Quectel L26-DR GNSS Module

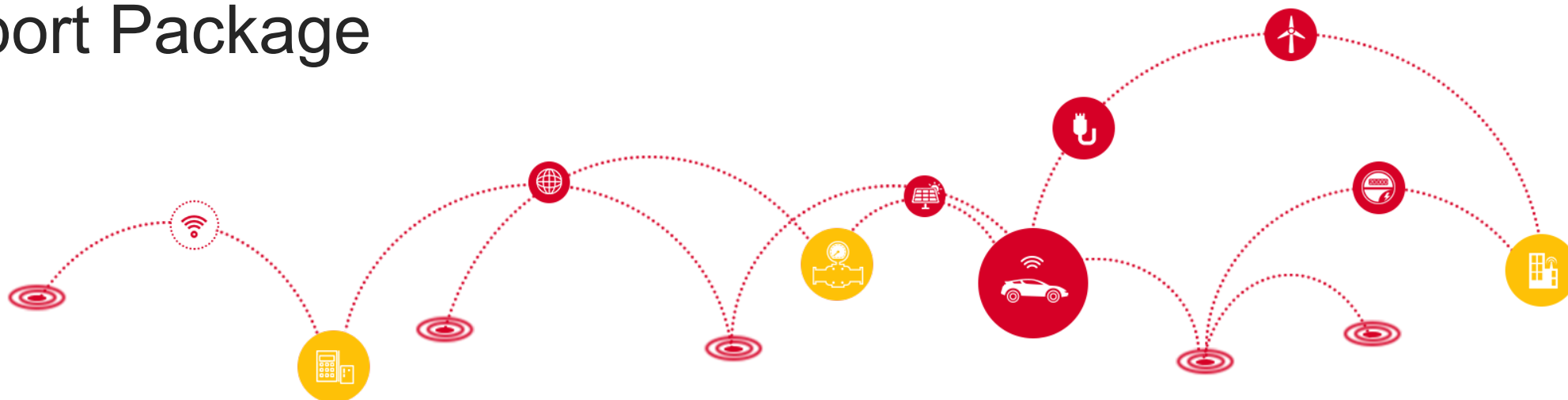## Product Overview

December, 2019

Product Overview

Technical Details

Performance-ADR
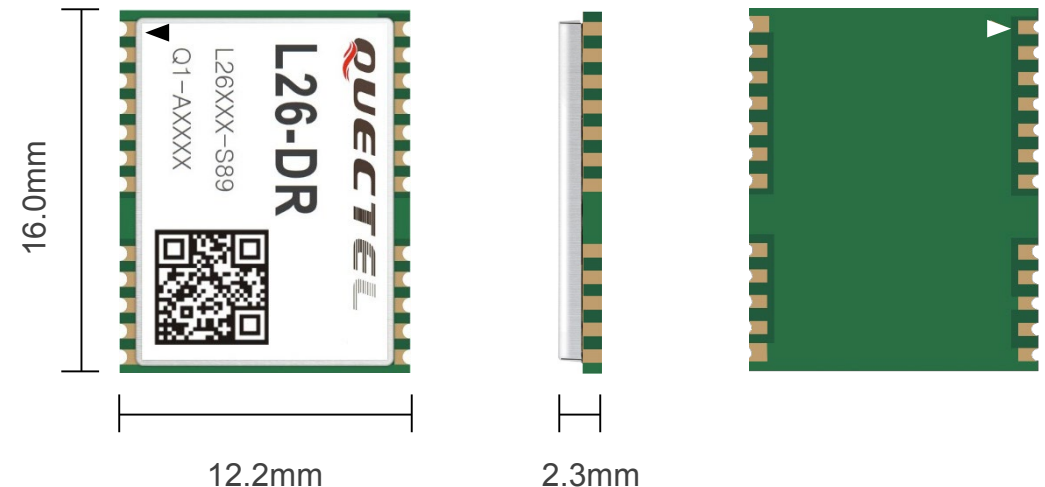
Performance-UDR

Support Package

Overview

Featuring dead reckoning, L26-DR gathers the tracks even under signal-challenging environments where GNSS signals are blocked, such as tunnels and garages. It can as well improve the positioning performance when the GNSS signal is weak and intermittent.
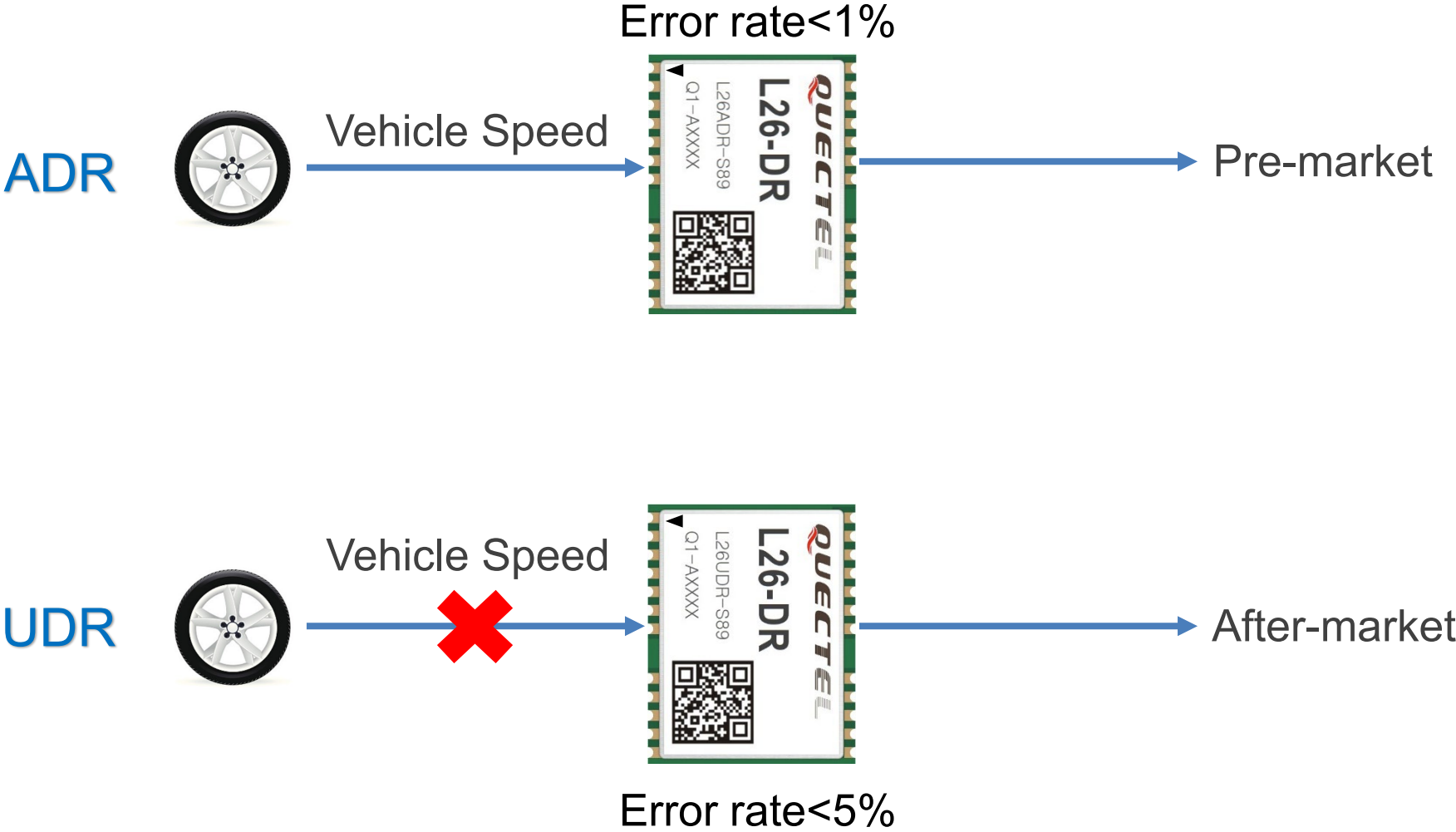
In order to satisfy various application demands, the module series have been designed separately complying with either industrial or automotive grade requirements in terms of hardware parts. The module is pin-to-pin compatible with the most popular 16.0mm × 12.2mm × 2.3mm package in the market, so, it's very easy for customers to replace and test without PCB modification. And for different applications, the module has two software versions: ADR and UDR.

The ordering codes are as following:

Industrial Grade	
ADR OC: L26ADR-S89	EVB Kit OC: L26ADREVB-KIT
UDR OC: L26UDR-S89	EVB Kit OC: L26UDREVB-KIT
Automotive Grade	
ADR OC: L26ADRA-S89A	EVB Kit OC: L26ADRAEVB-KIT

UDR and ADR

Error rate<1%

ADR — Vehicle Speed → L26-DR → Pre-market

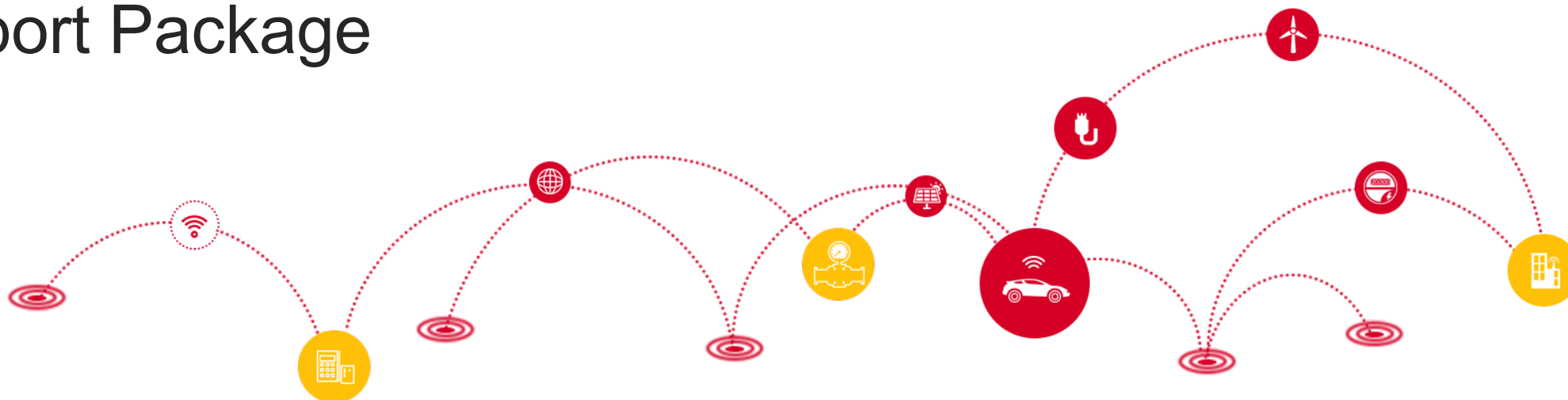**UDR** — Vehicle Speed ✗ → L26-DR → After-market

