

Opinion on WHVC mode

The Result of HYBRID Vehicle
following using chassis dyno.

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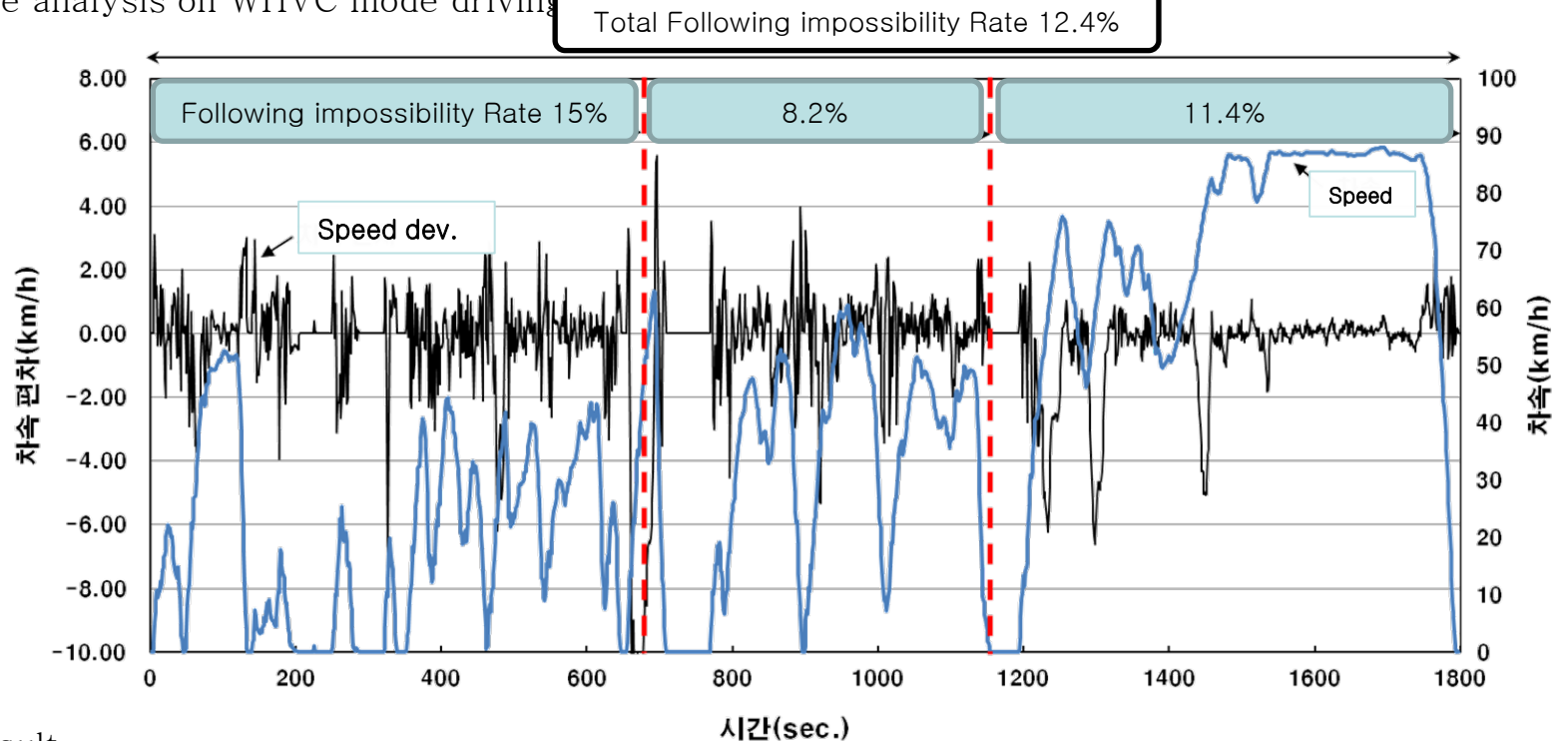
■ The Result of HYBRID Vehicle following

Object

The evaluation of Hybrid Vehicle following on WHVC mode which is developing in HDH using C/D
- To reflect the characteristic of Hybrid vehicle that manufactured in KOREA

