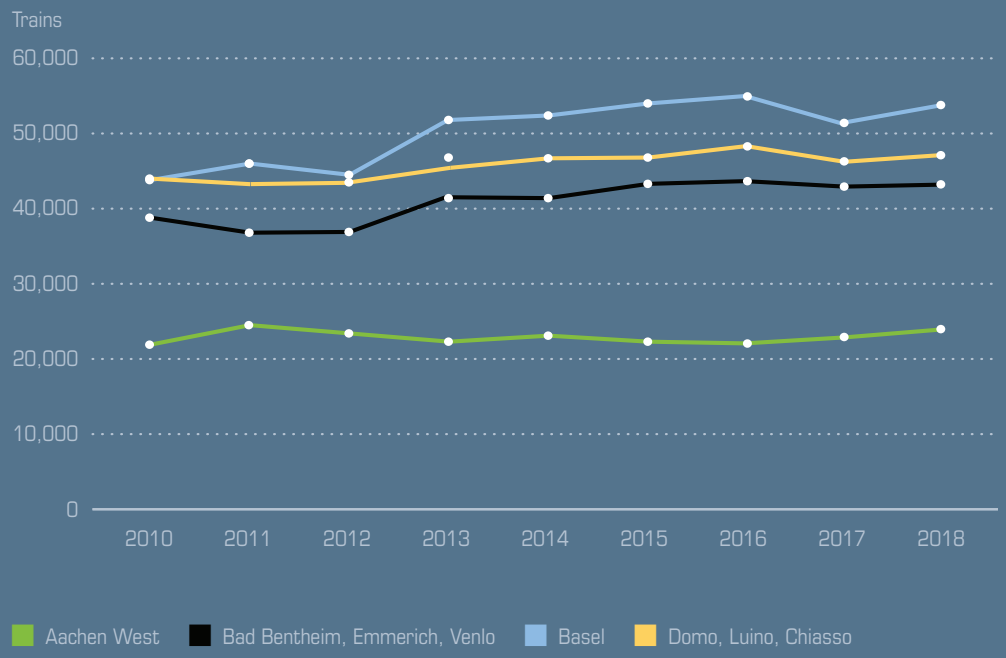
2 Performance Report

2.1 Traffic Development

Traffic volume

Figure 1: KPI International Traffic Volume



Sources: Aachen West: Infrabel, Bad Bentheim: ProRail, Emmerich: ProRail, Venlo: ProRail, Basel: SSB Infra, Domo: SSB Infra, Luino: SSB Infra, Chiasso: SSB Infra

Definition: number of international freight trains per year crossing a border of RFC Rhine-Alpine in either direction, regardless of origin or destination. If several cross-border sections exist these have been summed up:

NL–DE: Hengelo–Bad Bentheim	NL–DE: Venlo–Kaldenkirchen	DE–CH: Weil a. R.–Basel	CH–IT: Ranzo–Luino
NL–DE: Zevenaar–Emmerich	DE–BE: Aachen West–Montzen	CH–IT: Brig–Domodossola	CH–IT: Chiasso–Chiasso border

Overall traffic development

In 2018 overall traffic mostly recovered from the loss of confidence in the market following the Rastatt disruption in 2017. Compared to the 2017 decrease of 3.2%, the traffic for the entire corridor increased by 2.8% in 2018. The low water levels of the Rhine helped to slightly improve rail freight traffic. However, the growth could have been expected to be more significant. During 2018 the economy in Europe was slowing down, which could explain the low growth momentum of train volumes on RFC Rhine-Alpine. The lack of train drivers and moderate punctuality did not help the situation.

Border crossings NL–DE

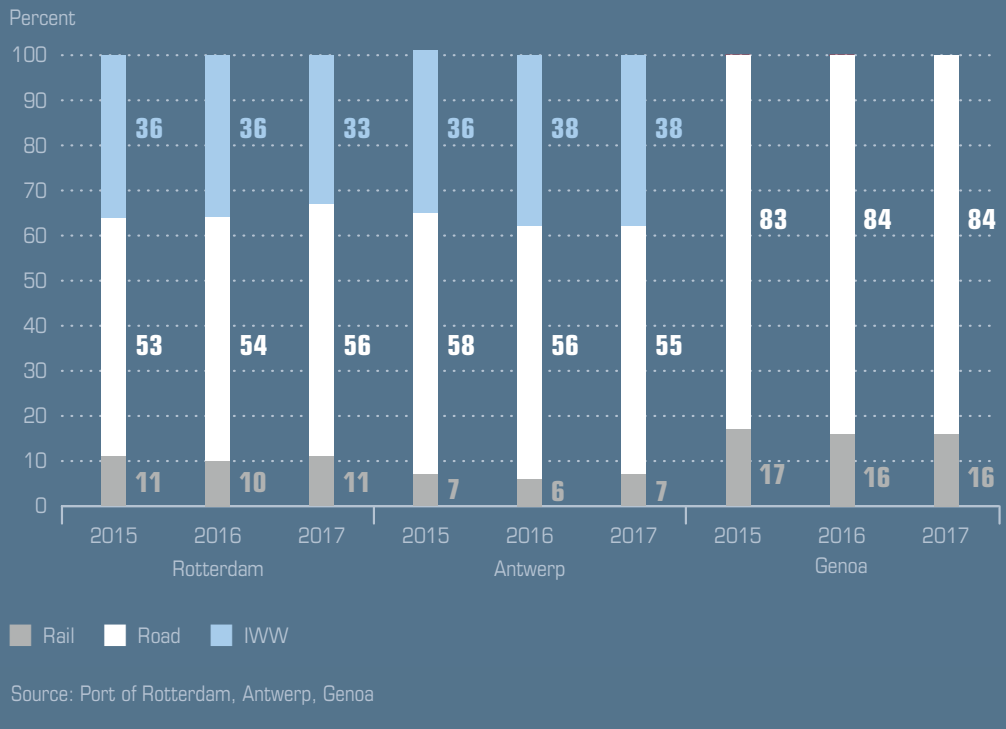
At the Dutch border points there was an overall increase in traffic of 0.9% compared to 2017.

