Организация Объединенных Наций ECE/TRANS/WP.29/GRVA/2023/18

Экономический и Социальный Совет

Distr.: General
14 July 2023
Russian
Original: English

## Европейская экономическая комиссия

Комитет по внутреннему транспорту

**Всемирный форум для согласования правил в области транспортных средств**

**Рабочая группа по автоматизированным/автономным и подключенным транспортным средствам**

**Семнадцатая сессия**
Женева, 25–29 сентября 2023 года
Пункт 4 e) i) предварительной повестки дня
**Автоматизированные/автономные и подключенные транспортные средства: координация работы по автоматизации между рабочими группами (РГ): применимость ГТП ООН и правил ООН для АСВ**

# Доклад о применимости правил и глобальных технических правил WP.29 для автоматизированных транспортных средств*, **

**Передан представителями Германии, Китая, Нидерландов, Соединенного Королевства Великобритании и Северной Ирландии, Франции, Японии, Европейской ассоциации поставщиков автомобильных деталей и Международной организации предприятий автомобильной промышленности**

Воспроизведенный ниже текст был подготовлен экспертами целевых групп, которым Всемирный форум для согласования правил в области транспортных средств (WP.29) поручил провести проверку и обзор правил ООН и глобальных технических правил (ГТП) ООН на предмет их применимости для автоматизированного вождения. На своей сто восемьдесят шестой сессии в марте 2022 года WP.29 просил каждую из своих вспомогательных рабочих групп провести соответствующий обзор правовых документов, относящихся к ее ведению. В настоящем документе обобщены результаты и ход проведения этого обзора, а также представлена краткая информация о применимости правил и ГТП ООН для АСВ.

* В соответствии с программой работы Комитета по внутреннему транспорту на 2023 год, изложенной в предлагаемом бюджете по программам на 2023 год (A/77/6 (разд. 20, п. 20.6)), Всемирный форум будет разрабатывать, согласовывать и обновлять правила ООН в целях улучшения характеристик транспортных средств. Настоящий документ представлен в соответствии с этим мандатом.

** Приложения к настоящему докладу распространяются только на том языке, на котором были представлены.

Настоящий документ отражает текущее мнение экспертов на момент его представления, поэтому содержащиеся в нем рекомендации могут претерпеть существенные изменения на следующих этапах процесса пересмотра правил и внесения в них поправок.

# Содержание

# I. Предисловие

1. Многие считают автоматизацию одним из самых значительных скачков в развитии автомобильной промышленности с момента ее зарождения в конце XIX века. В настоящий момент происходит становление технологии производства беспилотных транспортных средств, и поэтому как промышленность, так и общественность обращаются к властям за рекомендациями по безопасному вводу беспилотных автомобилей в эксплуатацию на дорогах общего пользования.

2. По итогам проводящейся уже более века активной работы по обеспечению безопасности дорожного движения к автомобилям применяется обширная международная нормативная база, разработанная Всемирным форумом по согласованию правил в области транспортных средств (WP.29). Необходимость создания системы регулирования процессов определения, испытания и утверждения (в контексте официального утверждения типа) эксплуатационных характеристик (в первую очередь относящихся к безопасности) автоматизированных транспортных средств была признана Всемирным форумом еще в 2018 году, что выразилось в учреждении вспомогательной рабочей группы — GRVA. С этого момента экспертами проводится серьезная работа по разработке функциональных требований и методов валидации для автоматизированных систем вождения.

3. Тем не менее даже если предположить, что благодаря своему «интеллектуальному уровню» оснащенное подобной технологией транспортное средство сможет безупречно выполнять возложенную на него задачу управления, то, несомненно, остальные элементы транспортного средства тоже должны соответствовать необходимым требованиям по обеспечению его безопасности (как для пассажиров, так и для других участников дорожного движения), а также его прочности, комфортабельности, удобства использования в любой точке мира и ограниченности воздействия на окружающую среду. В силу Соглашения 1958 года[1] и Соглашения 1998 года[2] WP.29 (по состоянию на июнь 2023 года) является гарантом соблюдения 166[3] действующих добавлений к Соглашению 1958 года (правил ООН) и 23 добавлений к Глобальному регистру (глобальных технических правил). В каждом из этих сводов правил излагаются технические положения и требования к испытаниям систем или характеристик автотранспортных средств. Тем не менее при разработке правил были сделаны определенные допущения относительно конструкции транспортных средств, согласно которым: водитель находится внутри транспортного средства и постоянно осуществляет управление; водитель находится на сиденье в передней части автомобиля и имеет доступ к органам управления и индикаторам состояния транспортного средства; водитель попадает в транспортное средство через двери; и т. д. Таким образом, с первого взгляда непросто определить, какие правила актуальны для полностью автоматизированных транспортных средств, поэтому прежде чем соответствующие правила станут применимы к таким транспортным средствам, в них, возможно, потребуется внести значительные изменения.

4. Ввиду настоятельной необходимости выяснить, какие правила могут быть применимы к транспортным средствам без водителя и потребуются ли для этого какие-либо изменения, WP.29 поручил[4] вспомогательным рабочим группам провести обзор всех правил и глобальных технических правил ООН в целях последующего внесения

[1] Соглашение о принятии согласованных технических правил Организации Объединенных Наций для колесных транспортных средств, предметов оборудования и частей, которые могут быть установлены и/или использованы на колесных транспортных средствах, и об условиях взаимного признания официальных утверждений, выдаваемых на основе этих правил Организации Объединенных Наций.

[2] Соглашение о введении глобальных технических правил для колесных транспортных средств, предметов оборудования и частей, которые могут быть установлены и/или использованы на колесных транспортных средствах.

[3] Правилам присвоены номера от 1 до 167, с добавлением Правил № 13-Н ООН и за вычетом двух исключенных правил ООН №№ 2 и 15.

[4] ECE/TRANS/WP.29/1164, пункт 30.

во все соответствующие правила поправок, необходимых для учета возможности автоматизированного вождения.

# II. Сфера охвата и методика проверки

5. Работа по проверке проводилась в период с октября 2022 по июнь 2023 года. Она охватывала правила и глобальные технические правила ООН, вступившие в силу до окончания периода проверки, — обычно с учетом последней серии поправок и последних дополнений. В ходе проверки не рассматривались другие документы, такие как резолюции WP.29, пояснительные документы к действующим правилам и другие документы, не являющиеся правилами. В настоящем документе термин «правила» может произвольно использоваться для обозначения как правил ООН, так и глобальных технических правил ООН.

6. Проверку проводили все вспомогательные рабочие группы WP.29, каждая из которых отвечала за правила, находящиеся в ее ведении. Таким образом, было учреждено шесть целевых групп по проверке, а именно:

a) Рабочая группа по вопросам шума и шин (GRBP). Председатель: Нидерланды, секретариат: Международная организация предприятий автомобильной промышленности (МОПАП);

b) Рабочая группа по вопросам освещения и световой сигнализации (GRE)[5]. Сопредседатели: Германия и Соединенное Королевство Великобритании и Северной Ирландии; секретариат: Международная группа экспертов по вопросам автомобильного освещения и световой сигнализации (БРГ);

c) Рабочая группа по проблемам энергии и загрязнения окружающей среды (GRPE). Председатель: Нидерланды;

d) Рабочая группа по общим предписаниям, касающимся безопасности (GRSG). Председатель: Нидерланды, секретариат: МОПАП;

e) Рабочая группа по пассивной безопасности (GRSP). Председатель: Германия, секретариат: МОПАП;

f) Рабочая группа по автоматизированным/автономным и подключенным транспортным средствам (GRVA). Сопредседатели: Китай и Франция.

7. Помимо проверки собственных правил, целевая группа GRVA обеспечивала координацию и поддержку согласования процесса проверки между целевыми группами, собирала информацию по вопросам высокого уровня и отчитывалась перед WP.29.

Таблица 1
**Распределение правил между вспомогательными рабочими группами WP.29**

| *Вспомогательная рабочая группа* | *Число правил ООН* | *Число ГТП ООН* |
|---|---|---|
| GRBP | 21 | 1 |
| GRE | 44 | 0 |
| GRPE | 17 | 12 |
| GRSG | 41 | 2 |
| GRSP | 29 | 6 |
| GRVA | 14 | 2 |

[5] Целевая группа GRE по проверке (ЦГ АВСР GRE) была учреждена до начала процесса проверки и первоначально преследовала цель внести изменения в Правила № 48 (установка устройств освещения и световой сигнализации) с целью обеспечить их применимость к автоматизированным транспортным средствам.

8. В процессе проверки выполнялись три задачи, подробно описанные ниже:

a) **задача 1**: оценить каждый свод правил на предмет его применимости к транспортным средствам, оснащенным АСВ, которая не выдает запросов о передаче управления, независимо от наличия средств ручного управления;

b) **задача 2**: оценить готовность каждого соответствующего свода правил к применению в сфере автоматизированных транспортных средств. В контексте правил ООН «готовность» означает, что нынешний текст правил может единообразно[6] применяться органами по официальному утверждению типа и техническими службами, желающими применить правила к автоматизированному транспортному средству;

c) **задача 3**: оценить каждый свод правил, который является актуальным, но не признается «готовым» к применению в контексте автоматизации, на предмет необходимости внесения в него значительных изменений в целях обеспечения «готовности».

9. Целевые группы рассматривали исключительно транспортные средства, оснащенные автоматизированной системой вождения (АСВ), которая не выдает запросов на передачу управления (далее по тексту — «полностью автоматизированные транспортные средства»), включая, в частности:

a) транспортные средства, оснащенные средствами ручного управления («двухрежимные транспортные средства»);

b) транспортные средства, не оснащенные средствами ручного управления;

c) транспортные средства, в которых не могут находиться водитель и пассажиры.

10. Помимо вышеперечисленных вариантов, было выявлено еще несколько вариантов использования, прямо или косвенно связанных с автоматизированным вождением. Тем не менее эти варианты использования было решено рассмотреть лишь в общих чертах, тогда как более конкретный анализ будет зависеть от будущих приоритетов в отношении внесения изменений. Эти варианты использования включают:

a) транспортные средства, которые могут двигаться в обоих направлениях («двунаправленные транспортные средства»);

b) транспортные средства без средств ручного управления и с крайне ограниченными ДШЭ, например автоматизированные городские маршрутные такси или роботы-доставщики;

c) транспортные средства с нетрадиционной компоновкой и расположением сидений, например с сиденьями, обращенными назад или вбок, либо сиденьями, которые могут откидываться под углом, превышающим действующие ограничения;

d) транспортные средства с находящимся в салоне оператором, который не является водителем;

e) транспортные средства, способные напрямую взаимодействовать с удаленными операторами или центрами наблюдения.

# III. Общие результаты

11. В ходе проверки было выявлено, что правила можно разделить на четыре группы по степени актуальности и готовности к применению для полностью автоматизированных транспортных средств.

[6] В этот процесс не входило внесение небольших редакционных поправок, которые могут потребоваться в будущем.

## A. Актуальные и готовые к применению в области автоматизированного вождения правила (хотя их доработка была бы желательна)

12. Некоторые правила не зависят от степени автоматизации транспортных средств, в отношении которых они применяются, например:

a) определенные правила, касающиеся элементов оборудования (особенно те, которые не содержат положений относительно их установки на транспортное средство);

b) правила в отношении аспектов, связанных с физическими характеристиками транспортного средства, в особенности ряд правил в области общей и пассивной безопасности, например касающихся наружных выступов, огнестойкости, систем отопления и т. д.

13. В эту группу также входят правила, которые могут быть доработаны в целях улучшения применимости к автоматизированным транспортным средствам. В частности, это относится к Правилам № 26 ООН, касающихся наружных выступов, для которых можно было бы разработать дополнительные положения относительно датчиков для автоматизированных транспортных средств.

Таблица 2
**Перечень правил, являющихся актуальными и готовыми к применению в контексте полностью автоматизированных транспортных средств**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| П30, П54, П75, П106, П108, П109, П117, П124, П142, П164, ГТП16 | П37, П45, П99, П128, П148, П149, П150 | П24, П103, П133 | П26, П34, П58, П73, П118, П122, П162, П163 | П22, П25, П42, П80, П114, П126, П129 | П155, П156 |

## B. Актуальные правила, но не готовые к применению и требующие незначительных изменений

14. Некоторые правила актуальны для автоматизированного вождения, однако не могут считаться готовыми к немедленному применению в сфере полностью автоматизированных транспортных средств по причине наличия в них положений, относящихся к элементам, которые непосредственно связаны с ручным управлением (таким, как сам водитель, водительское сиденье, педали или другие органы ручного управления, контрольные сигналы и т. д.) Однако в правилах этой группы содержится лишь несколько положений такого характера, которые, как считается, не требуют сложных изменений.

Таблица 3
**Перечень правил, являющихся актуальными, но не готовыми к применению и требующими незначительных изменений**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| П9, П28, П41, П51, П59, П63, П64, П92, П138, П141, П165 | | П68, ГТП19 | П18, П39, П61, П67, П93, П97, П110, П116, П161 | П32, П33, П111, П134, П146, ГТП13 | |

15. В дополнение к вышеизложенному перечисленные ниже правила относятся только к транспортным средствам с водителем и/или пассажирами.

Таблица 4
**Перечень правил, являющихся актуальными для полностью автоматизированных транспортных средств исключительно с водителем и/или пассажирами, но не готовыми к применению и требующими незначительных изменений**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| | | | П66 | П14, П25, П145, ГТП1, ГТП7 | |

## C. Актуальные правила, но не готовые к применению и требующие значительных изменений

16. Некоторые правила актуальны для автоматизированного вождения, однако в нынешнем виде их применение к полностью автоматизированным транспортным средствам весьма затруднительно в связи с многочисленными ссылками на характеристики транспортного средства, несовместимые с автоматизированным вождением, или поскольку для обеспечения удовлетворительного уровня безопасности полностью автоматизированных транспортных средств потребуется значительное число новых требований. К этой категории относится ряд правил, касающихся основных функций автомобиля, таких как торможение, рулевое управление, освещение, а также правил в отношении безопасности (электробезопасность, стойкость конструкции к ударным нагрузкам и т. д.). Поскольку для правил этой группы требуются многочисленные изменения, в двух приведенных ниже таблицах выделены предлагаемые приоритеты по доработке отдельных правил и ГТП ООН.

Таблица 5
**Перечень правил, являющихся актуальными, но не готовыми к применению и требующими значительных изменений**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| | **П10, П48,** *П53, П74,* П86 | ГТП2 | **П43**, П55, П102, П105, П144, П147, **П160**, ГТП6 | **П94, П95, П100,** П127, П135, П136, П137, П153, ГТП9, ГТП14, ГТП20 | **П13, П13-Н**, П78, **П79**, П90, ГТП3 |

*Примечание*: В данной таблице жирным шрифтом выделены правила, подлежащие первоочередному изменению (согласно пункту A главы V настоящего доклада); курсивом выделены правила, которые применяются только к двухколесным транспортным средствам и должны иметь низкий приоритет при внесении изменений.

