

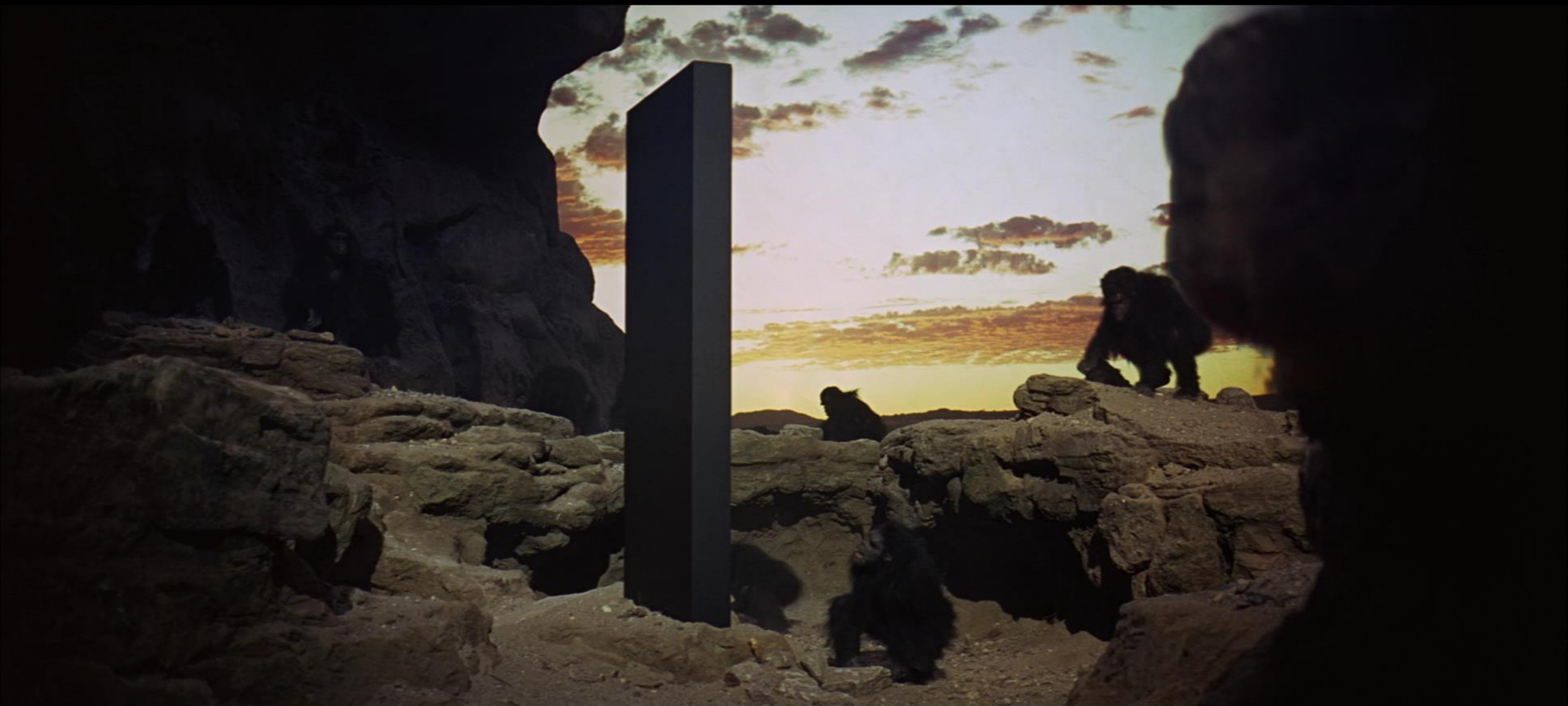
# PILOT PREPARATION AND AD FUNCTIONS

Yves Page  
RENAULT GROUP (and on behalf of the L3Pilot EU-Funded Project)

*Session SIS45 - Challenges on Testing and Validation of Automated Driving*

## *Testing and Validation of Automated Driving*

WHAT IS IT?



# WHAT IS IT?

## Testing

The **process** of **using** or **trying** something to see if it works, is suitable, obeys the rules, etc. (Cambridge Dictionary)

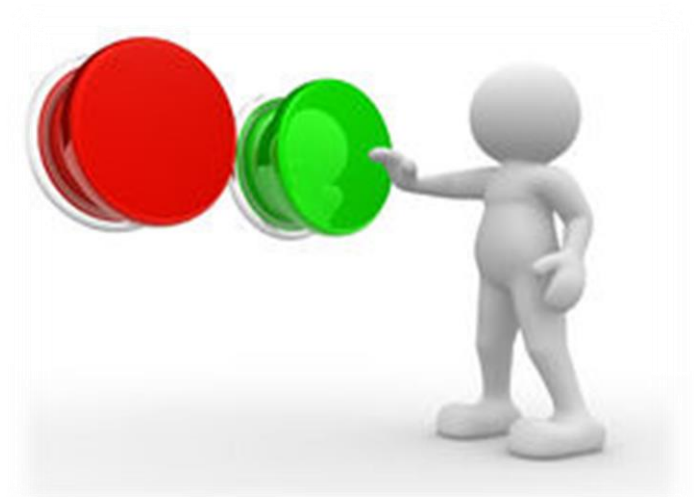
## Validation

**Confirmation**, through the provision of objective evidence, that the **specified requirements** for a **specific intended use** or application have been **fulfilled**