On the one hand, traffic recuperated moderately after the Rastatt incident in 2017. On the other, the low water levels of the Rhine also gave freight a boost. This was countered, however, by a drop in the amount of coal trains after the closure of several coal-fired energy plants in January and March.

Border crossing BE–DE

In Belgium, compared to 2017, traffic at the Montzen border point increased by 4% in 2018. This was mainly due to the general recovery of the train volume which was reduced by the Rastatt incident.

Figure 2: KPI Modal Split in Ports 2015–2017



Source: Port of Rotterdam, Antwerp, Genoa

Definition: modal split [%] of freight traffic at Port of Rotterdam, Genoa and Antwerp; the modal split is calculated for hinterland container traffic on the basis of TEUs.

Border crossing DE–CH
Compared to 2017, traffic at the Basel border point increased by 4.5% in 2018. Again, the effect of the Rastatt incident is evident.

Border crossings CH–IT
In 2018, in Italy traffic increased by 2% compared to 2017. Whereas the Chiasso and Domodossola border points had a significant increase in traffic in 2017 due to the Luino line closure, the trend was reversed in 2018 with the reopening of the line.

Modal split

Rotterdam
The total transport volume in the Port of Rotterdam increased in 2017, which slightly benefitted the rail transport. The share of rail traffic increased by 0.2% compared to the previous year (by rounding this results in 1% higher market share in Fig. 2).

Antwerp
In 2017 the overall volume of barge, rail and road traffic increased. The growing interest in rail transport led to a 1% increase for rail.

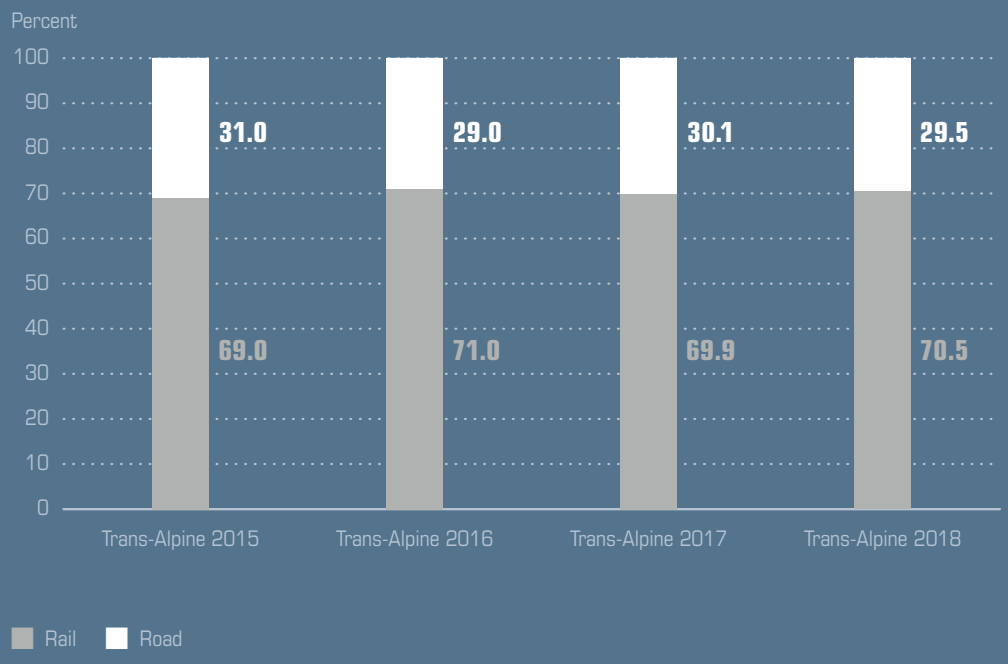
Genoa
In 2017, as in 2016, the rail sector could not benefit from the overall traffic increase. No changes in modal shift could be reported as most of the hinterland traffic continued to use the road.

Trans-alpine traffic

In 2018 the overall trans-alpine freight traffic increased by 2%. On RFC Rhine-Alpine 27.9 million tons crossed the Alps, which constitutes an increase of even 2.9% compared to the previous year. This was mainly due to the reopening of previously closed sections in Rastatt and the Luino line in 2017 which had severely reduced the overall rail freight transport volume. However, the 2016 level could not be reached in 2018; volumes remain 2.6% below the 2016 value.

The rail share of the overall trans-alpine traffic increased by 0.6%, benefitting from the continued decrease in road haulage. 52% of all freight transport crossed the Alps on the corridor in combined transport (unaccompanied and RoLas).

