

UTMC-TS004.0061:2010

UTMC Objects Registry

Annex D.1: UML Data Model

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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.

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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.

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.

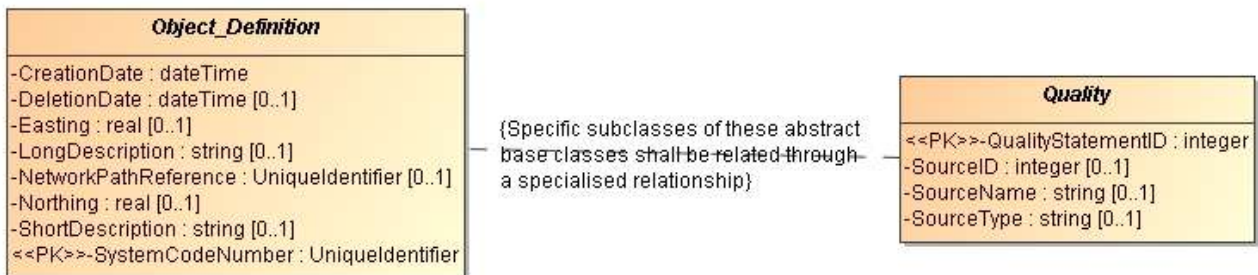
2.5 Mapping to UTMC TabularResults types

