Performance comparison workstream

Asset Management Group Annual Report

January 29th 2016

Disclaimer

- Report targets is to:
  - ✓ Provide a synthetic view of data provided by members and initial findings from results observed
  - ✓ Provide set of standards for data definition and production for the selected KPIs

- This report includes data provided by the following members of EIM Asset Management workgroup from July 2014 to December 2015: Banedanmark, Finnish Transport Agency, Infraestructuras de Portugal, Jernbaneverket, Network Rail, ProRail, SNCF Reseau, Trafikverket

- As performance differences observed can be explained not only by IM enablers but also by many other causes, it is not possible to draw up any recommendations related to IM enablers at this stage

- Nevertheless, EIM elaborated together with each member some “working hypotheses” that could explain part of IM position within the benchmark

- A good use of these working hypotheses could be to carry out further investigations in order to assess more precisely the impact of IM enablers in the differences observed

- These further investigations could be carried out either internally or through bilateral discussion or within EIM’s AM working group

- Regarding group work, it has been decided to extend existing benchmark to performance comparison at **network segment level** in order to mitigate the impact of traffic density and line speed

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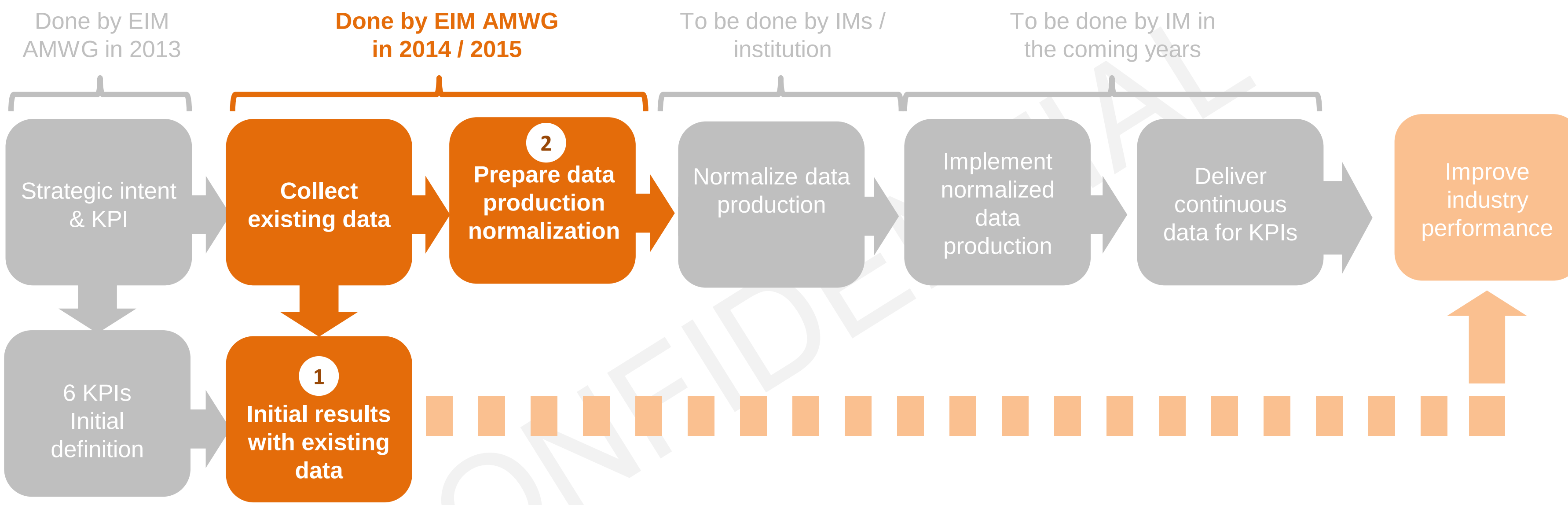
Overview of group achievements in 2015 for performance comparison

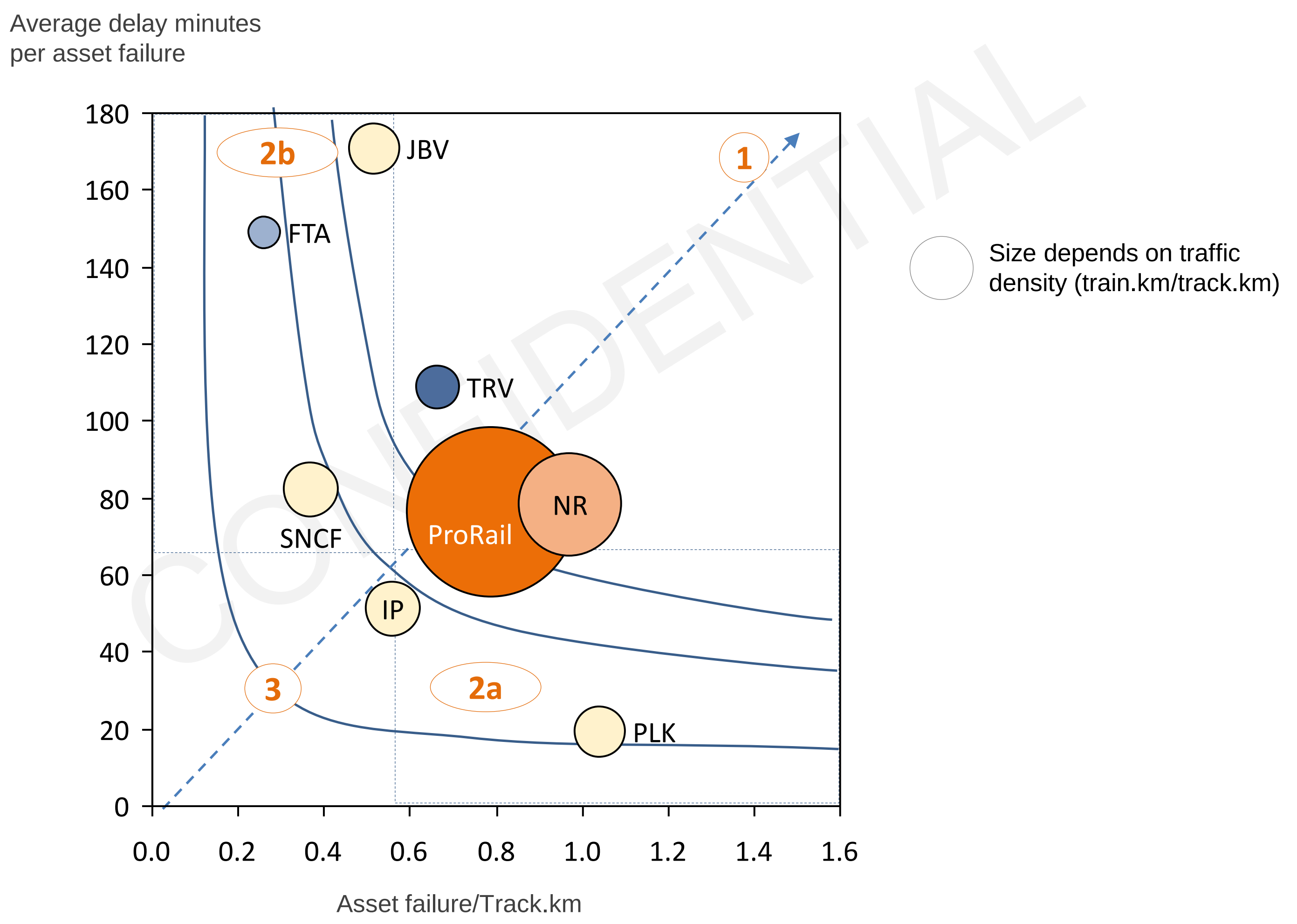
AM Group achievements in 2015 as part of normalized KPIs development



Working on asset policy and link with costs

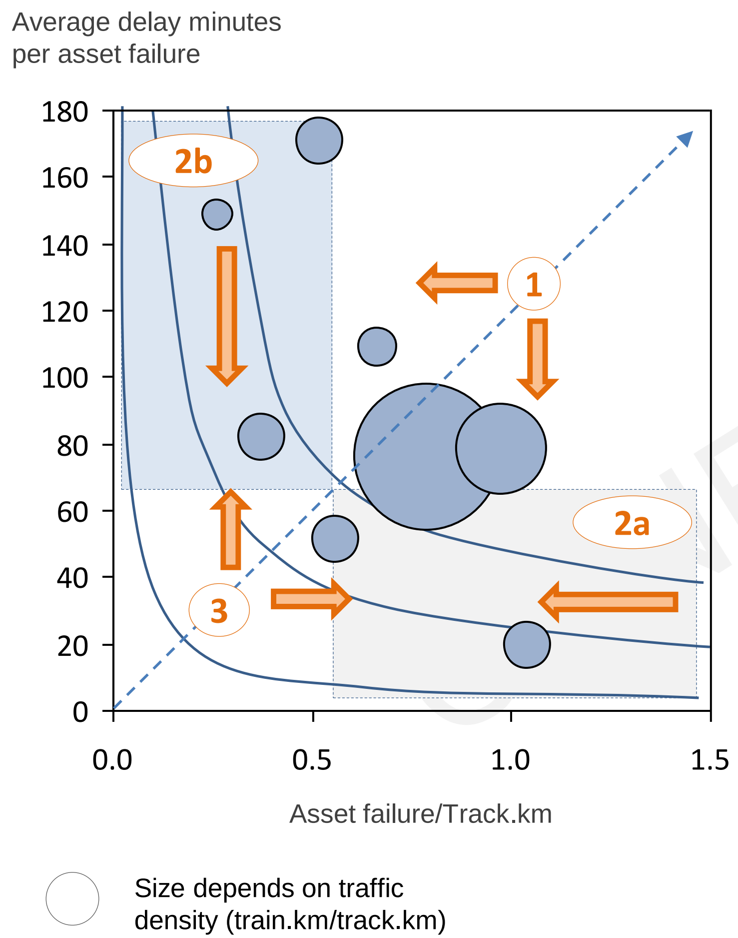
1	**Initial results**	•Update of 2014 report based on data with higher quality and reliability
2	**Data production normalization**	•Extension of definition normalization to allocation of failure / delayed mn / delayed train / cancelled train to infra manager and within infra manager to asset

Target 1- Synthetic view of performance comparison



Note: BDK is not included in the analysis as it does not record delay minutes. A separate analysis has been performed for BDK

Target 1 - Working hypothesis that could be investigated by IM based on performance comparison



1 REDUCE THE NUMBER OF FAILURE AND THE IMPACT OF FAILURE

a) See 2a AND 2b.

2a REDUCE THE NUMBER OF FAILURE

a) IM may consider backlog reduction, preventive and / or CBM focused either or asset category and / or network areas with high number of failures.

