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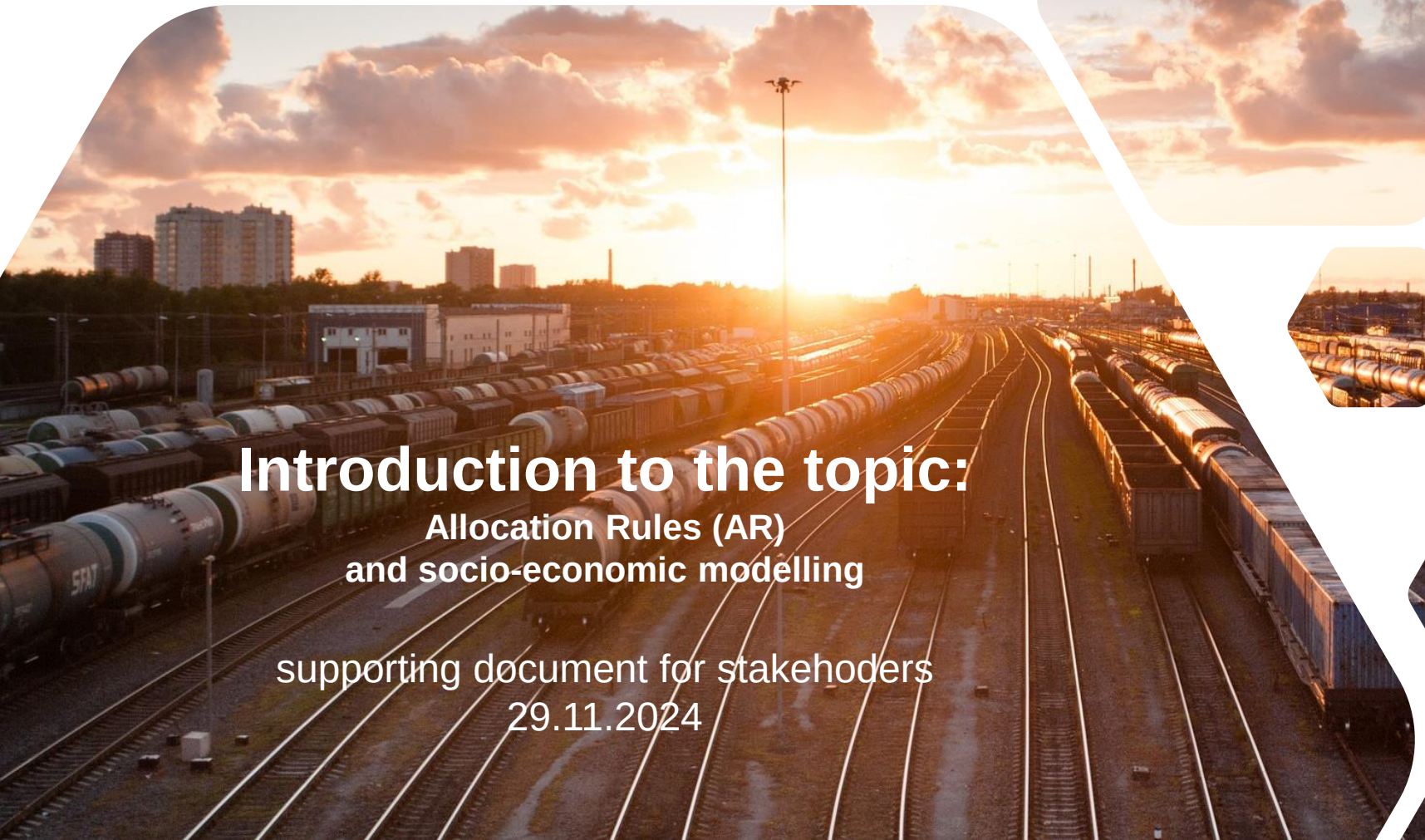


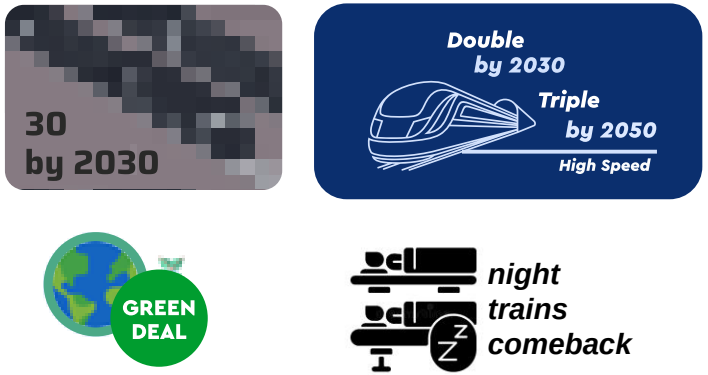
Introduction to the topic:

Allocation Rules (AR)
and socio-economic modelling

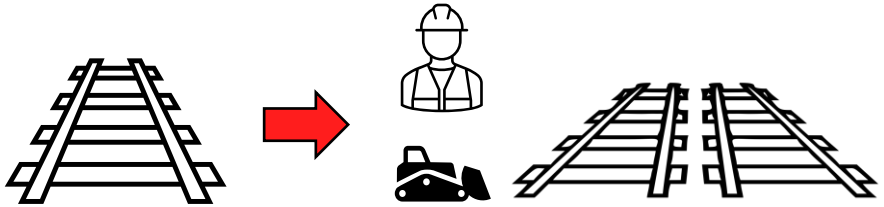
supporting document for stakeholders
29.11.2024

