From LC to smart crossing
AXES OF THE SMART CROSSING PROJECT

The project is based on two axes:

- Make the LC connected and communicating
- 2.0 rail-road crossing
- Test the impact of new equipment on behaviors
- Study behaviors and rethink LC design
- Transform the LC into a connected and intelligent rail-road intersection
FIGURE OF **V2X IEEE 802.11P (WIFI)**
Collisions at Level Crossings

There is a stagnation in the number of collisions in the last 10 years with 110 to 140 collisions and 25 to 35 killed per year.

99% of the causes of accidents are due to **non-compliance with the traffic regulations**, 3 main causes:
- **Delinquency** (zigzagging, non-respect of road signs, queuing, excessive speed, etc.)
- **The Error of Driving** (commitment of the gauge, confusion between the road and the railway, dazzled by the sun, loss of control of the vehicle, manoeuvring on the LC, stalled on the LC, ...)
- **Distraction**
WHAT WE LEARNED

NEW  40% of accidents occur on straight lines with 90 ° angle and good visibility
       => Similar result to road accident analysis
       Cause : overconfidence

NEW  The knowledge of the rail traffic (train timetable, number of train, strike, ...) confuse judgments as well pedestrian as road

       Other road configurations already known as S-roads, curves or complex crossroads are to be taken into consideration
       Cause: technical / driving error problem

The results of this study bring to light improvement such as:

- Visibility
- Readability
- Perception of risk
The objectives of the study:

- Rethinking equipment or materials and / or proposing new ones
- Rethinking the layout / integration of the LC in the environment and interacting with new mobilities
Partnership with an expert in road and cognitive training

Objectives:
- Model the expected behaviors when approaching level crossings
- Understand the precise nature of the behaviors described as "violation" or "error" and deviations from what is expected
- Help choose the test solutions proposed through the design study and the benchmark
- Analyze simulator behaviors to evaluate the impact of these new solutions and, if necessary, adapt them
The objective is to put in road user situation for:

- Observe and analyze dangerous behaviors that have never caused an accident
- Observe and analyze situations that caused accidents
- Evaluate the impact of new equipment on the LC on behaviors
- Evaluate the relevance of LC status message display on the vehicle dashboard (C Roads project)
THANK YOU FOR YOUR ATTENTION

virginie.taillandier@sncf.fr