Content

1. The analysis on WHVC mode driving



2. Result

- 1) Following impossibility Rate of WHVC urban is 17.9%(cold), 15%(hot) ; Not possible to evaluate
- 2) Specially difficult to follow the acceleration after gear shifting and the reacceleration after deceleration
- 3) Stop rate is different, WHVC 13%, KOREA local 20~30%

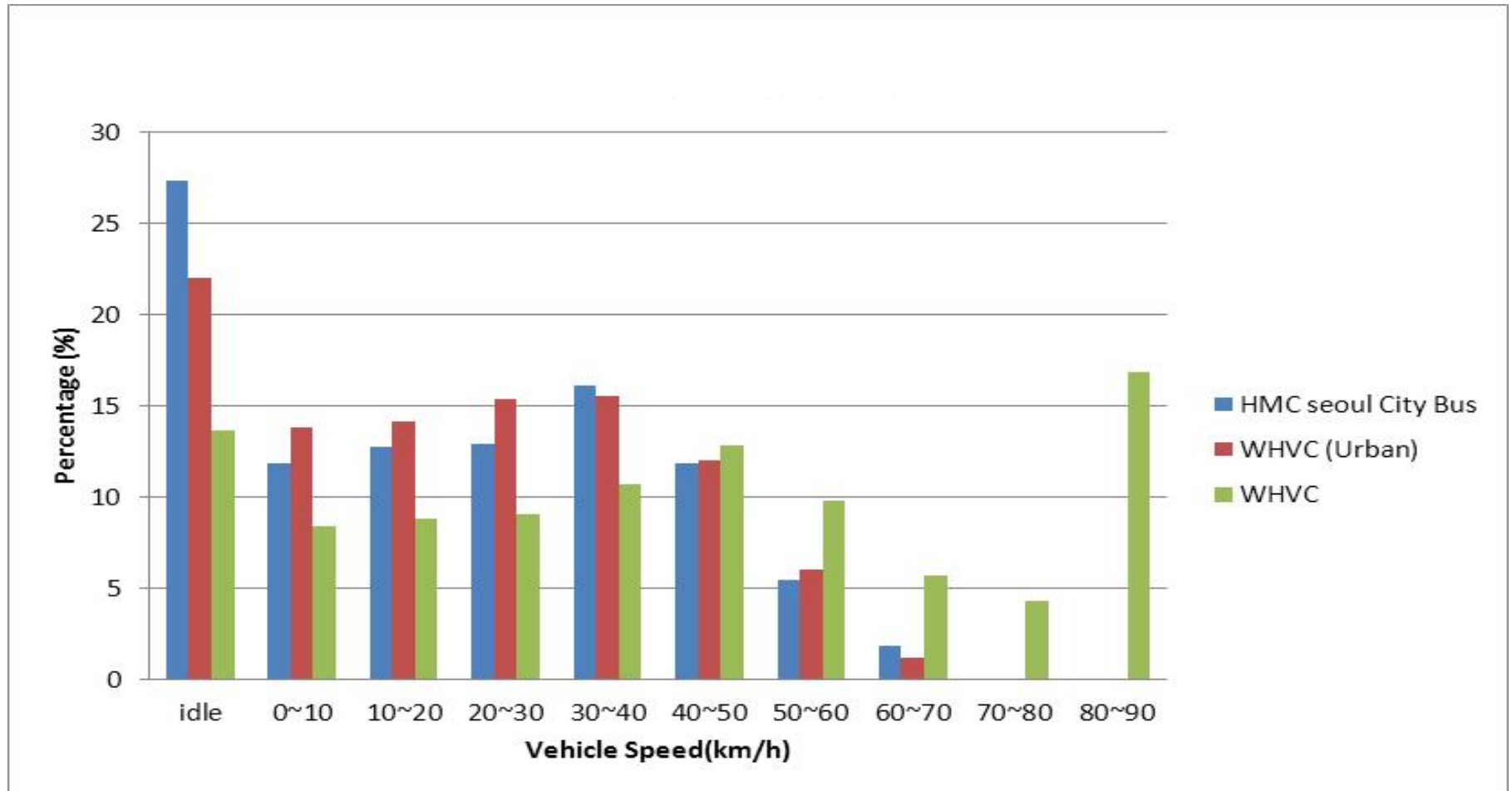
conclusion

1. WHVC mode is inconsistent to evaluate the Hybrid vehicle
2. Necessity of Supplement for acceleration and reacceleration period after deceleration.

