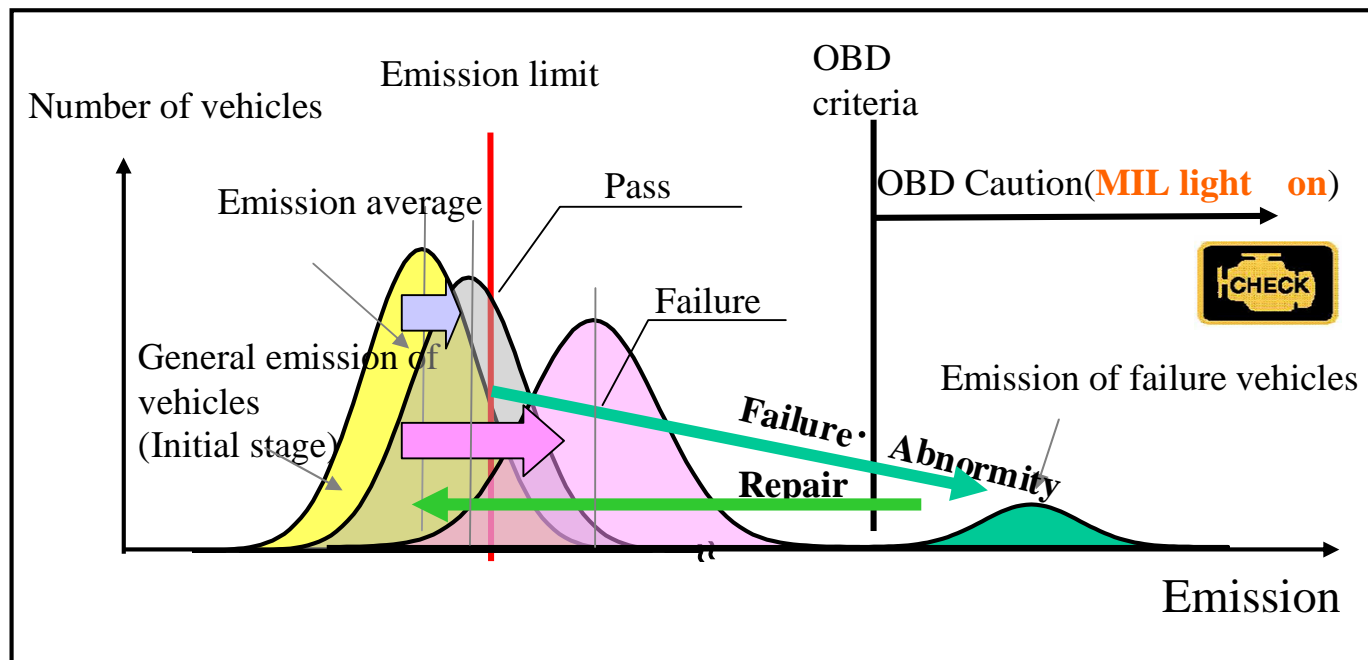


How to Face the Challenge of Compliance Management

TTCC [Toyota Technical Center China]
Regulatory&Technical Affairs Div.

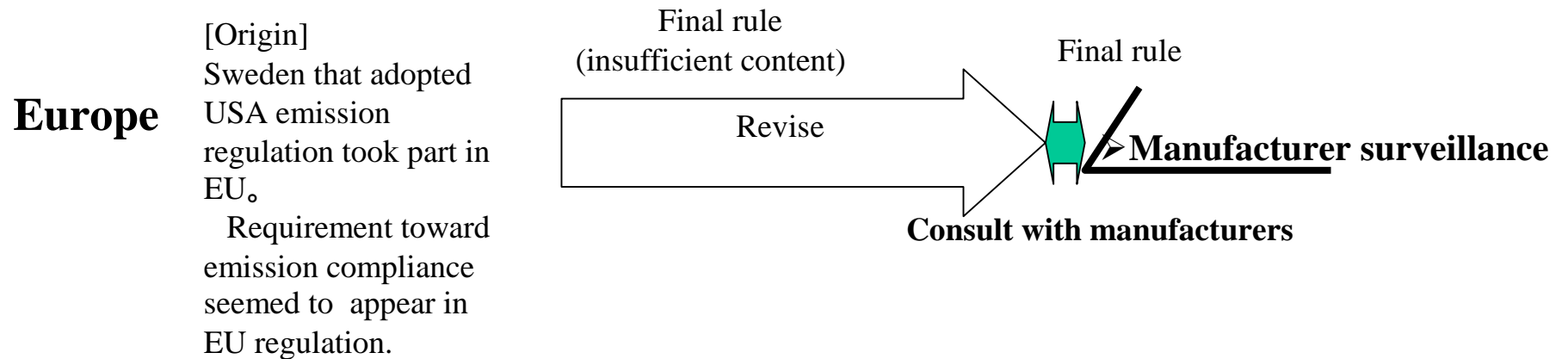
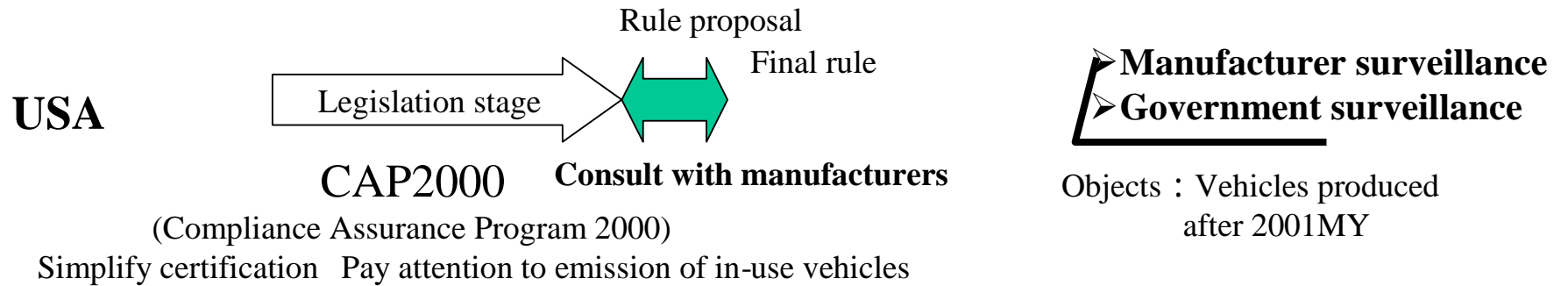
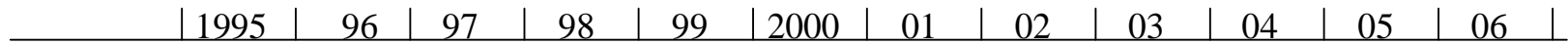
For the Emission Compliance