More information
(FTE website)

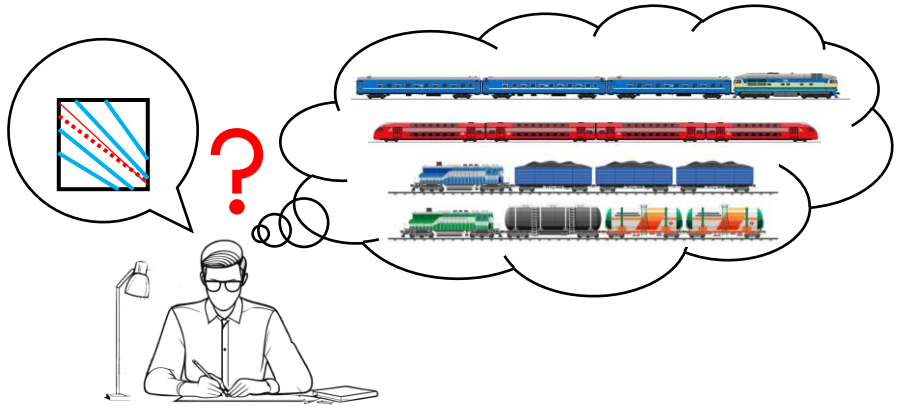
Allocation Rules



Capacity is getting scarce



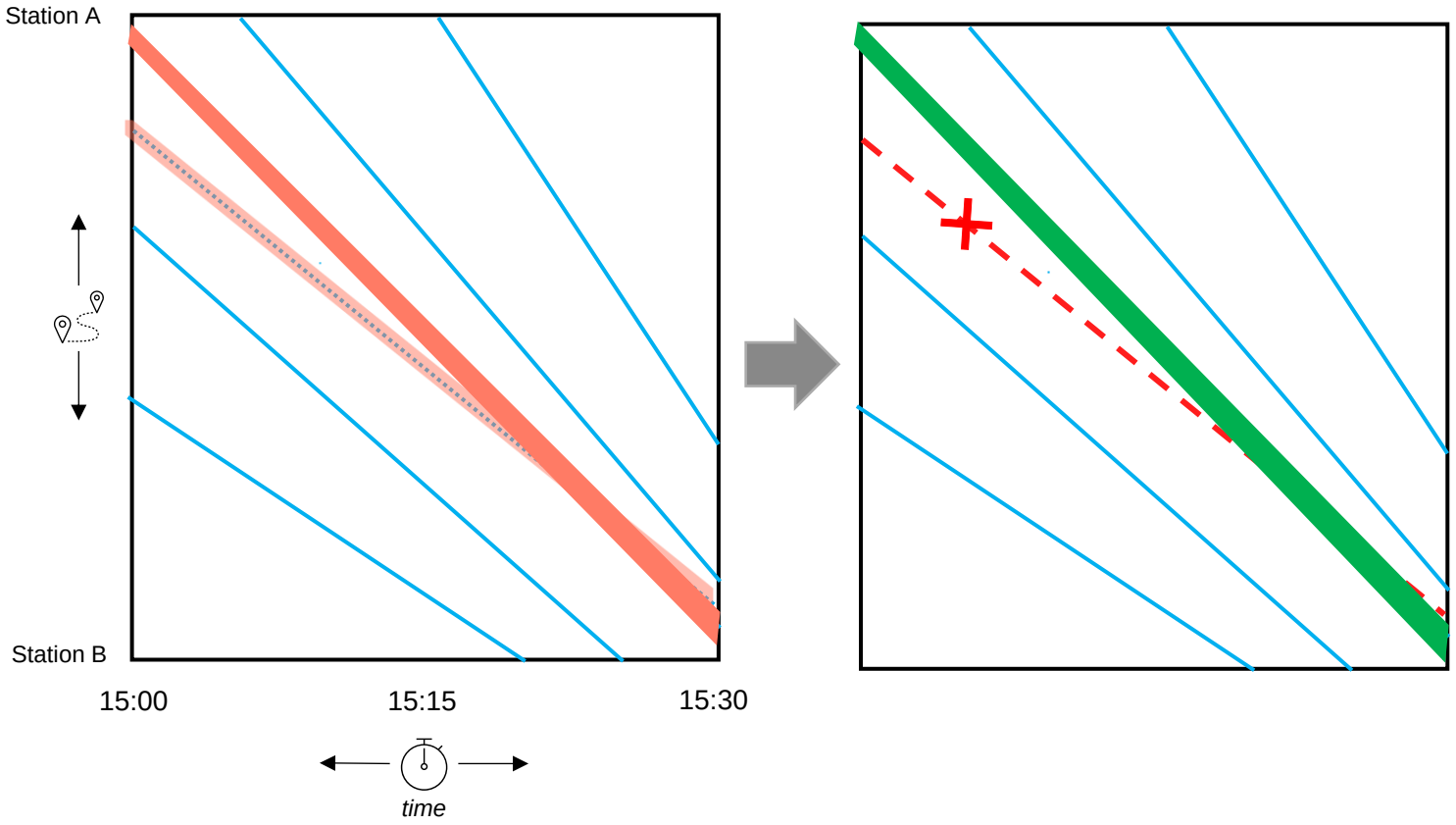
Need for **more capacity…**



But also, better use of existing one…
Define better **Allocation Rules…**

Allocation Rules

Classical approach



Situation description:

> Two requests in conflict are compared

> Priority given based on traffic type / paid TAC*

→ Compromise solution could have been found in coordination dialogue

→ But the expected winner is not motivated for compromises – why should?

