



IC5: HOW TO SUCCESSFULLY BUY 100 TRAINS AND TRANSFORM A NATION'S RAIL

RAILCPH

Per L Larsson | 2025-05-21





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How to Successfully Buy 100 Trains – WSPs support in IC5 Program

Agenda

1. Background of IC5
2. WSPs assignment
3. The project phases and WSPs methodology





Summary of DSB IC5 program

The program is a very large procurement of new trains and fully outsourced maintenance

- **The program is called New Trains (NT) or IC5**
- **Base order 100 trainsets, seating capacity of 300 each.**
- **Includes Full Service Maintenance Agreement for 30+5+5 years**
- **Two training centers are being equipped with simulators:**
 - Full Cab simulator, Desktop simulator and Nano simulators
- **Option of additional 50 trainsets**
- **An array of derived projects within DSB to prepare for the New Trains**

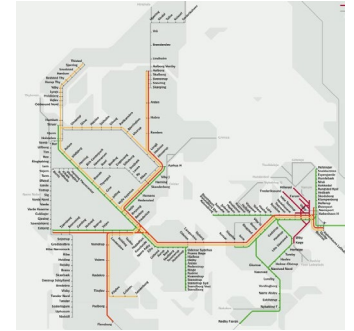
The purpose with the DSB IC5 program

Passenger operation on current and future 25 kV railway networks in *Fast Train Services and Regional Train Services*

Flexible to allow for multipurpose use, including flex areas for bicycles, prams and large luggage

Full Service Agreement (FSA), i.e. supplier responsible for all maintenance

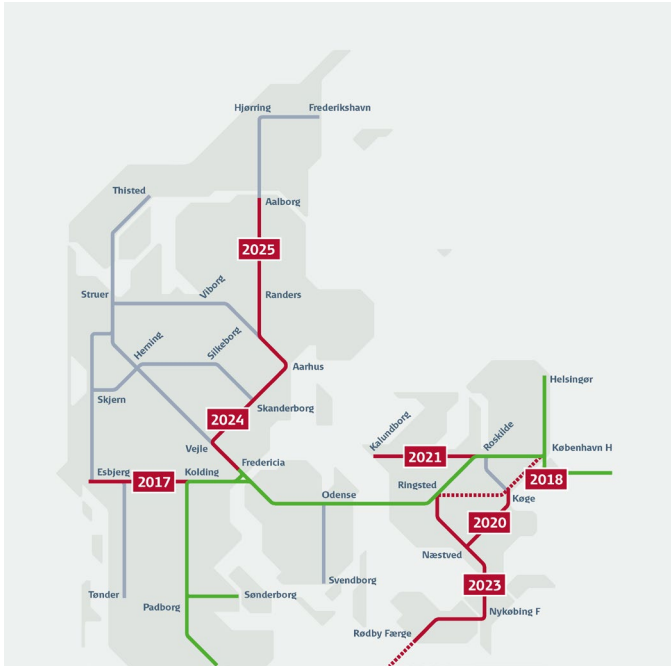
Supplier shall equip the Maintenance Facilities, plan and perform all maintenance and take full responsibility of *Reliability and Availability* performance



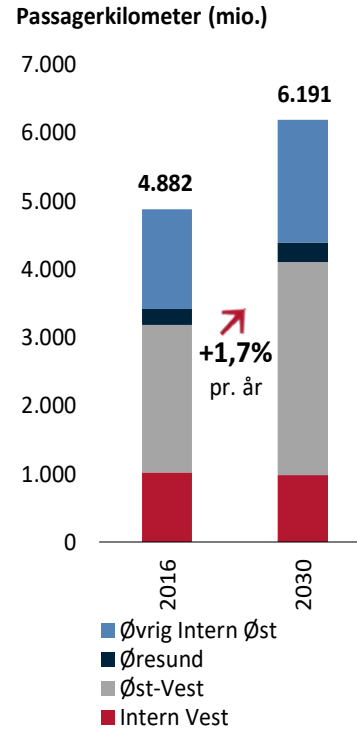
Background

A NEW ELECTRIC FLEET MAKES IT POSSIBLE TO...

