



**FORUM TERATEC – June 2019**

**The vision of the techno-providers for the development of AVs**

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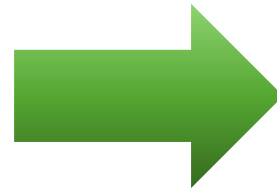
# A shift of a paradigm

you **DRIVE**

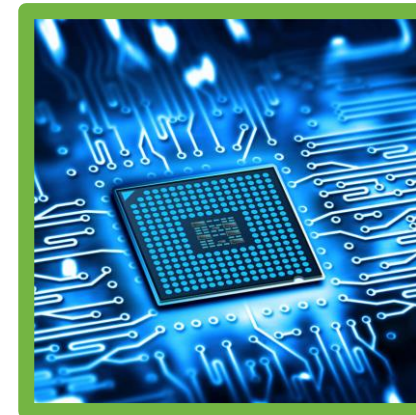


Vehicle  
Controls

Advanced  
Driving  
Assistance



you **RIDE**



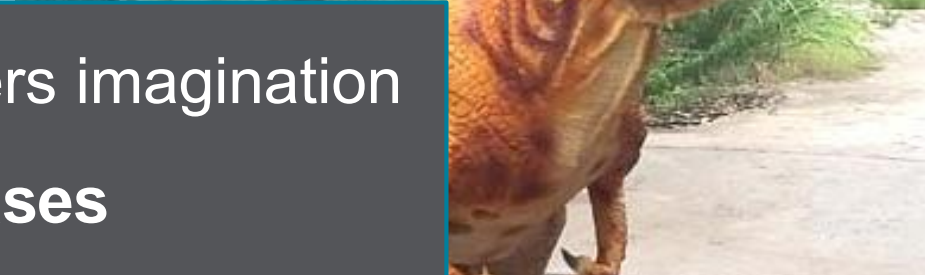
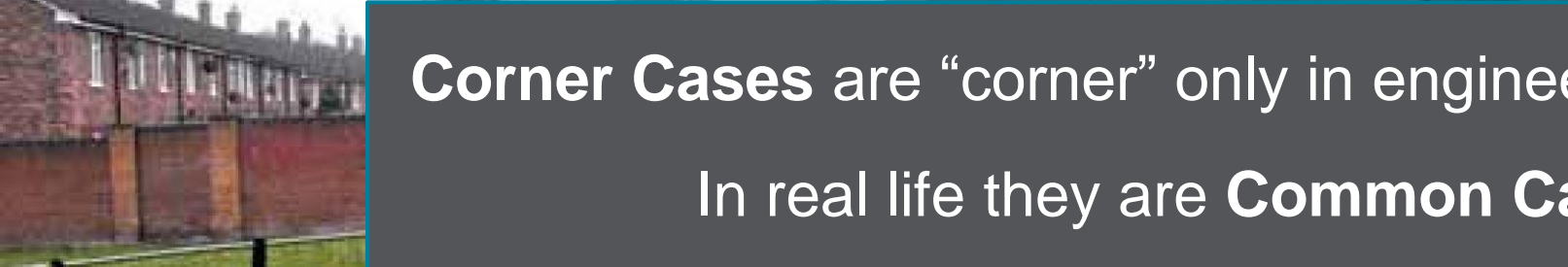
In some  
conditions