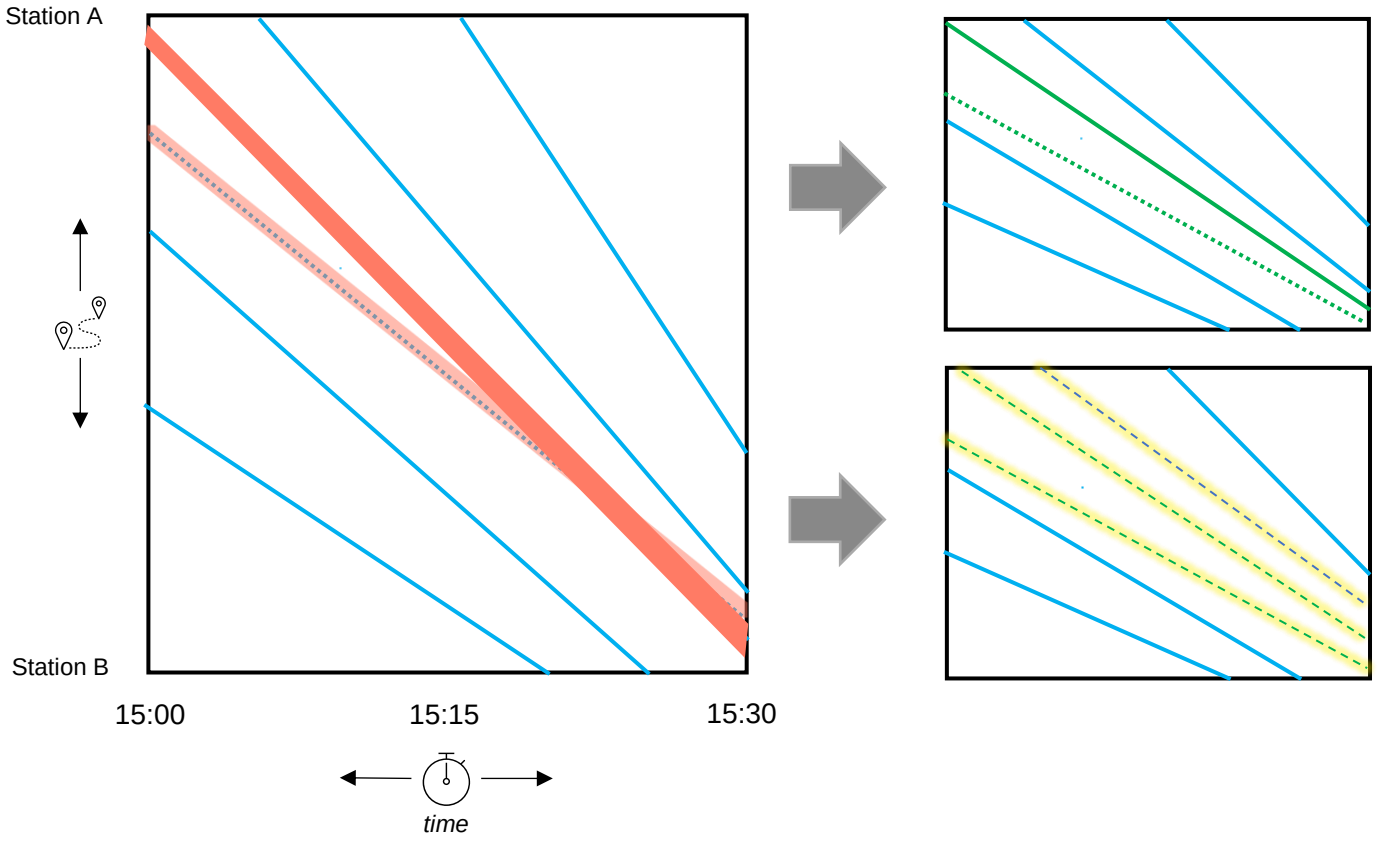
→ So, “winner” and “loser”

Can we change it to win-win situation?

*) *Track Access Charges*

Allocation Rules

Scenario approach



Situation description:

> Two requests in conflict

> In “scenario approach” also those who were not originally in conflict are considered.

> Identify scenarios to make more traffic possible

> May lead to “win-win-win” result

But how we can value a scenario?

Potential valuation approach

Example 2022
3200 conflicts
only **76** not solved in dialogue
and needed allocation rules

Step sequence

1. Market dialogue

→ RUs / IMs may find solutions
(experience show we solve most issues)

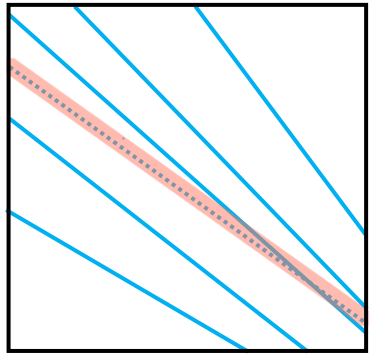
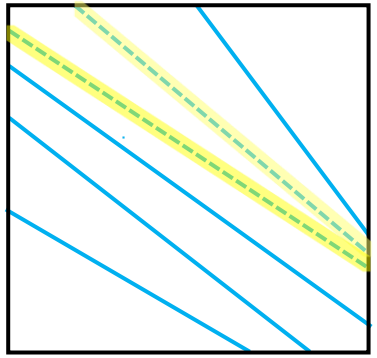
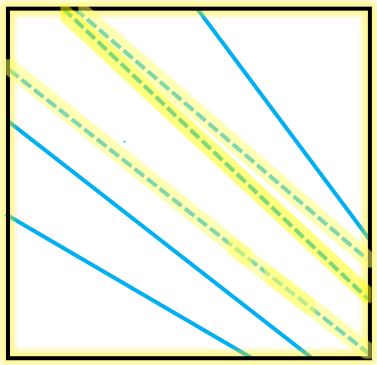
2. RU-IM identification of possible scenarios

