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FOREWORD

The text of prEN ISO 14819-3:2003 has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NNI*,* in collaboration with Technical Committee ISO/TC 204 "Transport information and control systems".

This pre-Standard was prepared by Working Group 4 of CEN TC278 and the TMC Forum Standards Working Group. In the field of Traffic and travel Information, the innovative rate is high, with many research and development projects under way in many countries, and there is a need to establish prospective standards which allow manufacturers to introduce competitive products to the market in the knowledge that they can accommodate the future issues of the standard(s) without fundamental change to equipment.

No known national standards (identical or conflicting) exist on this subject.

INTRODUCTION

This document sets out ways of specifying places and positions in traffic and travel information messages, including RDS-TMC messages (the Radio Data System - Traffic Message Channel).

It defines the structure and semantics of location tables for Traffic Information Centres (TICs) and receivers.

1. TRAFFIC AND TRAVEL MESSAGES

    a) Traffic and travel information is created and updated in an originating database, by human operators or automated systems. Information is transferred to one or more remote systems by means of messages.

    b) In this context, a message is a collection of data which is exchanged to convey information for an agreed purpose between two or more parties. Traffic and travel messages are digitally coded sets of data exchanged by interested parties, which convey information about traffic, travel and/or transport networks. Digital coding can be alphanumeric, as in EDIFACT, or binary, as in RDS-TMC.

    c) The traffic and travel messages developed in programmes of the European Union are open, non-proprietary proposals for standards intended to serve the public interest by facilitating interconnection and interoperability of the relevant information systems.

2. LOCATION REFERENCING

    a) Location references provide the means of saying *where* in traffic and travel messages.

1. SCOPE

This standard primarily addresses the needs of RDS-TMC ALERT-C messages, which are already being implementeded. However, the modular approach used here is intended to facilitate future extension of the location referencing rules to other traffic and travel messaging systems.

The location referencing rules defined in this standard address the specific requirements of Traffic Message Channel (TMC) systems, which use abbreviated coding formats to provide TTI messages over mobile bearers (e.g. GSM, DAB) or via exchange protocols like DATEX. In particular, the rules address the Radio Data System - Traffic Message Channel (RDS-TMC), a means of providing digitally-coded traffic and travel information to travellers using a silent data channel (RDS) on FM radio stations, based on the ALERT-C protocol.

2. NORMATIVE REFERENCES

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

CENELEC EN 50067:1998/IEC 62106:2000 Specification of the Radio Data System (RDS) for VHF/FM sound broadcasting in the frequency range from 87,5 to 108,0 MHz.

EN ISO 14819-1 Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC)

EN ISO 14819-2 Traffic and Travel Information (TTI) – TTI Messages via traffic message coding – - Part 2: Event and information codes for Radio Data System – Traffic Message Channel (RDS-TMC)EN ISO 14825 Geographic Data Files

3. ABBREVIATIONS

For the purpose of this standard, the following abbreviations apply:

CENELEC	**C**omité **E**uropéen de **N**ormalisation **ELEC**trotechnique
DATEX	**DAT**a **Ex**change protocol for exchange of traffic and travel information between traffic centres
ECC	**E**xtended **C**ountry **C**ode (an RDS feature)
EDIFACT	**E**lectronic **D**ata **I**nterchange **F**or **A**dministration **C**ommerce and **T**ransport
GDF	**G**eographic **D**ata **F**iles (EN ISO 14825 for modelling and exchange of geographic data for transport telematics applications.)
RDS	**R**adio **D**ata **S**ystem (digital information channel on FM sub carrier)
TIC	**T**raffic **I**nformation **C**entre
TMC	**T**raffic **M**essage **C**hannel
TTI	**T**raffic and **T**ravel **I**nformation
WGS 84	**W**orld **G**eodetic **S**ystem 19**84**

4. LOCATION CODING

Location references used by RDS-TMC are covered by the location referencing rules defined in this section. The ALERT-C coding protocol for RDS-TMC is defined in EN ISO 14819-1.

ALERT-C supports a digital, silent data broadcast service for motorists, providing information about many kinds of traffic situations. This includes roadwork, weather and traffic incident information relating to major national and international roads, regional roads and local or urban roads.

4.1 LOCATION TABLES

Within RDS-TMC, locations are identified and referenced by their location code. A given RDS-TMC service uses a pre-defined location table, containing the pre-stored details of the locations that can be referenced in messages from that service.

A location code in such a message refers and serves as a tabular ‘address’ of the pre-stored location details in the location table used by the service. A real world location may have more than one location code within the same location table. However, within a given location table, each location code refers to one and only one location. A location code has a number in the range 1 to 63,487.

Note: In ALERT-C, a further 2048 numbers are reserved for INTER-ROAD (see EN ISO 14819-1) and other forms of referencing.

A table may contain a maximum number of 65,536 codes allocated in the following way:

Location code	**Use**
0	reserved
1 - 63,487	free for normal location coding
63,488 - 64,511	for special purposes
64,512 - 65,532	for INTER-ROAD
64,533 - 65,535	special functions

Note: INTER-ROAD is a coding mechanism within ALERT-C to reference in a specific type of ALERT-C message (the INTER-ROAD message) a location belonging to a different location table. This can be a table in the same country as well as a table in another country.

4.1.1 Hierarchical structure

RDS-TMC location tables use a hierarchical structure of pre-defined locations. A system of pointers provides *upward references* to higher-level locations of which the specified location forms a part.

Example: Kent would have an upward **area reference** to south-east England. South-east England may be referenced up to the UK, then the British Isles, then Europe, etc. (Figure 4.1).

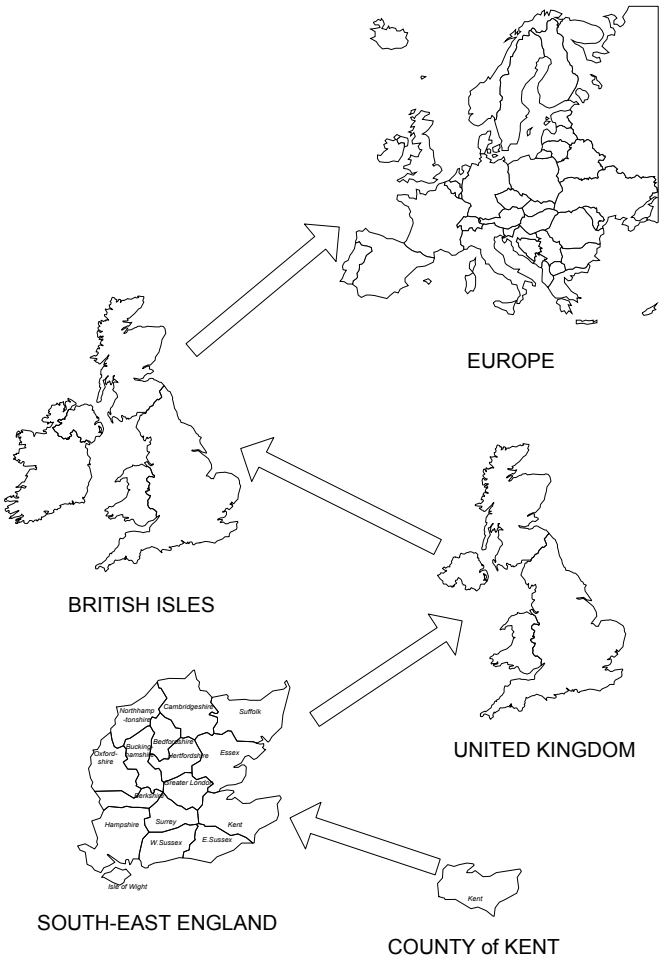

Figure 4.1 - Upward Area Referencing

Junction 25 on the M1 motorway in UK would have a **linear reference** to a motorway segment, e.g. Leicester - Sheffield. This segment could then be referenced up to the whole road (the M1 Motorway).

Hierarchical tables help to make location referencing simple and unambiguous. A major benefit of hierarchical tables is that they facilitate automated sorting and selection of information for users. However, both hierarchical and unstructured tables are currently used in various applications.

4.1.2 Offsets

Most point locations and certain linear locations point to previous and next locations of the same type. This is indicated by negative and positive offsets.

Example: Junction 25 on a motorway may be **offset** to Junction 26 in the positive direction, and to Junction 24 in the negative direction. A sign convention adopted at the time of coding locations specifies the **positive direction** of travel along each road (Figure 4.2).