17. В дополнение к вышеизложенному перечисленные ниже правила относятся только к транспортным средствам с водителем и/или пассажирами.

Таблица 6
**Перечень правил, являющихся актуальными для полностью автоматизированных транспортных средств исключительно с водителем и/или пассажирами, но не готовыми к применению и требующими значительных изменений**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| | | | **П107** | **П11, П16, П17, П21, П29** | |

*Примечание*: В данной таблице жирным шрифтом выделены правила, подлежащие первоочередному изменению (согласно пункту A главы V настоящего доклада).

## D. Правила, не являющиеся актуальными для полностью автоматизированных транспортных средств

18. Некоторые правила неактуальны для полностью автоматизированных транспортных средств либо потому, что они могут быть применимы только к транспортным средствам, оснащенным средствами ручного управления, и не имеют отношения к задаче управления, либо потому, что они охватывают системы или характеристики, за работу которых полностью отвечает АСВ.

Таблица 7
**Перечень правил, не являющихся актуальными для полностью автоматизированных транспортных средств**

| *GRBP* | *GRE* | *GRPE* | *GRSG* | *GRSP* | *GRVA* |
|---|---|---|---|---|---|
| | П1, П3, П4, П5, П6, П7, П8, П19, П20, П23, П27, П31, П38, П50, П56, П57, П65, П69, П70, П72, П76, П77, П82, П87, П88, П91, П98, П104, П112, П113, П119, П123 | | П35, П36, П46*, П52, П60, П62, П71*, П81*, П121, П125*, П151*, П158*, П159*, П166*, П167*, ГТП12 | П12, П44 | П89*, П130*, П131*, П139, П140*, П152*, П157, ГТП8* |

* Система или оборудование, на которые распространяется действие правил, должны управляться АСВ с обеспечением, по крайней мере, того же уровень надежности.

19. Хотя для полностью автоматизированных транспортных средств, не относящихся к двухрежимным транспортным средствам, эти правила не всегда актуальны, в них все же может потребоваться внести изменения, касающиеся взаимодействия между ручным и автоматическим режимами, состояния системы в случае эксплуатации транспортного средства в автоматическом режиме или поведения системы при переходе из одного режима в другой.

### E. Дополнительные соображения

20. Некоторые правила были рассмотрены с точки зрения их технической совместимости с полностью автоматизированными транспортными средствами, но не с точки зрения их актуальности относительно политики высокого уровня в области правил дорожного движения. Это относится к правилам ООН №№ 105 и 111, касающимся безопасности транспортных средств, предназначенных для перевозки опасных грузов, и автоцистерн соответственно. На момент подготовки настоящего доклада неясно, могут ли действовать ограничения или запреты на эксплуатацию таких транспортных средств на дорогах общего пользования. Однако сами правила актуальны для автоматизированных транспортных средств и могут начать применяться к таким транспортным средствам по итогам внесения поправок, поэтому в настоящем докладе они отмечены как «актуальные». В зависимости от политики высокого уровня в правила могут быть внесены поправки, содержащие запрет на приведение автоматизированных транспортных средств в соответствие с данными правилами (если будет принято решение о запрете официального утверждения типа таких автоматизированных транспортных средств), либо поправки, направленные на учет особенности автоматизированных транспортных средств (и оставляющие открытым вопрос о разрешении либо запрете эксплуатации таких автоматизированных транспортных средств на дорогах общего пользования).

## IV. Рекомендации по разработке будущих правил

### A. Общие принципы

21. При разработке правил, касающихся АСВ, следует учитывать несколько основных функций, являющихся обязательными для АСВ:

a) реагирование на все виды входящих сигналов, охватываемых не относящихся к АСВ правилами, в том числе на все виды сигналов, изначально предназначенных для водителя, и выполнение соответствующих действий;

b) обеспечение того же уровня надежности, который обеспечивает любое действие, выполняемое водителем, или же любая функция, предназначенная для помощи водителю;

c) обеспечение возможности проведения всех испытаний согласно другим правилам, в частности посредством активации режима испытаний или применения других способов специального управления транспортным средствам для выполнения заданного протокола испытаний, даже если транспортное средство не оснащено средствами ручного управления.

### B. Перечень актуальных ключевых слов, требующих тщательного изучения

22. В таблице 8 приводится перечень актуальных ключевых слов, использование которых в правилах, не относящихся к АСВ, может повлиять на их применимость к автоматизированным транспортным средствам. В связи с этим любое появление одного из этих слов (или аналогичных слов) в любом положении, которое может применяться к оснащенным АСВ транспортным средствам, следует сопровождать четкими эквивалентными положениями относительно этих транспортных средств.

23. Хотя слово «система» и неактуально в качестве самостоятельного ключевого слова, было отмечено, что в правилах оно нередко используется в тесном соседстве с положениями, относящимися к автоматизированному вождению.

## C. Открытые вопросы

24. Было установлено, что нижеследующие понятия тоже актуальны для разработки любого будущего свода правил, однако требуют дополнительного рассмотрения до формулирования окончательных руководящих указаний.

### 1. Категории или подкатегории автоматизированных транспортных средств

25. Одним из ключевых вопросов, выявленных в ходе проверки, является вопрос о категориях автоматизированных транспортных средств. Все действующие категории транспортных средств были определены на основе существующих вариантов конструкции транспортных средств и вариантов их использования. Автоматизированные транспортные средства подразумевают целый ряд новых возможных вариантов использования, например в качестве небольших городских автомобилей, которые перевозят сидящих и стоящих пассажиров, либо в качестве роботов-доставщиков, которые вообще не перевозят пассажиров, что не соответствует ни одной из существующих категорий транспортных средств. С другой стороны, цель разделения транспортных средств на категории связана не только с их назначением, но и с другими административными соображениями, такими как регистрация, налогообложение или выдача водительских удостоверений. Поэтому следует взвешенно подходить к изучению преимуществ введения новых категорий и или подкатегорий автоматизированных транспортных средств, а также связанной с ним дополнительной административной нагрузки. Хотя обсуждение этого вопроса уже началось, для внесения изменений в правила необходимо будет включить автоматизированные транспортные средства в Сводную резолюцию № 3 (СР.3) и Специальную резолюцию № 1 (СпР.1), поэтому GRSG и GRVA рекомендуется безотлагательно произвести совместную доработку обеих резолюций.

26. Кроме того, в связи с существующей разбивкой на категории некоторые правила не готовы к применению для автоматизированных транспортных средств, в частности легких квадрициклов. Хотя существует множество вариантов использования легких автоматизированных квадрициклов, например для доставки грузов по городу, наиболее подходящими из действующих в настоящее время категорий будут категории L6 или L7 (в соответствии с СР.3). (*Примечание*: В СпР.1 соответствующие категории не указаны.) Тем не менее некоторые актуальные правила (П78, П136) распространяются на все транспортные средства категории L, в том числе и на двухколесные транспортные средства, в отношении которых в процессе проверки не было выявлено ни одного случая применения для автоматизации, который отрасль признала бы в качестве неотложного. Следовательно, внести изменения во весь свод правил для учета автоматизированных квадрициклов будет затруднительно. В качестве альтернативы положения относительно этих категорий транспортных средств можно перенести в другие правила, касающиеся транспортных средств категорий M и N (П78–П13-H и П136–П100 соответственно). Однако этот вариант будет подразумевать существенное ужесточение требований к эксплуатационным характеристикам таких транспортных средств.

### 2. Влияние ДШЭ на требования к эксплуатационным характеристикам и испытаниям

27. Каждое автоматизированное транспортное средство может функционировать в рамках ДШЭ, характеризующегося точными и заранее определенными границами ситуаций, в которых такому транспортному средству разрешено движение. Соответственно, многие автоматизированные транспортные средства разрешено эксплуатировать только в определенных условиях (равнинная местность, городская зона, автомагистраль и т. д.), на низких скоростях или с другими серьезными ограничениями. В большинстве правил подразумевается, что транспортные средства эксплуатируются в различных условиях, и требования к их эксплуатационным характеристикам определяются соответствующим образом. Можно рассмотреть вопрос о том, следует ли отразить эксплуатационные ограничения автоматизированных транспортных средств в существующих правилах, например в

правилах, касающихся торможения, рулевого управления, освещения, стойкости конструкции к ударным нагрузкам и т. д.

### 3. Дублирование функционала АСВ

28. В ряде правил, касающихся основных функций транспортного средства (П13, П13-Н, П78, П79, ГТП3) или характеристик, связанных с активной безопасностью (П131, П140, П152, ГТП8), приведены требования, которые, как предполагается, будут охватываться функционалом АСВ. В частности, автоматизированное транспортное средство должно быть способно тормозить в экстренных ситуациях, причем уровень эффективности такого торможения должен быть, по крайней мере, равным уровню, требуемому для САЭТ. Аналогичным образом в многочисленных сценариях испытаний, связанных с торможением, могут дублироваться требования к испытаниям, которые изложены в правилах, касающихся торможения. Поэтому следует тщательно изучить вопрос о том, могут ли те или иные правила, в частности правила в отношении ЭКУ или САЭТ, считаться неактуальными для автоматизированных транспортных средств или же иметь ценность в качестве независимых доказательств соответствия транспортного средства в целом тем уровням эксплуатационной эффективности конкретных характеристик, которые уже применяются к неавтоматизированным транспортным средствам. По той же причине для обеспечения соответствия автоматизированного транспортного средства действующим эксплуатационным требованиям может быть уместно сохранить основные эксплуатационные испытания на соответствие правилам, касающимся торможения или рулевого управления.

### 4. Взаимодействие при двойном режиме

29. На двухрежимные транспортные средства может устанавливаться ряд систем, которые, судя по всему, будут актуальными только в ручном режиме, в частности систем помощи водителю или систем активной безопасности. Если работа этих систем приостанавливается при переходе из ручного режима в автоматический, то их поведение при повторном переходе в ручной режим следует четко регламентировать, чтобы помочь водителю безопасно восстановить контроль над транспортным средством, в том числе и в тех случаях, когда передача управления выполняется только во время остановки транспортного средства.

### 5. Режим испытаний

30. Во многих правилах содержатся положения об испытаниях, которые должны проводиться на испытательном стенде или испытательном треке. В обоих случаях автоматизированные транспортные средства, не имеющие средств ручного управления, должны быть способны выполнять именно те сценарии испытаний, которые описаны в соответствующих правилах. Хотя на данном этапе требования к способам выполнения этой задачи отсутствуют, одним из возможных решений является установка изготовителем на своих транспортных средствах специального режима испытаний, который позволит органу по официальному утверждению типа или технической службе задать любой конкретный сценарий движения. Этому вопросу следует уделить особое внимание, чтобы обеспечить ясность и четкие предписания, позволяющие избежать таких проблем, как возможная установка блокирующих устройств или обход требований в отношении выбросов.

### 6. Контроль действий пассажиров

31. Принято считать, что автоматизированные транспортные средства должны выполнять все аспекты задачи управления, которые в неавтоматизированных транспортных средствах возлагаются на водителя. Одной из таких областей ответственности является обязанность водителя контролировать и гарантировать безопасность других пассажиров: примером этого являются, в частности, сигнализаторы непристегнутого ремня безопасности, а также возможность отключения водителем электропривода задних стекол. Как АСВ должна реагировать на отстегивание ремня безопасности водителем и пассажирами во время движения

транспортного средства? Должна ли АСВ быть способна не допускать возможность открывания окон находящимися в автомобиле лицами? На данном этапе неясно, в какой степени АСВ способна нести такую ответственность.

### 7. Перевозка детей в автоматизированных транспортных средствах

32. В связи с вопросом № 6 к перевозке детей следует относиться с осторожностью. Поскольку при перевозке детей на водителя возлагаются дополнительные обязанности, пока неясно, можно ли разрешить детям ездить в автоматизированных транспортных средствах без физического присутствия взрослых, в каковом случае будет затронут ряд правил.

33. Резолюция WP.1[7] о внедрении в практику высоко- и полностью автоматизированных транспортных средств в условиях дорожного движения содержит рекомендации для пользователей автоматизированных транспортных средств, в которых говорится о необходимости «удовлетворять требованиям их безопасного использования» и «быть осведомленным/проинформированным об их правильном использовании».

### 8. Роли пользователей

34. В целом можно предположить, что АСВ примет на себя ответственность за принятие входных данных от всех систем транспортного средства и передачу надлежащей информации соответствующим заинтересованным сторонам (центру удаленного контроля, находящимся в автомобиле лицам, бортовому оператору...). Роли пользователей будут определяться АСВ в рамках ее функций с учетом определений ролей пользователей, приведенных в конвенциях о дорожном движении и аналогичных правовых документах. Однако в некоторых правилах может быть целесообразно определить роли пользователей для конкретных целей: так, в определенных аварийных ситуациях может быть признана необходимой подача звукового предупреждающего сигнала, который будут слышать все находящиеся в автомобиле лица.

### 9. Перевозка опасных грузов в автоматизированных транспортных средствах

35. Перевозка опасных грузов также связана с дополнительными рисками и ответственностью водителя и может быть предметом отдельных правил, касающихся динамического управления транспортным средством в зависимости от вида перевозимого груза. Поэтому вопрос о том, применимы ли Правила № 105 к автоматизированным транспортным средствам, следует изучать совместно с WP.15. Эта проблема в определенной степени относится и к транспортным средствам со сложным динамическим поведением, таким как автоцистерны для перевозки жидкостей, бетономешалки, внедорожные транспортные средства и т. д.

### 10. Действующие варианты правил

36. Многие правила ООН выпущены в нескольких вариантах (с несколькими сериями поправок), которые действуют одновременно. На данном этапе неясно, как следует проводить процесс внесения поправок в предыдущие варианты правил ООН, должны ли автоматизированные транспортные средства систематически охватываться новыми сериями поправок и т. д.

[7] ECE/TRANS/WP.1/2018/4/Rev.3.