→ Always more than 1

3. Socio-economic valuation

→ comparison of scenarios

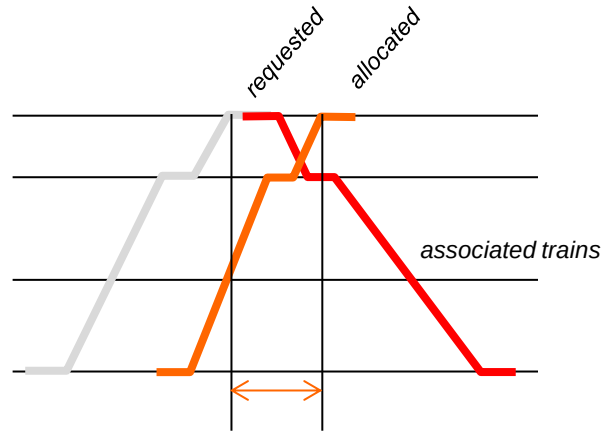
→ No compromise → scenario with “best value”

	Scenario 1 (classical)	**Scenario 2**	**Scenario 3**
			
Path excluded	**1**	**0**	**0**
Value («RU cost»)	- 3.500 EUR	0 EUR	0 EUR
Paths displaced	0	2	3
Value («RU cost»)	0	- 1.350 EUR	- 780 EUR
Total loss	**- 3.500 EUR**	**- 1.350 EUR**	**- 780 EUR**

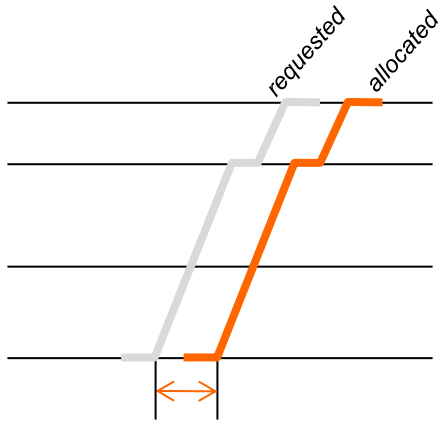
Potential valuation approach

Items of Socio-economic valuation

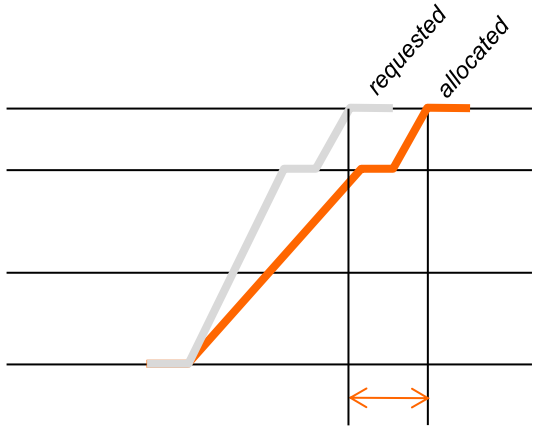
> Standardised costs/values per train category
> Negative “virtual” cost counted per:
→ Excluded path
→ Displaced path (per min)
→ Prolonged travel time (per min)
→ Extra train-km (re-routing per km)
→ Broken association: relations between trains)
(turnarounds, wagon/passenger/train staff transfers)



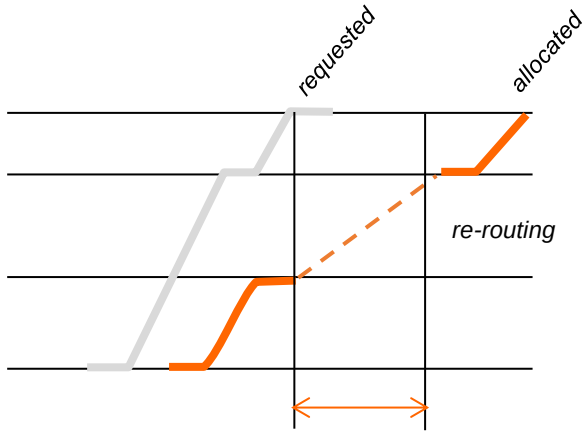
Broken train association: € 1200



Shift 8 mins: € 123



+ 17mins: € 530



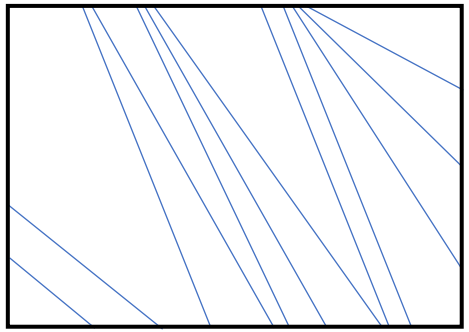
+ 30 mins: € 270
+ 12 kms: € 350

Potential valuation approach

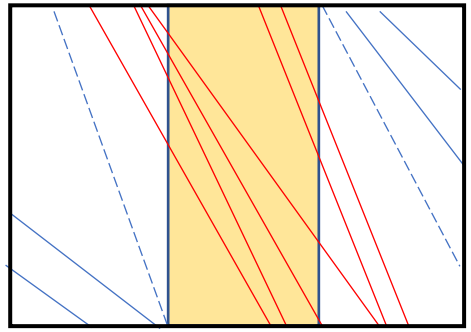
TCR Timing Evaluation (paths only)

> Socio-economic modelling
as instrument for TCR timing evaluation?

