

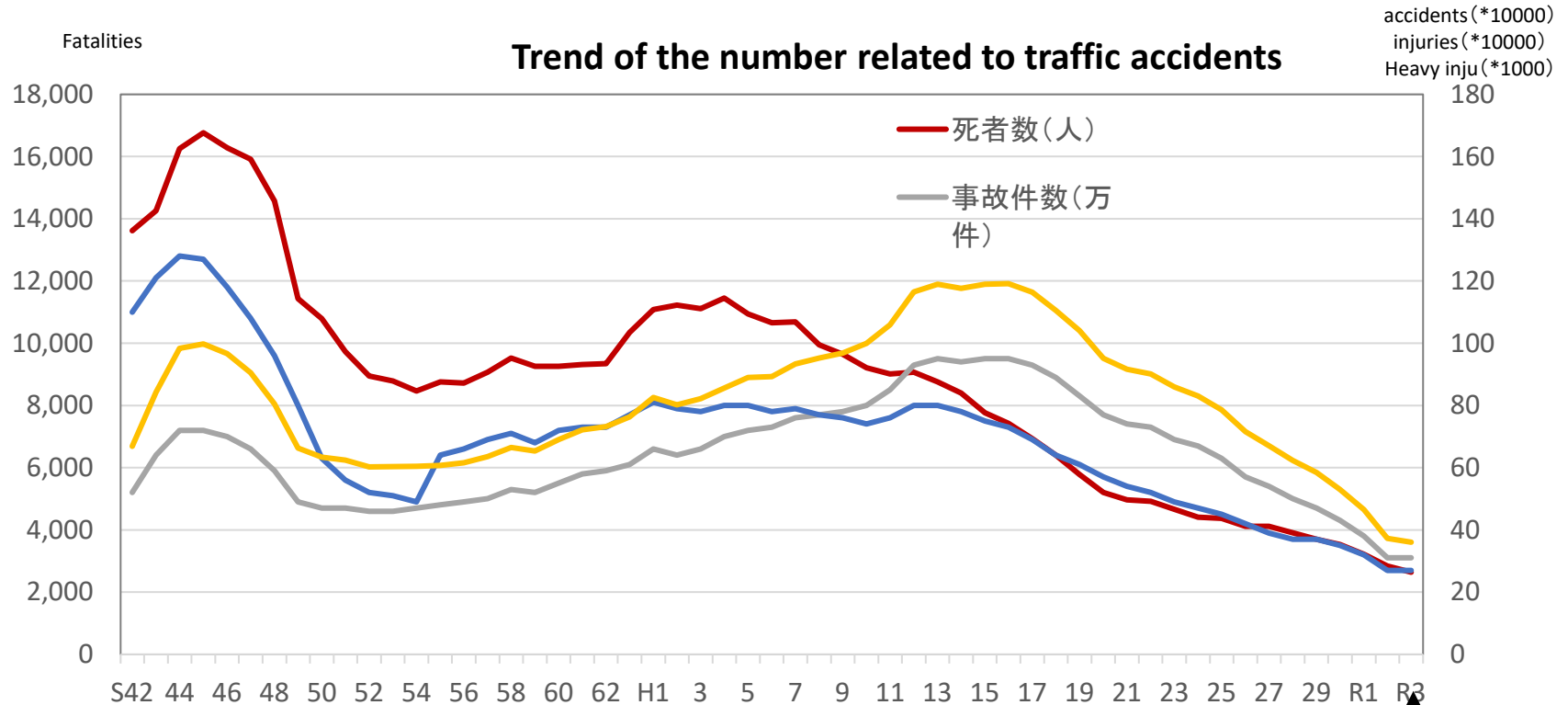
The Recent Situation in Japan related to ICV

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- Several numbers of traffic accidents, such as fatalities, heavy injuries, are decreasing recently in Japan.
- Such numbers became the least in our record.

