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FREIGHTWISE

Management Framework for Intelligent
Intermodal Transport

Integrated Project (IP)

Sustainable surface transport - Rebalancing and integrating different transport modes

Work Package 17.1a
Evaluation Framework

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RE	Restricted to a group specified by the consortium (including the Commission	
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WP 17 Evaluation Framework

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1.   Introduction

The FREIGHTWISE project has 8 cases. In these cases a number of intermodal services and/or applications will be investigated. A number of these cases will continue with a demonstration of the intermodal services and/or applications, while the others stop at the level of a feasibility study.

This document describes the methodology for the evaluation of these cases, both for the demonstration cases and for the non-demonstration cases. However, before describing the evaluation methodology it is important first to describe why we want to carry out an evaluation of the FREIGHTWISE cases.

1.1   Why evaluation?

There are a number of reasons why the cases should be evaluated:
- In each case 'something new' will be demonstrated. This demonstration should be seen as a pilot for the participating parties. A pilot that should be continued or might even be copied to other similar cases when it is considered successful. The evaluation will provide the respective parties with an answer to the question whether or not the demonstrator was successful with respect to the set objectives and the realised effects.
- The evaluation should also give an answer to the issue of 'pay-back period' or 'return on investment' of the investments made/needed. In the evaluation this will be done for the case itself (including start-up problems and subsidies), but also to get a picture in the case of a more commercial environment (no subsidy, mature service/product).
- Not only should the cases be evaluated from a business/commercial point of view, but also the socio-economic impacts should be taken into consideration, This concerns typical issues as CO_2 emissions, fuel consumption, noise, traffic safety, health, social inclusion, peripheral areas, etc. It should be evaluated whether the EC subsidy contributes to intermodal services that have positive societal benefits and whether these subsidies are essential for a further roll-out of these services, or whether these intermodal services can be realised without subsidies.
- Last but not least the cases should be evaluated for the purpose of taking a go/no-go decision. First of all the evaluation will be used to decide if and how to continue with the 'Demonstration' (WP24) and at a later stage with the 'Full scale operation' (WP26).

It can be concluded that evaluation is essential, both on the company level and on the society level. Furthermore it is important to define clearly beforehand when a demonstrator will be considered successful.

1.2   Purpose of this report

This report serves a number of purposes:
- to give an overview of the evaluation methodology to be applied;
- to give an overview of the topics to be addressed in the evaluation;
- to provide the case co-ordinators with information on the procedures to be followed;
- to provide the case evaluation co-ordinators, case evaluation assistants and case partners an impression of the deadlines and time windows for their contribution to the evaluation process;
- to assist the case partners (including co-ordinators and assistants) in defining objectives, indicators, criteria, etc. to make the evaluation as quantitative as possible.
- To provide the leader of the evaluation workpackage with an overview of deadlines and deliverables, in order to be able to monitor the progress of the evaluation activities.

2.   The FREIGHTWISE cases

Before going to discuss in detail the evaluation methodology of the cases, first the cases themselves will be presented briefly, in order to get a picture of the type of demonstrators to be evaluated. The expected impacts, and therefore also the evaluation methodology, will of course be largely dependent on the content of the cases. Therefore, in this chapter the cases will be presented briefly, just to get an impression of the objectives of the cases.

In the FREIGHTWISE project 9 cases are envisaged with a variety of case objectives. This is shown in table 2.1.

Case	Objective
A1: North West	To create solutions that help to provide robust transport services and are able to meet the requirements of production sites and customers in Norway, Sweden, Finland and UK: - Better integration of business partners through information sharing via the PapiNet system; - Identify improvement potential in the transport chain in co-operation with the Shortsea XML initiative; - Better asset utilisation of transport capacity through visualisation of capacity to potential shippers and business partners (especially inbound transport to Norway); - Indentify improvement potentials from better integration between PapiNet and SAP.
A2: North West (Sweden)	- To improve tracking and tracing of rail cargo and facilitate information exchange in the intermodal chain (data capture, automated information exchange); - Enhancing a port community system with an application for improved planning of road hauliers pick up and delivery of unit loads in a port terminal.
B: North East	To develop/test a cross-border transport network information system including - a cross-border sea link (Finland – Estonia), - two land transport links (Finland – Russia and Estonia – Russia) and - intermodal terminal points The main goal is to reduce waiting times for pick-up or delivery of cargo units at ports and terminals and waiting times at border crossings.
D: Central	To demonstrate an innovative solution for horizontal collaboration by implementing a portal for intermodal transport management on a network of services in transport hubs and on links from the Benelux to the Baltic, thus - providing SME's with low cost intermodal management capabilities and - supporting other forms of information sharing within intermodal networks.
E: Benelux	- To promote the use of electronic message exchange between the parties in the intermodal transport using the port of Rotterdam - To demonstrate how to make better use of traffic information for strategic, tactical and operational planning in road operations.
F: Elbe	- To improve the efficiency of project/heavy cargo transport involving inland waterway transport from the manufacturing site (East Germany, Czech Republic) to the inland terminal and to the terminal in Hamburg for loading the overseas transport

	- To demonstrate the ability of a transport operator to act as a freight integrator (complete and accurate information, necessary documents and tr&tr)
G: Southeast	Proodos (logistics operator), OSE (rail company), other rail companies, THPA (port authority) aim to: - Harmonise the business procedures and organisation - Integrate technologies - Realise complete chain management - Real-time monitoring and forecasting of transport process - Cargo/information security with the final aim to realise a modal shift in favour of rail transport.
H: Southwest (Arcelor)	- To improve the efficiency of intermodal chains serving Arcelor's customers across Europe from a production site in Spain by improving information management for planning, execution and follow-up. - Develop the function of a freight integrator within the Arcelor organisation.
J: Central South	- Assess the feasibility of an integrated information management system for a rail-road corridor - Quantify the benefits of the ICT application to the corridor by comparing the 'before' situation (road only) with the 'after' situation (implementation of rail-road corridor with or without ICT adoption)

Table 2.1: Short description of FREIGHTWISE cases

As can be seen from the case description, the cases vary in a number of ways:
- Some cases deal with vertical integration across the transport or supply chain, others deal with horizontal integration;
- Some cases want to set up a freight integrator function, while other cases are more focussed on improving specific parts of the transportation process, such as transport ordering, planning, pick-up and delivery of containers, etc.;
- In some cases only one or two actors are involved, while in some other cases a whole range of actors is involved, also often including actors from different modes and/or different countries;
- Some cases are 'shipper-driven', whereas other cases are more 'transport-operator driven'.

3. Evaluation methodology

In this chapter the evaluation methodology for the cases first will be described in a global way and then followed by a description of the methodology in more detail.

3.1 Global description of evaluation methodology

In this section the global evaluation methodology will be described.