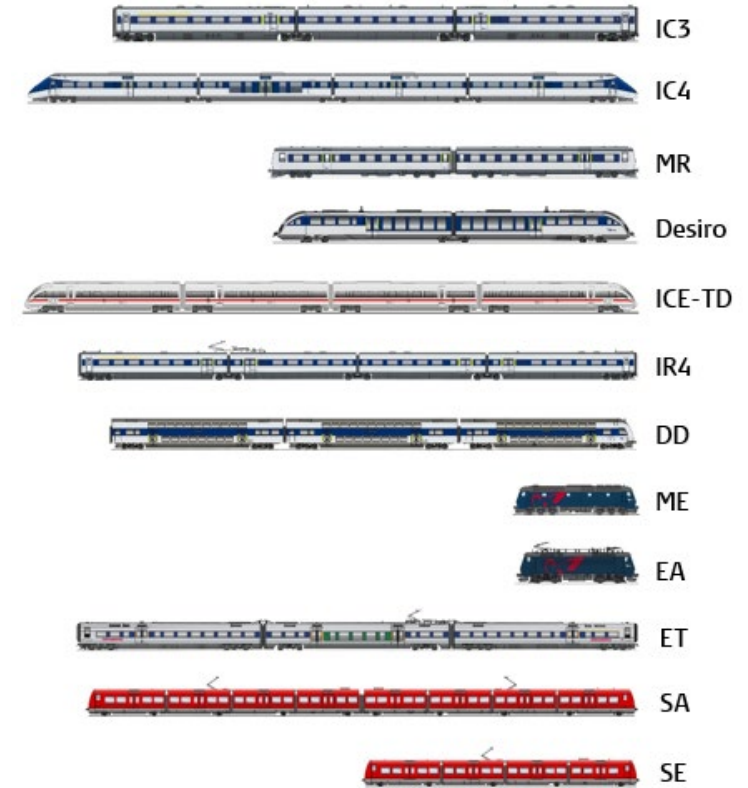
1 ...realize the benefits from the infrastructure investments















2 ...provide capacity for PAX growth



3 ...replace a complex and aging fleet



Background

Rolling stock types		2016	2030	Future Trains
	IC3	96	0	New electric trains (NT) - Approx. 150 units - From 2027
	IC4	77	0	
	MR	53	0	
	Desiro	20	0	
	ICE-TD	13	0	
	IR4	44	0	
	DD	113	113	New coaches (NC) - 16 15-car units - From 2025 New electric locos (AL) - 42 units (incl. NC) - From 2022
	ME	33	0	
	EA	5	0	
	ET	34	10-14	SA/SE remain in service until replaced in the New S-train programme. ET no longer in DSB service
	SA	104	104	
	SE	31	31	

Technical data IC5

Coradia Stream DSB

Top speed: 200 km/h

Power system: 25 kV / 50 Hz AC

Consist: 5 cars

Capacity: 300 seated passengers (incl 2 wheelchair spaces)

Toilets: 3 incl. one PRM

Doors per train side: 5

Bicycle capacity: 12

Number of flex areas: 2

Length: 109.4 m

Height: 4.2 m

Train control systems: ETCS BL 3, STM ZUB 123



Illustration: DSB





WSP's assignment

Multidisciplinary consultancy services for DSBs acquisition of Rolling Stock.

