



COREALIS Final Event

Just-In-Time Rail Shuttle Service

Carles Pérez (VPF)

April 23rd, 2021



Just-In-Time Rail Shuttle Service

Overview

Elaborate a **Feasibility Study** of an innovative JIT rail shuttle service for key port-hinterland corridor (Specific study for one corridor) to **increase the modal split** of the railway for inland transport

Outputs and KPI's:

- ❖ Solution Design & Service Characteristics
- ❖ Process reengineering & IT functional requirements
- ❖ Business Models and Market Analysis



Service KPI's

(e.g. Number of Daily Trains, Total TEUs/Tons transported, etc.)





Just-In-Time Rail Shuttle Service

The study:

Objective: To attract more shippers to use rail freight → Cost reduction derived from minimising handling movements.



The optimal solution will be the one that minimises the cost per unit of TEU transported.

Inputs and hypothesis

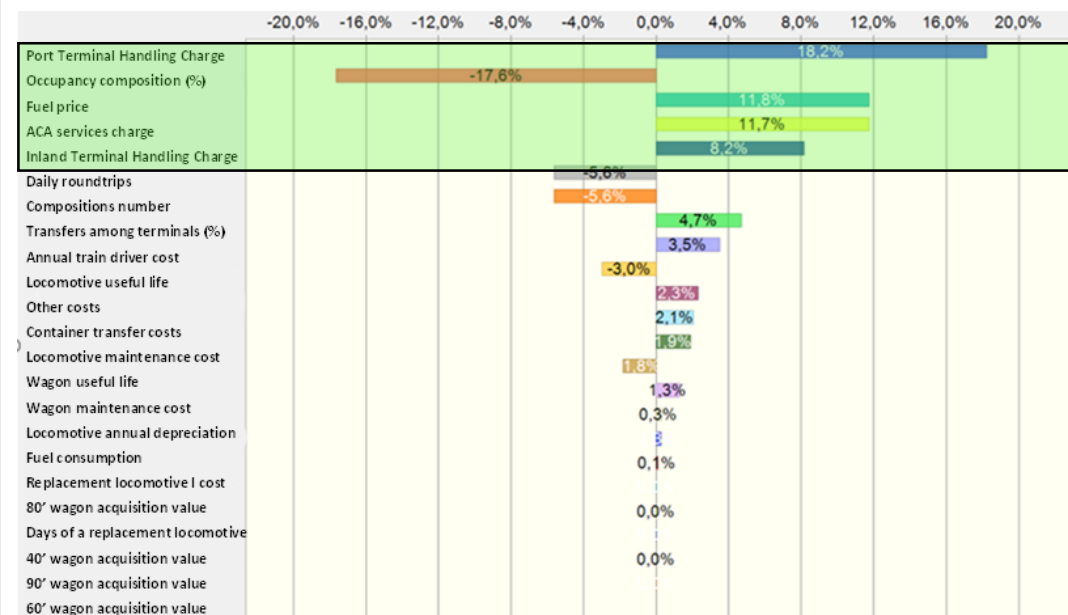
- RAILWAY ROUTE: Corridor, rail length
- TRAFFIC – CONTAINER TYPE: composition, full/empty containers, UTIs, container & UTIs weight, etc.
- LOCOMOTIVE: type, maximum load, consumption, fuel price, lifespan, residual value, maintenance, etc.
- WAGON: type, capacity, maximum load, acquisition value, lifespan, residual value, maintenance, etc.
- TRAIN OPERATION: roundtrips per week, terminal costs, handling costs, personnel costs, etc.
- TRAIN COMPOSITION: composition length, composition capacity, composition TEU capacity, composition UTI capacity, etc.
- OTHER: financial data, charges and fees, etc.