- Certification vehicles : Confirm the emission performance before mass-production
- Average emission of a vehicle family limit value . . . Pass
- Average emission of a vehicle family $>$ limit value . . . Failure
- The system and components failure causing enormous excess emission : Detected by OBD



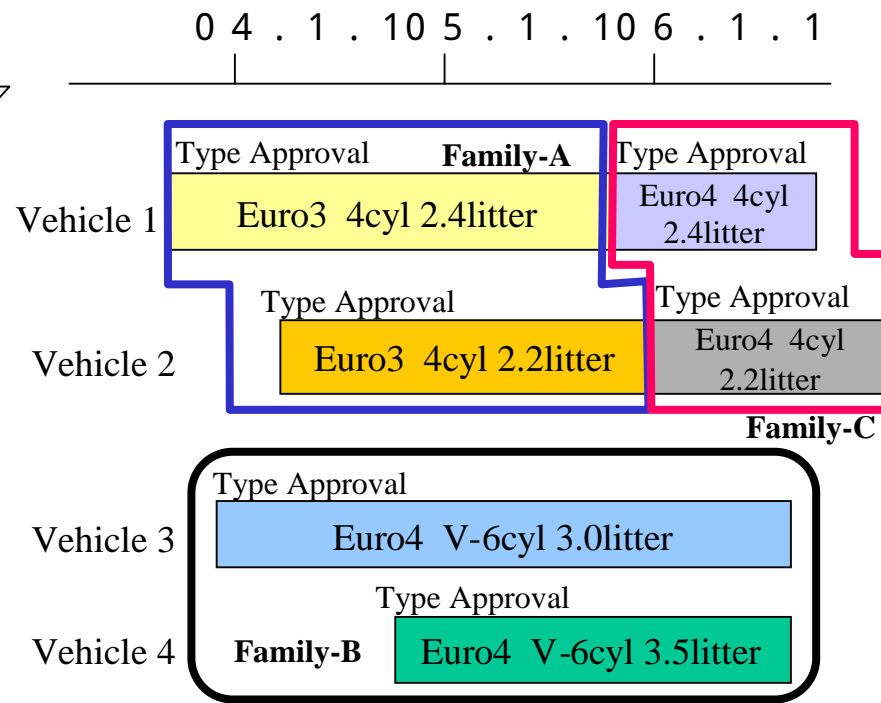
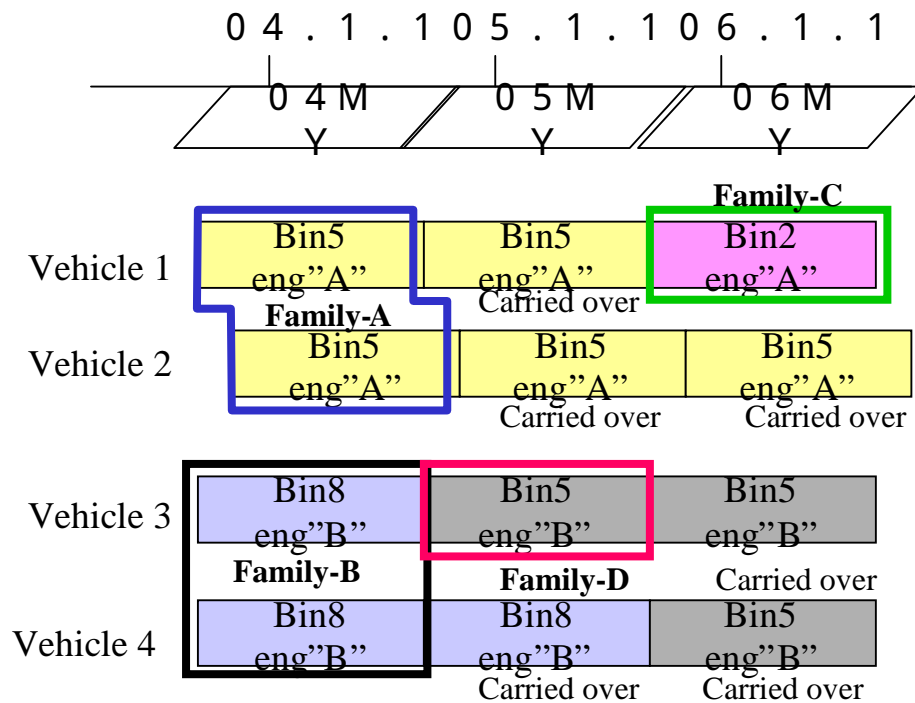
To assure emission performance of in-use vehicles, the emission performance of the group should be analyzed, and might give a feedback to the development if necessary.

