

Type	Begin	End
generalization	Traffic_Signal_FaultType class	FaultType class
association	Traffic_Signal_FaultType class	Traffic_Signal_Faults class

25.9 Traffic_Signal_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about traffic signal data.

Relations

Type	Begin	End
association	Traffic_Signal_Quality class	Traffic_Signal_Definition class
generalization	Traffic_Signal_Quality class	Quality class

25.10 Traffic_Signal_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of traffic signal. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = Intersection 2 = Pelican 3 = Puffin 4 = Toucan 5 = Pegasus 6 = Tram Crossing 7 = Wig Wag 999 = Other

Relations

Type	Begin	End
association	Traffic_Signal_TypeID class	Traffic_Signal_Definition class
generalization	Traffic_Signal_TypeID class	TypeID class

26 TransportLink Package

26.1 Introduction

General information

Qualified Name:	UTMC::TransportLink
Comment:	Package for classes representing road links within a system of traffic monitoring, including details of the traffic monitoring technology, its configuration and dynamic data.

Diagrams

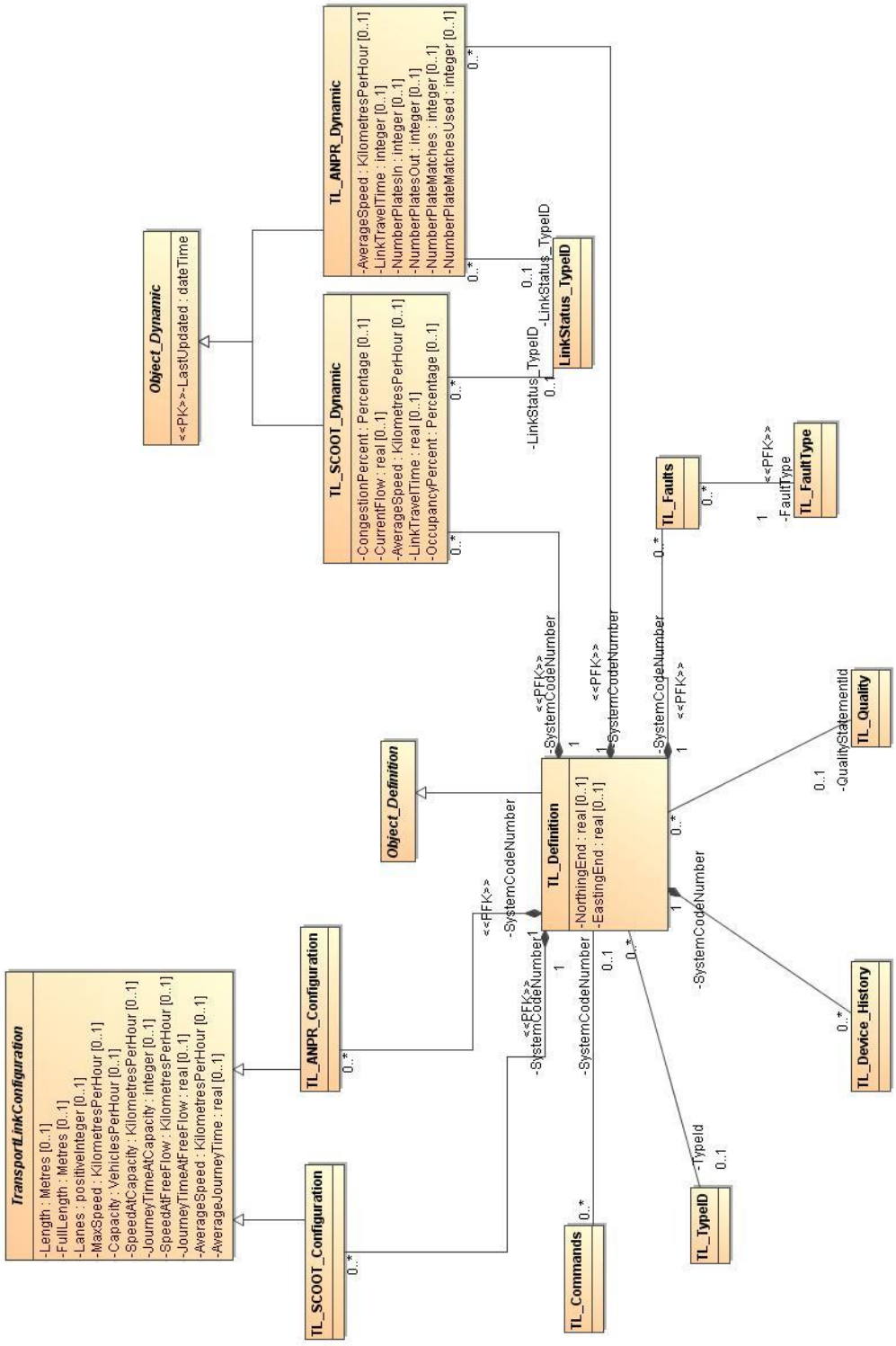


Figure 26-1: TransportLink diagram

26.2 LinkStatus_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Status of a Link. Initially giving the options: 0 = Normal 1 = Suspect