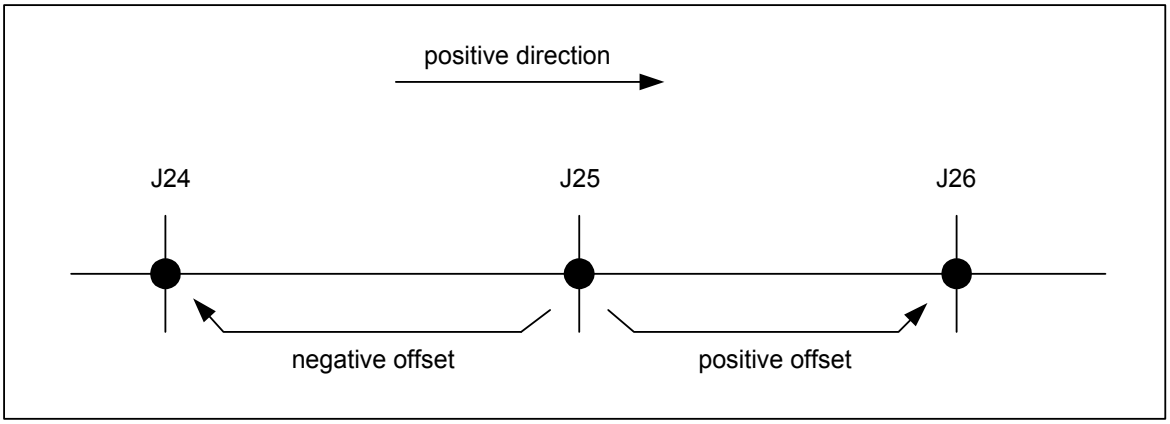

Figure 4.2. - Offsets

4.1.3 Location types

Location types and subtypes are required for language independence of the information given, and to tell the receiving system what data fields to expect.

At the highest level, locations fall into three categories:

1. area locations
2. linear locations
3. point locations

Within each category, location types are distinguished (in principle) whenever a location is functionally distinct in the way it must be handled by the message recipient. Therefore a set of predefined location types and subtypes is set out in Annex A.

Subtypes can be used to give further details of (for example) facilities available at a particular location, such as a service area. The current list, in Annex A, will be added to as further needs are agreed.

Official translations of the language-independent terms that describe location types and subtypes should be agreed on a national level.

4.1.4 Direction of the road

The predefined direction of the road (see section 4.1.2) is reflected in the positive and negative offsets in the location table and in the order of the names of the end points of a road or road segment (see table in 4.3.3).

When newly specifying positive directions along roads within pre-defined tables, it is recommended to use geographic positive directions relative to the co-ordinate system, i.e. on the Northern Hemisphere from south to north and from west to east.

For ring roads the clockwise travel direction is recommended positive.

In any case it is not allowed to reverse the direction along continuous and / or connecting segments of a road, e.g. at administrative borders.

4.1.5 Country codes and location table numbers

With ALERT-C, it is assumed that RDS-TMC service and location tables are organised and defined on a country-by-country basis. Therefore each service and each location table is associated to a country code in the range 1-15 (hexadecimal 1-F) as described in IEC62106:2000. A service and the location table it uses must have the same country code. There can be more than 1 location table per country. They are distinguished by an additional location table number in the range 1-63. In non-European countries, the full range of location tables per country code can be used provided that the Extended Country Code (ECC) is in use and transmitted (see IEC 62106:2000)

In Europe a different approach is in use for historical reasons, as the ECC is not in use in all countries. Country codes are shared by more than one country within Europe and the surrounding territories. To avoid ambiguity in European RDS-TMC location referencing, ranges of location table numbers are allocated to specific countries, in accordance with the table given in Annex B. In this way, each location table is identified uniquely by its country code and location table number. As can be concluded from Annex B, a country like e.g. Austria can have at most 8 location tables.

4.1.6 Unique location code

The combination of extended country code (8 bits), country code (4 bits) location table number (6 bits) and location code (16 bits) defines an extended location code, which is unique world wide.

In Europe the combination of country code (4 bits), location table number (6 bits) and location code (16 bits) is unique.

4.1.7 Constraints

Constraints on location coding may in future be agreed, modelled and documented. At present, however, national authorities and/or service providers are free to allocate location codes, as they wish, to locations specified in accordance with these rules.

4.1.8 Future developments

Within each location table, space (unallocated location codes) must be left to accommodate future requirements for additional locations (to deal with new construction, and location referencing requirements not originally foreseen).

Once a location has been allocated, it cannot easily be re-allocated (in an RDS-TMC/ALERT-C environment). Therefore, all existing locations and their associated location codes should be regarded as fixed. However, other attributes of a location may, within certain constraints, sometimes change (e.g. name, positive offset, negative offset).

Many location table numbers are not yet allocated. The responsible agency in a country can apply for additional location table numbers in future, to support further applications or more detailed, regional location tables. New tables can also be issued occasionally to allow for complete updates to existing tables. Such major changes will however be very disruptive for users, and should be avoided as far as possible or at least not be done too frequently.

4.2 TMC LOCATION CATEGORIES, TYPES AND SUBTYPES

Location categories, types and location subtypes are standardised, and specified in Annex A. Exceptionally, new subtypes may be proposed to ISO TC204 and CEN TC278 for approval, registration and publication. Each location is described by a code, which is composed of:

- a character (A, L or P), indicating the location category (area, linear or point)
- a number indicating the type

- a dot
- a number indicating a subtype

Example: *P1.8 - roundabout* (P = point, P1 = junction)

For types for which not a subtype is defined, the subtype code 0 (zero) has to be used to define the type as a subtype.

Example: *A3.0 - country*

4.3 LOCATION TABLE CONTENT

The location table content is fixed only for the purposes of definition and exchange. The information used within specific applications or by individual manufacturers is not fixed, and is not within the scope of these specifications.

For international consistency, one single location table content shall be adhered to for definition and exchange purposes. In this structure, some items are mandatory; some items are mandatory where they exist; and some items are optional.

4.3.1 Nominal Record Content

The nominal content of each record in the location table is as follows:

- location code
- code of location (sub) type
- road/junction number
- road name
- first name
- second name
- area reference
- linear reference
- negative offset
- positive offset
- urban
- intersection reference
- WGS 84 co-ordinates (longitude and latitude)

Not all of these items shall be present in every record. Table 4.1 indicates which references are required and/or allowed, according to location type.

Table 4.1: content of location table for ALERT-C

	location code	code of location (sub) type[4]	road/ junction number	road name	first name	second name	area reference	linear reference	negative offset	positive offset	ur-ban	inter-section reference	WGS 84 co-ordinates
Area	(M)	continent	-	-	name (M)	-	-	-	-	-	-	-	-
	(M)	country group	-	-	name (M)	-	country group or continent (M)	-	-	-	-	-	-
	(M)	country	-	-	name (M)	-	country group or continent (M)	-	-	-	-	-	-
	(M)	other area (water area, fuzzy area, application region)	-	-	name (M)	-	lowest order administrative area or other area (m)	-	-	-	-	-	-
	(M)	*n*th order area (n = 1 to 5)	-	-	name (M)	-	*n*th order area (M)	-	-	-	-	-	-
Linear	(M)	Road	(m)[2]	(m)[2]	negative end name (M)	positive end name (M)	*n*th order area or country (M)	-	-	-	-	-	-
	(M)	ring road	(m)[2]	(m)[2]	name (O)	-	*n*th order area or country (M)	-	-	-	-	-	-
	(M)	*n*th order segment (n = 1, 2)	(m)[2]	(m)[2]	negative end name (M)	positive end name (M)	*n*th order area or country or other area (O)	first order segment, road or ring road (M)	preceding *n*th order segment (m)	subsequent *n*th order segment (m)	-	-	-
	(M)	urban street	-	(M)	name (O)	name (O)	*n*th order area or other area (M)	-	-	-	-	-	-
	(M)	vehicular link	-	(m)	negative end name (M)	positive end name (M)	*n*th order area or other area (O)	-	-	-	-	-	-
Point	(M)	junction	(m)[3]	(O)[3]	junction name (m)[3]	road number or name of intersecting road (O)[3]	lowest order administrative area or other area (M)	lowest order segment, road or ring road (M)	preceding point (m)	subsequent point (m)	(M)	(m)	(M)
	(M)	intermediate point	-	-	point descriptor (M)	-	lowest order administrative area or other area (M)	lowest order segment, road or ring road (M)	preceding point (m)	subsequent point (m)	(M)	-	(M)
	(M)	other landmark point[1]	-	-	point name (M)	-	lowest order administrative area or other area (M)	lowest order segment, road or ring road (M)	preceding point (m)	subsequent point (m)	(M)	(O)	(M)

Table 4.1 contains an overview of the content of a location table for RDS-TMC. Mandatory fields are shown by (M), while (m) means *mandatory where it exists*, and (O) means *optional*. Fields not present are shown by - (dash). The first column is for explanation only. The second column (*location code*) represents the key of the database, and therefore has the entry (M) for each record in the database. The sequence of the columns in the table is not significant. Non-empty fields in the columns *area reference*, *linear reference, negative offset*, *positive offset* contain the code of the location within the same location table to which the field references. For detailed descriptions of all location types and their codes see Annex A.

Note 1: *Other points* include motorway service areas, and prominent landmarks such as named, major bridges and tunnels.