Figure 3: Modal Split Trans-Alpine Traffic 2015–2018



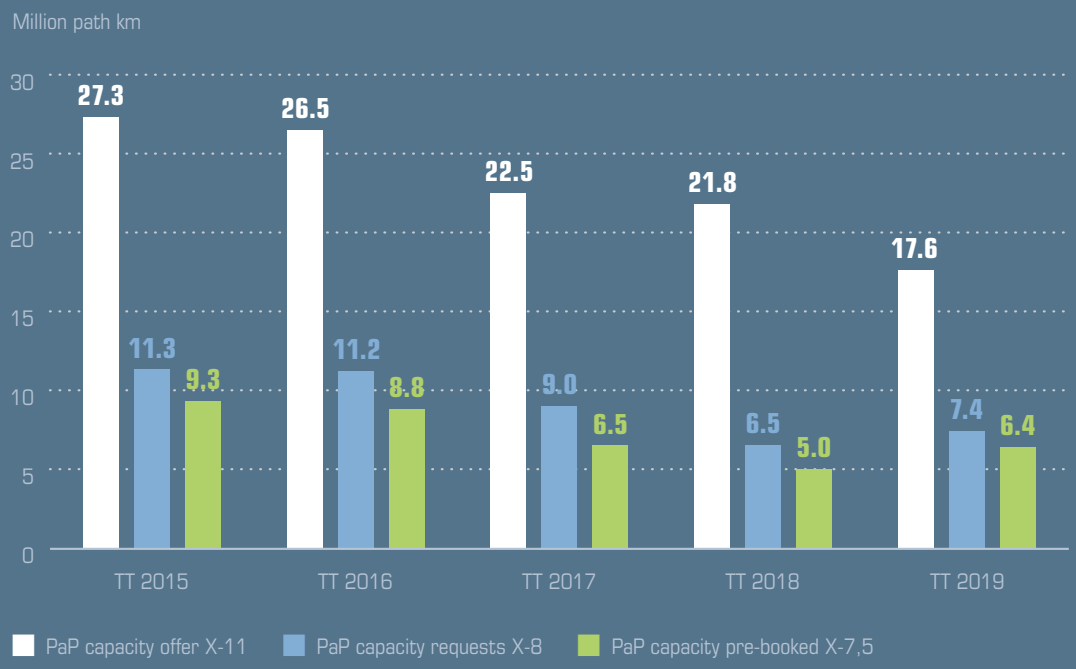
Source: BAV quarterly report 1/2019 on cross-alpine traffic

Definition: Modal split [%] for trans-alpine freight traffic is based on net tons.

2.2 Path Allocation

Volume of offered, requested and pre-allocated capacity

Figure 4: KPI Volume of Offered, Requested and Pre-Allocated Capacity



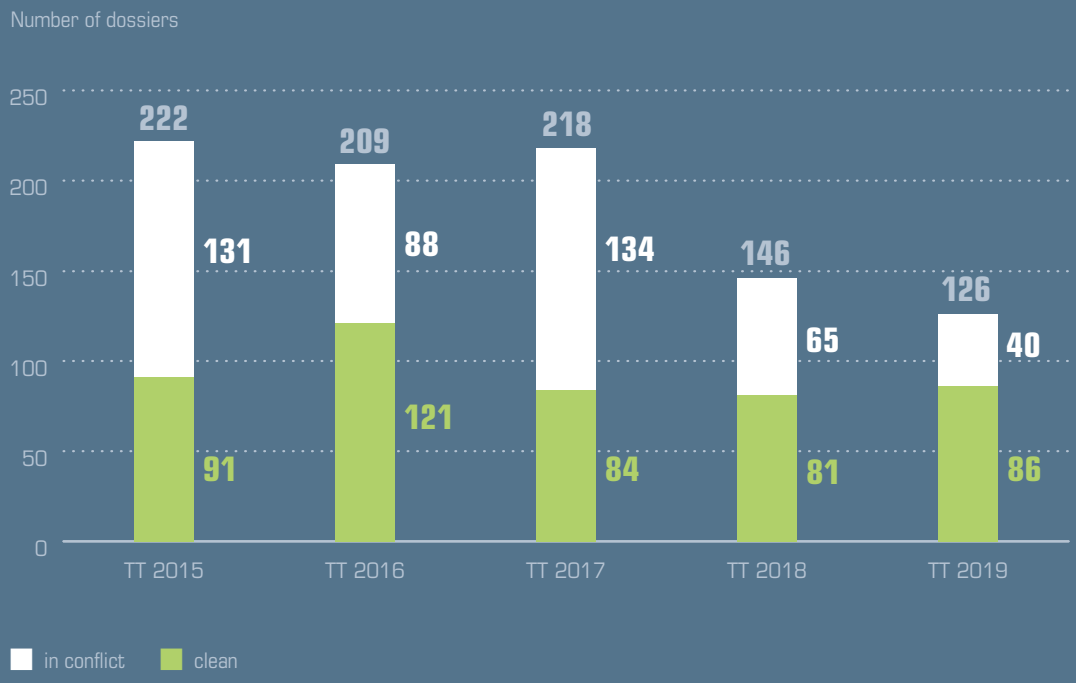
Definition: This indicator shows the volume of PaPs in the phases of PaP publication (X-11), PaP requesting (X-8) and PaP pre-allocation (X-7.5) in million path km per year.

