Source:	**SA1**
Title:	**Release 6 CRs to 22.071 on LCS (Various)**
Document for:	**Approval**
Agenda Item:	**7.1.3**

SA Doc	Spec	CR	Rev	Phase	Cat	Subject	Old Vers	New Vers	SA1 Doc
SP-020556	22.071	042		Rel-6	D	CR to 22.071: Too big file size	6.0.0	6.1.0	S1-021662
SP-020556	22.071	043		Rel-6	B	CR to 22.071 on LCS Anonymous requestor and anonymous target mobile (REL6)	6.0.0	6.1.0	S1-021794
SP-020556	22.071	044		Rel-6	B	CR to 22.071 on LCS Codeword improvements (REL6)	6.0.0	6.1.0	S1-021490
SP-020556	22.071	045		Rel-6	B	LCS extended user privacy	6.0.0	6.1.0	S1-021491
SP-020556	22.071	046		Rel-6	C	Update to 22.071 for regional specific location accuracy requirements	6.0.0	6.1.0	S1-021799

CR-Form-v7

CHANGE REQUEST

	⌘	**22.071** CR	**042**	⌘**rev**	**-**	⌘	Current version:	**6.0.0**	⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network ☐   Core Network ☐

Title:	⌘	Too big file size
Source:	⌘	SA1 (Nokia)
Work item code:⌘	LCS	***Date:*** ⌘ 06.08.2002

Category:	⌘ **D**	***Release:*** ⌘ Rel-6

Use one of the following categories:
   F *(correction)*
   A *(corresponds to a correction in an earlier release)*
   B *(addition of feature),*
   C *(functional modification of feature)*
   D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP <u>TR 21.900</u>.

Use one of the following releases:
   2   (GSM Phase 2)
   R96   (Release 1996)
   R97   (Release 1997)
   R98   (Release 1998)
   R99   (Release 1999)
   Rel-4 (Release 4)
   Rel-5 (Release 5)
   Rel-6 (Release 6)

Reason for change:	⌘	The file size of '22071-600.doc' is 12.1 Mbyte. Unvisible archived document versions from 1999 should be removed from the file.
Summary of change:⌘		Do the following in WORD: Select 'File', then 'Versions', delete old versions from 1999, the resulting file is 11 Mbyte smaller.
Consequences if not approved:	⌘	Waste of disc space as the specification can be reduced from 12.7 Mbyte to about 1 Mbyte.

Clauses affected:	⌘	No clauses affected, no attachment

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

CR-Form-v7

CHANGE REQUEST

⌘	**22.071** CR	**043**	⌘**rev**	**-**	⌘	Current version:	**6.0.0**	⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME **X** Radio Access Network ☐   Core Network **X**

Title: ⌘	Anonymous requestor and anonymous target mobile	
Source: ⌘	SA1 (Nokia)	
Work item code:⌘	LCS	***Date:*** ⌘ 05/08/2002

Category: ⌘ **B**	***Release:*** ⌘ Rel-6

Use one of the following categories:
  F *(correction)*
  A *(corresponds to a correction in an earlier release)*
  B *(addition of feature),*
  C *(functional modification of feature)*
  D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
  2   (GSM Phase 2)
  R96   (Release 1996)
  R97   (Release 1997)
  R98   (Release 1998)
  R99   (Release 1999)
  Rel-4   (Release 4)
  Rel-5   (Release 5)
  Rel-6   (Release 6)

Reason for change: ⌘	It is seen important from user privacy point of view to support anonymous requestor and anonymous target mobile in location services.
Section 6.4.6 on Requestor requirements should be its own section 6.5
Summary of change:⌘	Text added to describe anonymous requestor and anonymous target mobile
Consequences if not approved: ⌘	Anonymous requestor and anonymous target mobile would not be supported

Clauses affected: ⌘	6.1, 6.4.6, 6.4A (new subclause)

	Y	N		
Other specs affected: ⌘		X	Other core specifications ⌘	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	The substance of this CR was agreed in Rome SA1 LCS ad-hoc. The agreed text is moved to the correct sections of TS22.071 in this CR.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

[FIRST CHANGED SECTION]

6 Service Provision

6.1 Identification of a Target UE

For value added services, the following is applicable:

The LCS client shall identify a target UE using the UEISDN.