2b REDUCE THE IMPACT OF FAILURE

a) IM may consider a MTTR decrease, especially in high traffic density areas

b) IM may consider targeted actions (backlog reduction, preventive and / or CBM) in high traffic density areas in order to reduce the number of failures with huge impact

3 REALLOCATE COST

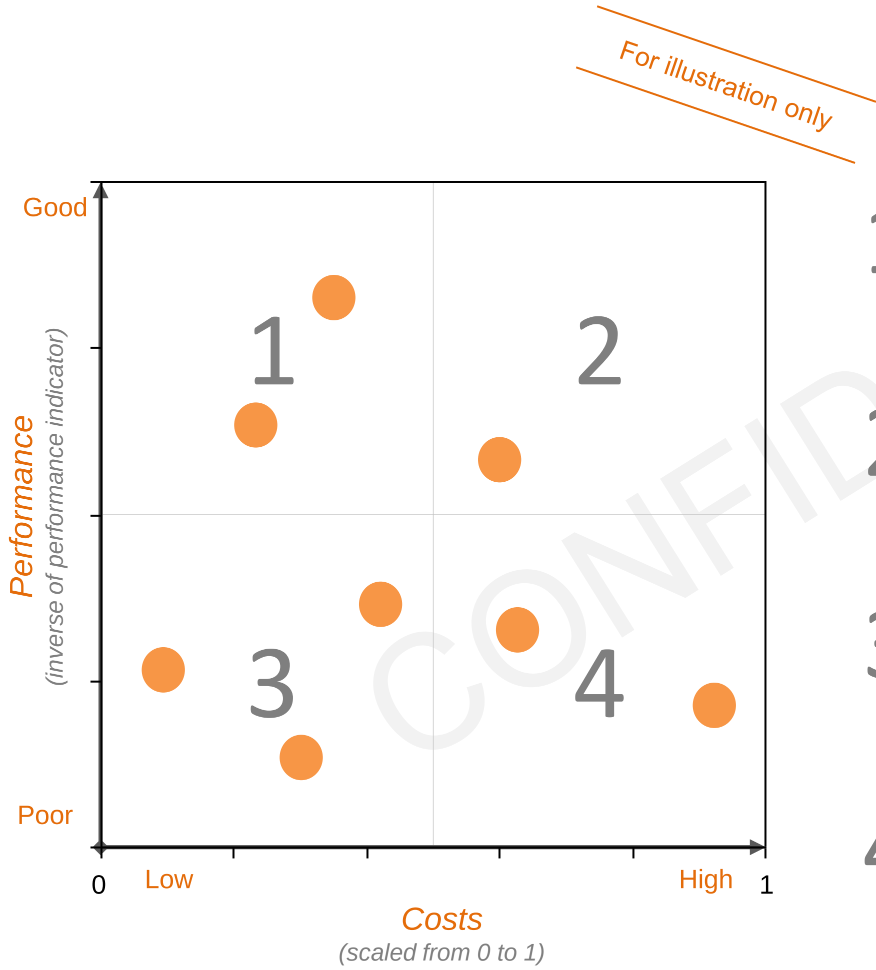
a) IM may consider a reduction of spending (MTTR increase, lifetime extension…) especially in the low density part of the network

CAVEAT

A position in the quadrants can be explained by many causes, above recommendations have to be considered as working hypotheses by IM

In particular, traffic density has a strong impact on IM position. Therefore, comparing network by segment would eliminate performance differences linked to traffic density and strengthen findings

Target 1 - Synthetic view of performance comparison combined with cost comparison



1 IMs with good performance associated with low costs

Other things equal, IMs in quadrant 2 could optimize their performance while maintaining their effectivity regarding investments

2 IMs with good performance associated with high costs

Other things equal, IMs in quadrant 1 could reduce their cost while maintaining a good performance

3 IMs with poor performance associated with low costs

Other things equal, IMs in quadrant 4 could reallocate/increase as to improve performance

4 IMs with poor performance associated with high costs

Other things equal, IMs in quadrant 3 could reallocate their investments so as to improve performance

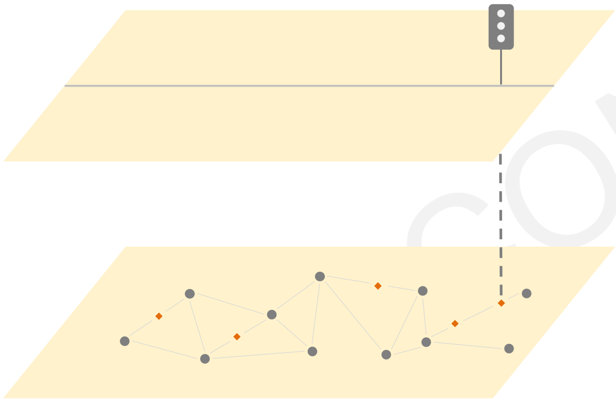
Target 2 - Data production normalization

Possible normalization

Failure affecting trains

Failure that has an impact on traffic, generating delay minutes

Specific to each IM



Failure

Based on IM's norms and risk management, failure is identified and ranked regarding its potential impact

Detection system

Set of sensors enabling the IM to monitor its network condition

AM Working group has agreed on:

- Definition of train affected by infra failure
  The definition takes into account five different parameters:
  - ✓ Threshold (in mn) from which trains are considered as affected
  - ✓ Time table against which running trains are compared
  - ✓ Location of measurement
  - ✓ Type of traffic included
  - ✓ Are cancelled trains also considered as part of affected train?
- Link between failure and train affected
  The definition takes into account four main issues:
  - ✓ Portion of trains delayed/cancelled for which a failure is identified
  - ✓ Root cause tree and process of allocation
  - ✓ Multiple cause allocation
  - ✓ Secondary delays allocation

The group came out with a first common allocation process to produce comparable data

2 **Data production normalization**

•Thanks to root cause tree analysis, data quality increased
•Next step would be to define standards for asset failures categories

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Methodology overview: data collection process

KEY STEPS | MAIN POINTS

Data collection

INITIAL COMMON DEFINITION (V0)
- Agreement upon common definitions for main indicators (threshold, type of traffic, location of measurement…)

FIRST DATA PACK
- Data pack with data for each indicator with EIM categories breakdown (assets (track and non track), traffic control, management process, external factors, weather, TOC)

COMMON DEFINITION (V1)
- Root cause trees provided by IM to strengthen data quality
- Root cause trees should provide causes linked to IM and to TOC/Traffic control
- Members to agree on common allocation rules

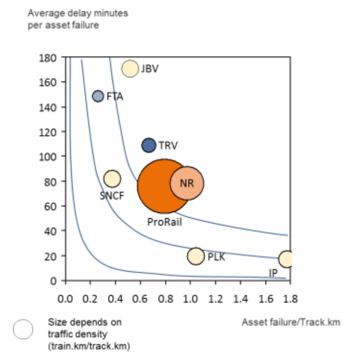
FINAL DATA PACK
- Based on common definition and root cause tree, a final data pack should be completed by members and challenged by EIM to guarantee highest possible data quality and consistency amongst members

Interpretation

FIRST INTERPRETATIONS
- EIM runs the analysis and proposes several potential interpretations that can explain members' performances

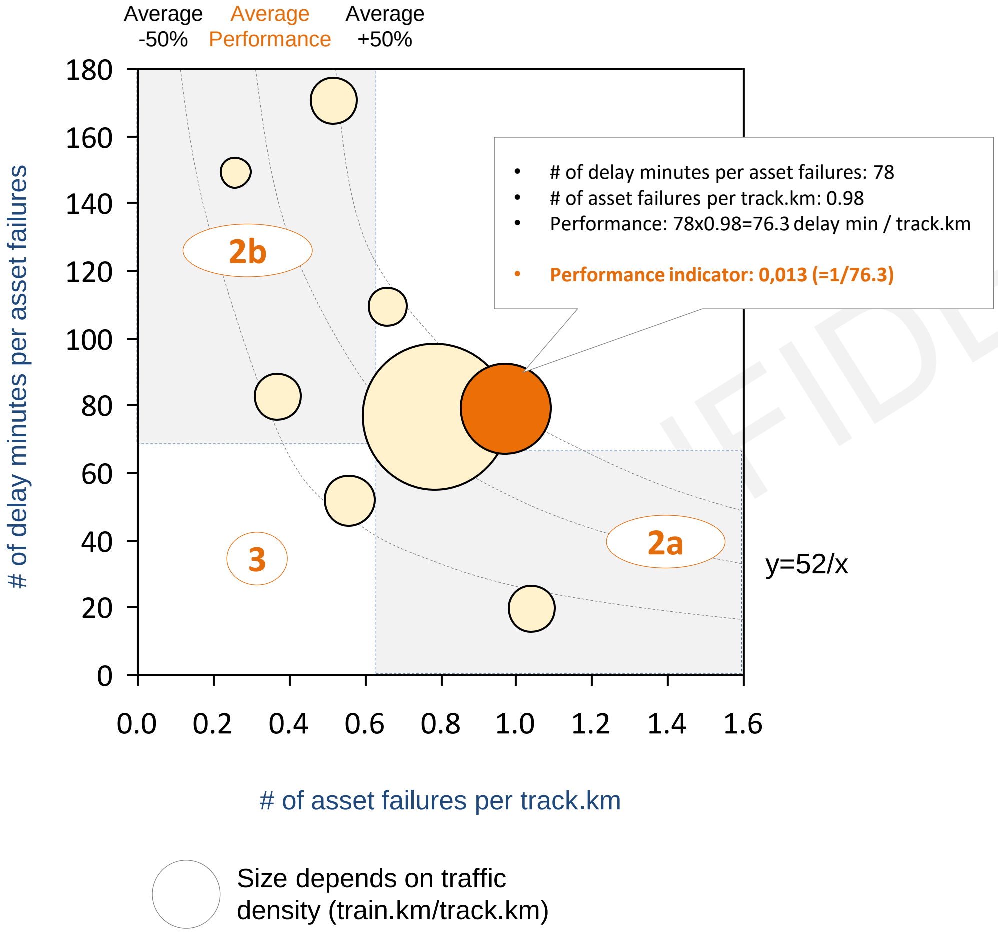
DISCUSSION / MEMBERS FEEDABCK
- Members challenge the preliminary interpretations using internal experts/knowledge

FINAL INTERTATIONS
- Based on members' feedback, a final interpretation is chosen together with IM representatives



- Performance comparison taking into account potential differences in data quality
- Interpretation for each network