Note 2: For roads, ring roads and nth order segments at least one of the two fields *road/junction number* and *road name* shall have a value.

Note 3: For junctions at least one of the four fields *road/junction number*, *road name*, *first name* and *second name* shall have a value.

Note 4:The column *code of location (sub)type* in this explanatory table contains descriptions of location types and subtypes. In a real location table this column contains location (sub)type codes.

4.3.2 Road descriptions

4.3.2.1 Road numbers and road names

Road descriptions are normally road numbers. They shall be indicated at the highest level of the hierarchy (e.g. road/ring road) only. In addition to the road number (A1 – R0), a road name (e.g. *Autoroute du Nord*) or other road number (e.g. *E13* for *A1*) may be defined. If no road number exists, a road name is mandatory (e.g. *Boulevard Périphérique*).

Some segments of a road may carry additional numbers and/or names (e.g. *A6 - Autoroute du Soleil*, *A4 - Kölner Ring*). In the case that a road segment belongs to more than one road this shall lead to multiple entries in the location table. If the multiple numbers and/or names do not signify the fact that the segment is part of more than one road, they can be indicated at the segment level in the road-name field, where required. The higher-level road number still applies.

For vehicular links, the road name can be the name of a company, e.g. *Stena Sealink*; *Eurotunnel*; a geographic name, e.g. *Simplon Tunnel*, *Channel Tunnel*; or a marketing name, e.g. *Le Shuttle*.

4.3.2.2 Junction numbers

For junctions, the field road/junction number is used to describe junction numbers, where they exist.

4.3.3 Names

Names of locations shall normally be given in the language of the locality. However, it s also permissible to produce versions of location tables with (bi- or multi-lingual) place names translated into other languages.

Junction name may be a description as known by road users.

Negative and positive end-names may be precise (e.g. *Dover-Calais*), or approximate (e.g. *Köln - Frankfurt*). Approximate names refer to nearby places that the road (usually a motorway) does not pass directly through.

Point descriptor for intermediate points is mandatory. Where required, they can be given in terms of kilometre/milepost references.

4.3.4 Upward references

Two paths shall normally be provided for upward referencing in ALERT-C (see EN ISO 14819-1). The first is for area references, the second is for linear references. Additional upward referencing paths can be used, but this is not required as part of the minimum standard for exchange purposes.

Upward references shall normally point to the next defined higher level. For example, a second order area shall reference a first order area; a first order area shall reference a country; etc.

4.3.5 Offsets

Offsets may be defined for nth order segment locations, and for all types of point locations.

4.3.6 Urban

The values in this column indicate whether the traffic on the point location has a mainly urban character (1) or inter-urban character (0)

4.3.7 Intersection reference

The intersection reference is a cross reference to a location code, representing the same real world point location, but related to another road, if the locations are in the same database, or to the same road in another database. If the location belongs to three or more roads, cross-references are represented in the location table anti-clockwise in a circular way

(see table 4.2), such that each location code references only one other location code explicitly, and the other(s) implicitly. The intersection reference has to include country code and database number if it refers to another database.

Location code	Code of location (sub)type	...		linear reference	.....	intersection reference
1	L1.1					
2	L1.1					
3	L1.1					
4	P1.1			1		5
5	P1.1			2		6
6	P1.1			3		4

Table 4.2 - Intersection reference - coding example

4.3.8 WGS 84 co-ordinates

For each point location the WGS 84 longitude and latitude of the (approximate) centre of the location shall be given (M), in decimal degrees with 5 microdegrees resolution, with a plus sign (+) for eastern longitude and northern latitude, and a minus sign (-) for western longitude and southern latitude. Degrees longitude are given in three digits (with leading zeros if needed), degrees latitude in two digits (with leading zeros if needed).

Example: *+00435455 +5083940* represents *4°.35455 E 50°.83940 N*

4.4 DETAILED JUNCTION REFERENCING

4.4.1 Conventional junctions

Lanes and slip roads are not individually numbered locations in ALERT-C. They are addressed within the structure of ALERT-C messages (e.g. first exit; second exit; or 'for traffic preceding towards <destination>'.)

4.4.2 Complex junctions

In more complex situations where coding of parallel access roads, link roads and slip roads is required, they shall all be referenced as point locations of the main highway, and shall be coded as separate records in the location table without positive or negative offset references to other point locations.

4.5 DETAILED SITUATION LOCATIONS

4.5.1 Normal location referencing

In most TMC location tables, locations are pre-defined only at junctions and at other prominent landmarks such as service areas; prominent, named tunnels and bridges; etc.

Where necessary, the detailed location of an accident shall in future be defined in the message by its distance from the pre-defined primary location.

Where necessary, the end of the roadworks shall in future be defined in the message by its distance from the TMC primary location.

Where necessary, the start of the roadworks shall in future be defined in the message by its distance from the end of the roadworks. Some non ALERT-C protocols like DATEX already allow precise distance indication.

4.5.2 Detailed location referencing

It is permissible to define intermediate points between junctions, at locations specified only in terms of a kilometre/milepost reference.

Such intermediate points can be used to give more detailed information about the location of an accident, or the start and end of roadworks, etc.

Intermediate locations can also be used to define traffic monitoring points, e.g. for use in systems where it is proposed to indicate monitored traffic speeds directly.

4.6 ONE AND TWO WAY LOCATIONS

4.6.1 Basic principles

All TMC locations on two-way roads refer to both directions of travel. It is not permissible to code each direction of travel separately, unless the carriageways are physically separated to the extent that drivers perceive them as two separate roads.

4.6.2 Junctions

Junctions are only coded once, not once in each direction. Also, the entry and exit points of slip roads and/or connecting roads in a junction shall not be separately coded. However, where entry and/or exit points are very widely separated, it is permissible to code them as separate junctions, if desired. The criterion for deciding whether to do this shall be: do drivers perceive them as separate junctions? (i.e. are they differently named and/or numbered?).

4.6.3 Locations having only an exit or entry and locations occurring on one side only

Some locations only have an exit or an entry, on one or on both sides. Other locations appear only on one side of the motorway. Examples of the latter are locations like service stations, tunnels, bridges. For such locations the usage of extra attributes is strongly recommended. An example is presented in figure 4.3 and table 4.3.

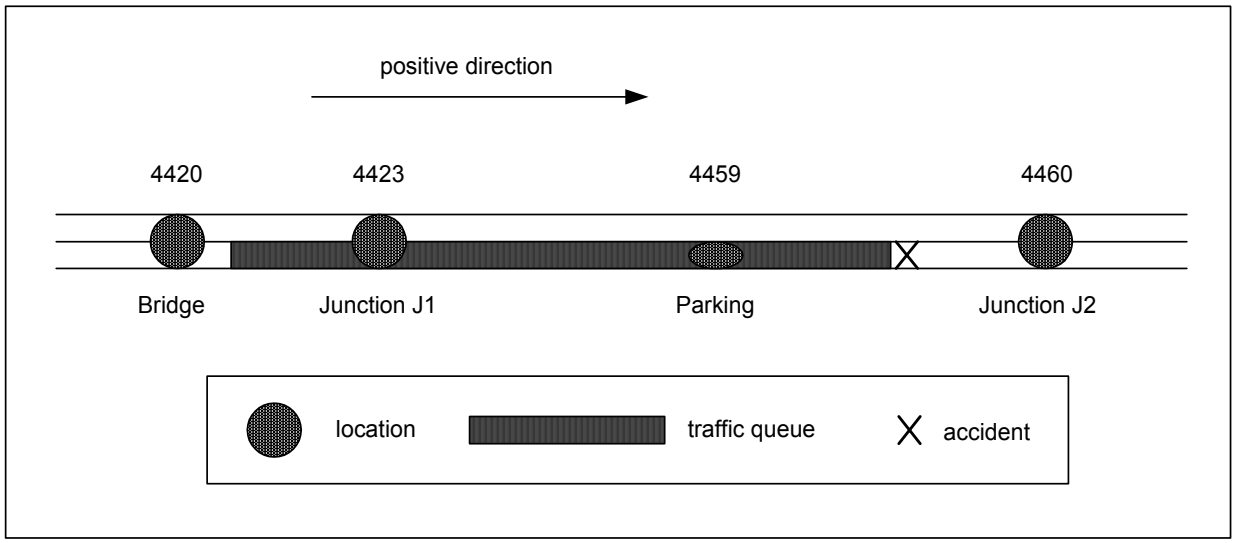

Figure 4.3 - Service area on one carriageway only

4.6.3.1 Using extra attributes for each location code.

The specific possibilities of a point location are described by six extra attributes:

1. **In +**
   Possibility to enter the road in positive direction
   (0 = disabled / 1 = enabled)

2. **Out +**
   Possibility to leave the road in positive direction
   (0 = disabled / 1 = enabled)

3. **In -**
   Possibility to enter the road in negative direction
   (0 = disabled / 1 = enabled)

4. **Out -**
   Possibility to leave the road in negative direction
   (0 = disabled / 1 = enabled)

5. **Present +**
   To indicate presence of location in positive direction
   (0 = not present / 1 = present)

6. **Present -**
   To indicate presence of location in negative direction
   (0 = not present / 1 = present)

Example:

loc. Code	code of loc. (sub) type	road/ junction number	first name	.. ..	neg. offset -	pos. offset +	. .	in +	out +	in -	out -	pre-sent +	pre-sent -
4420	P3.2		Bridge	.. ..	4456	4423	. .	0	0	0	0	1	1
4423	P1.3	J1	Junction J1	.. ..	4420	4459	. .	1	1	1	1	1	1
4459	P3.3		Parking	.. ..	4423	4460	. .	1	1	0	0	1	0
4460	P1.3	J2	Junction J2	.. ..	4459	4461	. .	1	1	1	1	1	1

Table 4.3 - The use of extra attributes

Each point location, independent from its attributes, now is referenced in both directions, using offset + and offset -. The attributes *in* +, *out* +, *in* -, *out* -, *present* + and *present* - limit the possibilities of the operator to choose specific offsets on transmitter side.