ZERO STATE

1. Formulate objectives per actor involved in the case
2. Identify proper indicators
3. Define target levels for each indicator
4. Describe current process and current levels of each indicator
5. Describe the feasibility of the new service/application

> ***Result: 'as is' description***
> Description of objectives and current situation, per actor and for the case as a whole.
>
> NOTE: In those cases where no new service/application will be demonstrated in the next phase, this report concludes the evaluation of the respective case(s).

IMPLEMENTATION

6. Describe the implementation process of the new service/application

> ***Result: description of the integration/implementation process***
> Description of the process of the implementation of the new service(s) or application(s).

DEMONSTRATION

7. Measure the effects of the new service/application(s) under operational conditions:
   - Technical performance
   - Organisational performance
   - Logistics efficiency
   - Legal issues
   - Commercial aspects
   - Financial performance
   - Societal aspects
8. Compare realisation with objectives and level 'before', explain differences
9. Draw conclusions for (minor) changes to the demonstrator

> ***Result: intermediate case evaluation***
> Description of impacts and degree to which objectives have been realised, per actor and for the case as a whole after 6-9 months.

10. Measure the effects of the new service/application(s) under operational conditions:
    - Technical performance
    - Organisational performance
    - Logistics efficiency
    - Legal issues
    - Commercial aspects
    - Financial performance
    - Societal aspects

11. Compare realisation with objectives and level 'before', explain differences
12. Draw conclusions for the demonstrator

Result: final case evaluation
Description of impacts and degree to which objectives have been realised, per actor and for the case as a whole after completion of the demonstration.

BEYOND DEMONSTRATION

13. Draw conclusions across all demonstrations and make recommendations for further roll-out/exploitation of the intermodal service/application within the cases and beyond the scope of the cases

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Result: final overall evaluation
Description of the potential for the services/applications within and beyond the scope of the cases and assessment of the evaluation results across all cases.

Schematically the evaluation methodology is shown in figure 3.1.
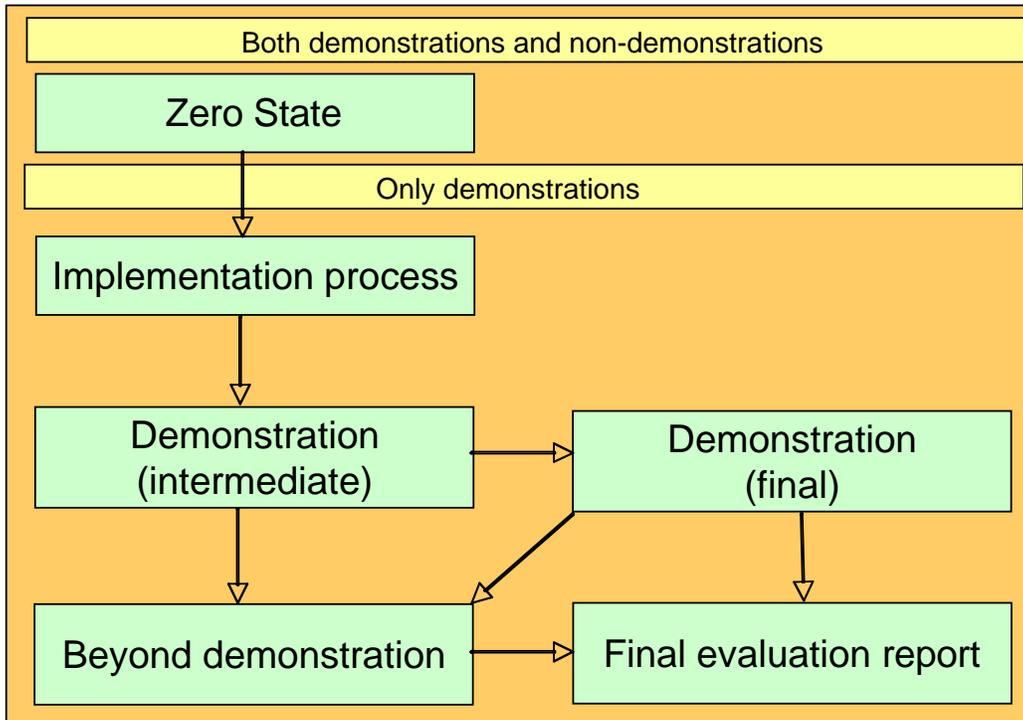
Figure 3.1: evaluation methodology

3.2   Detailed description of evaluation methodology

In this section the detailed description of the evaluation methodology will be presented.

ZERO STATE

1. **Formulate objectives per actor involved in the case**
   For each case the objectives should be identified *per actor*. The objectives give an answer to the question 'Why do you participate in this case?'. Two levels of objectives can be distinguished, it is general objectives and operational objectives. For example a general objective of case X could be to reduce the environmental impact of a transport chain. The operational objective could then be to start a new transport chain between

Y and Z using inland shipping. Especially for the operational objective applies that it should be possible to realise the objective within the scope and duration of the FREIGHTWISE project. Please note that the objectives should not only be viewed on the micro/company level, but also in relation to the overall FREIGHTWISE objectives (modal shift, improved information exchange, cost effective intermodal transport, contribution to FREIGHTWISE framework, freight market transparency, contribution to STS).

It should be noted that each actor could have a number of different objectives within one case. In addition actors within one case can have different objectives.

2. Identify proper indicators
For each general and operational objective indicators should be identified with which the objectives could be measured. E.g. for the general objective the indicator could be 'amount of CO_2 emission per tonkm' or 'external costs of transport'. For the operational objective the indicator could be 'number of tons shifted from road to inland shipping on relation Y-Z'.

3. Define target levels for each indicator
After having identified the indicators, the next step is to define the target level for each indicator, e.g. '-10% CO_2 emission compared to 2007 level' or '4.000 ton shifted from road to inland shipping'.

4. Describe current process and current level (level 'before') of each indicator
In addition to the objectives, indicators and target levels, it is important for a good understanding that the current situation is well described. This description could be taken from D21.n.1, but than in a summarized format, per actor and the interrelationships between the parties in the case.

5. Describe the feasibility of the new service(s) or application(s)
Based on the results of WP22 (Improvement specifications) the feasibility should be described for the new service(s) or application(s). Issues to be covered are:
- Technical feasibility (hardware, software, infrastructure, interfaces, information, …)
- Organisational feasibility (internal organisation, training/education, co-operation with external parties, business model, …)
- Legal feasibility (contracts, compliance with legislation, cross-border aspects, …)
- Financial feasibility (expected costs, expected benefits)
- Societal aspects (CO2-reduction, noise, congestion, fair competition, working conditions, …).

As a result of the five steps mentioned before, the following description of the 'as is' and 'should be' situation should be provided:
a) brief description of *current* process, actors involved, interrelationship between partners, information flows, problems to be solved through demonstration (where useful please use diagrammes).
b) brief description of the *expected* process, actors involved, interrelationship between partners, information flows (where useful please use diagrammes).
c) a tabular overview per actor (see table 3.1 below) with the objectives (general/operational), indicators, target levels and levels 'before'.
d) feasibility of the new service(s) or application(s).