Methodology overview: performance comparison



- Performance is measured as the combination of number of asset failures (# of failures per track.km) and impact of asset failures (average delay min per asset failure)
- Networks appear to have similar performances when they have the same average delay minutes per track.km (hyperboles)
- Average group's performance amounts to 52 delay min per track.km (arithmetic average)
- In order to have a low indicator value representing a low performance and conversely, inverse of average delay minutes per track.km has been used to measure IMs' performance

Methodology overview: cost benchmark

Based on every infrastructure manager's costs on each network segment, minimum, average and maximum costs have been calculated per network segments…

For illustration only

	High Speed line			Intercity - Fast			Intercity - Normal			Regional		
Network	High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density
PKP Polskie Linie Kolejowe S.A.				93	249	720	63	858	187	510	293	711
HIGH SPEED	947	784	659	499	424	310	79	10	322	25	47	29
SNCF Réseau	912	26	590	522	72	5	697	3	848	750	919	370
banedanmark	51	930	563	891	272	918	534	468	924	798	106	969
Infraestruturas de Portugal	961	408	205	828	537	690	379	101	299	946	601	985
Liikennevirasto Finnish Transport Agency	152	172	902	939	629	668	318	496	753	577	359	15
TRAFIKVERKET	668	605	902	455	170	637	337	806	851	816	458	715
INFRABEL	752	974	458	205	605	346	436	563	842	855	747	642
ProRail	934	439	417	162	507	15	907	607	620	845	866	849
Jernbaneverket	517	24	368	813	355	806	30	552	805	686	230	755
NetworkRail	11	709	899	114	985	262	482	750	724	729	991	614
Min	11	24	205	93	72	5	30	3	187	25	47	15
Average	591	511	611	502	437	489	388	474	652	685	511	605
Max	961	974	902	939	985	918	907	858	924	946	991	985

Note: cost benchmark has been built with data from 2009 to 2012. Costs include OPEX (Maintenance, Traffic management, Overhead, Other OPEX) and CAPEX (Total renewal costs, Other investments)

Methodology overview: cost benchmark

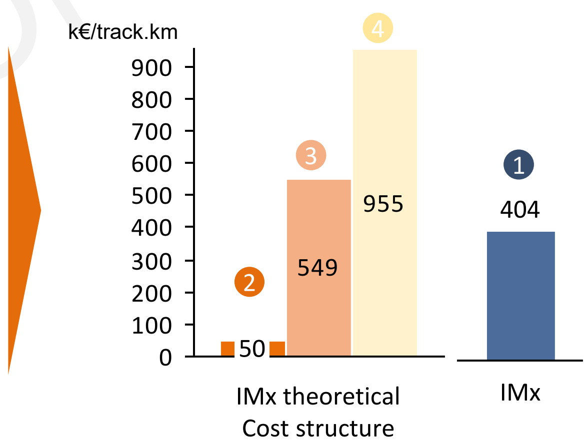
… which enables to compare each IM to three theoretical cost structures corresponding to its track km distribution and best case (min), average and worst case (max)

For illustration only

			High Speed line			Intercity Fast			Intercity - Normal			Regional			
			High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density	High traffic density	Medium Traffic density	Low traffic density	Weighted average cost
Imx actual	IMx track.km	A	0	0	0	1256	678	576	285	345	455	1350	1534	1240	
	IMx costs (k€/track.km)	B	0	0	0	93	249	720	63	858	187	510	293	711	1 404
IMx benchmark	Min cost (k€/track.km)	C	11	24	205	93	72	5	30	3	187	25	47	15	2 50
	Average cost (k€/track.km)	D	591	511	611	502	437	489	388	474	652	685	511	605	3 549
	Max cost (k€/track.km)	E	961	974	902	939	985	918	907	858	924	946	991	985	4 955

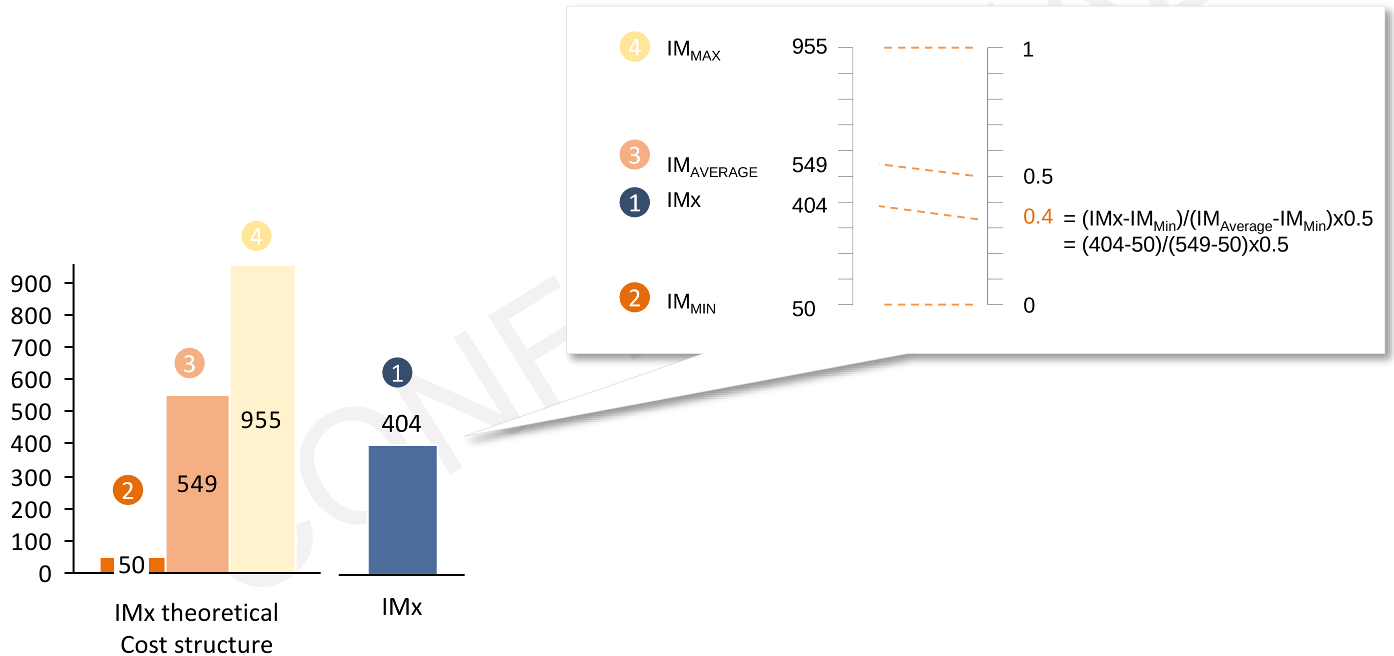
$$= \frac{A \times B}{A}$$

$$= \frac{A \times C}{A}$$

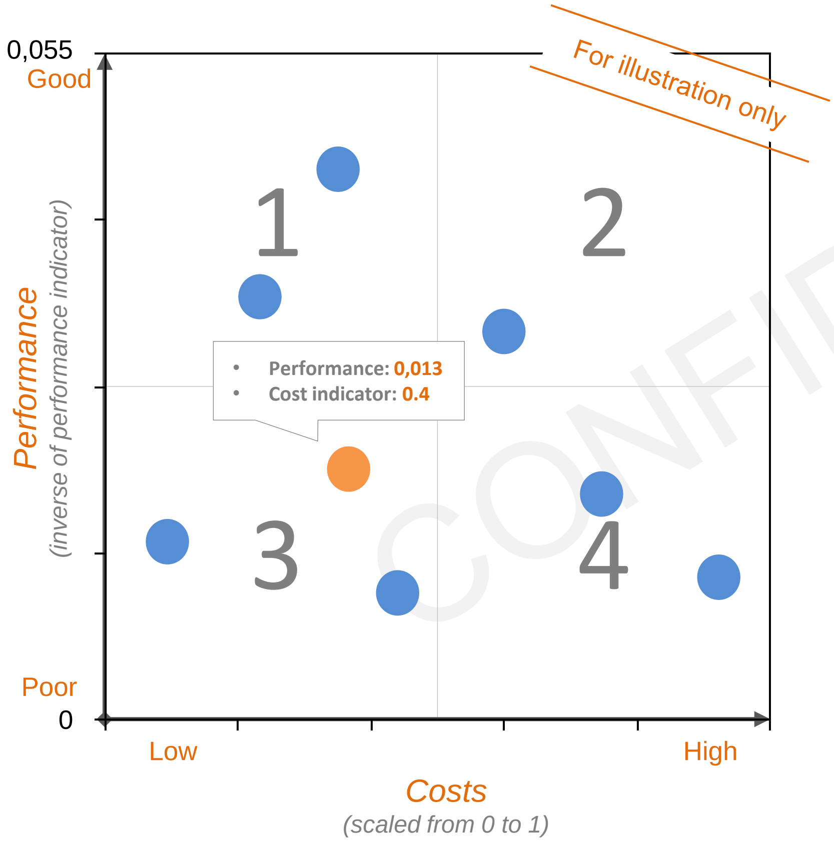


Methodology overview: cost benchmark

IMx cost performance score is than scaled between 0 and 1



Methodology overview: performance comparison and cost benchmark



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European Rail Infrastructure Managers EIM

Even though performance monitoring harmonization, performance difference observed can still be explained by multiple drivers

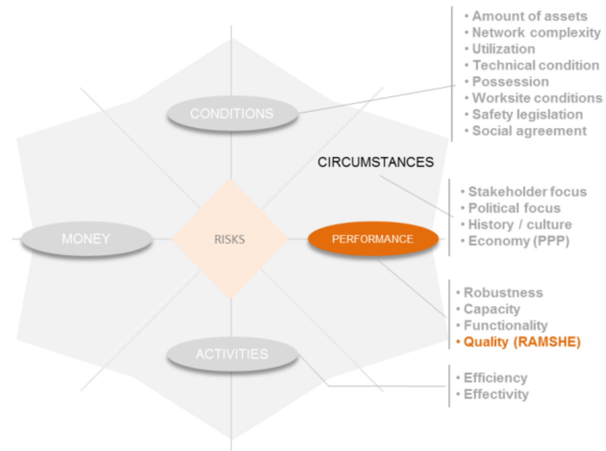
DIFFERENCE OBSERVED

PERFORMANCE MONITORING

- KPIs definitions
- Process used to record KPIs
- …

AM Group aims at mitigating the impact of performance monitoring differences

PERFORMANCE DRIVERS



The existence of multiple drivers makes the interpretation of the results complex