- 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

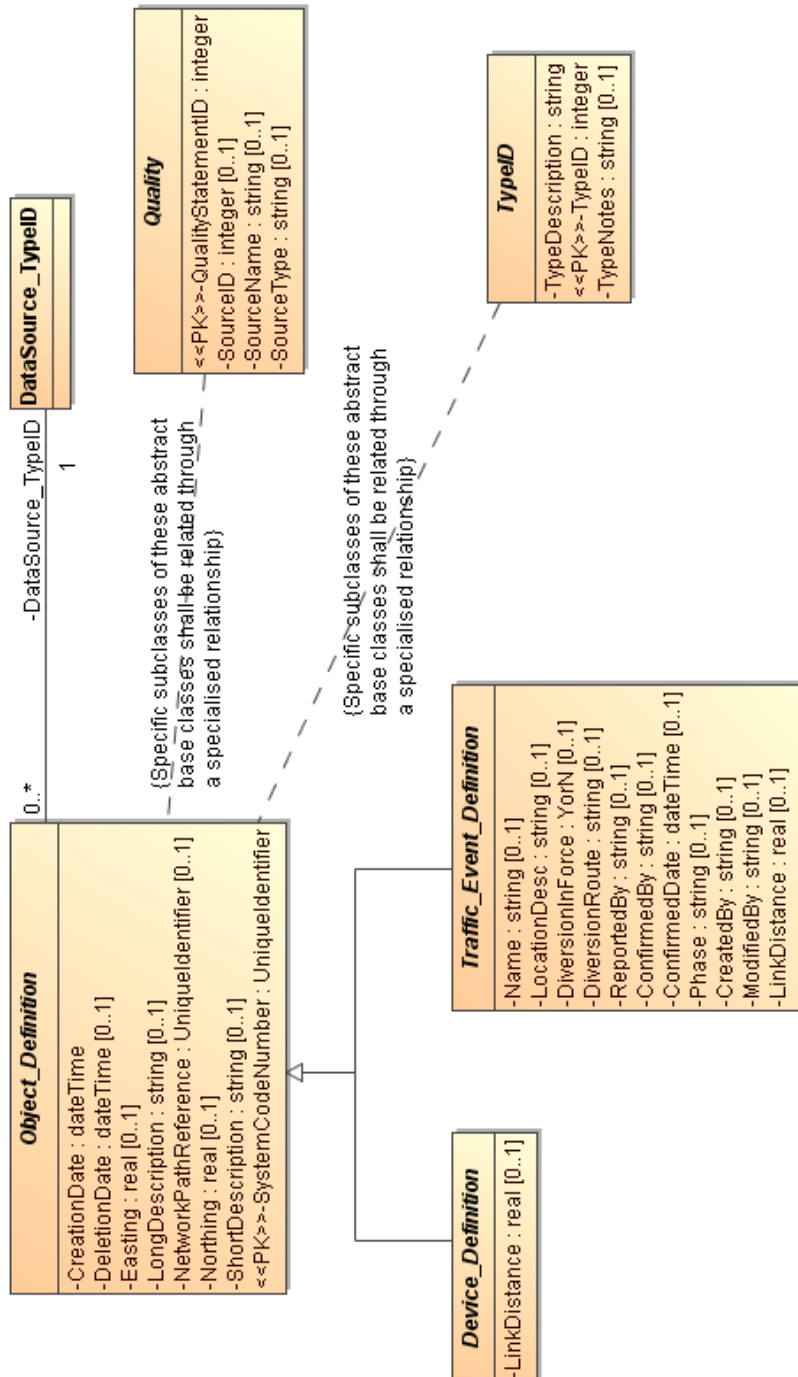


Figure 3-1: Abstract base classes diagram

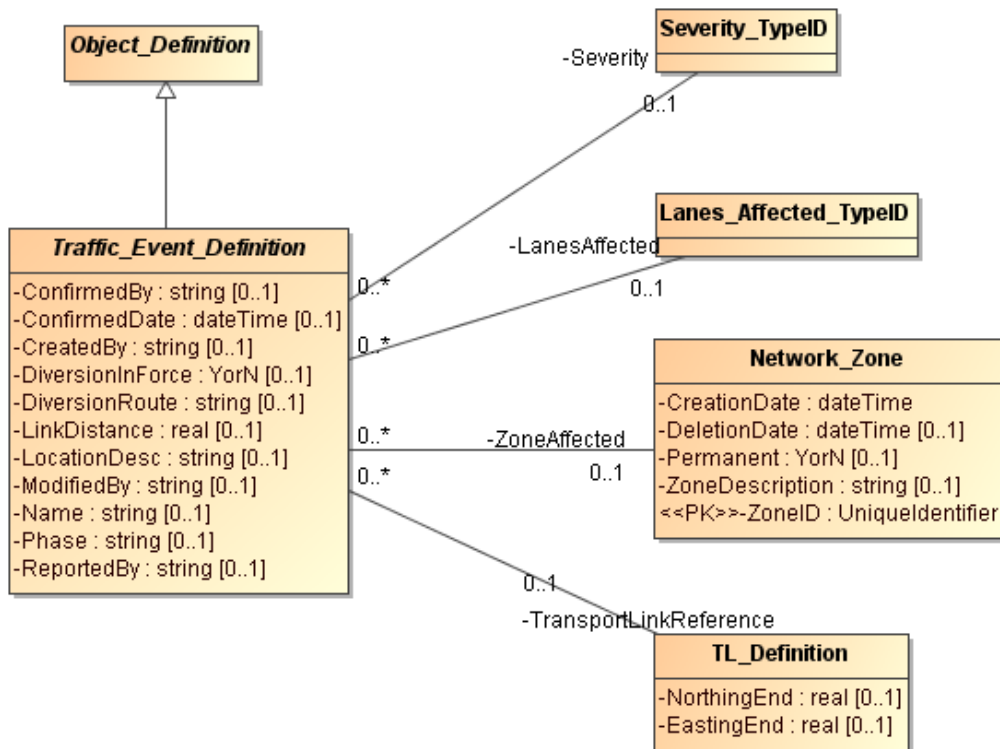


Figure 3-2: Abstract traffic event base class diagram

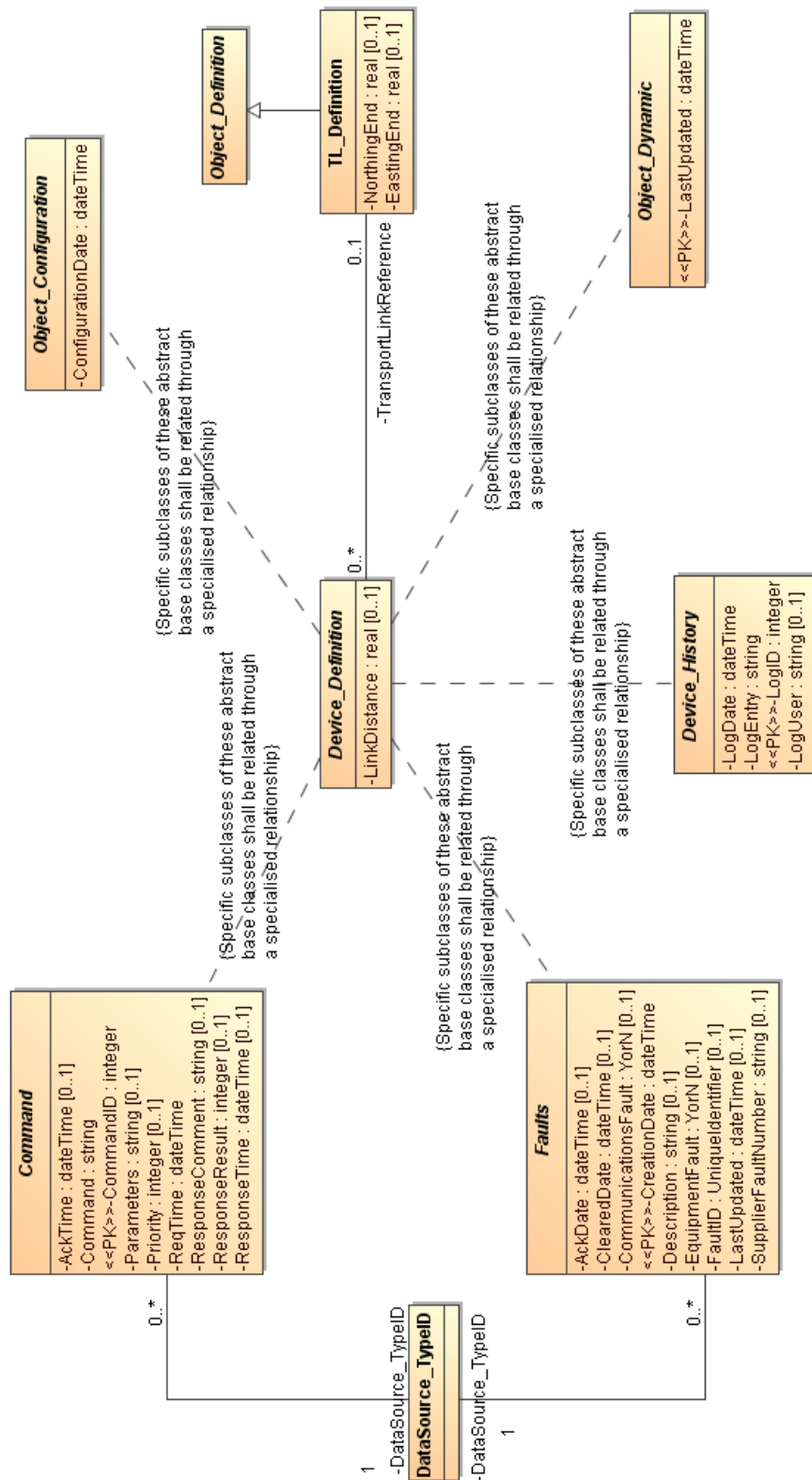


Figure 3-3: Abstract device base class diagram

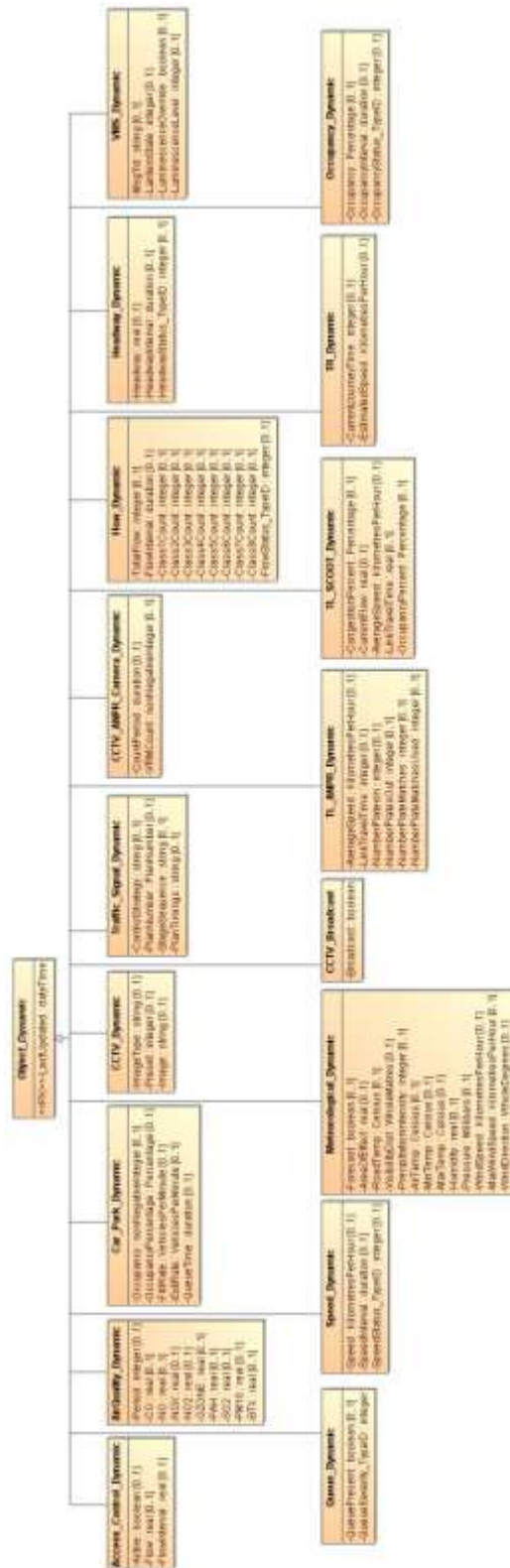


Figure 3-4: Dynamic diagram

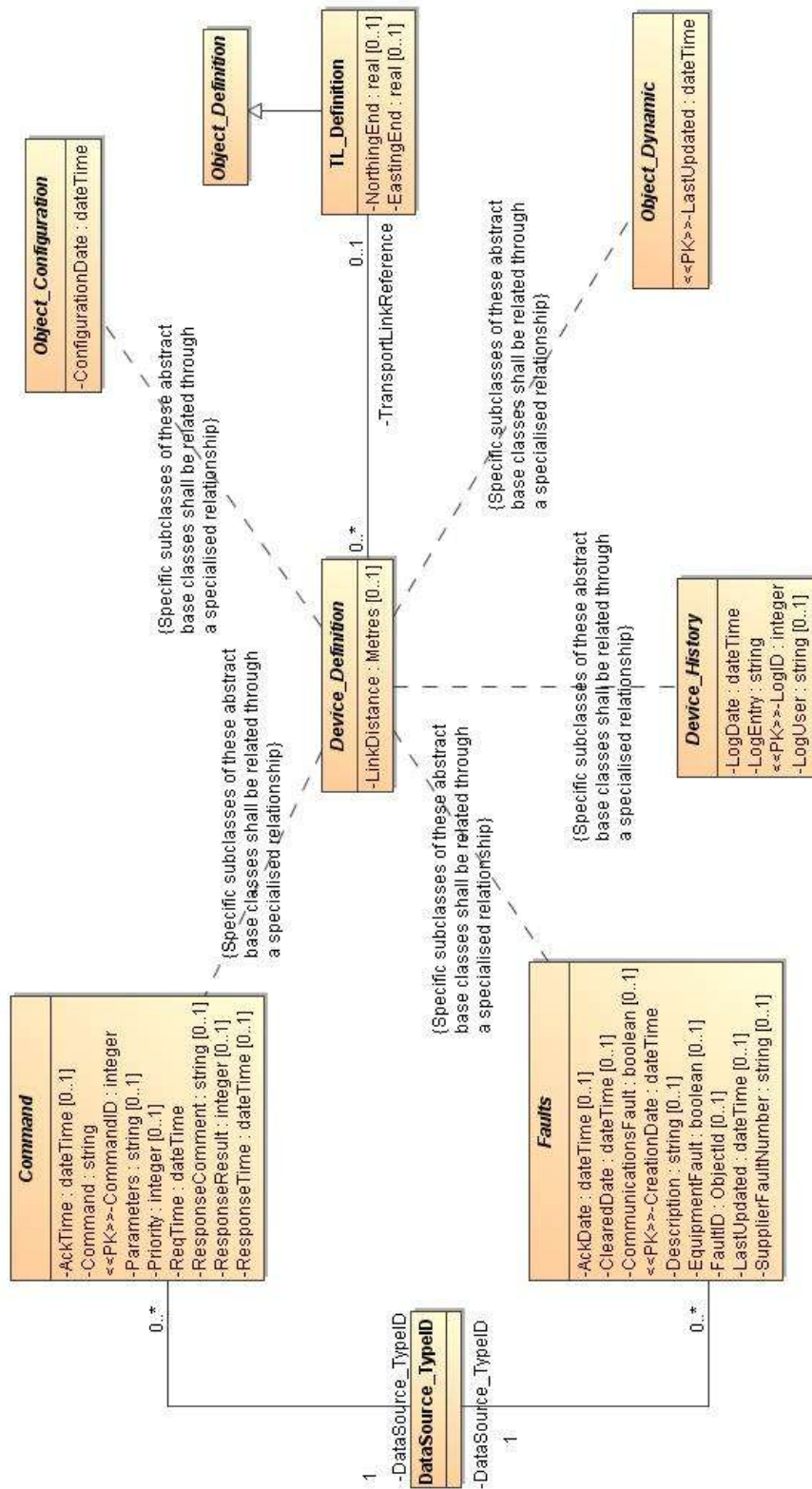


Figure 3-5: abstract device base class diagram

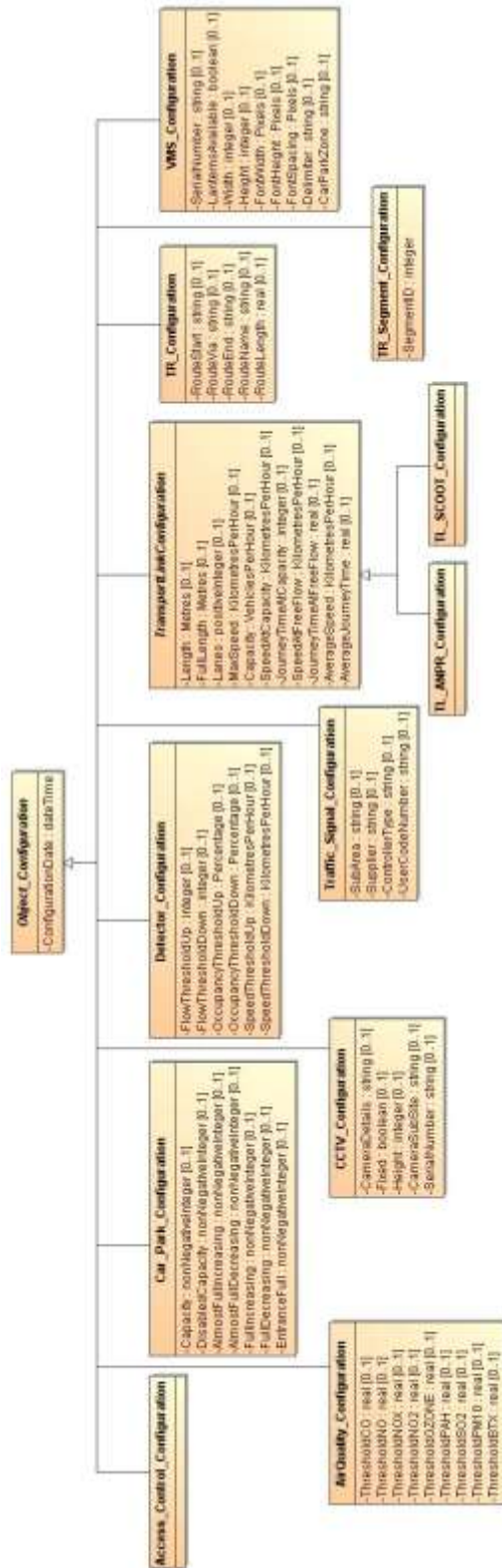


Figure 3-6: Configuration diagram

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 Gazetteer 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

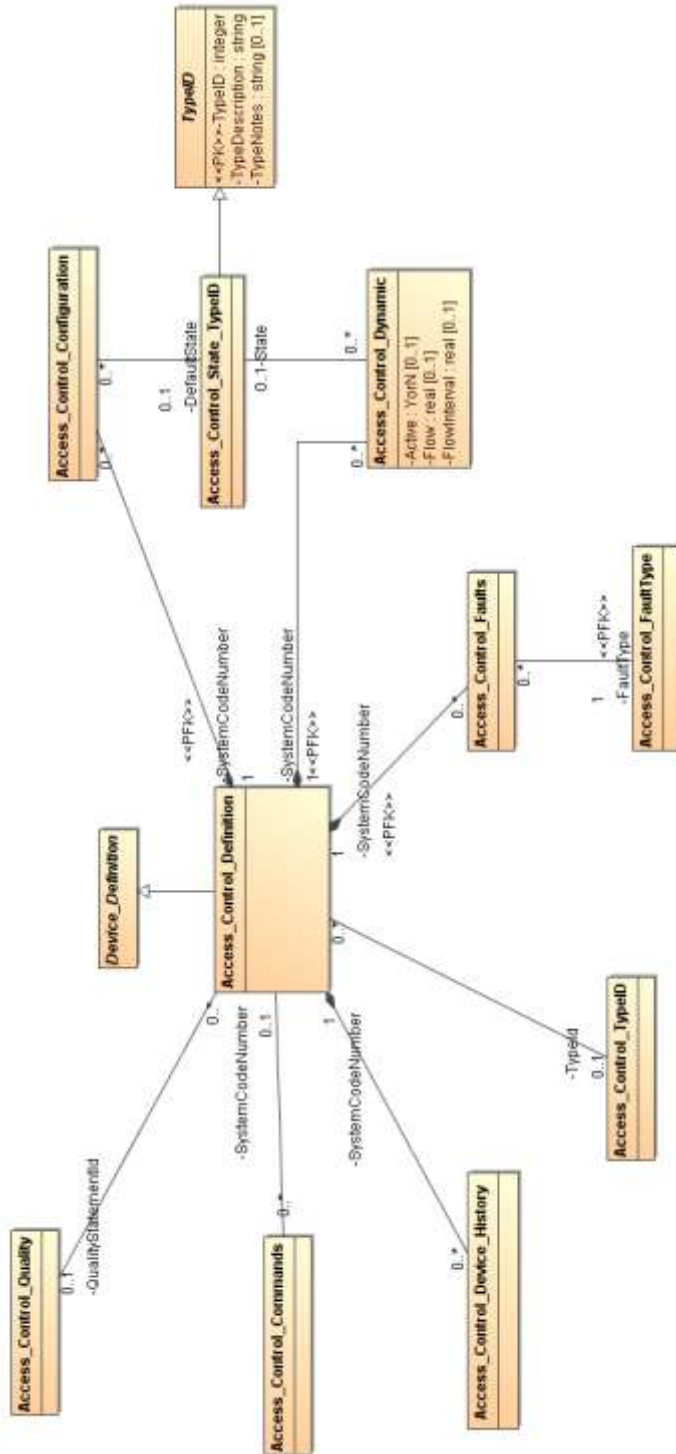


Figure 5-1: Access Control diagram

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

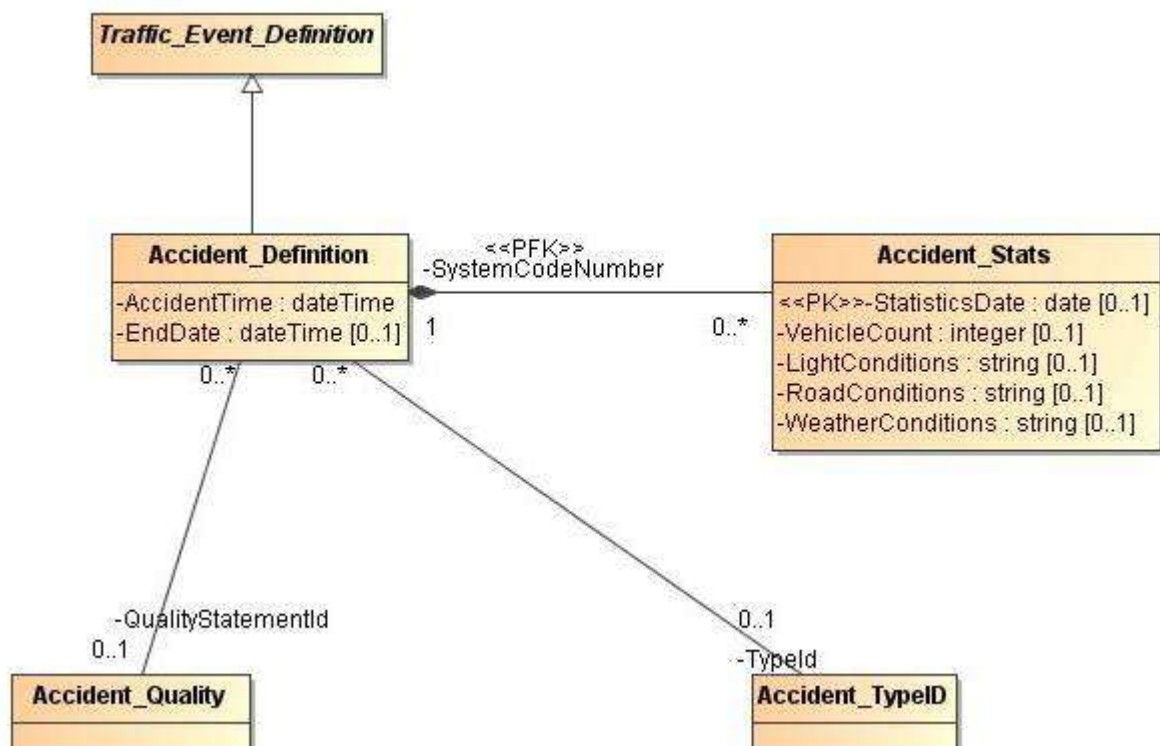


Figure 6-1: Accident diagram

6.2 Accident_Definition Class

General information

| | |
|------------------|--|
| Base Classifier: | Traffic_Event_Definition |
| Is Abstract: | false |
| Comment: | <p>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.</p> <p>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.</p> |