■ attach #1 : vehicle specification

items		Non-step bus	note
		Hybrid urban bus	
Vehicle No		LHEV#03	
ENGINE	MODEL	G-CNG	
	displacement (ℓ)	6.4	
	power (ps/rpm)	240 / 2,500	
	torque (kgm/rpm)	90 / 1,400	
drive motor	max / rated power (ps)	81 (60kW) / 40 (30kW)	
	max / rated torque (kgm)	58 / 29	
Battery	Rated voltage / capacity	380V / 3.8kwh	
T/M	MODEL	DYMOS T120S6	
	1 st step	6.552→ (37.61)	
	2 nd step	4.382→ (25.15)	
	3 rd step	2.671→ (15.33)	
	4 th step	1.612→ (9.25)	
	5 th step	1.000→ (5.74)	
	6 th step	0.711→ (4.08)	
R/AXLE RATIO		5.74	
TIRE	MODEL	275/70R 22.5	
	Dynamic radius (m)	0.470	
Empty vehicle weight (kg)		11,850	
Standard curve weight (kg)		14,990	

■ attachment #2 : comparison of the vehicle speed distribution according the test modes

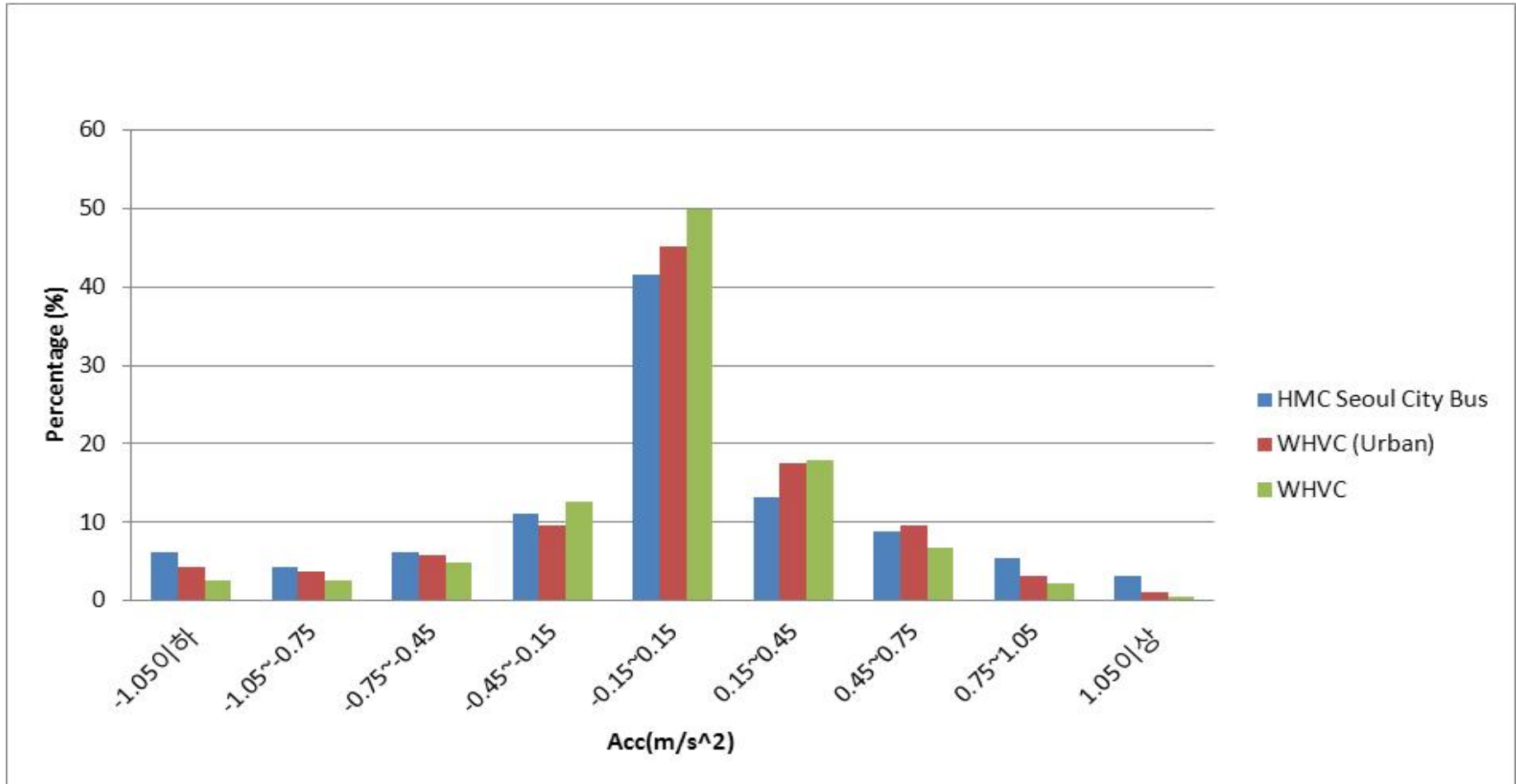


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1. idle stop rate is different (HMC : 27%, WHVC urban : 22%, WHVC : 13%)

2. avg. speed is similar, distribution is different (HMC 21.4km/h, W-urban 20.5, WHVC 40.1)

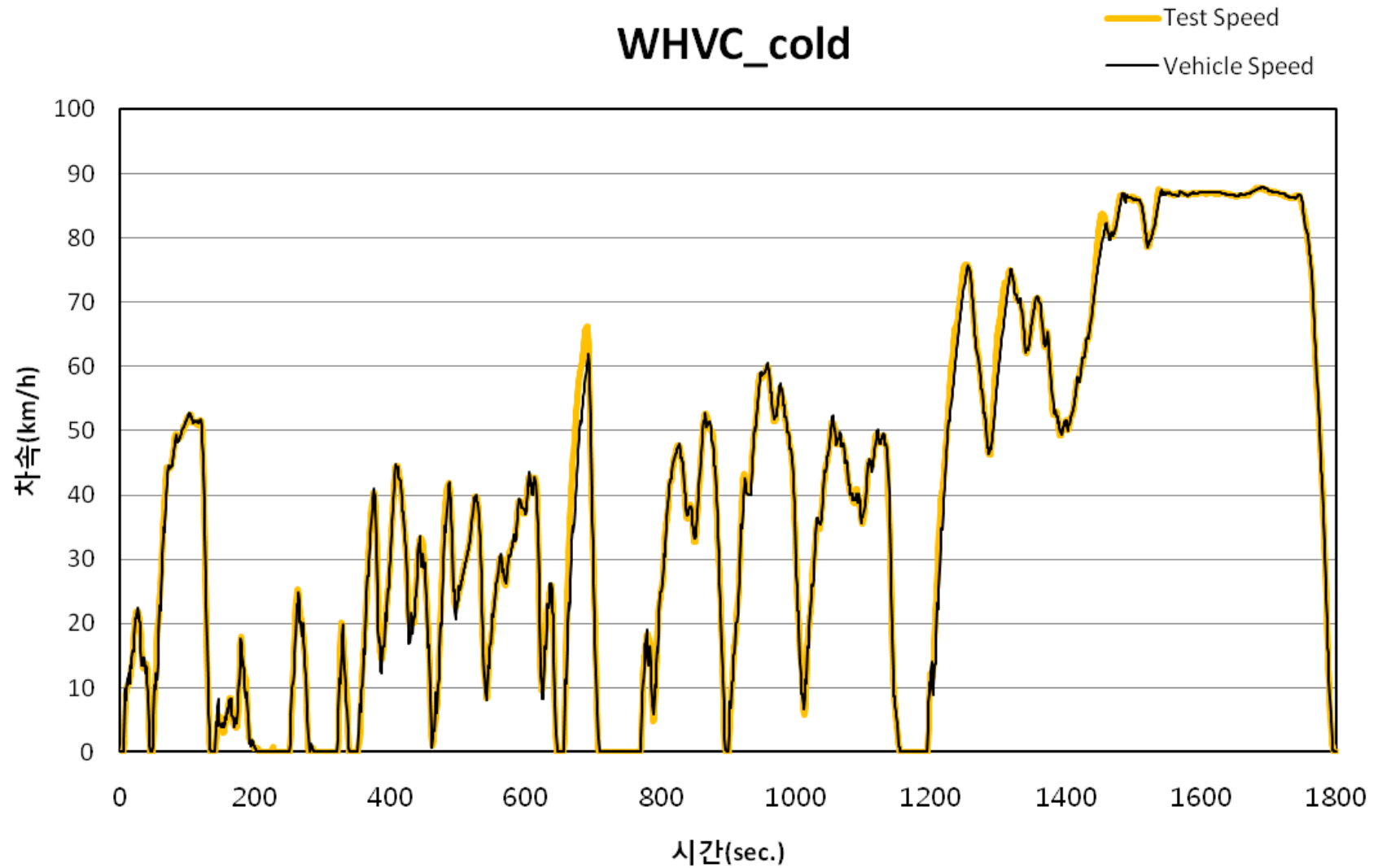
attachment #3 : comparison of acceleration distribution according the test modes