Relations

Type	Begin	End
association	LinkStatus_TypeID class	TL_ANPR_Dynamic class
generalization	LinkStatus_TypeID class	TypeID class
association	LinkStatus_TypeID class	TL_SCOOT_Dynamic class

26.3 TL_ANPR_Configuration Class

General information

Base Classifier:	TransportLinkConfiguration
Is Abstract:	false
Comment:	Describes the configuration of an ANPR-equipped link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
generalization	TL_ANPR_Configuration class	TransportLinkConfiguration class
association	TL_ANPR_Configuration class	TL_Definition class

26.4 TL_ANPR_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Details of link status, derived from ANPR.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AverageSpeed	KilometresPerHour	0..1			Average speed in kilometres per hour.
AnprPeriod	Duration	0..1			Period in minutes the ANPR information was calculated over.
LinkStatus_TypeID	LinkStatus_TypeID	0..1			Status of the link
LinkTravelTime	integer	0..1			Travel time in seconds.
NumberPlateMatches	integer	0..1			For ANPR, the number of successful matches for the link.
NumberPlateMatches Used	integer	0..1			For ANPR, the number of successful matches used in calculation.
NumberPlatesIn	integer	0..1			For ANPR, the number of successful reads at the start of the link.
NumberPlatesOut	integer	0..1			For ANPR, the number of successful reads at the end of the link.
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
association	TL_ANPR_Dynamic class	LinkStatus_TypeID class
generalization	TL_ANPR_Dynamic class	Object_Dynamic class
association	TL_ANPR_Dynamic class	TL_Definition class

26.5 TL_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to equipment for a road link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TL_Definition	0..1			

Relations

Type	Begin	End
association	TL_Commands class	TL_Definition class
generalization	TL_Commands class	Command class

26.6 TL_Definition Class

General information

Base Classifier:	Object_Definition
Is Abstract:	false
Comment:	A transport link that is equipped with vehicle monitoring equipment.

Attributes

Name	Type	Mult.	Key?	Max	Comments
EastingStart	real	0..1			Easting component of the location of the link in OS grid coordinates. Start and End indicate the direction of the link. All links are uni-directional.
NorthingStart	real	0..1			Northing component of the location of the link in OS grid coordinates. Start and End indicate the direction of the link. All links are uni-directional.
EastingEnd	real	0..1			Easting component of the location of the link in OS grid coordinates. Start and End indicate the direction of the link. All links are uni-

					directional.
NorthingEnd	real	0..1			Northing component of the location of the link in OS grid coordinates. Start and End indicate the direction of the link. All links are uni-directional.
QualityStatementId	TL_Quality	0..1			
TypeId	TL_TypeID	0..1			

Relations

Type	Begin	End
association	TL_Definition class	TL_TypeID class
association	TL_Definition class	Car_Park_Access_Location class
association	TL_Definition class	Link_Profile_Data class
association	TL_Definition class	TL_Quality class
association	TL_Definition class	TL_Device_History class
association	TL_Definition class	Device_Definition class
generalization	TL_Definition class	Object_Definition class
association	TL_Definition class	TL_ANPR_Dynamic class
association	TL_Definition class	Traffic_Event_Definition class
association	TL_Definition class	TL_Faults class
association	TL_Definition class	TR_Segment_Configuration class
association	TL_Definition class	Link_Prediction_Data class
association	TL_Definition class	TL_Commands class
association	TL_Definition class	TL_SCOOT_Dynamic class
association	TL_Definition class	TL_SCOOT_Configuration class
association	TL_Definition class	TL_ANPR_Configuration class

26.7 TL_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to equipment for a road link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TL_Definition	1			

Relations

Type	Begin	End
association	TL_Device_History class	TL_Definition class
generalization	TL_Device_History class	Device_History class

26.8 TL_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with the traffic monitoring equipment for a road link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	TL_FaultType	1	PFK		
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
generalization	TL_Faults class	Faults class
association	TL_Faults class	TL_Definition class
association	TL_Faults class	TL_FaultType class

26.9 TL_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with the traffic monitoring equipment for a road link.

Relations

Type	Begin	End
generalization	TL_FaultType class	FaultType class
association	TL_FaultType class	TL_Faults class

26.10 TL_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about data for a monitored road link.

Relations

Type	Begin	End
generalization	TL_Quality class	Quality class
association	TL_Quality class	TL_Definition class
association	TL_Quality class	Link_Prediction class
association	TL_Quality class	Link_Profile class

26.11 TL_SCOOT_Configuration Class

General information

Base Classifier:	TransportLinkConfiguration
Is Abstract:	false
Comment:	Describes the configuration of the SCOOT link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
generalization	TL_SCOOT_Configuration class	TransportLinkConfiguration class
association	TL_SCOOT_Configuration class	TL_Definition class

26.12 TL_SCOOT_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Details of link status, derived from SCOOT.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AverageSpeed	KilometresPerHour	0..1			Average speed in kilometres per hour.
CongestionPercent	Percentage	0..1			Current percentage congestion.
CurrentFlow	real	0..1			Current flow (vehicles/5mins)
LinkStatus_TypeID	LinkStatus_TypeID	0..1			Status of the link
LinkTravelTime	real	0..1			Travel time in seconds.
OccupancyPercent	Percentage	0..1			Average of occupancy percentage for detectors on link
SystemCodeNumber	TL_Definition	1	PFK		

