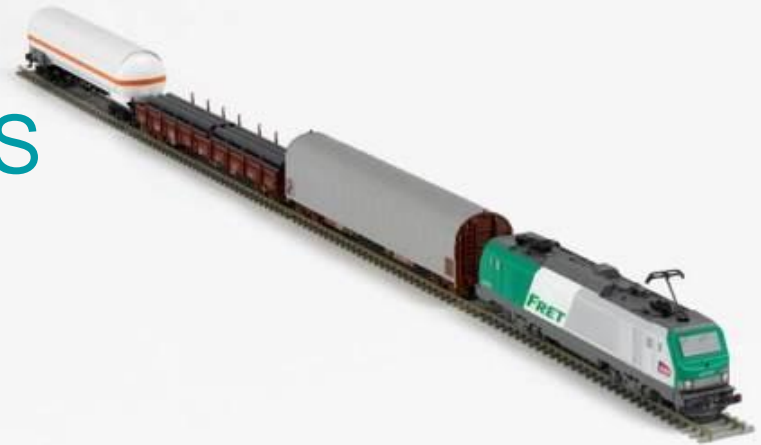


LEAN SOLUTIONS FOR “LAST MILE” OPERATIONS USING BI-MODAL ROAD/RAIL TRACTORS



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01. THE CONCEPT

A NEW BALANCE BETWEEN RUs AND SHIPPERS

In last mile operation of SWL traffics RU and private siding owner roles are usually:

- + The RU team runs the train on the national railway network and delivers the wagons inside the private siding.
- + The private team, when necessary, moves the wagons for logistic reasons.
- + Each private siding has its own light locotractor. Some have none.

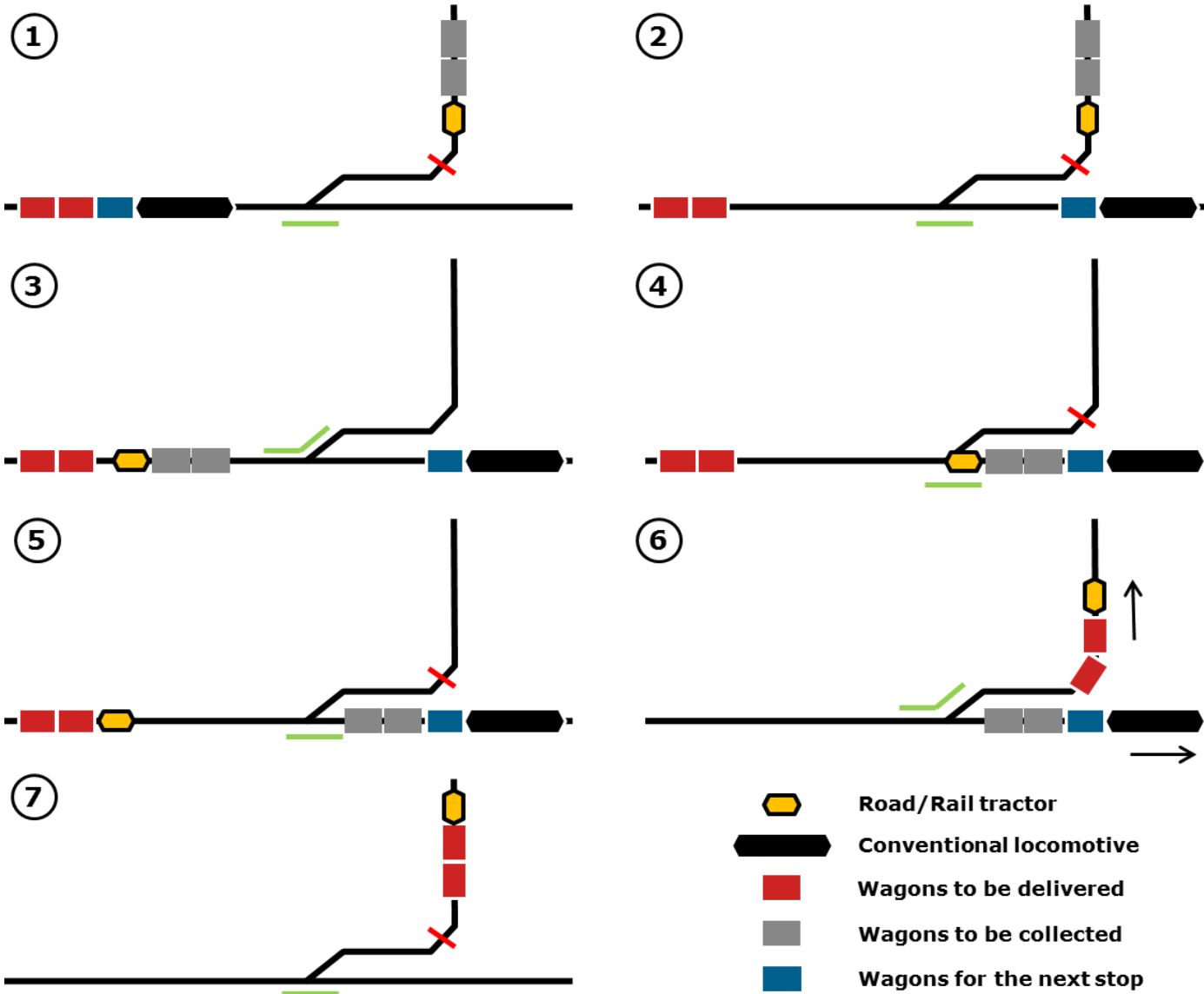
In the new approach, the roles are changed:

