

# ROADDNA

## ROBUST AND SCALABLE LOCALIZATION TECHNOLOGY



### OVERVIEW

Accurately determining the location of a vehicle in a robust and scalable manner is a key piece of the autonomous driving challenge. Because traditional GPS solutions fail to deliver the accuracy and robustness needed for autonomous driving, TomTom has developed RoadDNA, a new innovative product that addresses the localization challenge.

TomTom RoadDNA’s patented technology delivers a highly optimized 3D lateral and longitudinal view of the roadway. Through this, a vehicle can correlate RoadDNA data with data obtained by its own sensors. By performing this correlation in real-time, the vehicle’s precise location on a road can be determined, even while travelling at high speeds.

By converting a 3D point cloud of roadside patterns into a compressed, 2D view of the roadway, RoadDNA is a solution that can be used in-vehicle, with limited processing requirements. TomTom RoadDNA follows a feature-agnostic approach

that is robust and scalable, without losing roadway detail. This approach eliminates the complexity of identifying each single roadway object, while creating a unique pattern – the DNA of the roadway profile.

TomTom RoadDNA, combined with the TomTom HD Map, represents the most accurate and robust technology on the market to precisely and robustly locate an autonomous vehicle on the road.

### ROADDNA CONTENT

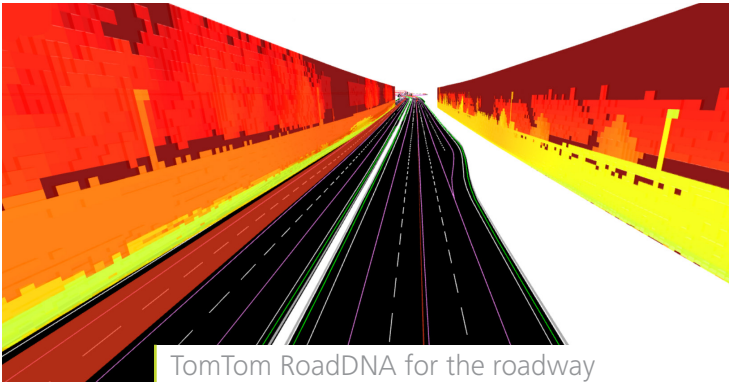
- Highly accurate positioned reference geometry aligned with TomTom HD Map content
- 3D pattern information from both sides of the road
- Template localization library for in-car use or simulation

### PRODUCT FEATURES AND BENEFITS

FEATURES	BENEFITS
3D depth map represented as 2D raster	<ul style="list-style-type: none"><li>• Facilitates pattern matching options and technologies</li><li>• Enables highly optimal data compression and storage management</li></ul>
High quality depth information that correlates with highly accurate reference geometry	<ul style="list-style-type: none"><li>• Allows real world depth information to be matched to exact position on the road</li></ul>
Smartly reduced 3D point cloud that maintains quality resolution	<ul style="list-style-type: none"><li>• Enables optimal storage and processing performance without loss of positioning accuracy</li><li>• Enables avoidance of potential data privacy issues</li><li>• Makes positioning robust against minor changes in reality such as weather and seasonal impacts</li></ul>
Positioning library that can align with other vehicle position inputs	<ul style="list-style-type: none"><li>• Gets you going without having to re-invent the wheel</li><li>• Speeds up implementation</li><li>• Allows for optimized positioning configuration</li></ul>