Relations

Type	Begin	End
generalization	TL_SCOOT_Dynamic class	Object_Dynamic class
association	TL_SCOOT_Dynamic class	LinkStatus_TypeID class
association	TL_SCOOT_Dynamic class	TL_Definition class

26.13 TL_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of transport link. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = SCOOT 2 = ANPR 3 = SCOOT Normal 4 = SCOOT Entry 5 = SCOOT Exit 6 = SCOOT Filter 7 = SCOOT Uncontrolled 8 = SCOOT Stop_line Normal 9 = SCOOT Stop_line Entry ... 999 = Other

Relations

Type	Begin	End
association	TL_TypeID class	TL_Definition class
generalization	TL_TypeID class	TypeID class

26.14 TransportLinkConfiguration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	true
Comment:	Static data about this transport link.

Attributes

Name	Type	Mult.	Key?	Max	Comments
AverageJourneyTime	real	0..1			Average time to travel the link, in seconds.
AverageSpeed	KilometresPerHour	0..1			Average speed over the link, in kph.
Capacity	VehiclesPerHour	0..1			Maximum flow in vehicles per hour.
FullLength	Metres	0..1			Distance from stop-line to stop-line in metres.
JourneyTimeAtCapacity	integer	0..1			Journey time when traffic is at maximum capacity, in seconds.
JourneyTimeAtFreeFlow	real	0..1			Journey time when traffic is in free flow in seconds.
Lanes	positiveInteger	0..1			Number of lanes.
Length	Metres	0..1			Distance from detector to stop-line in metres.
MaxSpeed	KilometresPerHour	0..1			Maximum speed associated with the link, in kph.
SpeedAtCapacity	KilometresPerHour	0..1			Speed when traffic is at maximum capacity, in kph.
SpeedAtFreeFlow	KilometresPerHour	0..1			Speed when the traffic is in free flow, in kph.

Relations

Type	Begin	End
generalization	TransportLinkConfiguration class	Object_Configuration class
generalization	TL_ANPR_Configuration class	TransportLinkConfiguration class
generalization	TL_SCOOT_Configuration class	TransportLinkConfiguration class

27 TransportRoute Package

27.1 Introduction

General information

Qualified Name:	UTMC::TransportRoute
Comment:	Package for classes representing routes and properties that apply to routes.