Error rate<5%

Product Overview

Technical Details

Performance-ADR

Performance-UDR

Support Package

Hardware Diagram
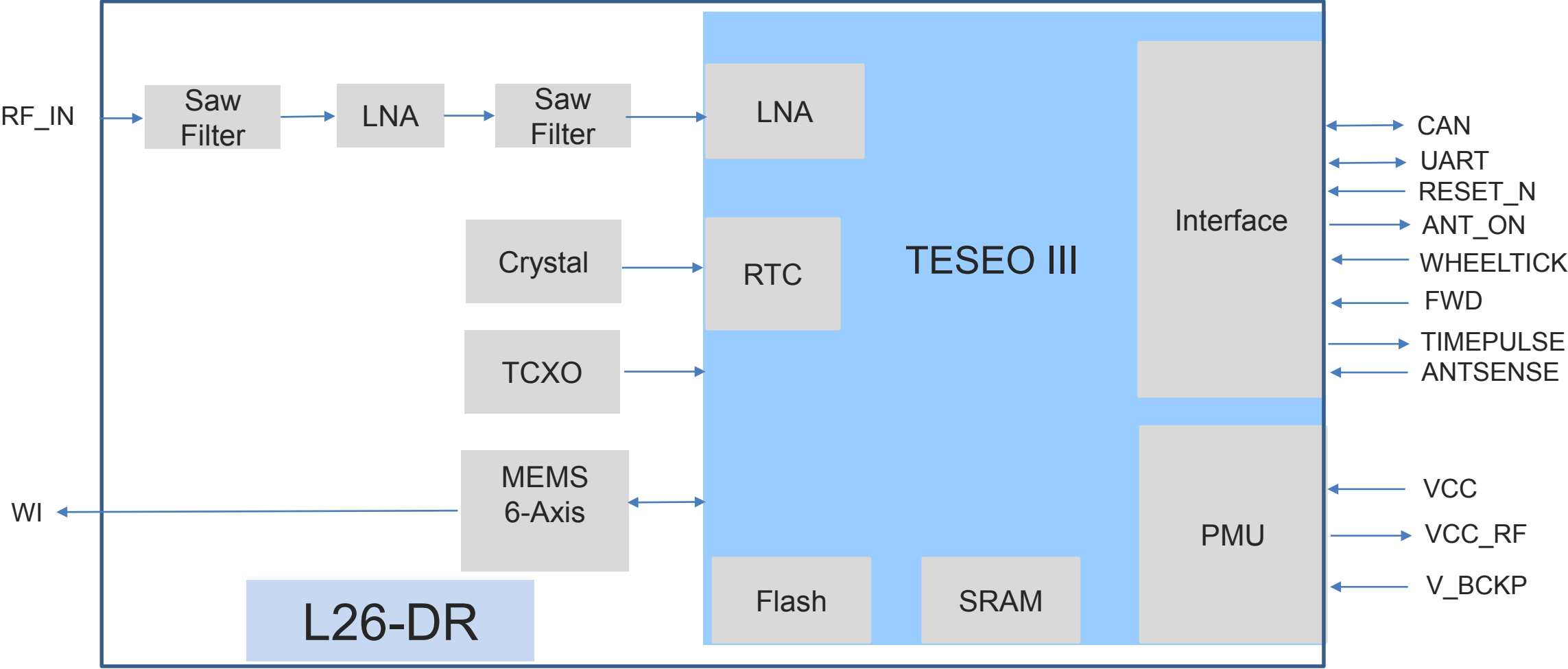
L26-DR Application Diagram
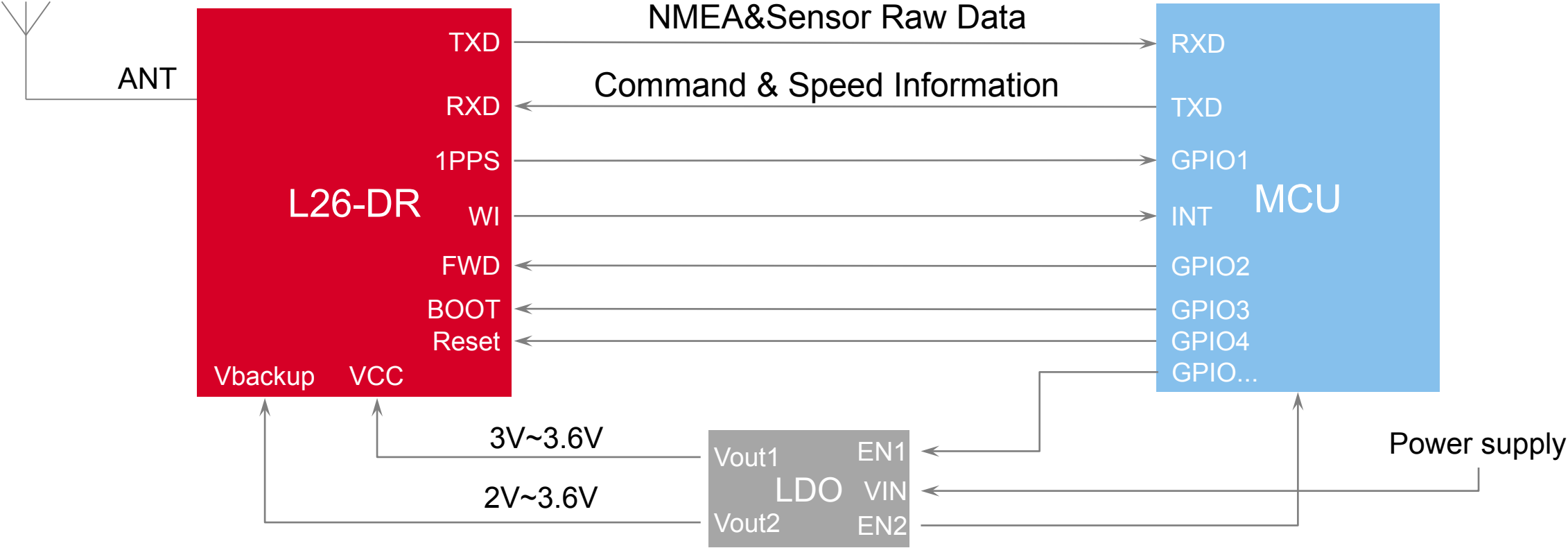
Software Features

- Speed information can be obtained via UART, WHEELTICK or CAN bus interfaces (L26-ADR)

- Dead reckoning algorithm integrated

- The module sends the sensor's raw data together with NMEA message

- Additional WI signal to wake up the host

- Active antenna detection function integrated

- Short calibration time (less than 3 min during evaluation stage) and no need calibrate during production

- Free installation angle

L26-DR Specifications

Multi-constellation GNSS	• GPS L1 C/A • GLONASS L1 • BeiDou (BDS) B1 • QZSS L1 • Galileo (GAL) E1	
SBAS	WAAS, EGNOS, MSAS, GAGAN	
Channels	48 (Tracking)/ 2 (Fast Acquisition)	
Horizontal Position Accuracy	Autonomous	1.5m CEP
Velocity Accuracy	Without Aid	<0.1m/s
Acceleration Accuracy	Without Aid	0.1m/s²
Timing Accuracy	1PPS	<100ns CEP
TTFF @-130dBm with AGPS	Cold Start	<13s
TTFF @-130dBm without AGPS	Cold Start	<32s
	Warm Start	<25s
	Hot Start	<2s

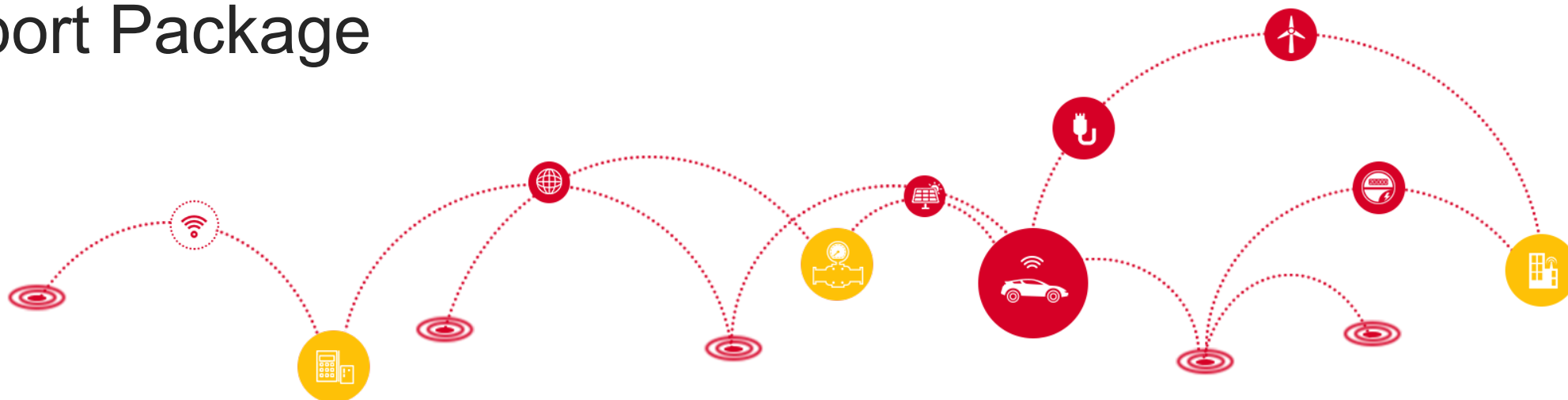| Sensitivity	Acquisition	-145dBm
	Tracking	-162dBm
	Reacquisition	-152dBm
Supply Voltage Range	3.0V~3.6V, typical 3.3V	
Operation Temperature	-40°C ~ +85°C	
Dimensions	(16.0±0.15)mm × (12.2±0.15)mm × (2.3±0.20)mm	
Weight	Approx. 0.9g	
Low Power Consumption	Acquisition: 72mA @3.3V Tracking 58mA @3.3V	
Power Saving Modes	17µA	
UART	• UART port: UART_TX and UART_RX • 115200~921600bps baud rate (115200bps by default) • Used for NMEA/PSTM transmission and firmware upgrade	
Remark	Two Versions: • Industrial Grade • Automotive Grade	

