FERRMED Study of Traffic and Modal Shift Optimisation in the EU

FINAL REPORT PRESENTATION

FERRMED CONFERENCE

+FIRRST Recommended Rolling Stock

Brussels, November 29th 2023

FERRMED

Promotion du Grand Axe Ferroviaire de marchandises
Scandinavie-Rhin-Rhône-Méditerranée Occidentale A.S.B.L

LOCOMOTIVES

The +FIRRST trains will be trains with a maximum load of 2.000 t. This type of trains requires a certain kind of locomotives, the main characteristics of which are listed below.

Values have been calculated from the data shown in the FERRMED LOCOMOTIVE CONCEPT, 2010, for the values for a load of 2.000 t.

ROLLING STOCK REQUIREMENTS

NECESSARY STARTING TRACTIVE EFFORTS (kN)

TRAIN LOAD	TRACK SLOPE (‰)	Co-Co locos (125 t)	Bo-Bo locos (85 t)
2.000 t	0	82	81
	4	164	162
	12	327	324

ROLLING STOCK REQUIREMENTS

NECESSARY POWER AT WHEEL RIM FOR 2.000 TONNES GROSS WEIGHT

SPEED (Km/h)	TRACK SLOPE (‰)	POWER (Kw)
60	0	1,155
	4	2,500
	12	5,210
100	0	2,830
	4	5,080
	12	9,589
120	0	4,000
	4	6,847
	12	12,250

ROLLING STOCK REQUIREMENTS

Based on the values specified, the following locomotives are suitable for use with +FIRRST trains, although not all are suitable for all possible scenarios.

Name	Manufactu-rer	Type	Electric Power (kw)	Diesel/Bat Power (kW)	Nº axles	Starting Tractive Effort (kN)	Max. speed (Km/h)
EURO9000	STADLER	DUAL Possible	9,000	D 2x950 or B 2x600	6	500	160
EURODUAL	STADLER	DUAL	Up to 7,000	D 2.800	6	500	120 (Opt.160)
VECTRON LM	SIEMENS	Last mile	6,400	D 240	4	300	160
TRAXX AC3 LM	BOMBARDIER	Last mile	5,600	D 320	4	300	160 Diesel 50

ROLLING STOCK REQUIREMENTS

ROLLING STOCK REQUIREMENTS

For +FIRRST trains with a load of 2,000 tonnes and for electrified journeys with slopes less than 4 ‰, any of the four locomotives can be used, and diesel or batteries could be used to move the train inside the terminals. For journeys not completely electrified, at present (2022), only the EURODUAL from STADLER could be used

CURRENT FREIGHT WAGONS

The main characteristic of the wagons used in the +FIRRST trains is that they must be able to load semitrailers, containers and swap bodies.

At present, there are several types of wagons that can be used for this kind of multimodal transport.

For these types of load, not all the European freight wagons are suitable for this job. A selection are listed below.