The LCS Client shall be able to identify the target UE using IP addressing.

For PLMN operator services, the LCS client may identify a target UE using any of the following:

MISISDN

IMSI

An identifier internal to the PLMN

For emergency services (where required by local regulatory requirements), the LCS client may identify a target UE using any one of the following:

MSISDN

IMSI

NA-ESRK + (optionally) IMEI

It shall be possible for the target mobile's user to hide her true identity from the requestor and the LCS client and replace it with an alias. The alias shall be a unique identification that has a one-to-one relationship to the true identity of the subscriber and may be permanent or temporary. The target mobile user shall be able to know her own alias so that she can pass the alias to the LCS client, e.g. when invoking a location-based service.

6.2 Location Information Provided to the LCS Client

For value added services, the following is applicable:

The LCS Server shall provide, on request, the current or most recent Location Information (if available) of the Target UE or, if positioning fails, an error indication plus optional reason for the failure.

For PLMN operator services (where allowed by local regulatory requirements and restrictions on UE privacy), Location Information for a particular target UE may be provided to a PLMN operator LCS client either on request or on the occurrence of an event in the LCS server that has been defined to equate to such a request.

For emergency services (where required by local regulatory requirements), the geographic location may be provided to an emergency services LCS Client either without any request from the client at certain points in an emergency services call (e.g. following receipt of the emergency call request, when the call is answered, when the call is released) or following an explicit request from the client. The former type of provision is referred to as a "push" while the latter is

known as a "pull". In the case of a "pull", the emergency service LCS Client shall identify the Target UE as defined in section 6.1. Table 3 shows the information that may be provided to the client for either a "push" or a "pull".

Table 3: Location related information provided to an emergency services LCS Client

Type of Access	Information Items
Push	Current Geographic Location (if available) MSISDN IMSI IMEI NA-ESRK NA-ESRD State of emergency call – unanswered, answered, released (note 1)
Pull	Geographic location (note 2), either: Current location initial location at start of emergency call

NOTE 1: indication of call release means that any NA-ESRK will no longer identify the calling UE subscriber

NOTE 2: which type of location is required will be indicated by the LCS Client

6.3 LCS Client Subscription

It shall be possible for an LCS Client to subscribe to the LCS feature for third-party location with or without subscription to other services. A LCS Client may subscribe to one or more service providers' LCS feature in one or more PLMNs. The LCS Client Subscription Profile of a client may contain the range of QoS and subscriptions that the LCS Client is allowed to request.

For certain authorized LCS Clients internal to the PLMN, a subscription profile may be unnecessary. For these LCS Clients subscription to LCS feature is given implicitly as a result of subscription to an authorized PLMN service (e.g. supplementary services). These LCS Clients are empowered to access the LCS Server and request location information for a Target UE.

For emergency services, the subscription requirements to the LCS feature may not be needed.

6.4 Target UE Subscription

6.4.1 Privacy Subscription Options

It shall be possible for a Target UE Subscriber to subscribe to various types of privacy classes. The default treatment in the absence of the information to the contrary in the Target UE Subscription Profile shall be to assume that access is restricted to all LCS Clients (unless using privacy overriding, or otherwise overridden by local regulatory requirements).

Privacy Attributes consist of:

Codeword: an additional level of security that may be set by a Target UE user to determine which Requestors are allowed to request location information;

Privacy Exception List: determines which LCS Clients and classes of LCS Clients may position a Target UE;

Service Type Privacy: determines whether the service type allows the LCS Clients to get the position of a Target UE;

Privacy Override Indicator: determines applicability of the Privacy Exception List.

6.4.2 Codeword

It shall be possible for a Requestor to request location information by indicating a Codeword associated with the Target UE user. The codeword may be either checked by the Target UE/user or by any entity in the network. In the former case, the codword supplied by the requestor and forwarded by the LCS client with the request shall be forwarded to the

TargetUE/user for verification and acceptance. In the latter case, the codeword shall be registered by the Target UE subscriber in advance. A comparision of the codeward sent by the requestor and the registered codeword shall be performed. A location request shall only be accepted if this comparision is successful. In the case where the Target UE/user does not check the codeword, the codeword need not be sent to the Target UE/user. In the case where the codeword is checked by the Target UE/user, the Target UE subscriber need not register the codeword in advance.