Major advantage of this method is the opportunity to easily change the referencing at changes of the real situation without the necessity to update the location tables of all receivers.

Example: if the parking in the example becomes available to traffic on both sides, simply enabling *in* - and *out* -' and setting *present* - to *1* for location nr. 4459 is sufficient for adapting to the new situation.

The extra attributes may be ignored on the receiver side. The use of 'illegal' combinations of locations and offsets is not allowed to the operator of the transmitter system, so messages that are broadcasted always are valid.

ANNEX A (NORMATIVE) TMC LOCATION CATEGORIES, TYPES AND SUBTYPES

Location categories, location types and location subtypes are standardised, and specified in this annex. New subtypes can be proposed to CEN/TC 278 for approval, registration and publication. Each location is described by a code which is composed of:

- a character (A, L or P), indicating the category (area, linear or point)
- a number indicating the type
- a dot
- a number indicating a subtype

Example: *P1.8 - roundabout (P = point, P1 = junction)*

If no subtype exists in a type, or if no subtype is available for a specific purpose, the number indicating a subtype should be set to 0 (zero).

Example: *A3.0 - country*

A.1 AREA LOCATIONS

Code	*Type/Subtype*	*Definition*
A1.0	**Continent**	One of the seven conventionally recognised, major geographic unbroken land masses of the world, i.e. Europe, Asia, Africa, North America, South America, Australasia, or Antarctica.
A2.0	**Country group**	Recognised, named set of adjacent countries. Example: *Benelux, British Isles, European Union*. Note: Not all countries belong to country groups. A country group may belong to another country group. Generally a country group belongs to one continent. Example: *The Benelux* belongs to the *European Union*
A3.0	**Country**	Administrative area which is a sovereign state, indivisible from a political point of view, recognised by a large majority of other countries. Example: *UK, Ireland, France, Germany, Luxembourg, Switzerland, Serbia, Croatia*.
A5.0	**Water area**	Named extent of water about which traffic and travel messages (e.g. weather information) may be given.
	Subtypes:	
A5.1	sea	Named extent of water which is contiguous with the world's oceans. Example: *North Sea*.

A5.2	lake	Named extent of water which is physically separated from the world's oceans. Example: *Lake Geneva*.
A6.0	**Fuzzy area**	Named extent of land (which is not a subdivision in the hierarchy below) about which messages may be given. The boundaries and shape of such areas need not be precisely defined, i.e. with an accuracy which is less than 10% of its size.
	Subtypes:	
A6.1	tourist area	Area with tourist character. Example: *Lake District; Ardennes*.
A6.2	metropolitan area	Area with a metropolitan character. Example: *Greater Nottingham*.
A6.3	industrial area	Area containing a significant concentration of industrial sites.
A6.4	traffic area	Complex traffic area involving two or more junctions and/or intersections.
A6.5	meteorological area	Area about which weather information may be given. Note: Not all locations on land need to belong to fuzzy areas of the above mentioned types. These areas can partially overlap or can contain one another.
A6.6	carpool area	Dedicated area where motorists can park and meet for ride-sharing.
A6.7	park and ride site	Dedicated area where motorists can park and take public transport
A6.8	car park area	Dedicated area where motorists can park.
A7.0	**Order 1 area**	Administrative area which belongs to the first level administrative subdivision of a Country, but which may not be the smallest unit in that country. Example: *England* within the *UK*.
A8.0	**Order 2 area**	Administrative area which belongs to the second level administrative subdivision of a Country, but which may not be the smallest unit in that country. Example: *East Midlands*
A9.0	**Order 3 area**	Administrative area which belongs to the third level administrative subdivision of a Country, but which may not be the smallest unit in that country. Example: *Nottinghamshire*
	Subtypes:	
A9.1	rural county	3rd order administrative area of rural character
A9.2	urban county	3rd order administrative area of urban character

A10.0	**Order 4 area**	Administrative area which belongs to the fourth level administrative subdivision of a Country, but which may not be the smallest unit in that country. Example: *Nottingham*
A11.0	**Order 5 area**	Administrative area which belongs to the fifth level administrative subdivision of a country. If defined, the order 5 area is the lowest level subdivision. Subdivisions may not overlap or contain one another, except that any lower order (e.g. 2nd order) subdivision always refers to a higher order (e.g. 1st order) subdivision. The actual definition of 1st, 2nd, 3rd, etc., order areas is normally based on existing political entities within each country, and therefore differs from country to country. Authorities in each country are responsible for defining these areas. Not all countries will utilise all levels; e.g. a small country may only require the first three. Different numbers of levels may be present in different parts of a country; e.g. in towns and cities there may be more levels than in rural areas. It is also permissible to omit one or more intermediate levels in some parts of a country. For example, large provinces may be administratively subdivided at an intermediate level above towns and cities, and small provinces not.
A12.0	**Application Region**	Area which is the subdivision of an Administrative Area of any level or of an Application Area of higher level. Example: The subdivision of *Scotland* into *North*, *Central* and the *Borders* (South).

LINEAR LOCATIONS

Code	***Type***	***Definition***
L1.0	**Road**	One or more contiguous segments of roadway within a single national or regional/departmental road numbering area, bearing a particular national or regional/departmental road number, whose end points are in different places. Note: Where two or more separate segments of roadway in a given road numbering area share the same number, e.g. because an intermediate stretch has yet to be built, the separated stretches of roadway shall be treated as the same road. Note: A roadway includes both (or all) carriageways of a divided highway, even if built on physically separate alignments, and all connecting carriageways in complex junctions, which are

		perceived by drivers to share the same road number. Note: European road numbers shall not be used to define roads except in countries which use these numbers in place of national numbers, e.g. for motorways. Note: Roads which coincidentally share the same regional/departmental number but are located in different regional or departmental numbering areas of a country shall not be treated as a single 'road'. Example: The M1 in Northern Ireland is separate from the M1 in Great Britain; the D1 in any department of France is separate from the D1 in another department; etc. However, the N1 in France is a single road, irrespective of which department it crosses, because it is numbered at national level. Note: Where a section of road carries more than one national and/or regional/departmental road number, it shall be considered part of the lowest numbered road of the highest category whose number it shares. Example: If a road is numbered as a motorway and as an all-purpose road, it shall be treated as part of the motorway. Or, if a stretch of road has more than one number of the highest standard which applies to that section of road (e.g. N1 and N15), it shall be treated as part of the lowest-numbered road (in this case, N1).
	Subtypes:	
L1.1	Motorway	Road signed with the *white overpass across a divided highway* logo on a blue or green background.
L1.2	1st Class Road	Example: national road.
L1.3	2nd Class Road	Example: regional road.
L1.4	3rd Class Road	Example: other road. The actual definition of 1st, 2nd, and 3rd Class roads is normally based on existing classification within each country, and therefore differs from country to country. Authorities in each country are responsible for defining these levels.
L2.0	**Ring road**	Road without end points, forming a continuous ring, with a single road number throughout. Note: Motorway (or other) rings which do not have a single number all the way round (e.g. Kölner Ring) shall not be treated as ring roads. Typically, each side of these rings has a different number, which is part of a longer, national highway passing the city tangentially.

