

**BACK TO A SUSTAINABLE FUTURE**



**RESILIENT CONNECTIVITY FOR SUSTAINED RECOVERY AND ECONOMIC GROWTH**

**INLAND TRANSPORT COMMITTEE**



**UNECE**

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# **UN Regulation No. 156**

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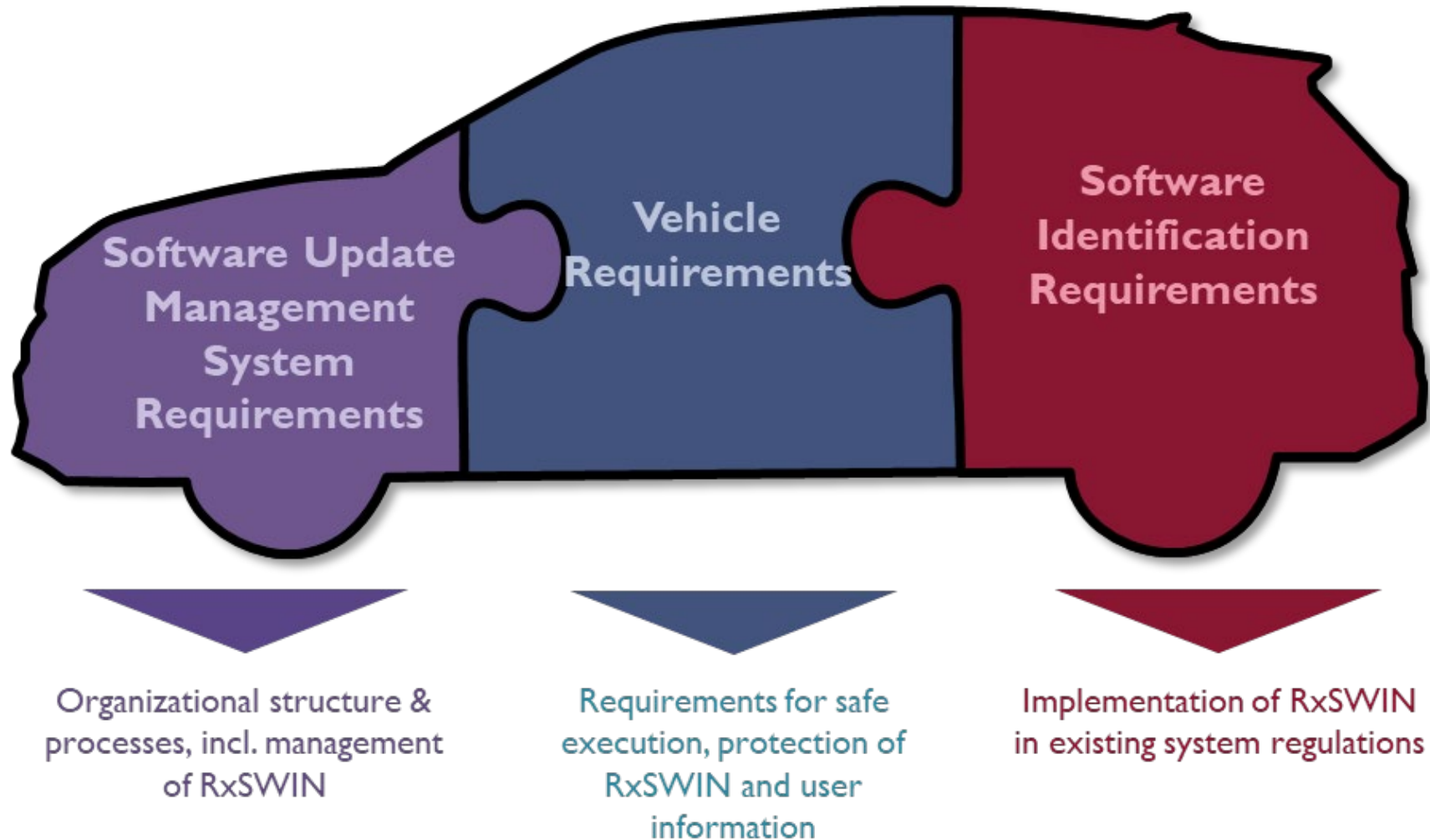
# Context

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- Some vehicle manufacturers made already SW updates OTA for new ADAS functions
- Necessity to update software on vehicles during the whole vehicle life
- WP.29/AC.2 Proposal from the secretariat to address software updates
- Decision to establish the Task Force on CS/OTA issues
  - Led y UK/DfT, Japan/NTSEL and US/NHTSA
  - Secretariat provided by OICA/Hyundai
  - Participants from CPs and NGOs
  - Profiles incl. Type Approval and CS experts.
- UN Regulation No. 156:
  - Adoption by GRVA (in March 2020).
  - Adoption by WP.29/AC.1
  - EIF: January 2021

# UN Regulation No. 156 - overview

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# Software Update Management System