Таблица 8

**Перечень тем и ключевых слов, актуальных для автоматизированного вождения**

| *Тема* | *Связанные ключевые слова* | | | | |
|---|---|---|---|---|---|
| *Человек* | водитель | пассажир | человек | водитель/ пассажир | экипаж (член экипажа) |
| *Зоны транспортного средства* | кабина<br>кабина водителя<br>кабина управления | пассажирский салон | | | |
| *Части тела* | кисть<br>стопа<br>рука<br>и т. д. | | | | |
| *Выполняемые вручную действия* | рычаг<br>кнопка<br>ручка<br>переключатель | надавливать<br>тянуть<br>нажимать<br>поворачивать | сила<br>мышечная<br>(энергия) | дотянуться<br>доступный | ручной |
| *Зрение* | видимый<br>зрение (поле зрения)<br>видеть | глазной<br>зрительный | освещать<br>отображать<br>распознавать<br>определять | контролировать | |
| *Слух* | слышимый<br>слуховой<br>слышать | | | | |
| *Информация для водителя* | предупреждать<br>сигнализировать<br>оповещать | сообщать<br>напоминать<br>указывать | огонь (проверка огня)<br>символ<br>указатель<br>знак<br>цвет<br>контраст<br>пиктограмма<br>текст | приборная панель<br>приборная доска | |
| *Физические средства управления* | Рулевое колесо | акселератор | педаль | вал коробки передач | |
| *Решение водителя* | отключить | управлять<br>включать<br>эксплуатировать<br>использовать<br>(неправильно использовать)<br>(де)активировать | намеренный<br>выбирать<br>преднамеренный | аварийная ситуация | |
| *Вход в транспортное средство или выход из него* | эвакуировать<br>покинуть<br>выйти<br>войти<br>производить посадку | вход<br>выход | | | |
| *Физические элементы, не имеющие отношения к автоматизированному вождению* | ветровое стекло<br>лобовое стекло<br>солнцезащитный козырек<br>зеркало<br>остекление | | | | |
| **Приведенные ниже ключевые слова актуальны при рассмотрении автомобилей без водителя и пассажиров:** | | | | | |
| *Лицо, находящееся в салоне* | Сидячее место | точка «R» точка «H» | застегивать (расстегивать)<br>пристегивать (отстегивать) | сидя<br>стоя | подлокотник<br>подголовник<br>ремень безопасности<br>дверь |

# V. Последующие шаги

## A. Приоритеты для внесения поправок

37. Решение о приоритетности внесения изменений в правила следует принимать с учетом следующих факторов:

a) национальные и региональные потребности в сертификации (самосертификации и официальном утверждении типа) автоматизированных транспортных средств;

b) актуальность вариантов использования (например, для двухколесных автоматизированных транспортных средств в настоящее время в активной разработке находится меньше вариантов использования, чем для автоматизированных транспортных средств, спроектированных на базе легковых автомобилей);

c) сложность необходимых изменений.

38. По общему мнению, приоритет в части внесения поправок следует отдавать тем правилам, которые охватывают основные характеристики транспортных средств и обеспечивают наибольшую ценность с точки зрения безопасности дорожного движения и экологических характеристик (относящихся к выбросам загрязняющих веществ и парниковых газов). Поэтому эксперты предложили в рамках своих РГ внести особо безотлагательные изменения в следующие правила:

Таблица 9
**Перечень правил, требующих внесения поправок в первоочередном порядке**

| *Вспомогательная рабочая группа* | *Правила, требующие внесения поправок в первоочередном порядке* |
|---|---|
| GRBP | П9, П28, П51, П138, П165 |
| GRE | П10, П48 |
| GRPE | Решение будет принято по итогам проверки всех правил |
| GRSG | П43, П107, П160, СР.3, СпР.1 |
| GRSP | П11, П14, П16, П17, П21, П29, П94, П95, П100 |
| GRVA | П13, П13-Н, П79 |

39. Несмотря на то что перед внесением поправок в правила необходимо решить все обозначенные выше открытые вопросы, параллельно с этой работой можно приступить к подготовке первоначального проекта. В частности, положения можно разрабатывать на основе выявленных вариантов использования в контексте автоматизированных транспортных средств, даже если новые категории транспортных средств еще не определены. Характеристики, косвенно относящиеся к автоматизированным транспортным средствам (двунаправленные транспортные средства, нестандартное расположение сидений) и не связанные с задачей управления, можно рассмотреть на более позднем этапе, поскольку они не являются прямыми последствиями автоматизации.

## B. Координация между вспомогательными органами (РГ) WP.29

40. С самого начала процесса проверки эксперты пришли к выводу о необходимости работы по единой методике и с едиными результатами, что позволило предложить в настоящем документе согласованный формат и аналитическую базу для пересмотра всех правил. Кроме того, целевые группы предполагают, что в случае внесения изменений в правила потребуется дальнейшая совместная работа.

41. В отношении всех будущих поправок к правовым документам, касающихся их пригодности для автоматизированного вождения, следует применять одни и те же

принципы и схожие формулировки, хотя они и находятся в ведении соответствующих вспомогательных рабочих групп WP.29. Такое единообразие следует обеспечить посредством постоянной координации работы различных РГ.

42. Помимо этого, многие из выявленных открытых вопросов относятся к нескольким РГ и не могут быть с легкостью решены в рамках самого WP.29 или какой-либо одной вспомогательной рабочей группы. И наоборот, некоторые вопросы относительно конкретных правил можно решить только с помощью рекомендаций GRVA или ее неофициальной рабочей группы по функциональным требованиям к автоматизированным транспортным средствам (НРГ по ФРАВ).

43. Исходя из этого, в дополнение к каждой вспомогательной рабочей группе WP.29, разрабатывающей поправки к правилам ООН и ГТП ООН, находящимся в ее ведении (будь то посредством существующей целевой группы по проверке или другими способами), рекомендуется учредить центральную группу экспертов, целью которой станет продолжение работы по согласованию, начатой в ходе проверки. WP.29 может наделить эту группу полномочиями по координации работы над поправками, предлагаемыми каждой РГ, и по ускорению решения ранее выявленных открытых вопросов путем прямого обращения к соответствующим экспертам и рабочим группам. В состав этой группы следует включить экспертов от каждой вспомогательной рабочей группы WP.29, а также экспертов по автоматизированному вождению. В административном плане эта группа экспертов может подчиняться непосредственно WP.29. В качестве альтернативы можно расширить полномочия целевой группы по проверке в составе GRVA, которая может взять на себя выполнение задачи по согласованию будущей работы и ускорению решения открытых вопросов.

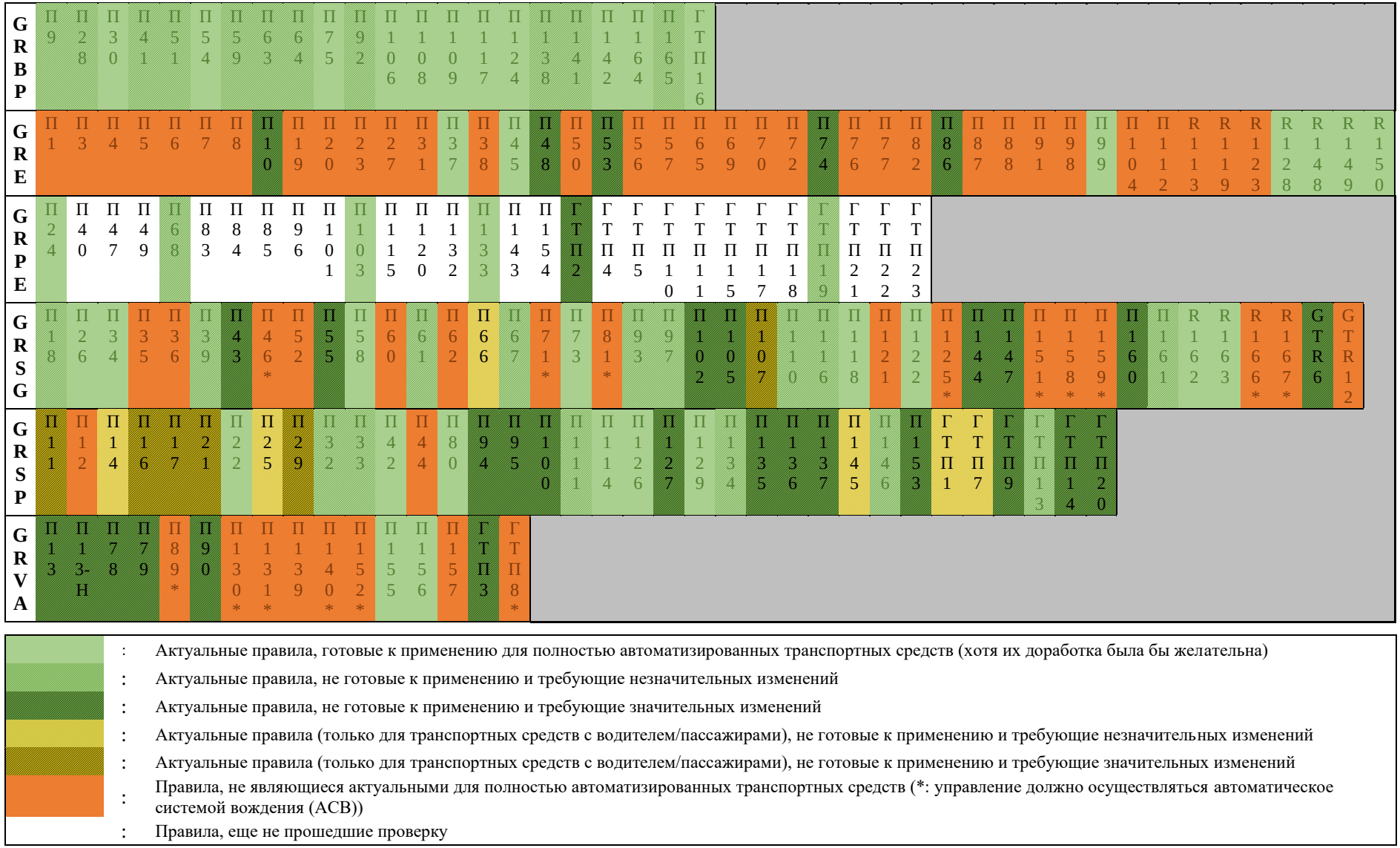
## C. Рекомендации, запрошенные у WP.29 на его сессии в июне 2023 года

44. WP.29 может принять решение либо о немедленном начале работы над поправками, либо о выделении дополнительного времени на обсуждение категорий транспортных средств, открытых вопросов и т. д. В настоящем докладе рекомендуется начать процесс внесения поправок в правила как можно скорее.

45. WP.29, возможно, пожелает утвердить список правил, в которые поправки необходимо внести в первоочередном порядке. В настоящем докладе рекомендуется уделить первоочередное внимание правилам, перечисленным в пункте A главы V доклада.

46. WP.29, возможно, пожелает дать указания относительно продолжения работы по координации различных РГ. Авторы рекомендуют назначить группу экспертов для ускорения решения выявленных проблем, а также для поддержки и согласования процесса внесения поправок в правила и ГТП ООН.

Рис. 1




: Актуальные правила, готовые к применению для полностью автоматизированных транспортных средств (хотя их доработка была бы желательна)

: Актуальные правила, не готовые к применению и требующие незначительных изменений

: Актуальные правила, не готовые к применению и требующие значительных изменений

: Актуальные правила (только для транспортных средств с водителем/пассажирами), не готовые к применению и требующие незначительных изменений

: Актуальные правила (только для транспортных средств с водителем/пассажирами), не готовые к применению и требующие значительных изменений

: Правила, не являющиеся актуальными для полностью автоматизированных транспортных средств (*: управление должно осуществляться автоматическое системой вождения (АСВ))

: Правила, еще не прошедшие проверку

# Annex 1

## Results of the review — summary sheets of the analysis of each screened regulation

Figure 2
**Template of summary sheets**

| | | | |
|---|---|---|---|
| **Regulation No.** | *The number and title of the Regulation, including the exact Series of amendments and supplement used during the screening process.* | **Date of review** | *Date of the creation of this one-page summary* |
| **Scope** | *Categories of vehicles (as defined in R.E.3 or S.R.1) which the Regulation is applicable to.* | | |
| **Content of existing Regulation** | *Short explanation of the purpose of the Regulations or the provisions contained therein.* | **Specifics for dual-mode vehicles** | *Any provisions that have a particular effect on dual-mode vehicles, e.g. because of interactions between manual driving capabilities and a driving task carried out by the ADS, or because of issues that may occur during transitions between manual and automated modes.* |
| **Content relevant for vehicles equipped with an ADS** | *Examples of provisions particularly relevant when the driving task is carried out by an ADS, whether the vehicle be "dual mode", without manual driving capabilities or not designed to carry occupants.* | **Specifics for vehicles without manual driving capabilities** | *Any provisions that have a particular effect on vehicles not equipped with manual driving capabilities.*<br>*Example: a "driver's seat" still exists in a dual-mode vehicle, but not in a vehicle without manual driving capabilities.* |
| **Content to be covered by (potential) ADS Regulation** | *Concepts related to the Regulation, and which should be handled by the ADS.* | **Specifics for vehicles without occupants** | *Any provisions that have a particular effect on vehicles not equipped that are not designed to carry occupants.*<br>*Example: a "passenger compartment" does not exist in a vehicle that is not designed to carry occupants.* |
| **Summary of recommended changes** | *Possible (non-exhaustive) changes that could contribute to making the Regulation applicable to automated vehicles.* | | |
| **Notes** | *Additional comments from the screening task force.* | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | *See OBJECTIVE 1* | |
| **Readiness:** | **Regulation ready** | *See OBJECTIVE 2* | |
| | **Major amendments needed** | *See OBJECTIVE 3* | |

# Annex 2

## Results of the review — GRBP Regulations

Figure 3
**Results of the review of GRBP Regulations**

| | | | |
|---|---|---|---|
| **Regulation No.** | 09R08/02 (Sound emissions - L2, L4 and L5)<br>28R00/06 (Audible warning devices)<br>41R05/01 (Sound emissions - L3)<br>51R03/06 (Sound emissions - M, N)<br>59R03/00 (Replacement silencing systems)<br>63R02/05 (Sound emissions - L1)<br>92R02/00 (Non-Original Replacement Exhaust Silencing Systems)<br>138R01/03 (Quiet road transport vehicles)<br>165R00/00 (Reverse warning sound) | **Date of review** | 7 February 2023 |
| **Scope** | L, M, N; components; etc. | | |
| **Content of existing Regulation** | Provisions on the levels and the measurement of sound emissions for various vehicles categories, warning signals and replacement silencing systems | **Specifics for dual-mode vehicles** | None, as long as the sound emissions in manual mode are representative of those in automated mode. |
| **Content relevant for vehicles equipped with an ADS** | Testing procedures | **Specifics for vehicles without manual driving capabilities** | Testing provisions might require a test mode. |
| **Content to be covered by (potential) ADS Regulation** | If the vehicle is not equipped with manual driving capabilities, a test mode or other means to perform the test scenarios should be available. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | Vehicles whose ODD does not reach the speed required for testing may need adapted requirements | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation applicable to fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 64R03/01 (Temporary-use spare tyres, etc.) | **Date of review** | 7 February 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Provisions for various types of vehicle equipment used to replace or extend the mobility of flat tyres. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | - Warning signals, Run-Flat Warning Systems<br>- Braking test carried out on a representative vehicle | **Specifics for vehicles without manual driving capabilities** | Testing provisions might require a test mode |
| **Content to be covered by (potential) ADS Regulation** | - The potential use of a spare tyre should be considered by the ADS.<br>- The ADS should handle warning signals and take appropriate action. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation applicable to fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 141R01/02 (Tyre Pressure Monitoring System - TPMS) | **Date of review** | 7 February 2023 |
| **Scope** | M, N, $O_3$, $O_4$ | | |
| **Content of existing Regulation** | Provisions on the effectiveness of the detection of low tyre pressure, and requirements for tests (puncture, diffusion and malfunction). Connection between towing and towed vehicles. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Despite being a warning system, the Regulation is relevant for automated vehicles because it gives information not directly related to the driving task. | **Specifics for vehicles without manual driving capabilities** | Testing provisions might require a test mode. |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle TPMS warnings and take appropriate action. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Different requirements for automated vehicles could be considered if the tyre pressure, due to vehicle dynamic changes or asymmetric behaviours that might lead to false adaptive behaviour of the automated system.<br>- Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation applicable to fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 142R01/01 (Tyre Installation) | **Date of review** | 7 February 2023 |
| **Scope** | M, N, O | | |
| **Content of existing Regulation** | Provisions on the installation of tyres such as fitment, load and speed capacities. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Potential interactions between the maximum design speed of the vehicle, the maximum speed of the ODD foreseen for a specific vehicle and tyre speed capacity could be considered in a similar way to the interaction with Speed Limiting Devices and Functions. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | If bidirectional vehicles are to be considered, the use of bidirectional tyres should be considered in this Regulation. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation applicable to fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