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: | <p>Type of accident. Relates the TypeID field in the object to a particular description.</p> <p>Values are as follows:</p> <ul style="list-style-type: none"> 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

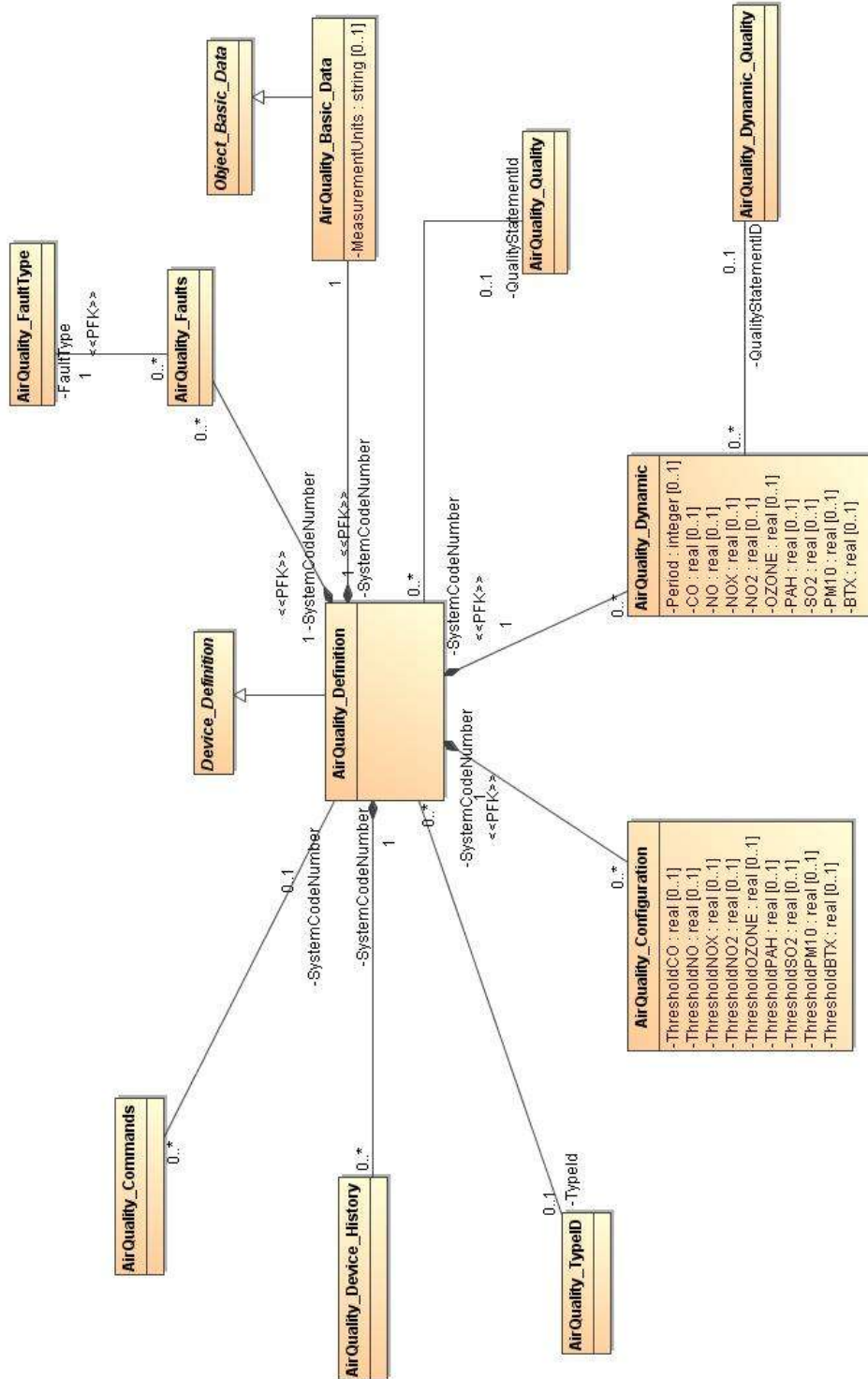


Figure 7-1: AirQuality diagram

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: | <p>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.</p> <p>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.</p> <p>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.</p> |

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

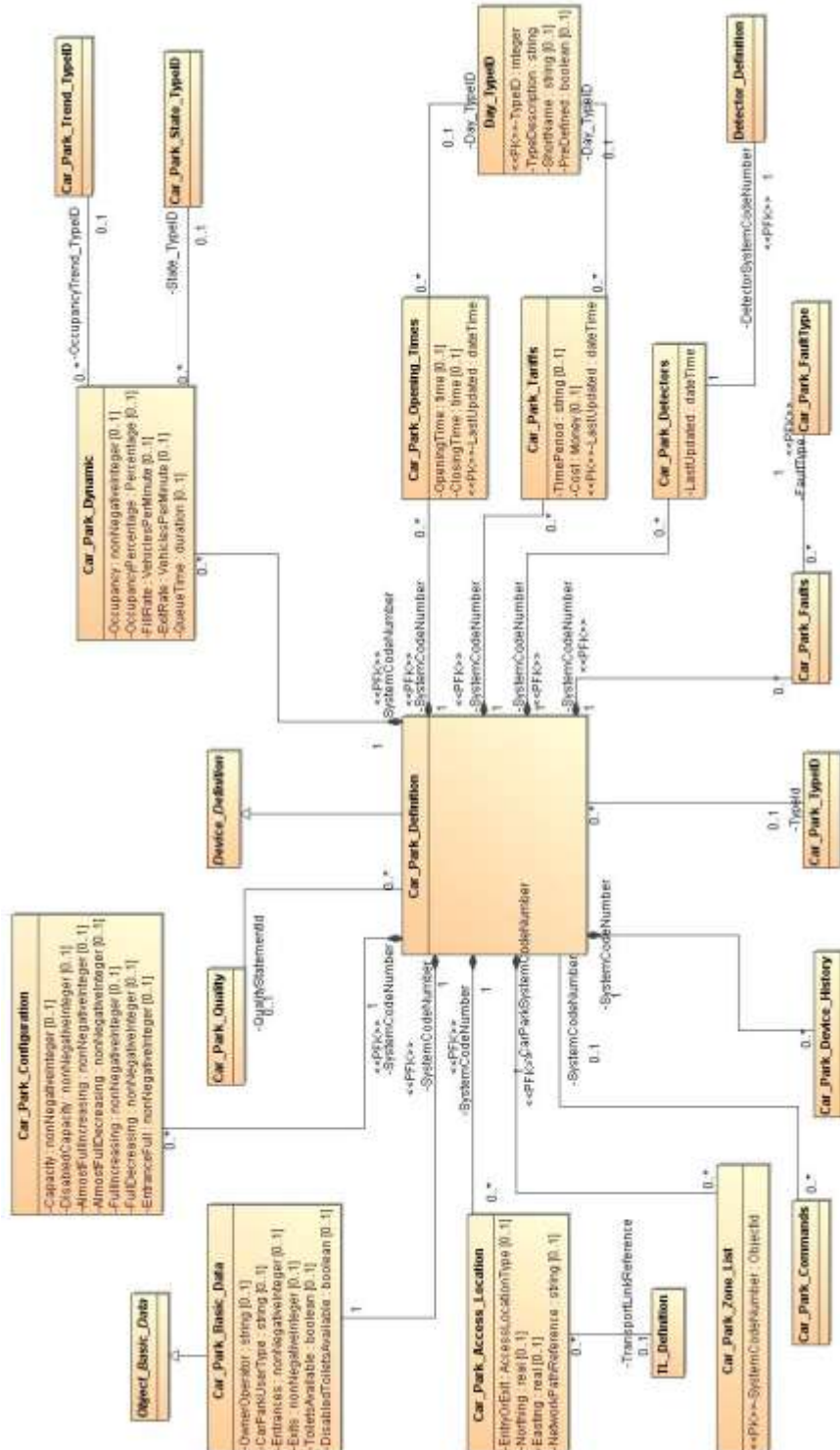


Figure 8-1: CarPark diagram

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 exit. |
| 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: | <p>Classification of car park state. Relates the State_TypeID field in Car Park Data object to a particular description.</p> <p>Values are as follows:</p> <ul style="list-style-type: none">1: Faulty2: Spaces3: Almost Full4: Full5: Closed6: Open999: 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: | <p>Classification of car park occupancy trend. Relates the OccupancyTrend_TypeID field in Car Park Data object to a particular description.</p> <p>Values are as follows: 1: Down/Decreasing 2: Stay/Static 3: Up/Increasing 999: Other</p> |

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: | <p>Type of car park system</p> <p>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</p> |

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

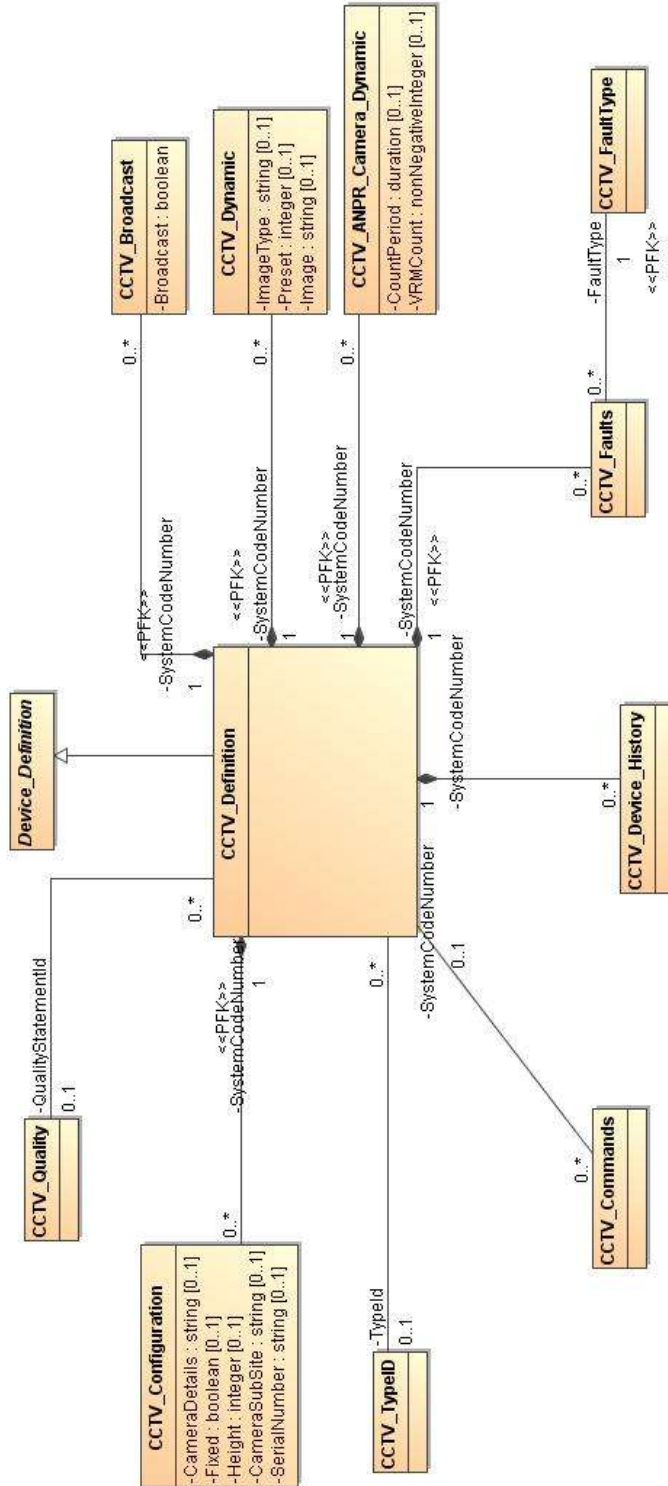


Figure 9-1: CCTV diagram

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 | | | <p>Image in Hex character form.</p> <p>Note: CCTV Image: The current UTMC interface specification does not allow for the transfer of binary images. Therefore, two interim solutions are proposed:</p> <ol style="list-style-type: none"> 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

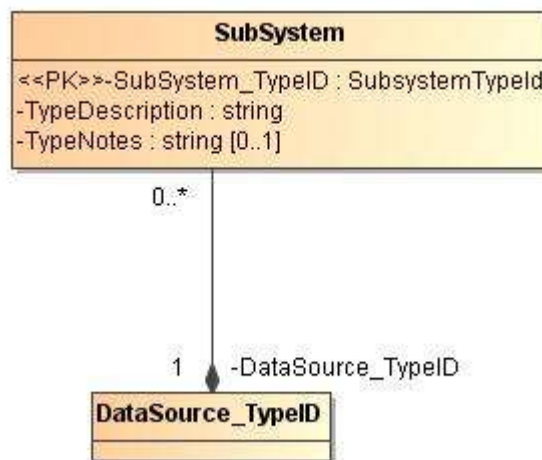


Figure 10-1: CommonSubSystemSupport diagram

10.2 SubSystem Class

General information

| | |
|------------------|---|
| Base Classifier: | |
| Is Abstract: | false |
| Comment: | <p>Subsystem that can supply UTMC information.</p> <p>The SubSystem_TypeID uniquely defines each of the subsystems 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.</p> <p>The subsystem object allows the system to manage and present a more accurate description of incoming fault information.</p> |