History of In-use Surveillance in USA and Europe **TTCC** TOYOTA TECHNICAL CENTER CHINA



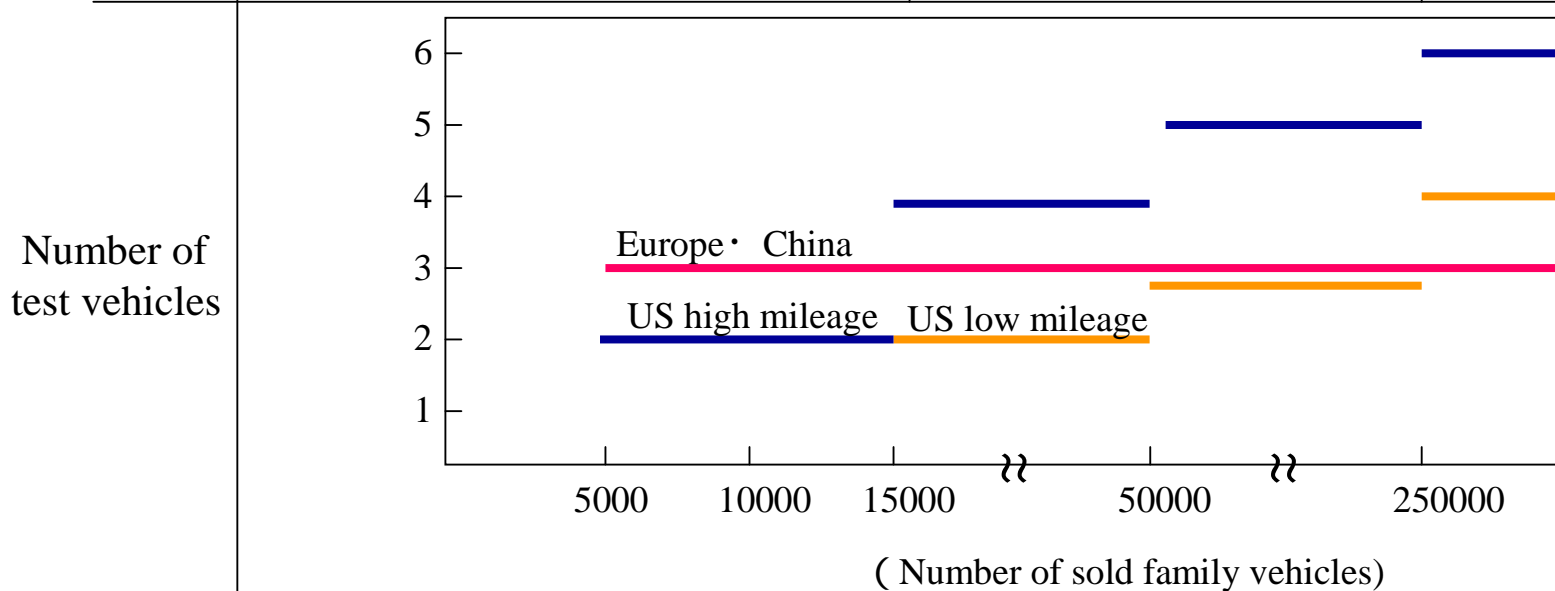
【Manufacturer's surveillance】

	USA	Europe	China GB
Definition of vehicle families	<ul style="list-style-type: none"> ▣ Identical family ▣ ➤ Identical emission standard ➤ Identical engine type 	<ul style="list-style-type: none"> ▣ Identical family ▣ ➤ Identical emission standard ➤ Identical number of engine cylinder ➤ Difference of displacement < 30% ➤ Other (fuel delivery system, turbo charged) 	