The evolution of the amount of offered PaPs from TT 2015 to TT 2019 is displayed here (white bars). These PaPs are offered along the routing of the corridor in the directions North–South and South–North. Most of the offered PaPs are planned from Monday to Sunday (seven days of operation); nevertheless, some might have a lower availability (e.g. four or five running days), or a given PaP might not be available during some days throughout the year because of TCRs.

The figure also shows a comparison of the volume of all requests (blue bars) that were received at the Corridor One Stop Shop (C-OSS) of the RFC Rhine-Alpine for the annual timetables 2015–2019. Due to conflicts, it was not possible to allocate all the requested capacity as PaPs (green bars), but in all other cases, tailor-made solutions could be offered to the applicants instead. In addition to the requests of PaPs, a high number of connected feeder and outflow paths were requested and allocated.

Volume of requests including number of conflicts at X-8

Figure 5: KPI Conflicting PaP Requests



Definition: This indicator shows the number of conflicting dossiers (path requests placed in PCS that referred to the same PaP on RFC Rhine-Alpine).

The parameter shows the number of PaP conflicts for the timetable period 2015–2019, in which two or more customers requested the same PaP during the phase of PaP requesting (X-8) in number of dossiers.

During the last timetable period, only 40 out of 126 dossiers were in conflict. That represents a reduction of 38% of conflicts in comparison with 65 dossiers in the previous year for TT 2018. Fewer conflicts made the process of pre-allocation easier and faster. The reduction of conflicting dossiers was, for example, due to the fact that the offer was presented in a more market-oriented fashion for TT 2019.

Volume of offered and requested reserve capacity

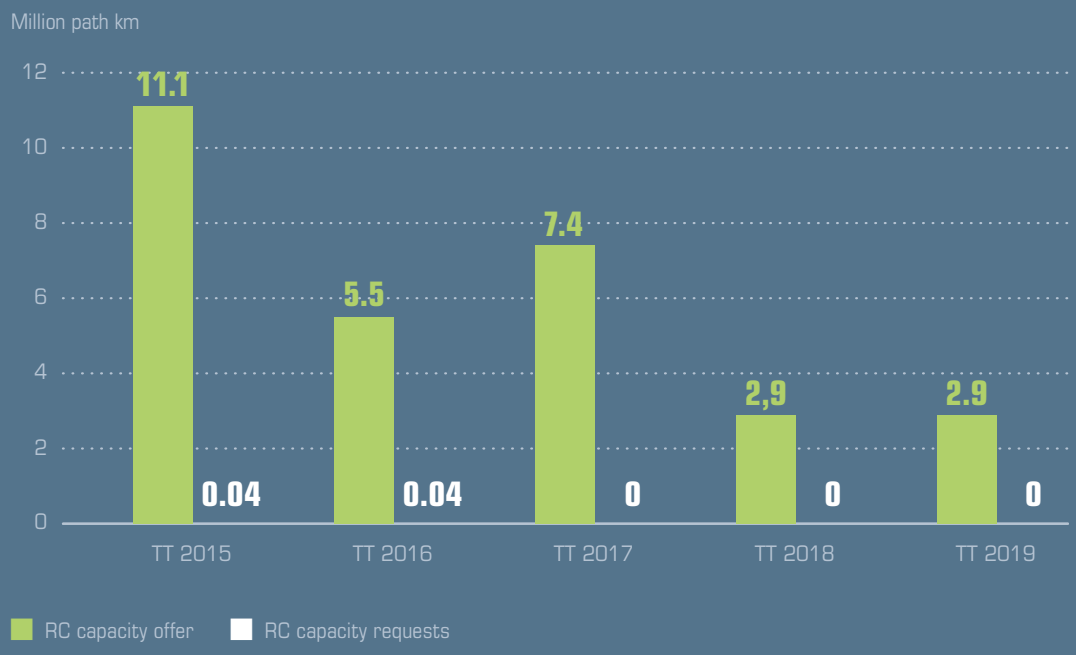
Reserve capacity (RC) for international rail freight on RFC Rhine-Alpine is developed in a flexible approach. The offer is published in the form of capacity slots with no specific time range and as capacity per section on a daily basis. Reserve capacity can be requested 30 days before the train run for the entire current timetable year.

Figure 6 shows a retrospective view of offered and requested reserve capacity from the timetable period 2015–2019. No requests were placed from TT 2017 to TT 2019.

Most other RFCs have a similar situation with very low or no reserve capacity requests. Several RFCs developed and tested a different approach for reserve capacity.

After many discussions on this topic, the RFC Rhine-Alpine Management Board decided to focus on improving the existing bilateral coordination of ad hoc requests. A study was carried out in 2018 and complemented by workshops with the ad hoc timetable experts at all. As a result, the so called "pre-check" coordination has been intensified at several borders. Other measures for improved coordination have been agreed. The results of the study will be followed up in 2019.

Figure 6: KPI Volume of Offered and Requested Reserve Capacity



Definition: This indicator shows the volume of reserve capacity offered (X-2) in million path km per year.

Average speed of offered PaPs

Figure 7: KPI Average Speed of Offered PaPs for TT 2019 and TT 2020

Definition: This indicator shows the average speed of published PaPs at X-11.