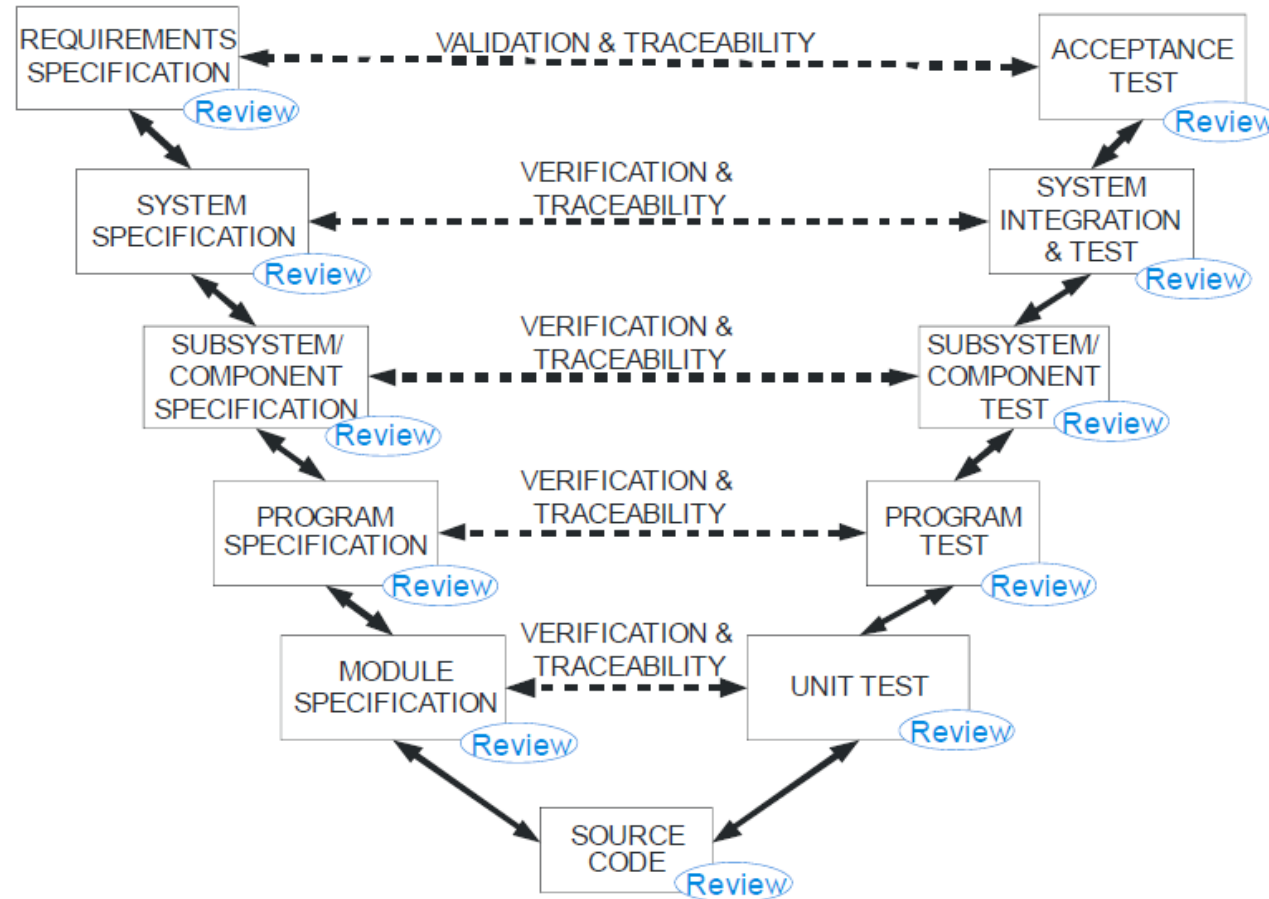
## Verification

**Confirmation**, through the provision of objective evidence, that **specified requirements have been fulfilled**

Reference: ANSI/ISO/ASQ Q9000-2005: Quality management systems - Fundamentals and vocabulary