# Annex 3

## Results of the review — GRE Regulations

Figure 4
**Results of the review of GRE Regulations**

| | | | |
|---|---|---|---|
| **Regulation No.** | 48R08/02 (Instal. of lighting devices — M, N, O)<br>53R03/03 (Instal. of lighting devices — $L_3$)<br>74R02/02 (Instal. of lighting devices — $L_1$)<br>86R02/01 (Instal. of lighting devices — R, S, T) | **Date of review** | 22 May 2023 |
| **Scope** | $L_1$, $L_3$, M, N, O, R, S, T | | |
| **Content of existing Regulation** | | **Specifics for dual-mode vehicles** | |
| **Content relevant for vehicles equipped with an ADS** | | **Specifics for vehicles without manual driving capabilities** | |
| **Content to be covered by (potential) ADS Regulation** | | **Specifics for vehicles without occupants** | |
| **Summary of recommended changes** | See existing work of the GRE TF on AVSR, such as document ECE/TRANS/WP.29/GRE/2023/9 proposing amendments and definitions to make R48 applicable to automated vehicles. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation applicable to fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

# Annex 4

## Results of the review — GRPE Regulations

Figure 5
**Results of the review of GRPE Regulations**

| | | | |
|---|---|---|---|
| **Regulation No.** | 68R00/01 (Measurement of maximum speed) | **Date of review** | 5 May 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions on the conditions and procedure to measure the maximum speed of a vehicle. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions related to the measurement procedure on a straight or loop track, the absence of action on the steering wheel, etc. | **Specifics for vehicles without manual driving capabilities** | Provisions on reaching the maximum speed of an automated vehicle might require a test mode. |
| **Content to be covered by (potential) ADS Regulation** | If the vehicle is not equipped with manual driving capabilities, a test mode or other means to manually reach the maximum speed of the vehicle should be available. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Minor amendments are needed to detail the testing procedure on automated vehicles (e.g. requiring that a test mode be provided by the manufacturer). | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 103R00/04 (Replacement pollution control devices) | **Date of review** | 4 May 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Provisions on the conditions and procedure to ensure that replacement pollution control devices have the same performance (emissions, noise, durability, OBD compatibility) as original devices. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions on the testing procedure | **Specifics for vehicles without manual driving capabilities** | Running urban cycles might require a test mode. |
| **Content to be covered by (potential) ADS Regulation** | - If the vehicle is not equipped with manual driving capabilities, a test mode or other means to manually reach the maximum speed of the vehicle should be available.<br>- The ADS should be able to handle OBD malfunctions. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Testing provisions regarding urban cycles may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 133R00/01 (Reusability, recyclability and recoverability) | **Date of review** | 11 April 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions on the preliminary assessment by the manufacturer and checks to be performed by the Competent Authority. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | GTR2 am 5 (Emissions measurement procedure — Two- and three-wheeled vehicles) | **Date of review** | 9 May 2023 |
| **Scope** | Two- and three-wheeled vehicles | | |
| **Content of existing Regulation** | Method for the determination of the levels of gaseous and particulate pollutant emissions at the tailpipe, the emissions of carbon dioxide and the energy efficiency in terms of fuel consumption. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Testing procedures | **Specifics for vehicles without manual driving capabilities** | Rider requirements are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | If the vehicle is not equipped with manual driving capabilities, a test mode or other means to perform the test scenarios should be available. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | GTR19 am 3 (WLTP EVAP) | **Date of review** | 9 May 2023 |
| **Scope** | 1-2, 2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Method to determine the levels of evaporative emission from light-duty vehicles in a repeatable and reproducible manner designed to be representative of real-world vehicle operation. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Testing procedures | **Specifics for vehicles without manual driving capabilities** | Testing provisions might require a test mode. |
| **Content to be covered by (potential) ADS Regulation** | If the vehicle is not equipped with manual driving capabilities, a test mode or other means to perform the test scenarios should be available. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure).<br>- The test track might need specific requirements to support navigation and path planning of the automated vehicle. | | |
| **Notes** | This Regulation only applies to vehicles with engines fuelled with petrol / reference fuels. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

# Annex 5

## Results of the review — GRSG Regulations

Figure 6
**Results of the review of GRSG Regulations**

| | | | |
|---|---|---|---|
| **Regulation No.** | 26R04/00 (External projections) | **Date of review** | 30 January 2023 |
| **Scope** | $M_1$ | | |
| **Content of existing Regulation** | Provisions for protruding parts of the external surface of the vehicle, to ensure the safety of Vulnerable Road Users | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | External projections due to sensors | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | The Regulation is applicable in its current state. Improvements could be considered, such as provisions for sensors replacing devices for indirect vision. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 34R03/02 (Prevention of fire risks) | **Date of review** | 30 January 2023 |
| **Scope** | M, N, O; components | | |
| **Content of existing Regulation** | Safety of fuel tanks, and their installation in vehicles, specifically regarding the prevention of fire risks | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | References are made to Regulations (R94, R95) that expect the vehicle having occupants. |
| **Summary of recommended changes** | References to other Regulations (R94, R95) should be investigated if they are not applicable to automated vehicles without occupants. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 35R01/00 (Foot controls) | **Date of review** | 30 January 2023 |
| **Scope** | $M_1$ | | |
| **Content of existing Regulation** | Arrangement and mode of operation of pedals. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 39R01/02 (Speedometer and odometer) | **Date of review** | 30 January 2023 |
| **Scope** | L, M, N | | |
| **Content of existing Regulation** | Provisions regarding the installation of speedometers (precision, legibility, markings) and odometers. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | - Odometers remain relevant for automated vehicles, e.g. for PTI or resale of the vehicle.<br>- Speedometers are not needed for automated vehicles, but may be desirable for different reasons (on-board operator, information to passengers) | **Specifics for vehicles without manual driving capabilities** | The definitions of speedometer and odometer refer to "the driver": the odometer might need to refer to the vehicle user or owner instead. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Minor amendments should be made, e.g. regarding the option to set units, the position of the odometer, etc. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 43R01/09 (Safety glazing) | **Date of review** | 14 March 2023 |
| **Scope** | L, M, N, O, T | | |
| **Content of existing Regulation** | Safety glazing requirements for windscreens and windows with regards to driver visibility and occupant safety. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | The relevance of impact and optical requirements may depend on the specific use case of the ADS. | **Specifics for vehicles without manual driving capabilities** | Several definitions, general requirements, and tests may not be needed for ADS (e.g. Optical-distortion test and Wiper laboratory test). Annex 3 references the driver's visibility, steering wheel, eye point, and R point of the driver's seat. |
| **Content to be covered by (potential) ADS Regulation** | Equivalent occupant safety requirements for HUD screens or alternative windscreen solutions. | **Specifics for vehicles without occupants** | If occupants are not present but the vehicle is fitted with safety glazing, parts of the Regulation may still be applicable in the interest of the protection of the other road users. |
| **Summary of recommended changes** | - Modify definitions that reference driver, driver's field of vision, steering wheel, etc.<br>- Modify the compliance tests (e.g. wiper laboratory and optical distortion test) to be performed if occupants are present.<br>- Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure). | | |
| **Notes** | If bi-directional vehicles are to be considered, further amendments will be required, e.g. extending impact requirements to the rear windscreen. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 46R05/00 (Devices for indirect vision) | **Date of review** | 21 February 2023 |
| **Scope** | L, M, N; components | | |
| **Content of existing Regulation** | - Performance criteria for mirrors<br>- Performance criteria for Camera-Monitor-Systems<br>- Functional requirements for CMS<br>- Mandatory required fields of vision to be displayed to the driver<br>- Geometrical requirements, minimum radii for mirrors and CMS<br>- Impact tests for protruding parts | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | The concept of indirect vision is irrelevant for an ADS. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should sense its environment with a level of coverage at least equal to what would be achieved by a driver, from the driver's seat. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | If certain use cases require some kind of device indirect vision (on-board operator or user who needs to monitor or interact with the exterior of the vehicle), and if it is determined that these devices should be regulated, a new Regulation could be considered. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 55R02/02 (Mechanical coupling devices) | **Date of review** | 14 March 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Requirements for coupling devices (design, operation, robustness) and vehicles fitted with such devices (attachment including remote indication and controls of coupling). | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Coupling requirements are not depending on whether a driver or occupants are present in the vehicle. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should function with all types of trailers which are part of its ODD.<br>- The ADS should be able to handle any incorrect engagement of the locking system detected while driving, and to detect any abnormal dynamic behaviour resulting from incorrect coupling. | **Specifics for vehicles without occupants** | Remote coupling (indication and control) is particularly relevant for vehicles with no occupants on board. |
| **Summary of recommended changes** | - Certain references to driver, including those mentioning verifications by "feel", "sight" or "touch", should be amended.<br>- Specific requirements related to remote indication and remote control should be considered for fully automated vehicles without occupants. | | |
| **Notes** | Whether automated vehicles without human interaction (either on board, or during the coupling phase) are allowed to tow trailers is independent from this screening process. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 58R03/03 (Rear Underrun Protection - RUP) | **Date of review** | 14 March 2023 |
| **Scope** | M, $N_1$, $O_1$, $O_2$; components | | |
| **Content of existing Regulation** | Provision for ensuring that vehicles protect other vehicles from rear underrun. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | For adjustable RUPDs only: an operator must verify the correct position of the device. |
| **Summary of recommended changes** | Requirements for adjustable RUPD, where an operator must verify the right position of the device, should be amended for vehicles with no occupants. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 60R00/05 (Controls & tell-tales) | **Date of review** | 4 February 2023 |
| **Scope** | $L_1$, $L_3$ | | |

| | | | |
|---|---|---|---|
| **Content of existing Regulation** | Control device, control position, control form operated by the driver (rider). Tell-tales, indicators, symbols, display positions, colours, etc. that informs the driver of the status of the vehicle. | **Specifics for dual-mode vehicles** | Dual mode vehicles must comply in manual mode, but do not need to provide tell-tales in automated mode. |
| **Content relevant for vehicles equipped with an ADS** | All controls should be directly actionable by the ADS, and all tell-tale information should be transmitted to the ADS directly. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - Overall management of failures<br>- Communication with vehicle occupants, remote supervision centres, on-board operator, etc. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 61R00/03 (External projections, commercial vehicles) | **Date of review** | 30 January 2023 |
| **Scope** | N | | |