Product Overview
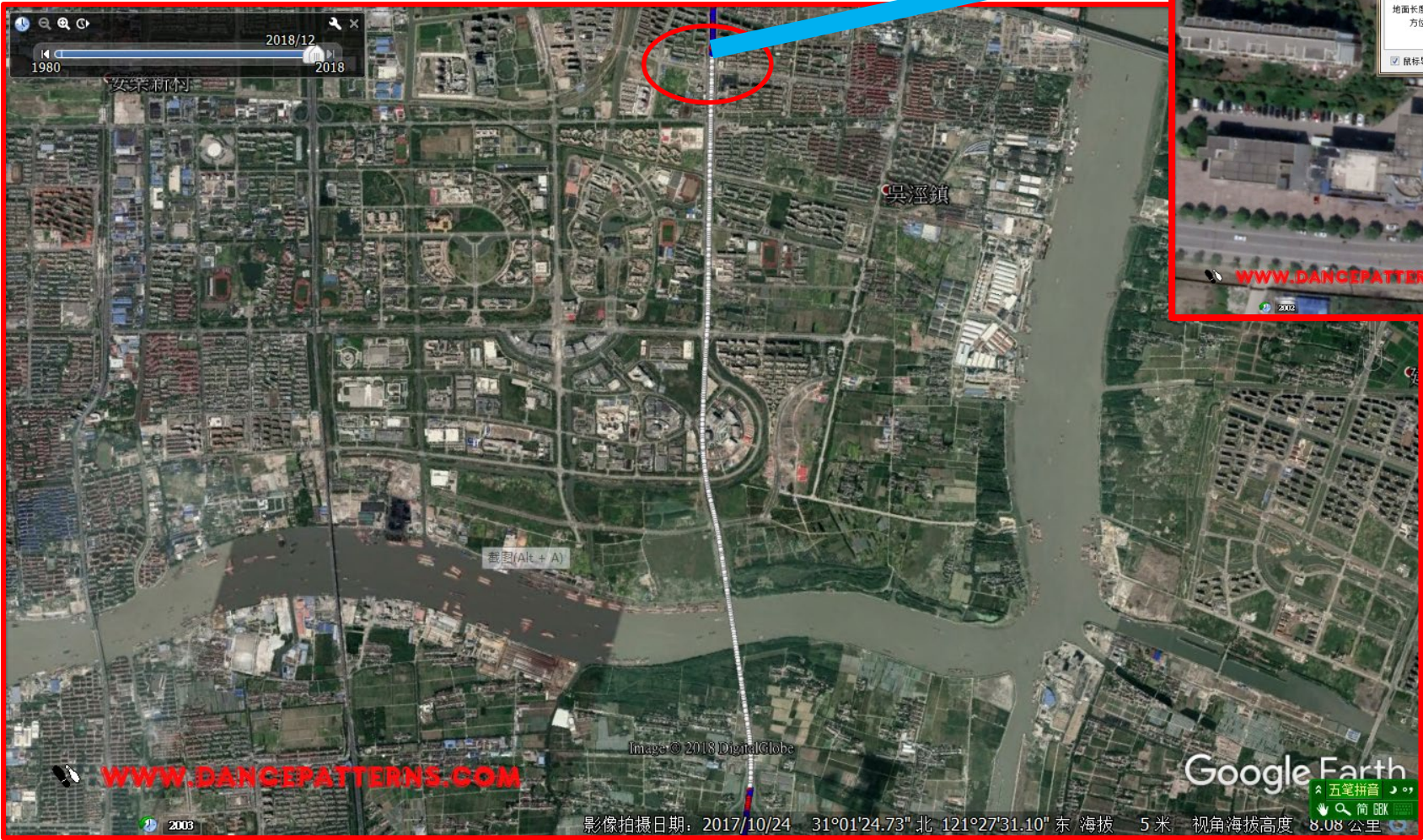
Technical Details

Performance-ADR

Performance-UDR
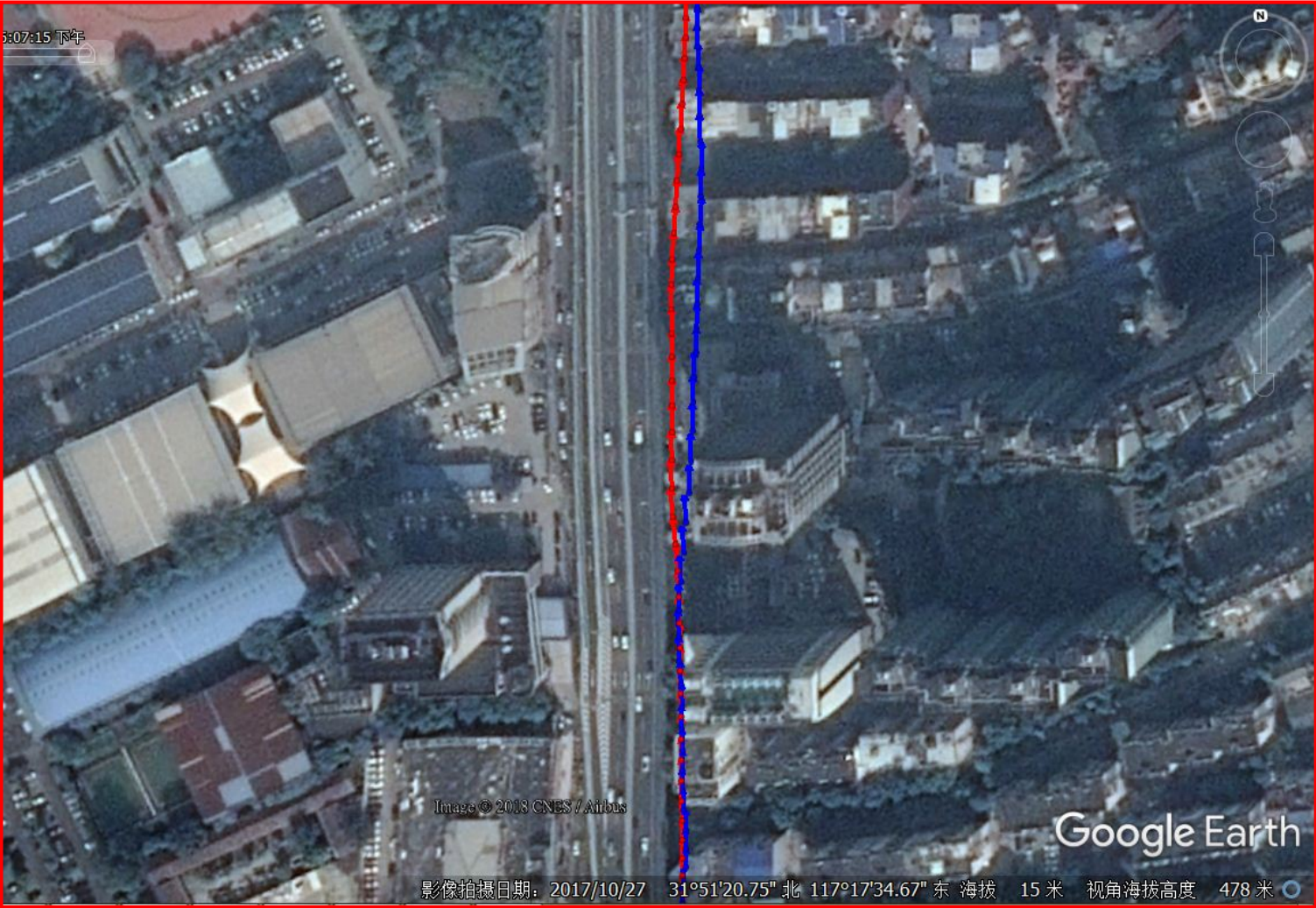
Support Package

Drive through Tunnel

Distance=5.8km
Drift: 1.3m
Speed: 60km/h
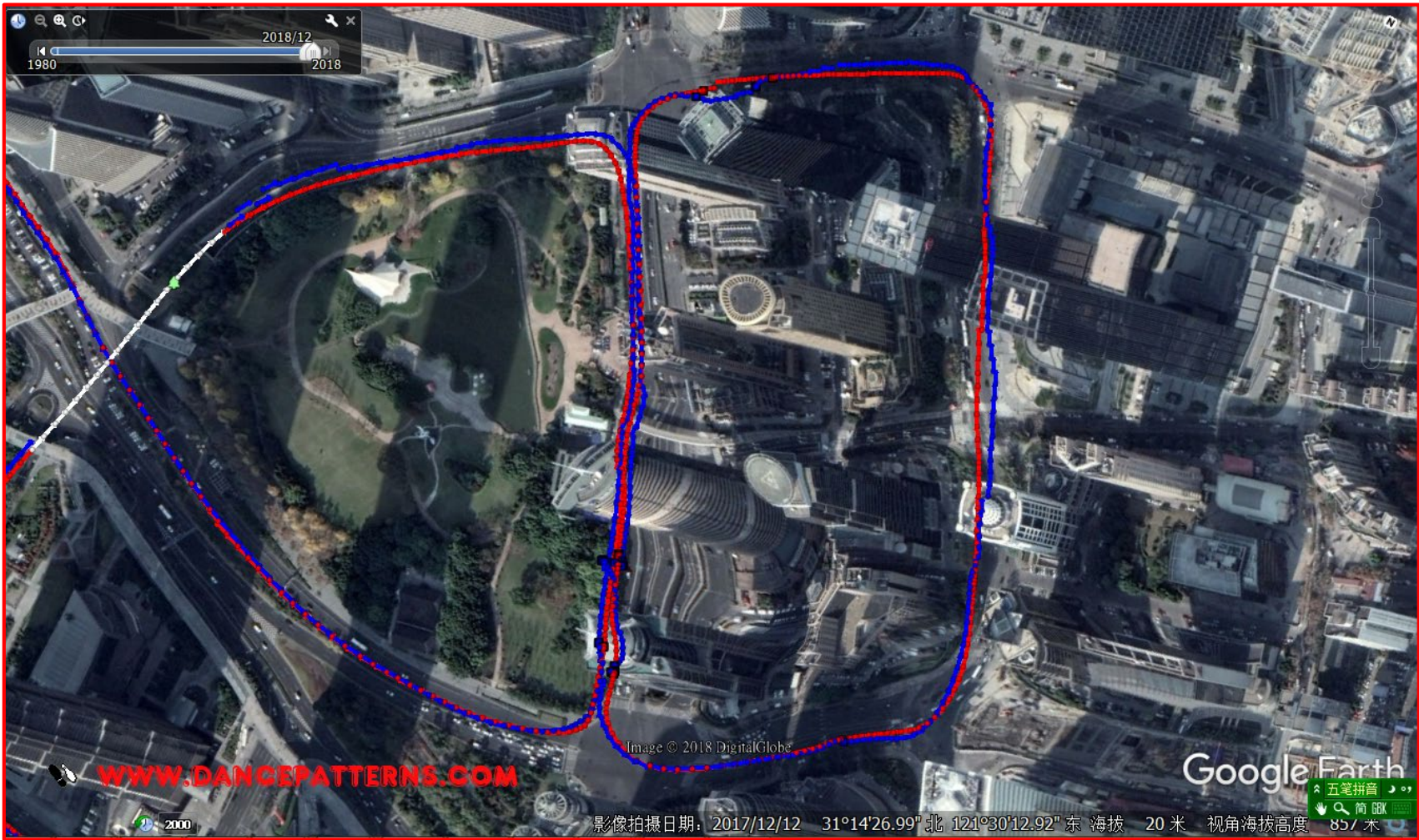
GNSS+DR
GNSS only
DR only

Under Elevated Highway

The track of L26-DR matches the real track better with the correction of dead reckoning under elevated highways.