The travel speed of a pre-arranged path varies due to the geography and the train parameters associated with the specific pre-arranged path as well as the applicants' need for operational stops (e.g. for changing engines, working break, driver change). These are the main factors that influence the complete travel time of a train from A to B. Therefore, and to see the evolution of this parameter during the different timetable periods, a new KPI has been agreed upon by the RFC Network based on discussions with RUs in the RNE KPI working group "Key Performance Indicators for Rail Freight Corridors".

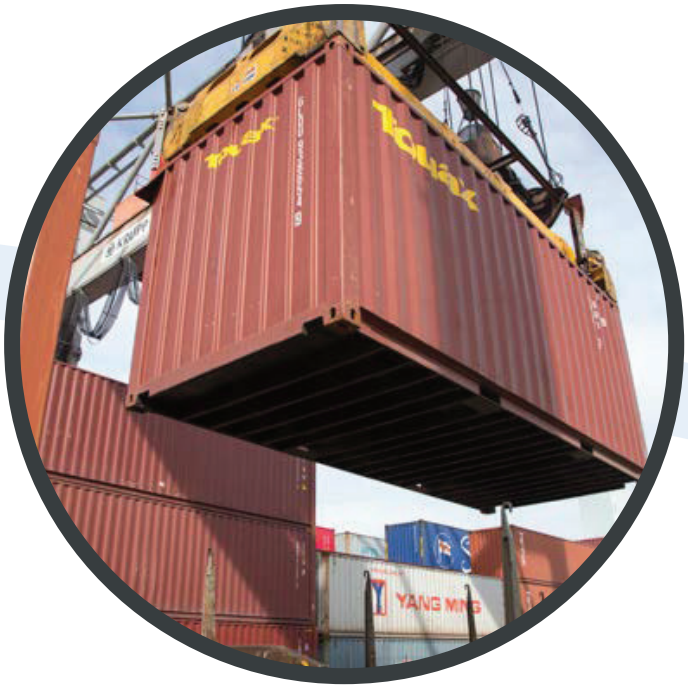
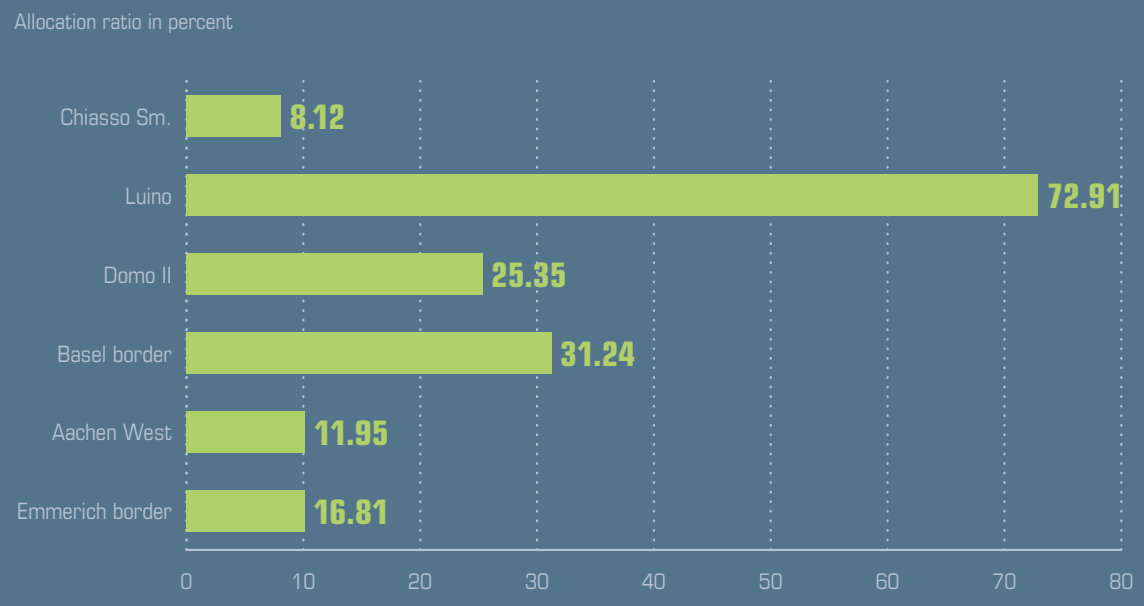


Figure 7 shows the most requested relations on the corridor. The KPI is calculated using the departure and arrival times including all foreseen stops along the train run. Every chosen relation consists of at least two published PaPs.

A comparison in the development of the KPI is also shown here for the timetable periods 2019 and 2020. The information has been retrieved from the PaP-Catalogue, which is published yearly on the second Monday in January of each year and therefore data concerning TT 2020 could

Allocation ratio of PaPs for TT 2019

Figure 8: KPI Allocation Ratio of PaPs for TT 2019



Definition: This indicator shows the percentage of allocated trains by the C-OSS in relation to the allocation of international rail freight trains in the annual timetable on the chosen border crossings of the corridor

be included in this report. Furthermore, new relations were included in respect to the former timetable period and a comparison could not always be made (empty columns of the graph). Overall, in some of the shown sections, a reduction of the average speed can be seen. One reason for this is the increase in works on the lines of the corridor, but transitions at border stations are also a crucial factor for decrease in average value.

The allocation ratio is calculated based on data provided by the infrastructure managers and the C-OSS of RFC Rhine-Alpine. At every border of the corridor, the number of crossing trains, which has been allocated via PCS and associated with PaPs, is compared to the number of trains in the annual timetable, which has been allocated by the infrastructure managers of the corridor.