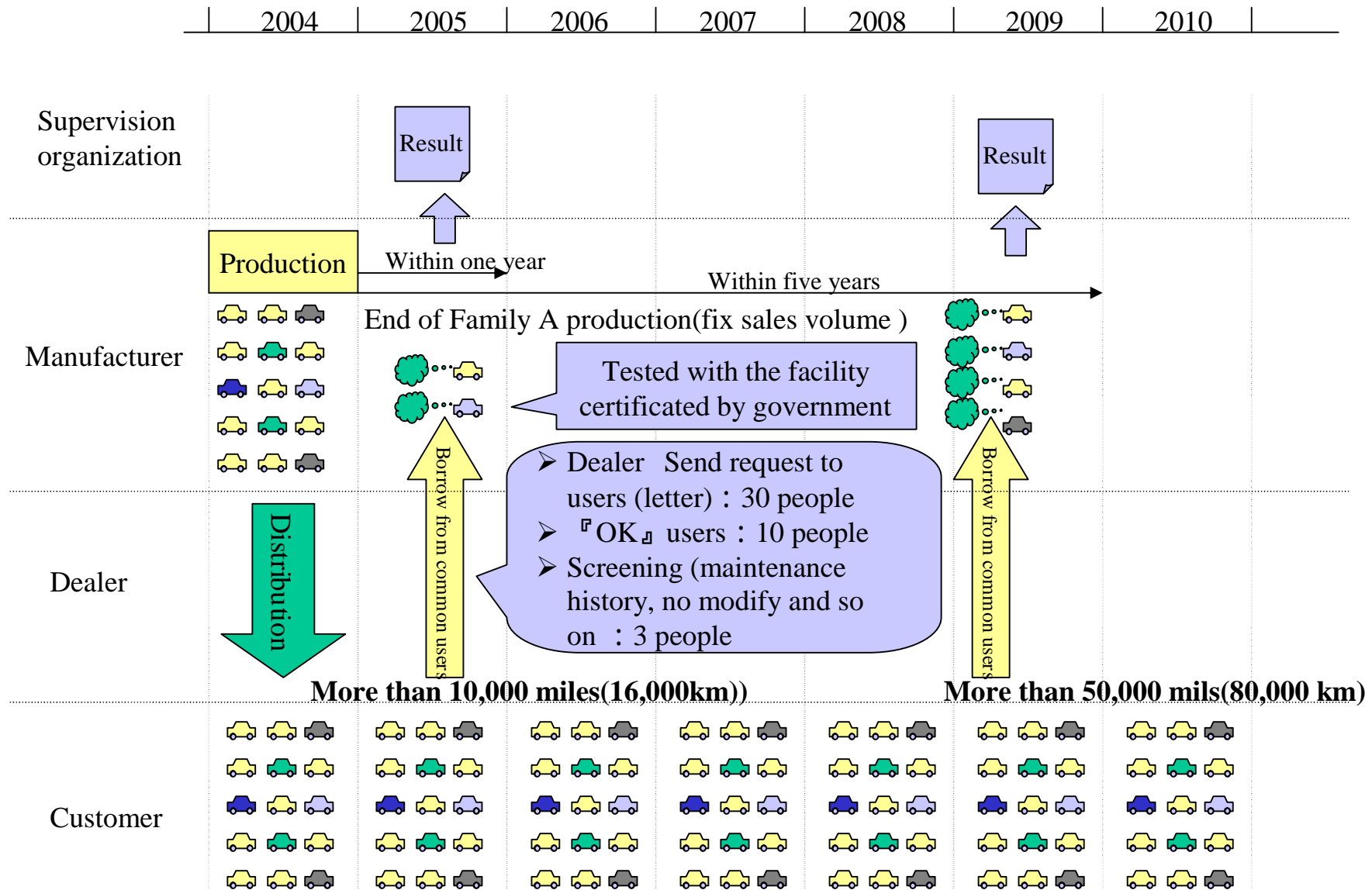


【 Manufacturer’s surveillance 】

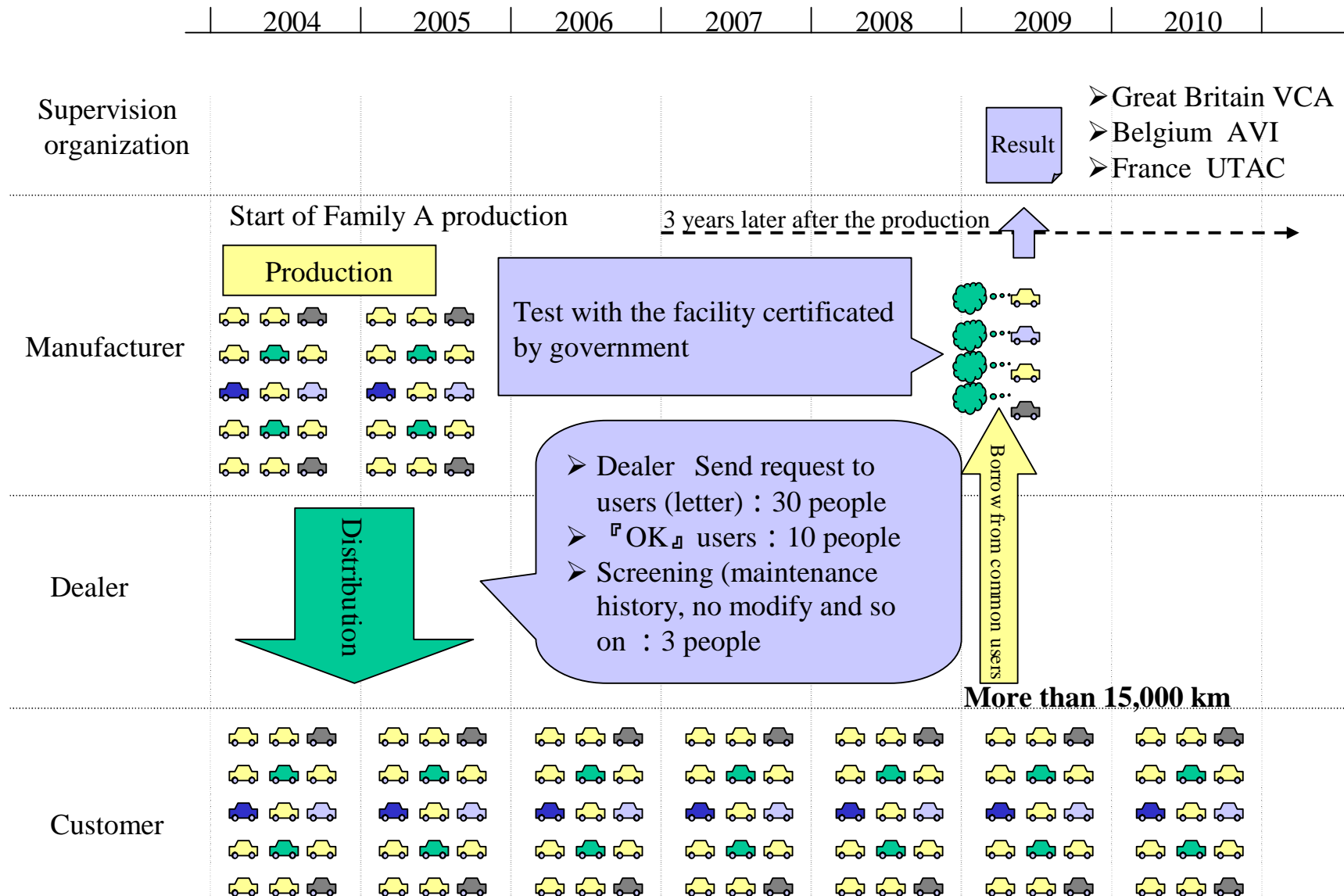
	USA	Europe	China GB
Timing and mileage	<p>Low mileage vehicles Vehicles with more than 10,000 miles (16,000 km) mileage in one year after the end of production</p> <p>High mileage vehicles Vehicles with more than 50,000 miles (80,000 km) mileage in five years after the end of production</p>	<p>Vehicles with more than 15,000 km mileage</p> <p>There is no requirement for surveillance timing Toyota implements after three years of the end of production</p>	<p>➤ More than 15,000 km or six months, and within 80,000 km or five years</p>