GNSS+DR
GNSS only
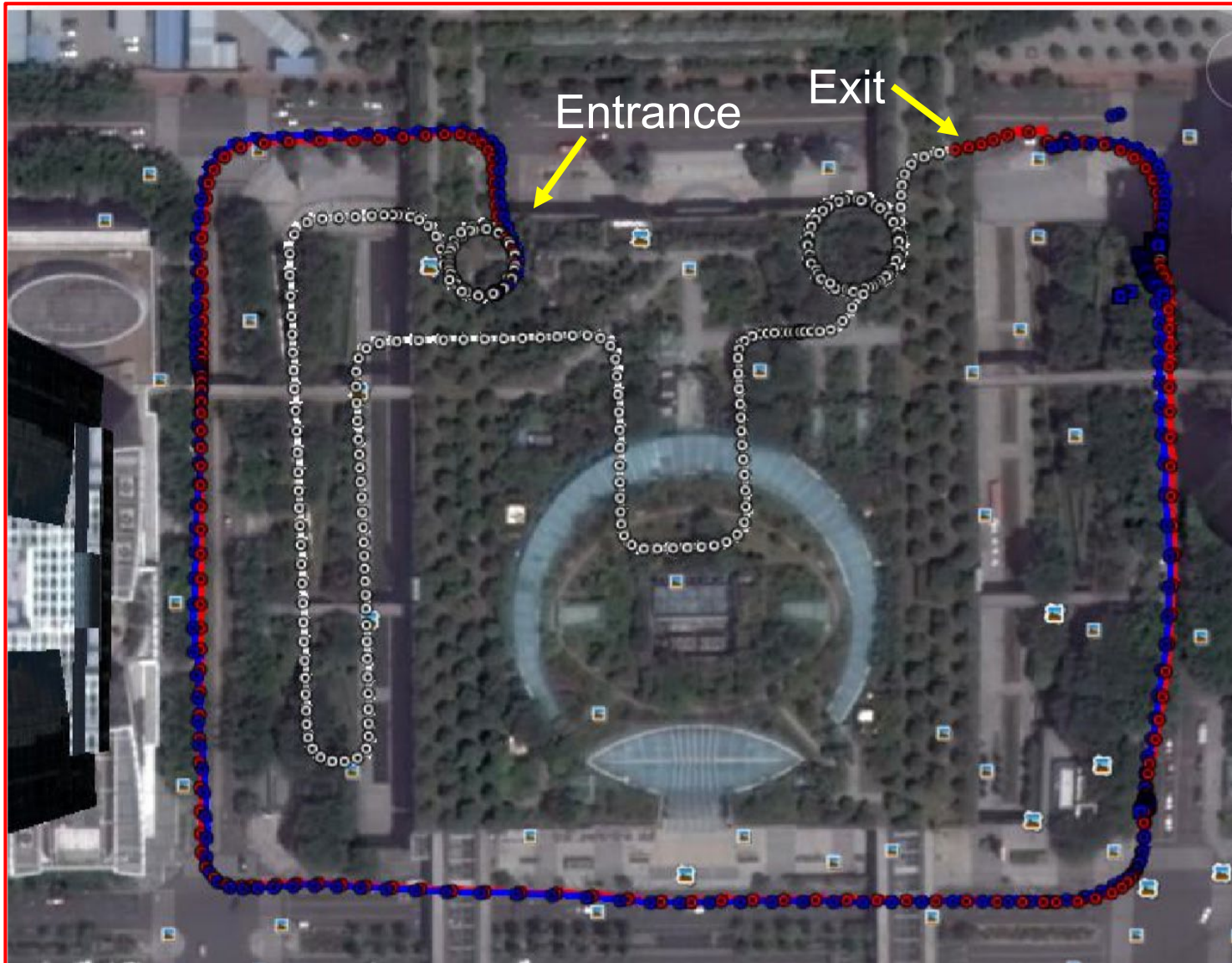**DR only**

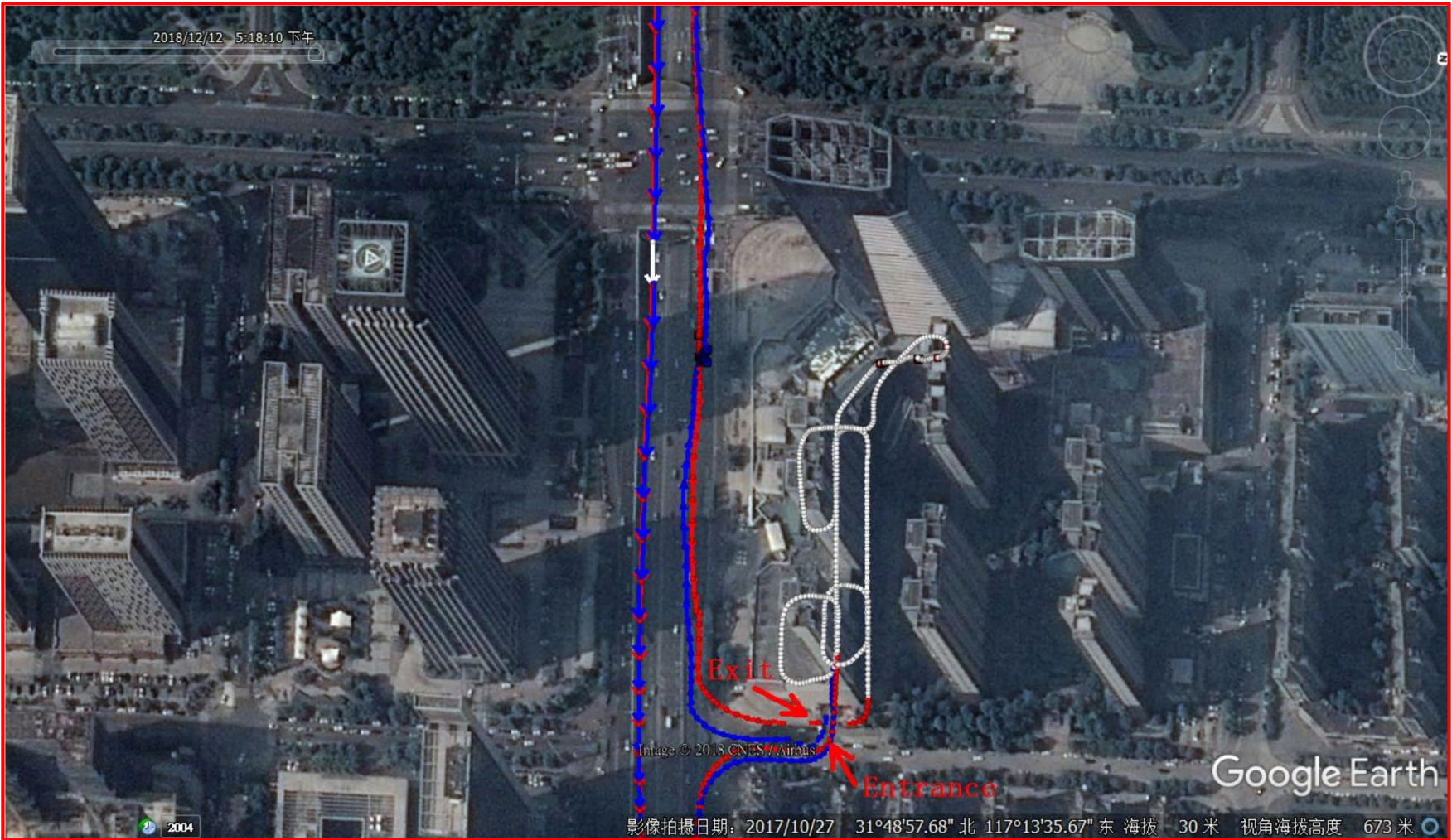# Urban Center (with High-rise Buildings)

GNSS+DR
GNSS only
DR only

Multilayer Car Parking System

L26-DR's track matches the real track of vehicle.

Legend:
- GNSS+DR (red)
- GNSS only (blue)
- DR only (white)

Underground Parking Garage

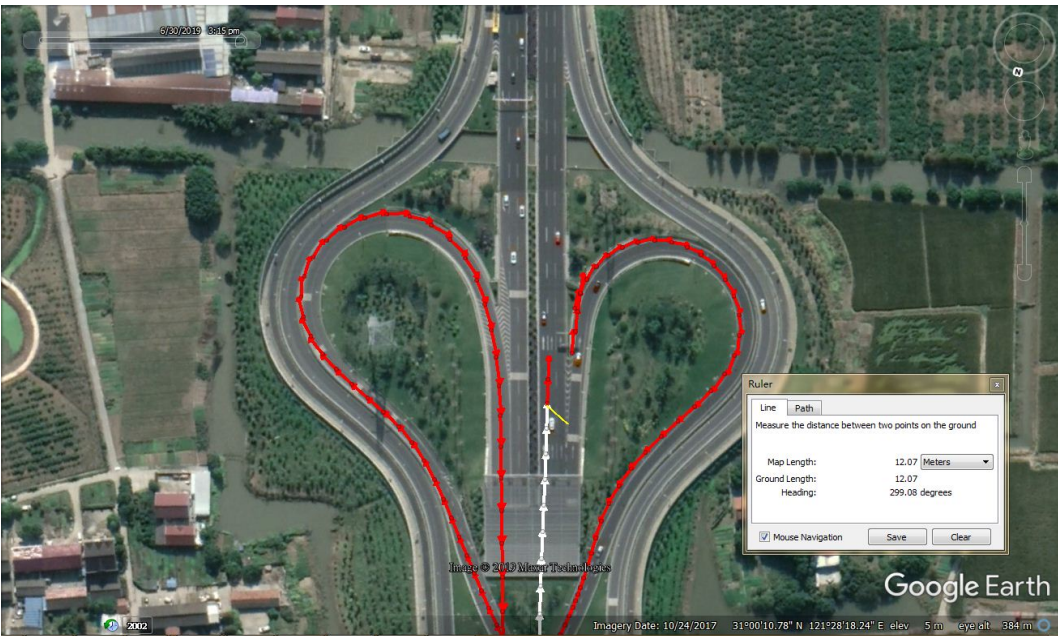L26-DR's track matches the real track of vehicle.