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1. WHVC mode is higher the initial start acceleration level → main factor on speed following
2. wide acceleration distribution rate is similar

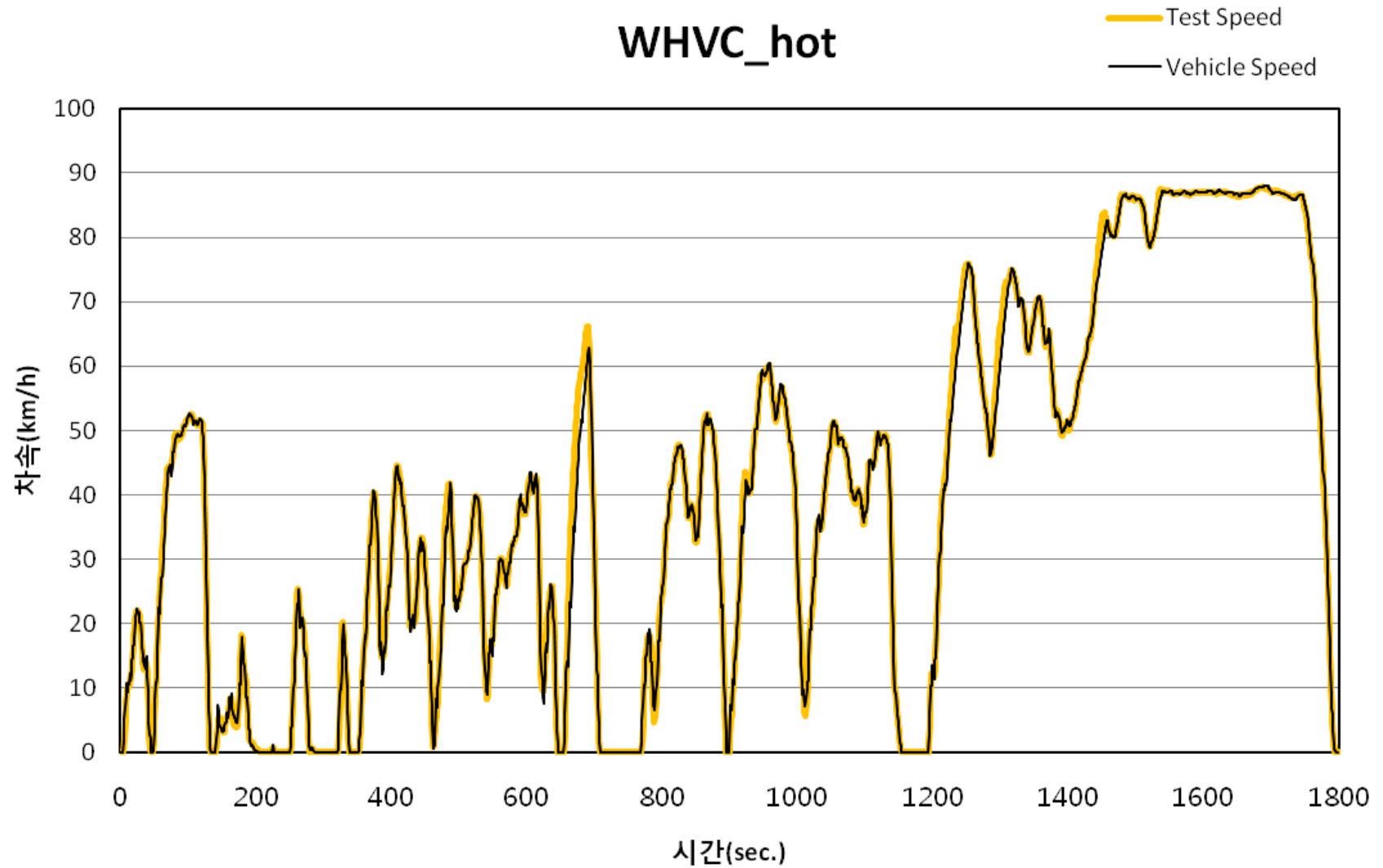
attachment #4 : result of WHVC mode driving at cold state