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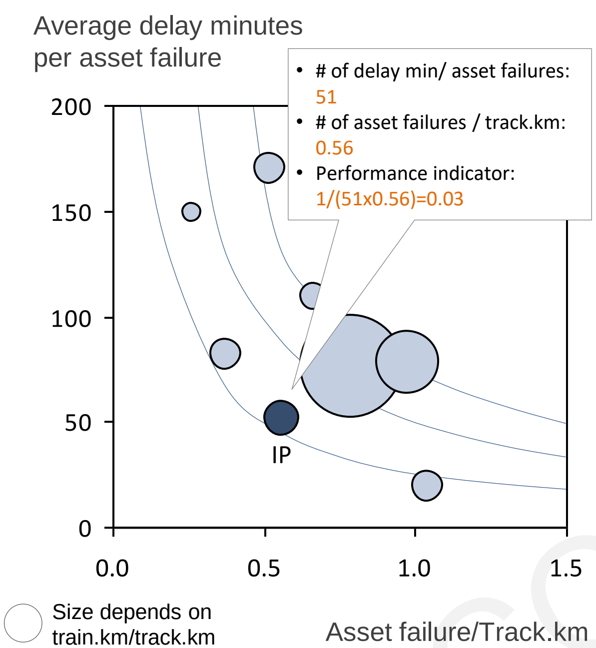
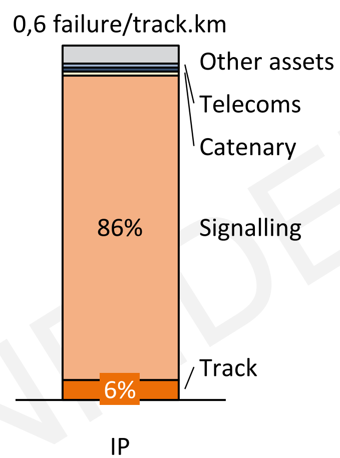
IP has a limited number of failures combined with low average impact on traffic

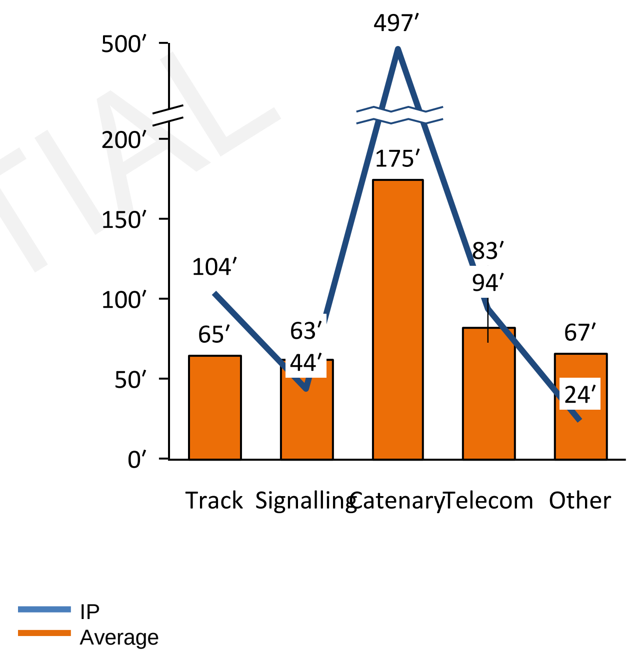
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK



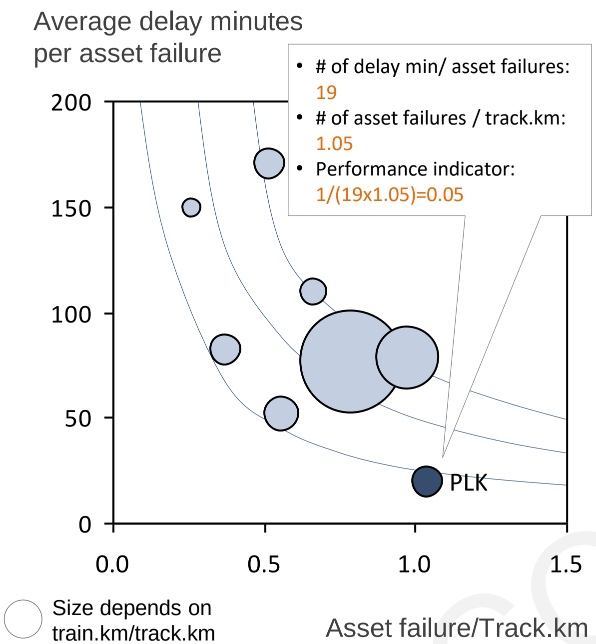
COMMENTS

- Compared to other networks with similar traffic density, IP has a low number of asset failure per track.km combined with relatively low delayed min per asset failure.
- Low delay min per asset failure is partially caused by the high proportion of signalling failures which generate a low amount of delay minutes (44' in average).
- IP mentioned that some failures with unknown causes and limited impact on traffic stay recorded as signaling failures just because they are detected by that specific system. IP also mentioned that, due to the fact that these results are associated with performance levels registered until 2013, actions were already pushed forward as a continuous improvement adjustment. Changes in results will only appear in future analyses.

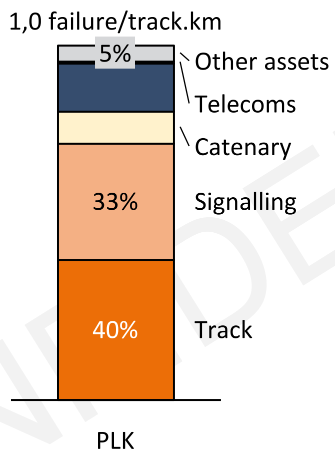
European Rail Infrastructure Managers EIM

PLK has a high amount of failures combined with a limited impact on delays

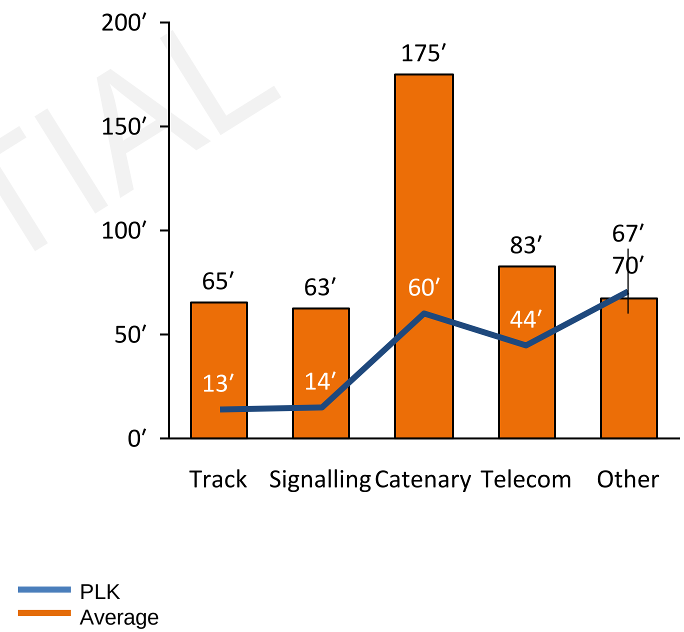
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK

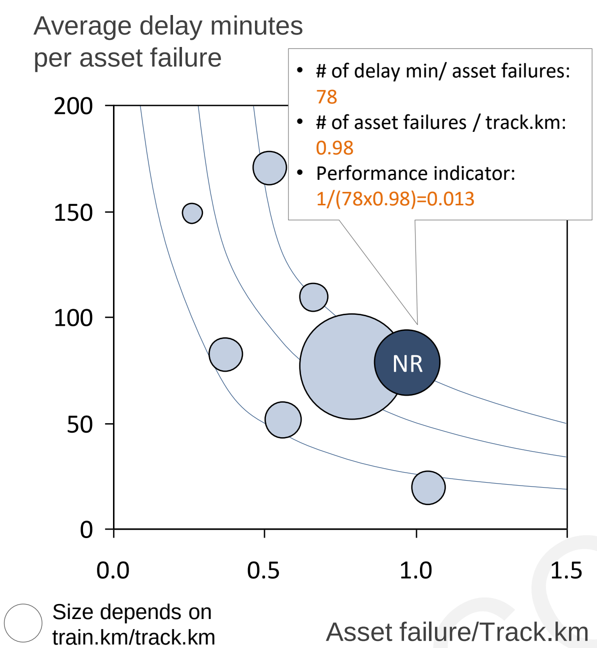


COMMENTS

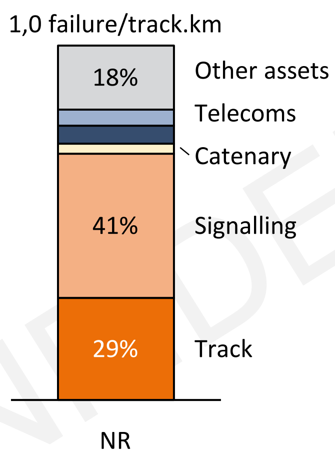
- Compared to other networks with relatively low traffic density, PLK delivers a good performance. In average, asset failures have a lower impact than the benchmark, which is consistent with the low traffic density of the network.
- Most of the failures are signalling and track failures. Signalling failures do not generate a high amount of delay minutes (14’ in average). In addition, compared to other networks, track failures have a very limited impact as well (13’). This situation might be explained by failures occurring in low traffic density areas
- Threshold used by PLK to count failures and delayed mn is 1’ instead of 5’ for the common definition, which could explain a high number of failure per track.km

NR has a high amount of failures combined with relatively limited impact on delays and significant average traffic density

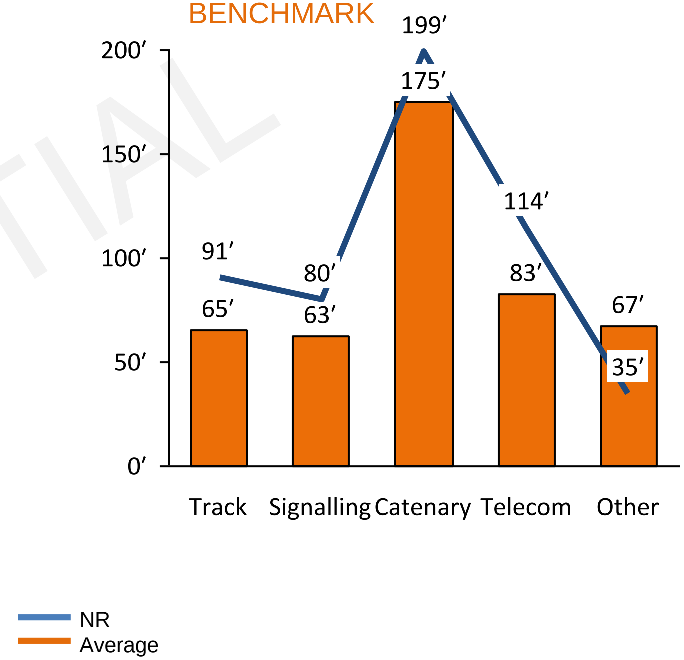
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK

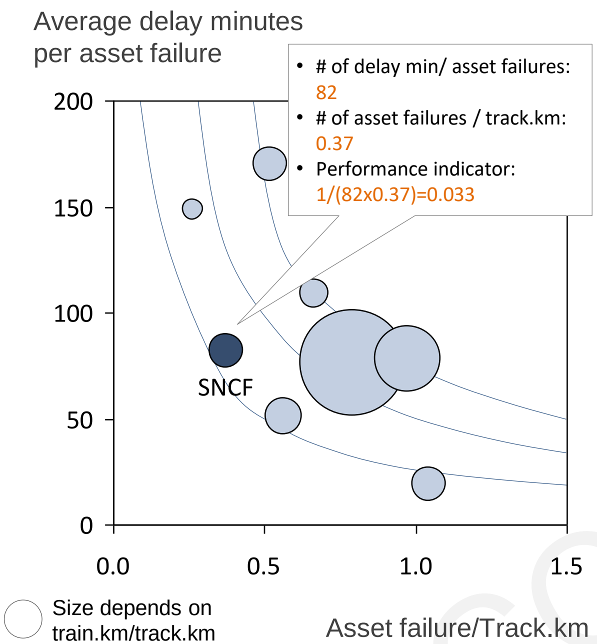


COMMENTS

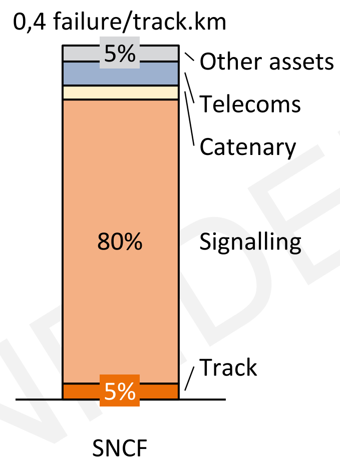
- NR has a relatively high number of failures per track.km compared to other IMs, with a relatively limited impact
- Most failures are signallling failures and track failures. For those two types of failure, NR has a relatively high average delay min per failure, which can explain its position in the benchmark
- As NR has a high traffic density, failures in dense parts of the network may be one of the causes for high average delayed min per failure
- Further investigations can be checked whether high average delayed min per failure is caused by failures located in dense areas.

SNCF Reseau has a limited number of failures with an average impact per failure

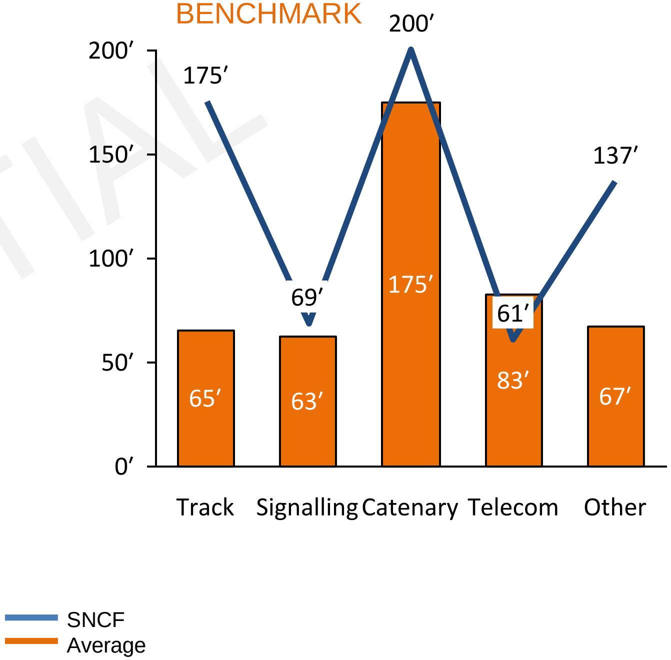
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK

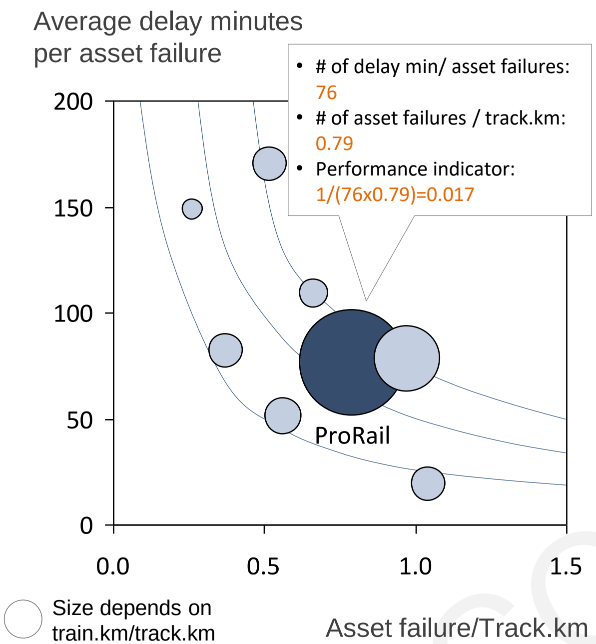


COMMENTS

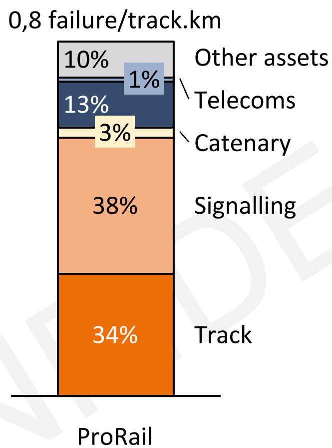
- SNCF has a relatively low number of failures per track.km compared to other IMs, with an average impact on traffic
- Most failures are signalling failures. For those failures, SNCF has a relatively high average delay min per failure, which explains most of its position amongst the IMs.
- As SNCF has a low traffic density, a potential explanation could be that failures occur in dense part of the network.

ProRail has a relatively high amount of failures combined with relatively limited impact on delays and the highest average traffic density

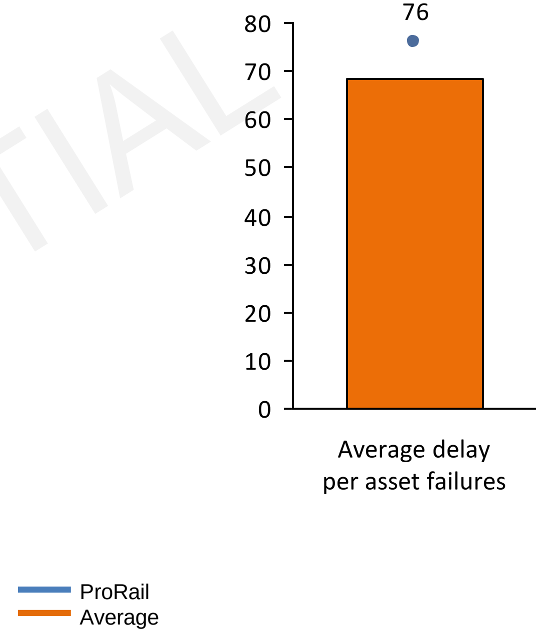
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK

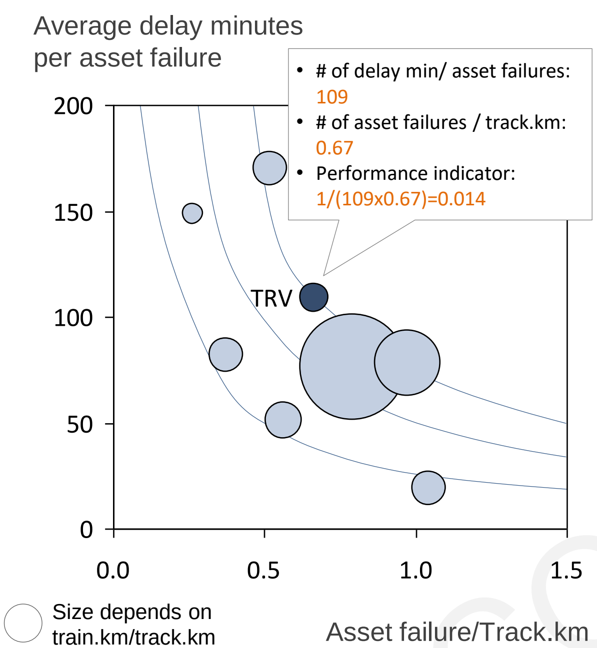


COMMENTS

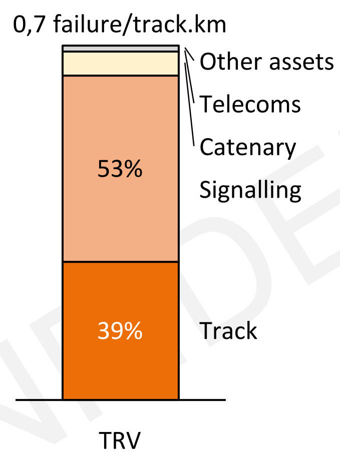
- ProRail has relatively high number of failures per track.km, combined with a relatively low impact on traffic
- Most of the failures are signalling and track failures
- Taking into account traffic density, ProRail's low failure impact is remarkable

TRV has a relatively high amount of failures per track.km combined with a relatively high impact on traffic

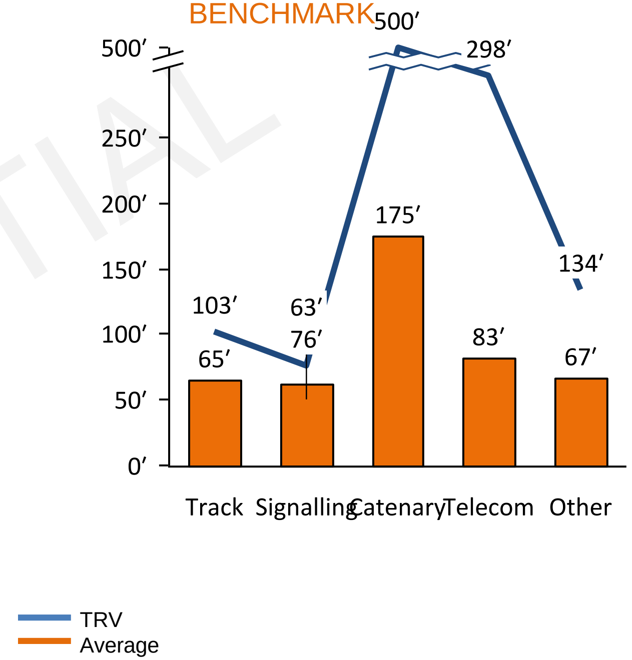
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK

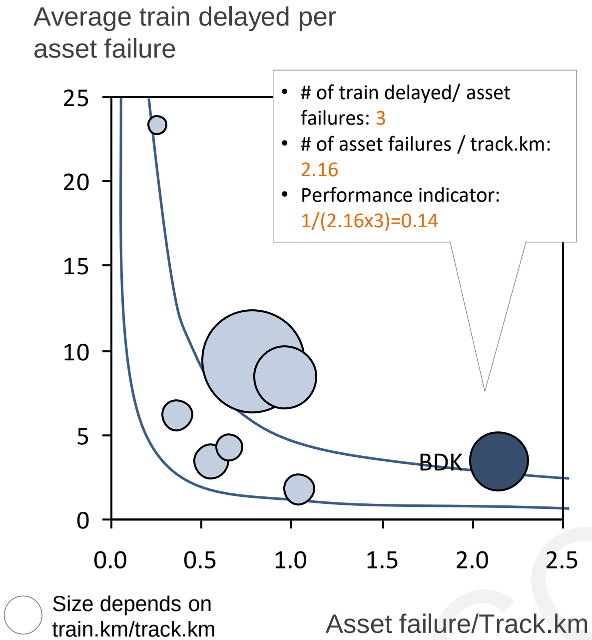


COMMENTS

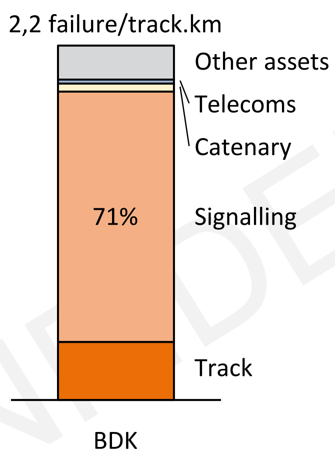
- TRV's network appears to be affected by a large amount of asset failures, mainly related to signalling and tracks
- These asset failures have also a significant average impact on delayed mn, though a rather small traffic density

BDK has the highest average number of failures per track.km combined with a relatively moderate impact on traffic*

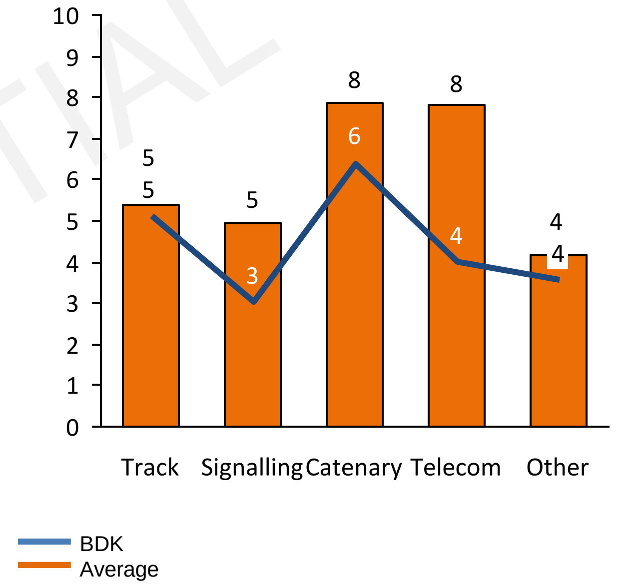
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE TRAIN DELAYED PER TYPE OF ASSET FAILURE VS. BENCHMARK



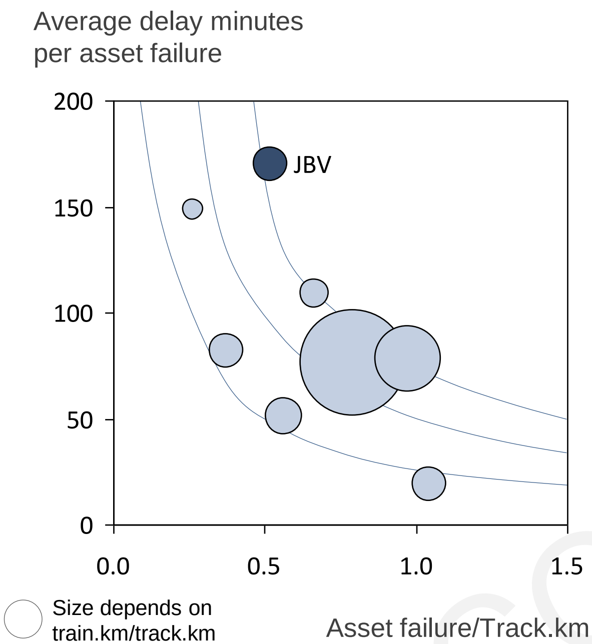
COMMENTS

- BDK has the highest number of failures per track.km
- Most of these failures are signalling failures
- However, these failures have a limited impact on traffic

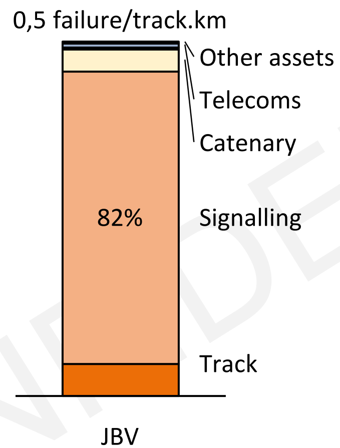
*Comparison has been made with train delayed since BDK do not count delayed mn. Comparison with other networks may be biased due to the way train delayed are counted

JBV has a low amount of failures but with a very high impact on traffic

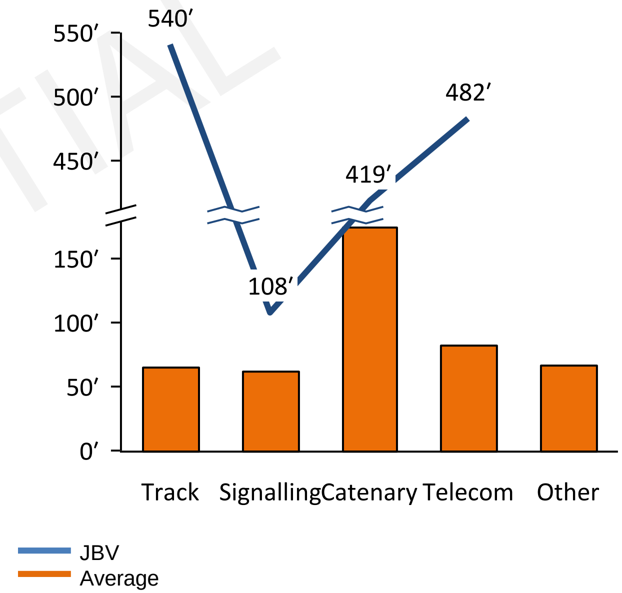
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK



COMMENTS

- JBV has a peculiar position within the benchmark, with a relatively low amount of failures but with very large impact on traffic
- Most of the failures are signalling failures. Compared to benchmark, JBV's network signalling failures have a very high impact on traffic, generating long delays

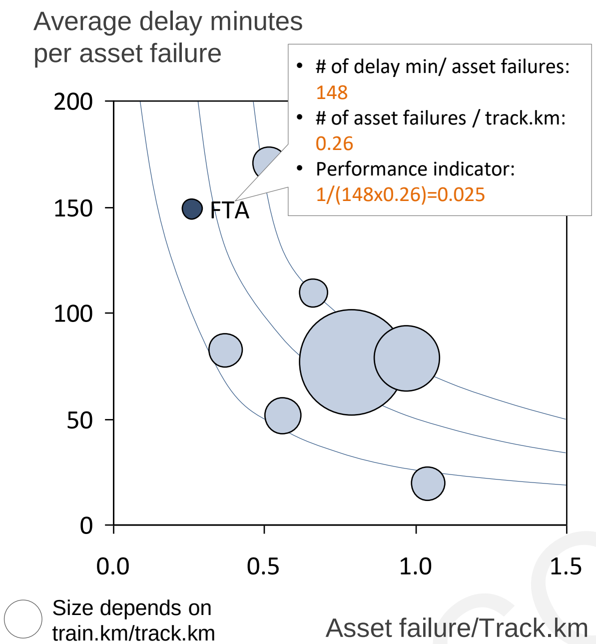
RECOMMENDATIONS

a) **Reduce failure impact:** JBV may consider a MTTR decrease, especially in high traffic density areas. JBV may consider targeted actions (backlog reduction, preventive and / or CBM) in high traffic density areas in order to reduce the number of failures with huge impact.

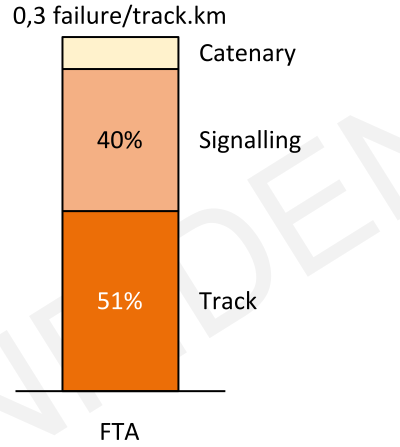
b) **Reduce cost without increasing the number of failures:** JBV may consider a reduction of efforts on low traffic density parts of the network.

