Transportation is quickly developing worldwide underlying new technologies. To support such evolution, it is necessary to develop interoperable solutions while ensuring overall consistency and performance control. Modeling - Interoperability - Communication (MIC) project is an enabler to the sizing, the positioning and the control of multimodal mobility.

1. Context

Multimodal systems are complex:
- Numerous public transportation
- Growing number of individual cars
- New technologies (e.g. geo-location)
- Thirst for individual mobility
- Undermined limits of capacity, performance and accessibility

2. Challenges

Proving concepts of multimodal development and operation lies in:
- Appropriate Modeling
- Optimizing upon selected parameters
- Getting data intensive simulation to converge

3. Innovation

Casting multimodality within a single traffic model is a breakthrough:
- Combining approaches (e.g. Nash, equilibrium, fluid mechanics analogy, stochastic approach, Min-Max theory, multi-agent simulation…)
- Handling time-dependent characteristics essential to real-time prediction
- Smart routing simulating the influence of a central regulator over a discreet set of passengers in case of incident (e.g. mean field type game)
- Scalable approximation with certified performance guarantee
- Observability with limited numbers of sensors

4. Expected results

The project shall deliver technical demonstrators providing tools for:
- Simulating new patterns and behaviors
- Improving traffic prediction
- Deploying interoperability

It is expected that re-routing scenarios will contradict current natural choices in the absence of a global model. Also, the multimodal supervision may break the traditional pattern complying with deterministic time table and fixed frequency turnaround. Results may foster reflections about public transportation, long term investments, choices of modes and business involvement of new actors.

Additional stakeholders increase complexity beyond technology. Legal and Economics shall also be integrated to fully assess the business soundness of multimodality.