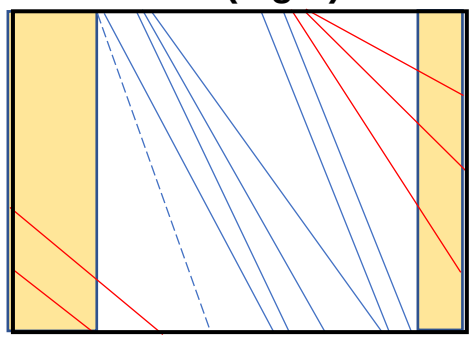
> Alternative: comparison of standardised compensation to be paid by IMs
(see Commercial Conditions vision)



Scheduled TT



Scenario 1 (day)



Scenario 2 (night)

Path excluded	**6**	**3**
Value («RU cost»)	12 000 EUR	6 000 EUR
Paths displaced	**2**	**1**
Value («RU cost»)	2 000 EUR	1 000 EUR
Total loss	**- 14 000 EUR**	**- 7 000 EUR**

Potential valuation approach

TCR Timing Evaluation (IM and RU costs)

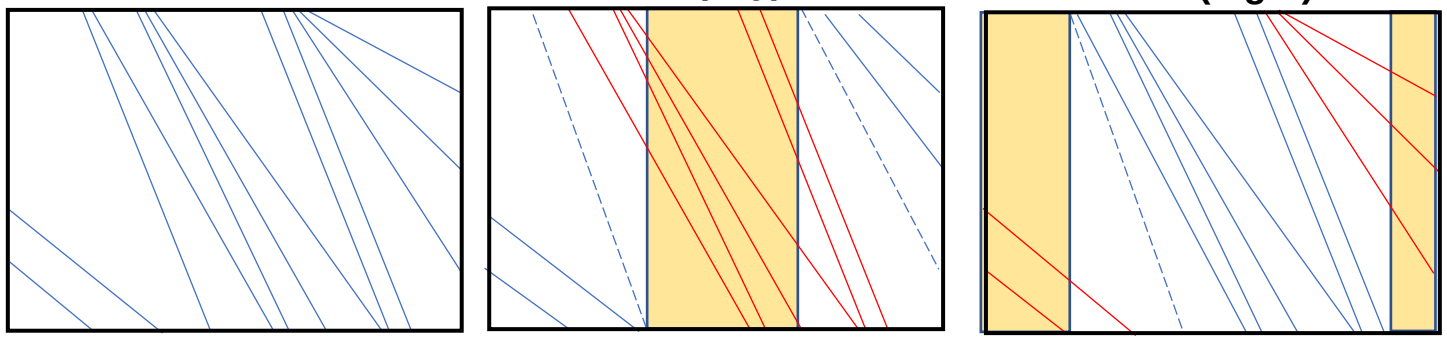
> Socio-economic modelling
as instrument for TCR timing evaluation?

> Can TCRs be also considered?

> It is **NOT** the **total TCR costs** valuated

> **ONLY** the "**TCR cost difference**"
if executed in less "market-harming" times.

> The IMs´ extra costs for "TCR repositioning"
can be valued against the impact on RUs



Path excluded	**6**	**3**
Value («RU cost»)	12 000 EUR	6 000 EUR
Paths displaced	**2**	**1**
Value («RU cost»)	2 000 EUR	1 000 EUR
TCR repositioning		
Value («IM extra cost»)	0	5 000 EUR
Total loss	**- 14 000 EUR**	**-12 000 EUR**

Website, LinkedIn

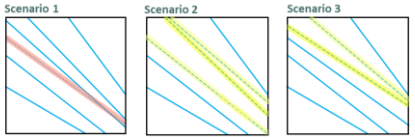
Note: approach not considered in the commissioned Feasibility Study

FAQ

Shall RUs provide individual costs and (sensitive) data? → **No!** Standardised costs/values are used. They represent the market, not 100% each specific situation.

Shall each case have specific calculation method? → **No!** Formula remains the same. The standardised values are identified via expert studies (one-off task).

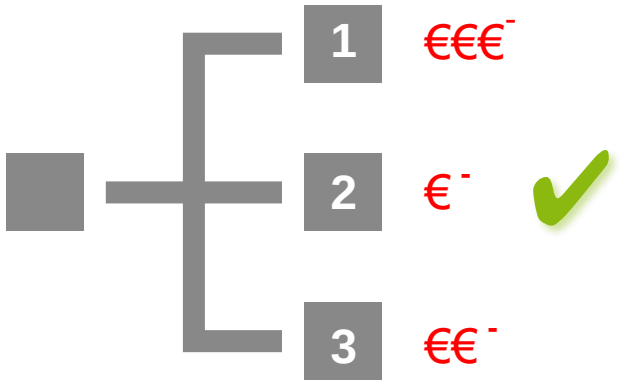
Would it not be too time consuming? → **No!** IT solutions for calculation facilitate easy application by IMs / RUs.



Timetable content

«costs» from the studies

Combine and calculate (simple sums)



Choose **least costly** scenario

FAQ

Was this somewhere already applied in practice?

Yes!

In Sweden, the socio-economic model for scenarios is used for Annual Timetable conflicts since 2011. Both the RUs and the IM are satisfied with the project / system.