Attributes

| Name | Type | Mult. | Key? | Max | Comments |
|-------------------|-------------------|-------|------|-----|--|
| DataSource_TypeID | DataSource_TypeID | 1 | | | Source of information, e.g. UTC |
| SubSystem_TypeID | SubsystemTypeid | | PK | | <p>Identifier for equipment type.</p> <p>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:</p> <p>MOTTS 1000 - 1099 PEEK 1100 - 1199 TENET 1200 - 1299 THALES 1300 - 1399 SIEMENS 1400 - 1499 SERCO 1500-1599 SIEMENS 14000-14999</p> |
| 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: | <p>The classes in this package are supporting objects that are generically applicable to the major traffic objects.</p> <p>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.</p> |

Diagrams

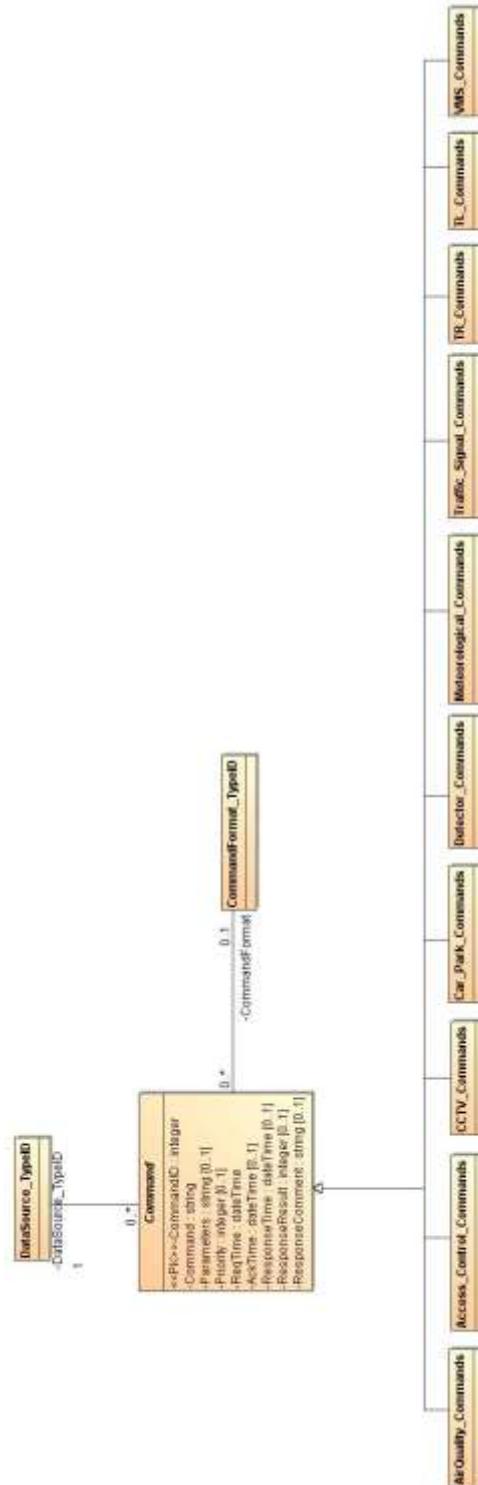


Figure 11-1: Commands diagram

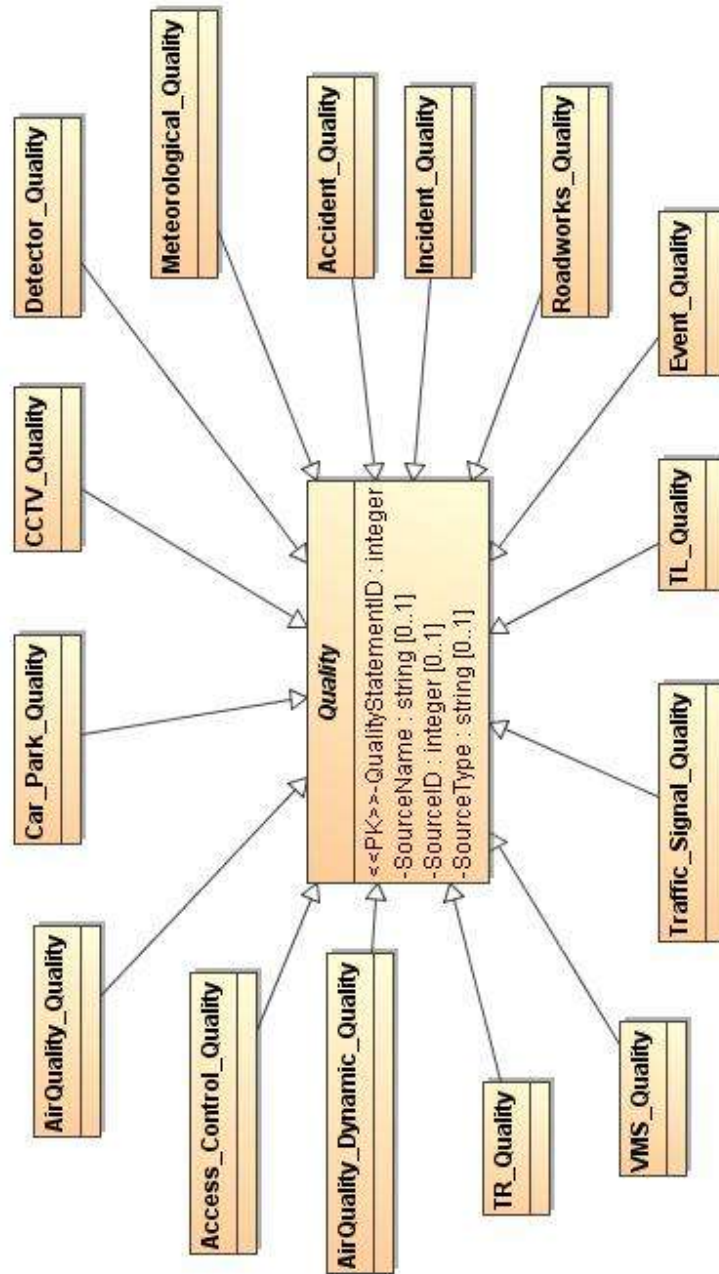


Figure 11-2: Quality diagram



Figure 11-2: Device History diagram

11.2 Command Class

General information

| | |
|------------------|--|
| Base Classifier: | |
| Is Abstract: | true |
| Comment: | <p>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)</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>The CDB does not dictate the type of commands that may be used with a particular data type.</p> <p>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:</p> <pre> COMMANDID=1024533 SYSTEMCODENUMBER='VMS01' COMMANDFORMAT=1 DATASOURCE_TYPEID=911 COMMAND='UPDATE' PARAMETERS="Use A999 For City Centre"; PRIORITY=100; </pre> <p>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.</p> <p>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.</p> <p>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</p> |

| | |
|--|--|
| | <p>successfully updated. Failed commands would be responded to but the VMS dynamic attributes would remain unchanged.</p> <p>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.</p> |
|--|--|

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: | <p>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.</p> <p>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.</p> |

Attributes

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

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: | <p>This class is provided for potential inclusion of the UTMC07/17 quality statements.</p> <p>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.</p> <p>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 carpark.</p> |

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: | <p>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:</p> <p>MOTTS 1000 - 1099 PEEK 1100 - 1199 TENET 1200 - 1299 THALES 1300 - 1399 SIEMENS 1400 - 1499 SERCO 1500-1599 AMEY 1600-1699 SIEMENS 14000-14999</p> |

Diagrams

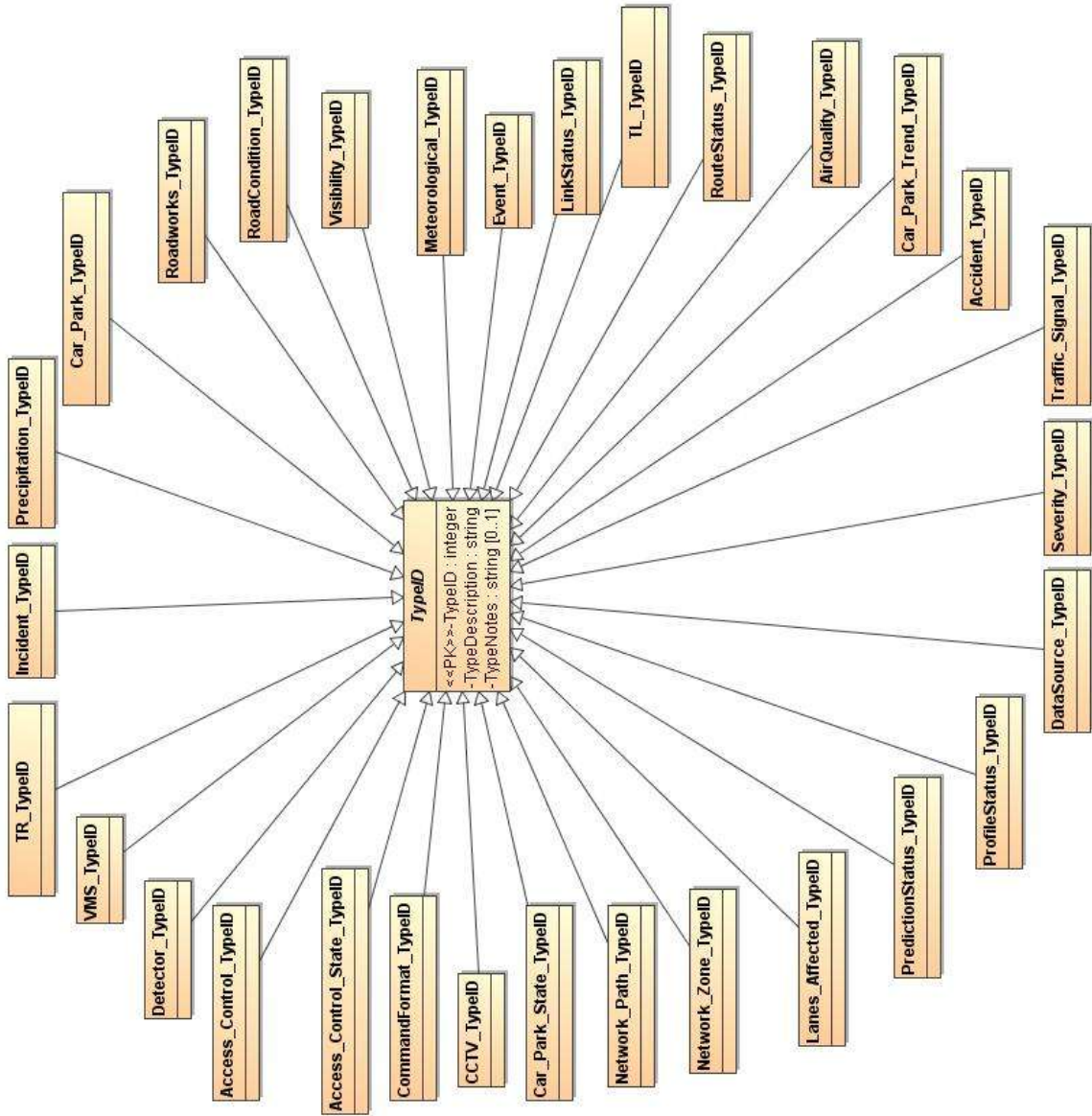


Figure 12-1: CommonTypeIDSupport diagram

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: | <p>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.</p> <p>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.</p> |
| 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

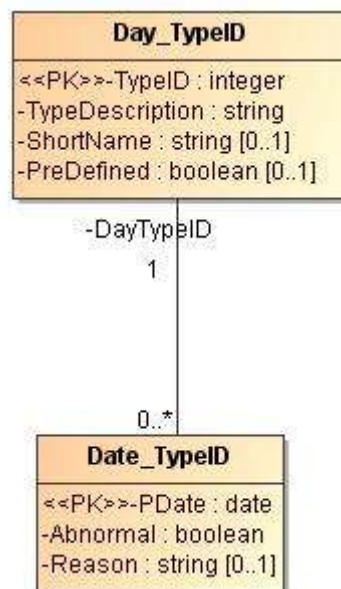


Figure 14-1: DayTypeSupport diagram

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 specific 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 accommodate 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