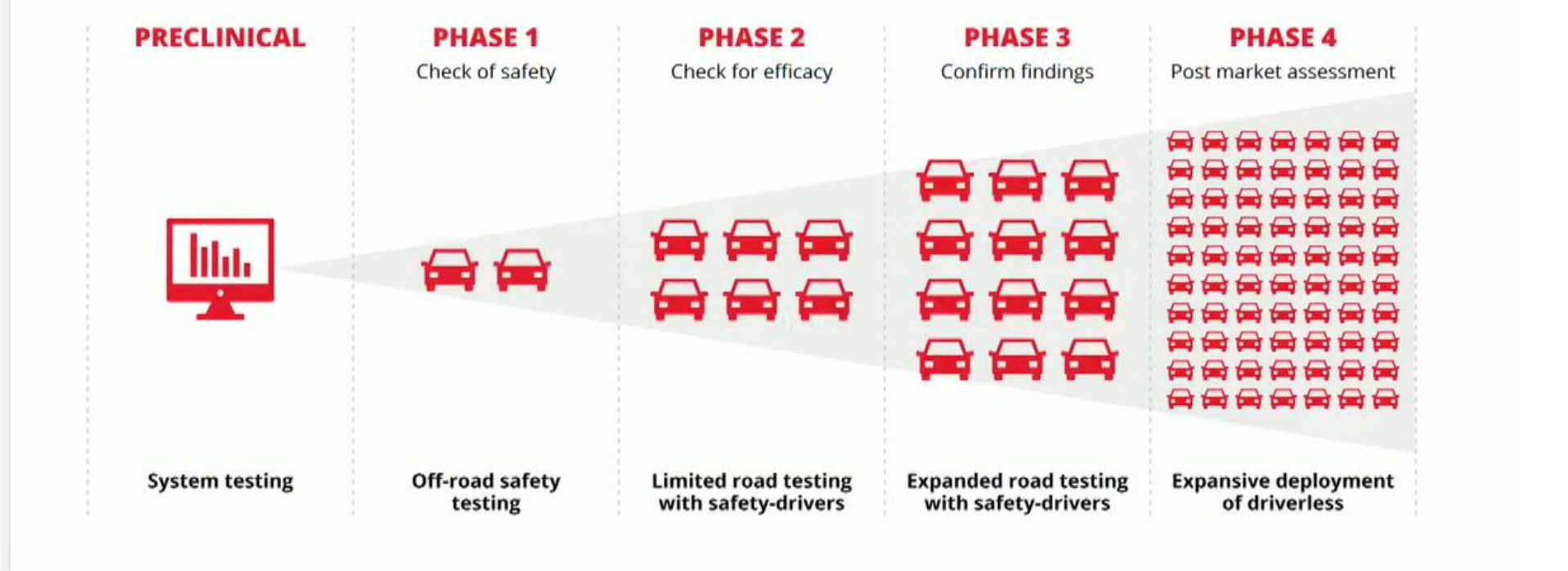
# WHAT IS IT?



Source: Challenges in autonomous testing and validation, Koopman & Wagner, 2016

# A SIMPLER WAY TO LOOK AT IT

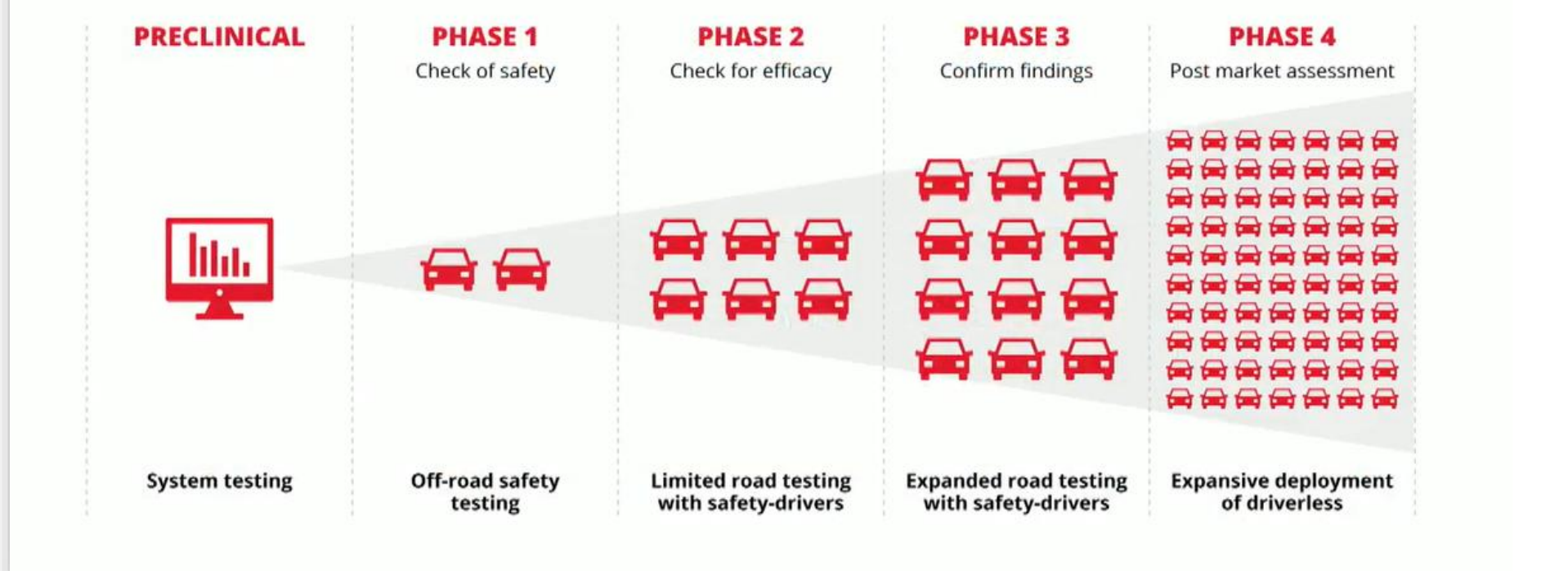
## Stages of an Automotive Clinical Trial