ROLLING STOCK REQUIREMENTS

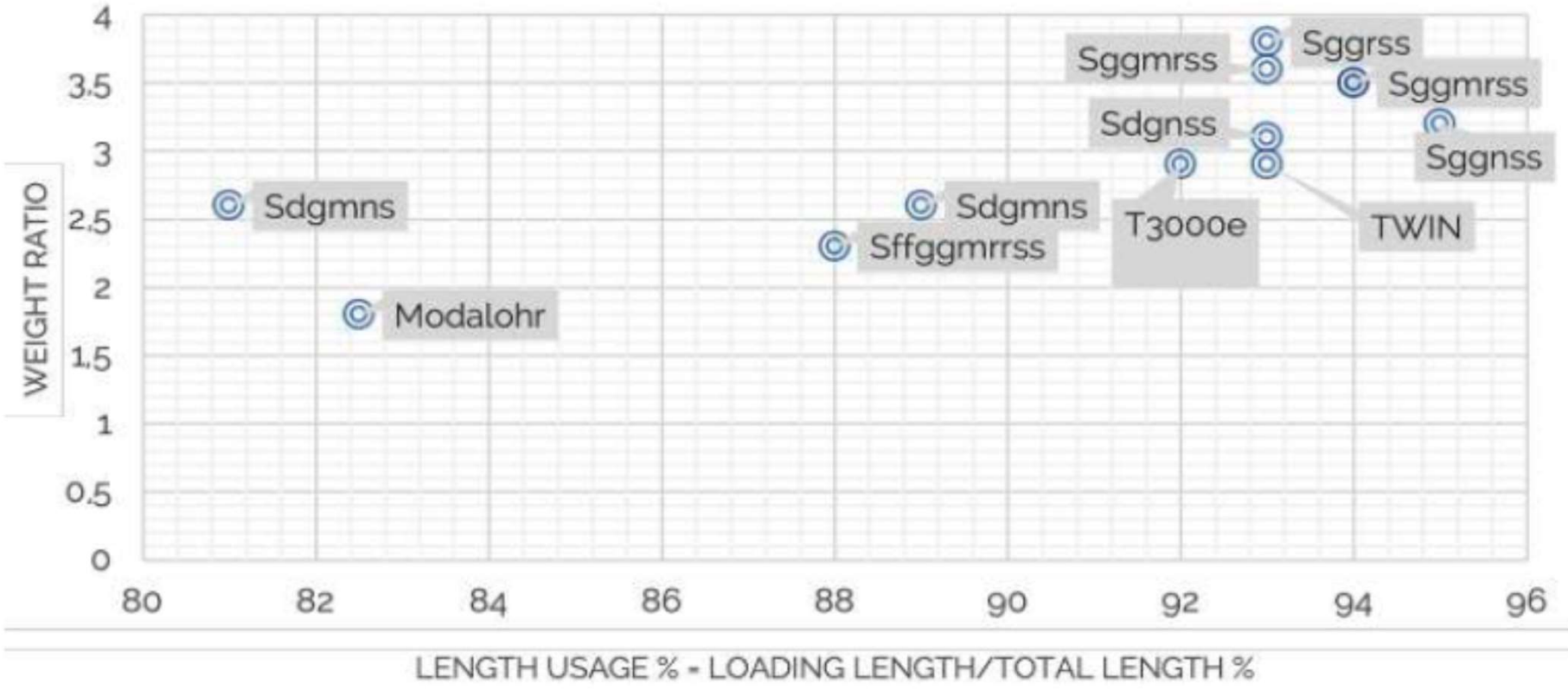
Efficiency of the most common freight wagons

Reference	Type	Length over buffers (mm)	Loading length (mm)	Use of length (%)	Tare weight (t)	Max. load (t)	Weight ratio
Sdggmrss	TWIN	34,030	31,522	93	35	100	2.9
Sdggmrss	T3000e	34,200	31,522	92	34.1	100	2.9
Sgnss	60'	19,640	18,400	94	20	72	3.5
Sggnss	80'	25,940	24,700	95	22	72	3.2
Sggrss	80'	26,700	24,740	93	28	107	3.8
Sggmrss	104'	33,480	31,530	94	30	105	3.5
Sffggmrrss	Megafret	36,440	32,210	88	39	89	2.3
Sggmrss	90'	29,590	27,640	93	29	106	3.6
Sdgnss	T5	20,000	18,650	93	21,5	68	3.1
Sdgmns	743	18,340	14,900 (1) 16,425 (2)	81 89	22	57,8	2.6
UIC 2	Modalohr	32,940	27,800	84	42,7	76	1.8

(1) Semitrailers; (2) Containers and swap bodies

ROLLING STOCK REQUIREMENTS

Combined performance



ROLLING STOCK REQUIREMENTS

Efficiency according the combined performance (I)

Wagon	Type	Length over buffers (mm)	ILU	ILU length (m)	Qty	Length occupied (m)	Ratio (%)
Sdggmrss	TWIN	34.030	ST	13.6	2	27.2	79.9
			CT 20'	6.06	4	24.24	71.2
			CT 40'	12.19	2	24.38	71.6
			SB 20'	7.17-7.82	4	28.68-31.28	84.3-91.9
			SB 40'	12.20-13.72	2	24.40-27.44	71.7-80.6
Sdggmrss	T3000e	34.200	ST	13.6	2	27.2	79.5
			CT 20'	6.06	4	24.24	70.8
			CT 40'	12.19	2	24.38	71.3
			SB 20'	7.17-7.82	4	28.68-31.28	83.8-91.5
			SB 40'	12.20-13.72	2	24.40-27.44	71.3-80.2
Sdgnss	T5	20.200	ST	13.6	1	13.6	67.3
			CT 20'	6.06	2	12.12	60.0
			CT 40'	12.19	1	12.19	60.3
			SB 20'	7.17-7.82	2	14.34-15.64	71.0-77.4
			SB 40'	12.20-13.72	1	12.20-13.72	60.4-67.9