	Subtypes:	
L2.1	ring motorway	Ring road which is a motorway.
L2.2	other ring road	Ring road which is not designated a motorway.
L3.0	**Order 1 segment**	Higher level subdivision of a **road/ring road/vehicular link,** which is defined in terms of the locations that it joins.
L4.0	**Order 2 segment**	Lower level subdivision of a road/ring road/vehicular link. An Order 2 segment wholly belongs to an Order 1 segment, which is defined in terms of the locations that it joins. Not all roads/ring roads (and very few vehicular links) need be divided into segments; therefore, inclusion of segments is optional. Where only one level of subdivision of a road/vehicular link is required, it shall be considered as Order 1. No more than two levels of segments shall be utilised.
L5.0	**Urban street**	One or more contiguous sections of roadway in a particular town or city which are commonly known by a specific street name, rather than by a road number. Example: *Oxford Street*.
L6.0	**Vehicular link**	Network segment, not part of a road, for transport by boat or rail. Note: Normally, one ferry/rail link describes a two-way service Example: Dover-Calais and return
	Subtypes:	
L6.1	ferry	Specific operator's service which uses roll-on, roll-off vessels to carry road vehicles between two points. Example: ferries across a river, an estuary or the sea.
L6.2	vehicular rail link	Specific operator's service which uses rail to carry road vehicles between two points. Example: alpine rail tunnels, the *Channel Tunnel*.

POINT LOCATIONS

Note: When viewed in close-up, typical points such as motorway junctions may spread over many hundreds of meters, and are not single points in a strict geometric sense.

Code	***Type***	***Definition***
P1.0	**Junction**	Point on a road or ring road where other road(s) and/or ring road(s) connect.
	Subtypes:	

P1.1	motorway intersection	Grade-separated junction where two or more limited-access motorway-designated highways cross, and where some (or all) turning movements are permitted.
P1.2	motorway triangle	Grade-separated junction where one limited-access motorway-designated highway joins a through limited-access motorway-designated highway, where some (or all) turning movements are permitted.
P1.3	motorway junction	Grade-separated junction where traffic can enter and/or leave a limited-access motorway-designated highway from the all-purpose road system.
P1.4	motorway exit	Grade-separated junction where traffic can only leave a limited-access motorway-designated highway to the all-purpose road system.
P1.5	motorway entrance	Grade-separated junction where traffic can only join a limited-access motorway-designated highway from the all-purpose road system. Note: In the definitions of the junction subtypes 1 to 5 motorway may also be interpreted as grade separated dual carriageway (the layout of which is very much like that of a motorway, but which has not the legal status of a motorway).
P1.6	flyover	Grade-separated junction where through lanes on one road pass over a junction with other road(s).
P1.7	underpass	Grade-separated junction where through lanes on one road pass under a junction with other road(s).
P1.8	roundabout	At-grade rotary junction, where traffic passes around a central traffic island.
P1.9	gyratory	At-grade rotary junction, where traffic passes around a very large central island, which is typically occupied by buildings, monuments, etc. Access to the gyratory may be signal-controlled, priority-controlled, or uncontrolled. Examples*: Hyde Park Corner, Place de l'Etoile*.
P1.10	traffic lights	At-grade junction between two or more roads, where traffic is signal-controlled.
P1.11	cross-roads	At-grade junction where two or more roads cross, where traffic is priority-controlled or uncontrolled.
P1.12	T-junction	At-grade junction where one road joins a through road, where traffic is priority-controlled or uncontrolled.
P1.13	Intermediate node	Point on a route where a major road attribute changes (road number, road name or administrative status).
P1.14	Connection	Single carriageway of limited length, connecting two roads.

P1.15	Exit	Generic exit for any purpose
P2.0	**Intermediate point**	Point between two junctions which is referenced in traffic and travel messaging.
	Subtypes:	
P2.1	Distance marker	Any pre-defined intermediate point between junctions whose sole purpose is to give higher resolution to location references. Such points are usually described in terms of a distance marker (kilometre/milepost) reference, and apply to both directions of travel.
P2.2	Traffic monitoring station	Place where traffic data are measured, in one or both directions.
P3.0	**Other landmark point**	Point of interest in traffic and travel messages.
	Subtypes:	
P3.1	tunnel	Prominent, named location where the road is covered over for a significant distance.
P3.2	bridge	Prominent, named location where the road is carried on an elevated structure.
P3.3	service area	Dedicated location where motorists can stop to use a range of facilities.
		Examples: parking, fuel, food, toilets, shopping, accommodation.
P3.4	rest area	Dedicated location where motorists can stop, with only limited facilities.
		Example: parking and toilets.
P3.5	view point	Dedicated location where motorists can stop to look at the scenery.
P3.6	carpool point	Dedicated location where motorists can park and meet for ride-sharing.
P3.7	park and ride site	Dedicated location where motorists can park and take public transport.
P3.8	car park	Dedicated location where motorists can park.
P3.9	kiosk	Dedicated location where motorists can access a limited range of shopping services.
P3.10	kiosk with WC	Dedicated location where motorists can access a limited range of facilities.
		Example: shopping, toilets.
P3.11	petrol station	Dedicated location where motorists may purchase fuel.
P3.12	petrol station with kiosk	Dedicated location offering a limited range of facilities.
		Example: fuel, shopping.
P3.13	motel	Dedicated location offering accommodation to motorists.

P3.14	border/frontier	Location where the boundary of an administrative area crosses a network segment.
P3.15	customs post	Dedicated location where custom officials operate. Note: Customs posts are often located close to national borders.
P3.16	toll plaza	Dedicated area where motorists pay for the use of toll roads.
P3.17	ferry terminal	Dedicated location where vehicles gain access for loading onto/unloading from ferry services.
P3.18	harbour	Dedicated location where a range of waterborne facilities may operate. Examples: ferry terminal services, recreational uses.
P3.19	square	Open area often located close to the centre of towns and cities which may be used for a variety of uses. Examples: recreational, as the site of markets or fairs, as a public meeting place.
P3.20	fair	Location which is the site of a periodic (e.g. annual), often traditional, gathering for entertainment or trade promotion.
P3.21	garage	Dedicated location where motorists can gain a limited range of facilities. Examples: fuel, car maintenance and breakdown repair.
P3.22	underground garage	Dedicated location situated beneath ground level where motorists can obtain a limited range of facilities. Examples: fuel, car maintenance and breakdown repair.
P3.23	retail park	Dedicated location where motorists can access a wide range of shopping facilities.
P3.24	theme park	Dedicated location for entertainment purposes. Example: *EuroDisney*.
P3.25	tourist attraction	Dedicated location where motorists can stop to look at a natural, commercial, social or historical tourist attraction.
P3.26	university	Dedicated location of an educational establishment instructing students in advanced learning.
P3.27	airport	Airfield with facilities for passengers and goods.
P3.28	station	Dedicated location which is a regular stopping place for public transport services. Examples: train, bus, etc.

P3.29	hospital	Dedicated location which is an institution providing medical or surgical treatment.
P3.30	church	Dedicated location for public worship.
P3.31	stadium	Dedicated location for public entertainment. Examples: sports meetings, athletic events, public concerts.
P3.32	palace	Dedicated location which is an official state or church residence or public state building.
P3.33	castle	Dedicated location which is a fortified building, often with towers and battlements.
P3.34	town hall	Dedicated location which is a public building often containing the seat of local government
P3.35	exhibition/convention centre	Dedicated location for the promotion of trade, congresses, exhibitions or conventions
P3.36	community	Locations of inhabited settlements that does not rest on the normal traffic network
P3.37	place name	Location on a road, named in accordance with the road signs (community, city)
P3.38	dam	Road located on solid ground (bank), separating two water areas
P3.39	dike	Road located on solid ground (bank), separating a water area and land area
P3.40	aqueduct	Waterway or water feature over a road
P3.41	lock	River lock
P3.42	mountain crossing/pass	Road crossing a mountain Note: This subtype is intended to be used in those mountain passes which usually present weather problems (mainly snow or ice) in winter.
P3.43	railroad crossing	Railway level crossing
P3.44	ford	Road bank across a river or to an island which is permanently or regularly flooded
P3.45	ferry	Short ferry connection to cross a river canal (instead of or to be replaced by bridge)
P3.46	industrial area	Commonly known area that is mainly used for industry
P3.47	viaduct	Bridge that leads a highly situated road over a lower situated road, valley or estuary.

ANNEX B (NORMATIVE) LOCATION TABLE NUMBERS

The Country Code must always be checked in IEC 62106. For assigning new Table codes see 4.1.8.