Diagrams

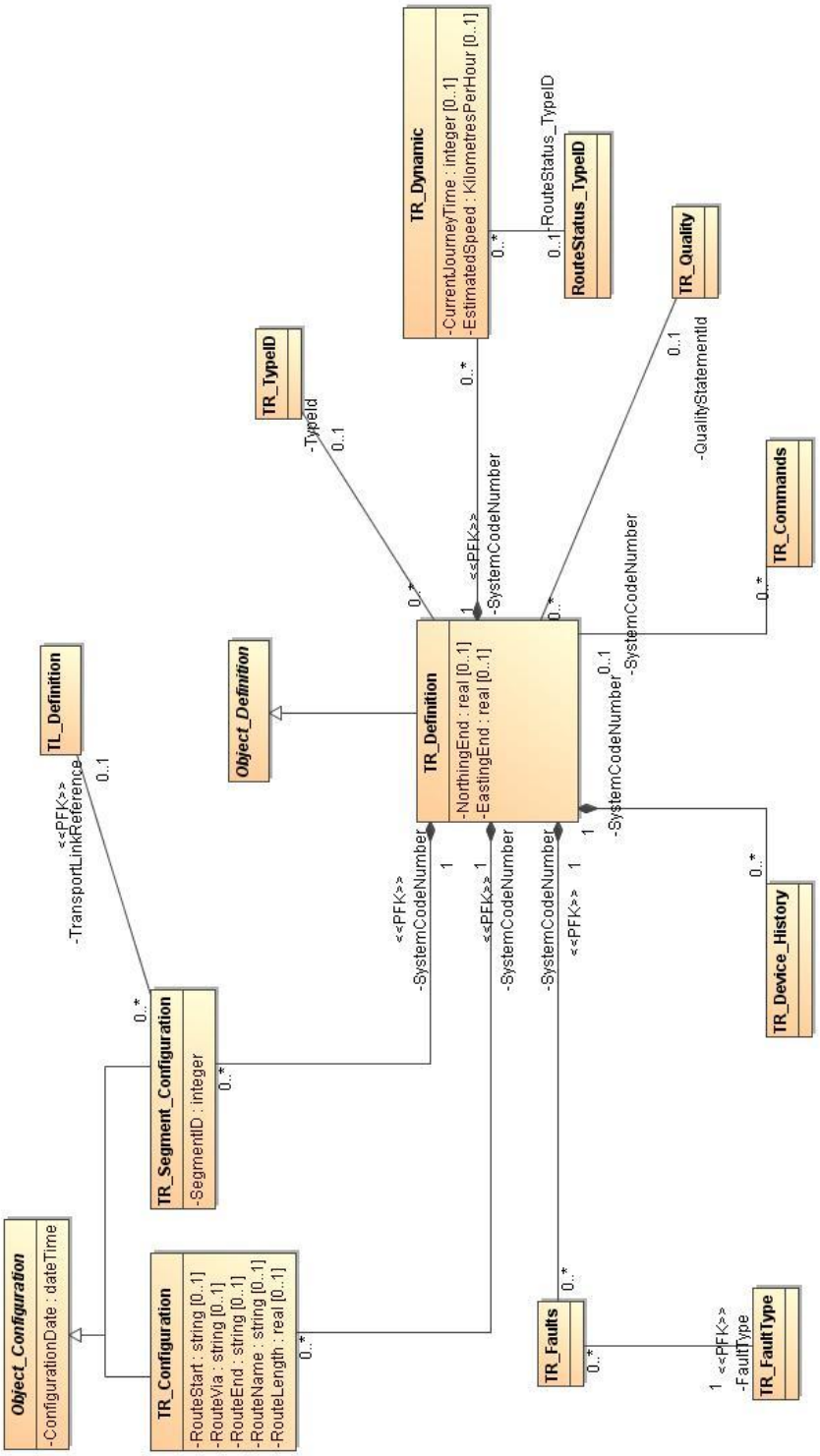


Figure 27-1: TransportRoute diagram

27.2 RouteStatus_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Route Status Values are as follows: 0: in range route status, JT within thresholds. 1 : out of range route status, JT outside of thresholds and profile values.

Relations

Type	Begin	End
association	RouteStatus_TypeID class	TR_Dynamic class
generalization	RouteStatus_TypeID class	TypeID class

27.3 TR_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command to the equipment for a route.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TR_Definition	0..1			

Relations

Type	Begin	End
generalization	TR_Commands class	Command class
association	TR_Commands class	TR_Definition class

27.4 TR_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Route configuration data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
RouteEnd	string	0..1		64	End point of the route.
RouteLength	real	0..1			Length of route.
RouteName	string	0..1		80	Name of route.
RouteStart	string	0..1		64	Start point of the route.
RouteVia	string	0..1		64	Intermediate point (if applicable).
SystemCodeNumber	TR_Definition	1	PFK		

Relations

Type	Begin	End
association	TR_Configuration class	TR_Definition class
generalization	TR_Configuration class	Object_Configuration class

27.5 TR_Definition Class

General information

Base Classifier:	Object_Definition
Is Abstract:	false
Comment:	A transport route on which measurements or predictions can be made.

Attributes

Name	Type	Mult.	Key?	Max	Comments
EastingStart	real	0..1			Easting component of the location of the route in OS grid coordinates. Start and End indicate the direction of the route. All routes are uni-directional.

Name	Type	Mult.	Key?	Max	Comments
NorthingStart	real	0..1			Northing component of the location of the routein OS grid coordinates. Start and End indicate the direction of the route. All routes are uni-directional.
EastingEnd	real	0..1			Easting component of the location of the route in OS grid coordinates. Start and End indicate the direction of the route. All routes are uni-directional.
NorthingEnd	real	0..1			Northing component of the location of the routein OS grid coordinates. Start and End indicate the direction of the route. All routes are uni-directional.
QualityStatementId	TR_Quality	0..1			
TypeId	TR_TypeID	0..1			

Relations

Type	Begin	End
generalization	TR_Definition class	Object_Definition class
association	TR_Definition class	Route_Prediction_Data class
association	TR_Definition class	TR_Configuration class
association	TR_Definition class	TR_Faults class
association	TR_Definition class	TR_Device_History class
association	TR_Definition class	TR_Dynamic class
association	TR_Definition class	TR_TypeID class
association	TR_Definition class	Route_Profile_Data class
association	TR_Definition class	TR_Segment_Configuration class
association	TR_Definition class	TR_Quality class
association	TR_Definition class	TR_Commands class

27.6 TR_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to equipment for a route.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	TR_Definition	1			

Relations

Type	Begin	End
generalization	TR_Device_History class	Device_History class
association	TR_Device_History class	TR_Definition class

27.7 TR_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Route dynamic data, principally the current journey time.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CurrentJourneyTime	integer	0..1			Current journey time in seconds.
EstimatedSpeed	KilometresPerHour	0..1			Estimated Speed in kph.
RouteStatus_TypeID	RouteStatus_TypeID	0..1			Route status
SystemCodeNumber	TR_Definition	1	PFK		

Relations

Type	Begin	End
association	TR_Dynamic class	TR_Definition class
association	TR_Dynamic class	RouteStatus_TypeID class
generalization	TR_Dynamic class	Object_Dynamic class

27.8 TR_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with the traffic monitoring equipment for a route.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	TR_FaultType	1	PFK		
SystemCodeNumber	TR_Definition	1	PFK		

Relations

Type	Begin	End
generalization	TR_Faults class	Faults class
association	TR_Faults class	TR_Definition class
association	TR_Faults class	TR_FaultType class

27.9 TR_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with the traffic monitoring equipment for a route.

Relations

Type	Begin	End
generalization	TR_FaultType class	FaultType class
association	TR_FaultType class	TR_Faults class

27.10 TR_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about data related to a route.

Relations

Type	Begin	End
generalization	TR_Quality class	Quality class
association	TR_Quality class	Route_Prediction class
association	TR_Quality class	Route_Profile class
association	TR_Quality class	TR_Definition class

27.11 TR_Segment_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Segment Configuration data.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SegmentID	integer				Unique identifier for the segment of route used as ordered list.
SystemCodeNumber	TR_Definition	1	PFK		
TransportLinkReference	TL_Definition	0..1	PFK		Unique identifier for the link.