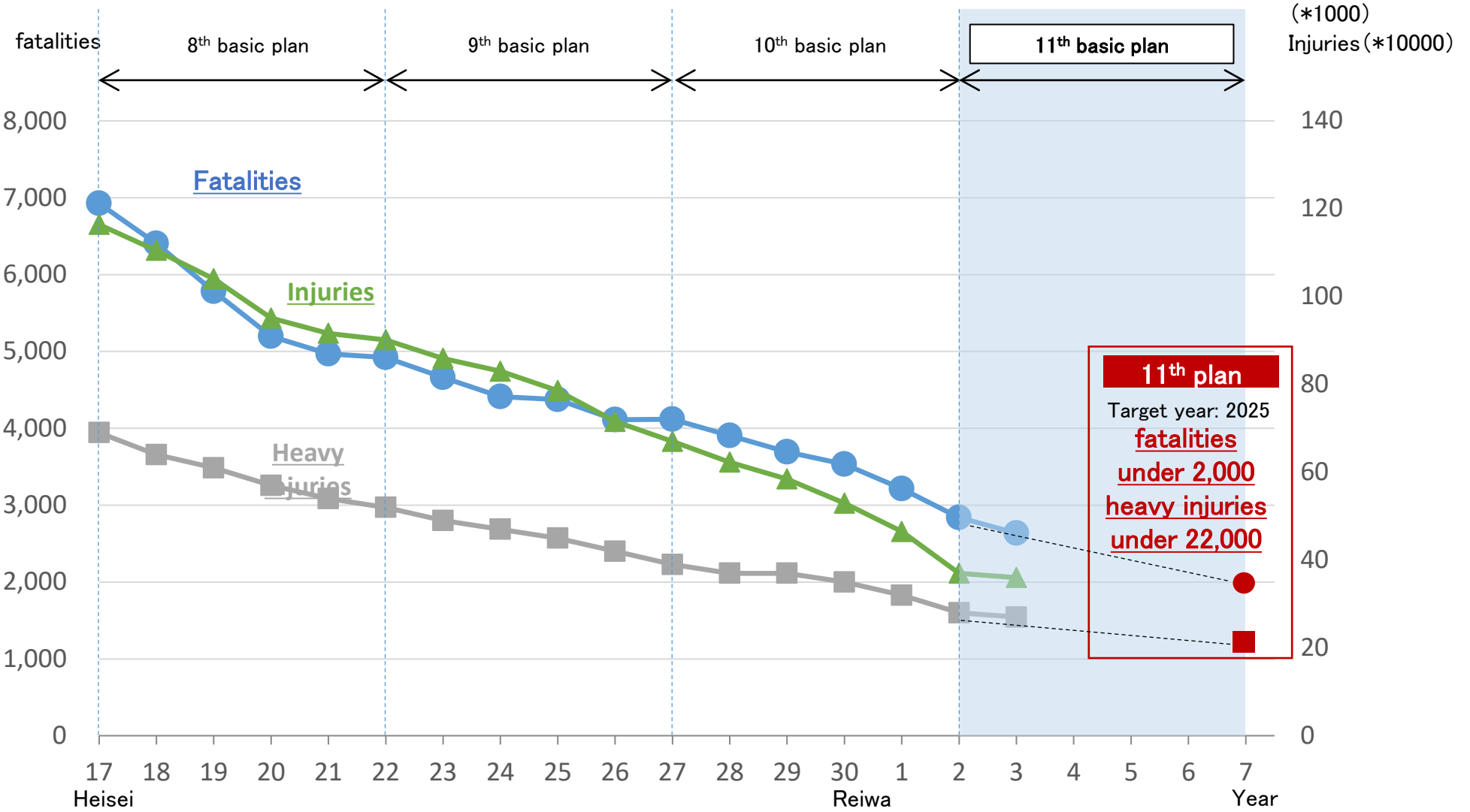


2021 fatalities: 2,636 heavy injuries 27,204 injuries: 364,767 accidents: 305,196

Source: National Police Agency

- We revised our basic plan in March 2021 for further reduction of traffic accidents.
- We set a target for reducing to under 2,000 of fatalities and 22,000 of heavy injuries by 2025.