Actor X				
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**
g.o.1	o.o.1.1	i.1.1	tl.1.1	cl.1.1
	o.o.1.2	i.1.2	tl.1.2	cl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	cl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	cl.3.1
	o.o.3.2	i.3.2	tl.3.2	cl.3.2

	o.o.3.3	i.3.3	tl.3.3	cl.3.3
Etc.				
Actor Y				
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**
…..				
…..				
Example				
Reduce environmental impact	Start new transport chain using inland shipping	Number of tons shifted from road to inland shipping on relation Y-Z	+4.000 tons shifted from road to inland shipping per year	0 tons per year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information

Table 3.1: template for objectives, indicators and target levels in 'before' evaluation

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Result: 'as is' description
Description of current and expected future situation (process, objectives, indicators and target levels), per actor and for the case as a whole, as well as a description of the feasibility of the new service(s) or application(s).

Completion date: month 14
Basis for go/no-go decision if and how to continue with the 'Integration' (WP23) and 'Demonstration' (WP24)

NOTE: in the cases where this phase is not followed by an implementation of a new service or application, this report concludes the evaluation of the respective case(s).

IMPLEMENTATION

6.   Describe the implementation process of the new service(s) or application(s)
Each partner should describe the process of the implementation of the new service(s) or application(s). Typically this comprises the following elements:
- selection of business partners (process, criteria, …)
- selection of new software/applications (process, criteria, …)
- contractual issues
- co-operation with other actors in the chain (leading, follower, conflicts, trust, dependencies, …)
- technical integration of ICT systems (within the company, between actors, interfaces, standards, …)
- management of the change-process (internal/external project manager, responsibilities, …)
- training of personnel
- marketing of new service
- legal issues (need for permits, cross-border issues, ….)
- market conditions (competition, changes in the market, ….)
- problems encountered (delays, budget, technical, management, co-operation, legal, …) and solutions applied.
- lessons learnt (recommendations)

The outcome of the process description should be very useful for other (similar) companies that would like to apply similar services or implement similar applications. However, also for the actor itself this process description should be very useful as a

moment of 'self-reflection' and to learn from this process for similar processes in the future.

Result: description of the integration/implementation process
Description of the process of the implementation of the new service(s) or application(s).

Completion date: month 20
Basis for go/no-go decision if and how to continue with the 'Demonstration' (WP24)

DEMONSTRATION

7. **Measure the effects of the new service(s) or application(s) under operational conditions**
    6-9 months after the new service or application has been operational, a first assessment will be made of the performance of the new service(s) or application(s):
    -   Technical performance (hardware, software, infrastructure, interfaces, information availability, …)
    -   Organisational performance (internal organisation, training/education, co-operation with external parties, business model, …)
    -   Logistics efficiency (cost reduction, empty running, modal shift, quality, …)
    -   Legal issues (contracts, compliance with legislation, cross-border aspects, …)
    -   Commercial aspects (attractiveness for existing and/or new clients, image, higher revenues, …)
    -   Financial performance (investment costs, operational costs, higher revenues, operational cost savings, benefits)
    -   Societal aspects (CO2-reduction, noise, congestion, fair competition, safety, security, working conditions, …).

8. **Compare realisation with objectives and 'before' level, explain differences**
    In the zero-state situation a table has been constructed with objectives, indicators, target levels and 'before' levels. In step 8 the measured impacts (see step 7) will be compared with the target level and the 'before' level. This is done by adding an additional column named 'demonstration level', in which the levels per indicator are described after 6-9 months of operational use of the service or application.

Actor X					
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**	**Demonstration level**
g.o.1	o.o.1.1	i.1.1	tl.1.1	bl.1.1	dl.1.1
	o.o.1.2	i.1.2	tl.1.2	bl.1.2	dl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	bl.2.1	dl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	bl.3.1	dl.3.1
	o.o.3.2	i.3.2	tl.3.2	bl.3.2	dl.3.2
	o.o.3.3	i.3.3	tl.3.3	bl.3.3	dl.3.3
Etc.					
Actor Y					
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**	**Demonstration level**
…..					
…..					
Example					
Reduce environmental impact	Start new transport chain using inland	Number of tons shifted from road to inland	+4.000 tons shifted from road to inland shipping per	0 tons per year	+2.000 tons shifted from road to inland shipping per

	shipping	shipping on relation Y-Z	year		year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information	Number of failures due to wrong/lack of information reduced by 25%

Table 3.2: template for objectives, indicators and target levels in the intermediate demonstration evaluation

Comparison of the demonstration level with the 'before' level will give an insight in the improvements realised through the demonstration of the new service or application compared to the old situation. A comparison of the demonstration level with the target level will show whether the demonstration already performs in line with the preset ambition.

9. **Draw conclusions for (minor) changes to the demonstrator**
   Based on the outcomes of steps 7 and 8 conclusions will be drawn on the overall performance of the demonstration so far. As a result it might be necessary to propose (and implement) changes to the demonstrator in order to improve the performance.

Result: intermediate case evaluation
Description of impacts and degree to which objectives have been realised, per actor and for the case as a whole after 6-9 months.

Completion date: month 28
Basis for minor modifications to demonstration

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10. **Measure the effects of the new service/application(s) under operational conditions:**
    At the end of the demonstration phase, a second -final- assessment will be made of the performance of the new service(s) or application(s). This assessment will be similar to the first evaluation and will comprise of the following elements:
    - Technical performance (hardware, software, infrastructure, interfaces, information availability, …)
    - Organisational performance (internal organisation, training/education, co-operation with external parties, business model, …)
    - Logistics efficiency (cost reduction, empty running, modal shift, quality, …)
    - Legal issues (contracts, compliance with legislation, cross-border aspects, …)
    - Commercial aspects (attractiveness for existing and/or new clients, image, higher revenues, …)
    - Financial performance (investment costs, operational costs, higher revenues, operational cost savings, benefits)
    - Societal aspects (CO2-reduction, noise, congestion, fair competition, safety, security, working conditions, …).

11. **Compare realisation with objectives, explain differences**
    Similar to the step 8 comparison, in this step the measured impacts of the demonstration will be compared with the target level, the 'before' level and the intermediate demonstration level. This is done by adding to the earlier table again an additional column named 'final level', in which the levels per indicator are described during the last 6 months of the demonstration under operational conditions.