| | | | |
|---|---|---|---|
| **Content of existing Regulation** | Provisions for protruding parts of the external surface of the vehicle, to ensure the safety of Vulnerable Road Users | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | External projections due to sensors. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | References to the "cab" of the vehicle should be amended if the vehicle has no occupants, and therefore no compartment for a driver of passengers. |
| **Summary of recommended changes** | The Regulation should be slightly reworked to become applicable to automated vehicles without occupants. Other improvements could be considered, such as provisions for sensors replacing devices for indirect vision. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 62R01/00 (Protection against unauthorised use) | **Date of review** | 4 February 2023 |
| **Scope** | $L_1$–$L_7$, if fitted with handlebars | | |
| **Content of existing Regulation** | Provisions for the steering lock of the vehicle and its security (breaking torque), security of physical keys (number of possible combinations). | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | This Regulation cannot be relevant for automated vehicles without introducing provisions for digital keys. | **Specifics for vehicles without manual driving capabilities** | The Regulation is inapplicable to vehicles without manual driving capabilities, as they would not be fitted with handlebars. |
| **Content to be covered by (potential) ADS Regulation** | Protection against unauthorised use in automated mode should also be guaranteed by the compliance of the vehicle with R155. However, as of June 2023, R155 is not applicable to L1–L5 vehicles. | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants, as they would not be fitted with handlebars. |
| **Summary of recommended changes** | None | | |
| **Notes** | This Regulation does not seem to be relevant for automated vehicles, as it relies on the vehicle being fitted with handlebars. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 66R02 (Strength of superstructure) | **Date of review** | 16 January 2023 |
| **Scope** | $M_2$, $M_3$ | | |
| **Content of existing Regulation** | Provisions to ensure that the superstructure of the vehicle shall have the sufficient strength to ensure that the residual space during and after the rollover test on complete vehicle is unharmed. | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | References to the driver | **Specifics for vehicles without manual driving capabilities** | Reference to the driver's compartment |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is not applicable to vehicles with no occupants. |
| **Summary of recommended changes** | Minor references to the driver and the driver's compartment should be amended. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 67R04/01 (Liquified Petroleum Gas) | **Date of review** | 13 January 2023 |
| **Scope** | M and N vehicles equipped with LPG | | |
| **Content of existing Regulation** | Specifications for and approval of LPG components, and vehicles equipped with an LPG system. Overall safety of the LPG system against overpressure, corrosion, ageing, extreme temperatures, etc. | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | Warnings, communication with the LPG ECU | **Specifics for vehicles without manual driving capabilities** | Reference to the accelerator pedal, etc. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | References to the passenger compartment |
| **Summary of recommended changes** | - Minor references to warnings, passenger compartment, etc. should be amended.<br>- Communication between the LPG ECU and the ADS should be detailed.<br>- Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure). | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 71R00/00 (Driver's field of vision) | **Date of review** | 21 February 2023 |
| **Scope** | T | | |
| **Content of existing Regulation** | - Minimum required field of vision<br>- Requires the equipment of wipers if a windscreen is mounted | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should sense its environment with a field of vision at least equal to what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | If certain use cases require some kind of field of vision (on-board operator or user who needs to monitor or interact with the exterior of the vehicle, passenger comfort), and if it is determined that these fields of vision should be regulated, a new Regulation could be considered. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 73R01/02 (Lateral Underrun Protection - LUP) | **Date of review** | 14 March 2023 |
| **Scope** | $N_2$, $N_3$, $O_3$, $O_4$; components | | |
| **Content of existing Regulation** | Provision for ensuring that vehicles protect other vehicles from lateral underrun. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | For adjustable LUPDs only: an operator must verify the correct position of the device. |
| **Summary of recommended changes** | Requirements for adjustable LUPDs, where an operator must verify the right position of the device, should be amended for vehicles with no occupants. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 81R00/02 (Rear-view mirrors) | **Date of review** | 4 February 2023 |
| **Scope** | $L_1$, $L_3$, $L_4$ | | |
| **Content of existing Regulation** | - Size, shape, and curvature of mirror surface.<br>- Impact test method of the mirror surface.<br>- Strength test method of the mirror holder. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should gather rear-view information by other means than R81-compliant mirrors. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 93R00/01 (Front Underrun Protection - FUP) | **Date of review** | 13 January 2023 |
| **Scope** | $N_2$, $N_3$; components | | |
| **Content of existing Regulation** | Provision for ensuring that vehicles of categories N2 and N3 protect other vehicles from front underrun. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | References to the driver's cabin |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Minor references to the driver's cabin should be amended. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 97R01/08 (Vehicle Alarm Systems - VAS) | **Date of review** | 16 December 2022 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | Provisions on the efficacy of Vehicle Alarm Systems, including the design of the alarm signal and its reliability (test scenarios for true positives, absence of false positives) | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | Relevance depending on the use case: some automated vehicles may have no "compartment" to monitor with an alarm system. | **Specifics for vehicles without manual driving capabilities** | References to "driver's door", etc. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | Many references are made to "passenger compartment", "glazed area", "authorised user". |
| **Summary of recommended changes** | Many references to actions by a human (driver or "authorised user") should be amended, especially those implying the action of a human ("rotation of the ignition key", "opening the driver's door"). | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 102R00/00 (Close Coupling Device - CCD) | **Date of review** | 22 March 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Provisions on the automatic coupling and system failures of CCDs. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Several testing provisions expect a driver to "feel" any difficulty or abnormal behaviour in controlling the vehicle | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle any incorrect engagement of the locking system detected while driving, and to detect any abnormal dynamic behaviour resulting from incorrect coupling. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | The Regulation should be modernised overall, and specifically testing provisions should be reworked with the assumption that the driving task might not be performed by a human. | | |
| **Notes** | It is unclear at this stage whether this Regulation is likely to be applied to automated vehicles. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 105R06/01 (Construction of ADR vehicles) | **Date of review** | 3 February 2023 |
| **Scope** | N, O transporting dangerous goods | | |
| **Content of existing Regulation** | Construction of vehicles intended for the transportation of dangerous goods, such as their electrical and braking equipment. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | References to the driver and their actions | **Specifics for vehicles without manual driving capabilities** | References to the driver's cab etc. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | References to the driver may be transformed into references to an operator, but this assumes that a human is present inside the vehicle. |
| **Summary of recommended changes** | If the Regulation is applicable to automated vehicles, references to the driver and the cab should be amended. | | |
| **Notes** | The screening process only considers the technical applicability of the Regulation to automated vehicles. It is still unclear whether automated vehicles should be able to transport dangerous goods, and if so, whether they are allowed to function with no human on board. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 107R10/00 (General construction) | **Date of review** | 22 February 2023 |
| **Scope** | $M_2$, $M_3$ | | |
| **Content of existing Regulation** | Provisions for the general construction of buses and coaches such as: protection against fire risks, masses & dimensions, stability, service doors and (emergency) exits, interior arrangements, etc. | **Specifics for dual-mode vehicles** | Clarifications are needed when certain provisions are handled differently in manual and automated mode. |
| **Content relevant for vehicles equipped with an ADS** | All interactions between passengers and the driver, or functions which the driver is expected to perform. | **Specifics for vehicles without manual driving capabilities** | Many schematics and provisions related to the driver's compartment should be reworked. |
| **Content to be covered by (potential) ADS Regulation** | The ADS must be able to handle all requirements related to the driver unless an on-board operator is present. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Many provisions should be created related to the information of passengers, interaction with the ADS, etc.<br>- Many schematics and provisions related to the driver's compartment should be reworked.<br>- Some provisions require further exploration, such as those implying that the driver or crew can physically offer their assistance in case of emergency: should on-board operators be required for certain classes of vehicles? | | |
| **Notes** | The Regulation is not currently adapted for automated urban shuttles, as no category for such vehicles (standing passengers and fewer than 9 seats) exists in RE.3. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 110R05/00 (Compressed / Liquified Natural Gas) | **Date of review** | 4 March 2023 |
| **Scope** | M, N | | |
| **Content of existing Regulation** | Provisions for the installation of compressed natural gas (CNG) and/or liquefied natural gas (LNG) for propulsion. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions related to fuel selection and indicators | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle fuel selection | **Specifics for vehicles without occupants** | Provisions regarding manual shut off valves and other manual components should be considered, if the Regulation is to be applicable to vehicles without occupants. |
| **Summary of recommended changes** | - In addition to amending provisions for pressure and fuel indicators, it should be clarified how fuel selection may be carried out in a fully automated vehicle.<br>- Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure). | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 116R01/00 (Protection against unauthorised use) | **Date of review** | 7 March 2023 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | - Locking systems (keys, including digital keys): provisions on the number of combinations or lock design, locking of the steering system, brakes, etc.<br>- Alarm systems (efficiency, absence of false positives, etc.)<br>- Immobilisers (setting and unsetting, etc.) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | All provisions that are not purely physical (digital keys, impact of immobilisers on the engine, etc.) | **Specifics for vehicles without manual driving capabilities** | Some parts of the Regulation become irrelevant if there are no driving capabilities (physical keys, locking of the gear shaft, etc.) |
| **Content to be covered by (potential) ADS Regulation** | Protection against unauthorised use in automated mode should also be guaranteed by the compliance of the vehicle with R155. | **Specifics for vehicles without occupants** | Alarm systems remain relevant for detecting interference with the vehicle, even if there is no compartment subject to intrusion. |
| **Summary of recommended changes** | Minor amendments are required, such as references to the "driver's intention" and provisions related to manual driving capabilities or the presence of occupants. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 118R04/01 (Burning behaviour) | **Date of review** | 14 March 2023 |
| **Scope** | $M_3$ classes II and III | | |
| **Content of existing Regulation** | Burning behaviour (ignitibility, burning rate and melting behaviour) and capability to repel fuel or lubricants of materials used in vehicles. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | The absence of a driver may negatively impact the reactivity on the measures that allow the evacuation (absence of anticipated indicators or remote interventions). Extending the scope to more categories of vehicles would give passengers more time for evacuation due to the use of materials with regulated performance regarding their fire behaviour. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | The Regulation is ready, but the scope may be extended to $M_2$ and all $M_3$ automated vehicles for safety reasons. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 121R01/05 (Controls, tell-tales and indicators) | **Date of review** | 16 January 2023 |
| **Scope** | M, N | | |
| **Content of existing Regulation** | Provisions on the location and identification (symbols, illumination, colour) of controls, tell-tales, and indicators | **Specifics for dual-mode vehicles** | It should be specified whether tell-tales and indicators should be illuminated during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | All controls should be directly actionable by the ADS, and all tell-tale information should be transmitted to the ADS directly. | **Specifics for vehicles without manual driving capabilities** | Vehicles without manual driving capabilities should not be equipped with controls related to the driving task. |
| **Content to be covered by (potential) ADS Regulation** | - Overall management of failures<br>- Communication with vehicle occupants, remote supervision centres, on-board operator, etc. | **Specifics for vehicles without occupants** | The Regulation is not applicable to vehicles without occupants. |
| **Summary of recommended changes** | For dual-mode vehicles, the behaviour of tell-tales and indicators in automated mode should be specified.<br>If certain use cases require some kind of controls, tell-tales, or indicators (on-board operator who should be informed in case of failures, information to the passengers), and if it is determined that they need to be regulated, drafting provisions for R121, R107 or a new Regulation could be considered. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 122R00/06 (Heating systems) | **Date of review** | 3 February 2023 |
| **Scope** | M, N, O | | |
| **Content of existing Regulation** | Requirements on heating systems, if fitted, either to heat the passenger compartment or the loading compartment. | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | The Regulation may not be applicable to certain automated vehicles with no passenger compartment and no loading compartment. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 125R02/02 (Forward field of vision of drivers) | **Date of review** | 3 February 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions defining the zone which must be directly visible by the driver, from the driver's seat | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should sense its environment with a field of vision at least equal to what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | If certain use cases require some kind of field of vision (on-board operator or user who needs to monitor or interact with the exterior of the vehicle, passenger comfort), and if it is determined that these fields of vision should be regulated, a new Regulation should be considered. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 144R01/01 (Accident Emergency Call System) | **Date of review** | 7 February 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions on Emergency Call Systems in case of accidents: position determination, data transfer and voice communication with PSAPs, resistance to impact, etc. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | All | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should handle the malfunction of the system.<br>- The ADS Regulation might need to introduce the possibility for the ADS to voluntarily activate the AECS in certain situations. | **Specifics for vehicles without occupants** | Some requirements are irrelevant or inapplicable (e.g. manual activation, reference to airbags) to vehicles without occupants, but AECS in general remain relevant. |
| **Summary of recommended changes** | Several requirements should be amended for vehicles without occupants: some to clarify their inapplicability (see above), others to introduce the notion of "user in charge" or "remote operator" as a point of contact with PSAPs. | | |
| **Notes** | - AECS are currently intended to communicate with PSAPs (emergency services). Direct communication with remote supervision centres could be considered under R144.<br>- The scope of the Regulation could be extended to include all vehicles equipped with an ADS and carrying occupants. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 147R00/00 (Mechanical coupling components for agricultural vehicles) | **Date of review** | 22 March 2023 |
| **Scope** | R, S, T; components | | |
| **Content of existing Regulation** | Requirements for coupling devices (design, operation, robustness) and vehicles fitted with such devices (attachment including remote indication and controls of coupling). | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Coupling requirements are not depending on whether a driver or occupants are present in the vehicle. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should function with all types of trailers which are part of its ODD.<br>- The ADS should be able to handle any incorrect engagement of the locking system detected while driving, and to detect any abnormal dynamic behaviour resulting from incorrect coupling. | **Specifics for vehicles without occupants** | Remote coupling (indication and control) is particularly relevant for vehicles with no occupants on board. |
| **Summary of recommended changes** | - References to a driver or operator should be amended when relevant.<br>- The Regulation should be modernised overall, and specifically testing provisions should be reworked with the assumption that the driving task might not be performed by a human. | | |
| **Notes** | Whether automated vehicles without human interaction (either on board, or during the coupling phase) are allowed to tow trailers is independent from this screening process. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 151R00/03 (Blind Spot Information System) | **Date of review** | 30 January 2023 |
| **Scope** | $M_2$, $M_3$, $N_2$, $N_3$ | | |
| **Content of existing Regulation** | Functional and performance requirements for blind spot information systems to inform the driver when turning to the right. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should provide the same level of performance and detection as what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | If information for low-speed manoeuvres is desirable (e.g. for on-board operators), it should not be regulated under R151. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 158R00/01 (Reversing motion) | **Date of review** | 4 February 2023 |
| **Scope** | M, N; components | | |
| **Content of existing Regulation** | Provisions for means of rear visibility and detection by direct vision, rear-view Mirror, rear-View Camera System or Detection System | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should provide the same level of performance and detection as what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | If information for rear visibility is desirable (e.g. for on-board operators), it should not be regulated under R158. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 159R00/01 (Moving Off Information System) | **Date of review** | 4 February 2023 |
| **Scope** | $M_2$, $M_3$, $N_2$, $N_3$ | | |
| **Content of existing Regulation** | Onboard system to detect and inform the driver of the presence of pedestrians and cyclists in the close-proximity forward blind-spot of the vehicle and, if deemed necessary based on manufacturer strategy, warn the driver of a potential collision | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should provide the same level of performance and detection as what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | If information while moving off is desirable (e.g. for on-board operators), it should not be regulated under R159. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 160R01/01 (Event Data Recorder) | **Date of review** | 6 February 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions for the recording, storage and retrieval of certain driving data. List of specific elements to record. | **Specifics for dual-mode vehicles** | An element indicating the driving mode at the time of the accident should be included. |
| **Content relevant for vehicles equipped with an ADS** | Most of the content is relevant.<br>Specific elements related to the ADS and that are not in the scope of the DSSAD should be recorded by the EDR.<br>Different conditions for triggering the recording of data should be considered (e.g. Minimum Risk Manoeuvre) | **Specifics for vehicles without manual driving capabilities** | Certain elements to record may no longer be relevant (including the driving mode indicator proposed above) |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | Existing elements to record conditions for triggering the recording of data may no longer be relevant (e.g. activation of a non-reversible occupant restraint system) |
| **Summary of recommended changes** | The Regulation could be applicable in its current state but should be improved. Specific elements related to the ADS and that are not in the scope of the DSSAD should be recorded by the EDR. Different conditions for triggering the recording of data should be considered (Minimum Risk Manoeuvre). | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 161R00/02 (Locking systems) | **Date of review** | 8 March 2023 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | Provisions for locking devices against unauthorised use (keys, including digital keys): provisions on the number of combinations or lock design., locking of the steering system, brakes, etc. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | All provisions other than the strictly mechanical protection against unauthorised use are relevant for automated vehicles. | **Specifics for vehicles without manual driving capabilities** | Some parts of the Regulation become irrelevant if there are no driving capabilities (physical keys, locking of the gear shaft, etc.) |
| **Content to be covered by (potential) ADS Regulation** | Protection against unauthorised use in automated mode should also be guaranteed by the compliance of the vehicle with R155. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Minor amendments are required, such as references to the "driver's intention". | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 162R00/03 (Immobiliser) | **Date of review** | 7 March 2023 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | Provisions for immobilisers against unauthorised use (preventing the use of the engine without removing the immobiliser with the correct key or other device) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | Protection against unauthorised use in automated mode should also be guaranteed by the compliance of the vehicle with R155. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 163R00/02 (Alarm system) | **Date of review** | 8 March 2023 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | Provisions for alarm systems against unauthorised use (indicating intrusion in or interference with the vehicle) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | Protection against unauthorised use in automated mode should also be guaranteed by the compliance of the vehicle with R155. | **Specifics for vehicles without occupants** | The Regulation remains relevant for detecting interference with the vehicle, even if there is no compartment subject to intrusion. |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 166R00/00 (Close-Proximity to the Front and Lateral Sides of Vehicles) | **Date of review** | 4 February 2023 |
| **Scope** | $M_1$, $N_1$; components | | |
| **Content of existing Regulation** | Provisions for means of front and lateral visibility and detection by direct vision, rear-view Mirror, rear-View Camera System or Detection System | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should provide the same level of performance and detection as what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 167R00/00 | **Date of review** | 3 February 2023 |
| **Scope** | $M_2$, $M_3$, $N_2$, $N_3$ | | |
| **Content of existing Regulation** | Direct Vision requirements to reduce blind spots for drivers. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Most of the Regulation refers to the sight of the driver, from the driver's seat, making the requirements inapplicable. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should have sensing abilities at least equal to what is required by the Regulation. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | If certain use cases require some kind of direct vision (on-board operator or user who needs to monitor or interact with the exterior of the vehicle, passenger comfort), and if it is determined that this kind of direct vision should be regulated, a new Regulation could be considered. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | GTR 6 am 3 (Safety glazing) | **Date of review** | 14 March 2023 |
| **Scope** | Category 1 and 2 as defined in S.R. 1 | | |
| **Content of existing Regulation** | Safety glazing requirements for windscreens and windows with regards to driver visibility and occupant safety. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | If occupants are present:<br>Impact requirements would be applicable.<br>Optical requirements may not be relevant. | **Specifics for vehicles without manual driving capabilities** | Several definitions, general requirements, and tests may not be needed for ADS (e.g. Optical-distortion test and Wiper laboratory test). Annex 3 references the driver's visibility, steering wheel, eye point, and R point of the driver's seat. |
| **Content to be covered by (potential) ADS Regulation** | Equivalent occupant safety requirements for HUD screens or alternative windscreen solutions. | **Specifics for vehicles without occupants** | If occupants are not present but the vehicle is fitted with safety glazing, parts of the Regulation may still be applicable in the interest of the protection of the other road users. |
| **Summary of recommended changes** | - Modify definitions which reference the driver, the driver's field of vision, or the steering wheel.<br>- Extend the applicability of the impact requirements to the rear windscreen for bi-directional vehicles.<br>- Testing provisions may need to be amended to account for automated vehicles (e.g. requiring that a test mode be provided by the manufacturer, or developing a specific procedure | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | GTR12 am 1 (Motorcycle controls, tell-tales, and indicators) | **Date of review** | 14 March 2023 |
| **Scope** | 3-3 as defined in S.R.1 | | |
| **Content of existing Regulation** | Control device, control position, control form operated by the driver (rider).<br>Tell-tales, indicators, symbols, display positions, colours, etc. that informs the driver of the status of the vehicle. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | All controls should be directly actionable by the ADS, and all tell-tale information should be transmitted to the ADS directly. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - Overall management of failures<br>- Communication with vehicle occupants, remote supervision centres, on-board operator, etc. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

