

# Introducing two proposals: Amendments for UN-Regulation for ALKS [157]

# Overview: UN-Regulation for ALKS [157] today

- Automated Lane Keeping System
- Highways\*
- Maximum speed: 60 km/h
- Scope: Vehicles of category M<sub>1</sub>
- **Optional system (not mandatory)!**



*\*The vehicle is on roads where pedestrians and cyclists are prohibited and which, by design, are equipped with a physical separation that divides the traffic moving in opposite directions.*

# Two proposals adding to UN-R ALKS

- Automated Lane Keeping System + Lane change functionality
- Highways\*
- Maximum speed: 60 km/h + Speed increase up to 130 km/h
- Scope: Vehicles of category M<sub>1</sub>
- **Optional system (not mandatory)!**

*\*The vehicle is on roads where pedestrians and cyclists are prohibited and which, by design, are equipped with a physical separation that divides the traffic moving in opposite directions.*

# Motivation – Why new proposals?

## General:

- Automated systems expected to bring advantage in traffic and road safety, therefore natural expansion for more usage (more often and longer periods of usage; not only linked to traffic jams)
- Increasing political attention and pressure in Germany
- Expectation: GRVA is the Working Party as technology driver for automated, autonomous and connected driving

## Specific:

- 130 km/h was discussed by experts in IWG ACSF, but reduced due to time/deliverables according time frame/limit; current proposal is continuation of this work

# New proposals: main ALKS principles unchanged!

## What's the same?

- High-level **requirements** regarding **safety**, for example:
  - Free of unreasonable risks for vehicle occupants or any other roads users
  - Not cause any collisions that are reasonably foreseeable and preventable
  - Comply with traffic rules relating to DDT in country of operation
  - Perform self-checks to detect the occurrence of failures and confirm system performance at all times
- Criteria for **activation**, **deactivation** & **override**
- Conditions and procedure for **Transition demand**, **Minimum Risk maneuver** & **Emergency Maneuver**

# Proposal 1: Speed increase up to 130 km/h

## Key details (GRVA/2020/32)

### What's the same?

- Compliance with traffic rules in the country of operation → legal speed limit!
- Requirements relating to DDT performance, in particular: adapt vehicle speed to infrastructural and environmental conditions
- Spatial awareness to front & sides
- Detect distance to next vehicle in front & respect minimum following distance
- Collision avoidance with unobstructed crossing pedestrian up to 60 km/h
- Validation & Testing: Annex 4 and 5

### What's new or different?

- Maximum speed up to 130 km/h
- New: table for forward detection range (values calculated with deceleration of  $5 \text{ m/s}^2$  = actual research data for braking performances of modern passenger cars; aligns to Emergency Maneuver)
- Minimum following distance (table) extended for max. speed 130 km/h (linear upscale with 2 s limit)

# Proposal 2: Lane change functionality

## High-level principles for lane change

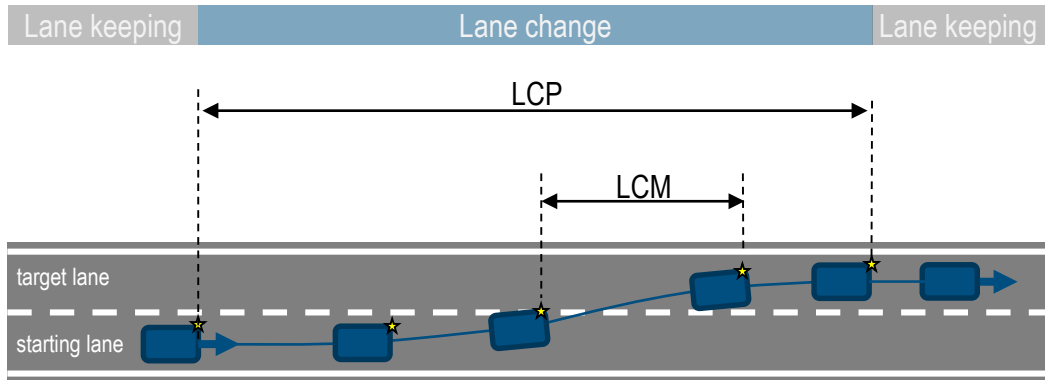
- No violation of traffic rules
- Only be performed:
  - if system has sufficient information about surrounding to front, side & rear,
  - if traffic situation allows it and if other road users are not endangered
    - LC shall not result in collision with another vehicle or road user in predicted path
    - Approaching vehicle in target lane should not have to unmanageably decelerate
- Intention of performing LC shall be indicated at all times in unambiguous way
  - Indicated in advance
  - Changing of lane one continuous movement
  - Take as long as necessary, but completed as quickly as possible
- Vehicle shall always end up in a single lane of travel
- ...

*compare ALKS MRM lane change  
(activity lead by UK)*

✓ UN-R ALKS —  Technical performance requirements

# Proposal 2: Lane change functionality

## Key details (GRVA/2020/33)



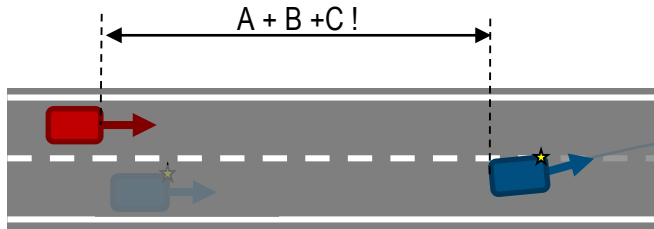
## What's new?

- Definitions (starting lane, target lane, lane change procedure, lane change maneuver)
- Activation criteria for LCP
  - ✓ Sensing capability to rear
  - ✓ System self-check positive
  - ✓ Target lane positively confirmed
  - ✓ Completion of LCP anticipated
- Conditions for lane change
- Specific requirements for LCM
- Indication of lane change



# Proposal 2: Lane change functionality

## Key details (GRVA/2020/33) - continued



### What's new?

Assessment of target lane:

- LCP only initiated if approaching vehicle in target lane not forced to **unmanageably decelerate**
- Factors taken into account:
  - A: Maximum deceleration,
  - B: Reaction time &
  - C: Safety gap

### What's left to do?

- Development of appropriate physical tests (Annex)

# Advance technology– increase traffic & road safety!

United Nations

ECE/TRANS/WP29/2020/81



**Economic and Social Council**

**Proposal for a new UN Regulation on uniform provisions concerning the approval of vehicles with regards to Automated Lane Keeping System**

**+** Speed increase up to 130 km/h

*finalized*

**+** Lane change functionality

*to be finalized  
(for GRVA-08)*

- Both proposals fit together, but are independent from each other
- Concept unchanged: ALKS (+amendments) is optional (not mandatory!)
- Proposals shall not hinder on-going activities in FRAV, VMAD or others
- Germany invites interested stakeholders for exchange

**SEEKING EXPERT FEEDBACK & GUIDANCE BY GRVA**

Thank you for your kind attention!