The Consultancy Firm shall during the entire Term of Agreement provide:

- **any and all consultancy services needed for the Program; and**
- **any other services, tools, goods, and activities not expressly described in the Agreement**

WSP's methodology when procuring new trains

- **Top-Down approach**



- **Utilize the expertise at the Buyer and Supplier**



- **Use processes and tools as support**





Top-Down approach

STAKEHOLDER NEEDS i.e. “DEMAND DRIVEN DESIGN”

- Use and users
 - Operation
 - Passengers
- Capacity
 - Number of vehicles and seats, options
- Maintenance and asset management
- Surrounding & Infrastructure
- Trends in society
- Decision makers
- Business case

HANDLE CONFLICT OF INTEREST

- Identify any conflicts in needs
- Revisit the needs to fully understand WHAT and WHY
- Address all conflicts

ALIGN AROUND A SET OF GUIDING OBJECTIVES

- The “core”, the most important objectives of the procurement
- Used in all areas of the procurement
 - Procurement strategy
 - Evaluation model & Award criteria
 - Specification
 - Agreement

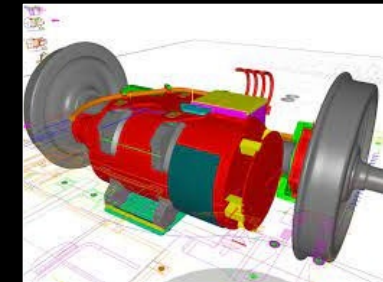


Utilize the expertise at the Buyer and Supplier

Buyers are experts in the needs of the
USE and USERS ↔ the “WHAT”