Country	Country Code	Tables	Country	Country Code	Tables
Albania	9	01 - 02	Liechtenstein	9	59 - 60
Algeria	2	01 - 04	Lithuania	C	43 - 44
Andorra	3	01 - 02	Luxembourg	7	01 - 04
Austria	A	01 - 08	Macedonia	4	01 - 02
Belarus	F	01 - 04	Malta	C	59 - 60
Belgium	6	01 - 08	Moldova	1	51 - 52
Bosnia Herz.	F	43 - 44	Monaco	B	33 - 34
Bulgaria	8	01 - 04	Montenegro	1	59 - 60
Croatia	C	33 - 34	Morocco	1	33 - 36
Cyprus	2	17 - 18	Netherlands	8	17 - 24
Czech Rep.	2	25 - 28	Norway	F	49 - 56
Denmark	9	09 - 16	Poland	3	05 - 08
Egypt	F	09 - 12	Portugal	8	41 - 48
Estonia	2	59 - 60	Romania	E	01 - 04
Finland	6	17 - 24	Russia	7	21 - 28
France	F	17 - 32	San Marino	3	21 - 22
Germany	1 or D	01 - 08	Serbia	D	51 - 52
Gibraltar	A	33 - 34	Slovakia	5	51 - 54
Greece	1	17 - 24	Slovenia	9	33 - 36
Hungary	B	01 - 04	Spain	E	17 - 24
Iceland	A	21 - 24	Sweden	E	33 - 40
Iraq	B	17 - 20	Switzerland	4	09 - 16
Ireland	2	41 - 48	Syria	6	53 - 56
Israel	4	33 - 36	Tunisia	7	53 - 56
Italy	5	01 - 16	Turkey	3	33 - 40
Jordan	5	33 - 36	United Kingdom	C	05 - 20
Lebanon	A	53 - 56	Ukraine	6	33 - 40
Libya	D	33 - 36	Vatican	4	25 - 26
Latvia	9	51 - 52			

ANNEX C (INFORMATIVE) BACKGROUND INFORMATION

C.1 OVERALL APPROACH

Most traffic and travel messages contain location references. Typically, these indicate:

- the location of a traffic and travel situation described in the message;
- the location of a route guidance link about which data are given;
- the location of a public transport stop in a timetable;
- *et cetera*.

Traffic and travel messages support a wide variety of location referencing methods. This informative annex explains a variety of possible approaches. Not all of these are currently used or possible in ALERT-C. Some are used by DATEX. Others are just theoretical possibilities.

A location in traffic telematics terminology may be defined as a real world object that has a geographical position. Examples of locations are parts of the road network (e.g. a road crossing, a road section), landmarks (e.g. a bridge) and points of interest (e.g. a petrol station). The technique to reference locations is called location referencing. Several approaches to location referencing exist. Locations may be referenced by:

- **location names**
  Descriptive identifiers;
  Examples: names of cities, towns, and villages; street names; road numbers; public transport route numbers; junction names and numbers;
- **distance marker systems**
  Kilometre post or milepost systems along transport routes.
- **co-ordinates**
  Longitude/latitude references, such as WGS 84, or rectangular grid references, such as UTM co-ordinates (Universal Transverse Mercator);
- **hybrid references**
  Use a combination of co-ordinates and (parts of) descriptive identifiers
- **pre-defined codes**
  In this approach locations are pre-defined and pre-coded. This approach is used in ALERT-C, and described in more detail in section 1.1.2 below.

C.1.2 Pre-defined locations

In many ATT applications, locations are pre-defined prior to use. Their details (i.e. location names, kilometre references, and/or co-ordinates) are stored in reference tables. Pre-defined locations are referenced by their location code, which is the tabular address of the pre-stored location details. Pre-defined locations are normally defined by the responsible agency in a country and standardised across all users. However, proprietary location tables can also be used (see C.2.9).

Each table of stored locations must be given a location table number by the responsible agency in each country or state (see 4.1.5).

C.1.3 GDF features

GDF (Geographic Data File) is an international standard (ENV ISO 14825) for representing geographic information in digital form. It provides an exchange format for proprietary digital maps. In principle, each geographic feature on a map has an equivalent representation in GDF format.

Many traffic and travel locations can be specified in terms of GDF features. However, traffic and travel messaging locations can be functionally distinct from GDF features.

Example: each traffic and travel location may have a unique reference code within a particular database, which is common to all users.

Example: messaging typically requires a GDF feature such as the intersection of two roads to be viewed as two distinct locations, one on Road A, and one on Road B. This is because an incident can have very different effects on each road.

Example: messaging may include reports on positions (e.g. A10, km 71.2; or 53° 17' 45"N, 44° 08' 11"W) at which no geographic feature is located.

Example: messaging often requires compact coding, using as few characters or bits as possible. Locations used in messaging therefore exclude large numbers of geographic features not of interest for referencing traffic and travel information.

These distinctions cannot be avoided, as they result from the different functional requirements of GDF and traffic and travel messaging. Therefore the GDF format is not further discussed here.

C.1.4 Primary and secondary locations

Many location references in ATT applications extend geographically through several adjacent sections of road. The concept of primary and secondary locations is often used to indicate the extremities of the affected sections, without having to list all the intervening places.

For example, if an accident occurs at km 41.2 on A10, and the resulting queue extends back to km 47.4, the situation location can be defined as A10, km 41.2 - 47.4 (Figure C.1).

Km 41.2 is defined as the **primary location**, and km 47.4 as the **secondary location**. For situation locations, by convention, the primary location is taken to mean the end where the cause of the problem can be found, whenever a cause can be pinpointed geographically.

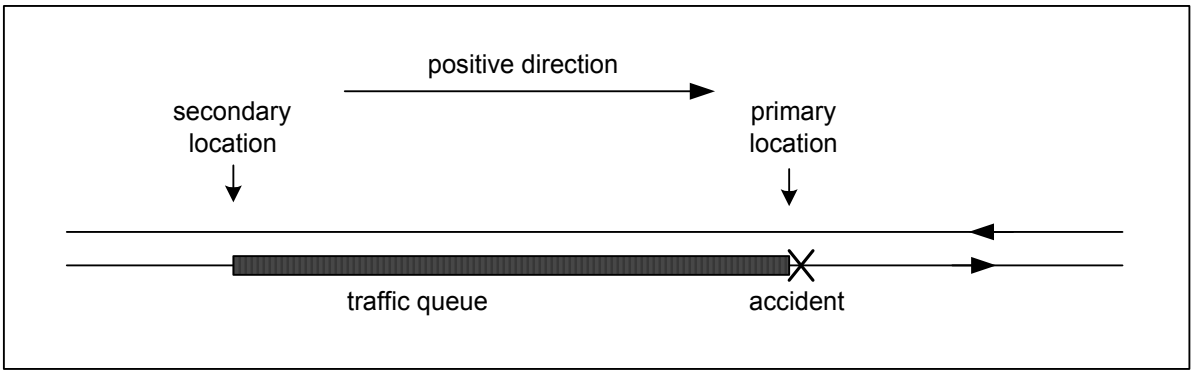

Figure C.1 - Primary and secondary locations

Thus, the primary location indicates the origin of the situation (e.g. the accident site). Where situations have no distinctive origin, either end of the location can be designated the primary location. The secondary location is at the other end of the affected length or area.

C.2 METHODS

This section summarises several methods of referencing affected road sections (see figure C.1) in traffic and travel messages. Not all methods can be used in all types of messages.

To avoid ambiguity, both primary and secondary location shall lie on the same road, i.e. can be connected by ‘stepping through’ the offsets in the location table (see C.2.1, C.2.7).

C.2.1 Pre-defined primary location + extent

This method requires a pre-defined hierarchical database of locations, including positive and negative offsets. These databases or tables can contain lists of text location names, distance marker references (i.e. road number and kilometre post), latitude/longitude references, and/or any other desired system of location referencing.

The primary location is indicated using the pre-defined location code of the nearest defined downstream location, measured in the direction of travel. The pre-defined secondary location is often indicated relative to the pre-defined primary location by means of an extent. Extent measures how far the situation spreads.

Extent is the number of steps along the road, from the pre-defined primary location, through other pre-defined locations, to reach the pre-defined secondary location. Extent data comprise a sign (+ or -) and a number of steps (Figure C.2).

In distance marker (kilometre/milepost reference) systems, extent can be used in a similar way, except that in this case, it is measured in kilometres, to any required degree of precision.

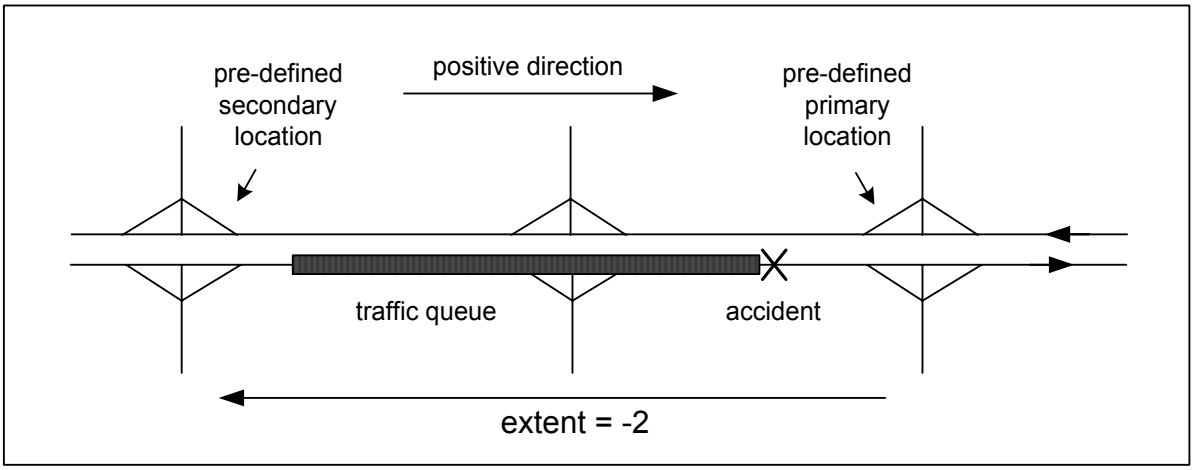

Figure C.2 - Pre-defined primary location + extent

C.2.2 Pre-defined primary and secondary locations

A variant of method C.2.1 uses primary and secondary location codes directly, instead of indicating the secondary location by means of extent (Figure C.2).