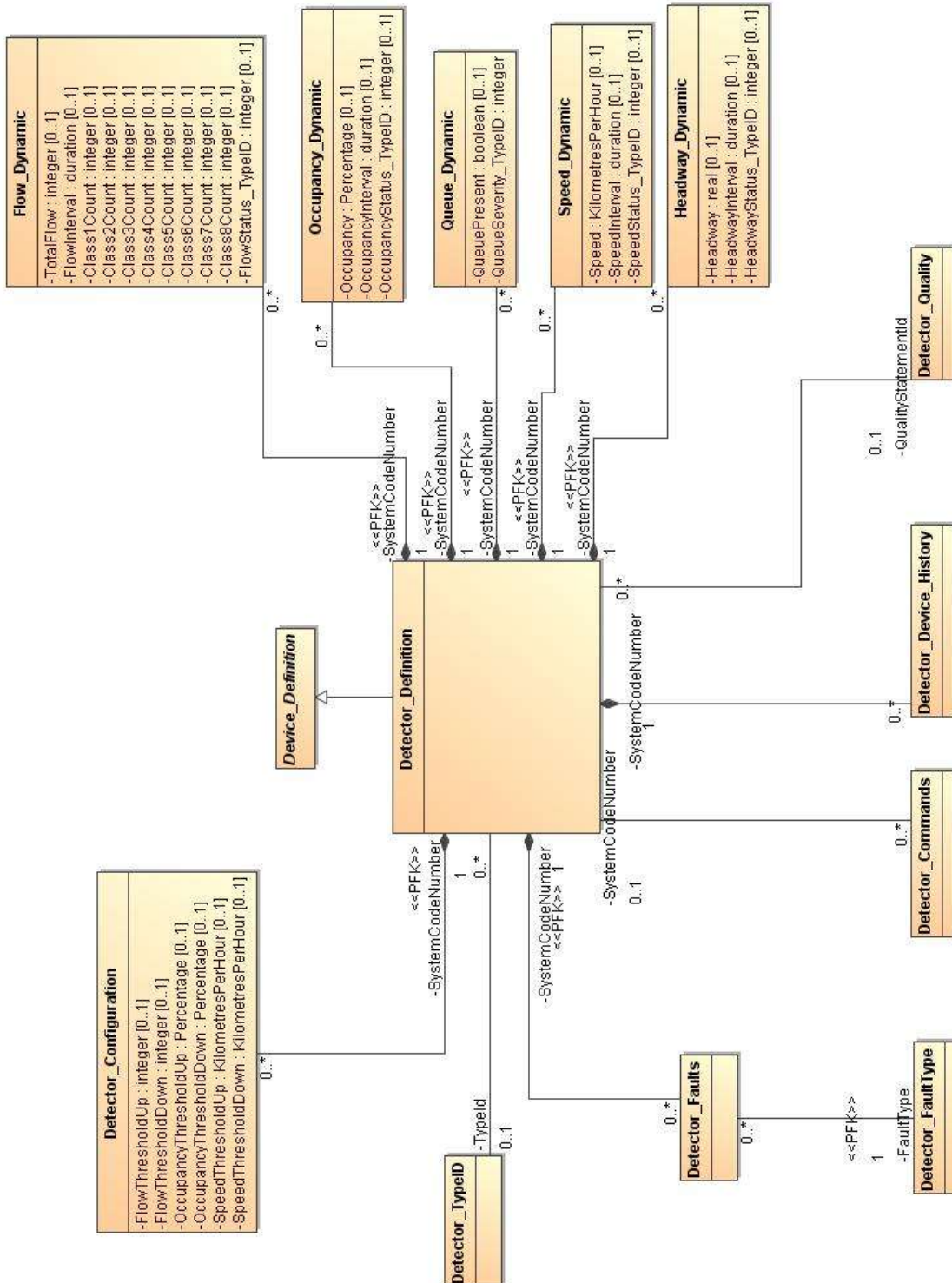


Figure 15-1: Detector diagram

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

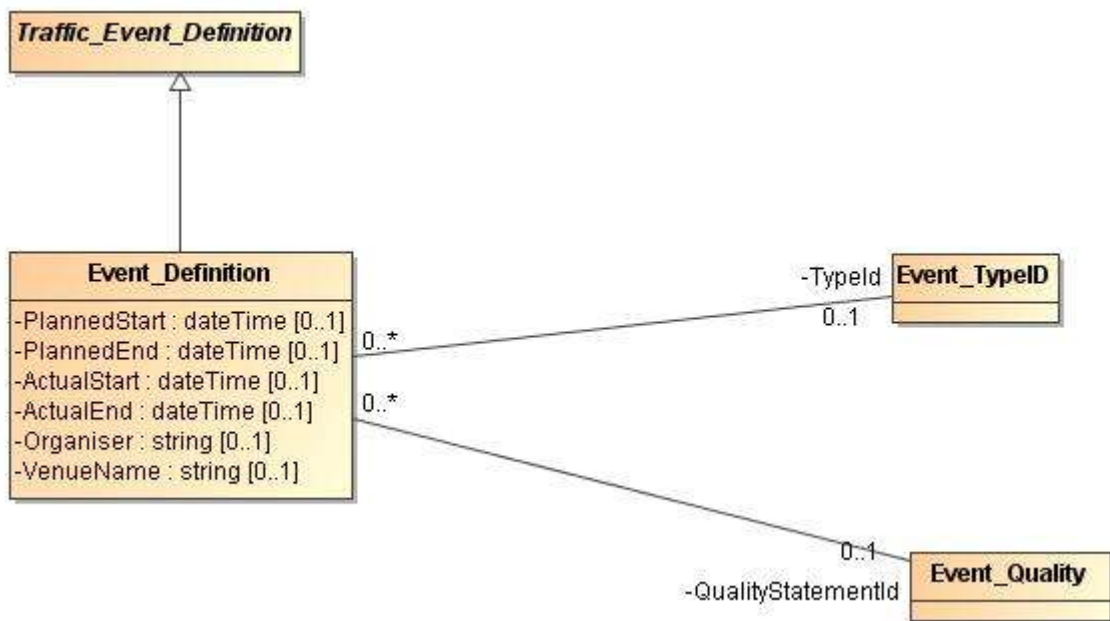


Figure 16-1: Event diagram

16.2 Event_Definition Class

General information

| | |
|------------------|--|
| Base Classifier: | Traffic_Event_Definition |
| Is Abstract: | false |
| Comment: | <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> |

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: | <p>Type of event. Relates the TypeID field in the object to a particular description. Values are as follows:</p> <ul style="list-style-type: none">1 = BALL GAME2 = BOXING TOURNAMENT3 = ATHLETICS MEETING4 = CEREMONIAL EVENT5 = CRICKET MATCH6 = CYCLE RACE7 = DEMONSTRATION8 = EVENT9 = EXHIBITION10 = FAIR11 = FESTIVAL12 = FOOTBALL MATCH13 = FUNFAIR14 = GOLF TOURNAMENT15 = INTERNATIONAL SPORTS MEETING16 = MAJOR EVENT17 = MARATHON18 = MARCH19 = MARKET20 = MATCH21 = PARADE22 = PROCESSION23 = RACE MEETING24 = RUGBY MATCH25 = SHOW26 = SHOW JUMPING27 = SPORTS EVENT28 = SPORTS MEETING29 = STATE OCCASION30 = STRIKE31 = TENNIS TOURNAMENT32 = TOURNAMENT33 = TRADE FAIR34 = WATER SPORTS MEETING35 = WINTER SPORTS MEETING999 = 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

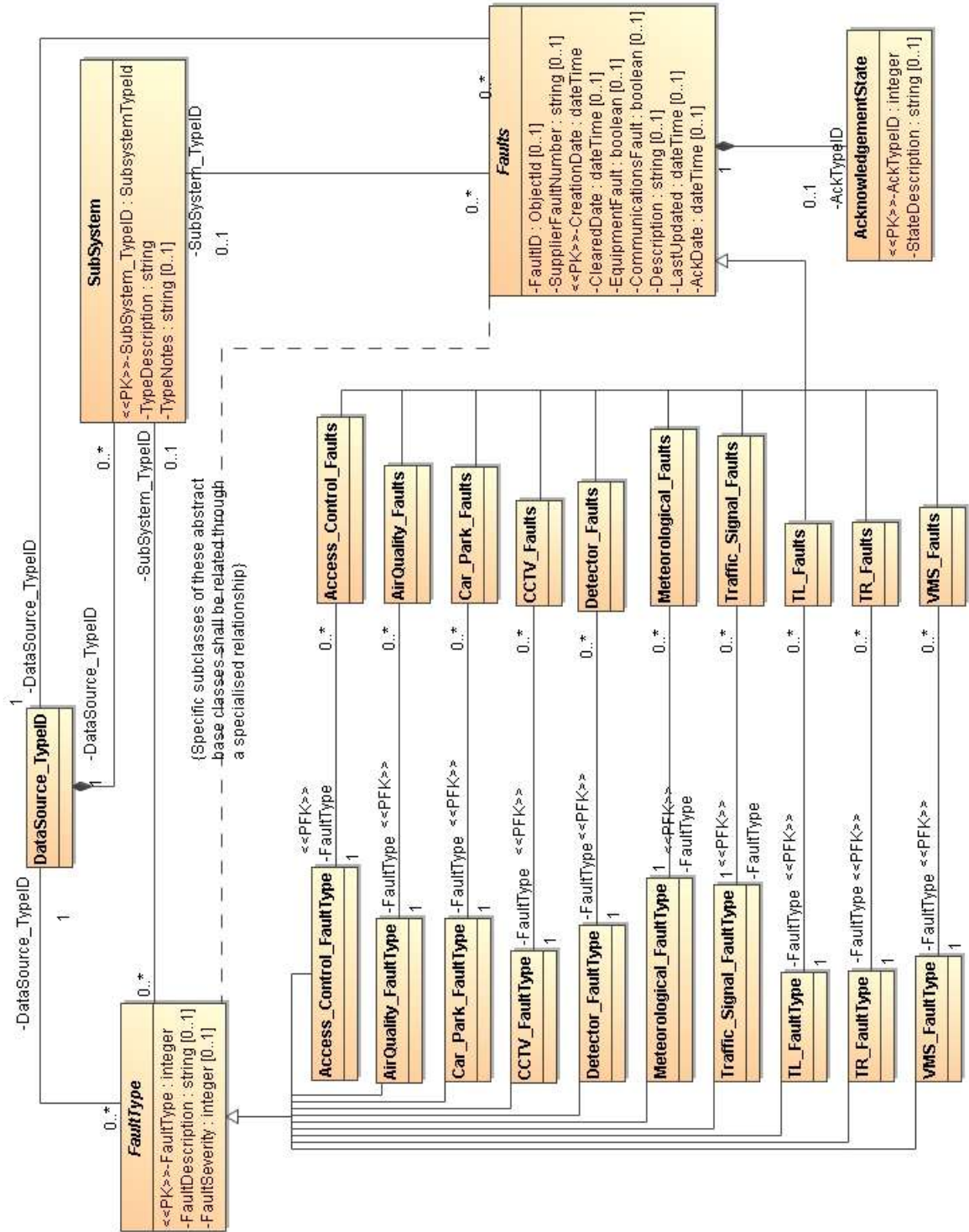


Figure 17-1: Faults and FaultTypes diagram

17.2 AcknowledgementState Class

General information

| | |
|------------------|--|
| Base Classifier: | |
| Is Abstract: | false |
| Comment: | <p>Global Support Object for all Fault Types.</p> <p>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.</p> <p>Predefined values are as follows: 0: not acknowledged 1: acknowledged 2: deferred 3: recorded for action</p> |

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: | <p>Abstract base class for representing a fault associated with an object.</p> <p>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.).</p> <p>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.</p> <p>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.</p> |

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: | <p>Abstract base class for classifying faults associated with an object.</p> <p>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 interpretation of the fault status of a Data Object.</p> <p>Predefined values are as follows: 0: No fault 999: Unknown type</p> <p>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.</p> |

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: | <p>Classification of the lanes affected. Relates the ClosureCodes field in the object to a particular description.</p> <p>Values are as follows:</p> <p>T means the lane is closed I means the lane is open</p> <p>0 = this means the road is fully open 1 = T 2 = I 3 = IT 4 = TI 5 = TT 6 = II 7 = III 8 = IIT 9 = TII 10 = ITT 11 = TTI 12 = TTT 13 = IIII 14 = TIII 15 = IIIT 16 = TTII 17 = IIIT 18 = TTTI 19 = ITTT 20 = TTTT</p> |

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: | <p>Classifies the visibility. Defined types:</p> <ol style="list-style-type: none">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

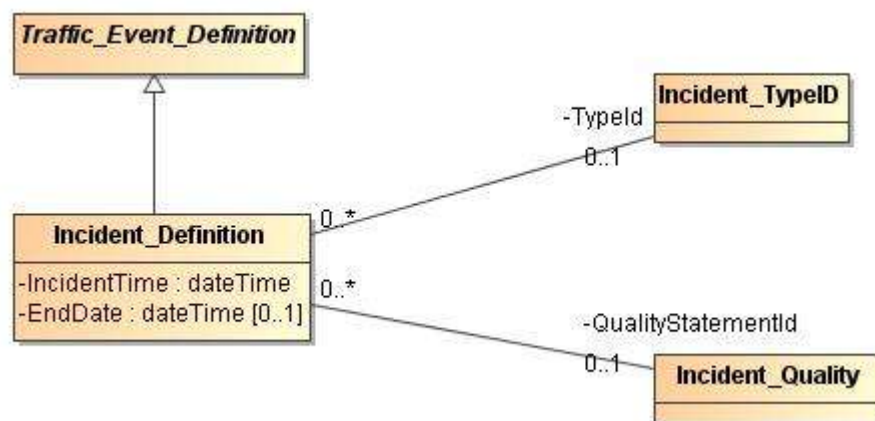


Figure 19-1: Incident diagram

19.2 Incident_Definition Class

General information

| | |
|------------------|---|
| Base Classifier: | Traffic_Event_Definition |
| Is Abstract: | false |
| Comment: | <p>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.</p> <p>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.</p> |