Just-In-Time Rail Shuttle Service

Costs results & sensitivity analysis

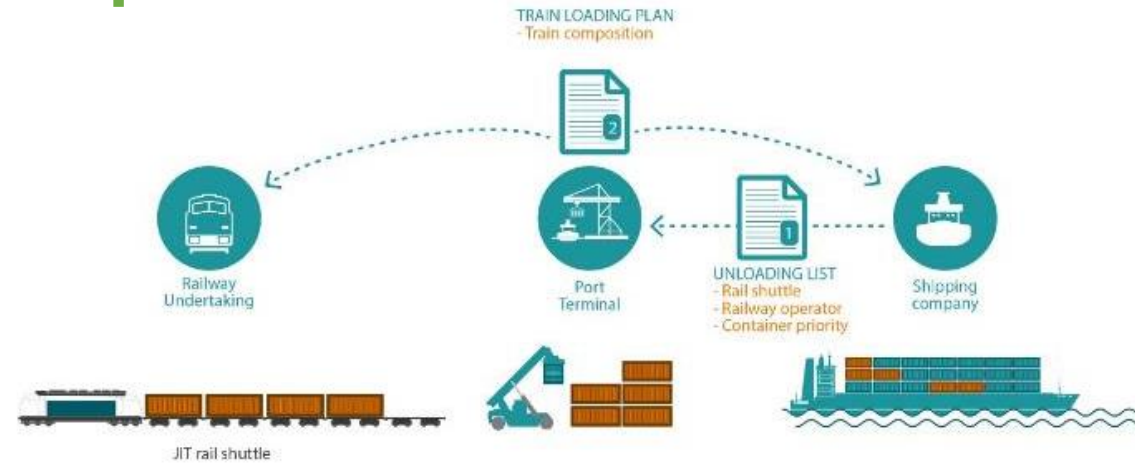
	COST	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 7
RAILWAY CHARGES	Access to the railway infrastructure annual charge	0	0	0	0	0	0	0
	Railway capacity reservation annual charge	13,365.04	20,047.56	20,047.56	13,365.04	20,047.56	13,365.04	13,365.04
	Rail traffic annual charge	19,050.72	28,576.08	28,576.08	19,050.72	28,576.08	19,050.72	19,050.72
FIXED COSTS	Locomotive annual depreciation	144,115	144,115	144,115	144,115	163,590	163,590	163,590
	Replacement locomotive annual cost	40,000	40,000	40,000	40,000	40,000	40,000	40,000
	Composition acquisition value	70,848	106,272	106,272	70,848	119,556	79,704	66,420
	Train driver annual cost	320,000	480,000	480,000	320,000	480,000	320,000	320,000
VARIABLE COSTS	Fuel consumption annual cost	564,525.26	846,787.89	846,787.89	564,525.26	846,787.89	564,525.26	564,525.26
	Locomotive maintenance annual cost	239,980.00	359,970.00	359,970.00	239,980.00	359,970.00	239,980.00	239,980.00
	Wagon maintenance annual cost	147,680.00	221,520.00	221,520.00	147,680.00	249,210.00	166,140.00	138,450.00
TERMINAL COSTS	Terminal handling annual charge at port terminals	698,880	1,048,320	1,048,320	698,880	1,179,360	786,240	546,000
	Handling annual charge at inland terminals	448,282	672,422	672,422	448,282	756,475	504,317	350,220
	Annual ACA services	208,000	312,000	312,000	208,000	312,000	208,000	208,000
	Container transfer annual costs	0	0	599,040	399,360	0	0	0
TOTAL	Other annual costs	437,209	642,005	642,005	437,209	683,336	465,737	400,440
	TOTAL COSTS (Euros)	3,351,934.46	4,922,035.57	5,521,075.57	3,751,294.46	5,238,908.64	3,570,648.59	3,070,041.17
TOTAL	COST PER UNIT OF TEU TRANSPORTED (Euros/TEU)	100.72	98.60	110.60	112.72	93.29	95.37	98.40





Just-In-Time Rail Shuttle Service

New information requirements:



Port terminals assume a **new role** in the loading/unloading → Containers that will be transported by train

Shipping Agencies indicate in the Discharge Lists (via PCS) which containers should be loaded into the shuttle service

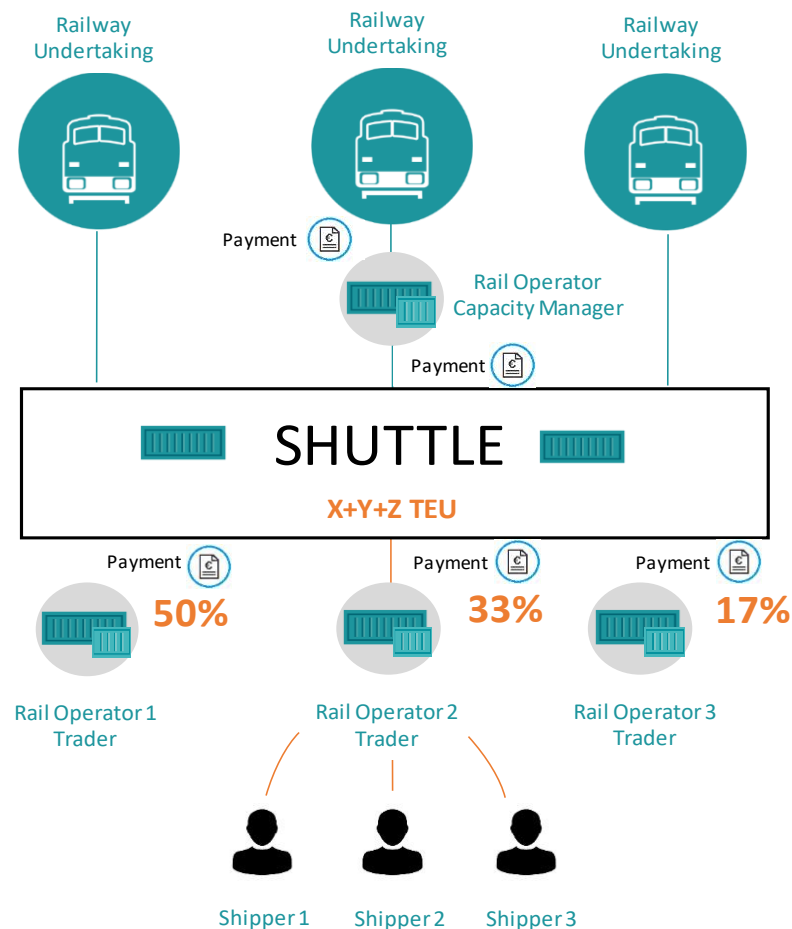
PCS transmits the discharge list to the port terminal operating systems (TOS) → Generate Shuttle Loading Lists

Train Loading Plan via PCS to the Railway Company → Freight List



Just-In-Time Rail Shuttle Service

Business Model



2. Railway companies add capacity under a "call for capacity" issued by the SHUTTLE entity. Once selected, railway companies are paid for the services that will carry out during a established period of time.