The other privacy settings should also be checked even when the codeword has been checked.

The Target UE Subscriber may register multiple codewords for multiple requestors. Once the codeword has been set and properly distributed, the Target UE user would be protected against location requests from third parties, which do not know the appropriate codeword.

It should be possible for a Target UE subscriber to enable and disable codeword checking for each of the LCS Clients.

The codeword is applicable to the value added services only.

6.4.3 Privacy Exception List

To support privacy, the LCS Server shall enable each Target UE Subscriber to subscribe to a "privacy exception list" containing the LCS Client identifiers, classes of LCS Clients, the target subscriber notification setting (with/without notification) and the default treatment, which is applicable in the absence of a response from the Target UE for each LCS Client identifiers.

The privacy exception list shall support a minimum of 20 clients. The maximum number of clients shall be determined by implementation constraints.

If the target subscriber notification is set as "notification with verification", each positioning request from the LCS Client shall be notified to the target UE before positioning. The treatment for location request from the LCS Client, which is not registered in the privacy exception list, shall also be specified in the privacy exception list. An empty privacy exception list shall signify an intent to withhold location from all LCS Clients.

The classes that can be included are as follows.

- Universal Class: location services may be provided to all LCS Clients;

- Call/session-related Class: location services may be provided to any value added LCS clients or a particular value added LCS client or particular group of value added LCS Clients – where each LCS Client or group of LCS Clients is identified by a unique international identification, e.g. E.164 or Access Point Name (APN) that currently has a temporary association with the Target UE in the form of an established voice, data call or PS session originated by the Target UE. For each identified LCS Client or group of LCS Clients, one of the following geographical restrictions shall apply:

    a) Location request allowed from an LCS Client served by identified PLMN only;

    b) Location request allowed from an LCS Client served in the home country only;

    c) Location request allowed from any LCS Client;

- Call/session-unrelated Class; location services may be provided to a particular value added LCS Client or particular group of value added LCS Clients – where each LCS Client or group of LCS Clients is identified by a unique international identification, e.g. E.164, number or Access Point Name (APN). For each identified LCS Client or group of LCS Clients, one of the following geographical restrictions shall apply:

    a) Location request allowed from an LCS Client served by identified PLMN only;

    b) Location request allowed from an LCS Client served in the home country only;

    c) Location request allowed from any LCS Client;

PLMN Operator Class – location services may be provided by particular types of LCS clients supported within the HPLMN or VPLMN. The following types of clients are distinguished (see note):

    a) Clients broadcasting location related information to the UEs in a particular geographic area – e.g. on weather, traffic, hotels, restaurants;

b) O&M client (e.g. an Operations System) in the HPLMN

c) O&M client (e.g. an Operations System) in the VPLMN

d) Clients recording anonymous location information (i.e. without any UE identifiers) – e.g. for traffic engineering and statistical purposes

e) Clients enhancing or supporting any supplementary service, IN service, bearer service or teleservice subscribed to by the target UE subscriber.

NOTE: The definitions of the various PLMN operator categories may be supplemented by more precise language in contractual agreements both between UE subscribers and their home service providers and between individual network operators with inter-PLMN roaming agreements. Such classification of the PLMN operator categories is outside the scope of this specification.

6.4.4 Privacy Override Indicator

The privacy override indicator is applicable to lawful intercept and emergency services as allowed by local regulatory requirements. It is not applicable to value added and PLMN operator services. The Privacy Override Indicator shall be used to determine whether Subscriber Privacy of the Target UE subscriber should be overridden or not. This indicator will be set for certain special LCS Clients when it is justified. Each LCS Client shall be associated with a particular value of a position privacy override indicator during the LCS Client provisioning. The privacy override indicator is normally only valid when the LCS Server for the LCS client is located in the same country of the Target UE. If agreed by bi-lateral agreements between operators, the privacy override indicator shall also be valid when the LCS client is not located in the same country as the Target UE.