FTA has the lowest amount of failure per track.km, but generating a high impact on traffic

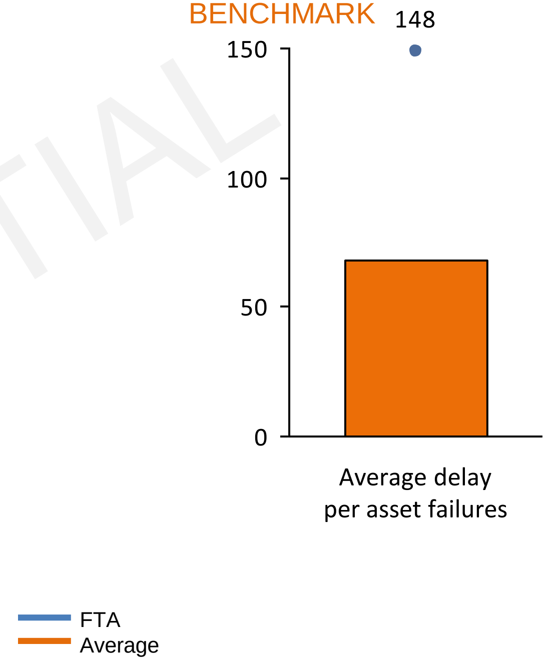
COMPARISON OF ASSET FAILURE IMPACT



BREAKDOWN OF ASSET FAILURE PER CAUSE



AVERAGE DELAY MIN PER TYPE OF ASSET FAILURE VS. BENCHMARK



COMMENTS

- FTA has a low amount of failures but with a significant impact on traffic
- Most of the failure are track and signalling failures
- With information available, EIM is not able to isolate impact per type of failures

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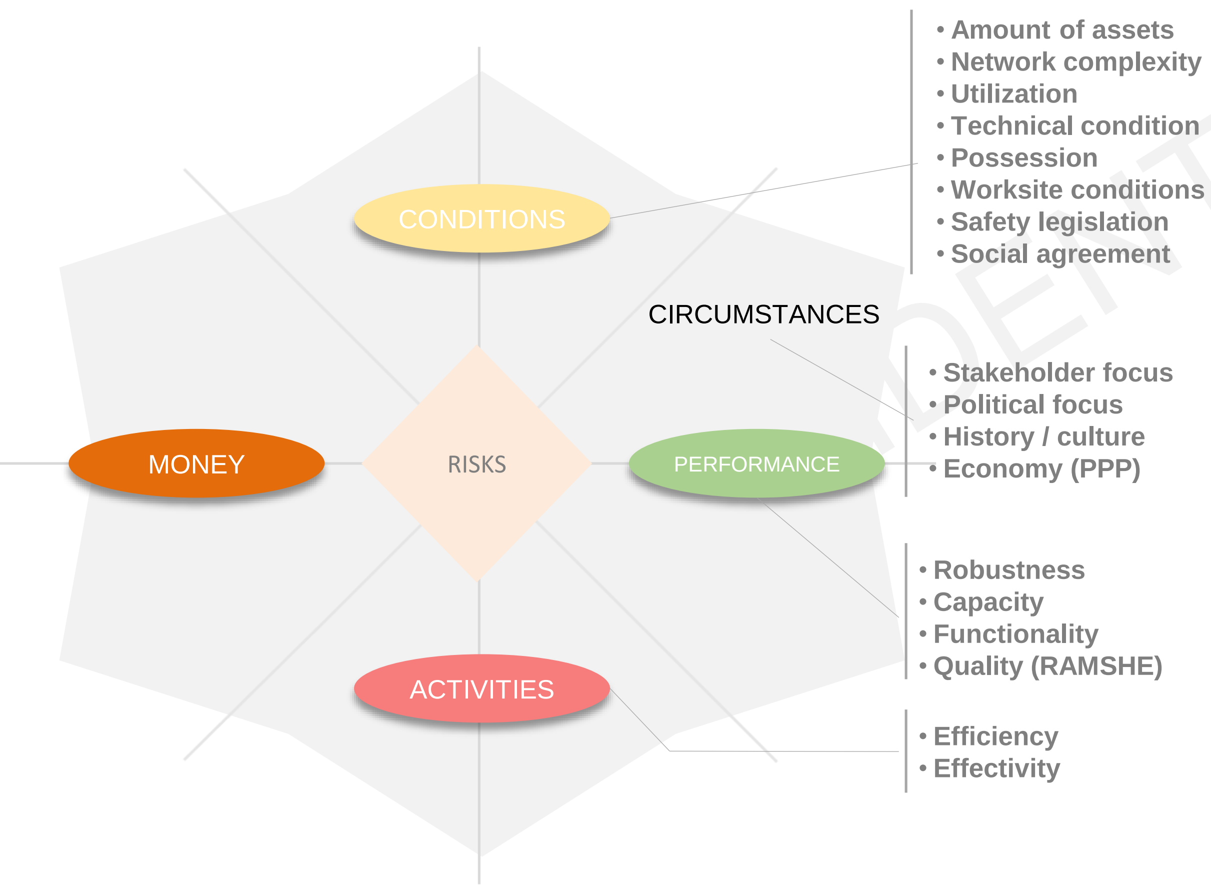
Further analyses could be conducted in order to isolate other parameters that can influence IMs' performance



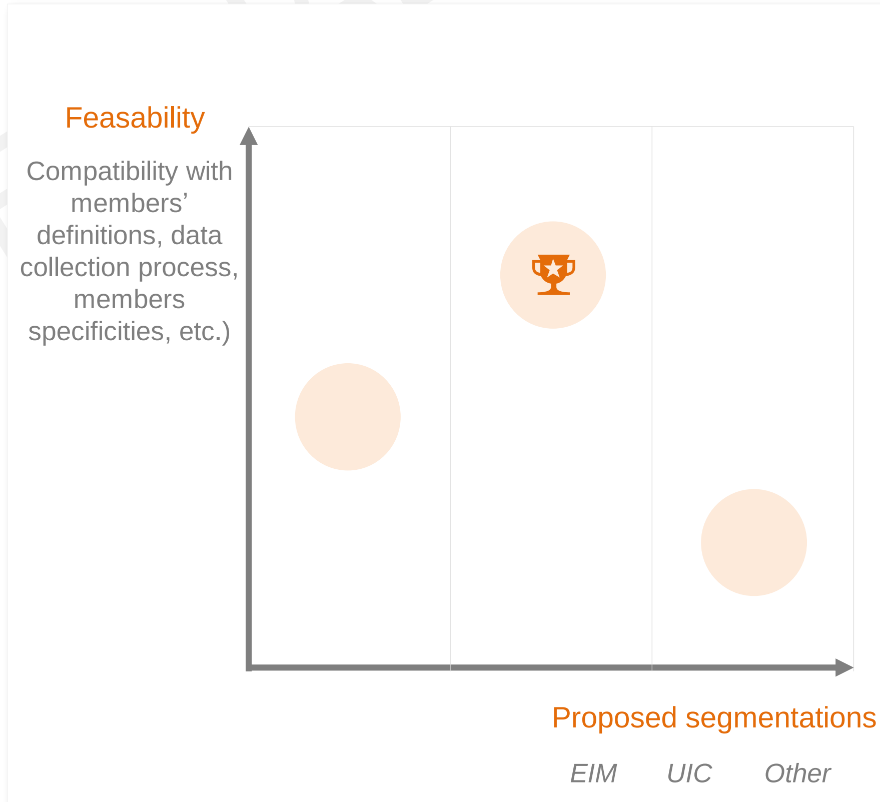
Segmenting networks into homogeneous segments ranked by traffic density could reduce the number of variables that influence performance

As of today, only networks with similar traffic density can be compared. A breakdown of each network into segments would broaden peer comparisons

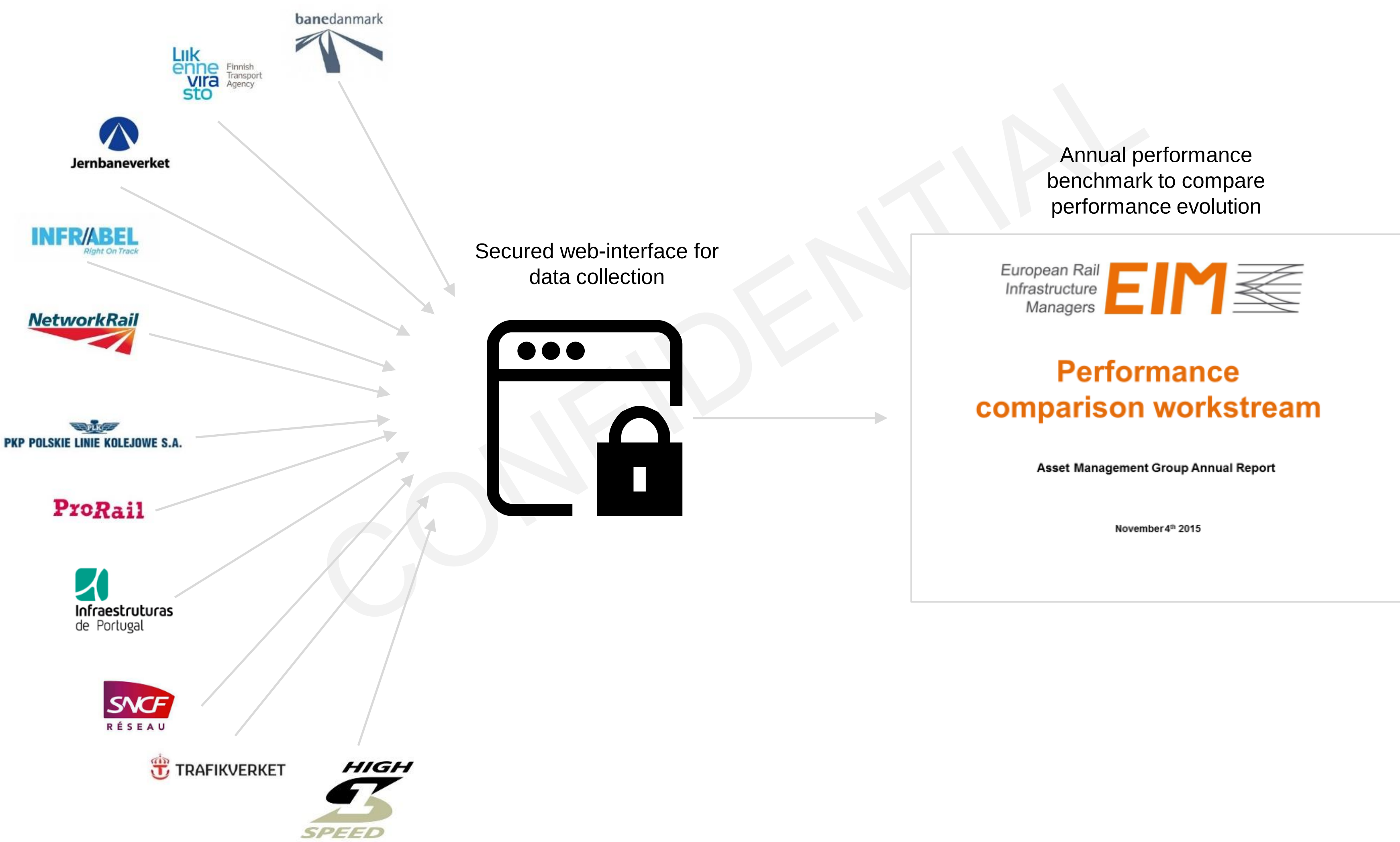
Segmentation could refine the analysis by isolating explanatory variables and increasing networks comparability

Example of segmentation

	LINESPEED *(kph)*	TRAFFIC DENSITY *(trains per weekday per route)*
High Speed	>250	High >130
		Medium 40-130
		Low <40
Intercity-fast	>160	High >130
		Medium 40-130
		Low <40
Intercity-normal	>120	High >130
		Medium 40-130
		Low <40
Regional	<120	High >130
		Medium 40-130
		Low <40
Freight		High >24
		Low <24
Sidetrack	<40	