GNSS+DR
GNSS only
DR only

Comparative Test in Long Open-Area Tunnel

In the long open-area tunnel, L26-DR's performance is better than its counterpart

L26-DR (ADR)

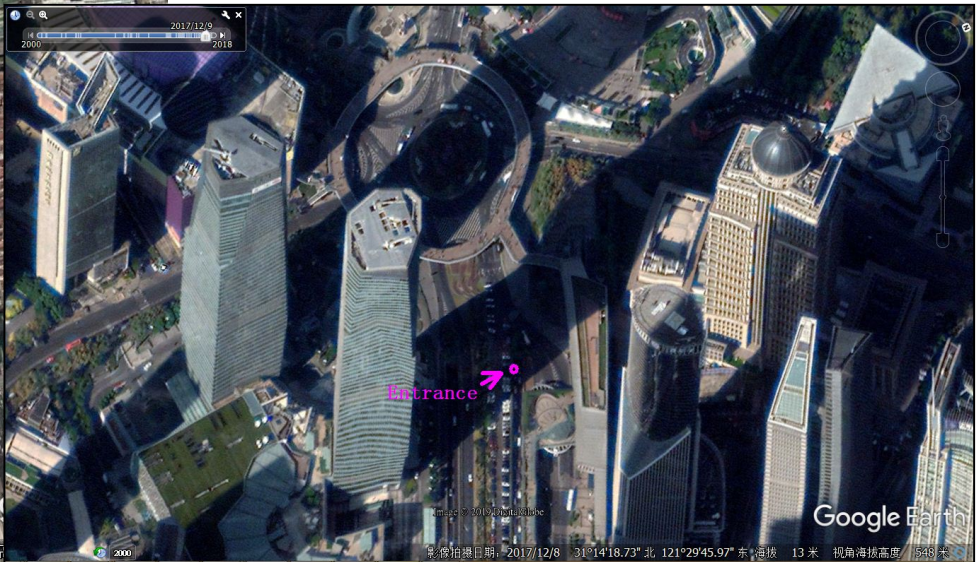## U-XXX

| GNSS+DR |
| U company standalone module |
| GNSS only |

Long Tunnel (5260 meters)		
Example	Error distance	Error percent
L26-DR(ADR)	12m	0.23%
U-XXX	52m	0.99%

Comparative Test in Urban-Area Tunnel

East of Yanan Road，2261 meters		
Example	Error distance	Error percent
L26-DR(ADR)-1#	18m	0.80%
L26-DR(ADR)-2#	15m	0.66%
U-XXX	70m	3.10%

In the urban-area tunnel, L26-DR's performance is better than its counterpart
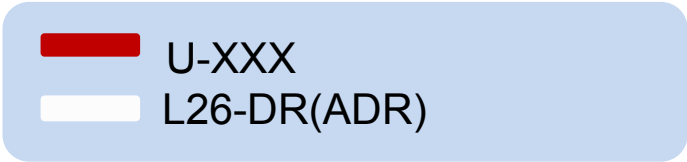
U-XXX
L26-DR(ADR)

Comparative Test in Curved Tunnel

Curved Tunnel，2860meters		
Example	Error distance	Error percent
L26-DR(ADR)-1#	3m	0.10%
L26-DR(ADR)-2#	15m	0.52%
U-XXX	45m	1.57%

In the curved tunnel, L26-DR's performance is better than its counterpart
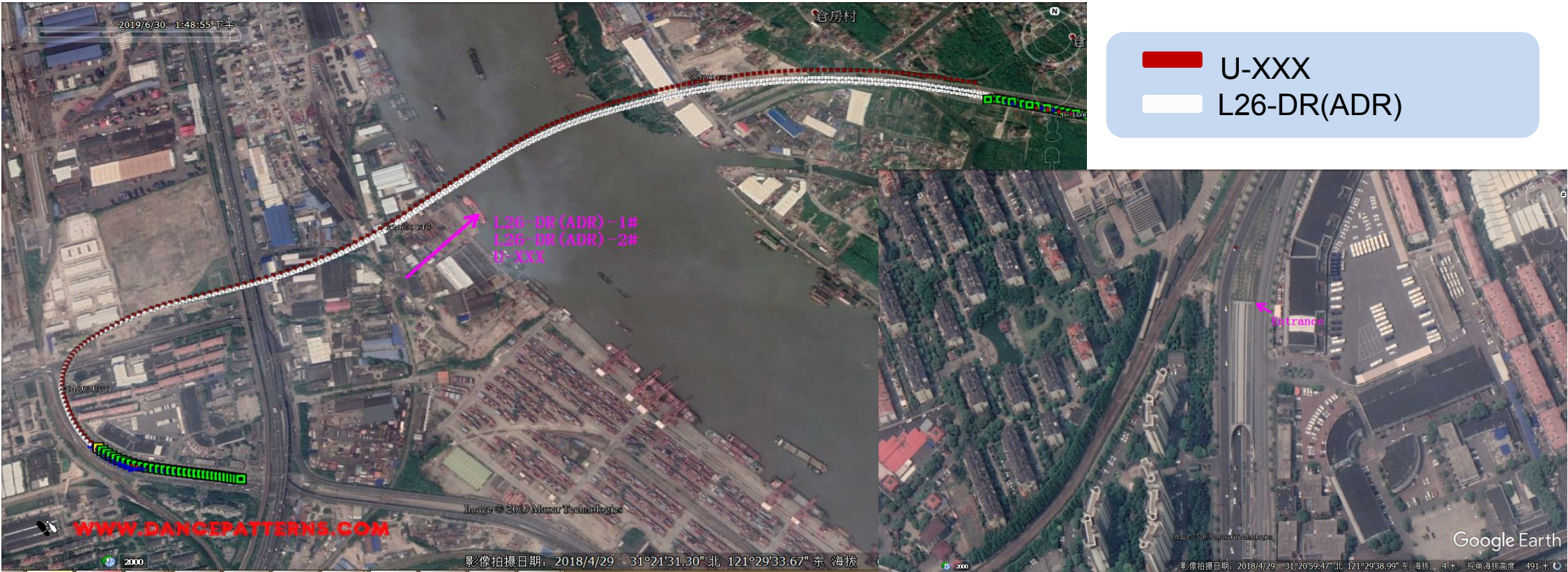
U-XXX
L26-DR(ADR)

Comparative Test Under Elevated Highway

Under elevated highway, L26-ADR's performance is better than its counterpart
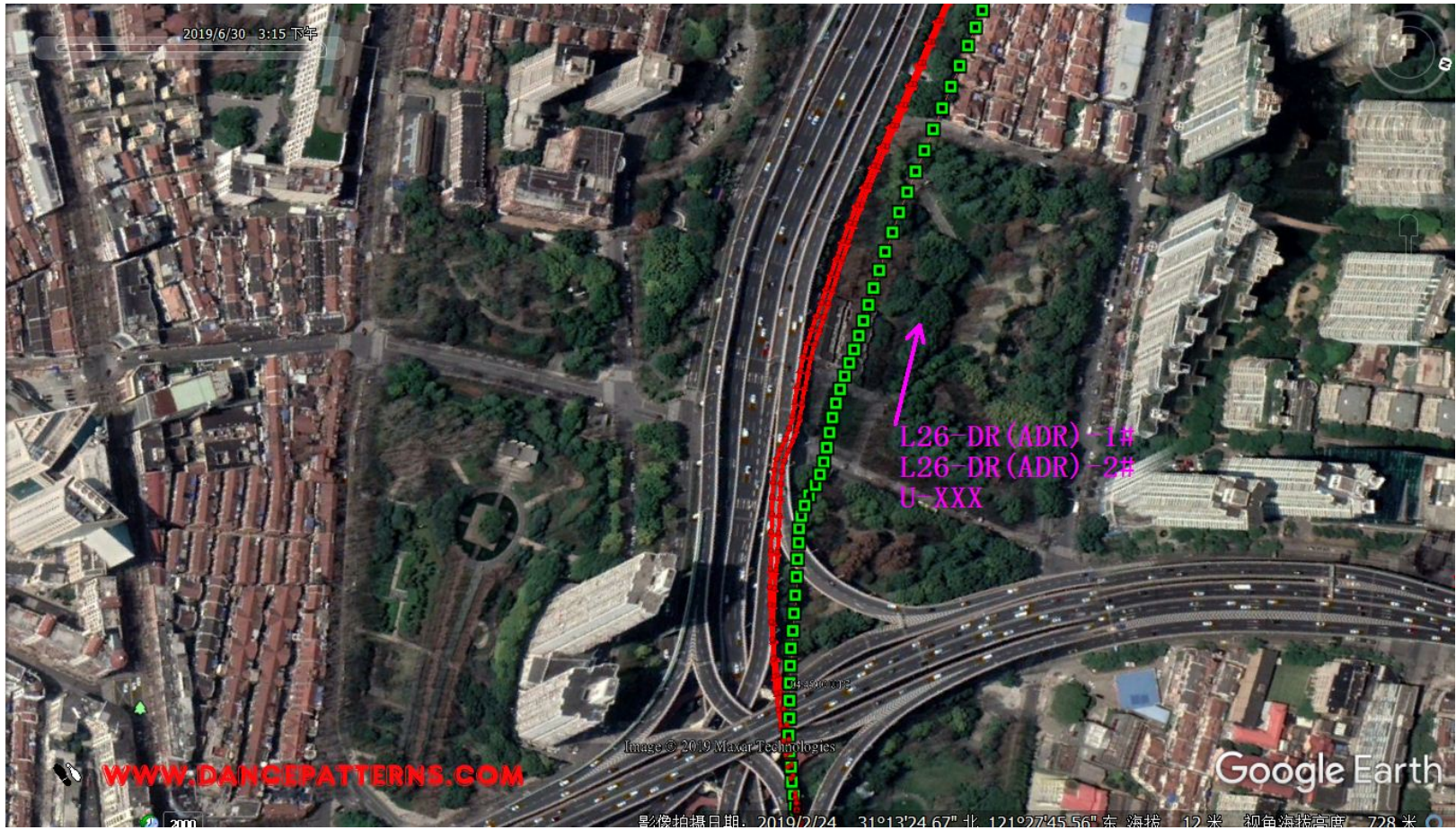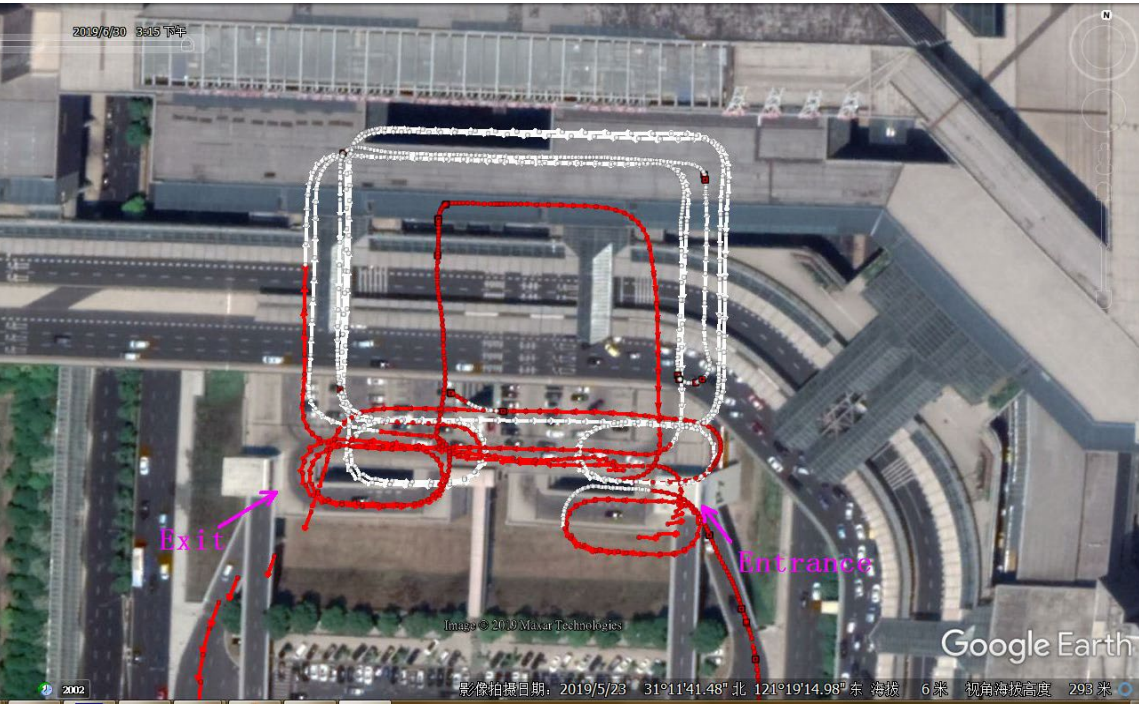

