

Capacity requirements

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1 Engineering works

1.1 Planned major engineering works

See annex 3 B - Planned major engineering works.

1.2 Pre-planned times in track for maintenance

In order to provide capacity for maintenance work, the Swedish Transport Administration intends to plan fixed times in tracks – referred to as service windows – according to what is stated below. It is possible to read off length, frequency and *approximate* time of day (daytime or night-time) in the Excel sheets to which it is linked.

This requirement for maintenance times will be submitted to the timetable process for Timetable 2017 together with the Swedish Transport Administration's other requirements for track engineering works. During the process, the exact times for the maintenance work will be determined.

There is therefore no need to give any consideration to these times in connection with train path applications. On the other hand, the Swedish Transport Administration wishes to make all applicants aware of the fact that these service windows represent the need for maintenance times within each respective geographical area that the Swedish Transport Administration sees, and which are expected to require the provision of time in the established Timetable.

Note also that the Swedish Transport Administration may indicate a further need for the provision of maintenance time in tracks. In this case, they will be made available in the normal track engineering works process.

1.2.1 Maintenance contract Malmö and south-east Skåne

The Swedish Transport Administration intend to apply for:

- traffic stoppages during four (4) hours every night before Monday on lines from Lockarp to Ystad and to Trelleborg
- shutdown of the entire I-group at Malmö godsbangård for ten (10) hours four (4) times a year
- signale-track for six (6) hours every night before Tuesday – Friday in Citytunneln

1.2.2 Maintenance contract Norra stambanan

The Swedish Transport Administration intends to apply for traffic stoppages in the daytime on every weekday for a period of two (2) hours on the stretch of line (Ramsjö)-(Ockelbo). Service windows (Storvik)-(Ockelbo)/(Gävle) are intended to be scheduled for the night-time on weekends and public holidays.

1.2.3 Maintenance contract Väst kustbanan south

Within this maintenance contract, service windows for 2017 are only planned for the Hallandsås tunnels (Båstad Norra)-(Förslov). A further need for time in tracks for maintenance purposes in this maintenance contract will in other words be presented at the same time as the Swedish Transport Administration submits its application for other track engineering works

The Swedish Transport Administration intend to apply for capacity in Hallandsåstunnelarna (Bån)-(Vbt) that means single-track for six (6) hours on the night before Monday –Friday, and for ten (10) hours on the night before Sunday. This enables maintenance work to be performed in one of the tunnel tubes during these times.

1.2.4 Maintenance contract Blekinge kustbana, Kust-till-kustbana

The Swedish Transport Administration intends to apply for traffic stoppages in the night time on every weekday for a period of 4 - 7 hours on the stretch of line Värnamo and Kalmar/Karlskrona, and 3 – 5 hours in the night time on every weekday on the stretch of line Hässleholm and Karlskrona.

1.2.5 Maintenance contract Länsbanorna i Östergötland och east Småland

The Swedish Transport Administration intends here to apply for seven (7) hours of traffic stoppage from Tuesday – Thursday on a larger part of those stretches of line that this maintenance contract covers.

1.2.6 Maintenance contract Värmland/Dalsland

The Swedish Transport Administration intends here to primarily gather the maintenance under three (3) track engineering works weeks per year and stretch of line, with a 5-hour traffic stoppage from Monday – Thursday.

1.2.7 Maintenance contract Västra Götaland, West

The Swedish Transport Administration intends here for each stretch of line to apply for a stoppage (single-track lines) and single-track operation (double-track lines) for a period of 2-7 hours, 1-3 days a week.

1.2.8 Maintenance contract Väst kustbanan, West

The Swedish Transport Administration intends to gather the maintenance on Väst kustbanan north of Halmstad on the one hand in single-track operations for 2.5 hours in the daytime once a week, and on the other hand in single-track operations at night with the same frequency and, in addition, in track engineering works

weeks with single-track operations. On the stretch of line (Varberg)-(Hamra), the Swedish Transport Administration intends to apply for traffic stoppages of 6.5 hours every other night before Sunday.