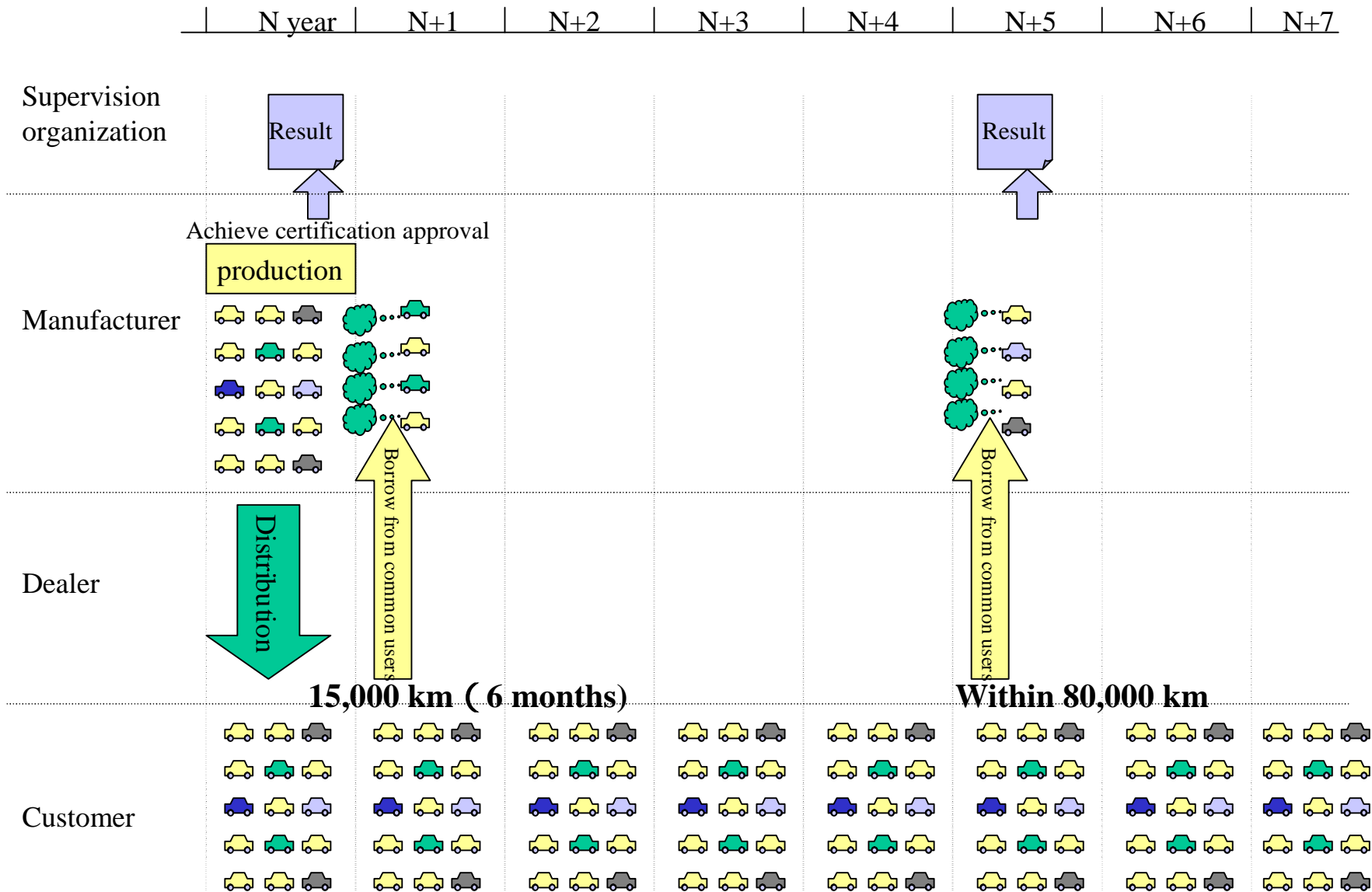
Manufacturer's Surveillance in USA



Manufacturer's Surveillance in Europe



Manufacturer's Surveillance in China



【 Manufacturer's surveillance 】

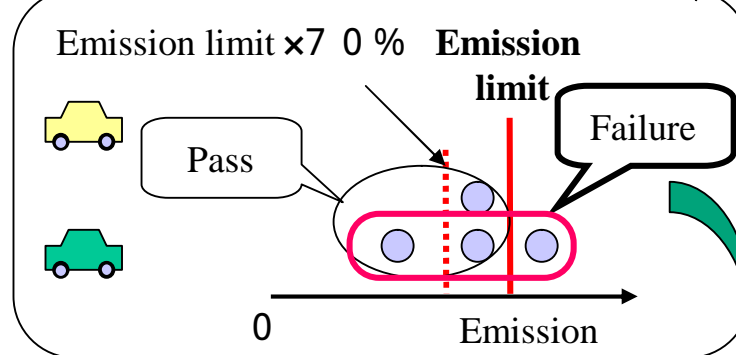
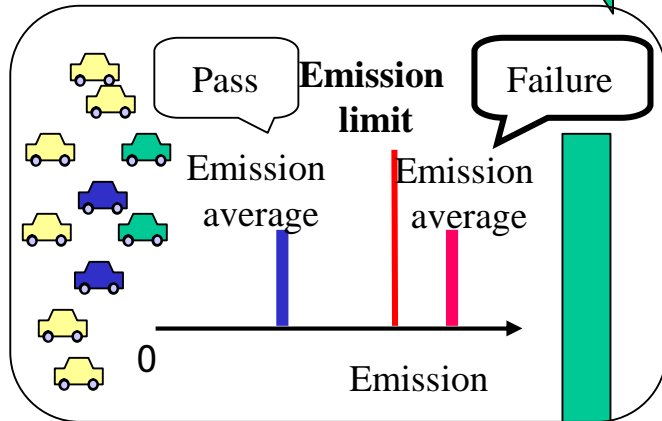
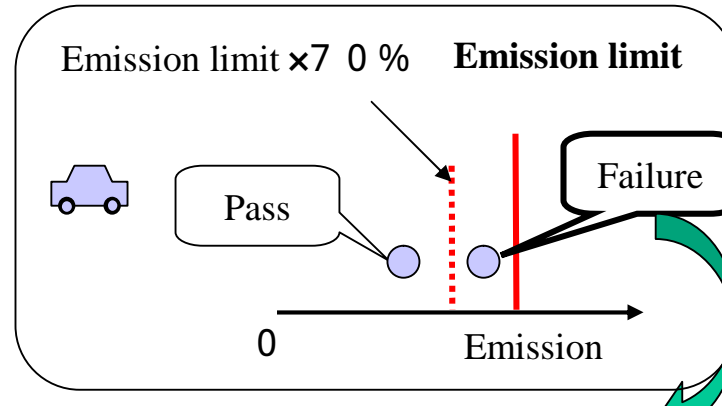
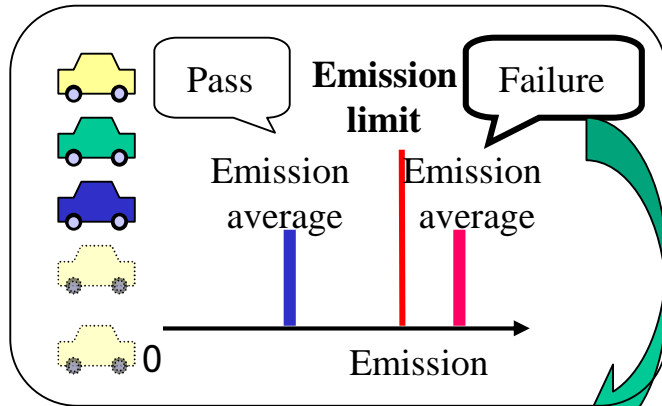
	USA	Europe	China GB
High emission vehicles	<p>Emission limit limit × 1.3</p> <p>➤ Emission of 50% of a family vehicles > limit and ➤ Emission average > limit × 1.3</p>	<p>Emission limit</p> <p>➤ Emission of a family vehicles > limit</p>	<p>Emission limit</p> <p>➤ Emission of a family vehicles > limit</p>
Additional test on high emission vehicles	<p>Additional test on more than 10 vehicles</p>	<p>Additional test on no more than 17 vehicles</p>	