Actor X						
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**	**Intermediate level**	**Final level**
g.o.1	o.o.1.1	i.1.1	tl.1.1	bl.1.1	dl.1.1	fl.1.1
	o.o.1.2	i.1.2	tl.1.2	bl.1.2	dl.1.2	fl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	bl.2.1	dl.2.1	fl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	bl.3.1	dl.3.1	fl.3.1
	o.o.3.2	i.3.2	tl.3.2	bl.3.2	dl.3.2	fl.3.2
	o.o.3.3	i.3.3	tl.3.3	bl.3.3	dl.3.3	fl.3.3
Etc.						
Actor Y						
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**	**Intermediate level**	**Final level**
…..						
…..						
Example						
Reduce environmental impact	Start new transport chain using inland shipping	Number of tons shifted from road to inland shipping on relation Y-Z	+4.000 tons shifted from road to inland shipping per year	0 tons per year	+2.000 tons shifted from road to inland shipping per year	+3.250 tons shifted from road to inland shipping per year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information	Number of failures due to wrong/lack of information reduced by 25%	Number of failures due to wrong/lack of information reduced by 15%

Table 3.3: template for objectives, indicators and target levels in final demonstration evaluation

Comparison of the final demonstration level with the intermediate level and the 'before' level will give an insight in the improvements realised through the demonstration of the new service or application compared to the old situation. A comparison of the final demonstration level with the target level will show whether the demonstration performed in line with the preset ambition.

12. Draw conclusions on the demonstration
Based on the outcomes of steps 10 and 11 conclusions will be drawn on the overall performance of the new services and applications in the demonstration per case. As a result it might be necessary to propose (and implement) changes for the full-scale operation in order to improve the performance.

Result: final case evaluation
Description of impacts and degree to which objectives have been realised, per actor and for the case as a whole during the demonstration.

Completion date: month 36
Basis for go/no-go decision full scale operation (WP26)

BEYOND DEMONSTRATION

13. **Draw conclusions and make recommendations for further roll-out/exploitation of the intermodal service/application beyond the scope of the cases and recommendations across all FREIGHTWISE cases**

    Based on the outcomes of steps 1 to 12 conclusions will be drawn on the overall performance of the new intermodal services and applications beyond the scope of the cases. Recommendations will be made on how the services and applications can be best rolled out to other companies. Recommendations will be based on the lessons learnt from the implementation and demonstration. Need for standardisation, legislation, EC-support, etc. will be highlighted if relevant. Commercial and economic viability of the new services and applications will be discussed with the providers and potential business opportunities mentioned.

Result: final overall evaluation

Description of the potential for the services/applications beyond the scope of the cases and assessment of the evaluation results across all cases.

Completion date: month 39

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4. Tasks and responsibilities

Chapter 3 clearly describes what has to be done for a proper evaluation of the cases. This chapter will describe the tasks and responsibilities of the FREIGHTWISE partners in the evaluation.

Each case has a ***case evaluation co-ordinator***, which will be responsible for the co-ordination of the evaluation of the respective case. The evaluation co-ordinators are printed in the dark grey marked cells in the table below. It is the task of the case evaluation co-ordinator to make sure that each partner in the case provides the information required per actor for the evaluation and to assist Mobycon in the evaluation of each case.
NOTE: *The case evaluation co-ordinator can be the same as the case leader, but this is not necessarily the case.*

Each case also has one or more ***case evaluation assistants***, which have a responsibility to assist in the evaluation. The evaluation assistants are printed in the light grey marked cells in the table below. It is the task of the case evaluation assistants to assist the case evaluation co-ordinator in the evaluation of the cases (e.g. due to its close proximity to some of the case partners, through its business relation with other case partners, etc.) and to help write the overall case evaluation, i.e. not just on an actor by actor basis, but truly as a complete case.

In addition each case also has ***case partners***, which will be responsible for providing sufficient information for a proper evaluation of their own performance in the case as well as the overall performance of the case. Their role in the evaluation will mainly be to provide information on request with respect to the zero-state, intermediate and final evaluation of the demonstration, and roll-out of the new services/applications.

	Partners involved per case													*Total*
Case A: North West -W	**Marintek**	LogIT	Norske Skog	EMS YS										5
	2													
Case A: North West -E	**BMT**	*Trelle borg*	SCA	DFDS	LogIT	POG	Green Cargo	Hang artner	SR A	Volvo	Marac anda			
	2	*1*												
Case B: North East	**Traffi con**	*Mobi soft*	*Tieto talo*	*Fin RoEn*	*Stratum*	*Foor*								6
	1	1	1	1	1	1								
Case D: Central	**Sequo yah**	*ATG*	*Emsys*	*TZL*	*Syn tens*	*P&G*	*ILIM*	*CS*	Log IT	Nova com	Tu Tech	SS S	Van Dieren	11
	3	1	1	1	1	1	2	1						
Case E: Benelux	**Moby con**	*PIL*	*JDR*											6
	4	1	1											
Case F: Elbe	**BMT**	*BLS*	*DBR*	*CSPD*	*SBO*	Sequo yah	Log IT							13
	5	2	2	2	2									
Case G: South East	**Proodos**	*OSE*	*THPA*	Tred it	Anco									17
	8	4	5											
Case H: South West	**Tredit**	*BMT*	LogIT	Anco	PAG	Acera lia	CTIC							4
	2	2												
Case J: Central South	**DITS**	ITL												2
	2													

Table 4.1: Number of manmonths per case for evaluation in WP25

Apart from the above roles and responsibilities, Mobycon is the ***overall responsible evaluation partner*** for all FREIGHTWISE cases, to be supported in this task by Ulg/CIEM. These tasks consist of the following:
- planning and monitoring of the evaluation process
- instructing case evaluation co-ordinators with respect to their evaluation activities
- providing templates for evaluation to the case evaluation co-ordinators
- carrying out on-site case visits and case evaluation working sessions with the case partners during the demonstration (intermediate and final)
- quality control of case-specific deliverables

- writing of reports with results across all demonstrations
- overall support to case evaluation co-ordinators and other case partners in carrying out their evaluation tasks.