6.4.5 Subscription to Mobile Originating Location

The UE subscriber may subscribe to the following types of Mobile Originating Location (as defined in section 4):

A) Basic Self Location

B) Autonomous Self Location

C) Transfer to Third Party

6.4.6 Requestor

~~The Location Request issued by the LCS client to GMLC shall optionally include also the identity of the originator of the location request, i.e. the Requestor, not only the identity of the LCS client.~~

~~The requestor shall be authenticated by the LCS client and/or the network.~~

~~The identity of the Requestor shall be included in the privacy interrogation request. It may be either checked by an entity in the network, the Target UE or the user.~~Void.

6.4A Requestor

The Location Request issued by the LCS client to GMLC shall optionally include also the identity of the originator of the location request, i.e. the Requestor, not only the identity of the LCS client.

The requestor shall be authenticated by the LCS client and/or the network.

The identity of the Requestor shall be included in the privacy interrogation request. It may be either checked by an entity in the network, the Target UE or the user.

It shall be possible for the requestor to use an alias, so that the true identity of the requestor is unknown to the LCS client. The alias shall be a unique identification that has a one-to-one relationship to the true identity of the requestor and may be permanent or temporary. The LCS client shall indicate the requestor alias instead of the real requestor

identity in the location request. The target mobile user in this case authorizes the requestor based on the requestor's true identity, after it has been decrypted in the requestor's operator's network.

6.5 Security

The LCS Server may authorize the LCS Client. There may be security mechanisms to authorize the LCS Client's request for locating a Target UE based on:

LCS Client access barring list(s),

PLMN/SP access barring list,

Point of origin of a location request.

<table>
<tr><td colspan="2"></td><td align="right">CR-Form-v5.1</td></tr>
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CR-Form-v5.1

CHANGE REQUEST

| ⌘ | **22.071** CR | **044** | ⌘**rev** | | ⌘ | Current version: | **6.0.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Codeword improvements

Source:	⌘	SA1 (Nokia)

Work item code:	⌘	LCS		*Date:* ⌘	13.06.2002

Category:	⌘	**B**		*Release:* ⌘	Rel-6

Use <u>one</u> of the following categories:
  F (correction)
  A (corresponds to a correction in an earlier release)
  B (addition of feature),
  C (functional modification of feature)
  D (editorial modification)
Detailed explanations of the above categories can
be found in 3GPP <u>TR 21.900</u>.

Use <u>one</u> of the following releases:
  2   (GSM Phase 2)
  R96 (Release 1996)
  R97 (Release 1997)
  R98 (Release 1998)
  R99 (Release 1999)
  REL-4 (Release 4)
  REL-5 (Release 5)

Reason for change:	⌘	To improve the codeword concept for LCS.

Summary of change:	⌘	New subsection added to desribe the improved codeword requirements

Consequences if not approved:	⌘	Only basic codeword concept in LCS.

Clauses affected:	⌘	6.4.2, new chapter 6.4.2.1

Other specs affected:	⌘	☐ Other core specifications	⌘	
		☐ Test specifications		
		☐ O&M Specifications		

Other comments:	⌘	

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<< First changed section >>

6.4　Target UE Subscription

6.4.1　Privacy Subscription Options

It shall be possible for a Target UE Subscriber to subscribe to various types of privacy classes. The default treatment in the absence of the information to the contrary in the Target UE Subscription Profile shall be to assume that access is restricted to all LCS Clients (unless using privacy overriding, or otherwise overridden by local regulatory requirements).

Privacy Attributes consist of:

Codeword: an additional level of security that may be set by a Target UE user to determine which Requestors are allowed to request location information;

Privacy Exception List: determines which LCS Clients and classes of LCS Clients may position a Target UE;

Service Type Privacy: determines whether the service type allows the LCS Clients to get the position of a Target UE;

Privacy Override Indicator: determines applicability of the Privacy Exception List.

6.4.2　Codeword

It shall be possible for a Requestor and an LCS client to request location information by indicating a Codeword associated with the Target UE user. The codeword shallmay be either checked by the Target UE/user or by any entity in the LCS server in the home networknetwork. In the former case, the codeword supplied by the requestor and forwarded by the LCS client with the request shall be forwarded to the TargetUE/user for verification and acceptance. In the latter case, the codeword shall be registered with the LCS server by the Target UE user (or subscriber) in advance. A comparision of the codeward sent by the requestor and the registered codeword shall be performed. A location request shall only be accepted if this comparision is successful. In the case where the Target UE/user does not check the codeword, the codeword need not be sent to the Target UE/user. In the case where the codeword is checked by the Target UE/user, the Target UE subscriber need not register the codeword in advance.