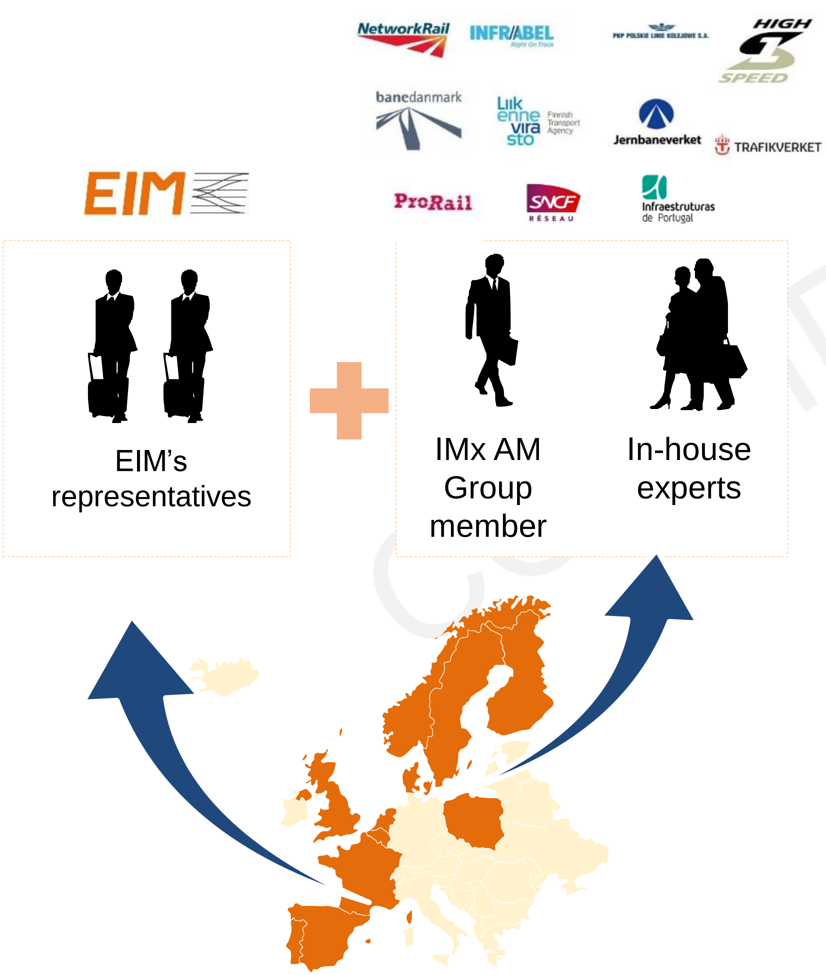


Once the relevant level of details has been reached for performance comparison, data collection process could be industrialized



Proposed methodology for next year data production

METHODOLOGY



OBJECTIVES

- Discuss with all stakeholders IMx' specific definitions (delays, cancelled trains, failure affeting trains) and data collection process
- Extract all the relevant databases for EIM's analyses at once and have a comprehensive overview of data quality
- Insure data quality and isolate potential bias thanks to discussion with IMx' in-house experts
- Identify potential explanations for performance compared to benchmark

Proposed methodology for next year data production

	PREPARATION	MEETING	VALIDATION
EIM	• EIM will send materials to IMx contact person (template for extractions, network segmentation, definitions, etc.) and detailed guidelines so as to insure consistency amongst networks	• EIM will have analyzed preliminary results and prepare first list of questions to be investigated • EIM will meet IMx in-house experts to discuss methodology employed and results. First interpretation may be discussed as well	• EIM will produce final datapack and send final results and interpretations to IMx
IMx	• IMx is expected to gather all the relevant in-house experts, produce a first datapack and send back datapack and questions if needed		• IMx is expected to validate results and interpretations

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Among the nine issues that should be harmonized to get comparable figures four are key

DEFINITION	DIMENSIONS	IMPORTANCE	REFERENCE
DEFINITION OF "DELAYED MINUTES"	Threshold (in min) from which trains are considered as delayed	low high	5'
	Time table against which running trains are compared	low high	Planned more than one week before train departure
	Location of measurement	low high	Each main stations
	Type of traffic included	low high	PAX only
	Threshold from which delayed minutes are counted	low high	0'
DEFINITION OF TRAINS THAT HAVE CIRCULATED	Are cancelled train included in the denominator ?	low high	No
DEFINITION OF DELAYED MIN ALLOCATION	Similar root cause tree and process of allocation	low high	
	Multiple causes allocation	low high	Main cause
	Secondary delays allocation	low high	Yes

Some differences remain for thresholds and types of traffic

	Reference	NR	ProRail	BDK	IP	Trafikverket	Infrabel	SNCF Reseau	FTA	JBV	PLK
THRESHOLD (IN MN) FROM WHICH TRAINS ARE CONSIDERED AS DELAYED	**5'**	5'	3'	5'	3' (suburban), 5' (Regional and Long Distance) and 30' (Freight)	5'	6'	5'	3' for capital commuter trains and 5' for all others	5'	5'
TIME TABLE AGAINST WHICH RUNNING TRAINS ARE COMPARED	**Planned more than one week before train departure**	Published timetables the night before to implement any short term changes to the long term plan.	Planned	Last Planned (-72h)	Timetable published by REFER in December Year-1	Planned 24h before		Communicate10 0 days before the service timetable	Annual timetable	Initial timetable	Annual timetable which is audited 1 time a year with 5 corrections
LOCATION OF MEASUREMENT	**each main stations**	At specified locations (timing points), including origin and destination points.	34 fixed measuring points	49 registration pass. stat. + 14 registration freight st. + many technical line segments	Origin and end stations.	Every station	All along the main tracks (to be confirmed)	Final destination (+ sometimes specific points)	End station	All stations along the line	Final destination
TYPE OF TRAFFIC INCLUDED	**PAX only**	Pax only	Pax only	Pax only	Pax & freight	Pax & freight	Pax only	Pax & freight	Pax only	Pax only	Pax only
THRESHOLD FROM WHICH DELAYED MINUTES ARE COUNTED	**0'**	1'	1'	0'	1'	0'		5' (TBC)	0'	3'59	1'

Secondary delays allocation may question results magnitude for three countries

	Reference	NR	ProRail	BDK	IP	Trafikverket	Infrabel	SNCF Reseau	FTA	JBV	PLK
ARE CANCELLED TRAIN INCLUDED IN THE DENOMINATOR ?	**No**	Cancelled pax no, cancelled freight trains yes	No		No	No	No (TBC)	No	Yes	No	No
ROOT CAUSE TREE AND PROCESS OF ALLOCATION		Information already provided	Required information available		Required information available			Required information available			Required information available
MULTIPLE CAUSES ALLOCATED ?	**Main cause**	Separately counted	No	Main cause / Latest cause	One train delay can only have one cause (primary cause)	every cause are allocated		Only one cause is allocated to the delay when it appears	Primary cause between two control points	Main cause	Delayed at final destination and % of train delayed are split into all causes
SECONDARY DELAYS ALLOCATION	**Yes**	Yes	Yes (reallocated)	Yes (to be confirmed)	Yes	Yes		Yes	No	Yes	Yes

Among the eight issues that should be harmonized to get comparable figures five are key

DEFINITION	DIMENSIONS	IMPORTANCE	REFERENCE
DEFINITION OF "TRAIN AFFECTED" BY INFRA FAILURE	Threshold (in mn) from which trains are considered as delayed*	low high	5'
	Time table against which running trains are compared	low high	Planned more than one week before train departure
	Location of measurement	low high	Final destination
	Type of traffic included	low high	All
	Are cancelled trains also considered as part of affected train?	low high	Yes
LINK BETWEEN FAILURE AND TRAIN AFFECTED	Portion of trains delayed/cancelled for which a failure is identified	low high	100%
	Root cause tree and process of allocation	low high	Asset / Traffic control / weather / external
	Multiple cause allocation	low high	One cause per train should be monitored
	Secondary delays allocation	low high	Not necessary, if yes, through first delayed train

Remaining data collection differences may affect results magnitude, especially for four IM

	Reference	NR	ProRail	BDK	Refer	Trafikverket	Infrabel	RFF	FTA	JBV	PLK
THRESHOLD (IN MN) FROM WHICH TRAINS ARE CONSIDERED AS DELAYED	**5'**	1'	3'	5'	1'	5'	20' + additional rules	5'	3' for capital commuter trains, 5' for all others pax trains, 15' for freight	4'	5'
TIME TABLE AGAINST WHICH RUNNING TRAINS ARE COMPARED	**Planned more than one week before train departure**	Published timetables the night before to implement any short term changes to the long term plan.	Planned	Latest planned (-72h)	Timetable published by REFER in December Year-1	Planned 24h before			Annual timetable (which is updated more often if needed)	Initial timetable	Annual timetable which is audited 1 time a year with 5 corrections
LOCATION OF MEASUREMENT	**Final destination**	Along the journey	34 fixed measuring points	49 registration pass. stat. + 14 registration freight st.	In the position/location of the affected train	Every station		Every where in the network	End station		Final destination
TYPE OF TRAFFIC INCLUDED	**All**	All	Pax only	Pax & freight (TBC)	Pax & freight	Pax & Freight	All (freight + passenger)	All (freight + passenger)	All (to be confirmed)	All (freight + passenger)	Pax only
ARE CANCELLED TRAINS ALSO CONSIDERED AS PART OF AFFECTED TRAIN?	**Yes**	Yes	Yes, as a separate category	Yes	Yes, if the failure was the cause of train cancelation	No (will be changed)	Yes	No	Yes	Only delayed trains	No

BDK special way of counting failures may also affect the comparability of its figures

	Reference	NR	ProRail	BDK	IP	Trafikverket	Infrabel	SNCF Reseau	FTA	JBV	PLK
PORTION OF TRAIN DELAYED / CANCELLED FOR WHICH A FAILURE IS IDENTIFIED	100% (secondary delay being considered as a cause)	100%	required information available	Require information available	100%	100%		100% of trains delayed by more than 5'	A cause for each delay is defined by an expert.		100%
ROOT CAUSE TREE AND PROCESS OF ALLOCATION		required information available	Main cause (to be confirmed)	Multiple causes can be monitored for one train	required information available			required information available			required information available
MULTIPLE CAUSES ALLOCATED ?	One cause per train should be monitored	They are counted separately			Multiple causes are allocated to each train as applied, but a main cause is selected (Infra, TOC, Other)				A cause for each delay is defined by an expert.		delayed at final destination and % of train delayed are split into all causes
SECONDARY DELAYS ALLOCATION	Not necessary, if yes, through first delayed train	To be confirmed				Yes first delayed train					Yes