【 Compliance surveillance carried by supervision organization 】

USA(EPA)

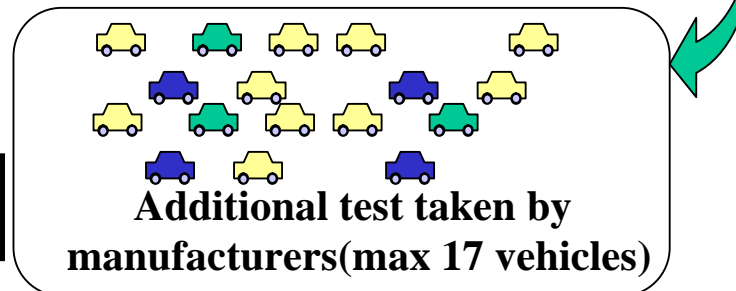
Europe(Only VCA)

China GB



Not determined yet

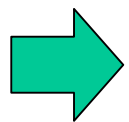
Decide to recall or not



Emission standard and fuels standard

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Europe	Emission	Euro 2		Euro 3				Euro 4				
	Fuels	500ppmS		150ppmS				50ppmS				
US California	Emission	LEV						LEV- II				
	Test fuels	Max. 80ppmS						Max. 60ppmS		Max. 30ppmS		
	Market fuels	Max. 80 ppmS										
US Federation	Emission	Tier 1		NLEV				Tier II				
		NLEV (一部州)										
	Test fuels	Max. 1000ppmS (350ppmS)						Max. 300ppmS		Max. 80ppmS		
Market fuels	Tier 1 (90ppmS), LEV (40ppmS)						15- 80ppmS					