The other privacy settings should also be checked even when the codeword has been checked.

The Target UE Subscriber may register multiple codewords for multiple requestors. Once the codeword has been set and properly distributed, the Target UE user would be protected against location requests from third parties, which do not know the appropriate codeword.

It should be possible for a Target UE subscriber to enable and disable codeword checking for each of the LCS Clients.

The codeword is applicable to the value added services only.

6.4.2.1 EnhancedSecured codeword

It shall be possible for the target UE/ user to secure the codeword from being misused. Only the intended requestor or LCS client shall be able to use the secured codeword.

It shall be possible for the target UE/user to ensure that the secured codeword can be used only within a specific time period, as determined by the target UE/user. It shall be possible for the target UE/user to ensure that a secured codeword can be used only a specific number of times, as determined by the target UE/user.

The user of the target UE shall not need to be involved in checking the validity of the secured codeword during the location service request. The secured codeword shall be checked by the LCS server.

CR-Form-v4

CHANGE REQUEST

	⌘	**22.071**	**CR**	**045**	⌘	ev	**-**	⌘	Current version:	**6.0.0**	⌘

Spec Title: Location Services (LCS); Service description, Stage 1   ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network ☐   Core Network **X**

Title:	⌘	Extended privacy settings
Source:	⌘	SA1 (Telia AB)
Work item code:	⌘	LCS1

Date: ⌘ 02/07/02

Category:	⌘	**B**

Use <u>one</u> of the following categories:
    F *(correction)*
    A *(corresponds to a correction in an earlier release)*
    B *(addition of feature),*
    C *(functional modification of feature)*
    D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP <u>TR 21.900</u>.

Release: ⌘ 6

Use <u>one</u> of the following releases:
    2   *(GSM Phase 2)*
    R96   *(Release 1996)*
    R97   *(Release 1997)*
    R98   *(Release 1998)*
    R99   *(Release 1999)*
    REL-4 *(Release 4)*
    REL-5 *(Release 5)*

Reason for change:	⌘	In order to secure subscriber privacy for LCS in a flexible way, additional privacy settings are needed. An LCS Client may have several services and different privacy settings may be needed per service. If the services within one LCS client are of the same service type, they cannot be differentiated with the privacy setting defined in Rel'5 (e.g. per service type and LCS client). Privacy settings per service are therefore added.
Summary of change:	⌘	Addition of privacy setting for services and service parameters in the chapter 6. Definition of service identifier in chapter 3.
Consequences if not approved:	⌘	The privacy settings remain inflexible.

Clauses affected:	⌘	3.2, 6.4.1, 6.4.3

Other specs affected:	⌘	**X**	Other core specifications	⌘
		☐	Test specifications	
		☐	O&M Specifications	

23.071

Other comments:	⌘	

How to create CRs using this form:
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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<u>**FIRST MODIFIED SECTION**</u>

3.2   Definitions

For the purposes of the present document the following definitions apply:

Change of Area: is one event supported for deferred Location Requests. Change of Area means that the network is required to report the location or the occurrence of the event of the requested subscriber in triggered fashion immediately after the network (MSC/SGSN) processes the mobility event for the the new location of the subscriber. Usually new location is noticed after the Location Update, Handover, RAU, Registration or RANAP Location Report, e.g. when the SAI changes.

Codeword: access code, which is used by a Requestor or LCS Client in order to gain acceptance of a location request for a Target UE. The codeword is part of the privacy information that may be registered by a Target UE user.

Current Location: after a location attempt has successfully delivered a location estimate and its associated time stamp, the location estimate and time stamp are referred to as the 'current location' at that point in time.

Deferred location request: a location request where the location response (responses) is (are) required after specific event has occurred. Event may or may not occur immediately. In addition event may occur many times.

Immediate location request: a location request where a single location response only is required immediately.

Initial Location: in the context of an originating emergency call the location estimate and the associated time stamp at the commencement of the call set-up is referred to as 'initial location'.