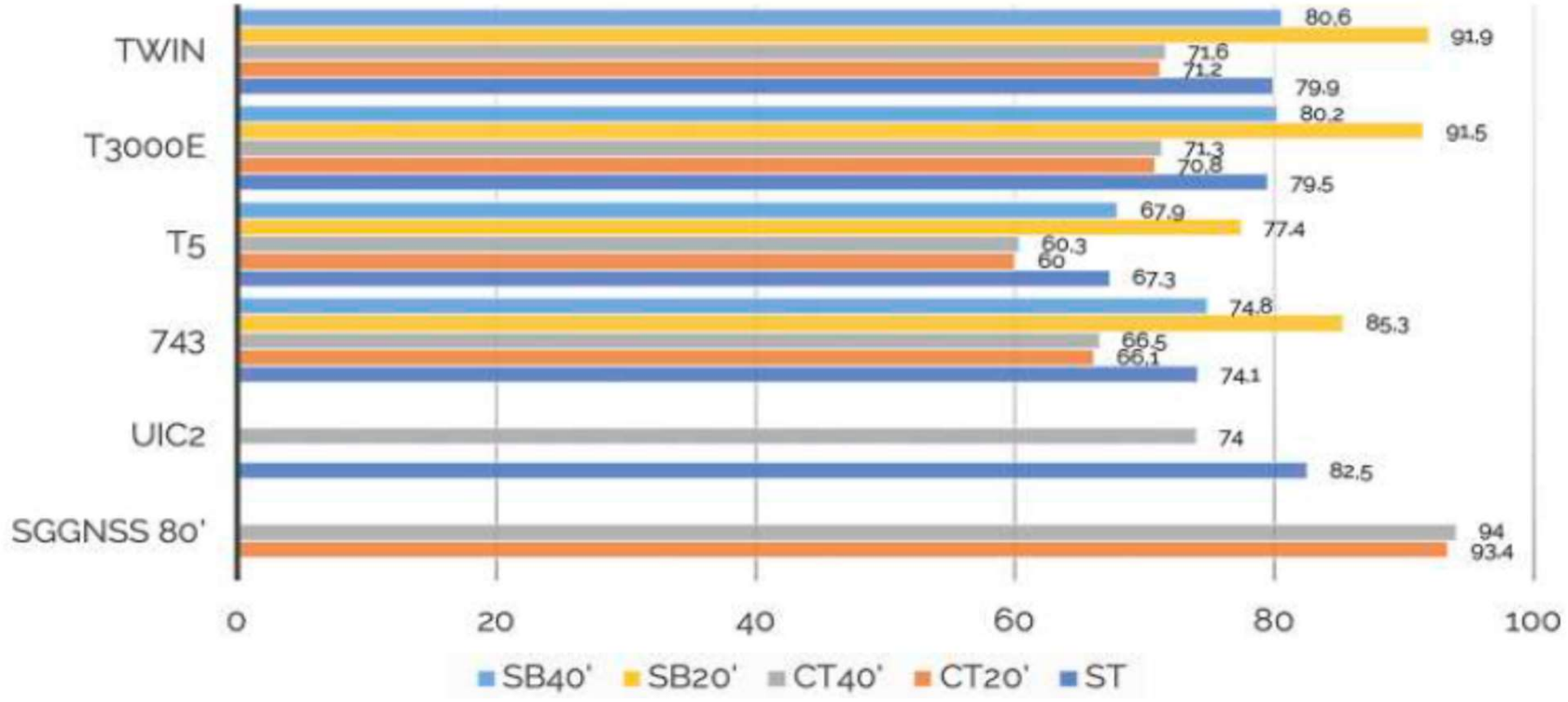
ROLLING STOCK REQUIREMENTS

Efficiency according the combined performance (II)

Wagon	Type	Length over buffers (mm)	ILU	ILU length (m)	Qty	Length occupied (m)	Ratio (%)
Sdgnss	743	18.340	ST	13.6	1	13.6	74.1
			CT 20'	6.06	2	12.12	66.1
			CT 40'	12.19	1	12.19	66.5
			SB 20'	7.17-7.82	2	14.34-15.64	78.2-85.3
			SB 40'	12.20-13.72	1	12.20-13.72	66.5-74.8
UIC 2	Modalohr	32.940	ST	13.6	2	27.2	82.5
			CT 40'	12.19	2	24.38	74.0
Sggnss 80'	Equiv. FERRMED wagon	25.940	CT 20'	6.06	4	24.24	93.4
			CT 40'	12.19	2	24.38	94.0

ROLLING STOCK REQUIREMENTS

Efficiency according the combined performance (III)



ROLLING STOCK REQUIREMENTS

In Summary, the most effective wagons able to load the five different types of ILUs we are considering (Semitrailers, 20' and 40' Containers, and 20' and 40' Swap bodies) are the types T3000e and TWIN, two versions of the Sdgg-mrss model. We therefore consider that the FIRRST trains must be composed of these types of wagons, equipped, for now, with the r2L baskets.

Nevertheless, the most efficient wagon to load only 20' and 40' containers (it can not load semitrailers) is the Sggnss 80', based on the FERRMED wagon.