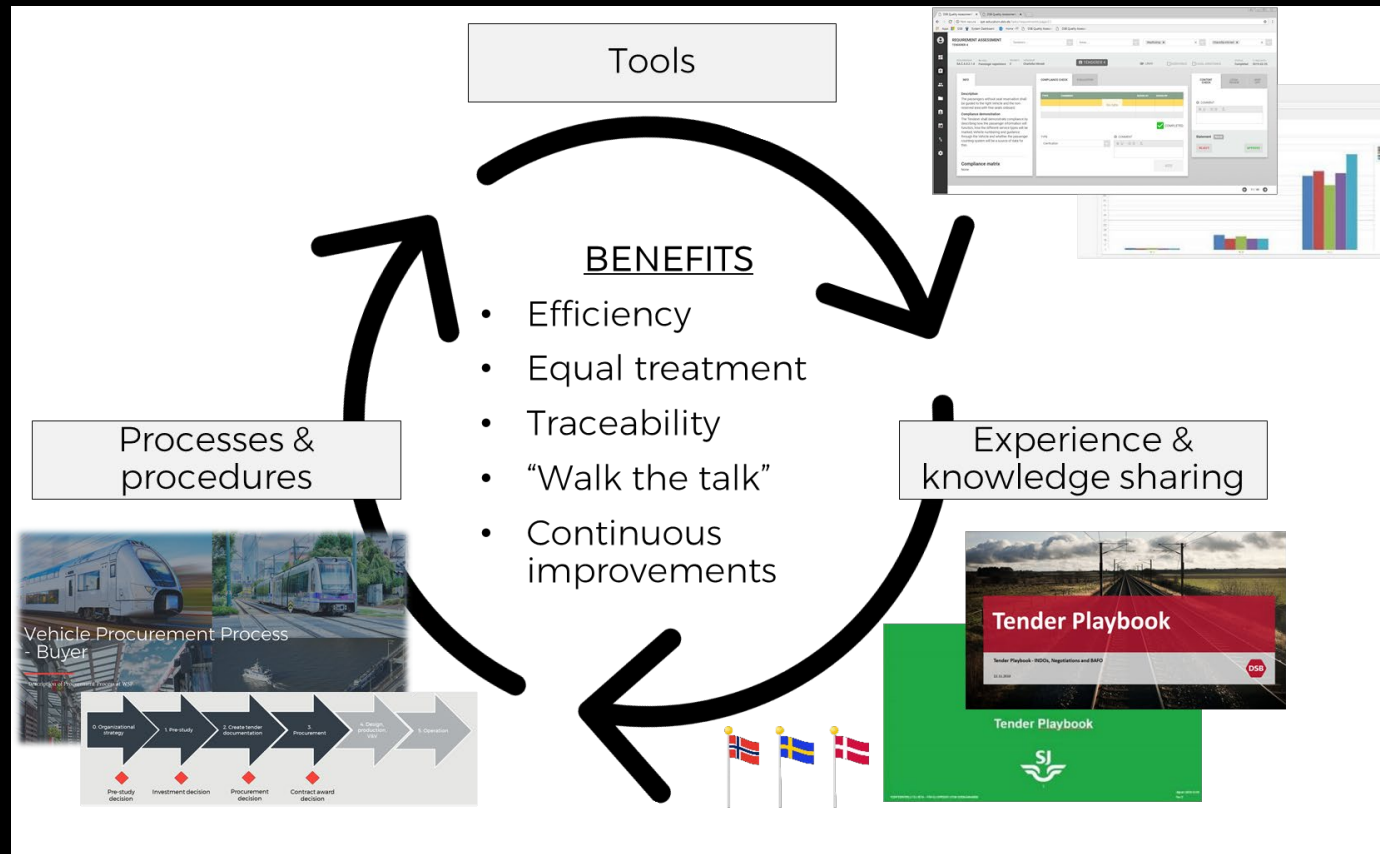


Suppliers are experts on
SOLUTIONS ↔ the “HOW”
how to fulfill use/users needs





Use processes and tools as support WSPs toolbox





WSP's assignment for DSB IC5

The program is divided into several phases:



WSP has been involved from phase 2, which started in February 2017.

Phase 2

Specify the requirements

- **1.5 years work – February 2017 – June 2018**

- Collect market information
- Guiding objectives
- Evaluation model
- Structure of tender material
- Requirements, different types (M, K, E)

- **Close cooperation with Kammeradvokaten**

- Advokatfirma Poul Schmith

- **Output based requirements**

- The function (What) – not the solution (How)

- **Two specifications/contracts**

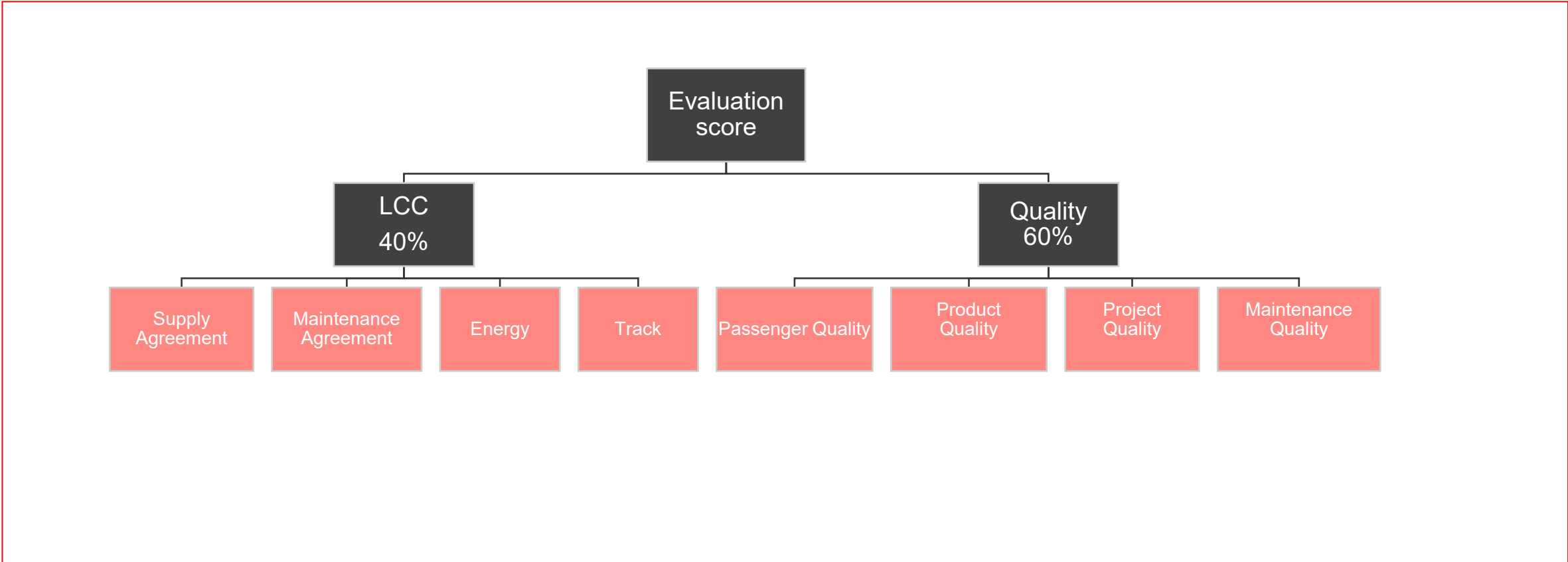
- SA – Supply Agreement
- MA – Maintenance Agreement
- Same supplier