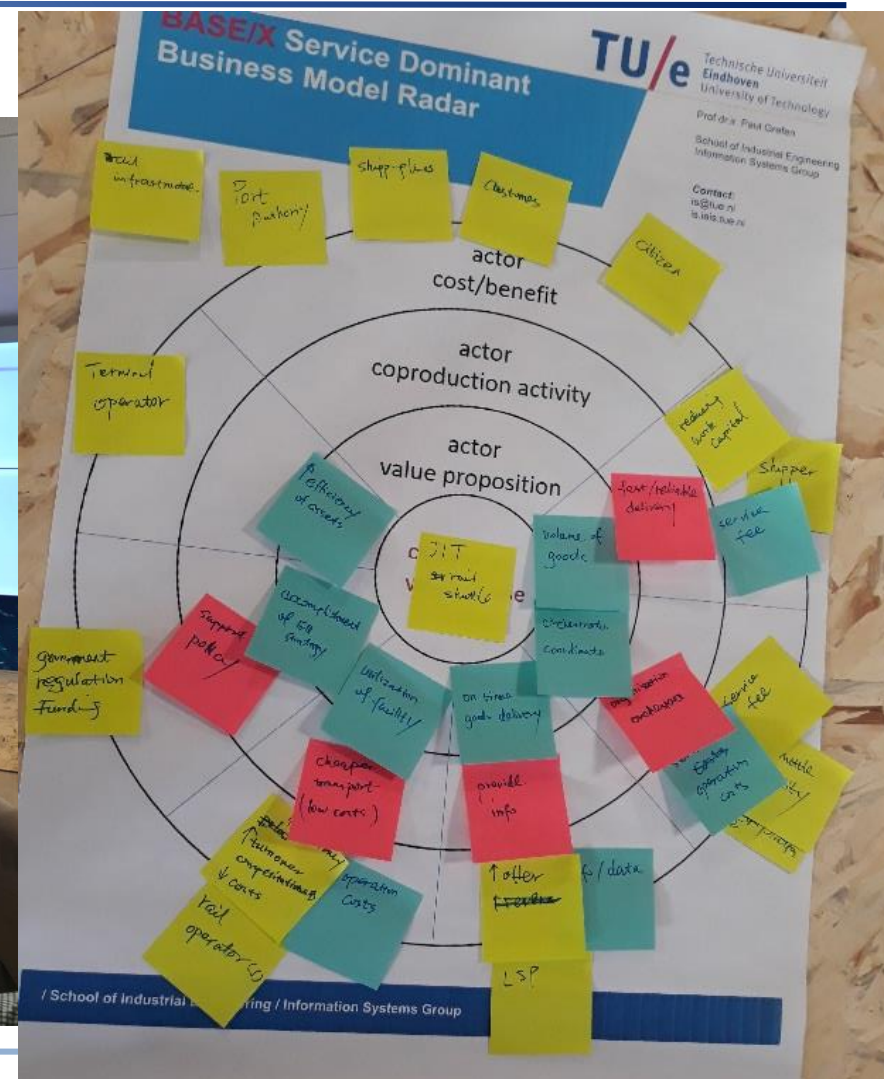
1. **SHUTTLE** entity is a private/public or PPP company that issues tender contracts called "calls for capacity" to select railway companies that wants to add capacity at lowest prices while maintaining an established quality of service.

3. After a railway company is selected, SHUTTLE entity issues a bidding process to sell the available slots among the interested rail operators/freight forwarders.

4. Rail operators/freight forwarders make their bids to be able to trade a certain percentage (%) of the available slots in the shuttle.

5. SHUTTLE entity studies the offers and choose the best bids (those that guarantee a lowest €/TEU for the shippers)

A financial compensation system is managed by the SHUTTLE entity so that rail operators can use more/less capacity than the one assigned in the bidding process.





www.corealis.eu



[corealis_eu](https://twitter.com/corealis_eu)



[COREALIS EU Project](https://www.youtube.com/COREALIS_EU_Project)



[Corealis_eu](https://www.linkedin.com/company/corealis_eu)



info@corealis.eu

THANK YOU FOR YOUR ATTENTION



Carles Pérez

cperez@fundación.valenciaport.com



This project has received funding from the European Union's horizon 2020 research and innovation programme under grant agreement No. 768994