# Annex 6

## Results of the review — GRSP Regulations

Figure 7
**Results of the review of GRSP Regulations**

| | | | |
|---|---|---|---|
| **Regulation No.** | 11R04/02 (Door locks and hinges) | **Date of review** | 29 November 2022 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions to the performance of door locks and door hinges, including provisions on Child locks. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | The notion of operating doors and locks becomes more complex, as they might be operated by either the ADS or by occupants. | **Specifics for vehicles without manual driving capabilities** | Definitions such as "driver side" becomes irrelevant for vehicle without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to open and close the doors of the vehicle. Regarding the operation of locks, more consideration should be given (see below). | **Specifics for vehicles without occupants** | The Regulation only applies to doors of compartments with occupants. |
| **Summary of recommended changes** | The concept of Child lock and locking in general should be carefully considered: should an ADS be able to lock occupants in the vehicle? Should children be able to travel unattended in automated vehicles? (See Open Issues) | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 12R04/05 (Protection against the steering mechanism) | **Date of review** | 30 January 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Protection of the driver (maximum force applied) against the steering mechanism in the event of impact and behaviour of the electrical power train (no electric shock, no electrolyte leakage) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | If the vehicle is equipped with a steering column, and if an occupant might be present in front of it, the Regulation remains fully applicable. | **Specifics for vehicles without manual driving capabilities** | The Regulation is not applicable to vehicle without manual steering control. The electrical protection needs to be covered by R94 or R137. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is not applicable. The electrical protection needs to be covered by R94 or R137. |
| **Summary of recommended changes** | Minor amendments are needed: for instance, they could indicate the inapplicability of the Regulation to automated vehicles without manual controls, and which already comply with R94 or R137. | | |
| **Notes** | If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 14R09/02 (Safety belt anchorages) | **Date of review** | 8 May 2023 |
| **Scope** | M, N | | |
| **Content of existing Regulation** | Provisions for the location, design and robustness of safety belt anchorages | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel or R point become inapplicable. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants |
| **Summary of recommended changes** | Minor amendments are needed for automated vehicles without manual driving capabilities. | | |
| **Notes** | If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), more significant amendments will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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|---|---|---|---|
| **Regulation No.** | 16R08/03 (Safety belts) | **Date of review** | 8 May 2023 |
| **Scope** | M, N, O, $L_2$, $L_4$, $L_5$, $L_6$, $L_7$, T; components | | |
| **Content of existing Regulation** | Provisions on:<br>- Safety-belts, restraint systems, child restraint systems (incl. ISOFIX);<br>- vehicles equipped with safety-belts, safety-belt reminders, restraint systems, child restraint systems (incl. ISOFIX) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions regarding safety belt reminders and failure warnings. | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel or R point become inapplicable |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should be able to detect whether safety belts are fastened and take appropriate action.<br>- The ADS should be able to handle failure warnings. | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants |
| **Summary of recommended changes** | - Many minor amendments regarding the driver's seat are needed, e.g. substituting it to a passenger seat;<br>- The concept of safety belt reminder should be carefully considered: how should the ADS react if passengers unfasten their safety belt while the vehicle is driving? | | |
| **Notes** | If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 17R10 (Seats, anchorages and head restraints) | **Date of review** | 13 March 2023 |
| **Scope** | $M_1$, $N_1$, ($M_2$, $M_3$) | | |
| **Content of existing Regulation** | Provisions on seats, their anchorages and their head restraints: design (size, seating positions, etc.) and safety performance (resistance to impact, moment, displaced luggage, etc.) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel or R point become inapplicable |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | Many minor amendments regarding the driver's seat are needed, e.g. substituting it to a passenger seat; | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, current restrictions on rear-facing seats for certain vehicle categories should be reconsidered. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 21R01/04 (Interior fittings) | **Date of review** | 2 December 2022 |
| **Scope** | $M_1$ | | |

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|---|---|---|---|
| **Content of existing Regulation** | Provisions regarding:<br>- the interior parts of the passenger compartment other than the rear-view mirror or mirrors;<br>- the arrangement of the controls;<br>- the roof or opening roof, and<br>- the seat-back and the rear parts of seats.<br>- power-operation of windows, roof panels and partition systems. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Most provisions regarding the protection of occupants and the operation of windows etc. by occupants remain relevant. Provisions related to driver controls (especially operation of windows etc. only possible for the driver) are not relevant. | **Specifics for vehicles without manual driving capabilities** | Provisions related to physical controls around the driver, such as the steering control, instrument panel, handbrake, pedals etc. are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | - The concept that some controls are only possible for the driver (one-touch closing, switching off rear window operation) should be re-evaluated. This issue is related to the question on whether children should be able to travel unattended in automated vehicles. (See Open Issues)<br>- Many minor amendments regarding the interior layout of the vehicle related to the driver are needed. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 25R04/01 (Head restraints) | **Date of review** | 26 December 2022 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Requirements for head restraints to reduce the frequency and severity of injuries caused by rearward displacement of the head. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | References to "driver head restraint" become irrelevant for vehicles with no manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | Regulation not applicable |
| **Summary of recommended changes** | Minor amendments related to the driver's seat are needed. | | |
| **Notes** | If new seating positions (side- or rear-facing seats, torso recline angles greater than 25°, unconventional seating layout) or bidirectional vehicles are to be considered, more work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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| **Regulation No.** | 29R03/05 (Protection of the occupants of the cab of a commercial vehicle) | **Date of review** | 1 February 2023 |
| **Scope** | N | | |

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| **Content of existing Regulation** | Provisions on the design of cabs to eliminate to the greatest possible extent the risk of injury to the occupants in the event of an accident. Provisions on the survival space in the cab after impact tests. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | Some provisions related to the steering wheel or the instrument panel become inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | Amendments are needed for automated vehicles without manual driving capabilities (redefinitions related to the steering wheel and instrument panel) | | |
| **Notes** | If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 42R00/02 (Front and rear protective devices) | **Date of review** | 16 January 2023 |
| **Scope** | $M_1$ | | |
| **Content of existing Regulation** | Provisions on the behaviour of protective devices (bumpers, etc.) when involved in a collision at low speed so as to allow contacts and small shocks to occur without causing any serious damage. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Currently, the Regulation allows sensors to become damaged or broken after impact tests, but also requires the vehicle's steering and braking system to keep operating in a normal manner. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | The current tolerance for sensors to become broken after an impact test should be investigated, as the Regulation did not consider sensors as being a critical component of basic braking and steering performance. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

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| **Regulation No.** | 44R04/18 (Child restraint systems) | **Date of review** | 31 January 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Design and performance requirements for the type-approval of child restraint systems, either as components or built into vehicle seating. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | None at this stage. However, consideration should be given on whether it is appropriate to leave R44 open to built-in child restraint systems in the long term. | | |
| **Notes** | UN R44 was amended in recent years, firstly, to stop new type-approvals for most categories of child restraint system, and secondly, to remove the obligation of Contracting Parties to accept R44 type-approvals. Going forward, WP.29/GRSP intends that all new child restraints are approved to R129 only and has given Contracting Parties the option of refusing to allow the sale of R44 CRS in their territory. However, R44 type-approval can still be granted to child restraints in Mass Group III. Furthermore, the obligation to accept R44 type-approvals still applies for child restraints that are built-in to the vehicle seating. This means that new Group III boosters that are built-in to vehicle seats can continue to be approved to R44 and they must be accepted by all Contracting Parties. Built-in child restraints are currently rare. However, some OEMs report that built-in child restraints may be the best solution for driverless shuttle vehicles and car-share services. If built-in child restraints become more common, it may be necessary to update UN R44 to stop new type-approvals and to allow Contracting Parties to stop accepting approvals in their territory. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 80R04 (Strength and anchorages of seats in buses and coaches) | **Date of review** | 13 March 2023 |
| **Scope** | Components; $M_2$, $M_3$ of Classes II, III and B | | |
| **Content of existing Regulation** | Provisions on seats, their anchorages and their installation in buses and coaches: design and safety performance. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | None strictly related to vehicle automation. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, current restrictions on rear-facing seats should be reworked. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 94R04/01 (Protection of occupants in the event of a frontal collision) | **Date of review** | 5 December 2022 |
| **Scope** | $M_1$, $N_1$ | | |

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| **Content of existing Regulation** | - Protection of front passengers in case of a frontal impact; protection of the occupants of vehicles operating on electrical power from high voltage.<br>- Provisions on electrical safety, fuel leakage, etc. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Some provisions are currently not fit for automated vehicles, such as door openings "de-activated by the driver" | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel etc. are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | - Provisions related to the safety of occupants are not applicable for vehicles without occupants.<br>- Provisions regarding leakage, fuel system integrity, etc. might be applicable.<br>- Provision on the opening of doors might not be applicable. |
| **Summary of recommended changes** | - Many minor amendments regarding the interior layout of the vehicle, especially around the driver's seat, are needed. The definition of vehicle width should be reconsidered to take into account sensors.<br>- If the provisions on leakage etc. are applicable to vehicles without occupants, this should be clearly specified. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, current restrictions on rear-facing seats should be reworked. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 95R05/02 (Protection of occupants in the event of a lateral collision) | **Date of review** | 30 November 2022 |
| **Scope** | $M_1$, $N_1$ | | |