Real roadway segment



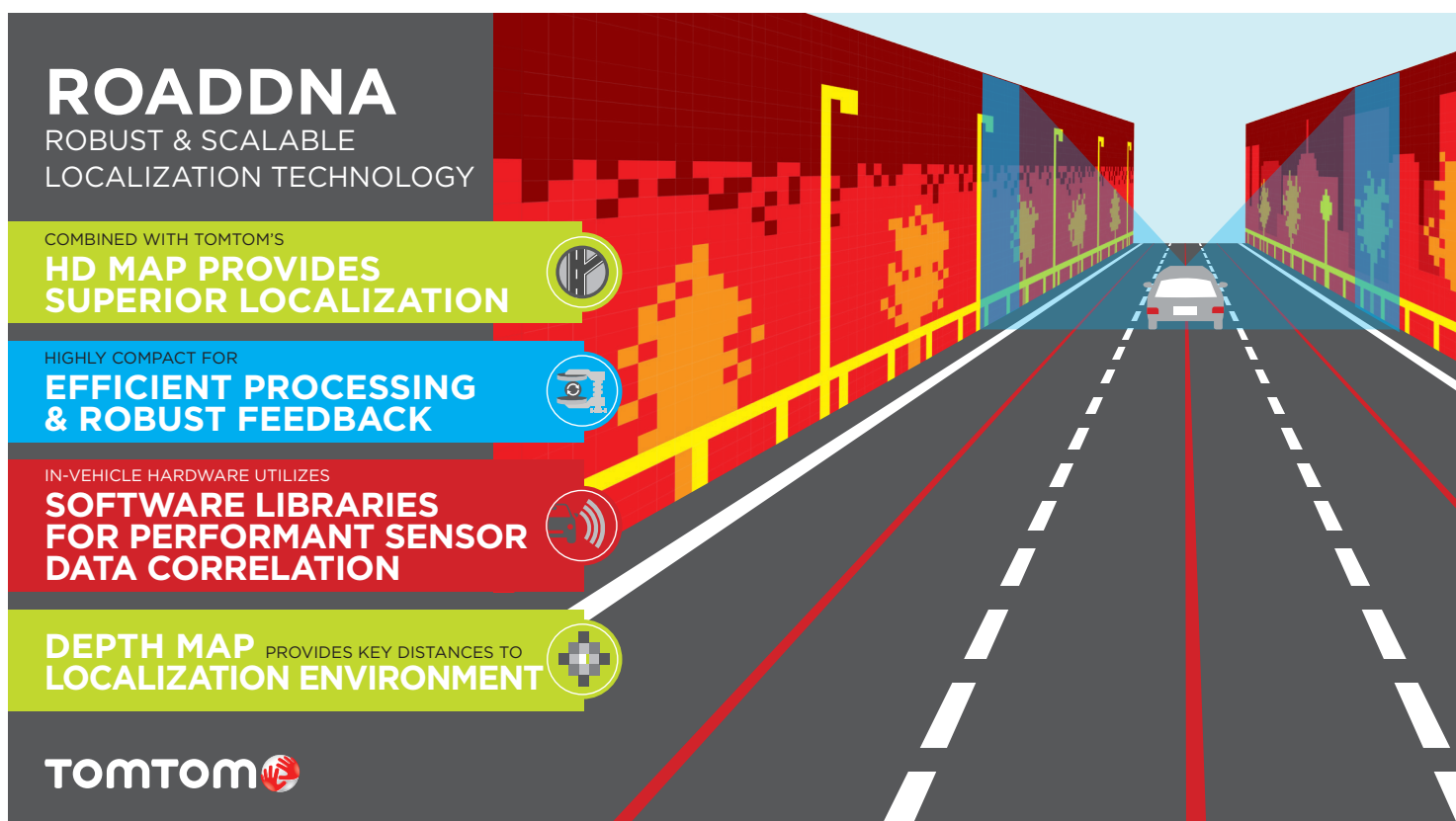
TomTom RoadDNA for the roadway segment pictured on the left

## ROADDNA BENEFITS COMPARED TO LANDMARK-BASED LOCALIZATION

- Robust localization correlation, highly adaptable to changes in reality
- Low storage and processing requirements
- Feature agnostic processing is less complex and less error prone
- <15cm lateral and <50cm longitudinal relative accuracy

## FORMAT

- Set of side-files in conjunction with TomTom HD Map
- Navigation Data Standard (NDS)
- Raster image as a .png



**ROADDNA**  
ROBUST & SCALABLE  
LOCALIZATION TECHNOLOGY

COMBINED WITH TOMTOM'S  
**HD MAP PROVIDES  
SUPERIOR LOCALIZATION**

HIGHLY COMPACT FOR  
**EFFICIENT PROCESSING  
& ROBUST FEEDBACK**

IN-VEHICLE HARDWARE UTILIZES  
**SOFTWARE LIBRARIES  
FOR PERFORMANT SENSOR  
DATA CORRELATION**

**DEPTH MAP** PROVIDES KEY DISTANCES TO  
**LOCALIZATION ENVIRONMENT**

**TomTom**

TomTom's high quality ADAS and autonomous driving content enable precise localization and motion planning for vehicles