

## SPIRIT Dead Reckoning Software

SPIRIT Dead Reckoning software for smartphone or in-vehicle navigation drastically improves car positioning in complex urban environment like tunnels and dense urban areas where GPS-signals do not reach.

SPIRIT Dead Reckoning software uses data from standard GNSS chip and MEMS sensors installed inside smartphones/tablets, as well as from in-vehicle speed sensor available from CAN-bus directly or by OBDII, NFC and MirrorLink interfaces. With no additional hardware<sup>1</sup>, SPIRIT Dead Reckoning software provides high accuracy in tunnels and dense urban areas.

With the help of SPIRIT Dead Reckoning software, a driver can continuously enjoy convenient map services and turn-by-turn navigation in difficult conditions where GNSS alone fails.



### Accuracy<sup>2</sup>:

GNSS outage duration	Average distance traveled (m)	Horizontal position CEP error (m)
30 sec	400	4
1 min	800	8
2 min	1600	18
3 min	2400	30

<sup>1</sup> CAN-bus-to-Bluetooth wireless adapter may be necessary for transferring car velocity information into the smart-phone/tablet

<sup>2</sup> Typical values. Accuracy depends on a smartphone's GNSS receiver performance, multipath and other effects

## The drive through Lefortovo Tunnel in Moscow

(Length 3 246 meters, Time ~ 2 min. 40 sec.)

