Road Infrastructure ready for mixed vehicle traffic flows

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INFRAMIX - Road Infrastructure ready for mixed vehicle traffic flows
project facts

Duration: *1 June 2017-31 May 2020*
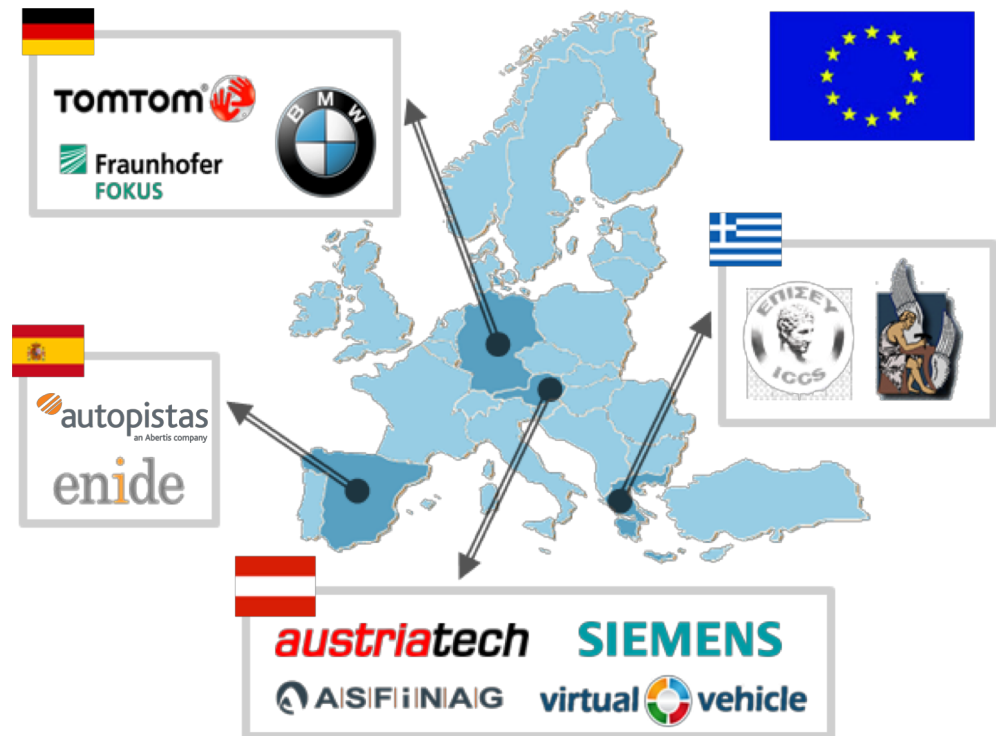**EC Funding:** *5M €*
Coordinator: *AustriaTech*
Consortium: *Austriatech, ICCS, Asfinag, Fraunhofer, Siemens, Virtual Vehicle, Autopistas, Enide,Technical University of Crete, TomTom, BMW*

Website: https://www.inframix.eu/
Social media: @inframix   INFRAMIX project

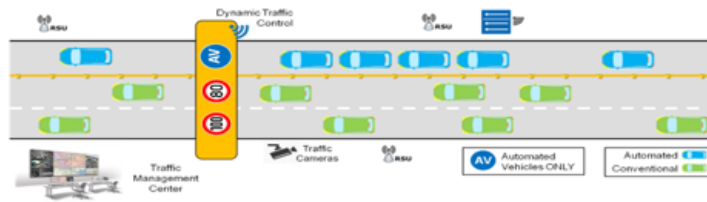INFRAMIX

INFRAMIX project objectives

- Design new and upgrade existing **physical** & **digital road infrastructure elements**

- Design **novel signalling** and **visualisation elements**

- Design and implement **novel traffic estimation**, **monitoring** and **control strategies**

- Develop a **co-simulation environment**

- Develop a **hybrid testing system**

- Evaluate **user's appreciation** and **acceptance**

- Evaluate **traffic safety**
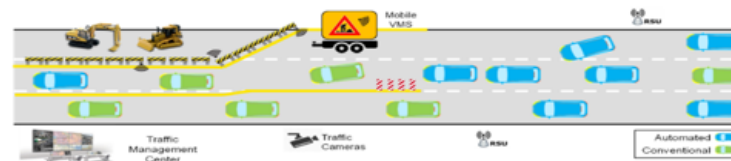
- Create a **Road Infrastructure Classification Scheme**

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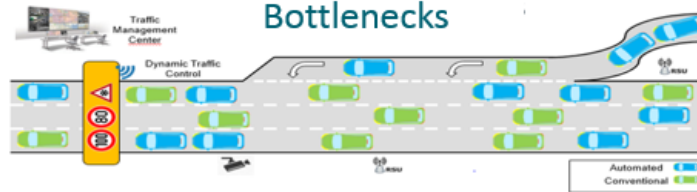# Use Case definitions – Basis for INFRAMIX activities