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1. speed following impossibility rate at cold state is 17.9%
2. following difficulty : braking deceleration, acceleration after deceleration and gear shifting

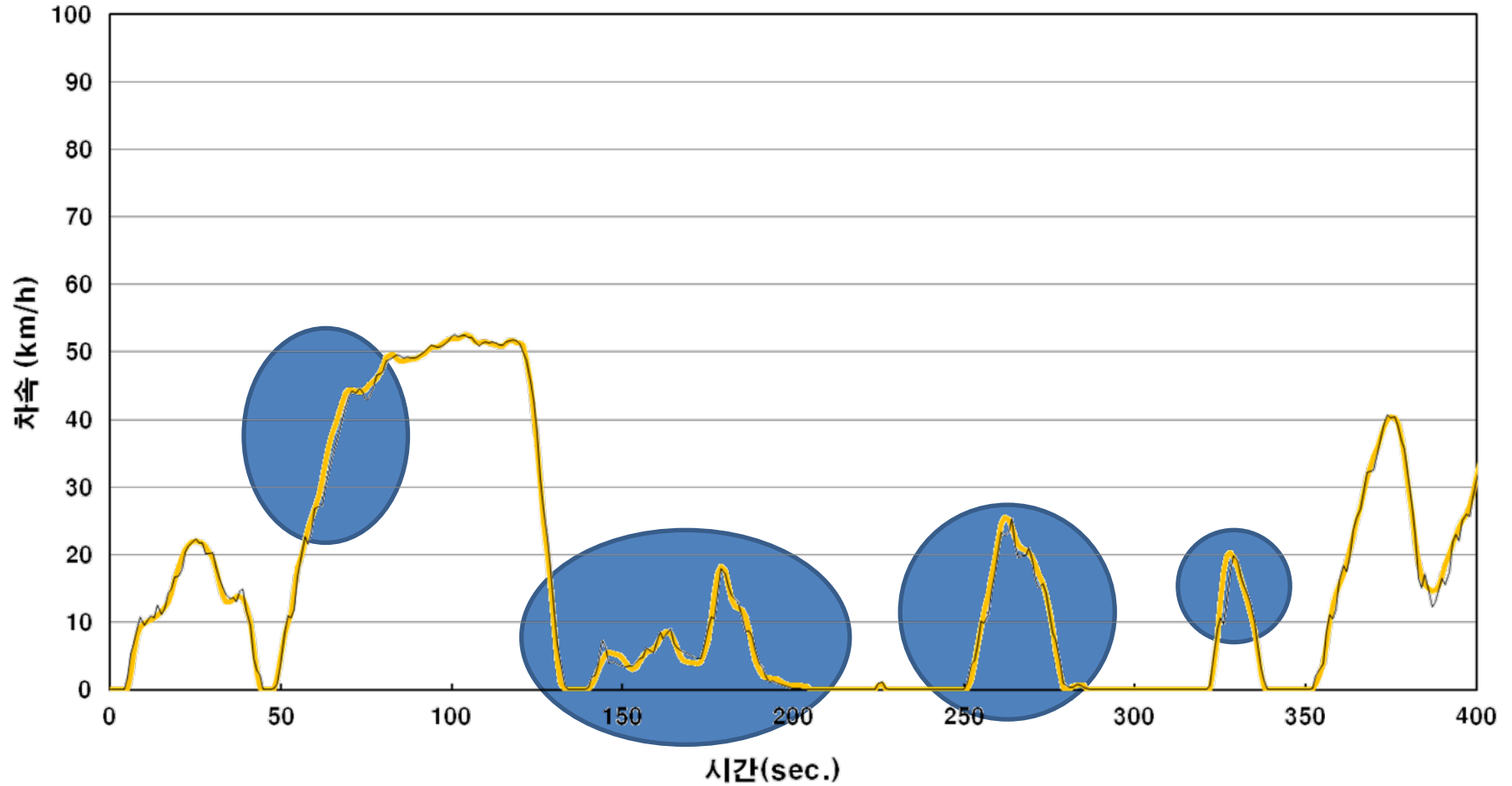
attachment #5 : result of WHVC mode driving at hot state