Last Known Location: The current location estimate and its associated time stamp for Target UE stored in the LCS Server is referred to as the 'last known location' and until replaced by a later location estimate and a new time stamp is referred to as the 'last known location'.

LCS Client: a software and/or hardware entity that interacts with a LCS Server for the purpose of obtaining location information for one or more Mobile Stations. LCS Clients subscribe to LCS in order to obtain location information. LCS Clients may or may not interact with human users. The LCS Client is responsible for formatting and presenting data and managing the user interface (dialogue). The LCS Client is identified by a unique international identification, e.g. E.164, number or Access Point Name (APN).

   NOTE: The LCS Client may reside inside or outside the PLMN.

LCS Client Access barring list: an optional list of MSISDNs per LCS Client where the LCS Client is not allowed to locate any MSISDN therein.

LCS Client Subscription Profile: a collection of subscription attributes of LCS related parameters that have been agreed for a contractual period of time between the LCS client and the service provider.

LCS Feature: the capability of a PLMN to support LCS Client/server interactions for locating Target UEs.

LCS Server: a software and/or hardware entity offering LCS capabilities. The LCS Server accepts requests, services requests, and sends back responses to the received requests. The LCS server consists of LCS components which are distributed to one or more PLMN and/or service provider.

<u>**Service Identifier:** A service provided by an LCS Client is identified by a Service Identifier. One LCS client may have one or more services. The combination of the LCS client Identifier and the Service Identifier constitutes a unique identification of a service.</u>

Location Estimate: the geographic location of a UE and/or a valid Mobile Equipment (ME), expressed in latitude and longitude data. The Location Estimate shall be represented in a well-defined universal format. Translation from this universal format to another geographic location system may be supported, although the details are considered outside the scope of the primitive services.

North American Emergency Services Routing Digits (NA-ESRD): a telephone number in the North American Numbering Plan (NANP) that can be used to identify a North American emergency services provider and its associated LCS client. The ESRD also identifies the base station, cell site or sector from which a North American emergency call originates.

North American Emergency Services Routing Key (NA-ESRK): a telephone number in the North American Numbering Plan (NANP) assigned to an emergency services call by a North American VPLMN for the duration of the call. The NA-ESRK is used to identify (e.g. route to) both the emergency services provider and the switch in the VPLMN currently serving the emergency caller. During the lifetime of an emergency services call, the NA-ESRK also identifies the calling mobile subscriber.

PLMN Access barring list: an optional list of MSISDN per PLMN where any LCS Client is not allowed to locate any MSISDN therein except for certain exceptional cases.

Privacy Class: list of LCS Clients defined within a privacy exception class to which permission may be granted to locate the target UE. The permission shall be granted either on activation by the target UE or permanently for a contractual period of time agreed between the target UE and the service provider.

Privacy Exception List: a list consisting of various types of privacy classes (i.e. operator related, personal etc.). Certain types of classes may require agreement between the service provider and the target MS.**Target MS:** The UE being positioned.

Requestor: an originating entity, which has requested the location of the target UE from the LCS client.

Target UE: The UE being positioned.

Target UE Subscription Profile: the profile detailing the subscription to various types of privacy classes.

UE available: deferred Location Request event in which the MSC/SGSN has established a contact with the UE. Note, this event is considered to be applicable when the UE is temporarily unavailable due to inaction by the UE user, temporarily loss of radio connectivity or IMSI detach and so on. Note that IMSI detach is only applicable in the case UE has previously been registered and information is still kept in the node.

<NEXT MODIFIED SECTION>

6.4.1   Privacy Subscription Options

It shall be possible for a Target UE Subscriber to subscribe to various types of privacy classes. The default treatment in the absence of the information to the contrary in the Target UE Subscription Profile shall be to assume that access is restricted to all LCS Clients (unless using privacy overriding, or otherwise overridden by local regulatory requirements).

Privacy Attributes consist of:

Codeword: an additional level of security that may be set by a Target UE user to determine which Requestors are allowed to request location information;

Privacy Exception List: determines which LCS Clients, services and classes of LCS Clients may position a Target UE;

Service Type Privacy: determines whether the service type allows the LCS Clients to get the position of a Target UE;

Privacy Override Indicator: determines applicability of the Privacy Exception List.