Priority category	Cost parameters for the following effects calculated per train				Parameters for excluding of train path		
	Transport time	Transport distance	Displaced path time	Excluded train path	Benefit limit for train path	Corr. factor basic time	Timing Load
Code	SEK/min	SEK/km	SEK/min	SEK/min	%	%	Code
A	**B**	**C**	**D**	**I**	**J**	**K**	**L**
GS	269	61	166	-	15 %	2 %	GB201211
GT	233	60	140	-	25 %	2 %	GR401410
GN	153	65	80	-	35 %	2 %	GR401409
GR	204	59	118	-	35 %	2 %	GB200710
GF	81	58	26	-	45 %	2 %	GR401410
GO	61	43	20	-	50 %	2 %	60 km/tim
SP	1 238	104	841	-	15 %	20 %	PX600616
RP	795	104	509	-	15 %	15 %	PX600616
RX	546	86	228	-	15 %	15 %	PX410020
RS	261	30	141	-	20 %	12 %	PX610016
RL	184	32	103	-	30 %	12 %	PX510018
RI	51	24	11	-	40 %	12 %	PY310014

Train category

Costs for prolonger travel time/ displacement per minute, cost per extra train-km (all in Swedish crowns - SEK)

1.22 Priority categories for train paths – passenger transports

Priority categories must comply with all identification conditions in one (and only one) of the rows (with an unique key) belonging to the Priority Category of interest

Priority category		Iden-tifi-ca-tion key	Identification conditions				Type of traffic, description	Example
			Num-ber	Time sensitive share	Regi-onal share	Traffic concept: ***Rapid**** transport	**Note:** The text in these two columns are aimed to give an estimation of the signification for each category	
Name	Code		of passengers					
Stor-pendel[1]	**SP**	*SP1*	≥ 700	≥ 75 %	≥ 75%	-	High share of time sensitive regional passengers, maximum load factor	Stockholm commuter train, peak periods
Regio-Pendel *Regional commuter*	**RP**	*RP1*	≥ 300	≥ 75 %	≥ 75 %	-	High share of time-sensitive regional passengers, very high load factor	Big cities commuter train, peak periods
		RP2	≥ 300	≥ 75 %	≥ 75 %	-	High share of time-sensitive regional passengers, very high load factor	Very heavy regional relations, peak periods
Regio-max *Regional max*	**RX**	*RX1*	≥ 200	≥ 75 %	≥ 75 %	-	High share of time-sensitive regional passengers, high load factor	Heavy regional relations
		RX2	≥ 75	≥ 75 %	-	Must	High share of time-sensitive passengers, medium high load factor + Rapid transport	Regional express traffic, peak and mid-peak periods
Regio-standard *Regional standard*	**RS**	*RS1*	≥ 75	≥ 75 %	≥ 75 %	-	High share of time-sensitive regional passengers, medium high load factor	Medium-principal regi-onal trains, peak periods
		RS2	≥ 25	≥ 25 %	-	Must	Frequent regional traffic, medium-high share of time-sensitive regional pass low load factor. Rapid transport	Regional express traffic, off-peak periods

Train category

Transparent Identification criteria

Explanation of category

Source: Network Statement Trafikverket Annex 4B

FAQ

Was this somewhere already applied in practice?

Yes!

In Sweden, the socio-economic model for scenarios is used for Annual Timetable conflicts since 2011. Both the RUs and the IM are satisfied with the project / system.