1.2.9 Maintenance contract Malmbanan, north

The Swedish Transport Administration intends, during the spring, winter and autumn to apply for two (2) hours' traffic stoppage in the daytime from Monday – Friday, every other week north of Kiruna, every other week south of Kiruna. These times are coordinated with maintenance periods on the Norwegian side of the border. During the summer, the Swedish Transport Administration intends primarily to coordinate the maintenance work with the major investment and reinvestment projects that are in progress on the route.

1.2.10 Maintenance contract Banorna i Bergslagen and Godsstråket

The Swedish Transport Administration intends here to apply, among other things for 3 hours' traffic stoppage one night a week and stretch of line on the single-track lines. On the Freight Corridor, the Swedish Transport Administration intends to apply for capacity for track engineering works, which means single-track operations to a somewhat greater extent.

1.2.11 Maintenance contract Södra stambanan and Västra stambanan (Hallsberg)-(Gnesta)

The Swedish Transport Administration intends to apply for capacity that means on parts of Västra stambanan and Södra stambanan southbound trains are given a running time mark-up about 3-15 minutes on nights before Monday – Friday of between 4 and 7 hours (exception: daytime (Nässjö)-(Alvesta)). When single-track operation is run owing to maintenance work, a train whose direction is prioritised in the operative stage. Limits for the number of closed stretches of line will be notified at the same time as the Timetable is adopted.

The Swedish Transport Administration's needs have the following consequences for each service window:

Västra stambanan

(Gnesta) – (Katrineholm) hours during the night	Running time mark-up southbound trains, 5,5
(Katrineholm) – (Hallsberg) hours during the night	Running time mark-up southbound trains, 5,5

Södra stambanan

(Katrineholm) – (Norrköping) hours during the night	Running time mark-up southbound trains, 6
(Norrköping) – (Mjölby) hours during the night	Running time mark-up southbound trains, 4-7
(Mjölby) – (Nässjö) hours during the night	Running time mark-up northbound trains, 4-7
(Nässjö) – (Alvesta)	Running time mark-up, 5 hours during daytime
(Alvesta) – (Hässleholm) hours during the night	Running time mark-up northbound trains, 5-7

(Hässleholm) – (Lund) hours during the night	Running time mark-up northbound trains, 5
(Lund) – (Arlöv) Citytunneln	Maximum capacity, 5-7 hours during the night Maximum capacity, 6 hours during the night

2 Pre-arranged paths for international corridors

Pre-arranged paths for international corridors are published in mid-January on each freight corridors website.

Link to freight corridor ScanMed RFC www.scanmedfreight.eu

Link to RailNetEurope (RNE) <http://www.rne.eu/>

3 Bottleneck Plans

3.1 Background

Rail traffic in the metropolitan areas is extremely intensive, with a high level of capacity utilisation. This means that the traffic system is sensitive to disruption – small delays propagate rapidly and the possibilities for recovery are restricted, at the same time as the demand for train paths has increased.

Capacity restrictions occur on those parts of the railway network where the demand for train paths is higher than the available capacity; applications for train paths cannot then be fully satisfied. On lines with a high capacity utilisation, it is especially important to establish the preconditions for the rail traffic that can be supplied with a high standard of transport quality. In order to be able to use the capacity in an efficient way in traffic-intensive areas, the Swedish Transport Administration draws up congested sector plans with pre-planned train path channels.

Bottleneck plans are part of a four-stage model which shows that a combination of running plan changes and adjustment measures in the infrastructure is extremely cost-effective. A system with pre-planned train-path channels leads to the existing facilities being used more efficiently. However, it is with a combination of improvements in the infrastructure that the best effect can be achieved.

3.2 Purpose

The bottleneck plans shall be used in the capacity allocation process for the purpose of:

- achieving an efficient capacity utilisation in traffic-intensive areas through finished train path channels
- guaranteeing punctuality by means of robust running timetables
- serving as planning support for applications for train paths and the construction of timetables.

The pre-planned train path channels shall serve as the basis for the applications made by railway undertakings for train paths and the Swedish Transport Administration's timetable construction.