Relations

Type	Begin	End
association	TR_Segment_Configuration class	TR_Definition class
generalization	TR_Segment_Configuration class	Object_Configuration class
association	TR_Segment_Configuration class	TL_Definition class

27.12 TR_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Type of transport route. Relates the TypeID field in the object to a particular description. Values are as follows: 1 = Road 2 = Bus 3 = Rail 999 = Other

Relations

Type	Begin	End
association	TR_TypeID class	TR_Definition class
generalization	TR_TypeID class	TypeID class

28 VMS Package

28.1 Introduction

General information

Qualified Name:	UTMC::VMS
Comment:	Package for classes representing Variable Message Signs (VMS) and their messages.

Diagrams

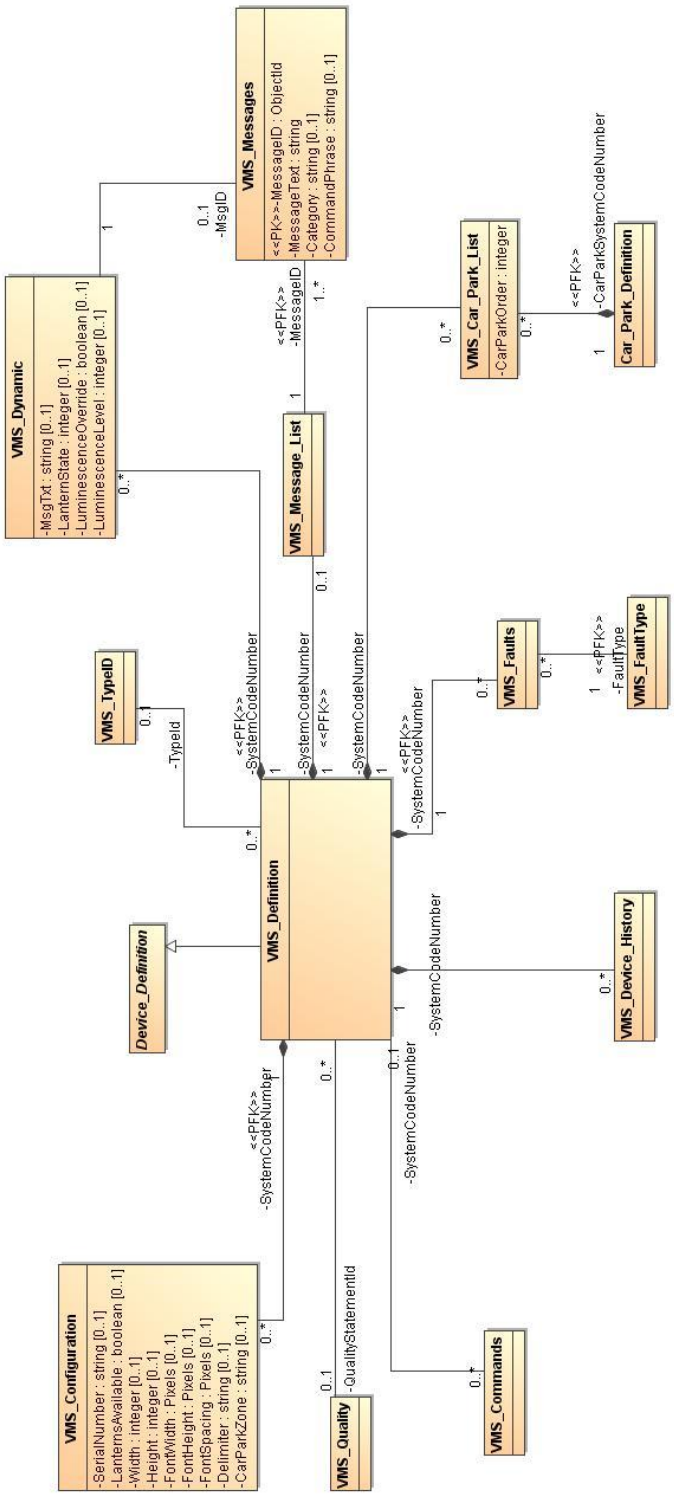


Figure 28-1: VMS diagram

28.2 VMS_Car_Park_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Represents the association between a car park and a VMS that can display information on that car park.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CarParkOrder	integer				Order of the car park in the sequence list. Required for multi-line car park VMS.
CarParkSystemCode Number	Car_Park_Definition	1	PFK		Unique identifier for a car park which is associated with the sign and/or zone.
SystemCodeNumber	VMS_Definition	1	PFK		Unique identifier for the sign.

