

SMART CITIES AND URBAN VIABILITY WHEN CONNECTED AND NOT CONNECTED VEHICLE COEXIST

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SCENARIO

- Smart cities offer new opportunities
- In the future, autonomous vehicles will drive in our cities
- Significant effort has been spent on single vehicles
 - Routing
 - Sensors and artificial vision
 - trolley problem
- Set of vehicles might be considered
 - Self-interested
 - fleets
- Transitory (long) period of coexistence:
 - autonomous and non autonomous vehicles
 - connected and non connected vehicles

CHALLENGES

- Intersection crossing
- Left turn at intersection
- Parking
- Behaviour learning
- Traffic mitigation
- Handling emergency situations

MORE CHALLENGES IN MIXED SCENARIO

- unpredicted not connected vehicles behavior
 - constraints to all vehicles behavior
- unknown data of not connected vehicles
 - use IoT smart city devices to gather (some of) the missing data
- how to communicate with not connected vehicles?
 - use city infrastructure (e.g., traffic lights, traffic bollards)

INTERSECTION MANAGEMENT

- Single intersection / intersection coordination
- One lane per direction
- One vehicle at the time in intersection / more vehicles from same lane
- Exploit existing traffic lights
- Comparison among auction strategies:
 - cooperative VS competitive
 - all pay VS only winner pays
 - considering queue length or not
 - allowing bid contributions from vehicles in queue or not
- Results and future directions

PARKING

- Parking reservation system for connected vehicles
- Parking reassignment procedure
- Comparison among strategies:
 - All connected vehicles
 - Mixed scenario with non connected acting as:
 - * random drivers
 - * greedy drivers
 - * optimized drivers
- Results and future directions