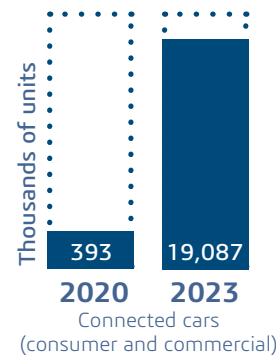


# CONNECTED VEHICLE COMMUNICATION PERFORMANCE DESIGN AND PLACEMENT OF 5G ANTENNA ARRAYS FOR V2V AND V2X COMMUNICATION

Worldwide the number of connected devices is expected to pass 25 billion in 2021. Many of these devices will be concentrated in dense urban environments. The promise of autonomous driving will radically change our daily lives from logistics to our everyday commute to work. To ensure the safety of everyone in this complex world, reliable connectivity between autonomous vehicles and their surrounding infrastructure is crucial.

5G with its unmatched speed, latency and connection density is uniquely positioned to be the game changing mobile communication standard, which will shape this world. Complex multi-antenna arrays need to be designed and verified to function both in isolation but also within their complex surroundings.

## 5G IoT—Connected cars worldwide 2020 and 2023



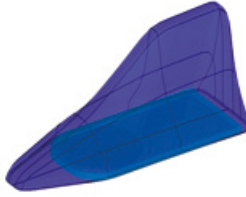
Data: Gartner, <https://www.zdnet.com/article/connected-cars-how-5g-and-iot-will-affect-the-auto-industry/>

# MASTER THE COMPLEXITY OF VEHICLE COMMUNICATION BY VIRTUAL PROTOTYPING

DASSAULT SYSTEMES OFFERS ACCURATE AND EFFICIENT ELECTROMAGNETIC COMPUTATIONAL SOLUTIONS FOR THE ANALYSIS OF ANTENNA DESIGN, ANTENNA PLACEMENT AND ANTENNA PERFORMANCE

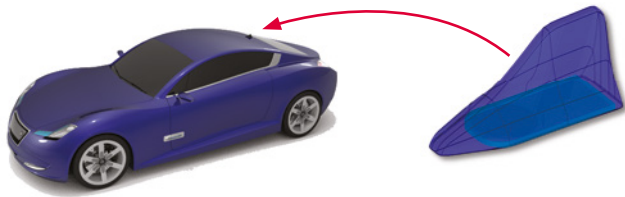
## ANTENNA DESIGN

Combine modern design concepts with functionality and electromagnetic compatibility requirements.



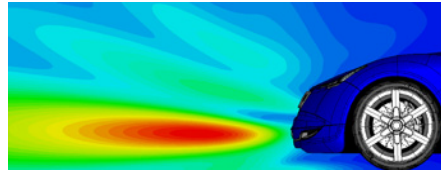
## ANTENNA PLACEMENT

Ensure structural integrity with respect to design variants as well as other antennas and electronic devices.



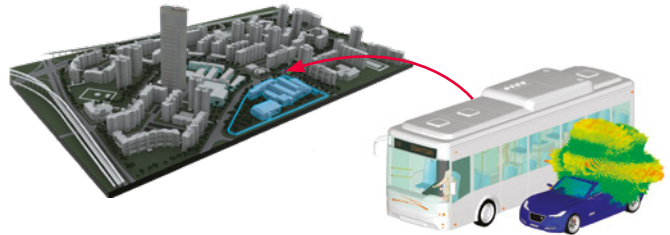
## ANTENNA PERFORMANCE

Simulate and optimize antenna gain, signal range and directivity in context of the full vehicle and ensure immunity to interference.



## FIELD COVERAGE

Investigate electromagnetic field distribution in the urban environment and analyze V2V and V2X communication in disruptive scenarios.



## BENEFITS

### Develop and Validate

Rapid and easy design and validation of new antenna concepts

### Digital Continuity

Seamless real time collaboration between electronic and mechanical engineers to ensure antenna integration at the full vehicle level

### Compliance and Safety

Accurate and validated results to ensure the product fulfills the required electronic certification standards

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