An alternative composition of the +FIRRST trains to serve the seaports (origin, destination or both), where the use of containers is very high, is to make a train that also includes some Sggnss 80' wagons, because of its high efficiency carrying 20' and 40' containers.

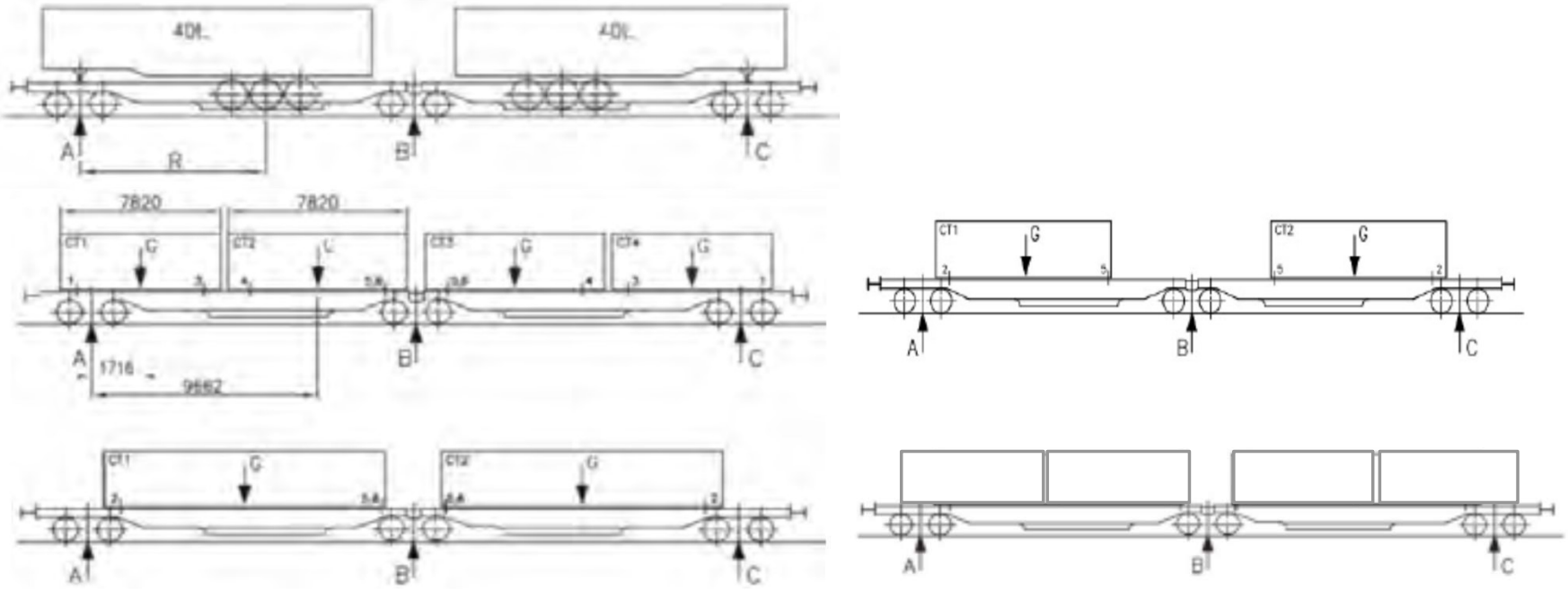
ROLLING STOCK REQUIREMENTS

The most adequate types of wagon to be used on the +FIRRST train are the Sdggmrss, T3000e or TWIN

ROLLING STOCK REQUIREMENTS

Indicative Loading Scheme Sdggmrss (T3000e or TWIN)

Semitrailers, swap bodies, 40', 30'and 20' containers



ROLLING STOCK REQUIREMENTS

Sdggmrss, T3000e wagon loaded with a semitrailer and two 20’ containers

INTERMODAL LOADING UNITS (ILU's)

TARE COMPARISON OF EQUIVALENT ILU's

ILU	TARE (tonnes)	DIFERENCE VS. SEMI-TRAILER
Semi-trailer 13,62 m	7.2	-
Swap-body 13.6	4.6	-2.6
ISO container 40'	3.8	-3.4
ISO container 20' (x2)	4.4	-2.8
Inland container 40'	4.1	-3.1

INTERMODAL LOADING UNITS (ILU's): WHAT TO DO?

For a more efficient intermodal transport, we consider that the use of a unique type of ILU, with the same external characteristics of the ones shown before, could be of great benefit.

This will simplify (so, make cheaper) the type of wagon and ILU that could be suitable for the system chosen.

But this is a question to be answered in the future…

THANK YOU FOR YOUR ATTENDANCE

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