Relations

Type	Begin	End
association	VMS_Car_Park_List class	VMS_Definition class
association	VMS_Car_Park_List class	Car_Park_Definition class

28.3 VMS_Commands Class

General information

Base Classifier:	Command
Is Abstract:	false
Comment:	Represents a command related to VMS.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	VMS_Definition	0..1			

Relations

Type	Begin	End
generalization	VMS_Commands class	Command class
association	VMS_Commands class	VMS_Definition class

28.4 VMS_Configuration Class

General information

Base Classifier:	Object_Configuration
Is Abstract:	false
Comment:	Application configuration information to setup the sign.

Attributes

Name	Type	Mult.	Key?	Max	Comments
CarParkZone	string	0..1		32	Identifier for the zone which controls this sign
Delimiter	string	0..1			Delimiter character for multi-line VMS.
FontHeight	Pixels	0..1			Font height in pixels.
FontSpacing	Pixels	0..1			Font spacing in pixels.
FontWidth	Pixels	0..1			Font width in pixels.
Height	integer	0..1			Number of rows available.
LanternsAvailable	boolean	0..1		1	Lanterns available (Y/N).
SerialNumber	string	0..1			Serial number of the sign.
SystemCodeNumber	VMS_Definition	1	PFK		
Width	integer	0..1			Number of columns available.

Relations

Type	Begin	End
association	VMS_Configuration class	VMS_Definition class
generalization	VMS_Configuration class	Object_Configuration class

28.5 VMS_Definition Class

General information

Base Classifier:	Device_Definition
Is Abstract:	false
Comment:	The VMS Data Object describes the location, configuation and dynamic status of a VMS. The VMS may relate to carpark or strategic signs. Fault information,based on the generic Fault Support Object, whether communications faults or equipment faults can also be associated with the VMS Object. Associated fault types may be used to determine the type of fault that has occurred, e.g. comms failure, heater failure. Command information may be sent to the VMS object by the VMS_Command common support object.

Attributes

Name	Type	Mult.	Key?	Max	Comments
QualityStatementId	VMS_Quality	0..1			
TypeId	VMS_TypeID	0..1			

Relations

Type	Begin	End
association	VMS_Definition class	VMS_TypeID class
association	VMS_Definition class	VMS_Car_Park_List class
generalization	VMS_Definition class	Device_Definition class
association	VMS_Definition class	VMS_Message_List class
association	VMS_Definition class	VMS_Configuration class
association	VMS_Definition class	VMS_Device_History class
association	VMS_Definition class	VMS_Quality class
association	VMS_Definition class	VMS_Commands class
association	VMS_Definition class	VMS_Faults class
association	VMS_Definition class	VMS_Dynamic class

28.6 VMS_Device_History Class

General information

Base Classifier:	Device_History
Is Abstract:	false
Comment:	Log entry describing an event relating to VMS.

Attributes

Name	Type	Mult.	Key?	Max	Comments
SystemCodeNumber	VMS_Definition	1			

Relations

Type	Begin	End
generalization	VMS_Device_History class	Device_History class
association	VMS_Device_History class	VMS_Definition class

28.7 VMS_Dynamic Class

General information

Base Classifier:	Object_Dynamic
Is Abstract:	false
Comment:	Dynamic information associated with the message currently being displayed by the sign.

Attributes

Name	Type	Mult.	Key?	Max	Comments
LanternState	integer	0..1			State of the Lantern for this message.
LuminescenceLevel	integer	0..1			Luminescence level.
LuminescenceOverride	boolean	0..1		1	State of the luminescence level for this message (Y/N).
MsgID	VMS_Messages	0..1			Identifier for the currently displayed message.
MsgTxt	string	0..1			Actual text displayed on the sign.
SystemCodeNumber	VMS_Definition	1	PFK		

Relations

Type	Begin	End
generalization	VMS_Dynamic class	Object_Dynamic class
association	VMS_Dynamic class	VMS_Messages class
association	VMS_Dynamic class	VMS_Definition class

28.8 VMS_Faults Class

General information

Base Classifier:	Faults
Is Abstract:	false
Comment:	Represents a specific fault with VMS.

Attributes

Name	Type	Mult.	Key?	Max	Comments
FaultType	VMS_FaultType	1	PFK		
SystemCodeNumber	VMS_Definition	1			

Relations

Type	Begin	End
association	VMS_Faults class	VMS_FaultType class
generalization	VMS_Faults class	Faults class
association	VMS_Faults class	VMS_Definition class

28.9 VMS_FaultType Class

General information

Base Classifier:	FaultType
Is Abstract:	false
Comment:	Identifies and describes a type of fault that may occur with VMS.

Relations

Type	Begin	End
association	VMS_FaultType class	VMS_Faults class
generalization	VMS_FaultType class	FaultType class

28.10 VMS_Message_List Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	Associates a message with a sign to indicaite that this message is allowed on this sign.

Attributes

Name	Type	Mult.	Key?	Max	Comments
MessageID	VMS_Messages	1..*	PFK		ID of a message that belongs to the list for this sign.
SystemCodeNumber	VMS_Definition	1	PFK		Unique identifier for the sign.

Relations

Type	Begin	End
association	VMS_Message_List class	VMS_Messages class
association	VMS_Message_List class	VMS_Definition class

28.11 VMS_Messages Class

General information

Base Classifier:	
Is Abstract:	false
Comment:	A message that may be sent to signs.