- + Neighbouring shippers organize themselves to own one shared bimodal tractor.
- + RU team runs the train on the national railway network and does not enter the private siding.
- + Bimodal tractor takes the loaded wagons from the train and brings them to the siding; then gives back the empties (or vice versa). The same team moves the wagons inside the siding when necessary. *(See next slide)*
- + When done, RU train runs (by rail) and bimodal tractor runs (by road) toward next siding.

EACH PLAYER CAN OPTIMIZE ITS RESOURCES

01. THE CONCEPT

OPERATIONAL SCHEME FOR TAKE AND LEAVE OPERATION



02. THE DEVELOPMENT OF THE PROJECT

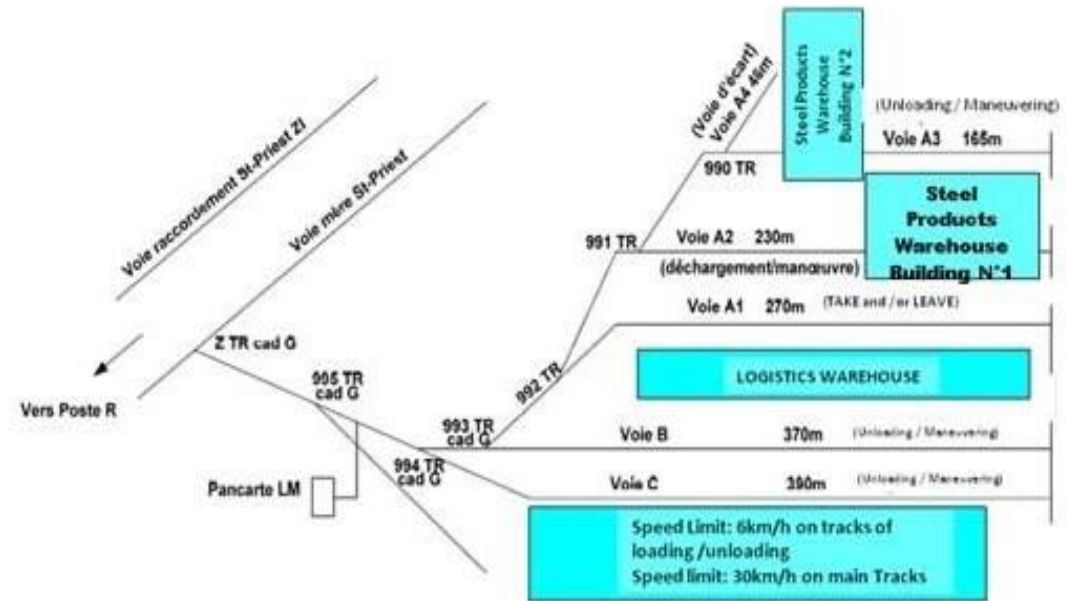
A MULTICRITERIA SEARCH

Difficulties to find adequate sites for tests

- + **First search:** Le Boulou, a station with many terminals. But social sensitivity made it delicate.
- + **Second search:** Vitry zone (many sidings on 20 km). But sites already optimized internally. However, interesting with 2 or 3 deliveries per day.
- + **Third search:** Saint-Priest (Lyon). Very interesting because no need to use public rail tracks.

Logistics site of Saint-Priest

- + 2 main users: Air Liquide and Steel Warehouse
- + Conventional rail locotractor replaced by Road Rail Tractor (MOL 2444)



03. THE DEMONSTRATION

A VERY RICH EXPERIENCE

Duration

- + 3 month (after staff training; ability to drive and operate obtained in only one day)

Operations

- + Road Rail tractor places ½ train of CO₂ on unloading track; exchanges with other ½ train; brings them globally back to entrance. SNCF takes in charge towards the national network.
- + Road Rail tractor serves the 2 sheds where steel coils are to be handled by several sets of few wagons placed under Gantry crane of shed.

A great simplification

- + Quite complex with an only-rail locotractor. Much easier when tractor can leave embedded track anywhere.
- + Additional simplification: remote control. As soon as it can be used with only one hand only, backing movements are possible with one single operator.

Numerous advantages

- + High safety level: convenient footboard, vigilance system in case of operator fall down.