Figure 8 shows that particularly in the southern part of the corridor the ratio of trains allocated by the C-OSS is higher than in the North.

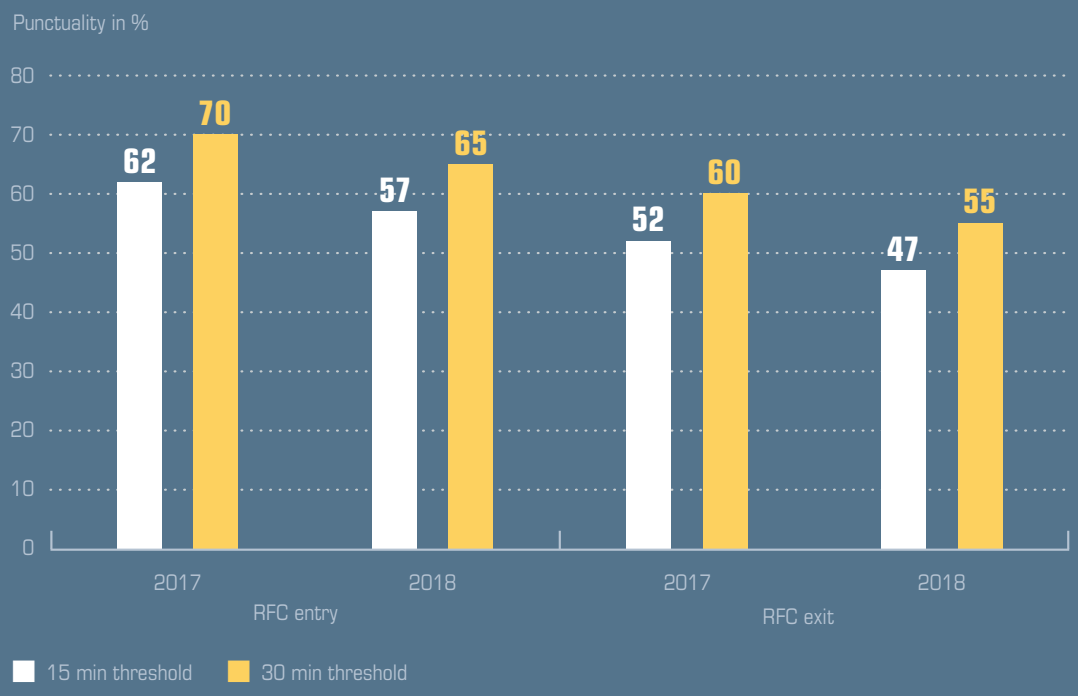
2.3 Train Performance Management

Punctuality improvements are a top priority of the Management Board of RFC Rhine-Alpine as well as of the Sector Statement (2016). In 2017 this was again confirmed by the inclusion into the corridor MoU signed by the CEOs of RFC Rhine-Alpine. The overall punctuality reported has been stagnating for many years. Both departure and arrival punctuality remains at a low level. RUs and their customers complain about decreasing and low punctuality and about low reliability, which have a negative impact on end customers' trust. On RFC Rhine-Alpine the high amount of traffic and many construction works lead to capacity bottlenecks which also influence performance. The goal of TPM on RFC Rhine-Alpine is an international approach to improve the quality of train performance together with the relevant stakeholders involved in the intermodal transport chain and hence improve customer satisfaction.

Train punctuality is measured based on the comparison of the time in the timetable of a train identified by its operational train number and the actual running time in operations at certain measuring points. Punctuality measurement is based on the timetable for the entire train run delivered to the Train Information System (TIS)[1].