Attributes

Name	Type	Mult.	Key?	Max	Comments
Category	string	0..1			Category of the message. Categories can allow various messages to be grouped.
CommandPhrase	string	0..1			Command phrase to send to implement this message.
MessageID	ObjectId		PK	32	Unique identifier for the message.
MessageText	string			512	Text for the message. Text may be split with delimitier character to separate lines.

Relations

Type	Begin	End
association	VMS_Messages class	VMS_Message_List class
association	VMS_Messages class	VMS_Dynamic class

28.12 VMS_Quality Class

General information

Base Classifier:	Quality
Is Abstract:	false
Comment:	Quality statement about VMS data.

Relations

Type	Begin	End
association	VMS_Quality class	VMS_Definition class
generalization	VMS_Quality class	Quality class

28.13 VMS_TypeID Class

General information

Base Classifier:	TypeID
Is Abstract:	false
Comment:	Proposed typeIDs are: 1 = CAR PARK LED 2 = FREE TEXT LED 3 = PRISM 4 = MS2 (Motorway sign #2, text) 5 = MS3 (Motorway sign #3, text + pictogram) 6 = MS4 (Motorway sign #4, full matrix) 7 = AMI (Automatic motorway indicator) 8 = MSU (motorway signal unit) 9 = Motorway Sign 101 10 = Motorway Sign 201 11 = Motorway Sign 202 12 = Motorway Sign 203 13 = Motorway Sign 204 14 = Motorway Sign 205 15 = Motorway Sign 206 16 = Motorway Sign 207 17 = Motorway Sign 208 18 = Motorway Sign 209 19 = Motorway Sign 210 20 = Motorway Sign 211 21 = Motorway Sign 212 22 = Diversion Sign 999 = Undefined

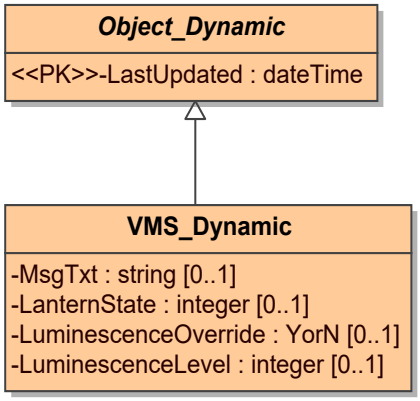
Relations

Type	Begin	End
association	VMS_TypeID class	VMS_Definition class
generalization	VMS_TypeID class	TypeID class

Appendix I Examples

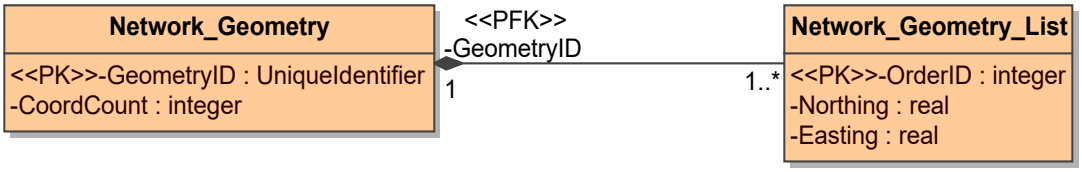
I.1 Example for Rule R3

I.1.1 The UML below specifies one physical table named "VMS_Dynamic", with five columns, one for each attribute from the "Object_Dynamic" and "VMS_Dynamic" classes.



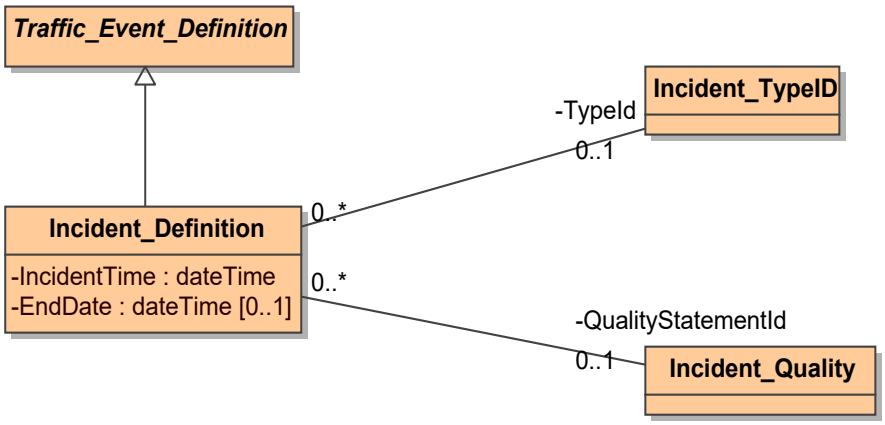
I.2 Example for Rule R7

I.2.1 For example, the UML below specifies that the Network_Geometry_List table includes a column GeometryID which is a foreign key.