Our target in the basic plan of countermeasure of traffic safety



- The number of fatalities in Japan is reducing, but the fatalities in the world is still increasing. There are over 1.35 million fatalities a year in the world.
- Japan wants to contribute for traffic safety in the world.

UN-WHO: 2nd Decade of Action for Road Safety

- The recent numbers of traffic accident are over **1.35 million of fatalities**, 500 million of injuries. The 90% of them is from low and middle income countries. **Traffic accident is one of the biggest reason of losing life of young persons**, 5 to 29 years old.
- Considering such situation, UN decided to designate 2021-2030 as “2nd Decade of Action for Road Safety” in August of 2020.
- UN set a target to reduce fatalities and injuries to at least 50% during 2021-2030.

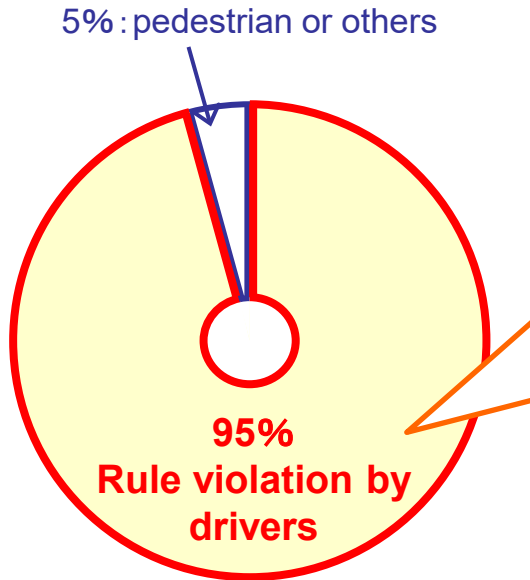
Global Plan for the Decade of Action for Road Safety 2011-2020

- ◆ 5 main pillars of traffic safety
 - ① Road safety management
 - ② Safer roads and mobility
 - ③ Safer vehicles
 - ④ Safer road users
 - ⑤ Post-crash response

http://www.who.int/roadsafety/decade_of_action/plan/plan_english.pdf?ua=1

- 95% of all accidents with fatalities are caused by “rule violation by drivers”
- We can expect ADS to prevent most of accidents caused by drivers violation.
- In addition, ADS can give a big impact for helping the elderly transportation, mitigating traffic jam, enhancing productivity etc..

Cause of accidents with fatalities(2021)



『令和4年版交通安全白書』より

Expected impact by ADS

交通事故の削減

自動で周辺車両や前方の状況を確認して危険を回避してくれるので安心だね！

高齢者等の移動支援

自動運転のお陰で遠出も可能になり行動範囲が広がったよ。

渋滞の解消・緩和

渋滞時でも自動で最適な車線、車間を選んでくれるのでスムーズに走れるよ！

生産性の向上・少子高齢化への対応

トラックドライバーの約4割が50歳以上

出典：総務省「労働力調査」(平成27年)

(地方部を中心に) 移動手段が減少

路線バスの1日あたり運行回数 (1970年を100とした指数)

国際競争力の強化

国内輸送の更なる効率化

パッケージ化

技術・ノウハウに基づく国際展開

- The government of Japan set targets and scenario related to ADS, in its strategy of “Public – Private ITS Concept Road Map”
- This Road Map describes some targets and scenario until 2025 for realizing high-level ADS.