Schematically the co-operation between the case partners, case evaluation assistants, case evaluation co-ordinators and evaluation leader is shown in the following figure.
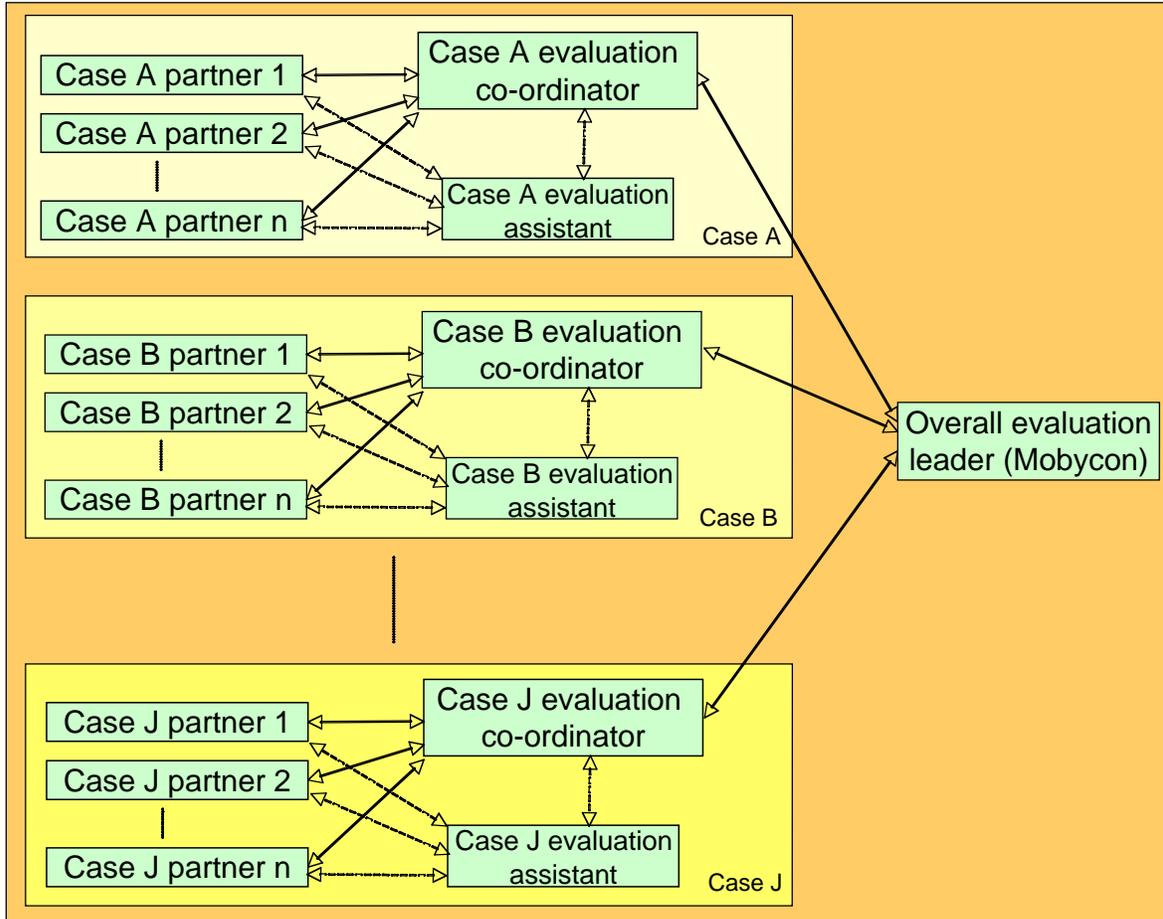
Figure 4.1: Co-operation in the evaluation of the cases

The total number of manmonths in Workpackage 25 is shown in table 4.2 below.

Partners involved (overall)							
BMT	Proodos	THPA	OSE	Mobycon	Sequoyah	Tredit	BLS
9	8	5	4	4	3	2	2
ILIM	DBR	CSPD	Marintek	DITS	SBO	Foor	Trelleborg
2	2	2	2	2	2	1	1
PIL	ATG	Emsys	TZL	Syntens	P&G	Tietotalo	CS
1	1	1	1	1	1	1	1
JDR	Trafficon	Mobisoft	FinRoEn	Stratum			**Total**
1	1	1	1	1			**64**

Table 4.2: Number of manmonths in WP25

5. Time planning

Table 5.1 shows the envisaged time table for the evaluation of the cases in W25.

→Months	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Template for 'as is' description (Mobycon)	X																											
'as is' description (case partners)		X	X																									
Description of 'as is' situation (case evaluation co-ord)				X																								
'as is' description (Mobycon)				X																								
Template for implementation process report				X																								
Write implementation report (case partners)					X	X	X																					
Description of implementation process (case evaluation co-ord)								X																				
Description of implementation process (Mobycon)									X																			
Template for intermediate evaluation report (Mobycon)										X																		
Data collection intermediate evaluation (case partners)											X	X	X	X	X													
Site visit + interviews (Mobycon)														X	X													
Description of intermediate evaluation of demonstration (case evaluation co-ord)																X												
Intermediate evaluation of demonstration (Mobycon)																	X											
Template for final evaluation report (Mobycon)															X													
Data collection final evaluation (case partners)																X	X	X	X	X	X	X	X					
Site visit + interviews (Mobycon)																						X	X					
Final evaluation of demonstration (case evaluation co-ordinator)																								X				
Final evaluation of demonstration (Mobycon)																									X			
Draw conclusions and recommendations (Mobycon)																										X	X	
Final overall evaluation (Mobycon)																												X

| ■ case partner | ■ case evaluation co-ordinator | ■ Mobycon |

Table 5.1: planning of evaluation of FREIGHTWISE cases

6. Evaluation guidelines for case evaluation co-ordinators

In this section guidelines will be given for the case evaluation co-ordinators, but it will also clearly show the responsibilities of the case partners and case evaluation assistants.

6.1 Guidelines Zero State evaluation

The aim of the 'zero state' is to get a good impression of the case and the objectives that should be realised within the case. Each case has a *case evaluation co-ordinator*, which will be responsible for the co-ordination of the evaluation of the respective case. It is the task of the case evaluation co-ordinator, together with the *case evaluation assistant*, to make sure that each partner in the case provides the information required per actor for the evaluation and to combine this information into a report reflecting the 'zero state' of the case. A template of the 'zero state' report is available on TEAMSPACE under WP25/Evaluation. A table of content is provided at the end of this 'zero state' section.

For the description of the 'zero state' the following activities have to be undertaken, co-ordinated by the case evaluation co-ordinator:

1. **Formulate objectives per actor involved in the case**
   For each case the objectives should be identified *per actor*. The objectives give an answer to the question 'Why do you participate in this case?'. Two levels of objectives can be distinguished, it is general objectives and operational objectives. For example a general objective of case X could be to reduce the environmental impact of a transport chain. The operational objective could then be to start a new transport chain between Y and Z using inland shipping. Especially for the operational objective applies that it should be possible to realise the objective within the scope and duration of the FREIGHTWISE project. Please note that the objectives should not only be viewed on the micro/company level, but also in relation to the overall FREIGHTWISE objectives (modal shift, improved information exchange, cost effective intermodal transport, contribution to FREIGHTWISE framework, freight market transparency, contribution to STS).
   It should also be noted that each actor could have a number of different objectives within one case. In addition actors within one case can have different objectives.
   An extensive list of potential objectives is included in Annex 1 at the end of this deliverable. Of course other objectives can be added if needed

2. **Identify proper indicators**
   For each general and operational objective indicators should be identified with which the objectives could be measured. E.g. for the general objective the indicator could be 'amount of CO_2 emission per tonkm' or 'external costs of transport'. For the operational objective the indicator could be 'number of tons shifted from road to inland shipping on relation Y-Z'.
   An extensive list of potential indicators is included in Annex 1 at the end of this deliverable. Of course other indicators can be added if needed.

3. **Define target levels for each indicator**
   After having identified the indicators, the next step is to define the target level for each indicator, e.g. '-10% CO_2 emission compared to 2007 level' or '4.000 ton shifted from road to inland shipping'.

4. **Describe current process and current level (level 'before') of each indicator**
   In addition to the objectives, indicators and target levels, it is important for a good understanding that the current situation is well described. This description could be taken from D21.n.1, but than in a summarized format, per actor and the interrelationships between the parties in the case.