L26-DR(ADR)
U-XXX

Comparative Test in Multi-layer Parking Garage
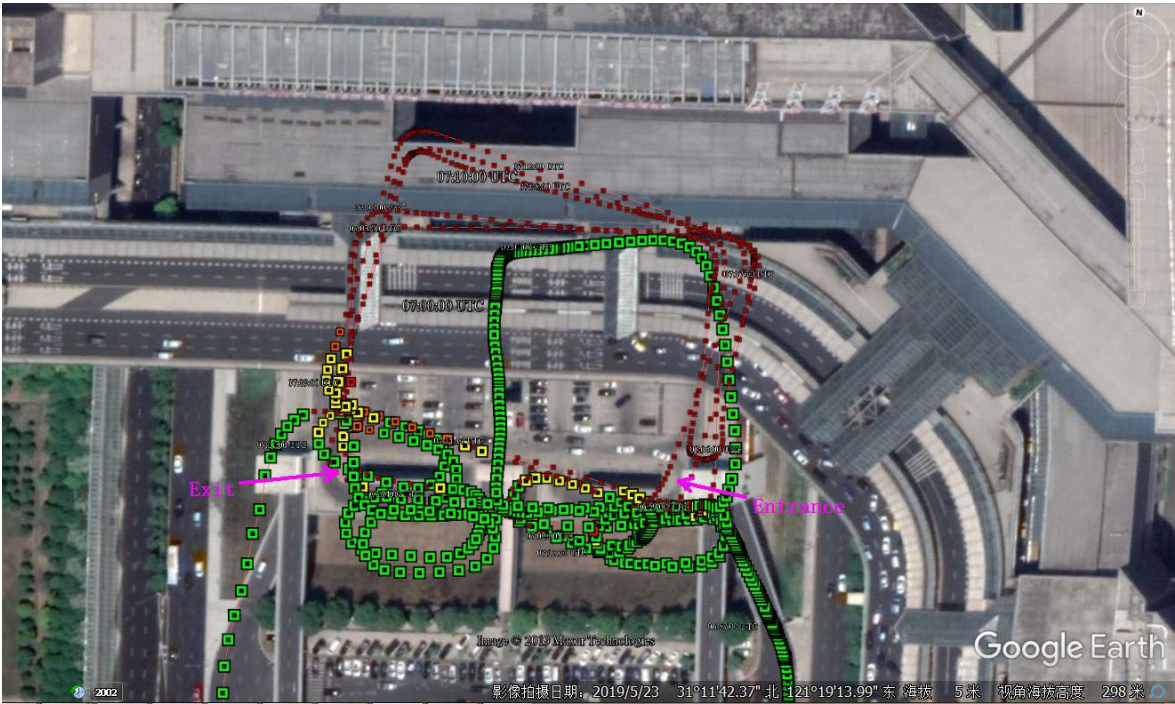(Shanghai Hongqiao Airport)

Under multi-layer parking system, L26-DR's performance is better than its counterpart.
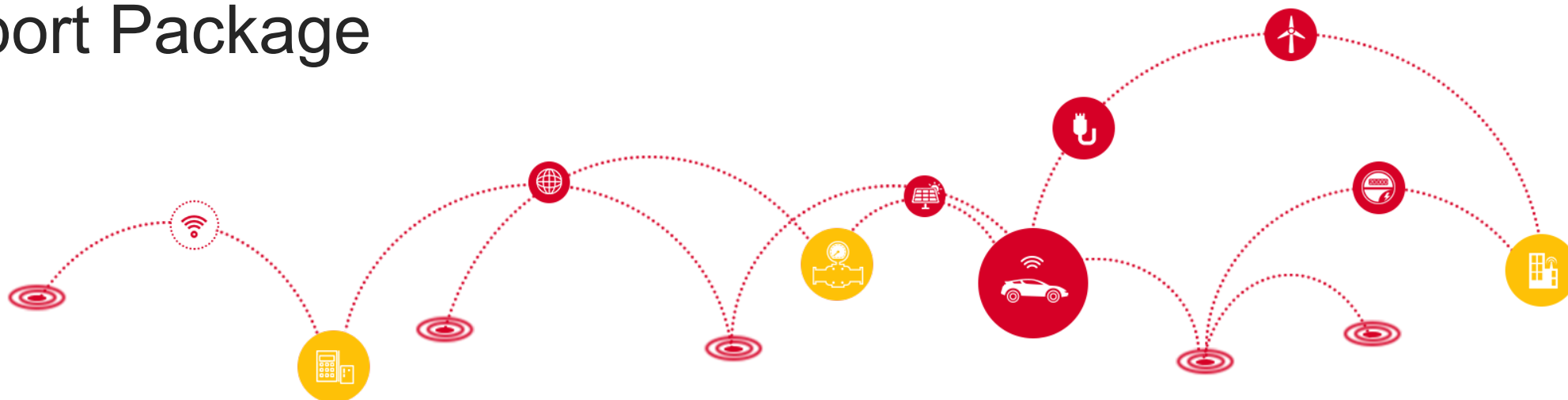
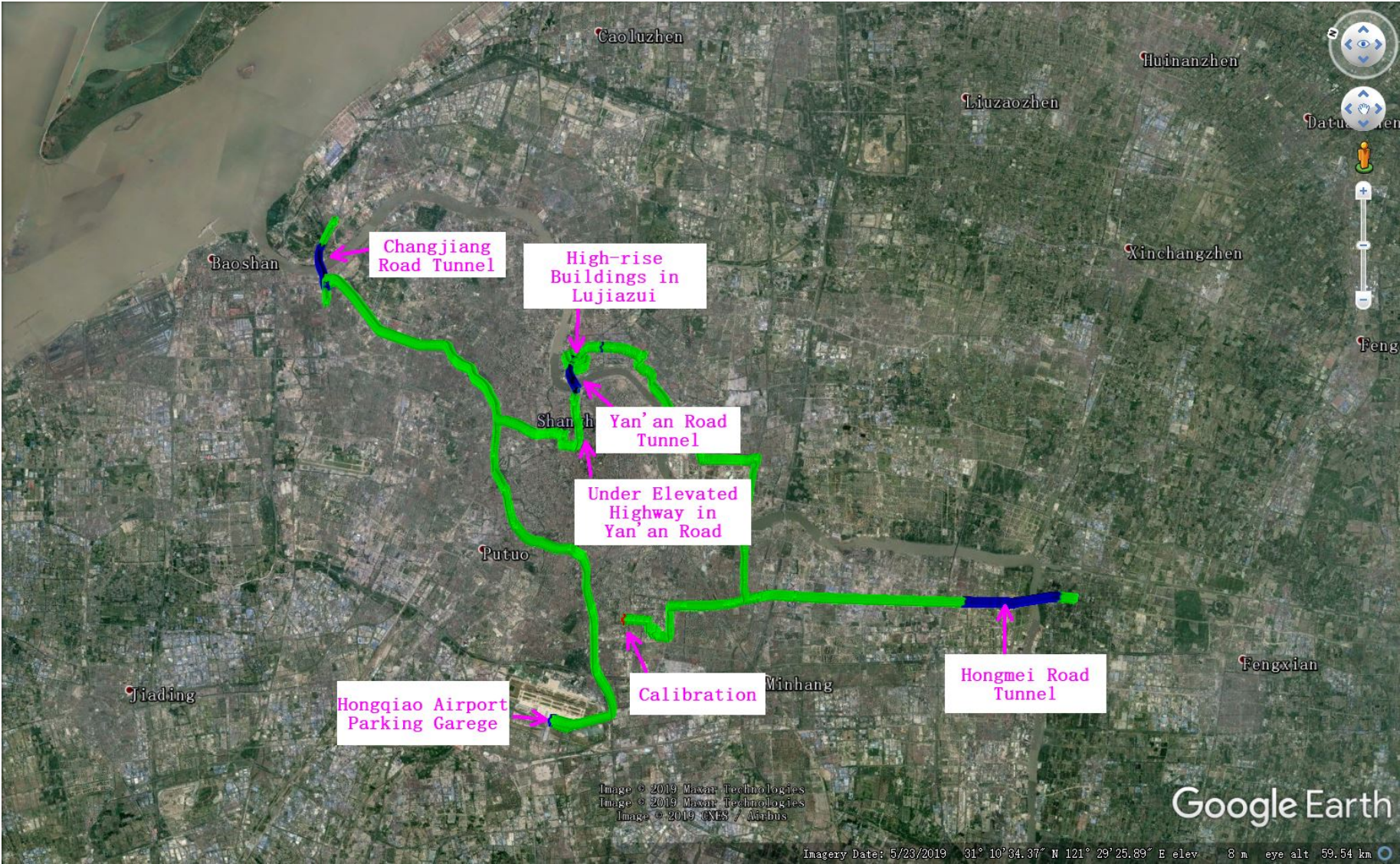L26-DR(ADR)

U-XXX

Product Overview
Technical Details
Performance-ADR
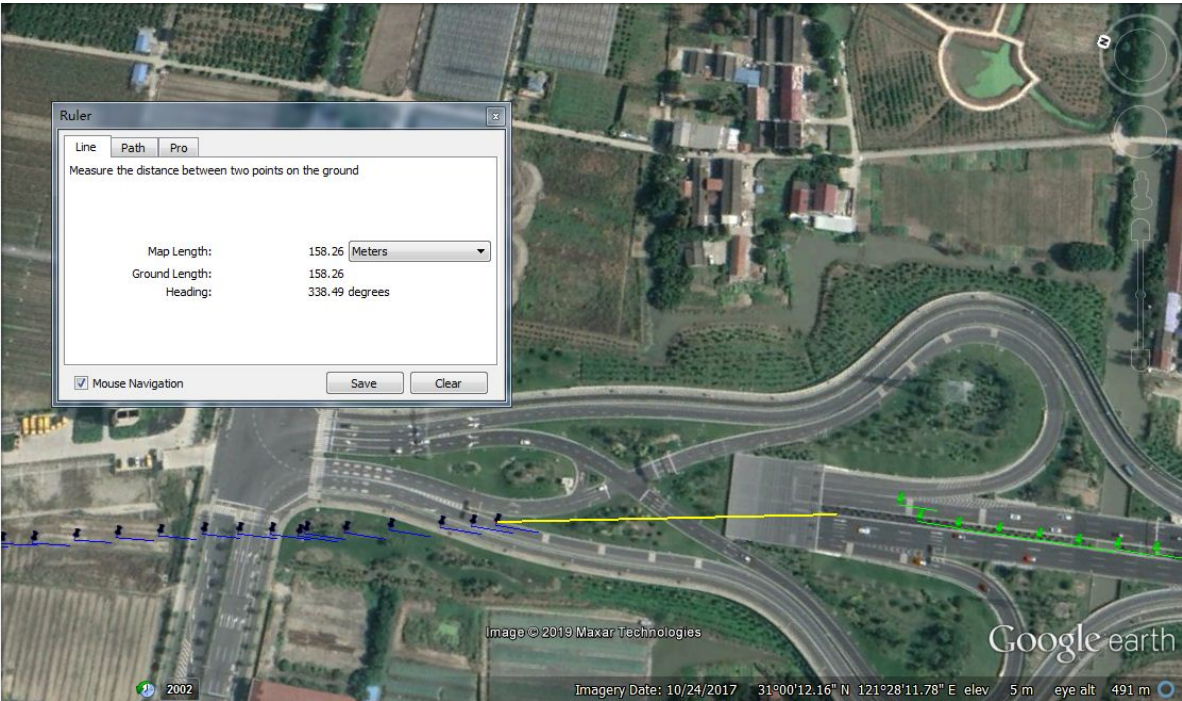**Performance-UDR**
Support Package