Everywhere,  
Every time

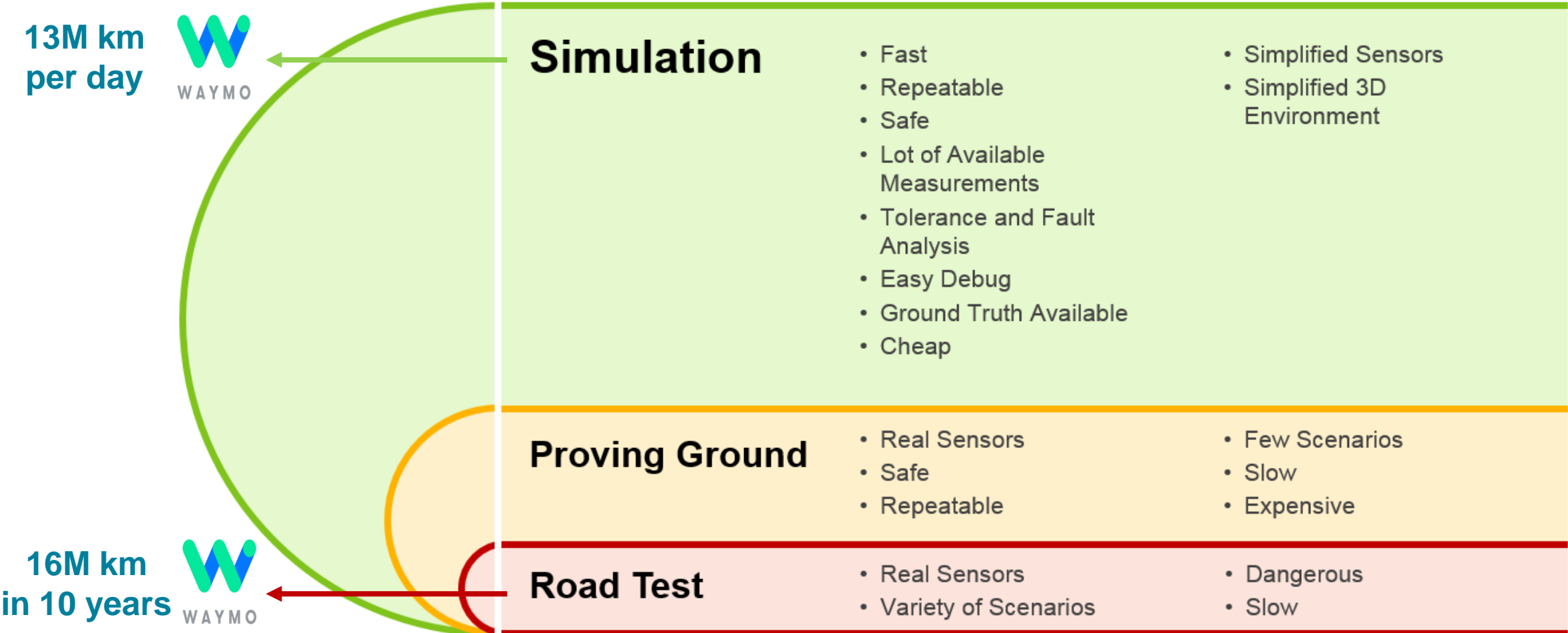


# Everywhere every time...

**Corner Cases** are “corner” only in engineers imagination  
In real life they are **Common Cases**

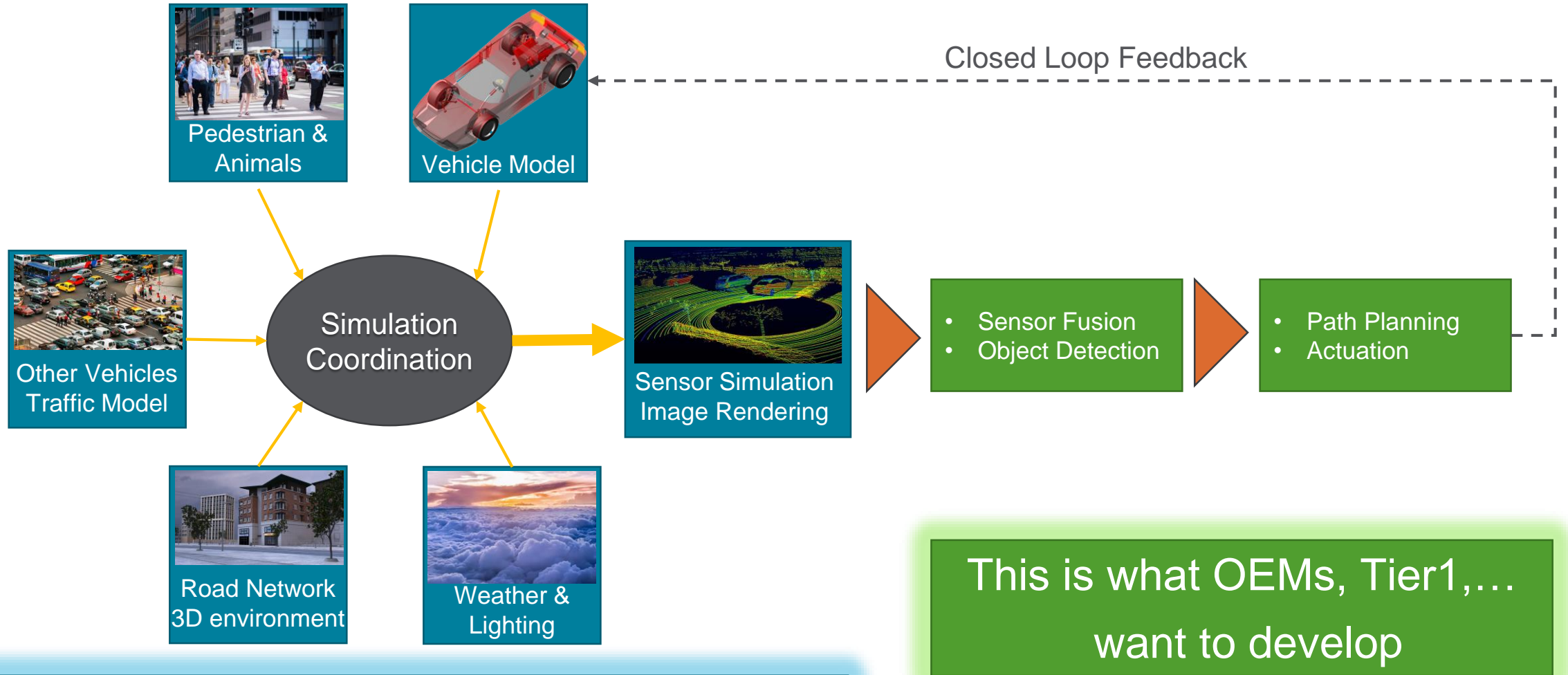


# Simulation is a must ...



# The Simulation Workflow

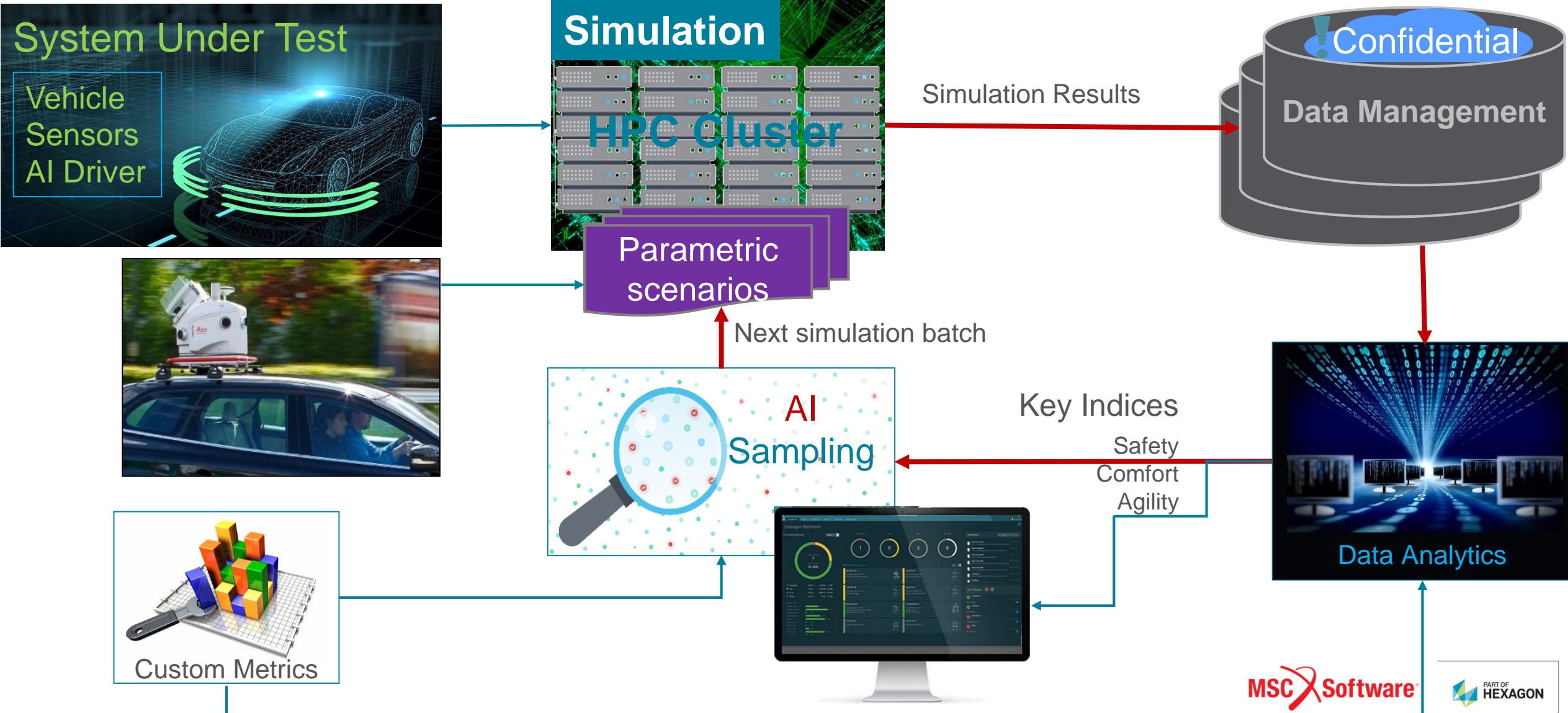
# End-to-End Simulation Workflow



This is how the simulation env. enables them



# Achieving massive simulation



# Let's be pragmatic...

## Road Testing & Data Acquisition



AS  
AutonomouStuff

HEXAGON  
POSITIONING INTELLIGENCE

NovAtel



HEXAGON  
GEOSYSTEMS