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

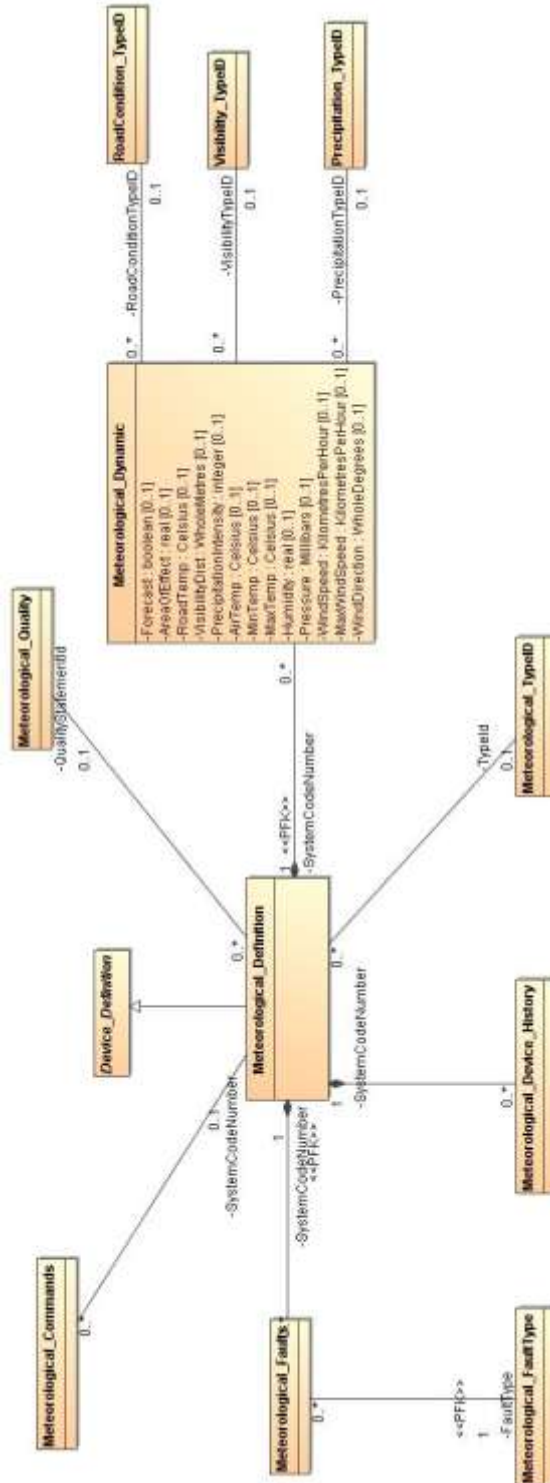


Figure 20-1: Meteorological diagram

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: | <p>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.</p> <p>Fault information, based on the generic Fault Support Object, may be stored for the meteorological object where appropriate.</p> |

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 meteorological 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

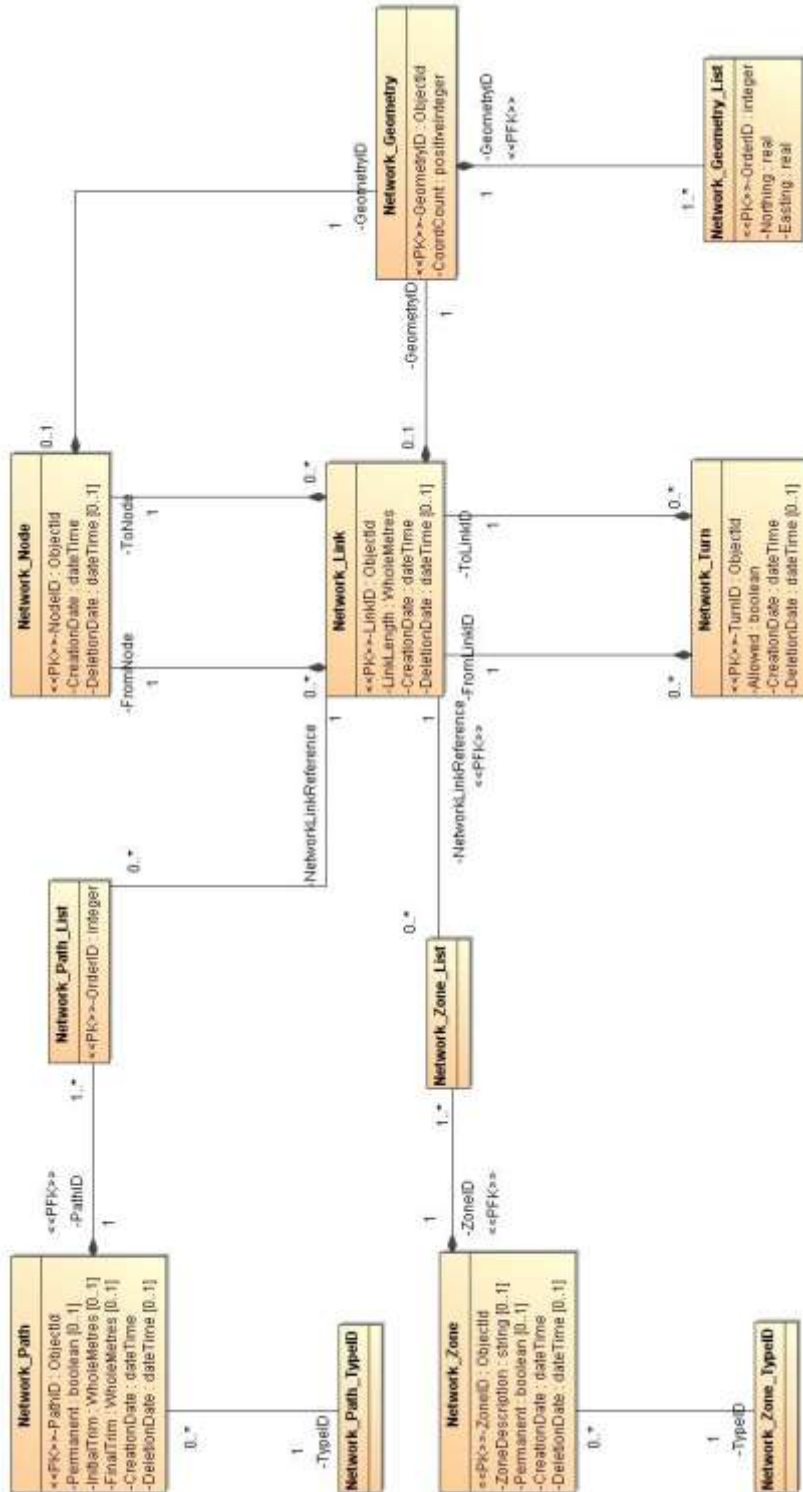


Figure 21-1: NetworkSupport diagram

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 its 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 and 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: | <p>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 an accident.</p> <p>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.</p> |

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

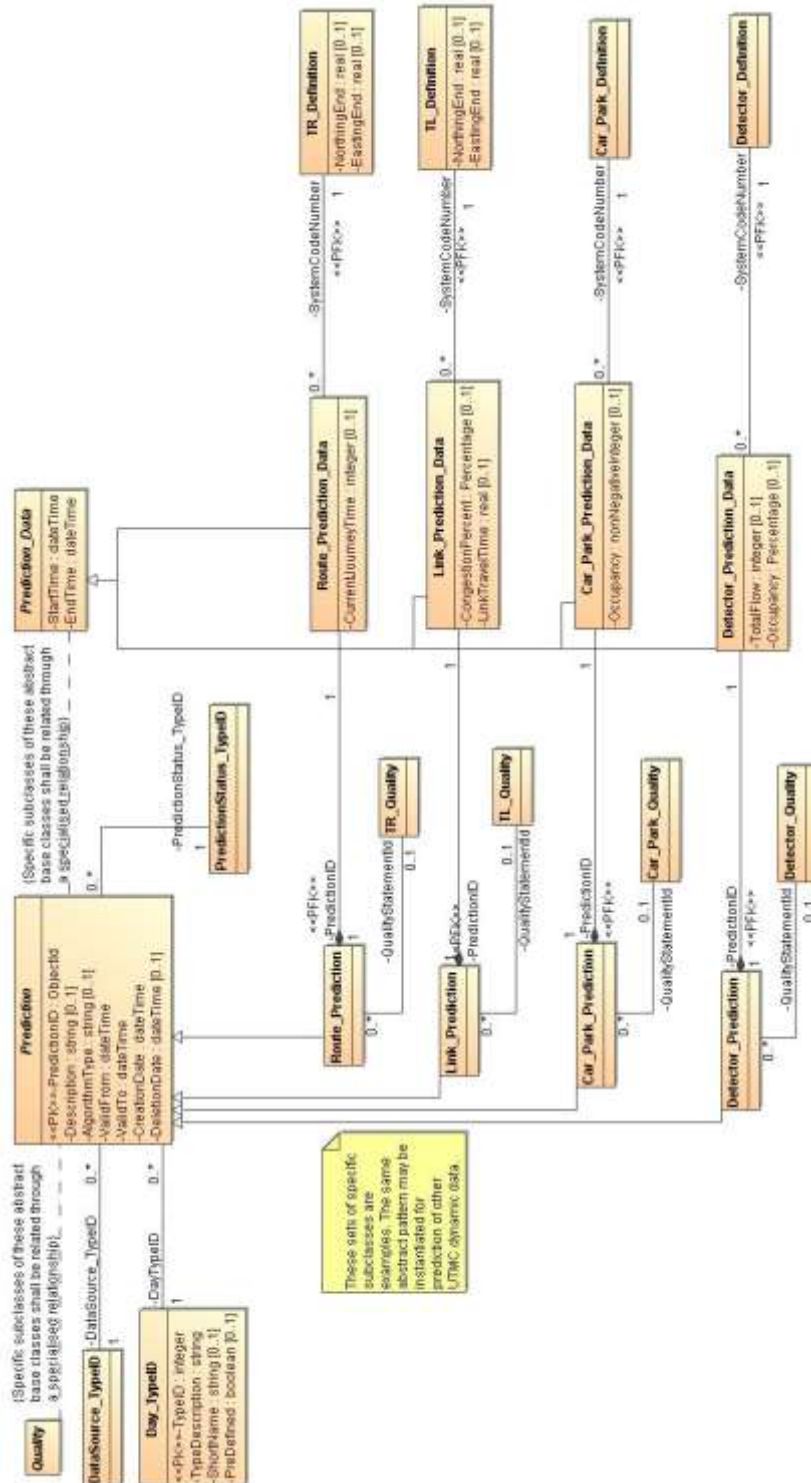


Figure 22-1: Prediction diagram

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 | Unque 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: | <p>Abstract base class for prediction data.</p> <p>Specific subclasses shall be named appropriate to the object type e.g. Car_Park_Prediction_Data.</p> |