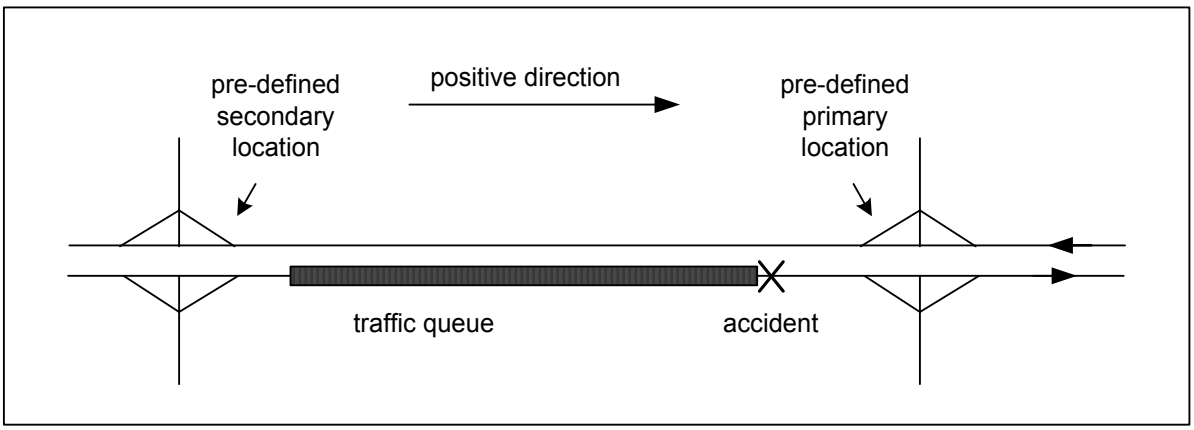

Figure C.3 - Pre-defined primary and secondary locations

Where pre-defined locations are used in the ways as described in C.2.1 and C.2.2, situations may not occur exactly between pre-defined points. In this case, the **pre-defined primary location** is at the nearest pre-defined location downstream from the origin of the situation (measured in the direction of travel). The **pre-defined secondary location** lies beyond the furthest extent of the situation (e.g. the back of the queue). These pre-defined points entirely **bracket** (i.e. straddle; enclose) the actual situation on the ground (Figures C.2 and C.3).

C.2.3 Distance markers (primary location + extent)

In this method, the primary location is given by a road number and kilometre reference. The secondary location lies on the same road, at the kilometre reference of the primary location, plus or minus the extent in kilometres (Figure C.4).

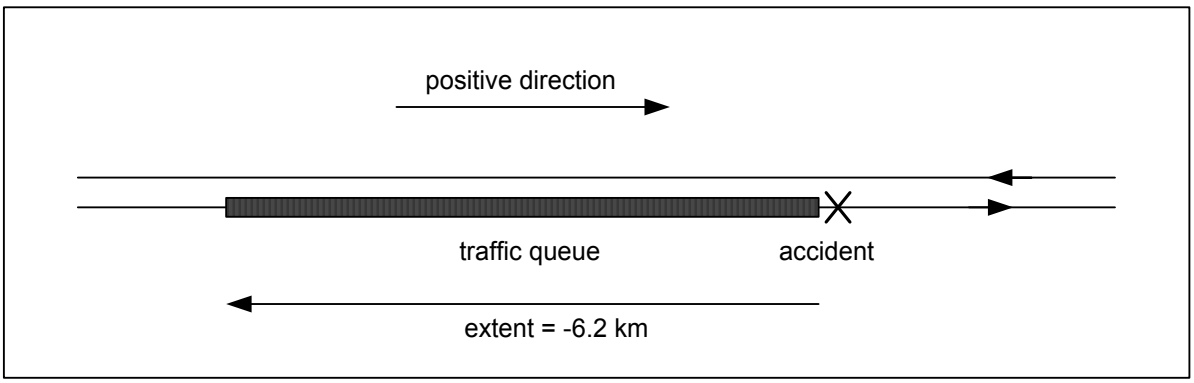

Figure C.4 - Distance markers - primary + extent

C.2.4 Distance markers (primary + secondary location)

A variant of method C.2.3 uses kilometre references directly to specify secondary as well as primary location, instead of using primary location plus or minus extent (Figure C.5).

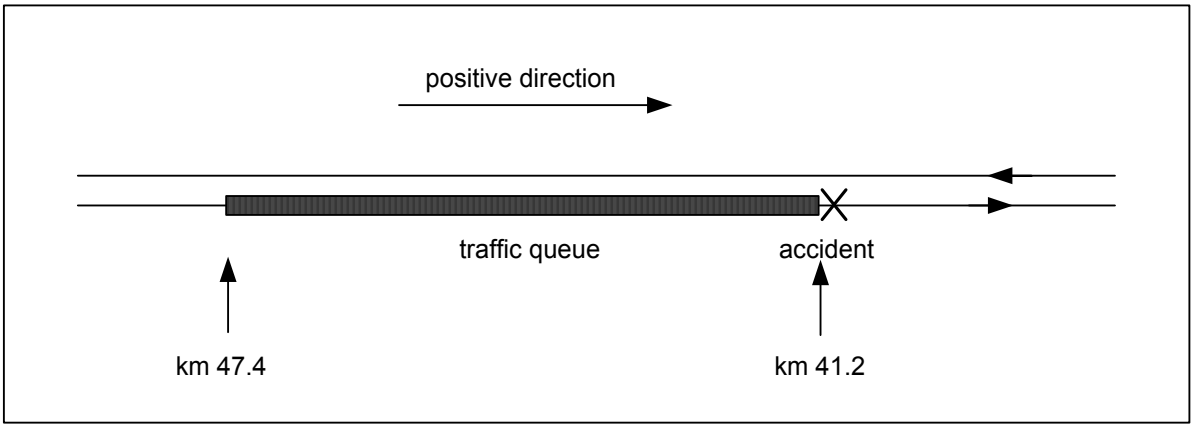

Figure C.5 - Distance markers - primary + secondary locations

C.2.5 Primary and secondary locations using pre-defined location, extent and distances

In this method, the pre-defined primary location is the nearest defined downstream location, the pre-defined secondary location is indicated in terms of extent. The predefined points

entirely bracket the actual situation on the ground (Figure C.6). The primary and secondary locations are each given by the pre-defined location and a distance. For the primary location, the distance is measured from the pre-defined location in upstream direction. For the secondary location, the distance is measured from the pre-defined location in downstream direction.

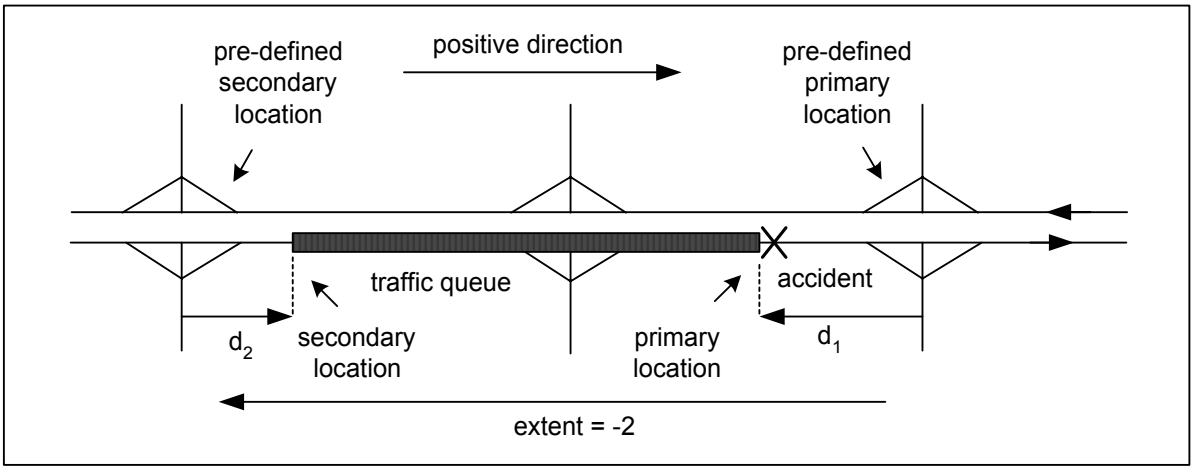

Figure C.6 - Pre-defined location, extent and distances

C.2.6 Primary and secondary locations using Pre-defined locations + distances

This method is a variant of method C.2.5 in which the pre-defined secondary location is given directly, instead of indicating it by means of extent. The pre-defined secondary location is the nearest pre-defined location upstream of the situation (Figure C.7).

