

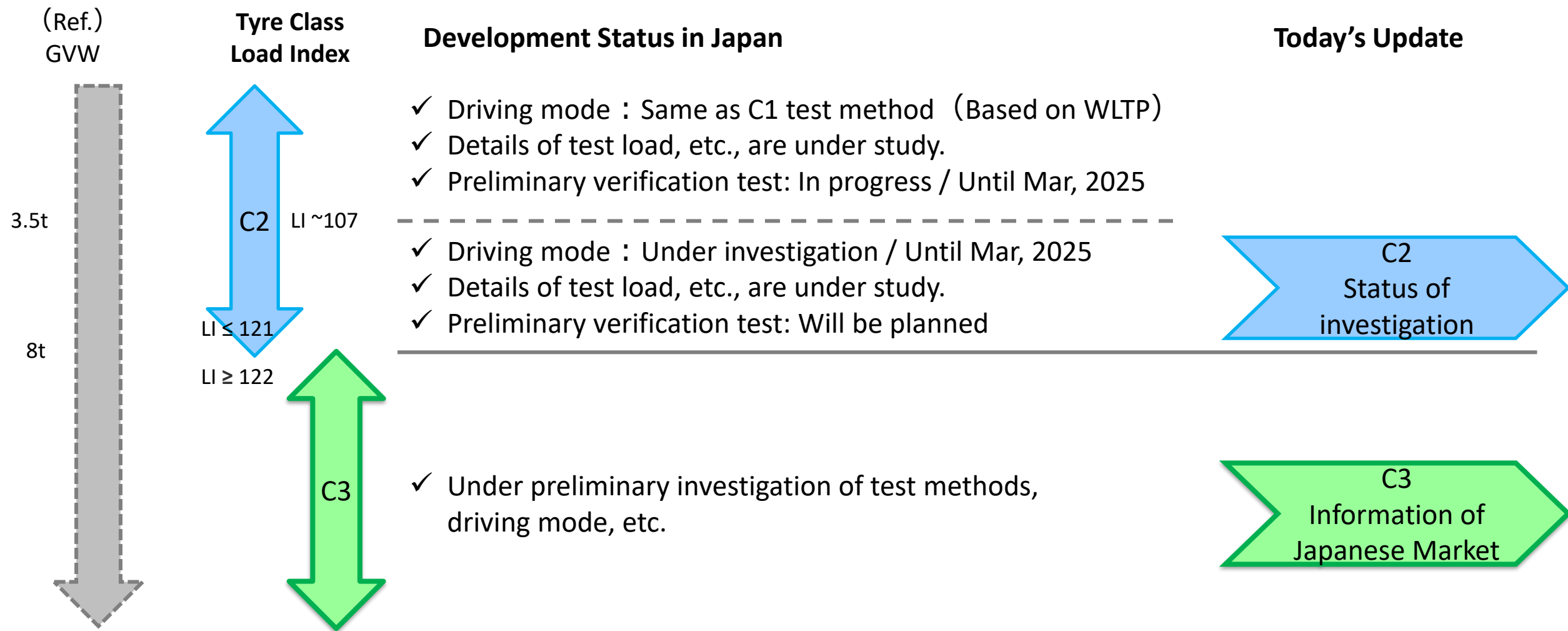
# Development of Abrasion Test Method for Commercial Vehicle Tyres

Sep 6<sup>th</sup>, 2024

26<sup>th</sup> TF TA

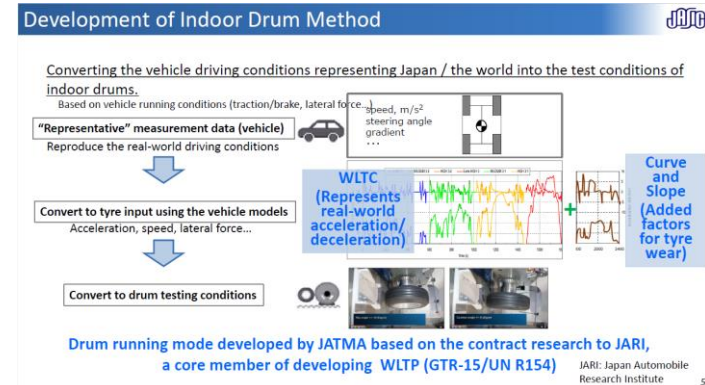


JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER



- **Develop test methods by taking the same approach as the C1 test method**

- ✓ Obtain real-world driving data
- ✓ Use vehicle model and convert to input for tyres
- ✓ Conversion to drum input conditions



- **Measure inputs on representative driving routes (same approach as C1 test method)**

- ✓ Drive on routes used in the development of the WHVC (World Harmonized Vehicle Cycle)
- ✓ Drive on routes with representative curves and slopes that are crucial for tyre abrasion

- **Frequency of forces to tyre (longitudinal, lateral, and vertical force)**

- ✓ Research in progress, contracted to JARI

Vehicle : Max. load capacity 3t class  
Front axle :single tyre  
Rear axle :dual tyres  
Tyre size: 205/85R16 LT



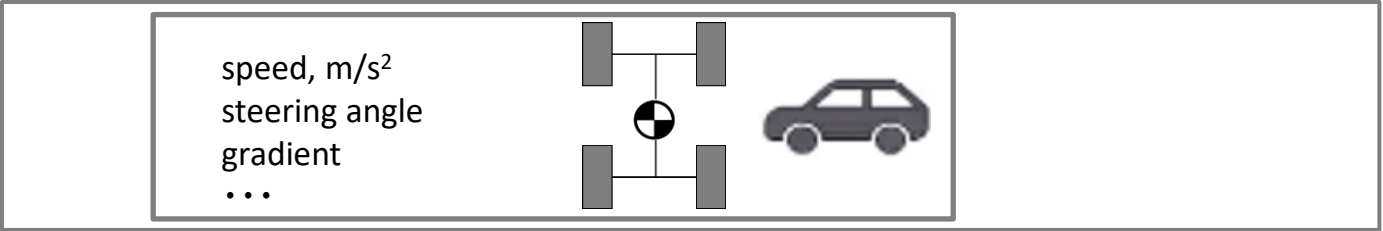
\*JARI: Japan Automobile Research Institute