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|---|---|---|---|
| **Content of existing Regulation** | - Protection of front passengers in case of a lateral impact; protection of the occupants of vehicles operating on electrical power from high voltage.<br>- Provisions on electrical safety, fuel leakage, etc. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Some provisions are currently not fit for automated vehicles, such as door locking systems "de-activated by the driver" | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel etc. are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | - Provisions related to the safety of occupants are not applicable for vehicles without occupants.<br>- Provisions regarding leakage, fuel system integrity, etc. might be applicable.<br>- Provision on the opening of doors might not be applicable. |
| **Summary of recommended changes** | - Many minor amendments regarding the interior layout of the vehicle, especially around the driver's seat, are needed. The definition of vehicle width should be reconsidered to take into account sensors.<br>- If the provisions on leakage etc. are applicable to vehicles without occupants, this should be clearly specified. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, current restrictions on rear-facing seats should be reworked. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 100R03/01 (Electric power train) | **Date of review** | 28 November 2022 |
| **Scope** | M, N; components | | |
| **Content of existing Regulation** | Provisions on the safety of the electric power train (electrical shock), Rechargeable Electrical Energy Storage System (shocks, vibrations, fire resistance, low and high temperatures, thermal propagation, warnings) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | - The provisions on the warning system are relevant to vehicles equipped with an ADS.<br>- Many definitions, such as active driving possible mode, are inapplicable when an ADS is controlling the vehicle. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should consider the energy level of the REESS and adjust its high-level route planning accordingly.<br>- The ADS should be able to handle warnings (for failures, thermal events, etc.) and take appropriate action. | **Specifics for vehicles without occupants** | Most provisions remain relevant for vehicles without occupants, for the protection of other road users, the prevention of thermal events, the intervention of emergency services, etc. |
| **Summary of recommended changes** | - Many minor amendments are required, especially definitions related to driving modes (reference to the acceleration pedal), driving conditions, and the behaviour of the warning system (which warning signals should be directly communicated to the passengers of an automated vehicle?)<br>- Certain provisions on charging, besides the obvious difficulty of charging the vehicle in the absence of a driver, should be investigated to understand any potential effect on the ADS, such as the impossibility of vehicle movement while charging. | | |
| **Notes** | The absence of a driver may negatively impact the speed of the evacuation of the vehicle in case of thermal propagation or other critical events, despite the presence of advance warnings in the Regulation. Whether this negative impact is significant and whether specific provisions should be drafted for automated vehicles is unclear at this stage. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 114R00/00 (Replacement airbag modules) | **Date of review** | 13 March 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Provisions for replacement airbag modules and systems. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions related to the driver are inapplicable to automated vehicles. | **Specifics for vehicles without manual driving capabilities** | Provisions for airbag modules for steering wheels are inapplicable. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants |
| **Summary of recommended changes** | Minor amendments related to the driver are needed, but the Regulation is already easily applicable to automated vehicles in its current state. | | |
| **Notes** | If bidirectional vehicles are to be considered, more significant work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 127R04/00 (Pedestrian safety) | **Date of review** | 11 January 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions on minimising the risk of injuries in case of collision (leg or head) of a pedestrian (child or adult) with the vehicle. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions related to ARHSS are relevant for automated vehicles that are equipped with one. | **Specifics for vehicles without manual driving capabilities** | - Provisions related to the driver's seat, R point etc. are inapplicable to automated vehicles without manual driving capabilities<br>- Vehicles without a windscreen may be the object of specific provisions |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to use ARHSS automatically in compliance with the Regulation. | **Specifics for vehicles without occupants** | New geometric criteria are needed for vehicles not designed to carry occupants. |
| **Summary of recommended changes** | - Amendments related to the interior layout of the vehicle are needed, such as references to the driver's R point.<br>- Vehicles without a windscreen might need further consideration.<br>- ARHSS for automated vehicles might need further consideration. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 129R03/06 (Enhanced child restraint systems) | **Date of review** | 26 January 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Design and performance requirements for the type-approval of enhanced child restraint systems, including i-Size and ISOFIX, either as components or built into vehicle seating. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | None at this stage. | | |
| **Notes** | This regulation applies to child restraint systems only. In most cases, these are separate from the vehicle, but they can also be "built-in" to the vehicle seating. The compatibility between child restraints and vehicles is regulated closely between UN R129 and UN R14, R16 and R145. Although not stated explicitly, UN R129 assumes that vehicles travel forwards only and that all seating in the vehicle is forward-facing. The regulation then defines child restraints according to the direction they face in the vehicle. It also sets different limits on the approval of child restraints and the requirements they must fulfil according to their orientation. Today, vehicles with rear-facing seating are a grey area with respect to the installation of CRS, but they are also quite rare. If bi-directional vehicles, and vehicles with new seating layouts become more common, it may be necessary to amend UN R129 to specify clear limits on the use of child restraints and/or to explain the basis for the direction they face in the vehicle. Some examples are shown below, but there are numerous references to the child restraint orientation throughout UN R129.<br><br>Similarly, the provisions in UN R129 for built-in child restraints are vague and incomplete. Built-in child restraints are currently rare. However, some OEMs report that built-in child restraints may be the best solution for driverless shuttle vehicles and car-share services. If built-in child restraints become more common, it will be necessary to update UN R129 to ensure built-in products are subject to a complete set of provisions and requirements. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 134R01/01 (Hydrogen-fuelled vehicles - HFCV) | **Date of review** | 10 January 2023 |
| **Scope** | M, N; components | | |
| **Content of existing Regulation** | Performance and testing requirements for compressed hydrogen storage systems (impact, extreme temperatures, on-road performance etc.), their components, and the vehicle incorporating them (fuelling, protection against flammable conditions and leakage, post-crash integrity, etc.) | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions on the tell-tale signal warning are inapplicable to automated vehicles. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should handle failure warnings and take action accordingly. | **Specifics for vehicles without occupants** | - Certain provisions related to the passenger compartment might not apply to vehicles without occupants.<br>- Other than the above, the possibility of requiring a lower level of safety for vehicles without occupants is not considered at this stage. |
| **Summary of recommended changes** | - Amendments are needed regarding warning signals to the driver.<br>- If certain provisions (e.g. leakage in the passenger compartments) are not applicable to vehicles without occupants, they should be clearly specified. | | |
| **Notes** | If bidirectional vehicles are to be considered, more significant work on the Regulation will be needed (labelling location of the vehicle, installation of the hydrogen storage system not subject to the frontal impact test) | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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|---|---|---|---|
| **Regulation No.** | 135R02/00 (Pole-side impact) | **Date of review** | 10 January 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | - Provisions to reduce the risk of serious and fatal injury of vehicle occupants in pole-side impact crashes by limiting the forces, accelerations and deflections measured by anthropomorphic test devices in pole side impact crash tests and by other means.<br>- Provisions on fuel system integrity, electrical and hydrogen safety | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Some provisions are currently not fit for automated vehicles, such as door openings "de-activated by the driver" | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel etc. are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | - Provisions related to the safety of occupants are not applicable for vehicles without occupants.<br>- Provisions regarding leakage, fuel system integrity, etc. might be applicable.<br>- Provision on the opening of doors might not be applicable. |
| **Summary of recommended changes** | - Many amendments regarding the interior layout of the vehicle, especially around the driver's seat, are needed. The definition of vehicle width should be reconsidered to take into account sensors.<br>- If the provisions on leakage etc. are applicable to vehicles without occupants, this should be clearly specified. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, more significant work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 137R02/02 (Frontal collision, restraint system) | **Date of review** | 4 December 2022 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | - Protection of passengers in case of a frontal impact; protection of the occupants of vehicles operating on electrical power from high voltage.<br>- Provisions on electrical safety, fuel leakage, etc. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Some provisions are currently not fit for automated vehicles, such as door openings "de-activated by the driver" | **Specifics for vehicles without manual driving capabilities** | Provisions related to the driver's seat, steering wheel etc. are inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | - Provisions related to the safety of occupants are not applicable for vehicles without occupants.<br>- Provisions regarding leakage, fuel system integrity, etc. might be applicable.<br>- Provision on the opening of doors might not be applicable. |
| **Summary of recommended changes** | - Many minor amendments regarding the interior layout of the vehicle, especially around the driver's seat, are needed. The definition of vehicle width should be reconsidered to take into account sensors.<br>- If the provisions on leakage etc. are applicable to vehicles without occupants, this should be clearly specified. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, more significant work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 145R00/02 (ISOFIX anchorages and i-Size seating positions) | **Date of review** | 1 February 2023 |
| **Scope** | Any vehicle fitted with ISOFIX or i-Size | | |
| **Content of existing Regulation** | Provisions on the design, positioning and robustness of ISOFIX anchorages and i-Size seating positions. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | The Regulation is inapplicable to vehicles without occupants. |
| **Summary of recommended changes** | Minor amendments related to the driver's seat are needed. | | |
| **Notes** | If new seating positions (side- or rear-facing seats, torso recline angles greater than 25°, unconventional seating layout) or bidirectional vehicles are to be considered, more work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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|---|---|---|---|
| **Regulation No.** | 146R00/00 (Hydrogen-fuelled vehicles — L1–L5) | **Date of review** | 10 January 2023 |
| **Scope** | $L_1$–$L_5$; components | | |
| **Content of existing Regulation** | Performance and testing requirements for compressed hydrogen storage systems, their components, and the vehicles incorporating them. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions on the tell-tale signal warning are inapplicable to automated vehicles. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should handle failure warnings and take action accordingly. | **Specifics for vehicles without occupants** | - Certain provisions related to the passenger compartment might not apply to vehicles without occupants.<br>- Other than the above, the possibility of requiring a lower level of safety for vehicles without occupants is not considered at this stage. |
| **Summary of recommended changes** | - Amendments are needed regarding warning signals to the driver.<br>- If certain provisions (e.g. leakage in the passenger compartments) are not applicable to vehicles without occupants, they should be clearly specified. | | |
| **Notes** | If bidirectional vehicles are to be considered and compatible with vehicle categories in the scope of this Regulation, more significant work will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | 153R00/02 (Electric power train safety and fuel system integrity at rear-end collision) | **Date of review** | 2 December 2022 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Provisions on electrical safety, fuel leakage, etc. in the event of a rear-end collision against the vehicle. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | One provision referring to the driver's seat becomes inapplicable. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | - All provisions related to the interior layout of the vehicle, especially the passenger compartment, are inapplicable.<br>- The rest of the Regulation may be applicable. |
| **Summary of recommended changes** | Many amendments regarding the interior layout of the vehicle, especially around the passenger compartment, are needed for automated vehicles without occupants. | | |
| **Notes** | If bidirectional vehicles are to be considered, more significant work will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | GTR01 am 2 (Door locks and door retention components) | **Date of review** | 26 December 2022 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Requirements for vehicle door locks and door retention components, including latches, hinges, and other supporting means, to minimize the likelihood of occupants being thrown from a vehicle as a result of impact.<br>This regulation applies to vehicle door locks and door retention components on side or back doors that lead directly into a compartment that contains one or more seating accommodations. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | Some notions such as "driver side" become meaningless when the vehicle has no manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle door closure warnings and take action accordingly, including in situations where the ADS cannot close the door automatically. | **Specifics for vehicles without occupants** | The Regulation is not applicable to vehicles without passengers containing seating accommodations. |
| **Summary of recommended changes** | Minor amendments (redefinitions) are needed to make the Regulation applicable to automated vehicles with occupants. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

| | | | |
|---|---|---|---|
| **Regulation No.** | GTR07 am 1 (Head restraints) | **Date of review** | 26 December 2022 |
| **Scope** | 1-1, 1-2, 2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Requirements for head restraints to reduce the frequency and severity of injuries caused by rearward displacement of the head. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | References to "driver head restraint" become irrelevant for vehicles with no manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | Regulation not applicable |
| **Summary of recommended changes** | Minor amendments related to the driver's seat are needed. | | |
| **Notes** | If new seating positions (side- or rear-facing seats, torso recline angles greater than 25°, unconventional seating layout) or bidirectional vehicles are to be considered, more work on the Regulation will be needed. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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|---|---|---|---|
| **Regulation No.** | GTR09 am 2 (Pedestrian safety) | **Date of review** | 27 December 2022 |
| **Scope** | 1-1, 1-2, 2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Provisions to bring about an improvement in the construction of certain parts of the front of vehicles, include passenger cars, vans and light trucks, which have been identified as causing injury when in collision with a pedestrian or other vulnerable road user. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | - Provisions related to the driver's seat, R point etc. are inapplicable to automated vehicles without manual driving capabilities<br>- Vehicles without a windscreen may be the object of specific provisions |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | New geometric criteria are needed for vehicles not designed to carry occupants. |
| **Summary of recommended changes** | - Amendments related to the interior layout of the vehicle are needed, such as references to the driver's R point.<br>- Vehicles without a windscreen might need further consideration. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | GTR13 (Hydrogen Fuel Cell Vehicles - HFCV) | **Date of review** | 16 January 2023 |
| **Scope** | 1-1, 1-2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Provisions to minimize human harm that may occur as a result of fire, burst or explosion related to the vehicle fuel system and/or from electric shock caused by the vehicle's high voltage system. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | Provisions on tell-tales | **Specifics for vehicles without manual driving capabilities** | Testing provisions using the driver's seat as a reference point |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle failure warnings and take appropriate action. | **Specifics for vehicles without occupants** | - Certain provisions related to the passenger compartment might not apply to vehicles without occupants.<br>- Other than the above, the possibility of requiring a lower level of safety for vehicles without occupants is not considered at this stage. |
| **Summary of recommended changes** | Minor amendments are needed, especially provisions on tell-tales and testing provisions. | | |
| **Notes** | Bidirectional vehicles should be considered in a second step<br>- Identification of Hydrogen Fuelled Vehicles: labelling location of the vehicle.<br>- Installation of the hydrogen storage system not subject to the frontal impact test: it restricts currently only front of the vehicle. In case of bi-directional vehicle, it could be both front and rear. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | | X |

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|---|---|---|---|
| **Regulation No.** | GTR14 (Pole-side impact) | **Date of review** | 22 February 2023 |
| **Scope** | 1-1, 1-2, 2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Provisions to reduce the risk of serious and fatal injury of vehicle occupants in side impact crashes by limiting the forces, accelerations and deflections measured by anthropomorphic test devices in pole side impact crash tests and by other means. This may complement other side impact tests. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | All provisions related to the driver's seat, pedals, steering wheel etc. become inapplicable to vehicles without manual driving capabilities. |
| **Content to be covered by (potential) ADS Regulation** | The ADS should be able to handle warnings and take appropriate action. | **Specifics for vehicles without occupants** | Provisions related to the safety of occupants are not applicable for vehicles without occupants; however, provisions regarding leakage, fuel system integrity, etc. may be applicable to these vehicles. |
| **Summary of recommended changes** | - Many minor amendments regarding the interior layout of the vehicle, especially around the driver's seat, are needed.<br>- If the provisions on leakage etc. are applicable to vehicles without occupants, this should be clearly specified. | | |
| **Notes** | - If new seating positions are to be considered (side- or rear-facing seats, torso recline angles greater than 25°), major amendments will be needed.<br>- If bidirectional vehicles are to be considered, current restrictions on rear-facing seats should be reworked. | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | GTR20 (Electric vehicle safety) | **Date of review** | 2 December 2022 |
| **Scope** | 1, 2 as defined in S.R.1 | | |
| **Content of existing Regulation** | Safety-related performance of electrically propelled road vehicles and their rechargeable electric energy storage systems. The purpose of this regulation is to avoid human harm that may occur from the electric power train. | **Specifics for dual-mode vehicles** | None (full compliance required) |
| **Content relevant for vehicles equipped with an ADS** | - The provisions on the warning system are relevant to vehicles equipped with an ADS.<br>- Many definitions, such as active driving possible mode, are inapplicable when an ADS is controlling the vehicle. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should consider the energy level of the REESS and adjust its high-level route planning accordingly.<br>- The ADS should be able to handle warnings (for failures, thermal events, etc.) and take appropriate action. | **Specifics for vehicles without occupants** | Most provisions remain relevant for vehicles without occupants, for the protection of other road users, the prevention of thermal events, the intervention of emergency services, etc. |
| **Summary of recommended changes** | - Many minor amendments are required, especially definitions related to driving modes (reference to the acceleration pedal), driving conditions, and the behaviour of the warning system (which warning signals should be directly communicated to the passengers of an automated vehicle?)<br>- Certain provisions on charging, besides the obvious difficulty of charging the vehicle in the absence of a driver, should be investigated to understand any potential effect on the ADS, such as the impossibility of vehicle movement while charging. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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# Annex 7

## Results of the review — GRVA Regulations

Figure 8
**Results of the review of GRVA Regulations**

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|---|---|---|---|
| **Regulation No.** | 13R12/02 (Braking) | **Date of review** | 11 May 2023 |
| **Scope** | $M_2$, $M_3$, N, O | | |
| **Content of existing Regulation** | - Applicable to towing and towed vehicles, incl. those involved in a modular vehicle combination<br>- No physical breakage of mechanical components (well dimensioned)<br>- Operating forces of service braking system, secondary braking system and parking brake system to ensure they can be handled by the driver<br>- Connections, communication, compatibility between towing and towed vehicles<br>- Operating of endurance braking systems; coupling force control<br>- Braking performance in nominal cases (Service, parking brake, endurance brake)<br>- Braking performance in failure cases (Secondary and residual braking)<br>- HMI: controls available to the driver and warnings issued to warn the driver<br>- ABS requirements & EVSC requirements<br>- Requirements regarding energy supply and storage | **Specifics for dual-mode vehicles** | - Consider that the braking demand can be requested by the actuation of manual controls (driver) or by generation of the ADS<br>- HMI<br>- Warning/failure signals (system status/condition) |
| **Content relevant for vehicles equipped with an ADS** | - System robustness (well dimensioned)<br>- Connections, communication and compatibility between towing and towed vehicles<br>- Operating of endurance braking systems; coupling force control<br>- ABS requirements & EVSC requirements<br>- Braking performance service/secondary/parking braking under nominal conditions<br>- Braking performance under failure conditions and in "maintenance mode"<br>- Warnings, failure, status signals to be provided to the | **Specifics for vehicles without manual driving capabilities** | - HMI<br>- Warning/failure signals (system status/condition) |