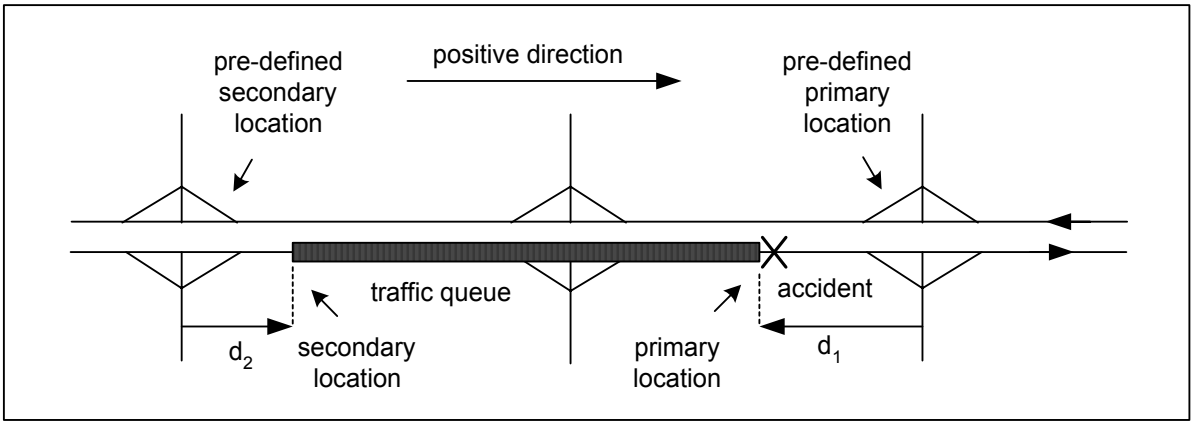

Figure C.7 - Pre-defined locations and distances

C.2.7 Explanation for ALERT-C

In many cases events affecting road traffic cover a number of locations, such as where an accident results in long tailbacks. The ALERT-C protocol defines such occurrences by the method described in section C.2.1, using the direction and extent fields of the standard ALERT-C message.

These fields consist of four bits of information: 1 direction bit and 3 extent bits. The direction bit indicates the direction of queue growth, not the direction of traffic flow affected by the event. The interpretation of the direction bit is as follows:

Direction bit = 0 (positive)	Direction of queue growth is in the positive road direction, traffic driving in the negative road direction is affected, the positive offset column is to be used to execute the number of steps indicated by the extent.
Direction bit = 1 (negative)	Direction of queue growth is in the negative road direction, traffic driving in the positive road direction is affected, the negative offset column is to be used to execute the number of steps indicated by the extent.

The extent bits identify the number of locations along the road that are affected by the problem with a maximum of 8 (primary location and 7 related locations). An extent of 1 would identify the secondary location (the end of the event's extent) as being the next location along the road from the primary location. An extent of 3 would force the receiver to search the database for the third location along the road from the primary location. This is illustrated in Table C.1 and Figure C.8.

In case of extents larger than 7, a control code within an ALERT-C message can be used to enlarge the offset:

Control code 6Increase number of steps in problem extent by 8.

Control code 7Increase number of steps in problem extent by 16.

By using this method, a maximum extent of 31 (7+8+16) can be used. It is recommended to avoid the use of these control codes, as they always use multi group messages for transmission. Wherever feasible, it is recommended to transmit a segment location code and (if necessary) an extent which refers to other segments. With this technique the transmission of single group messages for events affecting long distances becomes possible.

location code	code of location (sub) type	road/ junction number	first name	second name	area ref..	linear ref.	negative offset	positive offset
2009	A6.2		Greater Neighbourhood		1			
949	L3.0	E1	X-town	Y-Town	2009		948	950
4420	P3.2		Bridge		2009	949	4456	4423
4423	P1.3	J1	Junction J1	N207	2009	949	4420	4459
4459	P3.3		Parking		2009	949	4423	4460
4460	P1.3	J2	Junction J2		2009	949	4459	4461

Table C.1. - Coding example

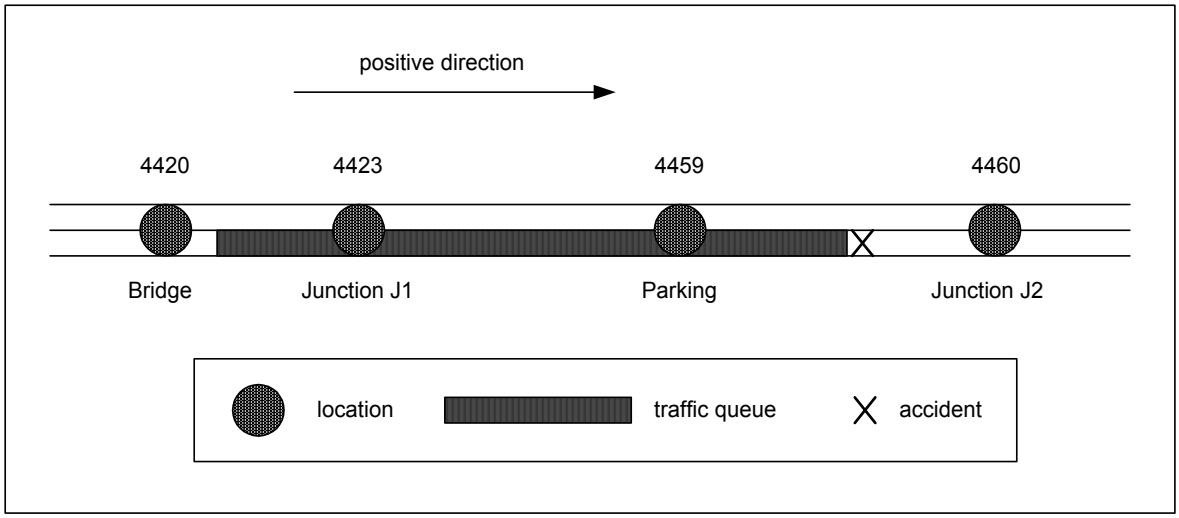

Figure C.8 - Accident on E1 showing extent

An accident occurring on the E1 between *Parking* and *Junction J2* on the eastbound carriageway stops traffic in the positive road direction. The resulting queue of traffic therefore extends in the negative direction. The full description of the incident would be: *E1, X-Town direction Y-Town, between Bridge* (the first location which motorists will reach) *and Junction J2* (the source of the problem), *accident*, *stationary traffic*. This would be coded as:

- Primary location 4460 (Junction J2)
- Direction bit 1 (negative)
- Extent 3 (3 steps to location 4420 - Bridge)

C.2.8 Co-ordinates (primary + secondary locations)

In some types of messages, co-ordinates can also be used to specify primary and secondary locations directly (Figure C.9).

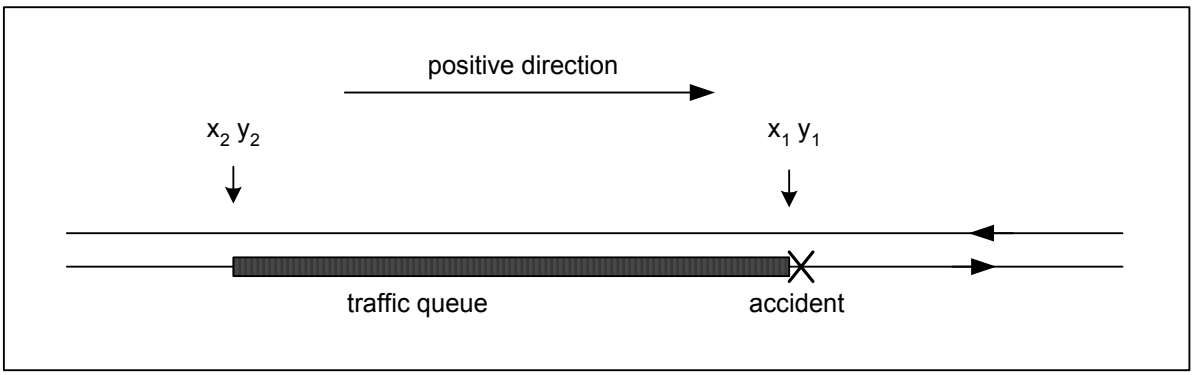

Figure C.9 - Co-ordinates of primary and secondary locations

C.2.9 Proprietary referencing systems, e.g. GDF

Some traffic and travel information applications utilise digital maps. Digital map references are not optimised for messaging, and referencing systems may not be the same in different proprietary map databases. However, it is permissible in some types of traffic and travel messages (where necessary) to utilise proprietary reference numbers directly to indicate primary and secondary locations.

C.2.10 Text location naming

Finally, it is also permissible (in some types of messages) to utilise text location names directly to indicate primary and secondary locations.