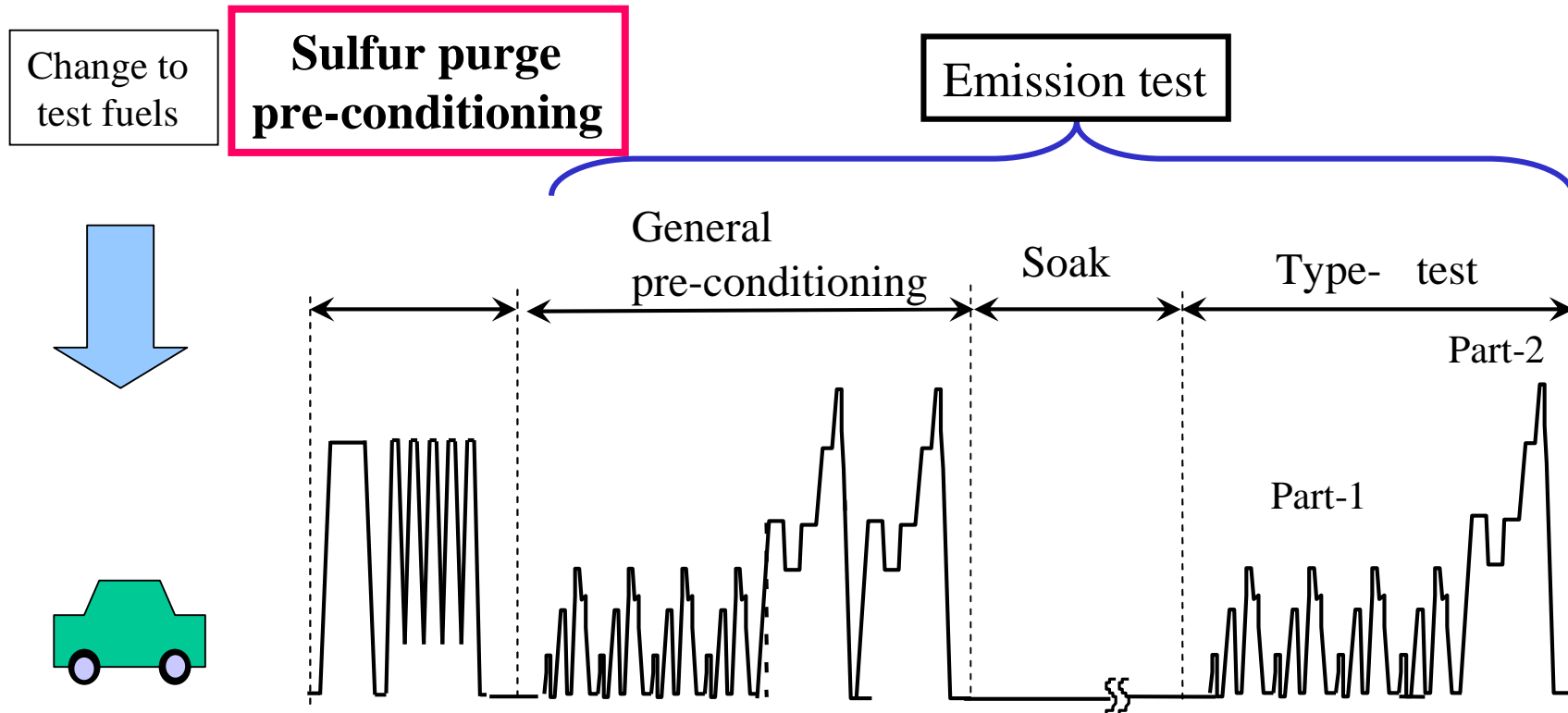
USA : Some requirements in emission standard and fuel standard(Content of Sulfur) are not in the same phase.



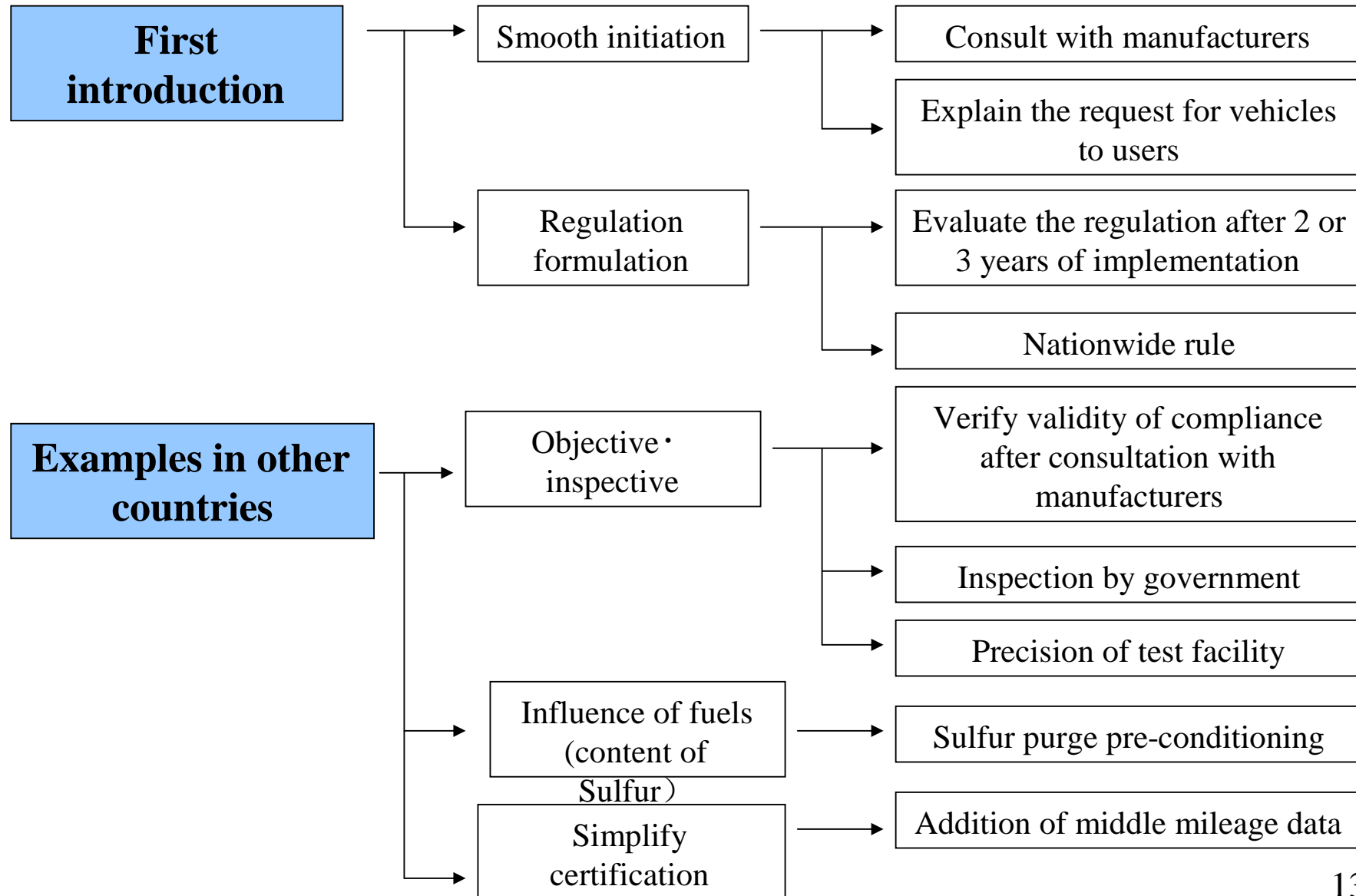
In USA, sulfur purge pre-conditioning has been approved as a rule in order to eliminate the influence of sulfur in fuels.