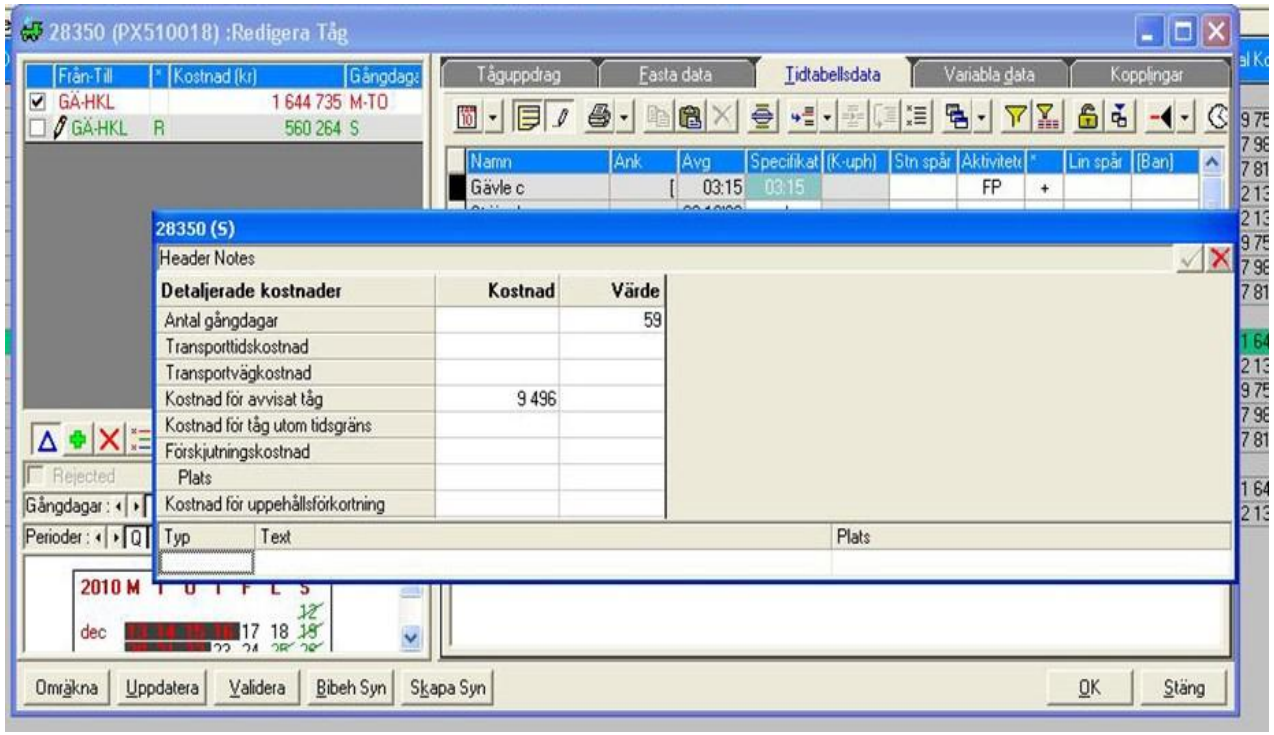
1.31 Cost parameters for associations

Priority category	Marginal costs for the following effect	
	Duration	Interrupted
Code	SEK/min	SEK/association
K	**L**	**M**
APX	693	59 300
APH	326	27 900
APS	204	17 400
APL	114	9 770
API	33	2 790
AGX	114	87 400
AGH	68	52 400
AGS	43	32 800

Train category

Costs for extended association

Costs for broken association



Timetabling construction system, where the socio-economic value is visible right away as a support for the planner.

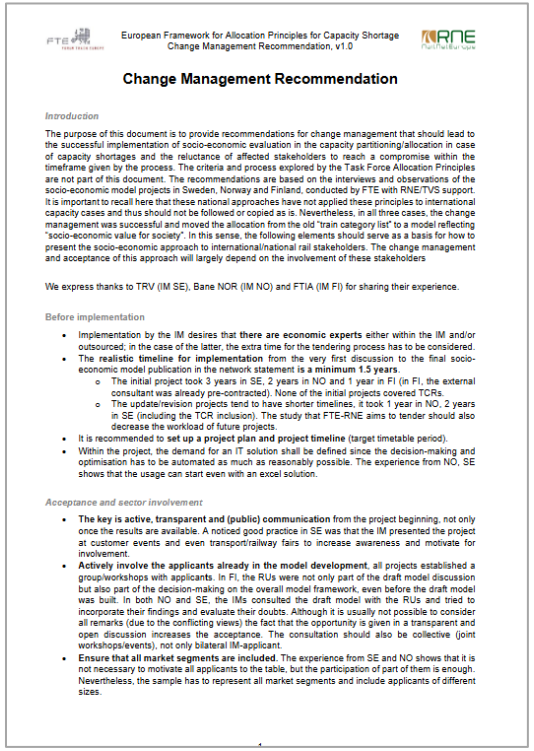
Source: Network Statement Trafikverket Annex 4B

FAQ

It is a significant change!
Change management will be important!

Yes!

Change management recommendations were collected from IMs with socio-economic allocation rules experience



European Framework for Allocation Principles for Capacity Shortage
Change Management Recommendation, v1.0

Change Management Recommendation

Introduction

The purpose of this document is to provide recommendations for change management that should lead to the successful implementation of socio-economic evaluation in the capacity partitioning/allocation in case of capacity shortages and the reluctance of affected stakeholders to reach a compromise within the timeframe given by the process. The criteria and process explored by the Task Force Allocation Principles are not part of this document. The recommendations are based on the interviews and observations of the socio-economic model projects in Sweden, Norway and Finland, conducted by FTE with RNE/TVS support. It is important to recall here that these national approaches have not applied these principles to international capacity cases and thus should not be followed or copied as is. Nevertheless, in all three cases, the change management was successful and moved the allocation from the old "train category list" to a model reflecting "socio-economic value for society". In this sense, the following elements should serve as a basis for how to present the socio-economic approach to international/national rail stakeholders. The change management and acceptance of this approach will largely depend on the involvement of these stakeholders

We express thanks to TRV (IM SE), Bane NOR (IM NO) and FTIA (IM FI) for sharing their experience.

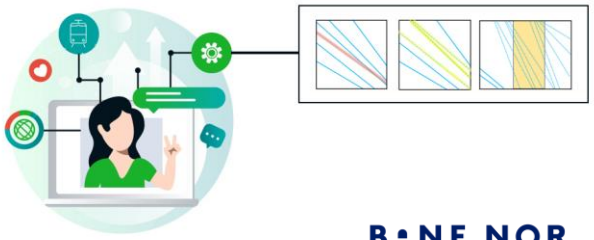
Before implementation

- Implementation by the IM desires that **there are economic experts** either within the IM and/or outsourced; in the case of the latter, the extra time for the tendering process has to be considered.
- The **realistic timeline for implementation** from the very first discussion to the final socio-economic model publication in the network statement **is a minimum 1.5 years**.
  - The initial project took 3 years in SE, 2 years in NO and 1 year in FI (in FI, the external consultant was already pre-contracted). None of the initial projects covered TCRs.
  - The update/revision projects tend to have shorter timelines, it took 1 year in NO, 2 years in SE (including the TCR inclusion). The study that FTE-RNE aims to tender should also decrease the workload of future projects.
- It is recommended to **set up a project plan and project timeline** (target timetable period).
- Within the project, the demand for an IT solution shall be defined since the decision-making and optimisation has to be automated as much as reasonably possible. The experience from NO, SE shows that the usage can start even with an excel solution.