Dynamic lane assignment to automated driving

Roadworks zone

Bottlenecks

- Described and analysed in detail
- Status quo of test sites and simulation tools as a starting point
- Definition of requirements:
  - functional
  - feasibility
  - non-functional
- Linking of requirements to major INFRAMIX components
- Comprehensive information on the use cases is available on the INFRAMIX website (D2.1)

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Develop a co-simulation environment

Co-simulation environment: combines the modelling of the behavior with the traffic simulation
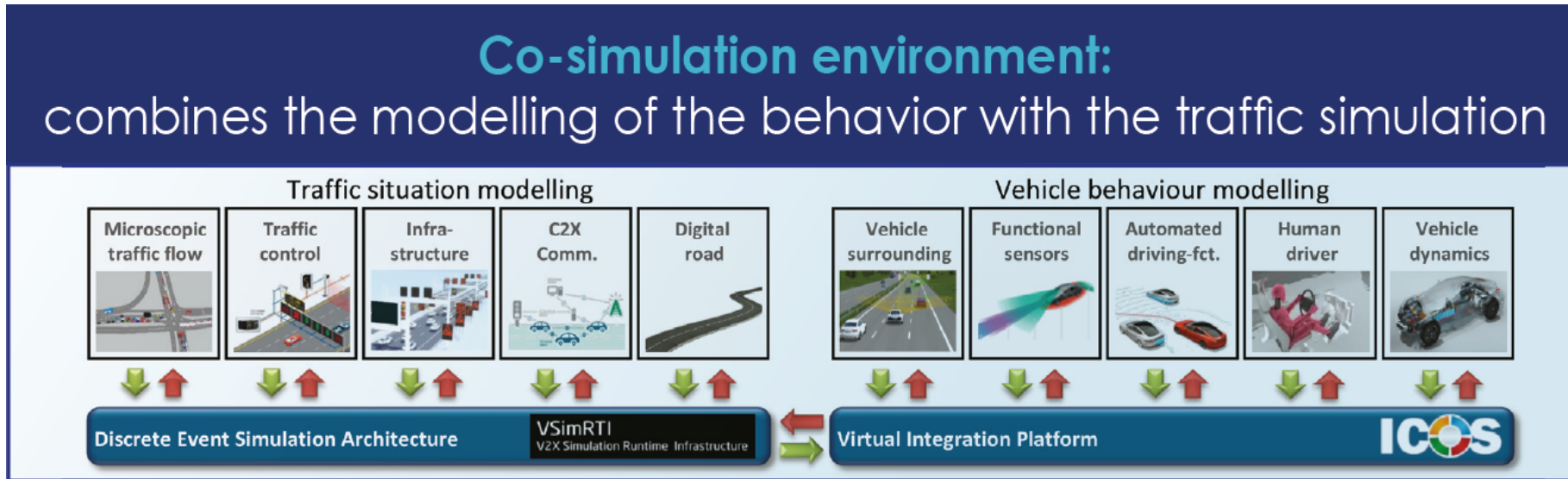
- Simulation platforms have been coupled to a co-simulation environment
- Tests have been carried out
- Communication features have been integrated
- Interfaces are specified
- Description of the co-simulation environment is available on the INFRAMIX website (D2.2)

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Create a Road Infrastructure Classification Scheme

Objective:

- Highlight the connectivity and automation capabilities of the infrastructure and its ability to manage the circulation of vehicles of different levels of automation

Targets:

- Indicate the infrastructure connectivity, automation capabilities, capability to host vehicles of different levels of automation and connectivity

- Provide dynamic classification – under certain conditions (e.g. an incident, extreme weather conditions) the circulation of automated vehicles will be affected

- Guide to incrementally upgrading levels of infrastructure to avoid stranded investments

Available on the INFRAMIX website: Road infrastructure support levels for automated driving

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Design and implement novel traffic estimation, monitoring and control strategies

Traffic estimation, monitoring and control strategies dynamically adapted to

- different penetration levels of automated vehicles,
- infrastructure equipment
- overall traffic status

Investigation of:

- exploiting AV capabilities towards increased traffic flow efficiency and safety
- increasing the bottleneck capacity by achieving a prespecified (possibly traffic-dependent) lane distribution of vehicles while approaching a bottleneck
- improving the traffic flow at bottlenecks by controlling the upstream flow (investigation of several innovative flow control strategies)

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Physical & digital road infrastructure elements and novel signaling and visualization elements