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

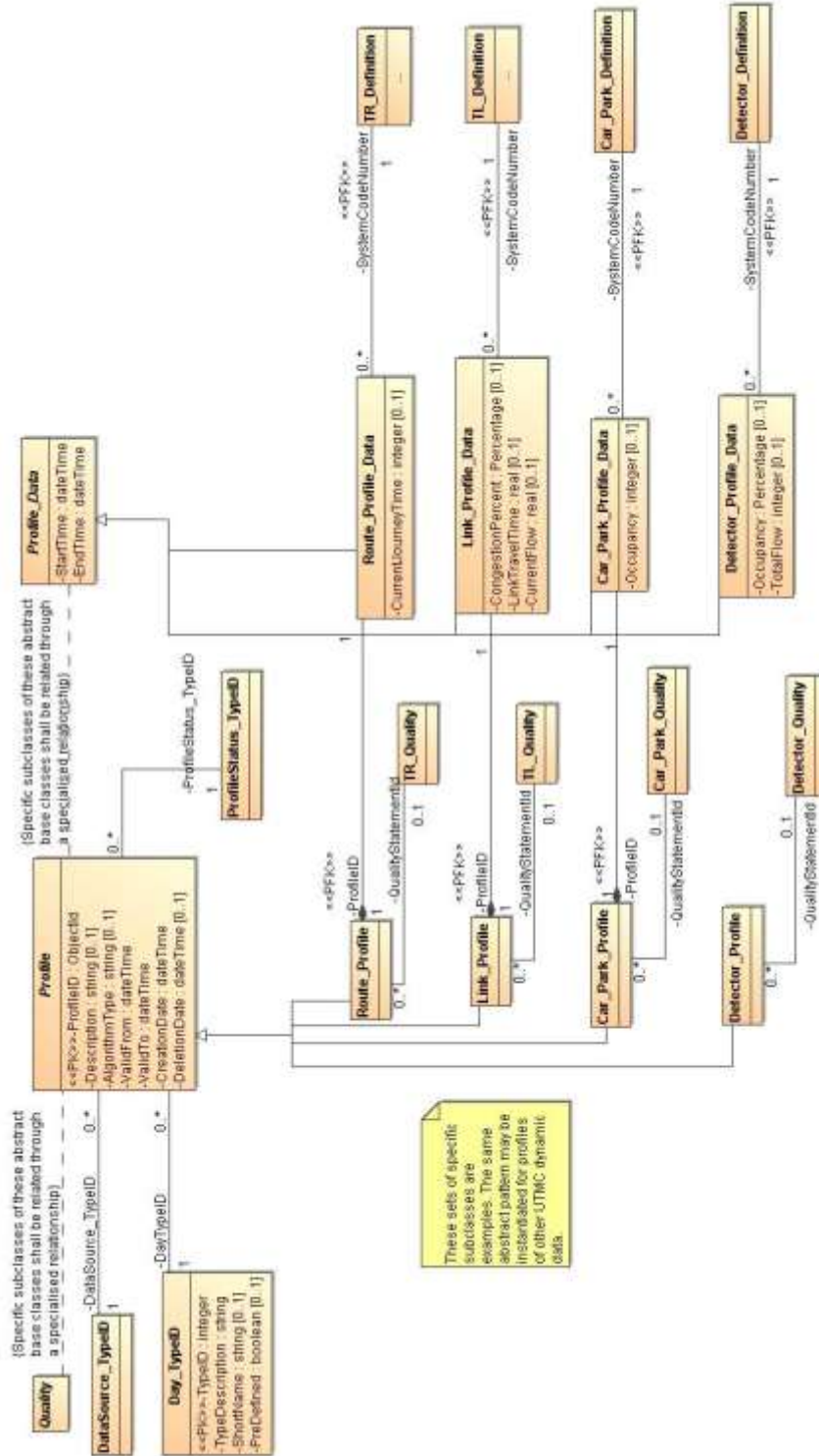


Figure 23-1: Profile diagram

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

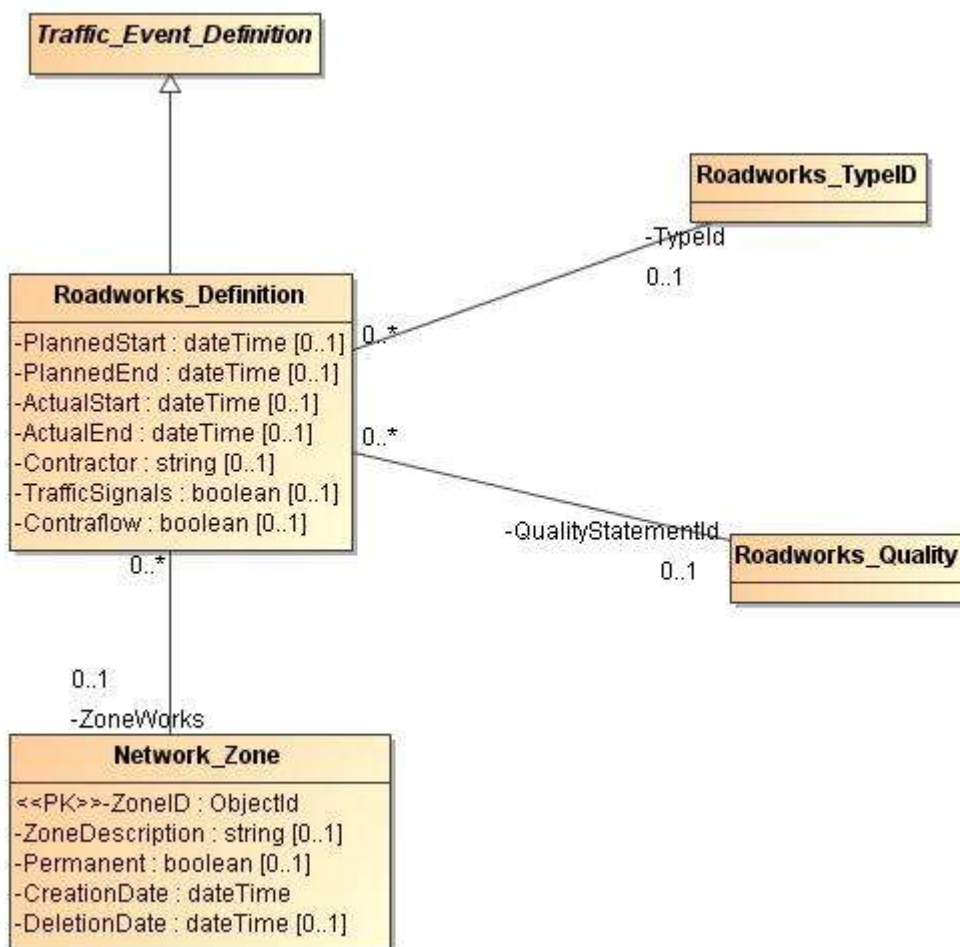


Figure 24-1: Roadworks diagram

24.2 Roadworks_Definition Class

General information

| | |
|------------------|--|
| Base Classifier: | Traffic_Event_Definition |
| Is Abstract: | false |
| Comment: | <p>A roadwork is a planned occurrence that may have a direct affect on the traffic flow in an area.</p> <p>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.</p> <p>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.</p> <p>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.</p> |

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 | | | <p>Reference to the network zone which defines the roadworks extent.</p> <p>If a roadworks covers a number of road elements this zone defines those elements.</p> |

