WLTP DHC subgroup	
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Title	**In-use data collection plan**
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1. INTRODUCTION

- This is in-use data collection plan which has been developed by Korean NIER based on the suggestion from WLTP/DHC.

2. SCHEDULE, Year 2010

Task	Jan	Feb	Mar	Apr	May	Jun	Jul
1. Budget allocation							
2. Test design							
3. Engineering service contract							
4. Data collection			1st half		2nd half		
5. Data Review and check							
6. Statistical work							
7. Report preparation							

3. CONTENTS

3.1. Review of currently available data

- 2 sets of in-use driving pattern data are currently available.
- Data collected in 2001 : It is very comprehensive data set and it meets DHC guideline, although it is a little bit old. Korea will use this data set as supplementary information.
- Data collected in 2008 : It is data set for LD commercial vehicle and taxi. It meets DHC guideline except the absence of route information. It would be very interesting data set to understand what commercial vehicle's driving pattern look like. Korea will use this data set as supplementary information.

3.2. Test vehicle

- The number of test vehicle : 8
- Test vehicle model selection will be based on Korean market sales volume in each vehicle category.
- Engine displacement will be considered, instead of power to mass ratio.
- Passenger car, SUV and van might be equipped with automatic transmission only. About half of LD commercial truck might be equipped with manual transmission.
- Test vehicle will be supplied by car rental service and instrumented by OBD based Portable Activity Monitoring System (PAMS).

Table 1. Test vehicle specification

		Displacement	Transmission	The number of vehicle		
				This group	Sub-total	Total
Car	PC	1 to 2 Liter 2 to 4 Liter	A/T only	2 1	3	8
	SUV	1 to 2 Liter 2 to 4 Liter	A/T only	1 1	2	
	Van	All	A/T only	1	1	
LD commercial	Truck	All	A/T M/T	1 1	2	

3.3. Data to be collected

- OBD based PAMS will be used for data acquisition.
- Time, vehicle speed, engine speed will be continuously sampled in 1 Hz frequency.

Table 2. Measurement items and methods

Measurement items	Method	Notes
Time	ECU	Must
Vehicle speed	ECU	Must
Engine speed	ECU	Must for M/T vehicle
Throttle position	ECU	
MAP or Air flow rate	ECU	
Engine coolant temperature	ECU	
Latitude	GPS	
Longitude	GPS	

Altitude	GPS and Geographic information	Vehicle's second-by-second GPS coordinates will be overlaid on altitude map using ArcGIS

3.4. Driving route, General

- Test location is city of Seoul and Seoul metropolitan area.
- Driving route has been defined based on Korean regulation as well as WLTP suggestion.
- Road type has been specified in driving route definition because several types of road can be facilitated in same area.
- Fixed driving route has been designed to fulfill the definition of each driving route.
- For further requirement for developing weighting factor, fixed route has been designed to pass the road segment where the traffic volume monitoring system has been facilitated as much as possible.
- Driving route definition
  - ✓ Urban route : Arterial, collector and local road inside and/or near central business district (CBD). Speed limit is from 40 to 80 km/h, depends on road type.
  - ✓ Rural route : Arterial, collector and local road inside non-urban area. Speed limit is from 50 to 80 km/h, depends on road type.
  - ✓ Motorway route : Motorway which is designed, constructed and controlled for faster traffic in urban and rural area. Speed limit is from 100 to 120 km/h, depends on area.

Table 3. Specific information for driving route

Driving route name		Urban route	Rural route	Motorway route
Area		Inside and/or near CBD Exclude mountain area	Non-urban area Exclude mountain area	Urban and rural area Exclude mountain area
Road type	Motorway	n/a	n/a	Applicable
	Arterial; major	Applicable	Applicable	n/a
	Arterial; minor	Applicable	Applicable	n/a
	Collector	Applicable	Applicable	n/a
	Local	Applicable	Applicable	n/a
Speed limit	Motorway	n/a	n/a	100 km/h in urban area 120 km/h in rural area
	Arterial; major	80 km/h	80 km/h	n/a
	Arterial; minor	60 km/h	70 km/h	n/a
	Collector	50 km/h	60 km/h	n/a

	Local	40 km/h	50 km/h	n/a

3.5. Time of data collection

- Data will be collected during on-peak and off-peak time.
- On-peak time means,
  - ✓ 7 to 9 AM and 6 to 8 PM during weekday (for urban and rural route)
  - ✓ Well-known rush hour during weekend and holiday (for motorway route)
- Off-peak time means every time except on-peak time.

3.6. Amount of data to be collected

- Target accumulated distance is 36,000 km.
- 1,500 km per vehicle category and driving route.

Table 4. Target amount of data according to driving route and time

		Urban route	Rural route	Motorway route
On-peak time	Weekday	8,000 km (1,000 km/vehicle)	8,000 km (1,000 km/vehicle)	4,000 km (500 km/vehicle)
	Weekend and Holiday	-	-	4,000 km (500 km/vehicle)
Off-peak time		4,000 km (500 km/vehicle)	4,000 km (500 km/vehicle)	4,000 km (500 km/vehicle)
Sub total		12,000 km (1,500 km/vehicle)	12,000 km (1,500 km/vehicle)	12,000 km (1,500 km/vehicle)
Total		36,000 km (4,500 km/vehicle)		

3.7. Test Drive

- No instruction for driving condition was made other than to follow overall traffic flow.
- Most of test driving and data acquisition work will be accomplished under contract with engineering service company or institute.
- Driver selection shall be based on population statistical information.
- Fuel will be paid by NIER, not by driver.