Source : Bryan Reimer, MIT – Tedx Waltham Event, June 2018

# MY RESTRICTIONS TODAY

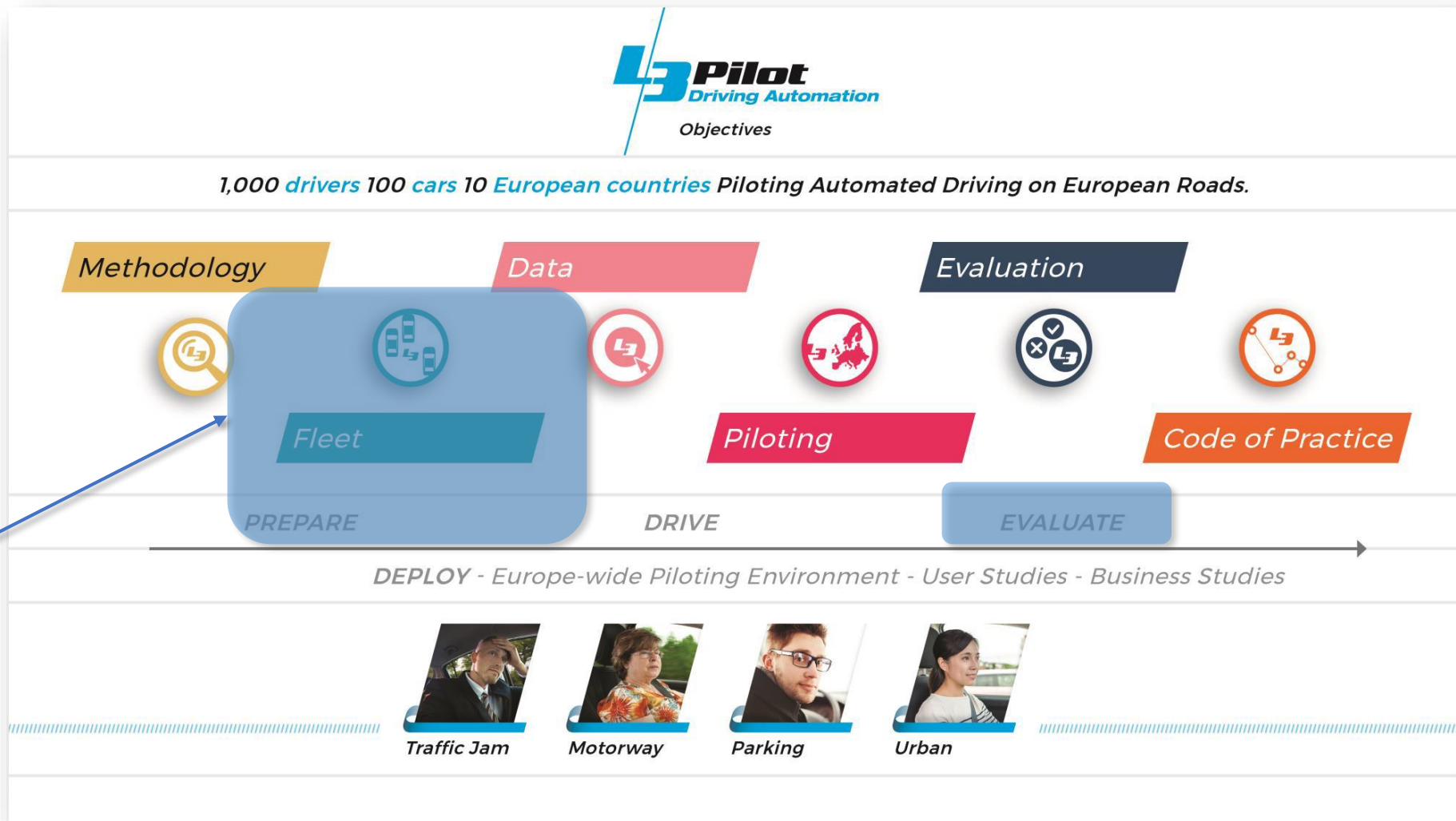
## Stages of an Automotive Clinical Trial



