|  |
| --- |
| 3GPP TR 38.744 V0.0.1 (2024-5) |
| Technical Report |
| 3rd Generation Partnership Project;Technical Specification Group Radio Access Network;Study on Artificial Intelligence (AI)/Machine Learning (ML) for mobility in NR;(Release 19) |
|   |
|  |  |
|  |
| The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP.The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented.This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification.Specifications and Reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices. |

|  |
| --- |
|  |
| ***3GPP***Postal address3GPP support office address650 Route des Lucioles - Sophia AntipolisValbonne - FRANCETel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16Internethttps://www.3gpp.org |
| ***Copyright Notification***No part may be reproduced except as authorized by written permission.The copyright and the foregoing restriction extend to reproduction in all media.© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).All rights reserved.UMTS™ is a Trade Mark of ETSI registered for the benefit of its members3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational PartnersLTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational PartnersGSM® and the GSM logo are registered and owned by the GSM Association |

Contents

[Foreword 4](#_Toc166179275)

[1 Scope 6](#_Toc166179276)

[2 References 6](#_Toc166179277)

[3 Definitions of terms, symbols and abbreviations 6](#_Toc166179278)

[3.1 Terms 6](#_Toc166179279)

[3.2 Abbreviations 6](#_Toc166179280)

[4 AI mobility use case 7](#_Toc166179281)

[4.1 RRM measurement prediction 7](#_Toc166179282)

[4.2 Measurement Event prediction 7](#_Toc166179283)

[4.3 Failure event prediction 7](#_Toc166179284)

[5 Evaluations 7](#_Toc166179285)

[5.1 Common evaluation methodology, metrics and assumptions 7](#_Toc166179286)

[5.2 RRM measurement prediction 7](#_Toc166179287)

[5.2.1 Evaluation methodology, metrics and assumptions 7](#_Toc166179288)

[5.2.2 Performance result 7](#_Toc166179289)

[5.3 Measurement event prediction 7](#_Toc166179290)

[5.3.1 Evaluation methodology, metrics and assumptions 7](#_Toc166179291)

[5.3.2 Performance result 8](#_Toc166179292)

[5.4 Failure event prediction 8](#_Toc166179293)

[5.4.1 Evaluation methodology, metrics and assumptions 8](#_Toc166179294)

[5.4.2 Performance result 8](#_Toc166179295)

[6 Potential specification impact 8](#_Toc166179296)

[6.1 LCM, protocol and procedure aspects 8](#_Toc166179297)

[6.1.1 Common mobility aspects 8](#_Toc166179298)

[6.1.2 RRM measurement prediction 8](#_Toc166179299)

[6.1.3 Measurement event prediction 8](#_Toc166179300)

[6.1.4 Failure event prediction 8](#_Toc166179301)

[6.2 Interoperability, testability, and requirements 8](#_Toc166179302)

[7 Conclusion 8](#_Toc166179303)

[Annex <A> (informative): <Informative annex for a Technical Specification> 9](#_Toc166179304)

[A.1 Heading levels in an annex 9](#_Toc166179305)

[Annex <B> (informative): Change history 10](#_Toc166179306)

# Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document …

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

…

[x] <doctype> <#>[ ([up to and including]{yyyy[-mm]|V<a[.b[.c]]>}[onwards])]: "<Title>".

# 3 Definitions of terms, symbols and abbreviations

This clause and its three (sub) clauses are mandatory. The contents shall be shown as "void" if the TS/TR does not define any terms, symbols, or abbreviations.

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Definition format (Normal)

**<defined term>:** <definition>.

**example:** text used to clarify abstract rules by applying them literally.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

Abbreviation format (EW)

<ABBREVIATION> <Expansion>

# 4 AI/ML mobility use cases

## 4.1 General

Editor Note: this section intends to capture the study goals, and description of use cases.

## 4.2 RRM measurement prediction

Editor Note: The RRM measurement refers to either L3 cell/beam level measurement and/or L1 beam level measurement

## 4.3 Measurement Event prediction

Editor Note: The measurement event refers to those measurement events defined in clause 5.5.4 in 38.331.

## 4.4 RLF/HOF prediction

Editor Note: RLF and HOF refer to radio link failure and handover failure respectively.

# 5 Evaluations

## 5.1 Common evaluation methodology, metrics and assumptions

Editor Note: This section intends to capture evaluation metrics, methodology and simulation assumptions common for all use cases

## 5.2 RRM measurement prediction

### 5.2.1 Evaluation methodology, metrics and assumptions

Editor Note: This section intends to capture RRM measurement prediction specific metrics, methodology and assumptions

### 5.2.2 Evaluation result

## 5.3 Measurement event prediction

### 5.3.1 Evaluation methodology, metrics and assumptions

Editor Note: This section intends to capture measurement event prediction specific metrics, methodology and assumptions

### 5.3.2 Evaluation result

## 5.4 RLF/HOF prediction

### 5.4.1 Evaluation methodology, metrics and assumptions

Editor Note: This section intends to capture unintended event prediction specific metrics, methodology and assumptions

### 5.4.2 Evaluation result

# 6 Potential specification impact

## 6.1 LCM, protocol and procedure aspects

Editor Note: Discussion on mobility specific LCM, protocol and procedures are captured in this section.

Editor Note: This SID will reuse the common frame work of LCM captured in section 7.2.1 and 7.3.2 of 38.843 and agreement concluded under WID NR\_AIML\_air-Core in principle. Anything mobility specific will be captured here.

### 6.1.1 Common aspects

Editor Note: Specification impacts common to all use cases are captured here

### 6.1.2 RRM measurement prediction

Editor Note: RRM measurement prediction specific part is captured here

### 6.1.3 Measurement event prediction

Editor Note: Measurement event prediction specific part is captured here

### 6.1.4 Failure event prediction

Editor Note: Failure event prediction specific part is captured here

## 6.2 Interoperability, testability, and RRM requirements

Editor Note: this section intends to capture spec impact on testability, interoperability, and RRM requirements and performance [RAN4] based on SID.

# 7 Conclusion

Annex <A> (informative):
<Informative annex for a Technical Specification>

Informative annexes may appear in both Technical Specifications and Technical Reports. Use style "Heading 8" for use in TSs.

Informative annexes shall not contain requirements for the implementation of the Technical Specification.

# A.1 Heading levels in an annex

Heading levels within an annex are used as in the main document, but for Heading level selection, the "A.", "B.", etc. are ignored. e.g. **B.1.2** is formatted using ***Heading 2*** style.

Annex <B> (informative):
Change history

Use style "Heading 8" in TSs and "Heading 9" in TRs. Do not use "informative" in the title in TRs.

This is the last annex for TS/TSs which details the change history using the following table.
This table is to be used for recording progress during the WG drafting process till TSG approval of this TS/TR.
For TRs under change control, use one line per approved Change Request
Date: use format YYYY-MM
CR: four digits, leading zeros as necessary
Rev: blank, or number (max two digits)
Cat: use one of the letters A, B, C, D, F
Subject/Comment: for TSs under change control, include full text of the subject field of the Change Request cover
New vers: use format [n]n.[n]n.[n]n

|  |
| --- |
| Change history |
| Date | Meeting | TDoc | CR | Rev | Cat | Subject/Comment | New version |
|  |  |  |  |  |  |  |  |