5. **Describe the feasibility of the new service(s) or application(s)**

Based on the results of WP22 (Improvement specifications) the feasibility should be described for the new service(s) or application(s). Issues to be covered are:
- Technical feasibility (hardware, software, infrastructure, interfaces, information, …)
- Organisational feasibility (internal organisation, training/education, co-operation with external parties, business model, …)
- Legal feasibility (contracts, compliance with legislation, cross-border aspects, …)
- Financial feasibility (expected costs, expected benefits)
- Societal aspects (CO2-reduction, noise, congestion, fair competition, working conditions, …).

Format 'zero state' report
As a result of the five steps mentioned before, the 'zero state' evaluation report will have the following format:

1. Introduction (1 page)

2. Brief description of the case (2-3 pages)
   General objective(s), parties involved, what will be demonstrated, current versus new processes/information flows (where useful use diagrammes)

3. Objectives, indicators, target levels, current levels (1-2 pages per case partner)
   *Tabular overview **per actor** (see table 1 below) with the objectives (general/operational), indicators, target levels and levels 'before'.*

Actor X				
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**
g.o.1	o.o.1.1	i.1.1	tl.1.1	cl.1.1
	o.o.1.2	i.1.2	tl.1.2	cl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	cl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	cl.3.1
	o.o.3.2	i.3.2	tl.3.2	cl.3.2
	o.o.3.3	i.3.3	tl.3.3	cl.3.3
Etc.				
Actor Y				
General objective	**Operational objective**	**Indicator**	**Target level**	**'before' level**
…..				
…..				
Example				
Reduce environmental impact	Start new transport chain using inland shipping	Number of tons shifted from road to inland shipping on relation Y-Z	+4.000 tons shifted from road to inland shipping per year	0 tons per year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information

Table 1: template for objectives, indicators and target levels in 'before' evaluation

4. Feasibility of the new service(s) or application(s) (5-10 pages).
   Description of the feasibility of the new service(s) or application(s), e.g. technical feasibility (hardware, software, infrastructure, interfaces, information, …), organisational feasibility (internal organisation, training/education, co-operation

with external parties, business model, …), legal feasibility (contracts, compliance with legislation, cross-border aspects, …), financial feasibility (expected costs, expected benefits) and societal aspects (CO2-reduction, noise, congestion, fair competition, working conditions, …).

Planning 'zero state':

Month 13 (November 2007): Case evaluation co-ordinators can start working on the 'zero state' information collection

Month 15 (January 2008): Completion of 'zero state' report of their specific case by the case evaluation co-ordinators and sending report to Mobycon

Month 15 (January 2008): Completion of integrated 'zero state' report across all cases by Mobycon

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6.2 Guidelines implementation evaluation

The aim of the evaluation of the implementation phase is to get a good impression of the implementation process per case and possibly per actor. The outcome of the implementation process description should be very useful for other (similar) companies that would like to apply similar services or implement similar applications. However, also for the actor itself this process description will be very useful as a moment of 'self-reflection' and to learn from this process for similar processes in the future.

The *case evaluation co-ordinator* will be responsible for the co-ordination of the evaluation of the respective case. It is the task of the case evaluation co-ordinator, together with the *case evaluation assistant*, to make sure that each partner in the case provides the information required per actor for the evaluation of the implementation process and to combine this information into a report reflecting the implementation process of the complete case. A template of the 'implementation' report will be available on TEAMSPACE under WP25/Evaluation in month 15 (January 2008). An indicative table of content is provided at the end of this 'implementation' section.

For the description of the implementation process the following activities have to be undertaken, co-ordinated by the case evaluation co-ordinator:

6. **Describe the implementation process of the new service(s) or application(s)**
   Each *partner* should describe the process of the implementation of the new service(s) or application(s). Typically this comprises the following elements:
   - selection of business partners (process, criteria, …)
   - selection of new software/applications (process, criteria, …)
   - contractual issues
   - co-operation with other actors in the chain (leading, follower, conflicts, trust, dependencies, …)
   - technical integration of ICT systems (within the company, between actors, interfaces, standards, …)
   - management of the change-process (internal/external project manager, responsibilities, …)
   - training of personnel
   - marketing of new service
   - legal issues (need for permits, cross-border issues, ….)
   - market conditions (competition, changes in the market, ….)
   - problems encountered (delays, budget, technical, management, co-operation, legal, …) and solutions applied.

- lessons learnt (recommendations)

Per case the case evaluation co-ordinator will collect all inputs from the partners and he will combine this into the implementation report.

Format 'implementation' report
The 'implementation' evaluation report will have the following format:

1. Introduction (1 page)

2. Brief description of the case (1-2 pages)
   General objective(s), parties involved, what will be demonstrated, current versus new processes/information flows (where useful use diagrammes). This can be taken from the 'zero state' report.

3. Selection process (3-5 pages)
   Business partners (process, criteria, …), new software/applications (process, criteria, …), contractual issues, co-operation with other actors in the chain

4. Technical integration of ICT systems (5-10 pages)
   Within the company, between actors, interfaces, standards, …

5. Management of the change-process (3-5 pages)
   Internal/external project manager, responsibilities, training of personnel, marketing of new service, legal issues (need for permits, cross-border issues,…)

6. Market conditions (1-3 pages)
   Competition, changes in the market, ….

7. Lessons learnt (2-3 pages)
   Problems encountered and solutions applied (delays, budget, technical, management, co-operation, legal), conclusions, recommendations

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Planning implementation process evaluation:

Month 16 (February 2008):	Case evaluation co-ordinators can start working on the implementation process information collection
Month 18 (April 2008):	Completion of information collection per partner and sending partner reports to case evaluation co-ordinator
Month 19 (May 2008):	Completion of implementation report per case by the case evaluation co-ordinators and sending report to Mobycon
Month 20 (June 2008):	Completion of integrated implementation report across all cases by Mobycon

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6.3   Guidelines for the demonstration evaluation

The evaluation of the actual demonstration is the core of the FREIGHTWISE evaluation. It consists of two evaluations:
-    a first evaluation after 6-9 months after implementation (approx. month 28 of the project), and
-    a final evaluation at the end of the demonstration (approx. month 36 of the project).

The aim of the evaluation of the demonstration is to draw conclusion on the extent to which the new application or service actually performs compared to the preset targets from the 'zero state' as well as to draw lessons from the experiences during the demonstration. Again, the *case evaluation co-ordinator* will be responsible for the co-ordination of the evaluation of the respective case. It is the task of the case evaluation co-ordinator, together with the *case evaluation assistant*, to make sure that each partner in the case provides the information required per actor for the evaluation and to combine this information into a report reflecting the performance of the new application or service in the demonstration phase. A template of the 'demonstration' report will be available on TEAMSPACE under WP25/Evaluation in month 21 of the project. A provisional table of content is already provided at the end of this 'demonstration' section.