3.3 Scope

The bottleneck plans cover the three metropolitan areas of Stockholm, Göteborg and Malmö

The bottleneck plan Stockholm includes the following stretches:

- Stockholm central/Stockholm city – Arlanda/Märsta – Uppsala
- Stockholm central/Stockholm city – Bålsta
- Stockholm central/Stockholm city – Nynäshamn
- Stockholm central/Stockholm city – Södertälje hamn – /Södertälje syd – Gnesta
- Södertälje hamn – Södertälje centrum
-

The bottleneck plan for Göteborg (Gothenburg) includes the following stretches:

- Göteborg – Stenungsund
- Göteborg – Öxnered
- Göteborg – Alingsås
- Göteborg – Almedal, (Borås)
- Göteborg – Kungsbacka

The Bottleneck Plan for Malmö includes the following stretches:

- Malmö/Godsbangården – Hässleholm
- Lund – Landskrona Ö – Helsingborgs C
- Malmö – Peberholm
- Malmö godsbangård – Fosieby – Lernacken

3.4 Infrastructure

The bottleneck plans are based on the fact that the infrastructure specified in the Network Statement is complete and fully operational. In the case of engineering works that have a major impact on the traffic, a special bottleneck plan may be drawn up. Planned major engineering works are presented in Annex 3.B

Extreme weather conditions and other external circumstances could require restrictions to be made in the transport services operated, which is specified in the reduction plans which the Transport Administration draws up in close cooperation with the train operators. On these occasions, deviations may also have to be made from the special planning preconditions for current operational site.

3.5 Traffic structure

By means of timetable analyses and simulations within the areas concerned, train path channels have been developed. With these as a basis, models have been created with the aim of facilitating the allocation of capacity. Minor deviations can be made from these on condition that no further train paths are required. The division of the train path channels cannot therefore be regarded as determined in advance.

3.5.1 Corridor paths

The stretch of line Stockholm–Hallsberg–Malmö–Peberholm and Kornsjö–Göteborg–Malmö have in Scandinavian-Mediterranean Rail Freight Corridor (ScanMed RFC) been defined as an international corridor with pre-planned train paths for freight trains. Applications can be made for both national and cross-border train paths. If there are several applications, however, the cross-border traffic has precedence over the pre-planned train path.

3.5.2 Bottleneck plan train types

Fast (S): trains with a high mean speed. It shall be possible for the vehicles to be driven at a speed of 160 km/h. In practice, only passenger and mail trains fulfil these requirements.

Slow (L): trains with a lower mean speed, normally freight trains or regional trains with stops at most of the intermediate stations. There is nothing to stop vehicles that meet the requirements for fast train paths being driven in a slower path if no faster train path is available. A certain train can use a slow train path on one line sub-section and a fast train path on another line sub-section.

3.5.3 Stockholm area

3.5.3.1 General

On the four-track stretches of line Stockholm södra and Flemingsberg and Stockholms central and Skavstaby, strict channel operation shall be employed. This means that no planned crossing between inner and outer tracks is normally allowed. The point connections between tracks should be primarily regarded as redundant in operational disruptions.

In order to make optimal use of the train path channels on the four-track stretches, it is assumed that the trains are driven at a homogeneous speed and on inner and outer tracks. Generally speaking, the inner tracks shall be used by slow trains (commuter and freight trains) and the outer tracks by fast trains (regional and inter-regional trains, and by fast trains and mail trains).



Figure 1. Bottleneck Plan Stockholm, geographic demarcation

3.5.3.2 Special conditions

A-Trains traffic along the route Stockholms central – Arlanda norra is governed by an agreement with the State. The agreement guarantees the operation of either four trains per hour in 15 minute intervals or six trains per hour in 8 to 12 minute intervals. A-Train trains operates track 1 and 2 at Stockholms central.

The stretch of line from Stockholm södra-Stockholm City-Tomtebodavästra (Citybanan) will become operational in the summer of 2017. Bearing this in mind, a special bottleneck plan will be published at the beginning of 2016.

3.5.3.3 North of Stockholms central

The capacity on the four-track stretch Stockholms central–Skavstaby is theoretically 20 train paths per hour and direction, but bearing in mind the differences in speed between different types of vehicle, the capacity on the outer tracks decreases to 16 trains per hour. On inner tracks, connections to the train path channels south of Stockholms central restrict the number of available train paths to 16 trains per hour.