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|---|---|---|---|
| | ADS (e.g. to ensure ADS algorithm to respond adequately, to warn the operator, control tower, occupants if or when appropriate, etc.)<br>- Status and warning signals sent by trailer regarding braking, EVSC, ABS, TPMS<br>- Performance considering max design speed of the vehicles, that the ADS is in control of the entire driving dynamics (safety concept incl. transfer to MRC)<br>- Annex "CEL" (safety concept) to be applied to the basic braking system (from interface receiving the braking demand originating from the ADS to its actuation) | | |
| **Content to be covered by (potential) ADS Regulation** | - Generation of braking demand by the ADS<br>- Response to warning, failure and status signals from both the towing and the towed vehicle<br>- HMI intended for communication with driver (control tower, occupants, etc.)<br>(- Overarching safety concept and management for the safe operation of the ADS) | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Replacing the driver actuating the braking control with the braking demand generated by the ADS (external brake request via interface)<br>- Testing section, Annex 4 to be updated, including some pass criteria related to the driver and require special software, test mode, or other means of implementing test protocols.<br>- If testing provisions can depend on the ODD, the vehicle speed control strategy and the likelihood of frequent braking should be considered.<br>- Warnings, failure and status signals to be transmitted to the ADS to ensure adequate response , including those from the trailer(s) and those linked to truck–trailer incompatibility<br>- Definitions to be checked, e.g. for Automatically Commanded Braking<br>- Update of Annex 18 as appropriate: Annex "CEL" (safety concept) to be applied to the basic braking system (from interface receiving the braking demand originating from the ADS to its actuation) | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 13HR01/04 (Braking) | **Date of review** | 11 May 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| | | | |
| **Content of existing Regulation** | -No physical breakage of mechanical components (well dimensioned)<br>- Operating forces of service braking system, secondary braking system and parking brake system to ensure they can be handled by the driver<br>- Braking performance in nominal cases (Service and parking brake)<br>- Braking performance in failure cases (Secondary braking system)<br>- Warnings to be issued to warn the driver<br>- ABS requirements<br>- (ESC regulated in UN R 140)<br>- (BAS regulated in UN R 139) | **Specifics for dual-mode vehicles** | - Consider that the braking demand can be requested by the actuation of manual controls (driver) or by generation of the ADS<br>- HMI<br>- Warning/failure signals (system status/condition) |
| **Content relevant for vehicles equipped with an ADS** | - System robustness (well dimensioned)<br>- Braking performance under nominal conditions<br>- Braking performance under failure conditions<br>- Braking performance in "maintenance mode"<br>- Warnings/failure signals to be provided to the ADS (e.g. to ensure ADS algorithm to respond adequately, to warn the operator/control tower/occupants as/if appropriate, etc.)<br>- Performance considering max design speed of the vehicles, that the ADS is in control of the entire driving dynamics (safety concept incl. transfer to MRC),<br>- Annex "CEL" (safety concept) to be applied to the basic braking system (from interface receiving the braking demand originating from the ADS to its actuation) | **Specifics for vehicles without manual driving capabilities** | - HMI<br>- Warning/failure signals (system status/condition) |
| **Content to be covered by (potential) ADS Regulation** | - Generation of braking demand by the ADS<br>- Response to warning/failure signals<br>- HMI intended for communication with driver (control tower, occupants, etc.)<br>(- Overarching safety concept and management for the safe operation of the ADS) | **Specifics for vehicles without occupants** | None |

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| **Summary of recommended changes** | - Provisions related to the driver or driver control should be deleted or amended as appropriate.<br>- Test procedure, Annex 3 should be reconsidered regarding necessity and implementation method with the case of mode/vehicles without manual driving capabilities.<br>-- Special software, test mode, or other means of implementing test protocols: to keep the specified vehicle speed, to achieve the maximum deceleration instead of 500 N pedal input by the driver, etc.<br>-- If testing provisions can depend on the ODD, the vehicle speed control strategy and the likelihood of frequent braking should be considered.<br>- Update of Annex 18 as appropriate: Annex "CEL" (safety concept) to be applied to the basic braking system (from interface receiving the braking demand originating from the ADS to its actuation) |
| **Notes** | Applicability to certain use cases (such as low-speed automated vehicles) is still unclear, and could be solved by introducing vehicles categories for automated vehicles, by creating a new Regulation, etc. |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 79R04/03 (Steering) | **Date of review** | 22 May 2023 |
| **Scope** | M, N, O | | |
| | | | |
| **Content of existing Regulation** | - Ensure that all components of the steering system are designed properly to ensure a high level of safety:<br>- No physical breakage of mechanical components (well dimensioned)<br>- Steering forces are at levels which can be handled by the driver, even in case of failure<br>- Steering performance (including behaviour, e.g. self-centring) in nominal cases<br>- Steering performance in failure cases<br>- Warnings to be issued to the driver<br>- ADAS specific requirements | **Specifics for dual-mode vehicles** | Consider that the steering demand can be requested by the actuation of manual controls (driver) or by the ADS<br>HMI<br>Warning/failure signals (system status/condition)<br>State of ADAS features after transitions of control<br>State of ADAS features during ADS control |
| **Content relevant for vehicles equipped with an ADS** | - System robustness (well dimensioned)<br>- Steering performance under nominal conditions<br>- Steering performance under failure conditions<br>- Steering performance in any "maintenance mode"<br>- Warnings/failure signals to be provided to the ADS (e.g. to ensure ADS<br>algorithm to respond adequately, to warn the operator as/if appropriate, etc.)<br>- Performance considering max design speed of the vehicles, that the ADS is in control of the entire driving dynamics (safety concept incl. transfer to MRC)<br>- Annex "CEL" (safety concept) to be applied to the basic steering system (from interface receiving the steering demand originating from the ADS to actuation) | **Specifics for vehicles without manual driving capabilities** | Need for behavioural requirements (e.g. self-centring, rear-wheel steer prohibition)<br>Applicability of ADAS features |
| **Content to be covered by (potential) ADS Regulation** | Detection of failures (including those which would normal be recognised by a driver but not electrically detected).<br><br>Overarching safety concept and management for the safe operation of the ADS. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Revise Scope with respect to "ACSF-B2, ACSF-E, Autonomous Steering" and associated definitions.<br>- Revise provisions covering handling and driveability.<br>- Revise definition of "steering control" and all references to driver operation.<br>- Introduce provisions covering the state of ADAS systems during ADS operation and following transition to manual driving.<br>- Revise testing requirements, considering ADS actuation ("test mode").<br>- Revise failure warnings to cover transmission to ADS. | | |

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| | - Consider failures that are currently detected directly by the driver (vibration, noise, increase in force, etc).<br>- Revise PTI / roadworthiness provisions.<br>- Revise Annex 6 (CEL) to clarify boundary of assessment; ensure alignment with corresponding annexes in other Regulations. |
| **Notes** | If bidirectional vehicles are considered, further amendments will be required.<br>If test provisions can be adapted depending on the ODD, further work on the Regulation will be required. |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 89R00/03 (Speed Limiting Devices and functions) | **Date of review** | 10 May 2023 |
| **Scope** | M, N; components | | |
| **Content of existing Regulation** | - Speed Limiting Devices and Functions (setting a fixed, maximum speed to the vehicle)<br>- Adjustable Speed Limiting Devices and Functions (where the driver can set the speed limit of the vehicle) | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the device or function during automated mode |
| **Content relevant for vehicles equipped with an ADS** | The interaction between the SLD and automated driving is unclear: should the device work during automated driving? Should the speed limitation be managed in the ADS regulation? | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS must comply with traffic rules, which includes any potential maximum speed for certain vehicles.<br>- Any adjustable speed limitation feature should be handled by the ADS. | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Harmonize the following with other Regulations for functions affecting speed: transition between automated and manual mode, state of the system during automated mode.<br>- If SLDs remain active during automated mode, specific provisions should be added. For now, it is assumed that SLDs and SLFs are not relevant for automated vehicles. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 90R02/10 (Replacement brake parts) | **Date of review** | 11 May 2023 |
| **Scope** | Components | | |
| **Content of existing Regulation** | Provisions for approval of replacement brake parts | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | - Test procedures where pedal force or line pressure is the input (without a brake pedal, how may this be generated and measured?)<br>- Changes may be introduced to R13 and R13-H for vehicles not equipped with a brake pedal, such as achieving service braking performance within a certain time as an alternative to the 500N pedal force at 6.43m/s² |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | - Vehicle categories to be updated to cover new automated vehicles categories<br>- Several parts of the test procedure need to be addressed. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | | X |
| | **Major amendments needed** | X | |

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|---|---|---|---|
| **Regulation No.** | 130R00/01 (Lane Departure Warning System) | **Date of review** | 14 November 2022 |
| **Scope** | $M_2$, $M_3$, $N_2$, $N_3$ | | |
| **Content of existing Regulation** | - Provides warning to driver when they drift out of lane<br>- Performance requirements (lane markings to be identified, conditions under which it should operate, response to lane crossing, failure detection, activation and deactivation criteria)<br>- Degree of warnings and timings for the driver | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the system during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Harmonise the following with other Regulations for active safety functions: transition between automated and manual mode, state of the system during automated mode. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 131R02/00 (Advanced Emergency Braking System - AEBS) | **Date of review** | 9 May 2023 |
| **Scope** | $M_2$, $M_3$, $N_2$, $N_3$ | | |
| **Content of existing Regulation** | - The system detects a potential forward collision, provides the driver with an appropriate warning and activates the vehicle braking system to decelerate the vehicle with the purpose of avoiding or mitigating the severity of a collision in the event that the driver does not respond to the warning.<br>- During any action taken by the system, the driver can take control and override the system. | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the system during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | Emergency braking demand, speed range and speed reduction in specified scenarios. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should specifically guarantee the same level of performance as what is required by the AEBS.<br>- Response to warning/failure signals.<br>- HMI intended for communication (with remote supervision, occupants, etc.) | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Harmonise the following with other Regulations for active safety functions: transition between automated and manual mode, state of the system during automated mode. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 139R00/01 (Brake Assist System - BAS) | **Date of review** | 14 November 2022 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | Prescriptions on systems for delivering strong braking when detecting a certain force or speed applied by the driver to the braking pedal. | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the system during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | None | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Harmonise the following with other Regulations for active safety functions: transition between automated and manual mode, state of the system during automated mode. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 140R00/04 and GTR8 (Electronic Stability Control - ESC) | **Date of review** | 9 May 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | - Yaw moment generated by adjusting the braking force of a single wheel to enhance the directional stability of the vehicle;<br>- Control algorithm to determine whether there is a need to change the output torque of the engine; corresponding method to achieve the adjustment of the output torque, helping the driver maintain the control of the car.<br>- Test Procedures (e.g. Sine with Dwell test and "ESC Off" control check.). | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the system during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | Emergency braking demand, speed range and speed reduction in specified scenarios. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | - The ADS should specifically guarantee the same level of performance as what is required by the ESC.<br>- Response to warning/failure signals.<br>- HMI intended for communication (with remote supervision, occupants, etc.) | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Harmonise the following with other Regulations for active safety functions: transition between automated and manual mode, state of the system during automated mode. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 152R02/02 (Advanced Emergency Braking System - AEBS) | **Date of review** | 9 May 2023 |
| **Scope** | $M_1$, $N_1$ | | |
| **Content of existing Regulation** | - The system automatically detects a potential forward collision, provides the driver with an appropriate warning and activates the vehicle braking system to decelerate the vehicle with the purpose of avoiding or mitigating the severity of a collision in the event that the driver does not respond to the warning.<br>- During any action taken by the system, the driver can take control and override the system. | **Specifics for dual-mode vehicles** | Transition between automated and manual mode.<br>State of the function during automated mode. |
| **Content relevant for vehicles equipped with an ADS** | Emergency braking demand, speed range and speed reduction in specified scenarios. | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS should specifically guarantee the same level of performance as what is required by the AEBS.<br>Response to warning/failure signals.<br>HMI intended for communication (with remote supervision, occupants, etc.) | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | Harmonise the following with other Regulations for active safety functions: transition between automated and manual mode, state of the system during automated mode. | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 155R00/01 (Cybersecurity) | **Date of review** | 14 November 2022 |
| **Scope** | M, N; O if fitted with ECU; $L_6$-$L_7$ if ADS | | |
| **Content of existing Regulation** | Company-wide management of cybersecurity and implementation on the electronic architecture of vehicles (Risk assessment, test results and mitigations)<br>Management of risks along the whole supply chain (including suppliers)<br>Detection of and response to cyberattacks, analysis and forensics of successful attacks<br>Periodical reporting to authorities of surveillance activities | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | All parts related to the vehicle type | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS Regulation should be contingent to the existence and validity of a R155 type approval | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | (Keeping the lists in Annex 5 up to date with the technology used in automated vehicles, e.g. interactions with infrastructure or other vehicles) | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

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|---|---|---|---|
| **Regulation No.** | 156R00/00 (Software Updates) | **Date of review** | 14 November 2022 |
| **Scope** | M, N, O, R, S, T | | |

| | | | |
|---|---|---|---|
| **Content of existing Regulation** | Company-wide management of software updates and implementation on vehicles<br>Security of software updates and safety of their execution<br>Traceability of updates, in particular changes related to type approved functions and communication with the Approval Authority to ensure continuous validity of Type Approvals<br>Specific prescriptions for over-the-air updates | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | All parts related to the vehicle type<br>HMI for fully automated vehicles may not be present inside the vehicle (e.g. remote supervision centre) | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | The ADS Regulation should be contingent to the existence and validity of a R156 type approval | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | None | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | X | |
| **Readiness:** | **Regulation ready** | X | |
| | **Major amendments needed** | | |

| | | | |
|---|---|---|---|
| **Regulation No.** | 157R01/00 (Automated Lane Keeping System) | **Date of review** | 14 November 2022 |
| **Scope** | M, N | | |
| **Content of existing Regulation** | Definition of an operational design domain<br>Level 3 system: details on fail-safe response (MRM, transitions)<br>Human-Machine Interface and communication of information to the human driver<br>Guidance on scenarios<br>Data storage (DSSAD)<br>Series 01 of amendments: lane change procedures | **Specifics for dual-mode vehicles** | None |
| **Content relevant for vehicles equipped with an ADS** | Regulation is not inherently relevant because the task force covers automated driving systems which do not issue transition demands | **Specifics for vehicles without manual driving capabilities** | None |
| **Content to be covered by (potential) ADS Regulation** | None | **Specifics for vehicles without occupants** | None |
| **Summary of recommended changes** | | | |
| **Notes** | | | |

| **Outcome of the review** | | | |
|---|---|---|---|
| | | **Yes** | **No** |
| **Regulation relevant for fully automated vehicles** | | | X |
| **Readiness:** | **Regulation ready** | | |
| | **Major amendments needed** | | |