Overview

Comparative Test in Long Open-Area Tunnel

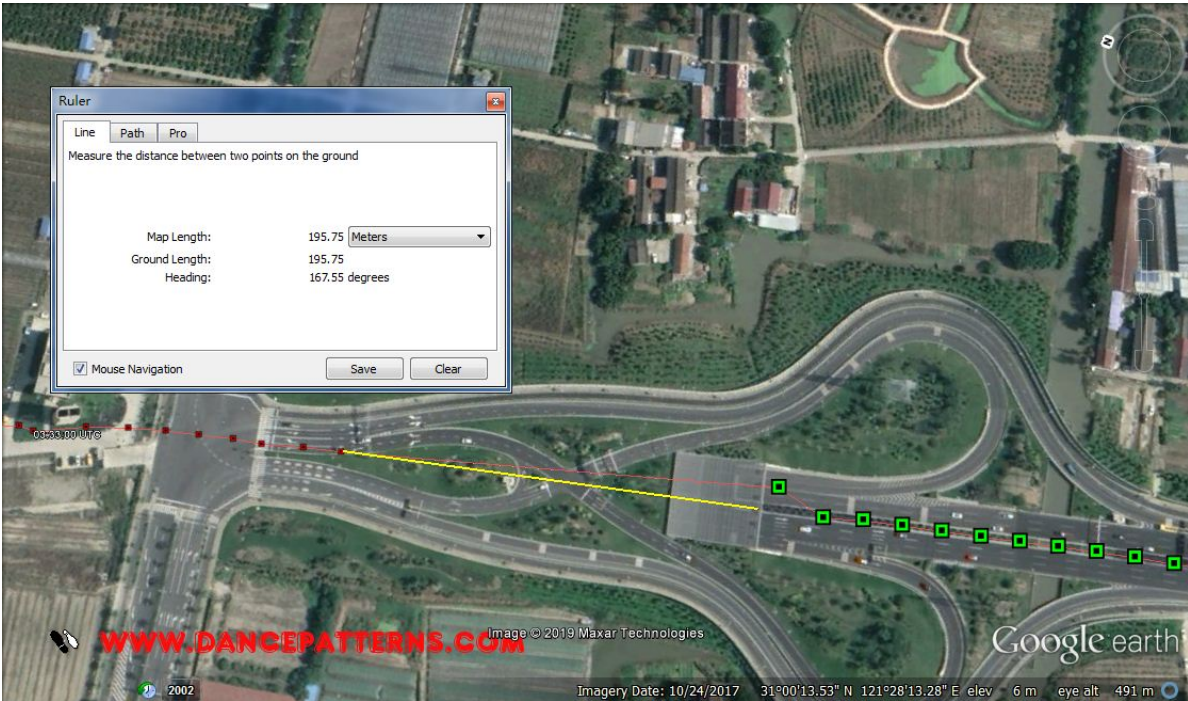| Hongmei Road Tunnel (5260 meters)		
Example	Error Distance	Error Rate
L26-DR(UDR)-1#	158m	3%
L26-DR(UDR)-2#	99m	1.89%
U-XXX	195m	3.7%

In the long open-area tunnel, L26-DR's performance is better than its counterpart

L26-DR(UDR)

U-XXX

Comparative Test in Curved Tunnel

Changjiang Road Tunnel (2860 meters)		
Example	Error Distance	Error Percentage
L26-DR(UDR)-1#	143m	5%
L26-DR(UDR)-2#	110m	3.85%
U-XXX	263m	9.2%

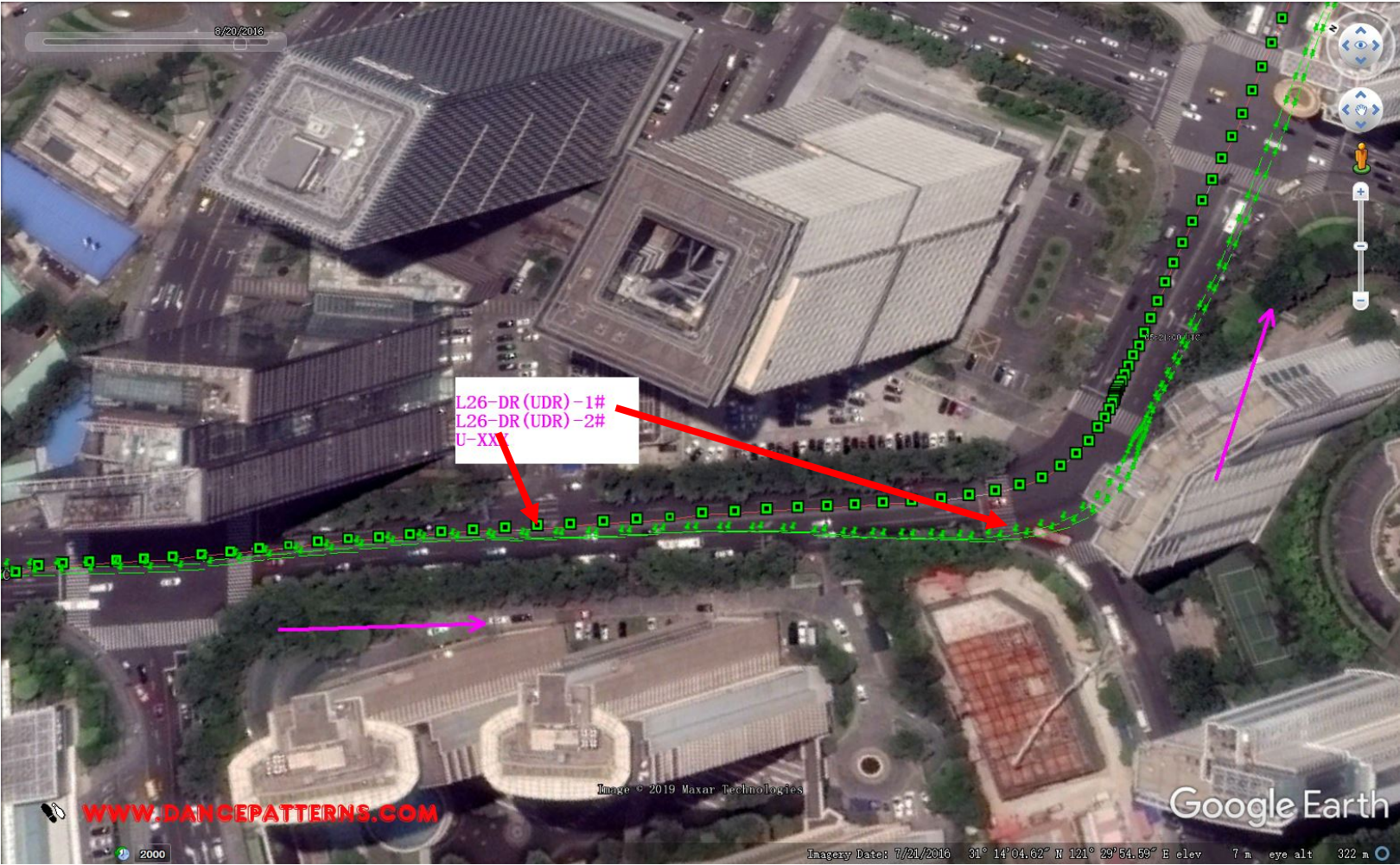In the curved tunnel, L26-DR's performance is better than its counterpart

U-XXX
L26-DR(UDR)

Comparison Test Under Elevated Highway

Under elevated highway, L26-DR's performance is better than its counterpart

Comparative Test in Urban Area (with High-rise Buildings)

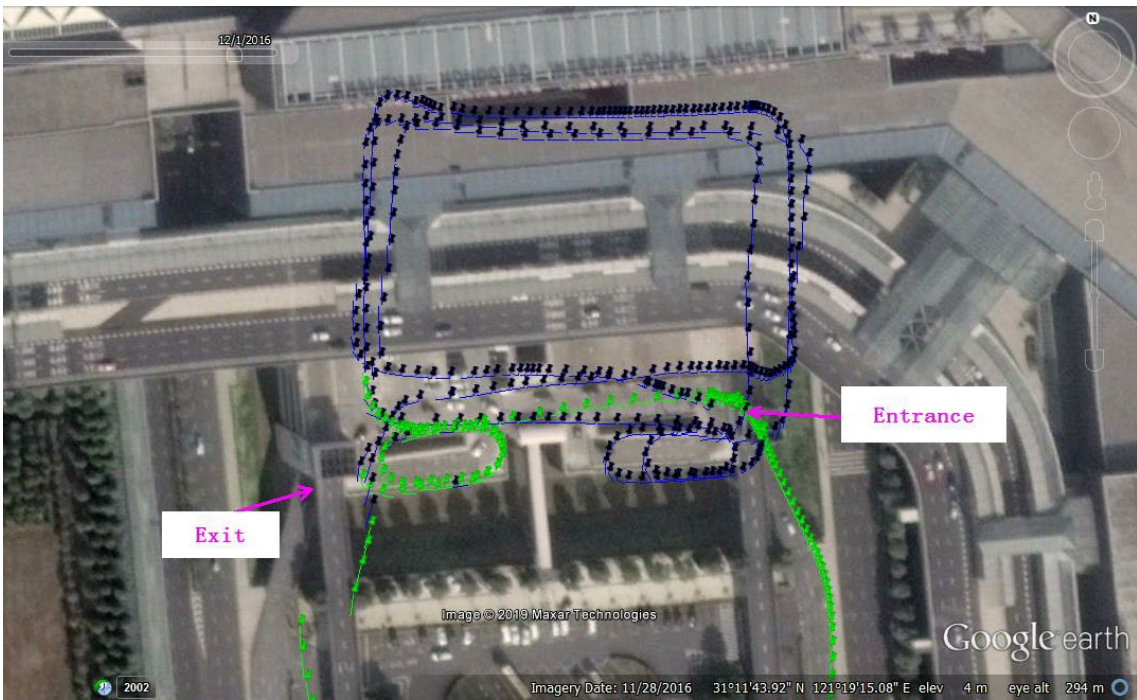L26-DR's performance is much better than its counterpart