- **In total 126 documents – the largest 240 pages**

- About 1500 requirements

Evaluation Model – Key to get what you want

Costs and Quality, and weight



Requirements - Guidelines

- **Define the Guiding Objectives**
 - Stick to **them !!**
 - Handle conflicts of interest as soon as they are identified, seek guidance from the principles
- **Base requirements on stakeholders and stakeholders needs**
- **Use functional, need-based, requirements**
 - Allows re-use of existing “proven in use” solutions
 - Keeps the risk with the supplier
 - For both “product” and “project execution”
- **As few requirements as possible**
 - Better overview and identification of conflicts
 - Saves time, each requirement gets more focus and importance
 - TSI is a foundation
- **Requirements and commercial T&Cs shall make an integrated foundation**
- **Contract**
 - Balanced between buyer and supplier with regards to risk, the one who can control the risk should carry the risk

Phase 3 – Tender and contract

Negotiated procurement

3 years work – August 2018 – August 2021

- Prequalification
- Prepare for the bid evaluation work
 - INDO1 (Indicative Offer 1) evaluation
 - Negotiation with tenderers
 - Update of tender material
 - INDO2 evaluation
 - Negotiation with tenderers and another update of tender material
 - BAFO (Best and Final Offer) evaluation

PQ - prequalification

Evaluate that bidders meet all formal requirements and capability to deliver

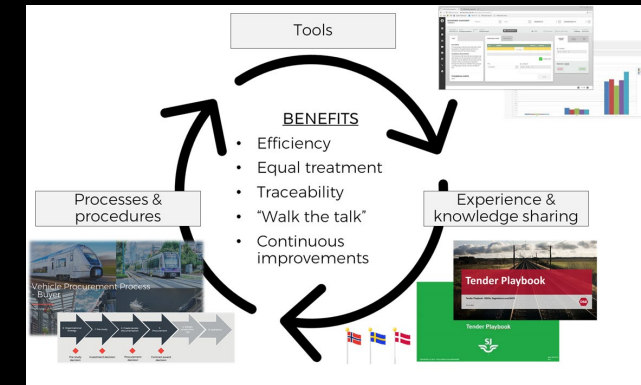
Approximately 2 months' work – October – November 2018

- **7 bidders applied**
- **4 pre-qualified**
 - Siemens
 - Stadler
 - Bombardier
 - Alstom

Prepare for the evaluation work

Evaluate 8000 bid pages in 12 weeks - strictly follow the procurement rules

- Develop evaluation tools – LCC and QAT (Quality Assessment Tool)
- Develop "tender playbook"
- Develop check-lists
- Develop standard phrases
- Expand the team with additional experienced assessors
- Evaluation training
- Evaluation planning



QAT – WSPs Quality Assessment Tool



TASKS

Alstom x Maintenance services x Spares and material su... x Well proven mainten... x Maintenance service s... x Maintenance services_K x Users ... Status ...