- Design new and upgrade existing physical & digital road infrastructure elements
- Design novel signaling and visualization elements
- "Hybrid" infrastructure (physical and digital) able to cope efficiently with the new safety challenges
- Static and dynamic digital representation of the physical world with which the automated vehicle will interact to operate
  - New traffic signs for mixed traffic
  - Novel traffic monitoring recommendations (wireless messages extensions)
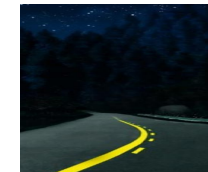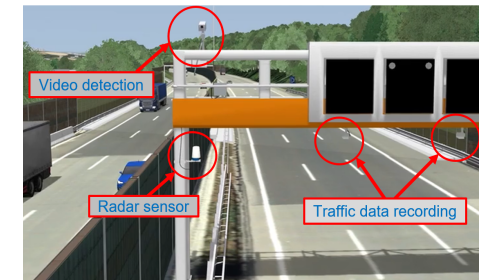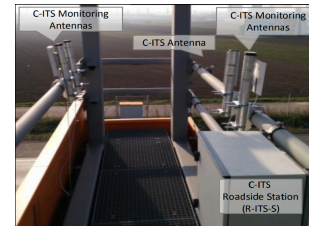
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Develop hybrid testing system

Coupling infrastructure elements and vehicles on real roads with virtual traffic environment
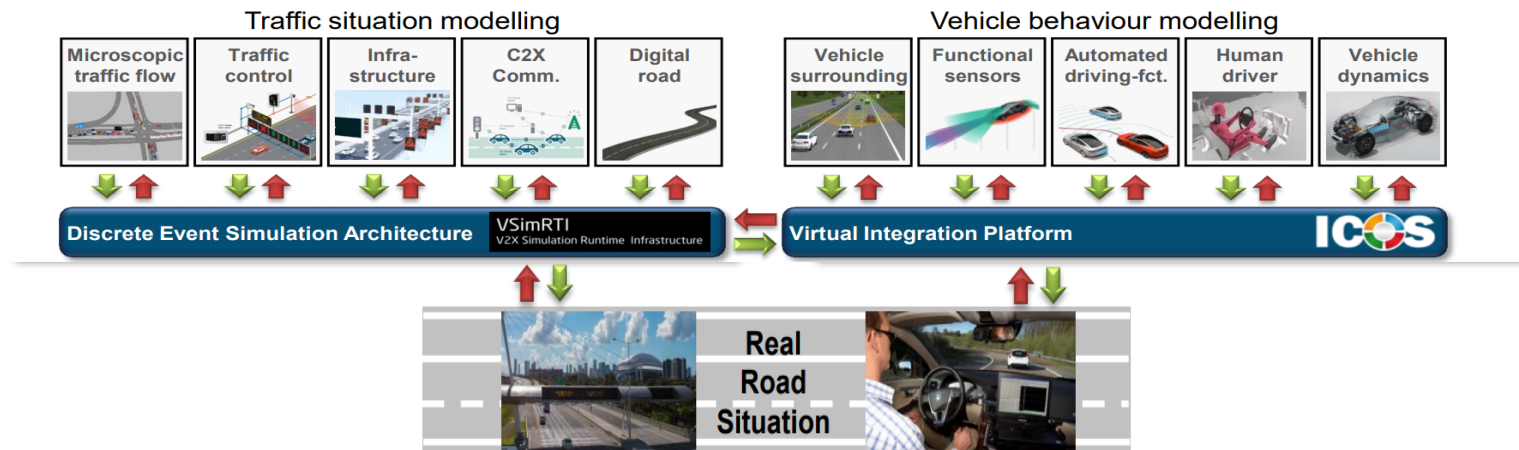
- Enables detailed and realistic investigations of real driving behaviour in a complex but safe virtual traffic to demonstrate the potential of INFRAMIX.
- Testing of new developments of connected and automated driving
- Emulation of critical traffic situation in a safe artificial environment

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Evaluate traffic safety and user's appreciation & acceptance

- Evaluation of
  - users appreciation and
  - traffic safety
  - in mixed traffic through dynamic lane assignment, roadworks zones and bottlenecks traffic scenarios
- Investigation of several cases with safety critical impact (e.g. for the roadworks zones scenario)
- Testing of the developed traffic control algorithms (e.g. for the bottlenecks scenario)
  - with increased traffic densities in exceptional conditions
  - with different rates of conventional and automated vehicles.

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Expected or potential impact (long-term) of the project

- New traffic estimation and control algorithms for mixed traffic environments
- Simulation environments and hybrid testing for mixed traffic situations
- Extension of traffic messages
- Extensions of existing technologies
- Infrastructure classification scheme (for automation levels of vehicles)
- Set of minimum interventions for infrastructure upgrades
- New safety parameters for assessment

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- Twitter: @inframix
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- Sign up to our newsletter:

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