〈Out line of targets and scenario〉

	Level	Expecting technology (example)	Target time for market
Owner car	Level 2	Driving assist on city road	Until 2020
	Level 3	ADS on highway	About 2020
	Level 1,2	Enhanced system of driving assist	First half of 2020s
	Level 4	ADS on highway	About 2025
Cargo service	-	Truck platooning with user on highway	Until 2021
		Truck platooning without user on highway	After 2022 f.y.
	Level 4	ADS trucks on highway	After 2025
Passenger service	Level 4	Passenger service by ADS without user in limited area	Until 2020
	Level 2 or higher	ADS or Driving assist system of Bus/Coach on highway	After 2022

Bus with remote management or operation

国内初、大型バスの遠隔監視・操作による自動運転を営業運行で実施する公道実証

- 主体： 相鉄バス、群馬大学 等
- 場所： 神奈川県横浜市
- 時期： 2020年10月



※相鉄バスHPより

Experiment on BRT road

JR気仙沼線(廃線跡のBRT専用道)での、大型バスによる公道実証

- 主体： JR東日本、先進モビリティ 等
- 場所： JR気仙沼線
- 時期： 2019年1月～



※JR東日本HPより

Middle size Bus

中型バスを使用した、地元運行事業者による公道実証

- 主体： 産総研、先進モビリティ等
- 場所： 全国5か所 (滋賀県大津市等)
- 時期： 2020年7月～2021年3月



Vehicle without steering wheel

自動運転を前提に設計されたハンドルなどが無いバスの公道実証

- 主体： BOLDLY 等
- 場所： 東京都千代田区 茨城県境町 等
- 時期： 2019年7月～
※2020年11月より茨城県境町において事業開始



※BOLDLY HPより

Small cart

小型カートを用いた遠隔型自動運転システムの公道実証

- 主体： 産総研、先進モビリティ等
- 場所： 福井県永平寺町、沖縄県北谷町 等
- 時期： 2017年12月～



※2020年12月より福井県永平寺町において、2021年3月より沖縄県北谷町において事業開始

Taxi with 5G telecommunication

5Gを活用した自動運転タクシーの公道実証

- 主体： ティアフォー 等
- 場所： 東京都新宿区
- 時期： 2020年11月、12月



※ティアフォー HPより

First approval of Level3 ADS in Fukui pref.

- In March 2021, we approved Level 3 for the vehicle using in the experiment in Eiheiji of Fukui pref.
- That ADS detects pedestrians, bicycles and objects, and goes following the electromagnetic wire buried in the road.

First approval in Japan as level 3 ADS



Communicate



Special number Plate



Remote Operation Room

Name: ZEN drive Pilot

- MLIT has made a guideline, national vehicle law, technical requirement, international regulation related to Level3 ADS.
- In November 2020, we type-approved Level3 ADS. And that car started to be sold in March 2021.

Type-approval of Level 3 ADS

自動運行装置の構成

外界認識（車両周辺）

- カメラ
- レーダー
- ライダー

自車位置認識

- ・高精度地図
- ・全球測位衛星システム（GNSS）

ドライバー状態検知

- ・ドライバーモニタリングカメラ

自動運行装置に必要な対応・装備

- ・サイバーセキュリティ
- ・ソフトウェアアップデート
- ・作動状態記録装置
- ・外向け表示（ステッカー）

機能冗長化

- ・電源系統
- ・ステアリング機能
- ・ブレーキ機能



※Source: Honda

- International harmonized requirement is essential part for realizing ADS. WP.29 is only one and the most important party for discussing international requirement of vehicle.
- Japan has been contributing the activities in WP29.