REQUIREMENTS FACTORS AREAS

TENDERER	AREA	REQUIREMENT	PRI...	LABELS	CD?	STATEMENT	ASSESSOR	ASS...	LEG...	STATUS	DUE DATE
Alstom	Maintenance services	MA.C.2.1.1.1.a	M	Essential elements, DP elements	✓	FULLY COMPLIANT	Thore Engholm			Content check approved	2021-02-08
Alstom	Maintenance services	MA.C.2.1.1.1.b	K	Essential elements, DP elements		FULLY COMPLIANT	Fredrik Bengtsson			Content check approved	2021-01-18
Alstom	Maintenance services	MA.C.2.1.1.1.c	K	DP elements		FULLY COMPLIANT	Fredrik Bengtsson			Content check approved	2021-01-18
Alstom	Maintenance services	MA.C.2.1.1.1.d	M	Essential elements, DP elements	✓	FULLY COMPLIANT	Thore Engholm			Content check approved	2021-02-08
Alstom	Maintenance services	MA.C.2.1.1.1.e	K	DP elements		FULLY COMPLIANT	Fredrik Bengtsson			Content check approved	2021-01-18
Alstom	Maintenance services	MA.C.2.1.1.1.f	K	DP elements		FULLY COMPLIANT	Fredrik Bengtsson			Content check approved	2021-01-18
Alstom	Maintenance services	MA.C.2.1.1.1.g	K	DP elements		FULLY COMPLIANT	Fredrik Bengtsson			Content check approved	2021-01-18

Page 1 / 9 20 Rows

Phase 3 - Finalizing

- **Conclusion on BAFO evaluation – assessment reports to all bidders**
 - **Prepare presentation material for stakeholders**
 - **Contract award 2021-04-12**
 - **Preparation of contract documents**
 - **Prepare documents required by complaint**
 - **Respond to complaint**
 - **Contract signature with Alstom 2021-06-17**



Transferring from Tender to Project Execution

Even with a good contract the purchaser needs to be an active part in the project execution

WSP continue support DSB according to the multidisciplinary consultancy services agreement



Phase 4 - Contract execution

Design, test, production and approval

Almost 10 years' work (including series delivery) – June 2021 – Q1 2031

Divided into 6 sub-phases:

1. Project Execution Start-up Phase
2. Design Phase
3. Production Phase
4. Testing, Homologation and Maintenance Preparation Phase
5. Reliability and Availability Demonstration Phase
6. Warranty and Series Delivery Phase

Current Phase

Phase 4 - Contract execution

WSP advise DSB based on knowledge and experience from both supplier and procurement sides

Examples of areas of support:

- Project management expertise
- Expert technical support
- Verify that Alstom meets the requirements
- Support with changes – Variation Orders
- Review and comment of documents
- Review of training plans and materials
- Design reviews
- First Article Inspections
- First Mounting Reviews
- Testing

Phase 4 - Contract execution

Support regarding Maintenance Preparation

- **Monitor Alstom's preparation work**
- **Solve interfaces between workshop buildings and Alstom installations**
- **Detailing of how DSB can access information in the MMS (Maintenance Management System) including KPIs for Availability and Reliability**
- **Develop processes for sending/receiving trains to/from maintenance**
- **Develop processes for all fault reporting from different sources**

Photos from IC5 full scale mock-up

Mock-ups has been a central element in the desing process



Foto: Bjarke Ørsted



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Photos from IC5 full scale mock-up