Sulfur Purge Pre-conditioning

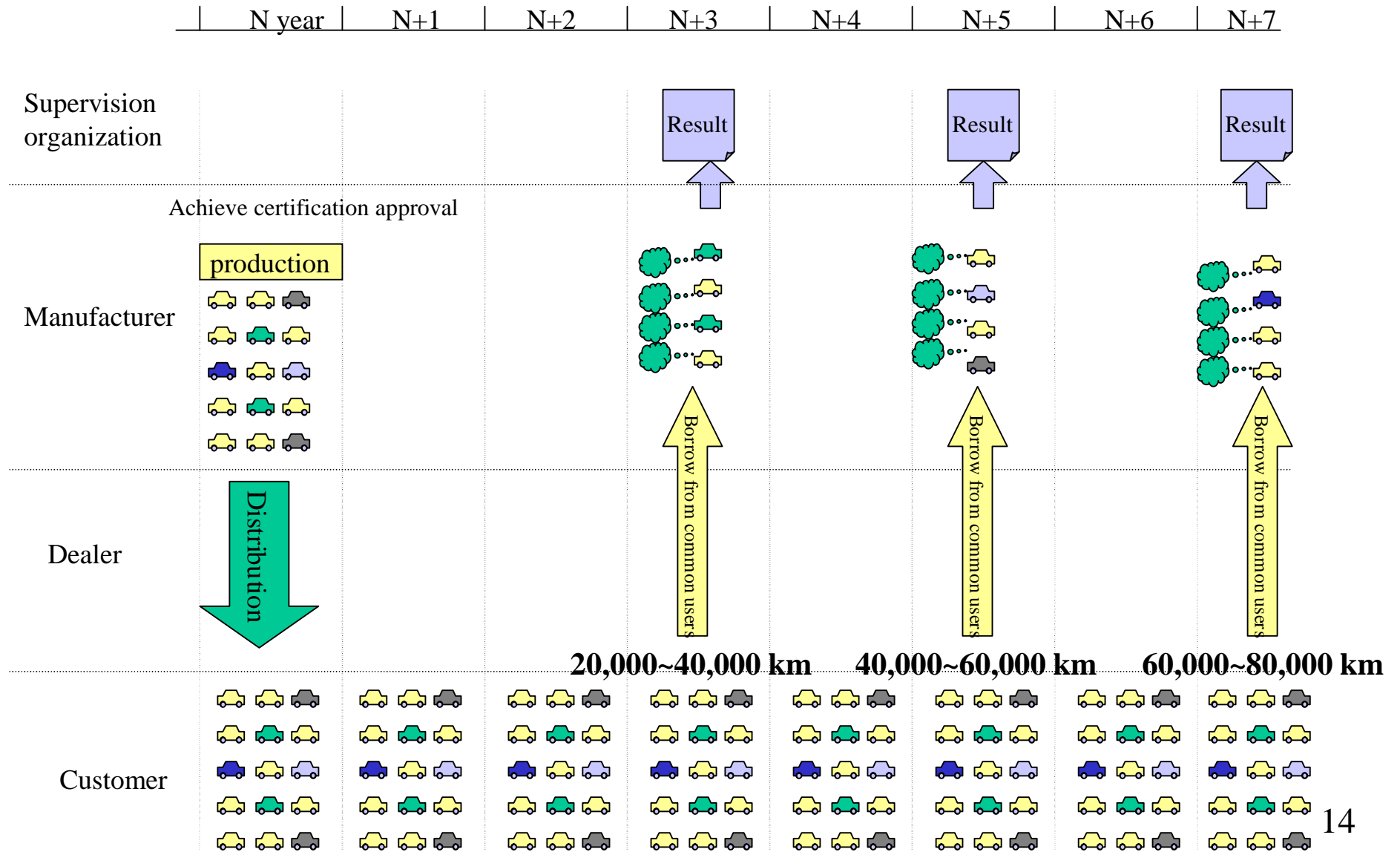
【 High load in operation 】



Emission performance can be analyzed through eliminating the influence of sulfur.



Proposal of Manufacturer's Surveillance in China **TTCC** TOYOTA TECHNICAL CENTER CHINA

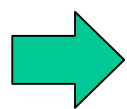


Emission standard and fuels standard

		2006	2007	2008	2009	2010	2011
Beijing	Emission	Euro 3		Euro 4			
	Sulfur	150ppmS		Max.50ppmS			
Guangzhou	Emission	Euro 2	Euro 3		Euro 4 ?		
	Sulfur	500ppmS	Max.150ppmS		Max.50ppmS ?		
nationwide	Emission	Euro 2		Euro 3		Euro 4	
	Sulfur	500ppmS		Max 150ppmS		50ppmS	

(In GB18352.3-2005, content of Sulfur has been regulated as III:150ppm, IV:50ppm).

In a similar way, some requirements in emission standard and fuel standard(Content of Sulfur) are not in the same phase(territory diversity)



Situation is similar to the USA's.

So the cause might be identified to be in vehicles or in fuels, by eliminating the sulfur influence.