**Study test conditions with the same approach as for the C1 test method**

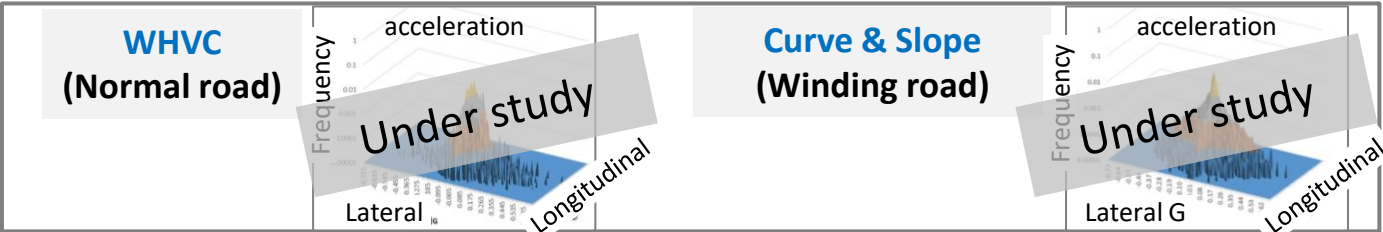
## Force mode Concept

- ◆ Drum running mode based on **WHVC**
- ◆ **“Curve and Slope”** running mode is added as lateral force is a necessary element for tyre abrasion

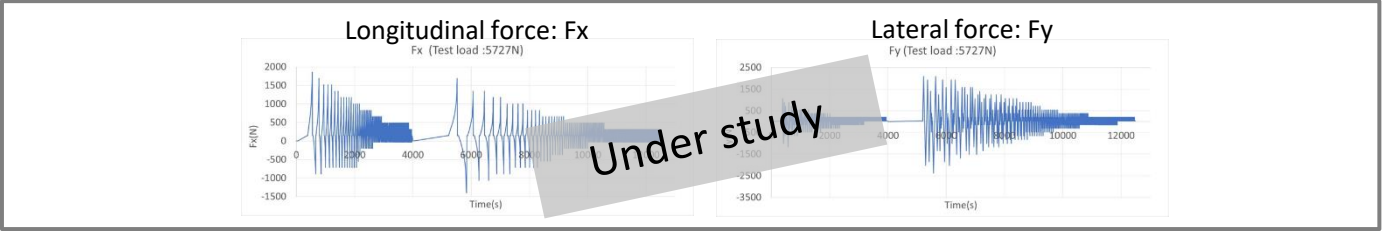
**Measurement Vehicle data**  
\*selecting representative public road



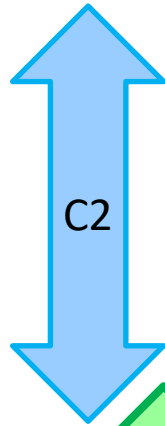
**Conversion to tyre input acceleration**  
\*using the vehicle models



**Conversion to drum testing conditions**



- ✓ Drum running mode developed by contract research to JARI
- ✓ Converting the vehicle driving conditions representing the world into the test conditions of indoor drums



Mini van/mini truck: 2 axles, 4 tyres of same size



Light van : 2 axles, 4 tyres of same size



Light / Medium-duty trucks : 2 axles, dual tyres on rear axle 6 tyre of same size



Both C2 and C3 are used

C2 size is mainly used up to maximum loading capacity of 2 t,  
while the GVW 8 t vehicle uses C3 size, 225/80R17.5 123/122L

Heavy-duty trucks : Wide range of settings

i.e. 2 axles, 3 axles, 4 axles, front 2 axles, rear 2 axles,  
different size front and rear, etc.



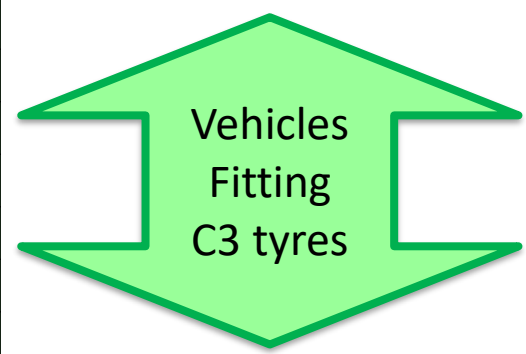
## Number of trucks by weight

Vehicle Weight	Number
≤500kg	4,824
501~1,000kg	37,220
1,001~1,500kg	1,359,370
1,501~2,000kg	1,264,473
2,001~2,500kg	737,752
2,501~3,000kg	704,088
3,001~4,000kg	586,509
4,001~5,000kg	428,312
5,001~6,000kg	264,474
6,001~7,000kg	120,256
7,001~8,000kg	122,082
8,001~9,000kg	32,442
9,001~10,000kg	51,062
>10,001kg	438,673
<b>Total</b>	<b>6,151,537</b>

## Top 5 sizes of C3 tyres sold in Japan

11R22.5
245/70R19.5
225/80R17.5
275/80R22.5
265/70R19.5

\*JATMA survey(non-public information)



\*Automobile Inspection & Registration Information Association  
"The Number of Motor Vehicles Owned"

**After development of the C2 tyre test method is completed,  
the abrasion test method of C3 tyre will be developed.**