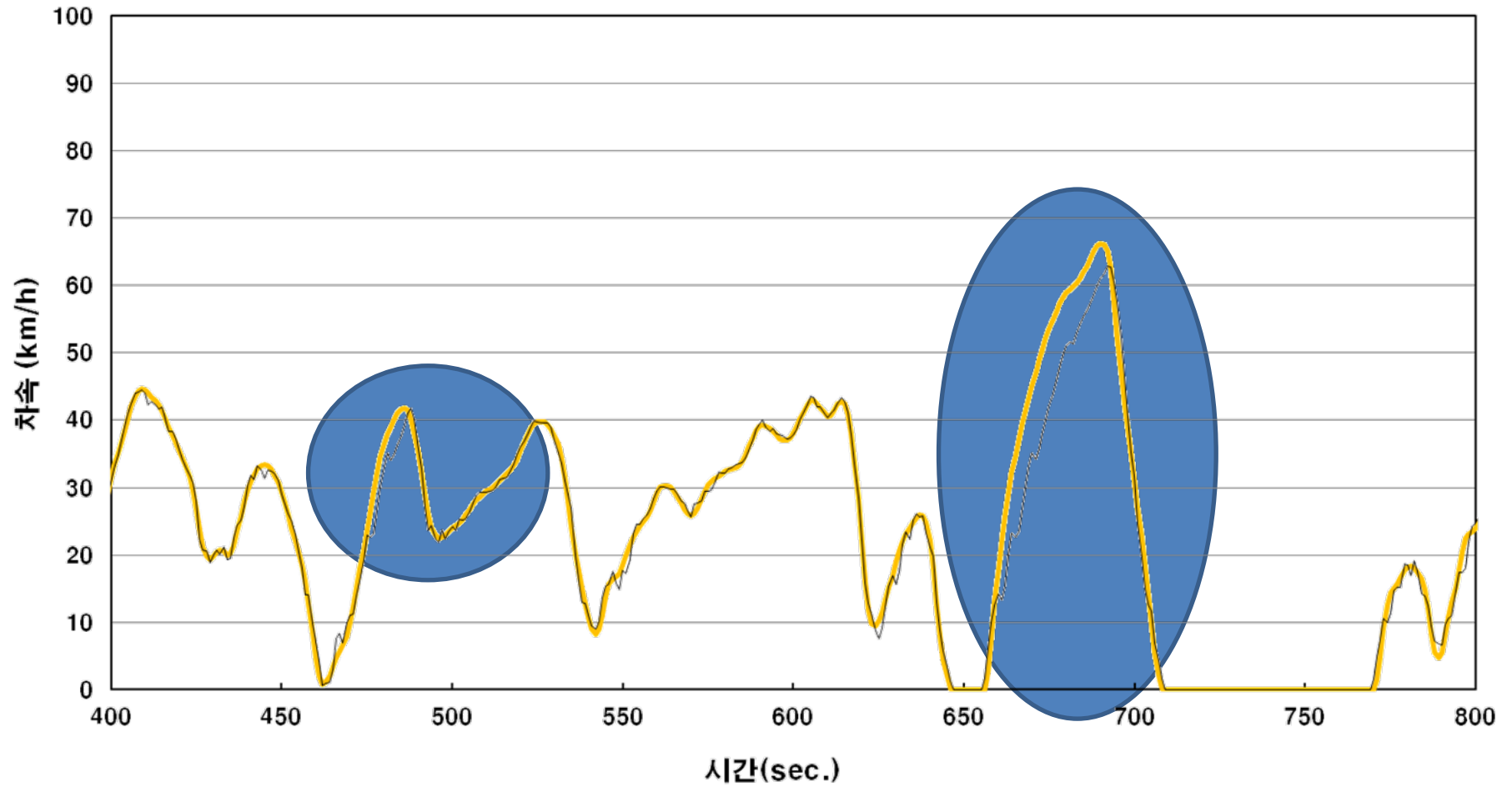
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1. speed following impossibility rate at hot state is 15% (urban period)
2. Necessity of supplement on decel. considering braking performance and on accel.