Punctuality KPI for RFC Rhine-Alpine

Figure 9: Yearly Punctuality KPI

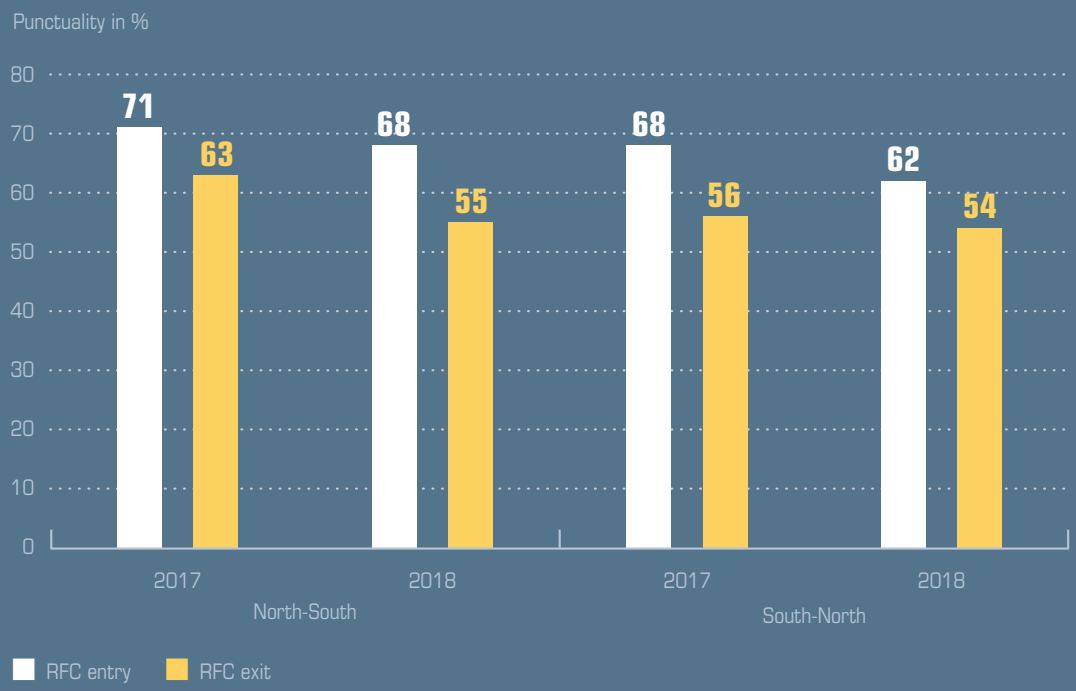


Source: Report provided by RNE based on TIS data

Definition: The KPI considers all international freight trains crossing at least one border and defined point on the corridor. The trains are measured at their entry and exit points on the RFC.

1 TIS is a web-based application provided by RNE that conveys real-time train data for international freight trains.

Figure 10: Punctuality on RFC Rhine-Alpine (0–30')



Source: Report provided by RNE based on TIS data

Definition: 2018 common RFC punctuality KPI based on RNE data base (TIS). The KPI considers all international freight trains crossing at least one border and defined point on the corridor. The trains are measured at their entry and exit points on the RFC by direction.

RNE calculates the defined punctuality figures using TIS data. Based on these punctuality figures as well as specific reports, which deliver additional figures for intermediate and border stations, weak points with high delays can be identified and analysed, with the aim to improve overall punctuality on the corridor. A special focus is set on departure punctuality which is the major influencing factor for arrival punctuality.

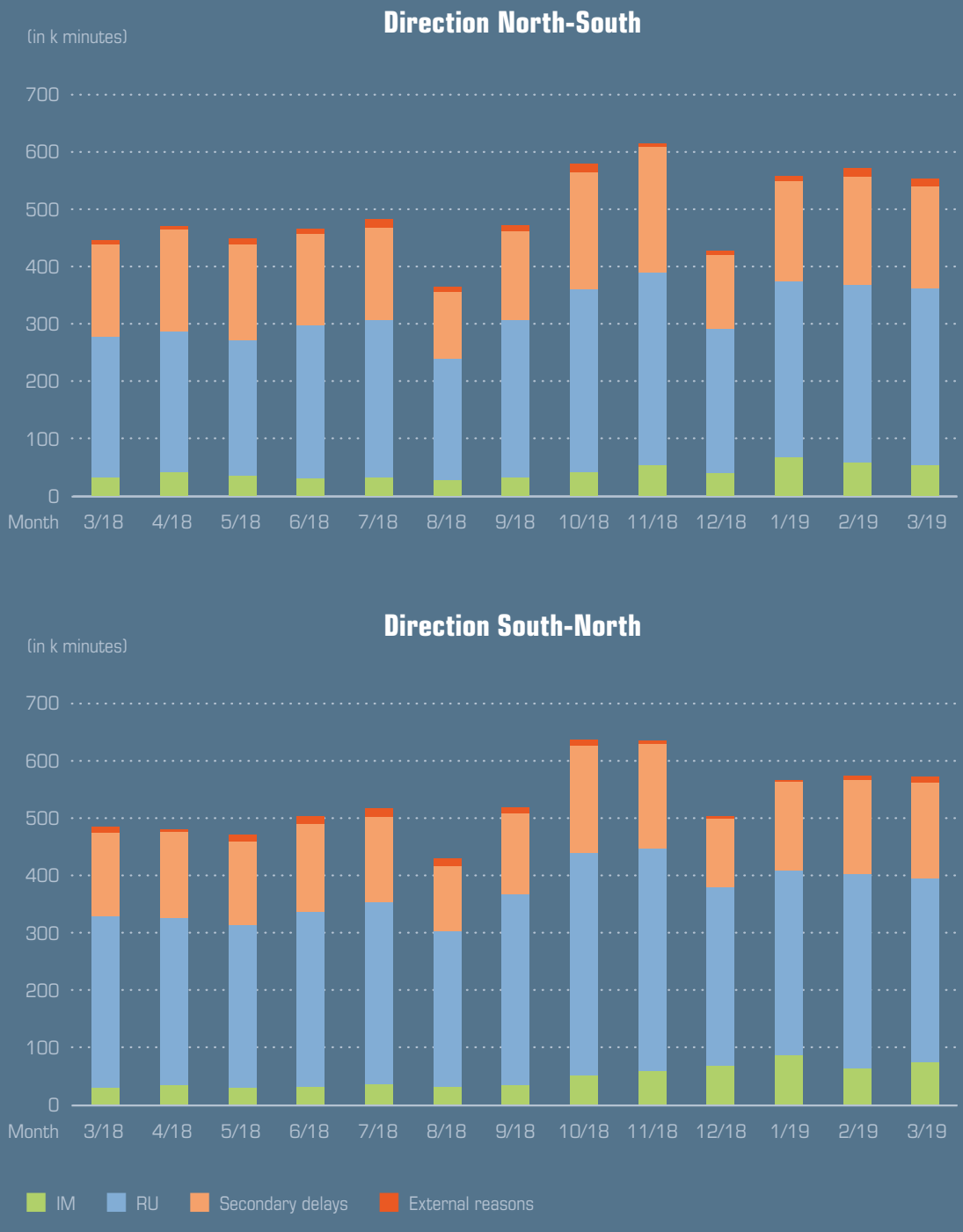
The involvement of RUs, terminals and other actors along the transport chain is a key factor for punctuality analysis and improvement measures. Therefore, the Working Group Train Performance Management of RFC Rhine-Alpine organises dedicated task forces and workshops with the relevant stakeholders on specific points or trains.