- + Comfort: slewing seat to find the best driving position
- + Shunting ability: very precise positioning when touching wagon buffers, devices like cameras...
- + Braking system: Right pressure in wagons brake pipe 20% quicker than with regular locotractor.

A GENERAL SATISFECIT

04. THE ECONOMIC ANALYSIS AND THE KPIs

DEPENDS ON MANY FACTORS

Obvious economies

- +Reduction of the number of necessary tracks and switches
- +→ Maintenance and/or investment

Various elements impact the efficiency of the Road Rail solution

- +Frequency of deliveries – Volume of traffic
- +Nature of logistic operations on siding – Distance of backing movements
- +Layout of private siding – Existence of other sidings for joint use of RR tractor

Rough estimation of global economies for train service and siding operation

- +Taking into account the main possibilities including to access marginally the national network and the use of the remote control with one hand
- +10% for simple delivery/day**
- +20% for double delivery/day**
- +In Saint-Priest, the economies could even reach 35%.

REALLY WORTH STUDYING CASE BY CASE

05. RESULTS, FURTHER DEVELOPMENTS AND IMPLEMENTATION

SOME JOB STILL TO BE DONE!

Saint-Priest case

+ KPIs gave positive results:

- *Cost of investment and maintenance per meter of usable track*
- *Cost of delivery per wagon*
- *Time gained for hauling the wagons*

+ Further improvement foreseen since adjacent siding (car carrier trains) could join the operational scheme in hidden time

Developments still to be lead

+ Find an understanding with IM and NSA to authorize Road Rail Tractors on the public network

- *In order to operate the complete operational scheme as shown above*
- *Among other topics: track circuit connection, lower gauge*

+ Develop a single hand remote control command

A technical-commercial project

+ Find the adequate sites and the favourable situations

+ Convince the siding owners and find a balance to share the benefits

+ Disseminate the results of the test

NOT A ONE-FIT-ALL PROJECT, BUT SOME VERY PROMISING HOPES