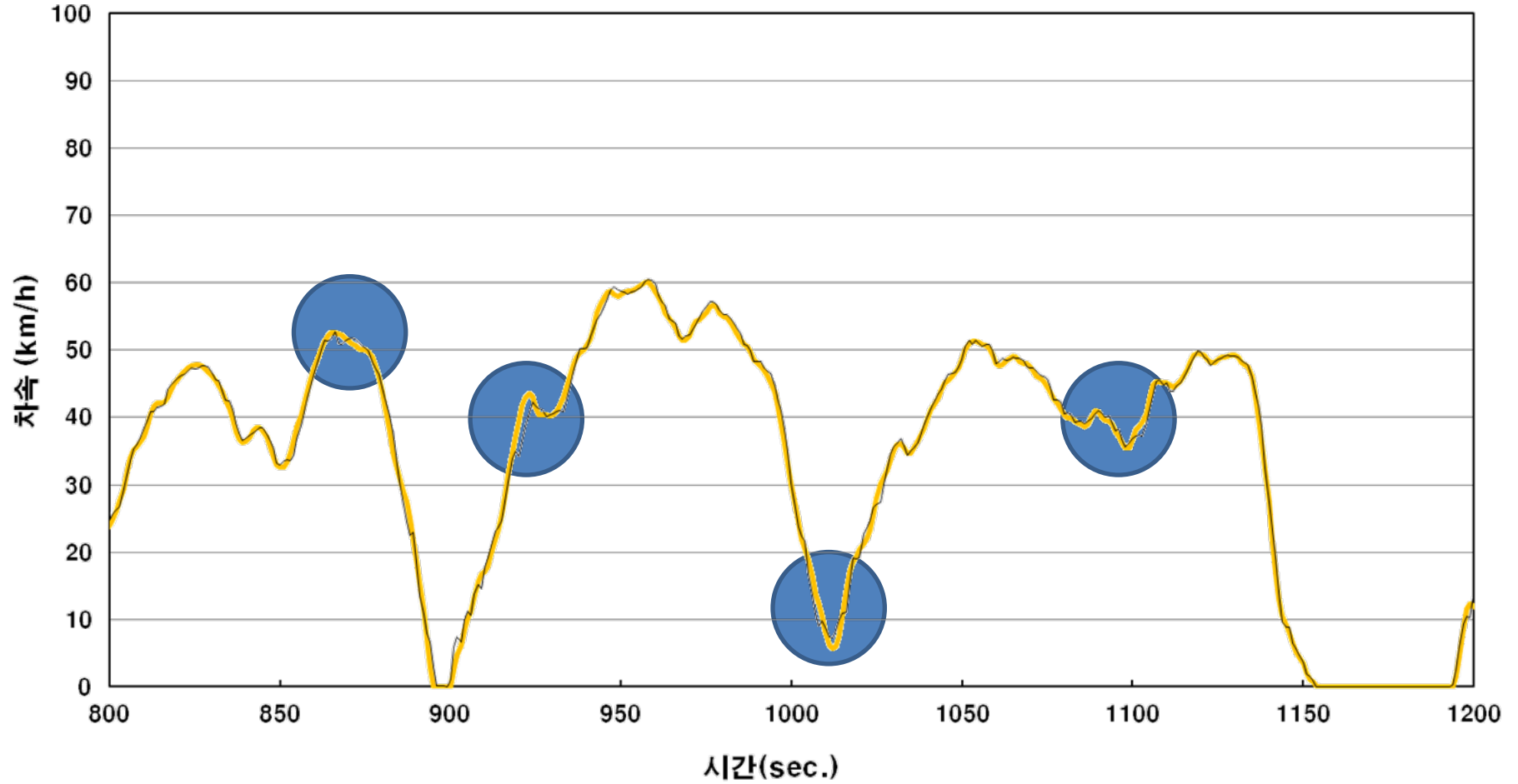
■ attachment #6 : result of WHVC mode driving at hot state during 0 ~ 400sec.



■ attachment #6 : result of WHVC mode driving at hot state during 400 ~ 800sec.



■ attachment #6 : result of WHVC mode driving at hot state during 800 ~ 1200sec.



■ attachment #6 : result of WHVC mode driving at hot state during 1200 ~ 1800sec.