Source : Bryan Reimer, MIT – Tedx Waltham Event, June 2018

# L3PILOT IN A NUTSHELL

Focus





# WHAT IS IT (AGAIN)?

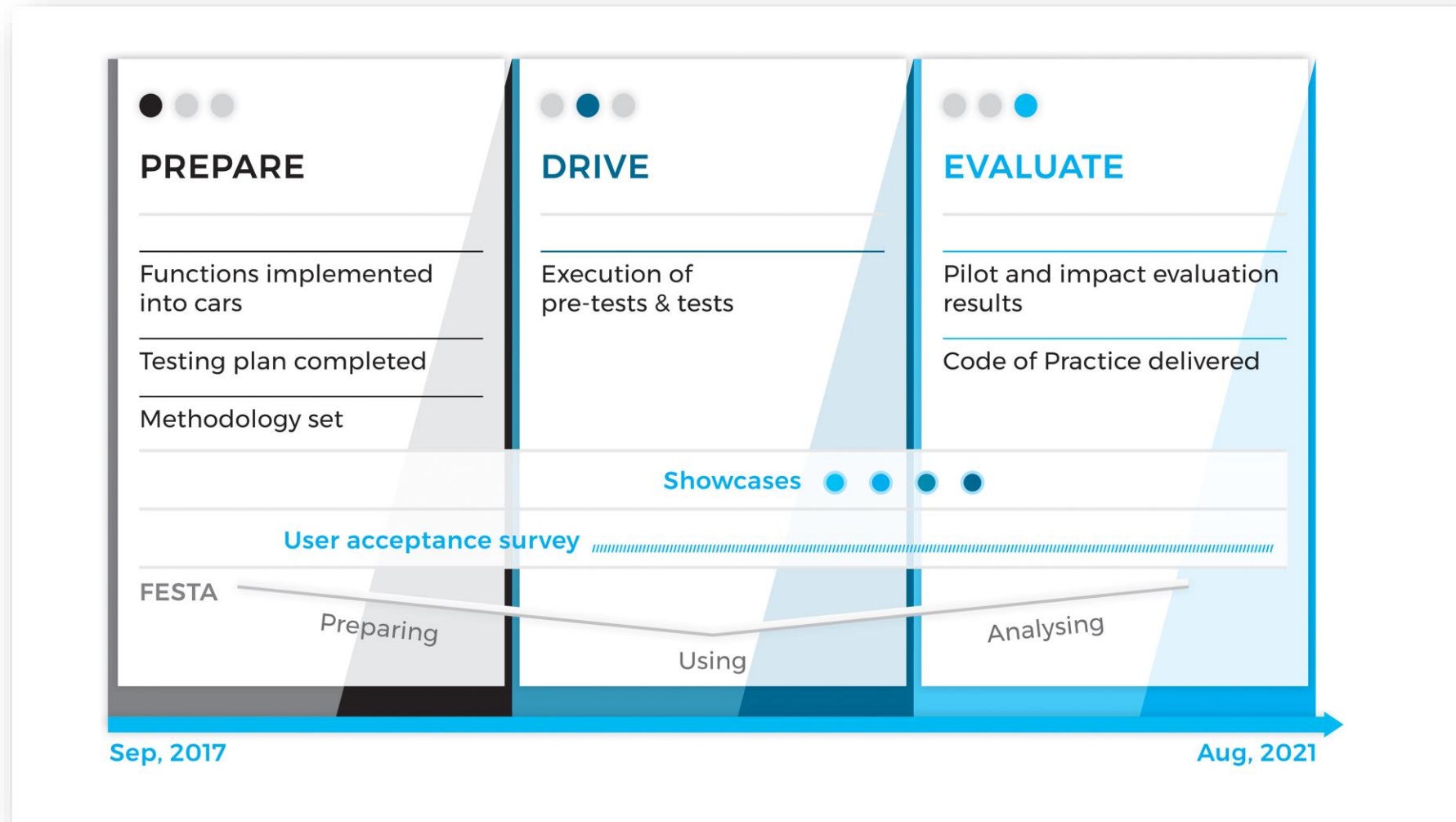