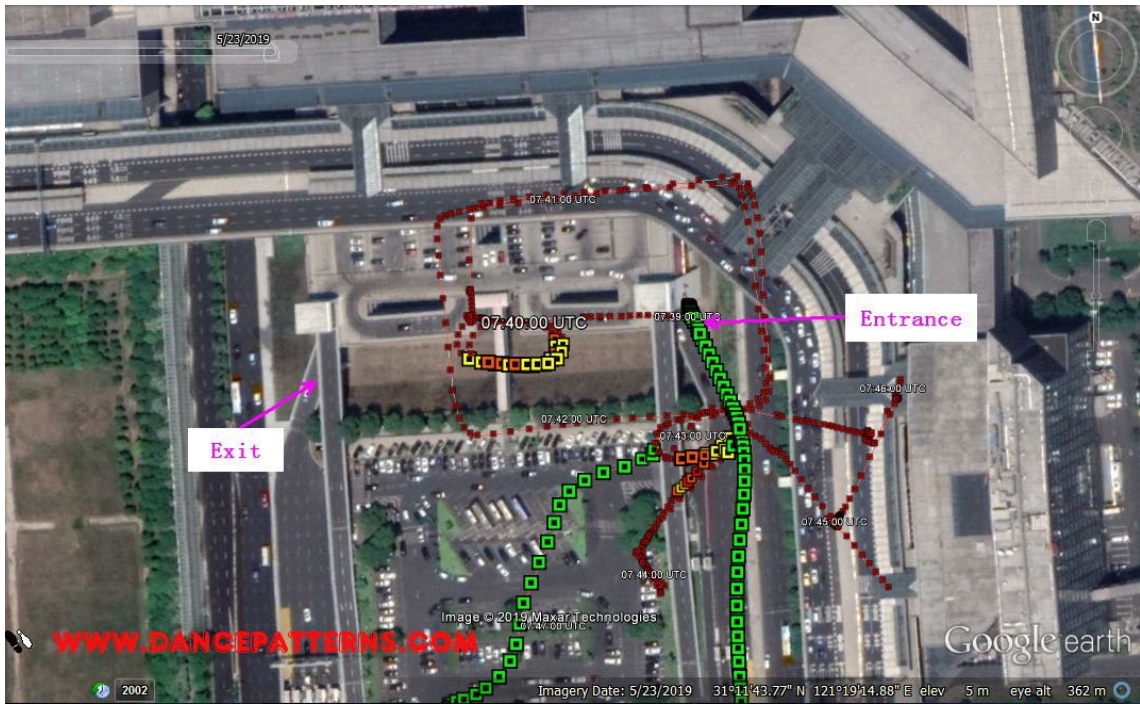# Comparative Test in Multi-layer Parking Garage
(Shanghai Hongqiao Airport)

Under multi-layer parking system, L26-DR's performance is better than its counterpart.
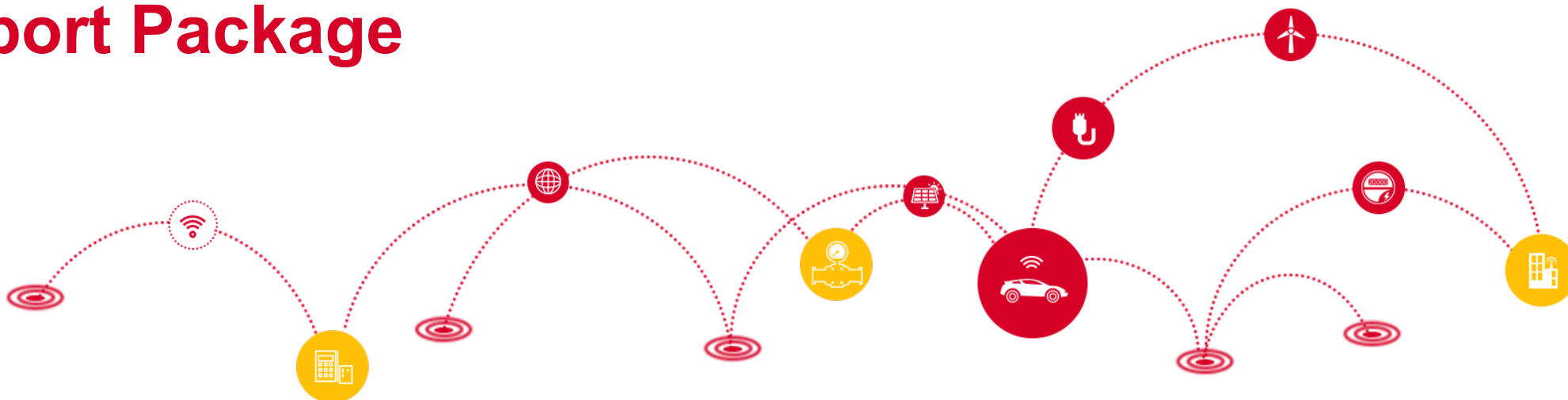
L26-DR(UDR)

U-XXX

Product Overview
Technical Details
Performance-ADR
Performance-UDR
Support Package

Support Package – EVB and Technical Materials

L26-DR EVB Kit

➢ Interfaces

- Serial port
- Antenna interface
- Micro-USB interface
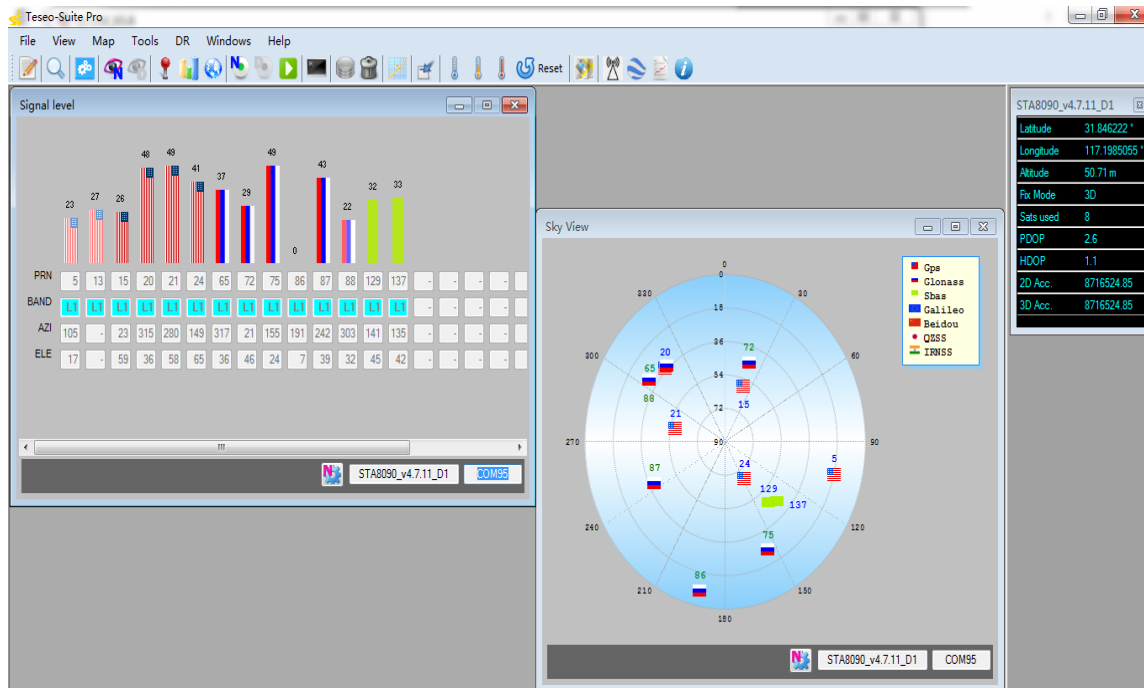- OBD interface

➢ Accessories

- Micro-USB cable
- Antenna
- OBD cable

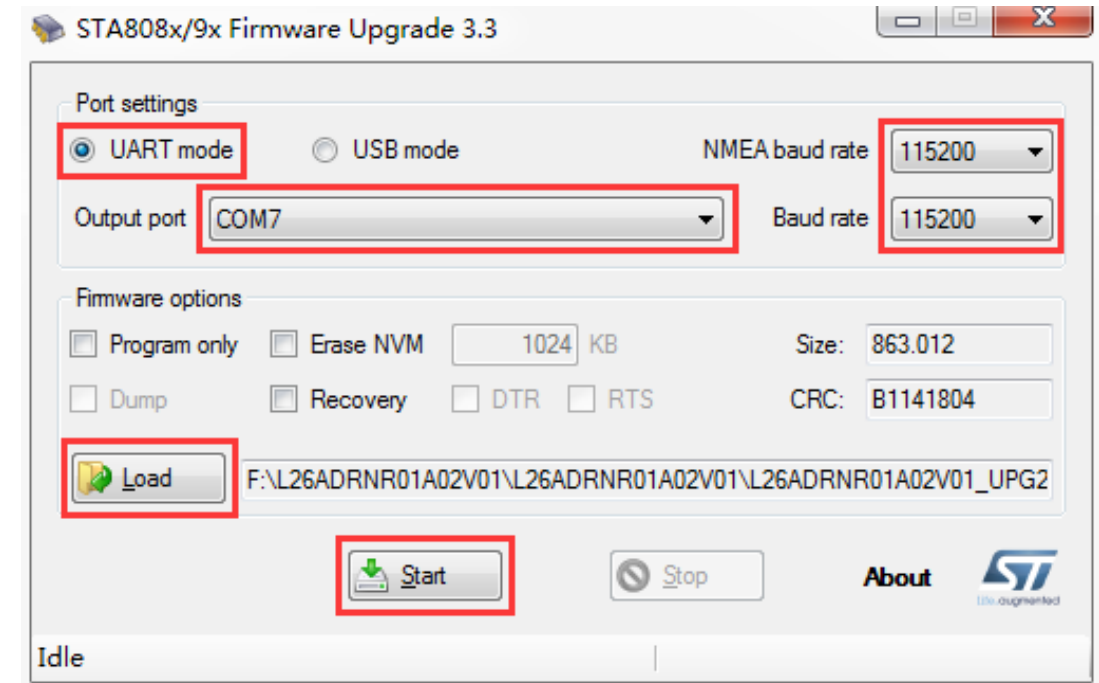# Support Package – EVB and Technical Materials

Technical Documents

- Hardware Design
- Reference Design
- Protocol Specification
- Evaluation Board User Guide
- Part&Decal in PADS and 3D File

PC Tools

- Teseo-Suite-multi-constellation testing tool
- STA808x-9x Firmware Upgrade

Thank you!

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f https://www.facebook.com/quectelwireless

🐦 https://twitter.com/Quectel_IoT