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

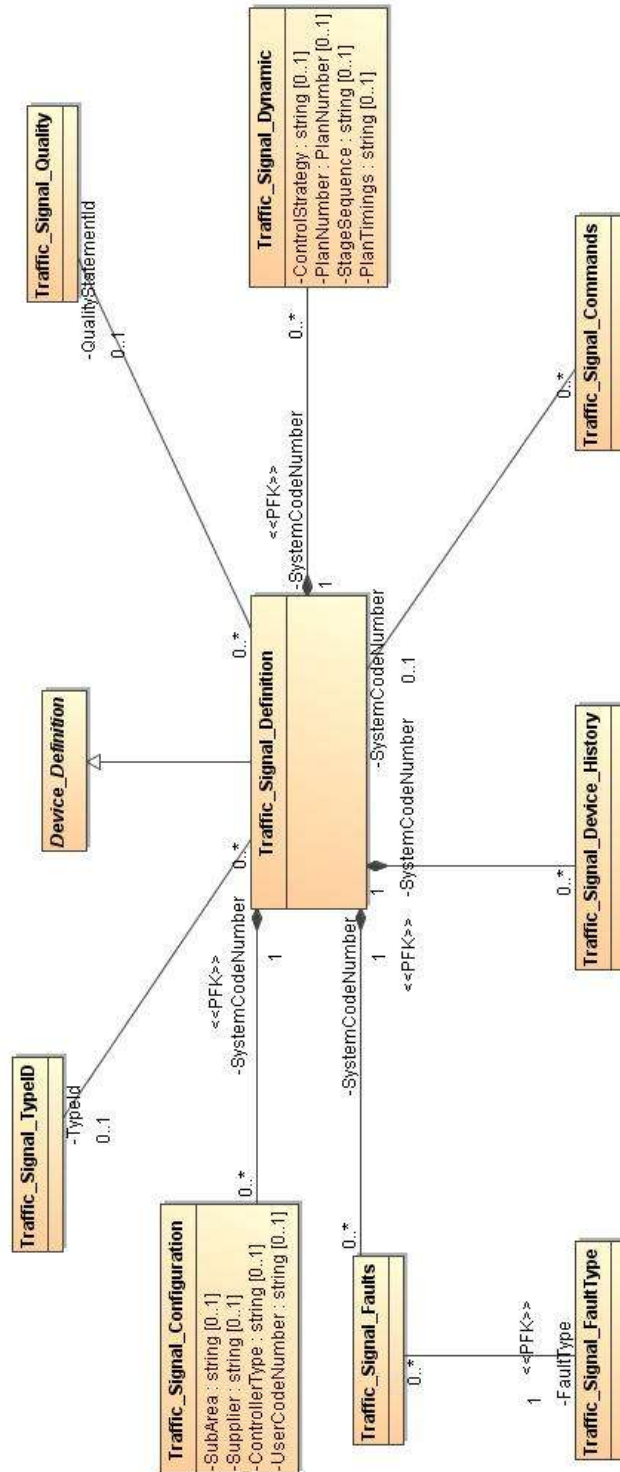


Figure 25-1: TrafficSignal diagram

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

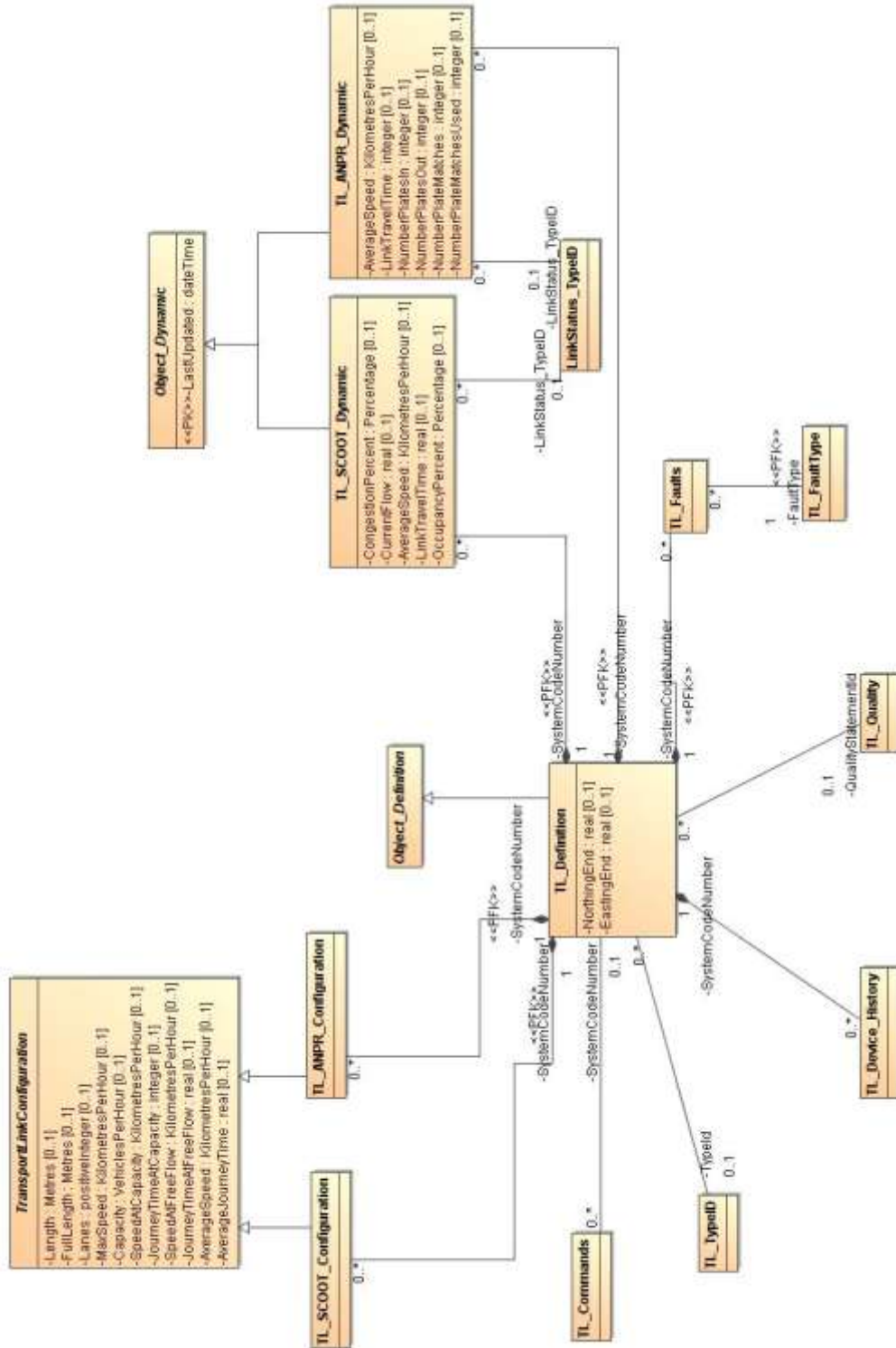


Figure 26-1: TransportLink diagram

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

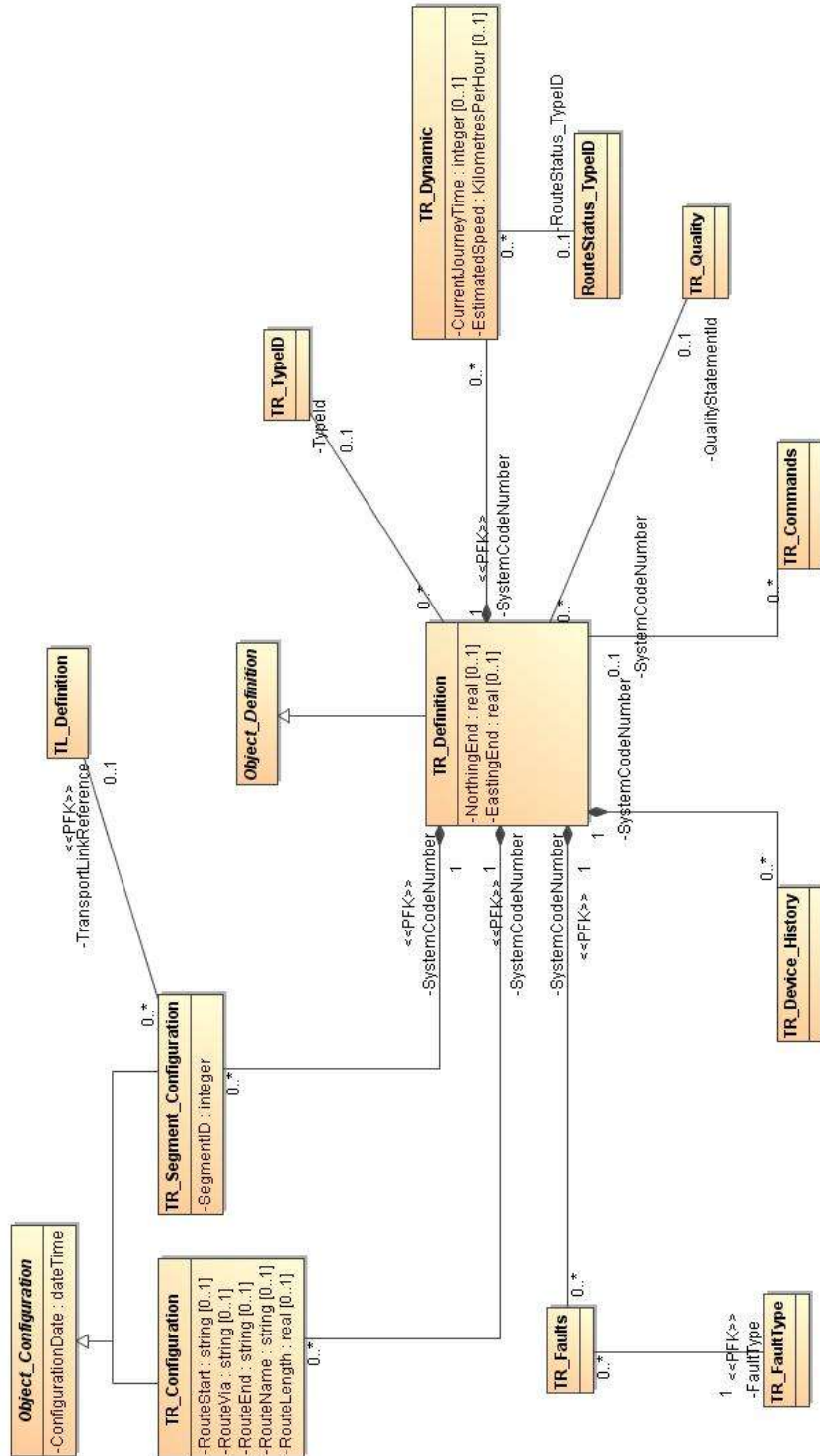


Figure 27-1: TransportRoute diagram

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 route in 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 route in 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

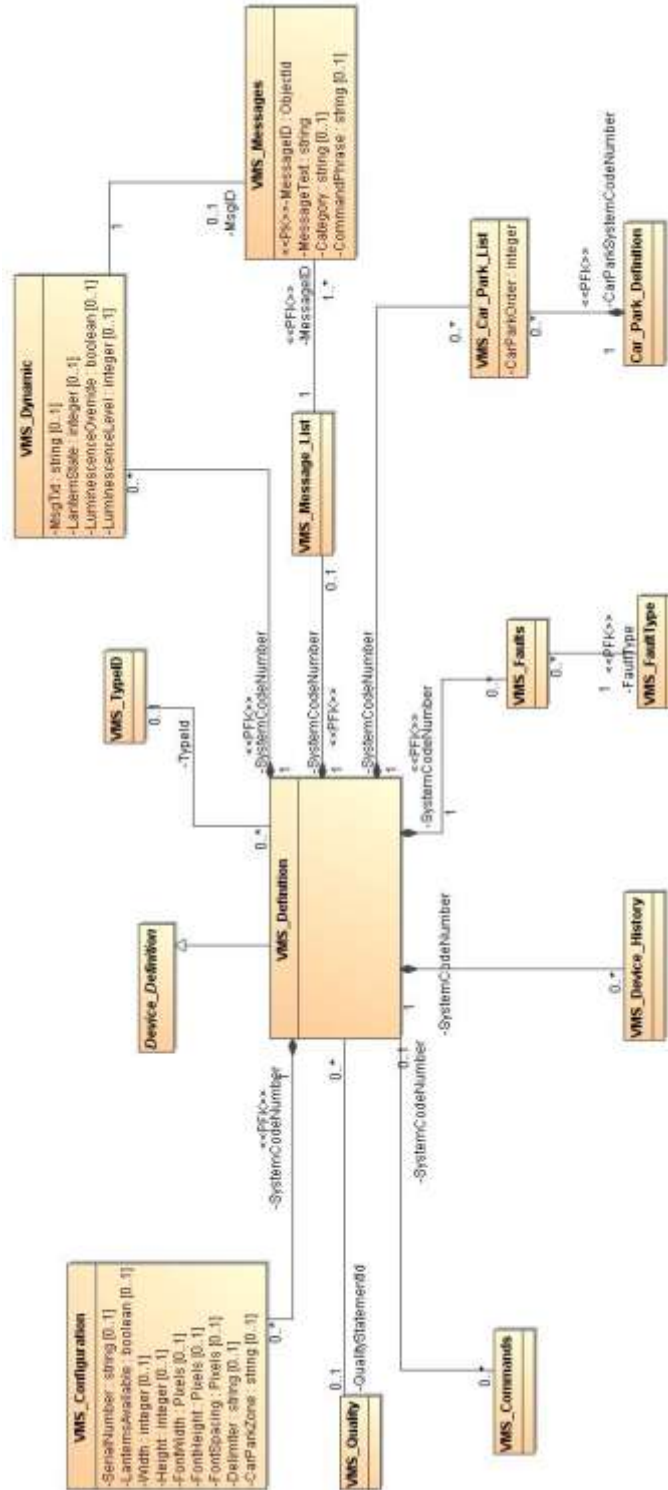


Figure 28-1: VMS diagram

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: | <p>The VMS Data Object describes the location, configuration and dynamic status of a VMS. The VMS may relate to carpark or strategic signs.</p> <p>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.</p> <p>Command information may be sent to the VMS object by the VMS_Command common support object.</p> |

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 indicate 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 delimiter 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: | <p>Proposed typeIDs are:</p> <ul style="list-style-type: none"> 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 |

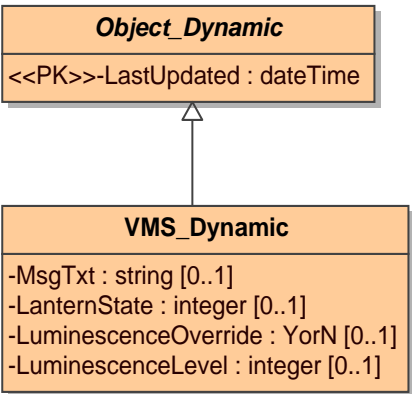
Relations

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

Appendix I Examples

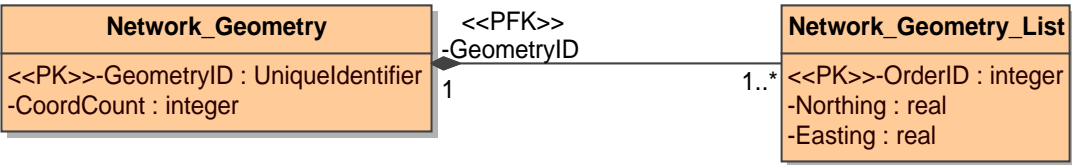
I.1 Example for Rule R3

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.



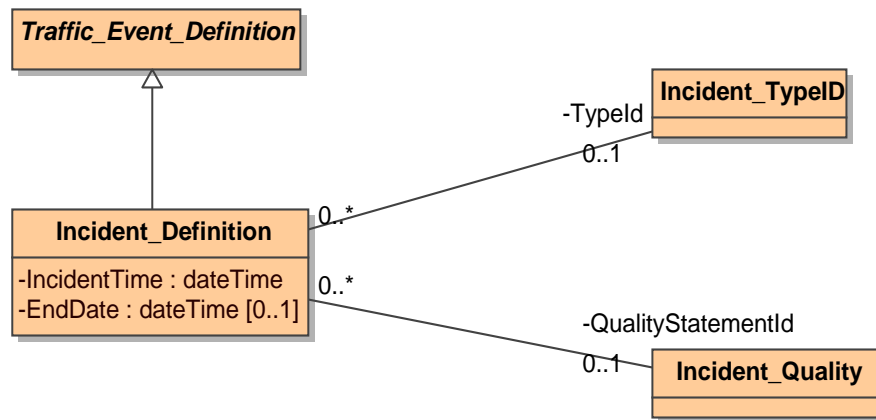
I.2 Example for Rule R7

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

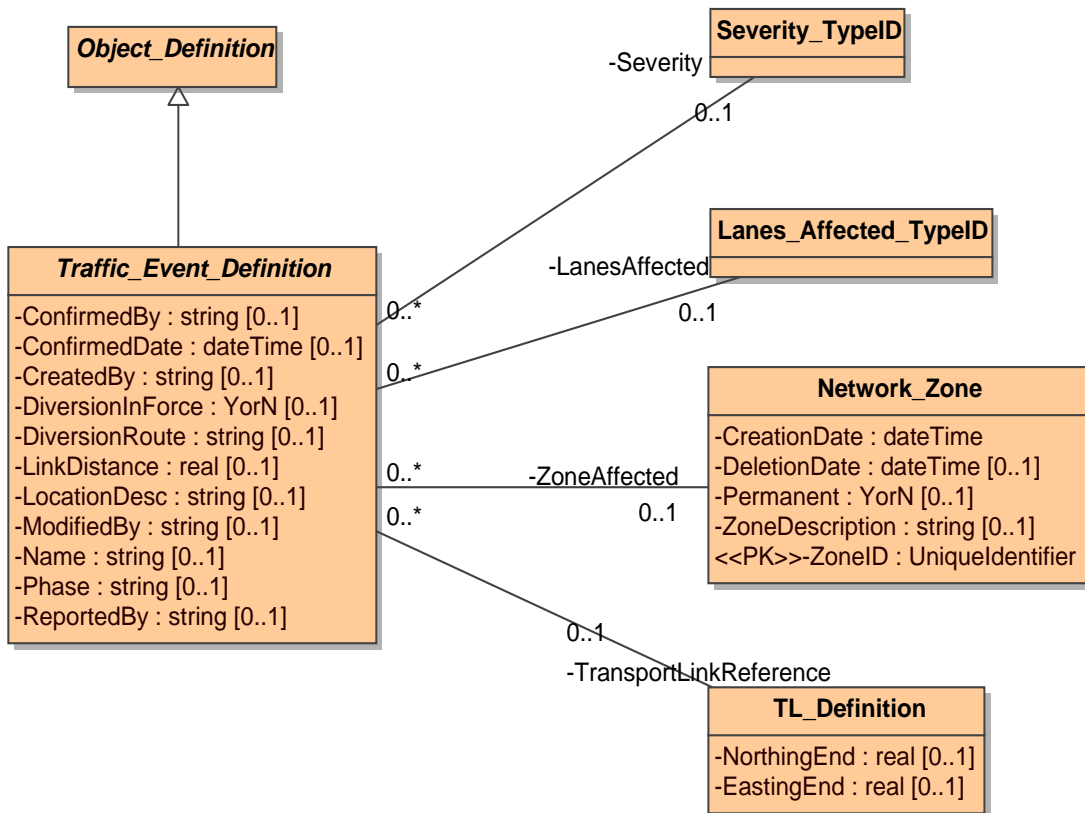


I.3 A larger example – Incidents

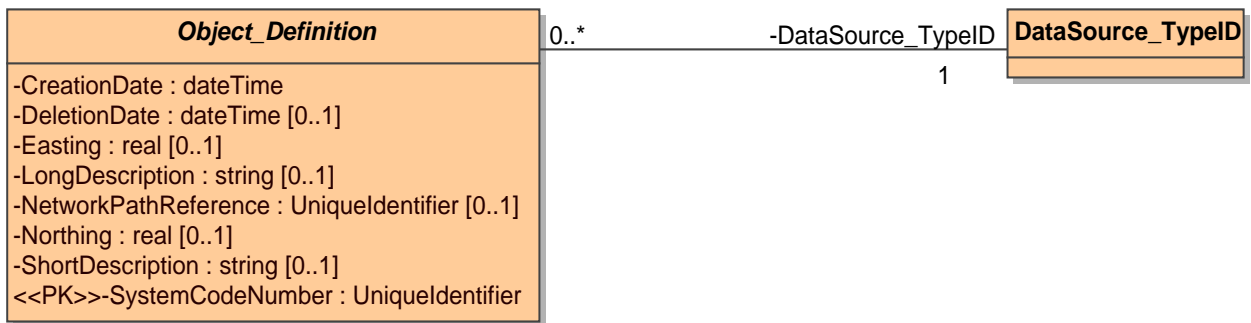
I.3.1 This section applies the above rules in combination to illustrate the relational structures for the UTMC "Incident_Definition" class. "Incident_Definition" is a sub-class of Traffic_Event_Definition.



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_Definition 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.