## Evaluation

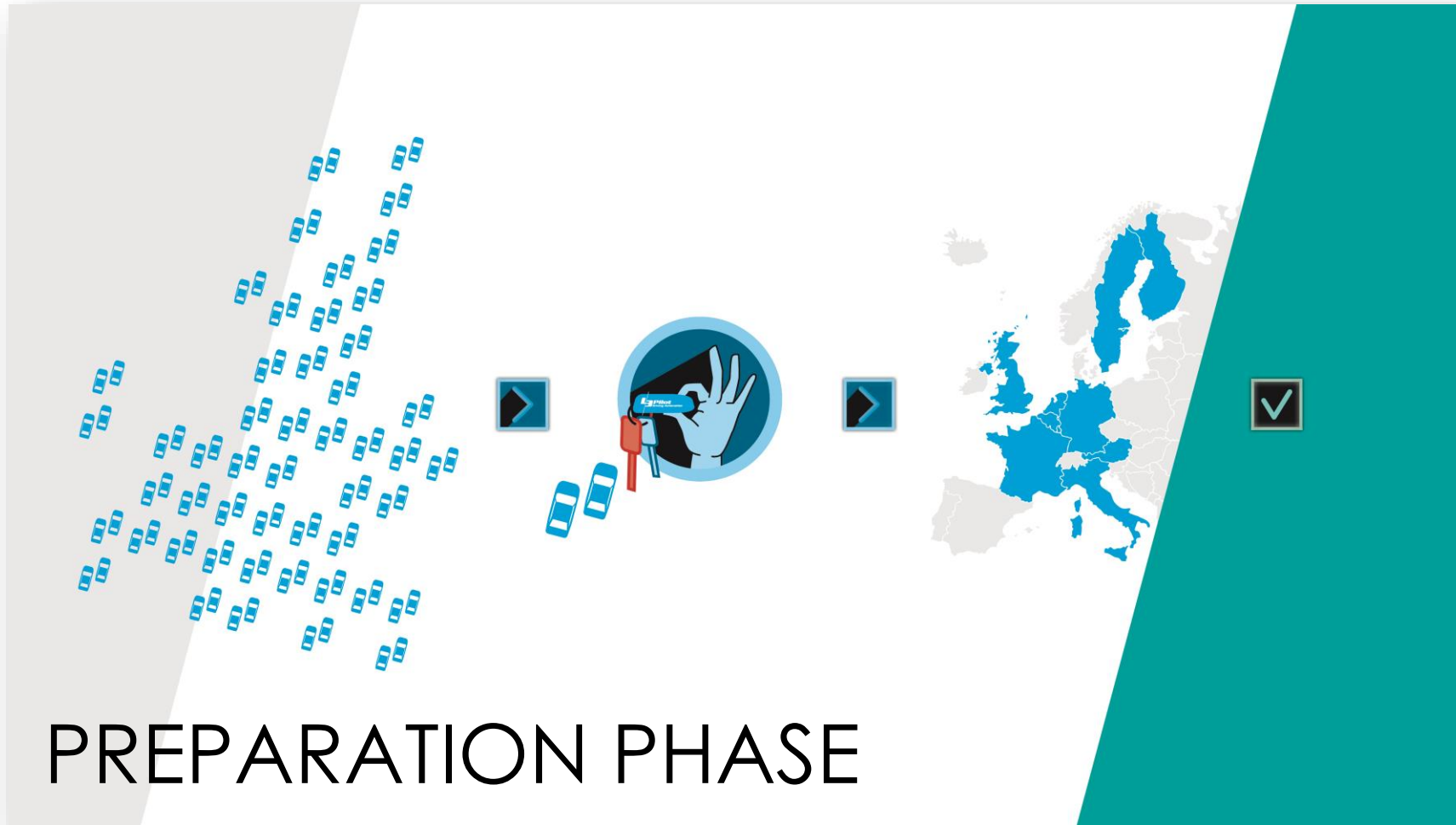
The process of **judging** something's quality, importance, or value