Foto: Bjarke Ørsted



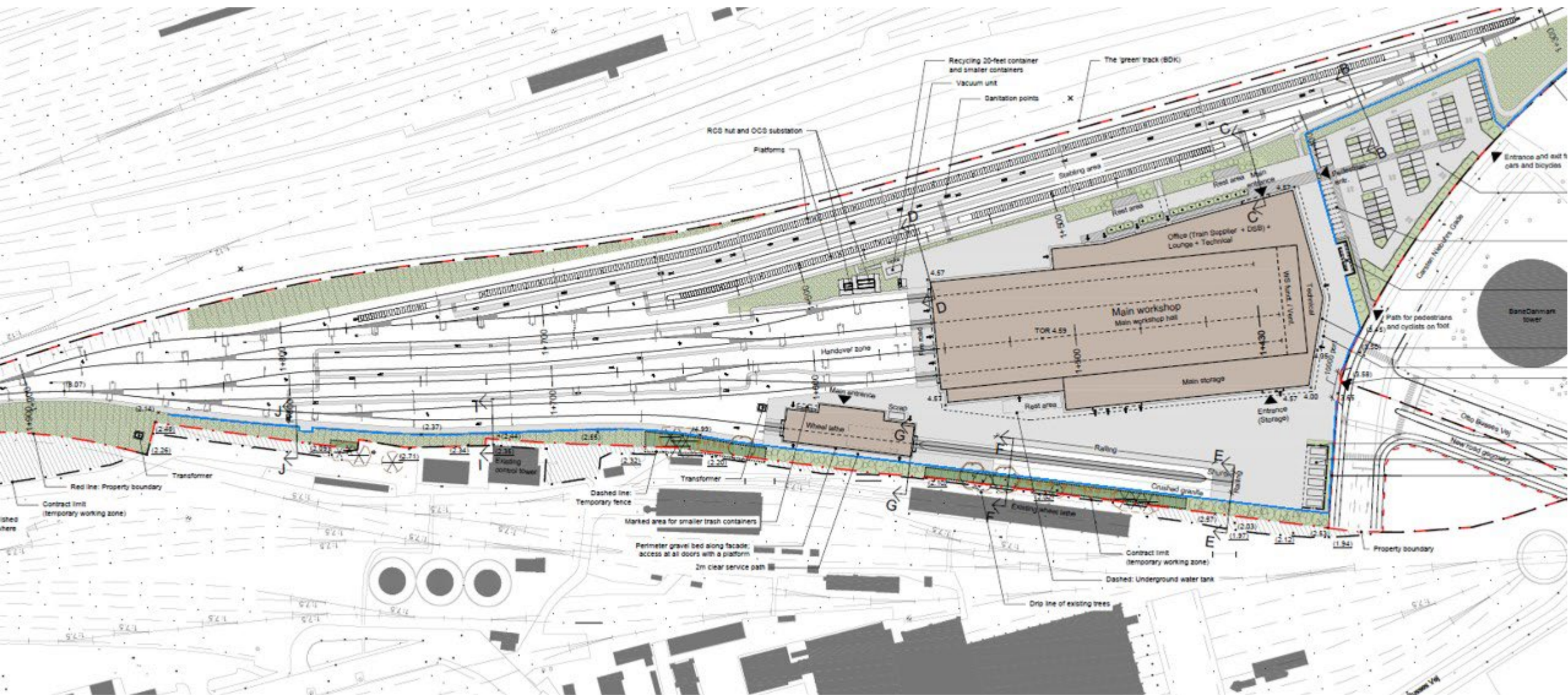
Foto: Jan Lundstrøm



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Copenhagen Depot – Site layout





WSPs support of IC5 procurement

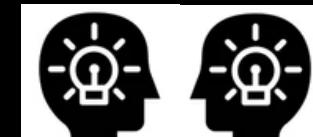
Utilizing the experience within WSP:

- Vehicle procurement with buyers
- Vehicle development at suppliers



WSP vehicle procurement process:

- Flexible and adaptable
- Top-Down approach
- Utilize the expertise at the Buyer and Supplier
- Use processes and tools as support



Used in several large vehicle procurements





Looking forward to seeing IC5 in operation 2027!

Questions?



**THANK
YOU**