<NEXT MODIFIED SECTION>

6.4.3   Privacy Exception List

To support privacy, the LCS Server shall enable each Target UE Subscriber to subscribe to a "privacy exception list" containing the LCS Client identifiers, the service identifiers, classes of LCS Clients, the target subscriber notification setting (with/without notification) and the default treatment, which is applicable in the absence of a response from the Target UE for each LCS Client and service identifiers.

The privacy exception list shall support a minimum of 20 clients. For each client the privacy exception list shall support a minimum of 10 services. The maximum number of clients and services shall be determined by implementation constraints.

If the target subscriber notification is set as "notification with verification", each positioning request from the LCS Client or the service shall be notified to the target UE before positioning. The treatment for location request from the LCS Client or service, which is not registered in the privacy exception list, shall also be specified in the privacy exception list. An empty privacy exception list shall signify an intent to withhold location from all LCS Clients.

The classes that can be included are as follows.

- Universal Class: location services may be provided to all LCS Clients;

- Call/session-related Class: location services may be provided to any value added LCS clients or a particular value added LCS client or a particular service or particular group of value added LCS Clients – where each LCS Client, service or group of LCS Clients is identified by a unique international identification, e.g. E.164, service ID or Access Point Name (APN) that currently has a temporary association with the Target UE in the form of an established voice, data call or PS session originated by the Target UE. For each identified LCS Client, service or group of LCS Clients, one of the following geographical restrictions shall apply:

    a) Location request allowed from an LCS Client or service served by identified PLMN only;

    b) Location request allowed from an LCS Client or service served in the home country only;

    c) Location request allowed from any LCS Client or service;

- Call/session-unrelated Class; location services may be provided to a particular value added LCS Client or a particular service or particular group of value added LCS Clients – where each LCS Client, service or group of LCS Clients is identified by a unique international identification, e.g. E.164, number, service ID or Access Point Name (APN). For each identified LCS Client, service or group of LCS Clients, one of the following geographical restrictions shall apply:

    a) Location request allowed from an LCS Client or service served by identified PLMN only;

    b) Location request allowed from an LCS Client or service served in the home country only;

    c) Location request allowed from any LCS Client or service;

- PLMN Operator Class – location services may be provided by particular types of LCS clients supported within the HPLMN or VPLMN. The following types of clients are distinguished (see note):

    a) Clients broadcasting location related information to the UEs in a particular geographic area – e.g. on weather, traffic, hotels, restaurants;

    b) O&M client (e.g. an Operations System) in the HPLMN

    c) O&M client (e.g. an Operations System) in the VPLMN

    d) Clients recording anonymous location information (i.e. without any UE identifiers) – e.g. for traffic engineering and statistical purposes

    e) Clients enhancing or supporting any supplementary service, IN service, bearer service or teleservice subscribed to by the target UE subscriber.

NOTE: The definitions of the various PLMN operator categories may be supplemented by more precise language in contractual agreements both between UE subscribers and their home service providers and between individual network operators with inter-PLMN roaming agreements. Such classification of the PLMN operator categories is outside the scope of this specification.

CR-Form-v5.1

CHANGE REQUEST

⌘ **22.071 CR 046** ⌘**rev** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Update to TS 22.071for United States specific location accuracy requirements for US implementations.
Source: ⌘	SA1 (SWG LCS)
Work item code: ⌘	LCS **Date:** ⌘ 06.08.2002

Category: ⌘ **C** **Release:** ⌘ Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘	CR to TS 22.071 to recognize regulatory location accuracy requirements e.g. for US implementations.
Summary of change: ⌘	Alignment of 22.071 with regulatory requirements (e.g. USA)
Consequences if not approved: ⌘	Divergence between regulatory requirements and 3GPP specifications.

Clauses affected: ⌘	Table 4.1, in Section 4.3: Quality of Service
Other specs Affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments: ⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<< First changed section >>

4.3.1   Horizontal Accuracy

The accuracy that can be provided with various positioning technologies depends on a number of factors, many of which are dynamic in nature. As such the accuracy that will be realistically achievable in an operational system will vary due to such factors as the dynamically varying radio environments (considering signal attenuation and multipath propagation), network topography in terms of base station density and geography, and positioning equipment available.