6.3.1 Guidelines for the intermediate evaluation of the demonstration

For the evaluation of the demonstration the following activities have to be undertaken, co-ordinated by the case evaluation co-ordinator:

7. **Measure the effects of the new service(s) or application(s) under operational conditions**
   6-9 months after the new service or application has been operational, a first assessment will be made of the performance of the new service(s) or application(s):
   - Technical performance (hardware, software, infrastructure, interfaces, information availability, …)
   - Organisational performance (internal organisation, training/education, co-operation with external parties, business model, …)
   - Logistics efficiency (cost reduction, empty running, modal shift, quality, …)
   - Legal issues (contracts, compliance with legislation, cross-border aspects, …)
   - Commercial aspects (attractiveness for existing and/or new clients, image, higher revenues, …)
   - Financial performance (investment costs, operational costs, higher revenues, operational cost savings, benefits)
   - Societal aspects (CO_2-reduction, noise, congestion, fair competition, safety, security, working conditions, …).

8. **Compare realisation with objectives and 'before' level, explain differences**
   In the zero-state situation a table has been constructed with objectives, indicators, target levels and 'before' levels. In step 8 the measured impacts (see step 7) will be compared with the target level and the 'before' level. This is done by adding an additional column named 'demonstration level', in which the levels per indicator are described after 6-9 months of operational use of the service or application.

   Comparison of the demonstration level with the 'before' level will give an insight in the improvements realised through the demonstration of the new service or application compared to the old situation. A comparison of the demonstration level with the target level will show whether the demonstration already performs in line with the preset ambition.

9. **Draw conclusions for (minor) changes to the demonstrator**
   Based on the outcomes of steps 7 and 8 conclusions will be drawn on the overall performance of the demonstration so far. As a result it might be necessary to propose (and implement) changes to the demonstrator in order to improve the performance.

Per case the case evaluation co-ordinator will collect all inputs from the partners and he will combine this into the implementation report.

Format intermediate evaluation of demonstration report
The intermediate evaluation report will have the following format:

   1. Introduction (1 page)

2. Brief description of the case (1-2 pages)
   General objective(s), parties involved, what will be demonstrated, current versus new processes/information flows (where useful use diagrammes). This can be taken from the 'zero state' report.

3. Summary of intermediate evaluation in tabular format

Actor X

General objective	Operational objective	Indicator	Target level	'before' level	Demonstration level
g.o.1	o.o.1.1	i.1.1	tl.1.1	bl.1.1	dl.1.1
	o.o.1.2	i.1.2	tl.1.2	bl.1.2	dl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	bl.2.1	dl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	bl.3.1	dl.3.1
	o.o.3.2	i.3.2	tl.3.2	bl.3.2	dl.3.2
	o.o.3.3	i.3.3	tl.3.3	bl.3.3	dl.3.3
Etc.					

Actor Y

General objective	Operational objective	Indicator	Target level	'before' level	Demonstration level
…..					
…..					
Example					
Reduce environmental impact	Start new transport chain using inland shipping	Number of tons shifted from road to inland shipping on relation Y-Z	+4.000 tons shifted from road to inland shipping per year	0 tons per year	+2.000 tons shifted from road to inland shipping per year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information	Number of failures due to wrong/lack of information reduced by 25%

Objectives, indicators and target levels in the intermediate demonstration evaluation

4. Technical performance (3-5 pages)
   Hardware, software, infrastructure, interfaces, information availability, risks …

5. Organisational performance (3-5 pages)
   Internal organisation, training/education, co-operation with external parties, business model, public/private synergy, …

6. Logistics efficiency (3-5 pages)
   Cost reduction, empty running, modal shift, quality, …

7. Legal issues (3-5 pages)
   Contracts, compliance with legislation, cross-border aspects, …

8. Commercial aspects (3-5 pages)
   Attractiveness for existing and/or new clients, image, higher revenues, …

9. Financial performance (3-5 pages)
   Investment costs, operational costs, higher revenues, operational cost savings, benefits, risk assessment

10. Societal aspects (3-5 pages)
    CO2-reduction, noise, congestion, fair competition, safety, security, working conditions, …

11. Conclusions (2-3 pages)
    Main problems, solutions applied (delays, budget, technical, management, co-operation, legal), conclusions, recommendations

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Planning intermediate evaluation:

Month 22 (August 2008):	Case evaluation co-ordinators can start working on the information collection for the intermediate evaluation of the demonstration
Month 26 (December 2008):	Completion of information collection per partner and sending partner reports to case evaluation co-ordinator
Month 27 (January 2009):	Completion of intermediate evaluation report per case by the case evaluation co-ordinators and sending report to Mobycon
Month 28 (February 2009):	Completion of integrated intermediate evaluation report across all cases by Mobycon

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6.3.2 Guidelines for the final evaluation of the demonstration

10. **Measure the effects of the new service/application(s) under operational conditions:**
    At the end of the demonstration phase, a second -final- assessment will be made of the performance of the new service(s) or application(s). This assessment will be similar to the first evaluation and will comprise of the following elements:
    - Technical performance (hardware, software, infrastructure, interfaces, information availability, …)
    - Organisational performance (internal organisation, training/education, co-operation with external parties, business model, …)
    - Logistics efficiency (cost reduction, empty running, modal shift, quality, …)
    - Legal issues (contracts, compliance with legislation, cross-border aspects, …)
    - Commercial aspects (attractiveness for existing and/or new clients, image, higher revenues, …)
    - Financial performance (investment costs, operational costs, higher revenues, operational cost savings, benefits)
    - Societal aspects (CO2-reduction, noise, congestion, fair competition, safety, security, working conditions, …).

11. **Compare realisation with objectives, explain differences**
    Similar to the step 8 comparison, in this step the measured impacts of the demonstration will be compared with the target level, the 'before' level and the intermediate demonstration level. This is done by adding to the earlier table again an additional column named 'final level', in which the levels per indicator are described during the last 6 months of the demonstration under operational conditions.

    Comparison of the final demonstration level with the intermediate level and the 'before' level will give an insight in the improvements realised through the demonstration of the new service or application compared to the old situation. A comparison of the final demonstration level with the target level will show whether the demonstration performed in line with the preset ambition.

12. Draw conclusions on the demonstration

Based on the outcomes of steps 10 and 11 conclusions will be drawn on the overall performance of the new services and applications in the demonstration per case. As a result it might be necessary to propose (and implement) changes for the full-scale operation in order to improve the performance.

Format final evaluation of demonstration report

The final evaluation report will have the same format as the intermediate evaluation report (see section 6.3.1):

1. Introduction (1 page)

2. Brief description of the case (1-2 pages)
   General objective(s), parties involved, what will be demonstrated, current versus new processes/information flows (where useful use diagrammes). This can be taken from the 'zero state' report.

