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**Re:** [vlc_sg]

**Abstract:** [This document presents VLC use cases using automobile LED for smart driving]

**Purpose:** [To introduce VLC use cases using automobile LED for smart driving]

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# VLC Use Cases using Automobile LED for Smart Driving

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# Contents

- Automotive lighting
- LED at Automobile
- VLC use cases using automobile LED for smart driving

# Automotive lighting

- Forward illumination
  - Headlamps
    - Low beam, High beam
  - Assistant lamps
    - Driving lamps, Rally and off-road lamps, Fog lamps, Cornering lamps, Spot lighting
- Signaling devices
  - Stop lamps (Break lamps)
  - Centre High Mount Stop lamp
  - Turn signal
  - Reversing lamps

# LED lamps at Automobile

- Centre High Mount Stop Lamps (CHMSL)
  - First application of LED at Automobile
- Stop lamps (Break lamps)
  - Fast lighting then incandescent bulbs
- Turn signal
- Head lamps recently

*www.hyundai-motor.com




# How can we use LED lamps for VLC at automobile ?

- Vehicle-to-vehicle communication
  - Information exchange
  - Auto driving by following the car ahead
- LED traffic light to vehicle communication
  - Idle stop
  - Car black box
- LED signboard to vehicle communication
  - Vehicle condition indication
  - Service information
  - Advertisement

# Vehicle-to-vehicle VLC with an unknown driver

- Information exchange using the voice communication
  - Exterior device condition which driver is unaware
  - Ask a way
- Speed information
  - Reduction of speed by sudden stop of car ahead
  - Traffic information map

# VLC mesh network

- Traffic information exchange
  - Mesh network by automobile

# Vehicle-to-vehicle VLC with a companion

- Navigation information
  - Direction information
  - Best route
- Sharing entertainment
  - Movie, music and so on
- Auto driving by following the car ahead
  - Speed, turn information

# LED traffic light to vehicle communication using VLC

- Idle stop
  - Receive the red light interval from LED traffic light and save gas
- Car black box
  - Save the traffic signal information.
  - Check the stored data after car accident.

# Signboard communication at the Gas station

- Service information
  - Oiling amount, price
  - Fuel efficiency
  - Possible mileage according to oiling amount and fuel efficiency
- Vehicle Condition
  - Maintenance information

# Signboard communication on the road

- Interworking with Navigation system
  - Traffic information
  - change a route


Road condition information

- Advertisement on public transportation
  - display on the monitor in the bus or taxi.


Advertisement

# Considerations

- Is there any kind of barrier?
- What application can be realized only by VLC?
- What can be the VLC Killer application?

# Next Step

- System requirements for Automobile VLC
- MAC/PHY requirements for Automobile VLC