Cambridge Dictionary

# L3PILOT MACRO PROCESS





# PREPARING THE FLEETS FOR A PILOT

## A CHALLENGES ODYSSEY



Technologies

Methodologies

Objectives

Data collection

Technical  
maintenance

Evolution of  
systems

Use Cases

Automation Level

Critical scenarios

Cyber Security

Safety Validation

Regulations

ODDs

Time

Confidentiality

Common outputs

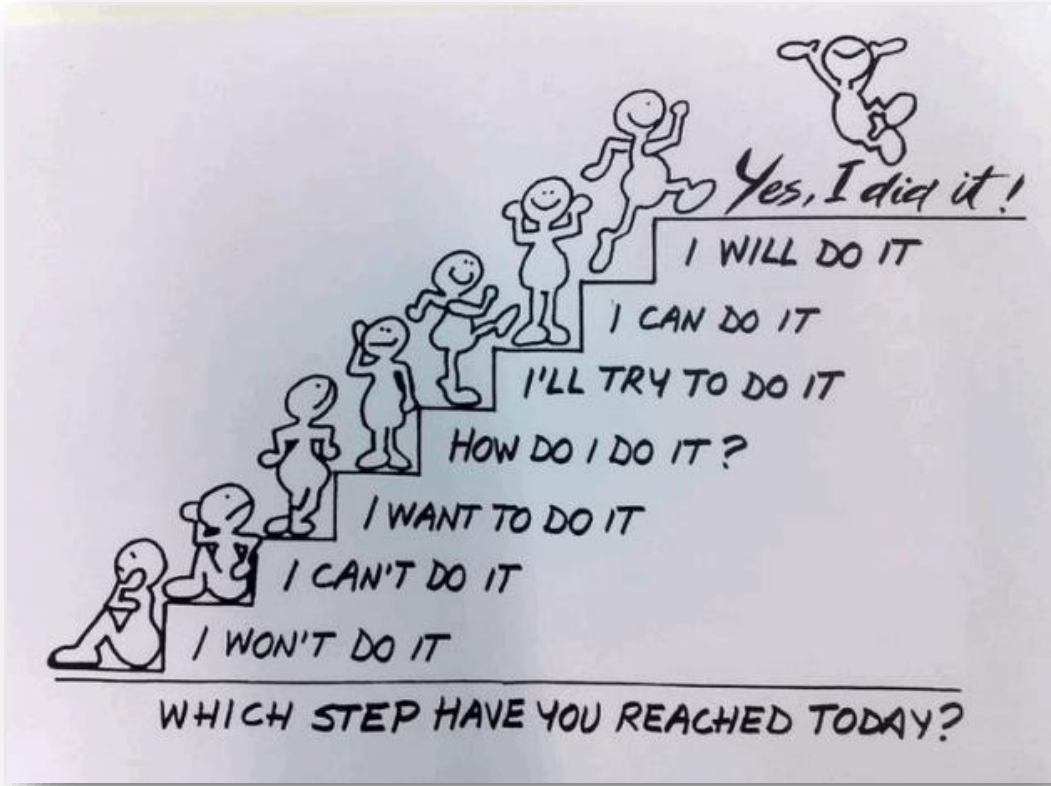
# PREPARING THE FLEETS FOR A PILOT

## A CHALLENGES ODYSSEY

**Methodologies**

**Technologies**

**Process**



# PREPARING THE FLEETS FOR A PILOT

## CHALLENGE 1

### Trust



# PREPARING THE FLEETS FOR A PILOT CHALLENGE 2

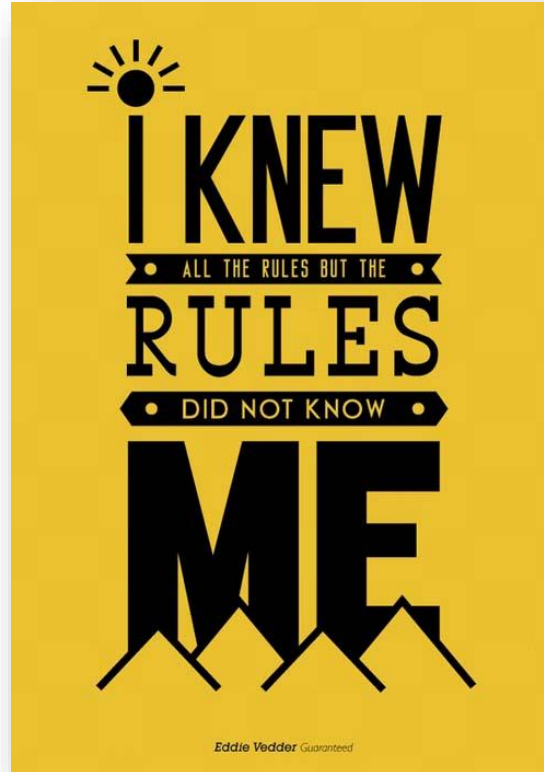
## Commitment



**Decide.  
Commit.  
Succeed.**

# PREPARING THE FLEETS FOR A PILOT CHALLENGE 3

## Inspiration





# PREPARING THE FLEETS FOR A PILOT

## CHALLENGE 4

### Capabilities



# PREPARING THE FLEETS FOR A PILOT

## CHALLENGE 5

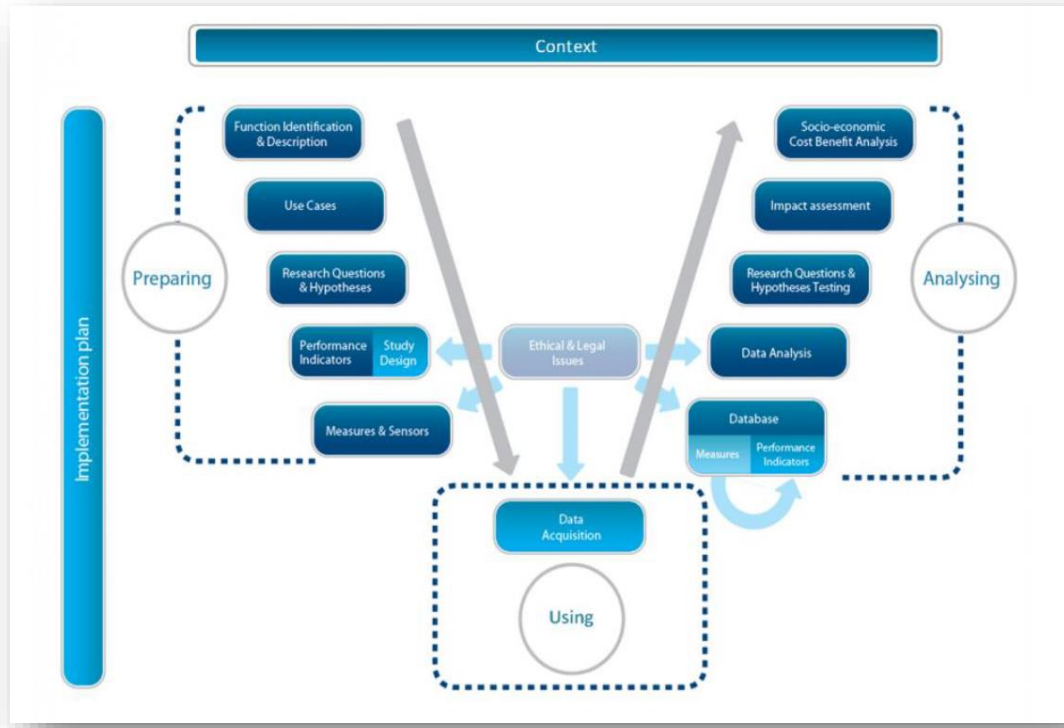