International regulation related to ADS

Level 0, 1, 2

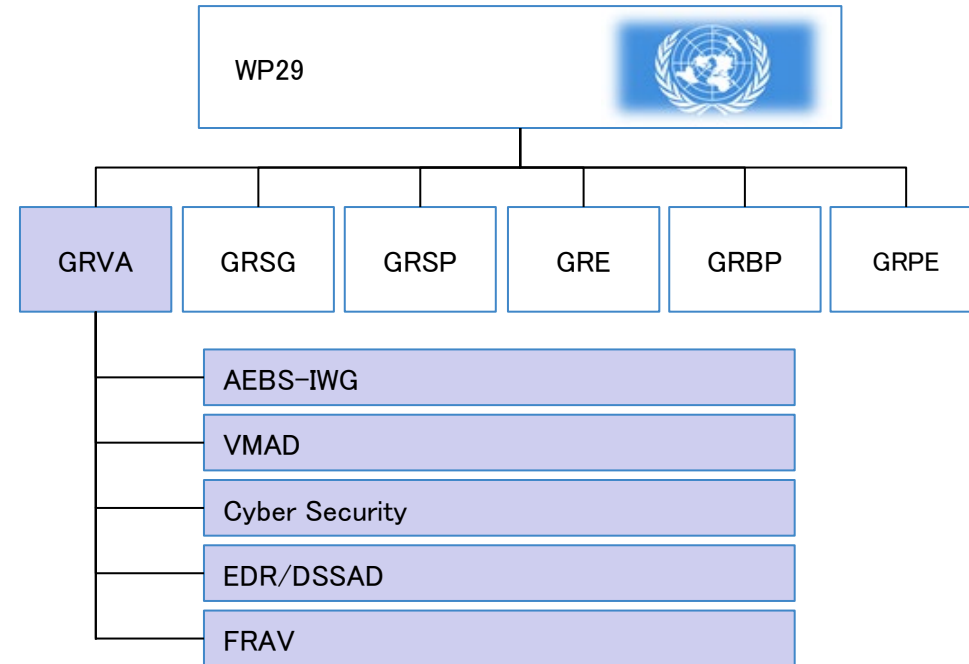
- AEBS
- Automated parking
- ADAS hands-on (LKAS / ACSF)



Level 3

- 【2020, June】
- ALKS (under 60km/h, within one lane)
- 【2021, Nov】
- Scope extension to all N and M
- 【2022, June】
- Max speed extension (under 130km/h)
- Lane change be permitted

UN WP29



- The amendment of traffic law for realizing automated driving without driver was adopted in last national Diet in Japan.
- We expect that automated driving can be achieved safely by collaborating hardware(vehicle) and software(operator).

Amendment of Traffic law

(1) Approval for driverless ADS

- Defining “driverless ADS” as automated driving without driver
- Service provider of driverless ADS shall be approved by local police agency

(2) Operator of driverless ADS

- Operator of driverless ADS shall use ADS according to approved rule.
(number and placement of remote operators, education for remote operators e.t.c.)

(3) Treatment in case ADS cannot manage

- Service provider shall treat incidents which ADS itself cannot manage, by remote operators

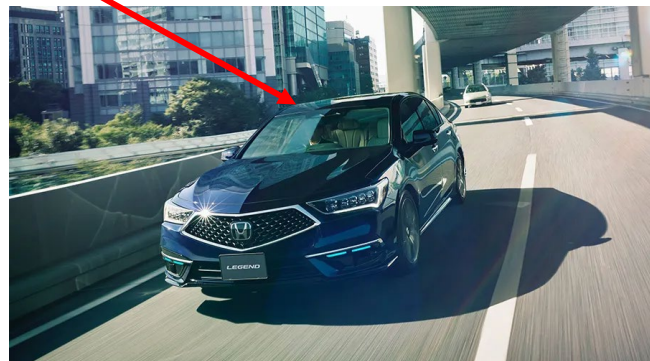
(4) Enforcement by authority

- Local police agency can indicate or cancel the approval in case service provider violated a rule.
- Head of police official can stop the approval in case accidents happened.

- In Japan, we ask vehicle with level3 ADS to put a sticker on its backside, in order to inform surrounding traffic participants that this vehicle has ADS.
- It would be better to inform whether ADS is ON or OFF, rather than this vehicle has ADS or no
- In WP.29 as well, we are discussing the necessity and requirement of external HMI (light, audible device). I hope we can find a proper way for external HMI for securing traffic safety



Image of sticker
(more than 95mm × 100mm)



Thank you for your attention.