The accuracy for location services can be expressed in terms of a range of values that reflect the general accuracy level needed for the application. Different services require different levels of positioning accuracy.   The range may vary from tens of meters (navigation services) to perhaps kilometers (fleet management).

The majority of attractive value added location services are enabled when location accuracies of between 25m and 200m can be provided.

Based on decreasing accuracy requirement some examples of location services are provided in table 4.1. The LCS service shall provide techniques that allow operators to deploy networks that can provide at least the level of accuracy required by the regional regulatory bodies (e.g. Annex A).

Table 4.1; Example of location services with decreasing accuracy requirement

·	Location-independent	Most existing cellular services, Stock prices, sports reports
·	PLMN or country	Services that are restricted to one country or one PLMN
·	Regional (up to 200km)	Weather reports, localized weather warnings, traffic information (pre-trip)
·	District (up to 20km)	Local news, traffic reports
·	Up to 1 km	Vehicle asset management, targeted congestion avoidance advice
·	500m to 1km	Rural and suburban emergency services, manpower planning, information services (where are?)
·	100m (67%)	U.S. FCC mandate (99-245) for wireless emergency calls using network based positioning methods
·	300m (95%)	
·	75m-125m	Urban SOS, localized advertising, home zone pricing, network maintenance, network demand monitoring, asset tracking, information services (where is the nearest?)
·	50m (67%)	U.S. FCC mandate (99-245) for wireless emergency calls using handset based positioning methods
·	150m (95%)	
·	10m-50m	Asset Location, route guidance, navigation

Accuracy may be independently considered with respect to horizontal and vertical positioning estimates. Some location services may not require both, others may require both, but with different degrees of accuracy.

Given that the location estimate is the best possible within the bounds of required response time, the location estimates of a fixed position UE (assuming several estimates are made) will reveal a 'spread' of estimates around the actual UE position. The distribution of locations can be described by normal statistical parameters and suggests that a small proportion of location estimates may lie outside of the acceptable Quality of Service (QoS) parameters for specific services (as determined by the network operator).

It may be possible to provide information on the confidence that can be associated with a location estimate. This may be used by location services to decide if a position update should be requested, for example, if the reported accuracy falls below a threshold determined by the LCS Client or Network Operator for a specific service.

It may also be possible to determine velocity (speed and heading) information from a single location request. (i.e. the response to a single request may provide the results of multiple positionings).

When delivered with a location estimate, the confidence region parameters, speed and heading may allow an application to improve the service delivered to the UE user. Some examples are given below:

a) Confidence Region: Simple measure of uncertainty that specifies the size and orientation of the ellipse in which an UE is likely to lie with a predetermined confidence (e.g. 67%). The size of the confidence region may be used by the network operator or the LCS Client to request an updated location estimate.

b) Speed: enables e.g. congestion monitoring, and average travel time estimates between locations.

c) Heading: the location estimate of a vehicle may be improved to identify the appropriate side of the highway. This may enable the provision of traffic information that relates only to the user's direction of travel.

For Value Added Services and PLMN Operator Services, the following is applicable:

Accuracy is application driven and is one of the negotiable Quality of Service (QoS) parameters.

The precision of the location shall be network design dependent, i.e., should be an operator's choice. This precision requirement may vary from one part of a network to another.

The LCS shall allow an LCS Client to specify or negotiate the required horizontal accuracy. The LCS shall normally attempt to satisfy or approach as closely as possible the requested or negotiated accuracy when other quality of service parameters are not in conflict. The achieved accuracy level of location information shall be indicated using the shapes and uncertainty areas defined in 3GPP TS 23.032 [2].

For Emergency Services (where required by local regulatory requirements) the following requirements shall be met:

- The LCS Server shall attempt to obtain the horizontal location of the calling UE, in terms of universal latitude and longitude coordinates, and shall provide this to an Emergency Service Provider. The accuracy shall be defined by local regulatory requirements. Annex A shows such requirements as exist in the United States.

NOTE: The LCS Server provides the location service capabilities but the mechanism by which location is reported to an emergency service provider is outside the scope of this service.