Acceptance and sector involvement

- **The key is active, transparent and (public) communication** from the project beginning, not only once the results are available. A noticed good practice in SE was that the IM presented the project at customer events and even transport/railway fairs to increase awareness and motivate for involvement.
- **Actively involve the applicants already in the model development**, all projects established a group/workshops with applicants. In FI, the RUs were not only part of the draft model discussion but also part of the decision-making on the overall model framework, even before the draft model was built. In both NO and SE, the IMs consulted the draft model with the RUs and tried to incorporate their findings and evaluate their doubts. Although it is usually not possible to consider all remarks (due to the conflicting views) the fact that the opportunity is given in a transparent and open discussion increases the acceptance. The consultation should also be collective (joint workshops/events), not only bilateral IM-applicant.
- **Ensure that all market segments are included.** The experience from SE and NO shows that it is not necessary to motivate all applicants to the table, but the participation of part of them is enough. Nevertheless, the sample has to represent all market segments and include applicants of different sizes.

Change management recommendations:
"How to successfully implement socio-economic capacity allocation principles"



BANE NOR

Finnish Transport Infrastructure Agency

TRAFIKVERKET

Download the document: https://www.forumtraineurope.eu/fileadmin/Allocation_Principles_Change_Management_Recommedantion_v1.0.pdf

Study information

> In 2023, FTE/RNE commissioned feasibility study (CEF co-funding) with focus on:

→ Using socio-economic modelling in capacity planning,

→ Using minimum input from RUs (standardised values and categories)

→ Handling of trains crossing borders

→ Meta-analysis of available national and EU average values

RI. SE

Final report – Feasibility study on using Socio-Economic Cost Criteria in Case of Capacity Shortages

Martin Aronsson[1], Emanuel Broman[2], Kristofer Odolinski[2]

[1]RISE, Isafjordsgatan 22, SE-164 40 Kista, Sweden

[2]Swedish National Road and Transport Research Institute (VTI), Malvinas väg 6, SE-114 28 Stockholm, Sweden

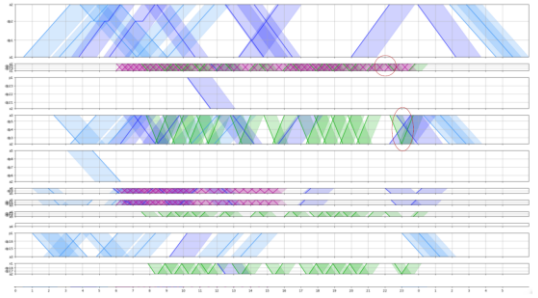


Figure 19. Waiting time for planned arrival at station.

Co-funded by the European Union

Study information

> RISE/VTI study and **Excel model examples** published 2024/11

> The Expert Observation Summary is available here.

EXPLANATION OF EXAMPLES

Priority category

Country (chossen in sheet 'PT calc')

Occupancy rate

Capacity of train

Distance travelled (is given by the basic route)

Speed

Used to compute running time in this demonstration examples

Number of days in plan period

Example Calculation	LDPT	Basic case	Train	Calculation
Country	EU+UK+CH+I	EU+UK+CH+NO		
VOT €/passenger	15,28 €	15,28 €		15,28 €
Occupancy rate		*75%*	*75%*	75%
Capacity	500	*L*	*L*	500,00
Distance, km		*475*	*475*	475
Speed, nominal, km/h		*160*	*160*	160
Basic Duration, hours		02:58:07		02:58:07
VOT		17 006 €		17 006 €
Operational cost duration	535,14 €	1 589 €		1 589 €
Variable cost duration	1,67 €	1 855 €		1 855 €
Operational cost distance	2,86 €	1 358 €		1 358 €
Variable cost distance	0,01 €	1 855 €		1 855 €
Basic cost		**23 662 €**		**23 662 €**
Number of days	*220*	220		220
BASIC COST YEAR		**5 205 646 €**		**5 205 646 €**
Displacement cost, duration	11,46 €			
Prolongation, prognosis			*00:10:00*	1 044 €
Displacement, duration			*00:05:00*	477 €
Prolongation operational cost				193 €
Total value/day				**25 377 €**
TOTAL COST YEAR		**5 205 646 €**		**5 582 862 €**
			Margin cost	**377 215,60 €**

Prolongation of runtime in example

Displacement of departure time (anchor point)

Marginal cost

Basic proprties and valuation without timetable compromises

Valuation after timetable compromises

Cargo associations

	Normalized average cargo types, €/ton & hour							
	WLFT	WLFT	BTFT	BTFT	IMFT	IMFT	OWN BT	
VOT, €/h	0.16	0.16	0.09	0.09	0.28	0.28	0.38	

	Association size							
	Train type	WLFT	WLFT	BTFT	BTFT	IMFT	IMFT	OWN BT
	Tons	€/hour						
Association price per hour	40	6.52	6.52	3.48	3.48	11.22	11.22	15.32
	100	16.30	16.30	8.70	8.70	28.05	28.05	38.30
	200	32.60	32.60	17.40	17.40	56.10	56.10	76.60
	400	65.20	65.20	34.80	34.80	112.20	112.20	153.20
	700	114.10	114.10	60.90	60.90	196.35	196.35	268.10
	1200	195.60	195.60	104.40	104.40	336.60	336.60	459.60
Own declaration	4200	684.60	684.60	365.40	365.40	1178.10	1178.10	1608.60

Broken association	*Wait time to next departure*
	1:00:00
	2:00:00
	4:00:00
	8:00:00
	12:00:00
	18:00:00
	24:00:00

Multiply AG20-AG27 with choosen Association price above (and 24 hours)

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