### Readiness



# PREPARING THE FLEETS FOR A PILOT

## CHALLENGE 6

### Compliance



# PREPARING THE FLEETS FOR A PILOT

## CHALLENGE 7



**... Money**

# PREPARING THE FLEETS FOR A PILOT

## *ACHIEVEMENTS/ISSUES IN L3PILOT/SP4 SO FAR*



- ✓ Description and Taxonomy of AD Functions (18)
- ✓ Proposition for a fleet of vehicle by vehicle owners
- ✓ Description of realistic experimental procedures
- ✓ Safety requirements for the experiments
- ✓ Implementation of AD systems in prototypes
- ✓ Starting tests for collecting data
- ✓ .... With all European OEMs + a supplier onboard

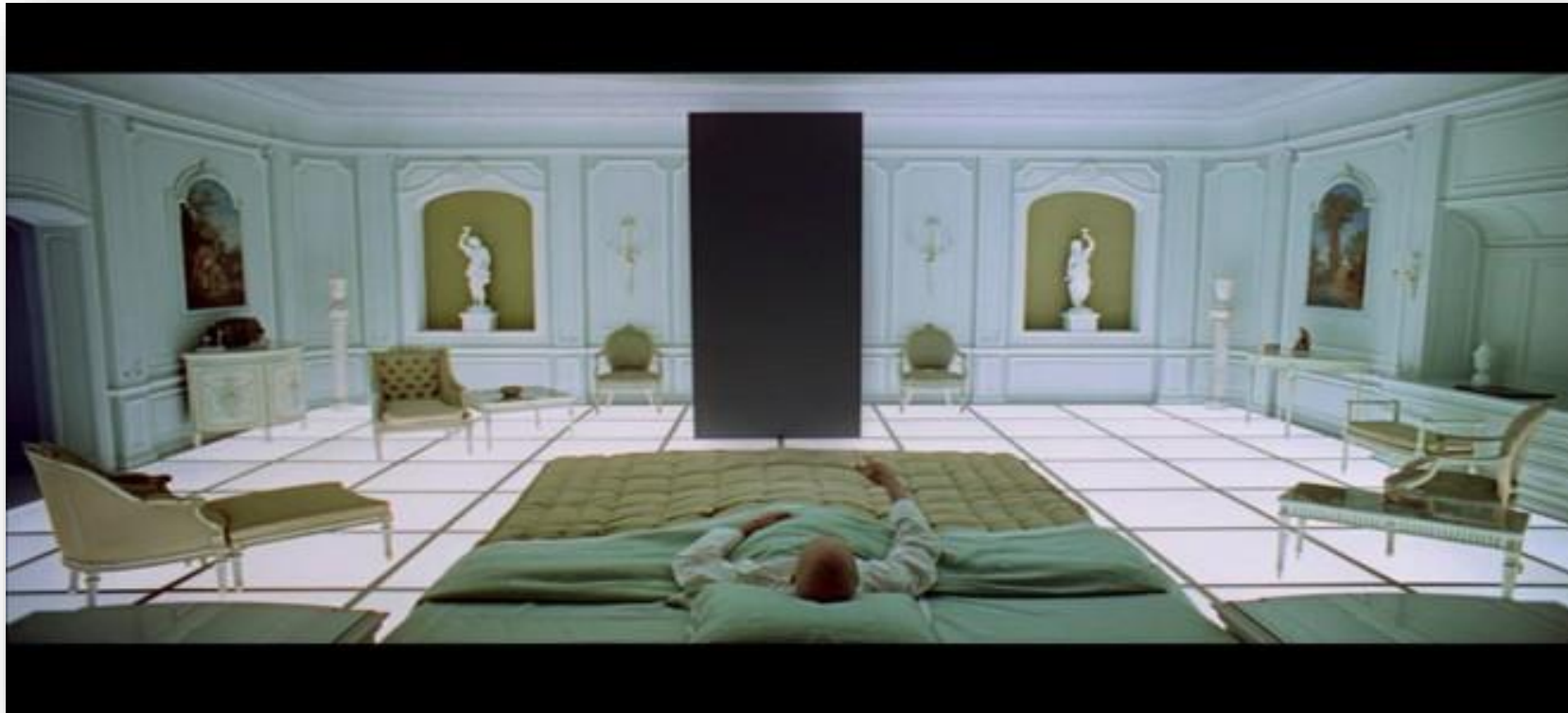
# PREPARING THE FLEETS FOR A PILOT

## ACHIEVEMENTS/ISSUES IN L3PILOT/SP4 SO FAR

- ✓ Description and Taxonomy of AD Functions (18)



1,000 *drivers* 100 *cars* 10 *European countries* Piloting Automated Driving on European Roads.



THANK YOU VERY MUCH FOR YOUR ATTENTION

☺ And also to Stanley Kubrick for his insights into mystery and complexity ☺