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- This requires vehicle manufacturers to have, at an organisational level, the following:
  - Processes for configuration control for **recording the hardware and software versions** relevant to a vehicle type, including integrity validation data for the software
  - Processes for **identifying** the software and hardware on a vehicle relevant to a specific UN regulation and **tracking** if that software changes (the RxSWIN concept)
  - Processes **for verifying** the software on a vehicle component is what should be there
  - Processes for **identifying interdependencies** of systems, particularly with respect to software updates
  - Processes for identifying target vehicles and **verifying their compatibility** with an update
  - Processes to **assess if a software update will affect type approvals** or other legally defined parameters for a given target vehicle (including adding or removing functionality)
  - Processes to assess to assess if an **update will affect the safety** or safe driving of a vehicle
  - Processes to **inform vehicle owners of updates**
  - Processes to **document all of the above** and make it available for inspection at an audit
  - Processes to **ensure the cyber security of software updates before they are sent to a vehicle**

# Type approval requirements

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For every vehicle type that is declared, and approval sought, the following must be provided:

- Evidence that the SUMS applies to the vehicle type
- The software update delivery mechanism and process must be protected for the vehicle type to ensure authenticity and integrity of the software update
- The RxSWIN must be protected on the vehicle type
- Information regarding RxSWIN or type relevant software must be easily readable from the vehicle

# Requirements for OTA

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For over the air updates (non-wired), the vehicles of the vehicle type must:

- Be able to restore systems if an update fails
- Only execute updates when there is sufficient power
- Ensure updates are executed safely, especially when the update may affect safety critical systems
- Be able to inform users about each updates, incl. their successful execution (or otherwise)
- Ensure the vehicle is capable of conducting the update
- Be able to inform the user when a mechanic is needed

# RxSWIN

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## Definition:

"RX Software Identification Number (RXSWIN)" means:

- a dedicated identifier,
- defined by the vehicle manufacturer,
- representing **information** about the **type approval relevant software** of the Electronic Control System **contributing to UN Regulation No. X** type approval relevant characteristics of the vehicle

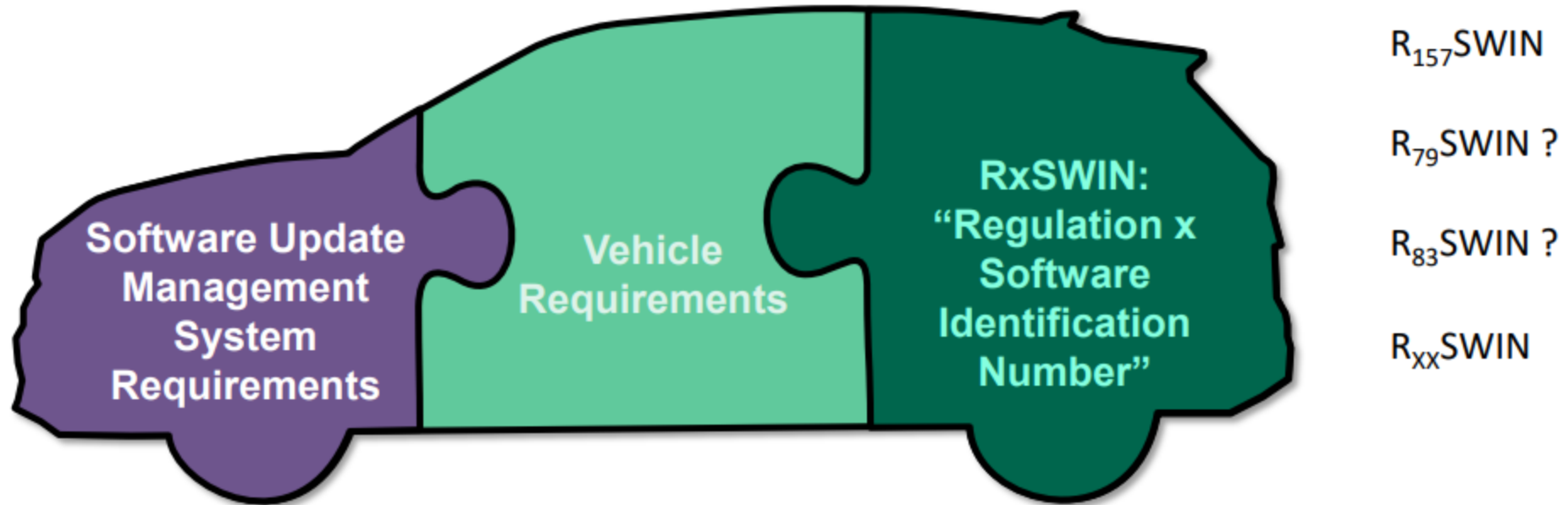
Note: alternatives to RxSWIN are allowed



# RxSWIN and other UN Regulations

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If inserted in UN Regulations:



A template is provided in Annex 7 of the consolidated resolution R.E.3

## RxSWIN - Outlook

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UN R156 is in force.

RxSWIN and UN R156 are mentioned in UN R157.

Effective implementation and proper use of software updates / RxSWIN require harmonized rules for **post registration approval updates**

Thank you for your attention



Text of the regulation

<https://unece.org/transport/documents/2021/03/standards/un-regulation-no-156-software-update-and-software-update>

Interpretation document

<https://unece.org/transport/documents/2020/12/working-documents/grva-proposals-interpretation-documents-un-regulation>

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