Leica

Mobile Mapping

Content Program

## Virtual Testing & Analysis HPC Cluster



Vehicle Model

AI Driver

Traffic

Sensors

3D Environment



Adams



Adams  
Real Time



AI  
sampling



Data  
Management



Data Analytics

MSC Software

PART OF  
HEXAGON



# Simulation trends (just to name a few...)

	BEFORE	NOW
<b>Execution</b>	Single Seat	HPC Cluster
<b>Operation</b>	Interactive	Test Automation
<b>Scale</b>	hundreds	Hundreds of thousand
<b>Precision</b>	“Good Enough”	Physically Based
<b>Validation</b>	Verifiable	ISO 26262
<b>Traffic</b>	Local	City Scale
<b>Interoperability</b>	“Islands”	Standards

# Important: Collaboration for standardization... some examples



## Delivers the standards for automated driving

Partners: Audi, BMW, Daimler, Opel, Volkswagen, Bosch, VIRES...



## European initiative to enable validation for highly automated systems

Six domains: Automotive (VIRES is partner), Aerospace, Rail, Maritime, Health, Faring



## Association for Standardization of Automation and Measuring Systems

Responsible for well known OpenDRIVE, OpenCRG and OpenSCENARIO standards





MSC Software®

# Where Simulation gets Real

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