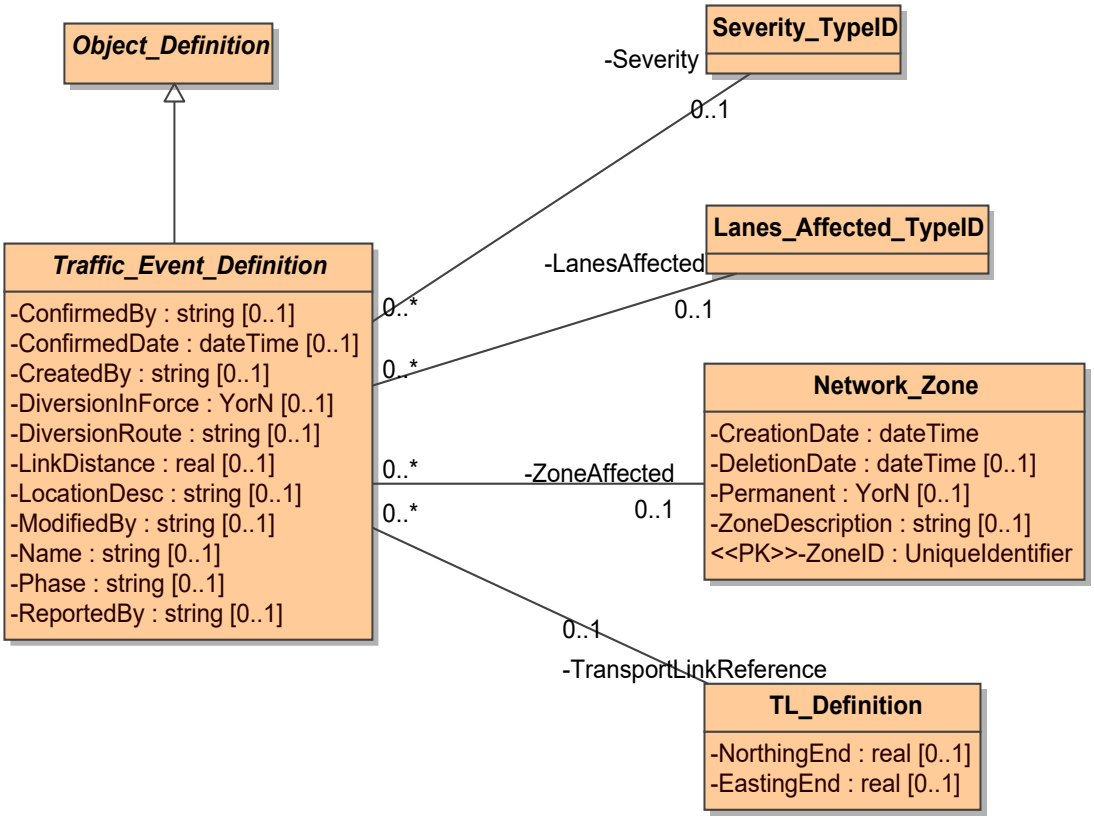


I.3 A larger example – Incidents

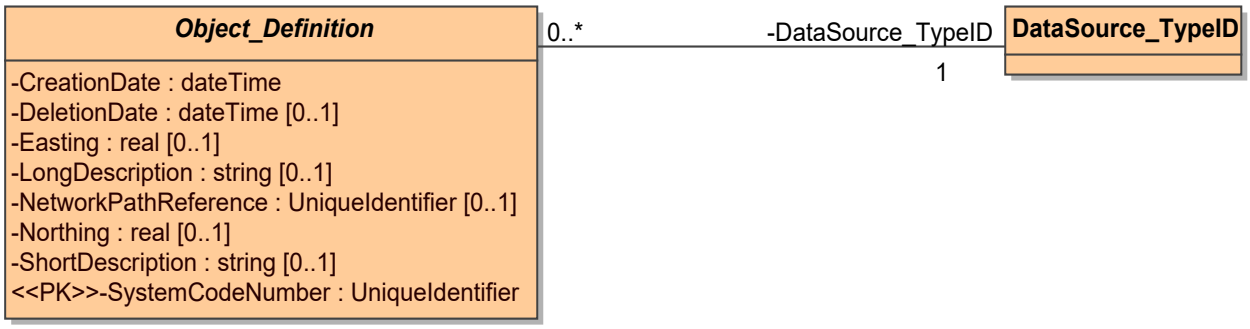
I.3.1 This section applies the above rules in combination to illustrate the relational structures for the UTMC "Incident_Definition" class. "Incident_Definition" is a sub-class of Traffic_Event_Definition.



I.3.2 Traffic_Event_Definition is one of the major abstract classes defined in the "template" package.



I.3.3 Traffic_Event_Definition is itself a subclass of Object_Definition.



I.3.4 The Incident_Definition class is not abstract, so this specifies that there shall be a table called "Incident_Definition". It shall contain eight columns corresponding to the attributes inherited from the Object_Definition class (CreationDate etc), another eleven columns corresponding to the attributes inherited from the Traffic_Event_Definition class (Name etc), and another two columns corresponding to the attributes specified in the Incident_Defintion class itself. It shall also contain one foreign key column corresponding to the association inherited from Object_Definition (DataSource_TypeID), four more foreign key columns corresponding to the associations inherited from Traffic_Event_Definition (Severity etc), and two foreign key columns corresponding to the associations specified for the Incident class itself. The primary key of the table is the SystemCodeNumber as specified in the Object_Definition base class.