All RFCs agreed to measure punctuality within a 30 minutes threshold. However, as discussions in PRIME have focussed on a 15 minutes threshold, this value is also shown for the overall punctuality KPIs for RFC entry and RFC exit. Trains have to be identified as international trains (with an international train number) and cross at least two predefined points on RFC Rhine-Alpine to be included into our performance statistics.

Punctuality measured at RFC entry and RFC exit decreased in 2018 compared to 2017. Trains running from North to South are slightly more punctual than punctuality of trains running from South to North.

Amount and distribution of delays

Figure 11: Total Amount of Delay Minutes Reported to TIS



The different colour sections of the bars represent the share of responsibility for these delays.

These graphs show all delay minutes, also for the trains within the 30 minutes punctuality threshold. As far as available, all delay reasons are taken out of TIS which is fed by national delay coding agreed within UIC. National coding can be done slightly differently at each RFC Rhine-Alpine member IM (as at all European IMs), especially concerning the treatment of secondary delays.

Distribution of delay reasons is assigned according to the UIC leaflet 450-2 and shown by main delay reason group:

IM[2]:
UIC code-groups 10–49 considering all IM reasons, such as timetable planning, dispatching errors, infrastructure failures, temporary capacity restrictions (as far as not considered in timetables), unplanned works.

RU[3]:
UIC code-groups 50–79 considering all RU reasons, such as loading, train preparation, train formation by RU, rostering/re-rostering, rolling stock failures, loading irregularities, RU staff. Delays caused by terminals before handing trains over to the IM network are also coded as RU reasons (normally as late train preparation/loading).

Secondary delays:
UIC code-groups 90–99 considering delays which are indirectly caused by previous reasons, such as the delayed circulation of the same or another train and the resulting track occupations or conflicts within nodes. Incidents with trains/dangerous goods are also reflected here.

External reasons:
UIC code-groups 80–89 considering delays which are beyond the influence of IMs and RUs, such as weather conditions, natural events, suicides, authorities, strikes.

Line closures or other events affecting punctuality in 2018:

Derailment in Pioltello (RFI)
On 25 January 2018 a passenger train derailed on the Milano–Brescia line, close to the Pioltello station. This event also affected freight trains from/to the eastern part of Milan (e.g. Milan Smistamento, Melzo, Brescia). The capacity of this section was reduced until 1 March 2018.

Modernisation of railway infrastructure Cadenazzo–Luino (SBB-RFI)
Total line closure Cadenazzo–Luino due to infrastructure works from 8 January until 28 April 2018 (8:00 am–5:00 pm) leading to major capacity restrictions with re-routings via the Lötschberg/Simplon line.

Track renewal Gelterkinden–Tecknau (SBB)
Basel border GER/F–Basel SBB–Olten: Track renewal Gelterkinden–Tecknau from 30 June until 12 August 2018. Major capacity restrictions, re-routing of 2–3 trains per hour (direction N–S) via Läufelfingen.

Basel Rangierbahnhof: Partial renewal of shunting technology (SBB)
Partial renewal of shunting technology from 1 August 2018 until 30 November 2019. Moderate capacity reduction with partial closure of the station at weekends. Since 10 August 2018, only half of the track group F has been available. Direction N–S: Adaptation of processes, adaptation of formations to the North, restrictions in the acceptance of trains from the South.

Third track Zevenaar–Oberhausen (ProRail)
In the context of the project Third Track Zevenaar–Oberhausen there were different periods during the year with single track use between Zevenaar Oost and Emmerich. Besides the freight trains, ICE trains as well as the regional and the regional passenger trains RE19 of RU Abellio were still running. These delays often caused major congestion on both sides of the border. This had a negative impact on the punctuality of the freight trains on the corridor.

Recurring delay causes which impact freight traffic on the Infrabel network
No major one-time events were identified that had a significant influence on the punctuality of freight trains on the Infrabel network in 2018. From analysis of the validated delays, several recurring delay causes could be identified, which had a significant impact on punctuality. Cable theft, accidents involving a person, caused 10.88% and 10.65%, respectively, of the validated delays. Infrabel has several ongoing campaigns which try to mitigate the delays due to these causes.

Weather conditions caused major disruptions (DB Netz)
The operational performance on the RFC Rhine-Alpine routes was negatively affected by several factors in 2018. Several disruptions due to bad weather conditions were significant. These events led to line closures and capacity restrictions in rail traffic. In addition, many construction works were carried out in the DB network. A representative example is the commissioning of the new signal box in Basel Bad Rbf and Weil am Rhein.

2 The codes 40/41 delays caused by previous/next IM/RU are not considered in the calculation as otherwise delays would be counted twice in the international context.

3 The codes 70/71 delays caused by previous/next IM/RU are not considered in the calculation as otherwise delays would be counted twice in the international context.