3. Summary of final evaluation in tabular format

Actor X

General objective	Operational objective	Indicator	Target level	'before' level	Intermediate level	Final level
g.o.1	o.o.1.1	i.1.1	tl.1.1	bl.1.1	dl.1.1	fl.1.1
	o.o.1.2	i.1.2	tl.1.2	bl.1.2	dl.1.2	fl.1.2
g.o.2	o.o.2.1	i.2.1	tl.2.1	bl.2.1	dl.2.1	fl.2.1
g.o.3	o.o.3.1	i.3.1	tl.3.1	bl.3.1	dl.3.1	fl.3.1
	o.o.3.2	i.3.2	tl.3.2	bl.3.2	dl.3.2	fl.3.2
	o.o.3.3	i.3.3	tl.3.3	bl.3.3	dl.3.3	fl.3.3
Etc.						

Actor Y

General objective	Operational objective	Indicator	Target level	'before' level	Intermediate level	Final level
…..						
…..						
Example						
Reduce environmental impact	Start new transport chain using inland shipping	Number of tons shifted from road to inland shipping on relation Y-Z	+4.000 tons shifted from road to inland shipping per year	0 tons per year	+2.000 tons shifted from road to inland shipping per year	+3.250 tons shifted from road to inland shipping per year
Smooth flow of information	Build platform for communication between party A and party B	Number of failures due to wrong/lack of information	Reduce number of failures due to wrong/lack of information by 20%	10% failures due to wrong/lack of information	Number of failures due to wrong/lack of information reduced by 25%	Number of failures due to wrong/lack of information reduced by 15%

Objectives, indicators and target levels in final demonstration evaluation

4. Technical performance (3-5 pages)

Format final evaluation report

The final evaluation report will add one additional chapter to the final demonstration report from section 6.3, focussing on conclusions and recommendations for further roll-out/exploitation of intermodal services/applications beyond the scope of the cases. This section will be written by Mobycon with contributions from Ulg/CIEM and the case co-ordinators.

Planning final conclusions and recommendations of evaluation:	
Month 37 (November 2009):	Mobycon starts working on the information collection for the final conclusions and recommendations beyond the scope of the cases
Month 39 (January 2010):	Completion of final conclusions and recommendations from evaluation and submission of final evaluation report (by Mobycon)

Annexes

Annex 1: Examples of indicators

General

Improve speed	Km/h
Increase frequency	Number
Task size of shipments	Number
Shipment size	Number
Value of shipment	Number
Density of shipment	Number
Punctuality of trains	Number
Competitiveness	Qualitative
Connection to international en national transport network	Qualitative

Technical aspects

Decrease of queue time	Minutes
Decrease of queue length	Meters
Increase of reliability (of the system)	Number
Increase of overview	Qualitative
Improved use of infrastructure (rail, road, fairway) capacity	Relative number
Increase of better services	Qualitative
Increase of just-in-time service	Number
Reaction time measure	Minutes
Nature of reaction	Number
Quality of reaction	Relative Number
Technology obsolete	Relative Number
Dependency on meteorological conditions	Relative Number
Weather sensitivity	Relative Number
Terminal efficiency (turn-around time)	Minutes
Wagon availability	Number

Information aspects

Scale of information	Relative Number
Capacity of information	Relative Number
Quality of information flows	Relative Number
Quantity of information flows	Number
Visibility of information segregation	Qualitative
Traceability of information	Relative Number
Data storage technology	Relative Number
Duration of data storage	Minutes
Procedure for data retrieval	Qualitative
Strength of EDI technology	Relative Number
IT-supplier dependency	Relative Number
Dependency on third parties	Relative Number
Time gain in detecting and tracking vessels/vehicles	Minutes
Use of portal for intermodal transport management	Number
Electronic tracking capability	Qualitative
Contribution to FWF	Qualitative
Contribution to STS	Qualitative

Organisational performance

Decrease of men hours in route planning	Minutes
Time gain in sending reports	Minutes
Time gain in receiving authorisation	Minutes
Decrease of number of contacts with authorities	Minutes
Decrease of men hours on information collection	Minutes
Decrease of men hours on information exchange	Minutes
Decrease of men hours on navigation/driving hours	Minutes
Training, education	Minutes
HMI, increase of comfort caused by the system	Relative Number
HMI, decrease of procedures and data handling	Relative Number
Language adaptability	Relative Number
Operation and management of the terminal	Qualitative
Administrative time savings	Minutes
Planning & management time savings	Minutes
Control time savings	Minutes
Proactive notification of problem	Qualitative
Electronic booking/payment capability	Qualitative

Efficiency

Time gain in port's arrival and departure processes	Minutes
Time gain in adjusting logistics activities	Minutes
Travel time reduction in door-to-door time	Minutes
Decrease of transport time	Minutes
Improved transport efficiency	Qualitative
Time gain in collecting the right information	Minutes
Time gain in processing the right information	Minutes
Decrease of delays	Number
Decrease of waiting time	Minutes
Innovation	Relative Number
Harmonization/complementarity	Relative Number
Development, flexibility	Relative Number
Success rate of information transmission	Relative Number
Transmission time	Minutes
Improve lead times	Minutes
Reduce handling	Minutes
Reduce waiting time for trucks at port entrances	Minutes
Better use of electronic message exchange	Qualitative
Transhipment process less dependent on staff expertise	Qualitative

Context/Legal Issues

Legal aspects	Qualitative
Reduce waiting time for trucks at border crossings (by providing information)	Minutes
Planning security	Qualitative
Availability of land	Qualitative
Governmental policy on freight transport	Qualitative
Regional access to markets	Qualitative
Freight transport market transparency	Qualitative
Impact on international trade	Qualitative

Impact on cross-border investments	Qualitative

Commercial aspects

Increase business activities	Number
Market	Relative Number
Autonomous developments: demand for freight transports	Relative Number
Increase orders	Number
Ability to respond to customer needs	Qualitative
Availability of equipment to meet user needs	Qualitative

Economic aspects

Increase of goods transported	Amount
Increase of occupancy rate	Relative number
Benefits of additional loads	Amount
Decrease of costs	Euro
Investment costs	Euro
Operating costs	Euro
Maintenance costs	Euro
Cost of legislation	Euro
Avoided investment costs	Euro
Occupancy rate vessels	Number
Transport costs	Euro
Costs of enforcement	Euro
Pay back period	Months
Net cash flows	Euro
Autonomous developments: economic growth	Number
Mutations in number of employees	Number
Increase RoRo and Rail Services	Number

Societal aspects

Decrease of environmental damages	Extent & nature
Decrease of oil spill	Extent & nature
Increase of quality	Qualitative
Reduction of illegal and threatening activities	Number
Modal shift from road to rail/water	Amount/percentage
Emission reduction of CO_2	Amount
Emission reduction (air quality of port district)	Amount
Use of cleaner and alternative fuels	Amount
Reduction of covered mileages and related emissions	Milages & grammes
Decrease of accidents	Number & nature
Decrease of collisions	Number & nature
Decrease of injuries	Number & nature
Decrease of fatalities	Number & nature
Decrease of emergency response time	Minutes
Decrease of emergency activities	Number
Improved feeling of personal safety	Qualitative
Prevent damage	Number

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