Trains on inner track and outer track, respectively, shall normally be driven completely independently of each other on the stretch Stockholms central–Arlanda (outer track/Märsta (inner track)–Myrbacken. Crossing points¹ however, are located at the branch station Skavstaby. In order to avoid capacity losses, trains that are driven on different tracks, but which lack contact points with each other, make joint use of train path channels where this is possible. As with the four-track

¹ Crossing points in this context are understood to be points/switch connections where trains are allowed according to plan to be led over from an inner track to an outer track, and vice versa.

stretch of line south of Stockholms central, the platforms are positioned alongside the inner track system. The outer tracks are therefore preferably served by non-stopping trains (see Figure 3).

On the stretch of line north of Stockholms central, the bottleneck plan structure allows a total of 32 pre-planned train path channels according to the following subdivision:

- 16 train paths to and from the inner tracks on four-track stretch
- 16 train paths to and from the outer tracks on four-track stretch.

3.5.3.4 South of Stockholms central

The theoretical capacity on the route reaches the equivalent of 30 train paths, and to meet a rhythmic 15-minute traffic for the SL commuter canal system it consists of 28 pre-planned train paths per hour. The Swedish Transport Administration has reserved four train path channels per hour for the restoration of traffic as a result of disruptions (referred to as buffer paths), but these are not presented in the bottleneck plans. Altogether, this means that a maximum of 24 train paths per hour/direction are available.

In order to make maximum use of the capacity during peak traffic, it is assumed that all trains are driven at the highest allowable speed on the stretch of line in question, which is 80 km/h. The vehicle performance is assumed to be enough so that only one train path channel per train needs to be made use of during the design period.

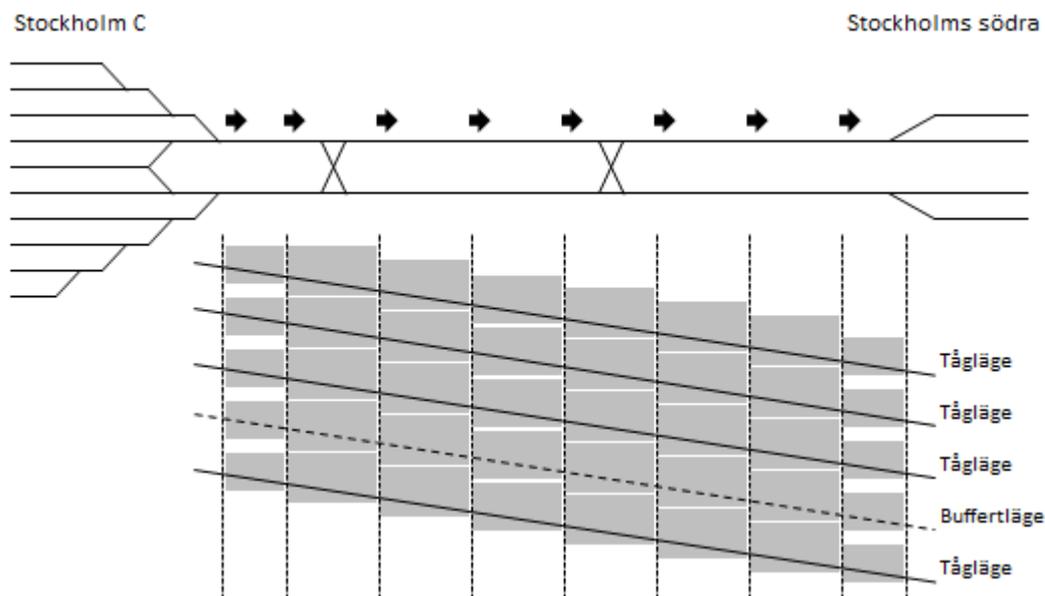


Figure 2: Graphic illustration of signal shadows and train path distribution on the stretch of line between Stockholms central–Stockholm södra (southbound direction)

Bottleneck plans are based on train path channels with two-minute intervals on the stretch of line from Stockholms central–Stockholm södra. An exception is made

every 15 minutes when a 3-minute gap is created. In this way, 15-minute frequency traffic on SL's commuter train routes is made possible. By operating the inner and outer tracks on the four-track stretch of line south of Stockholm södra alternately, train paths are created every fourth minute on the respective tracks.

Trains on inner tracks and outer tracks, respectively, shall normally be operated entirely independently of each other on the stretch Stockholm södra–Södertälje syd (outer tracks)/Södertälje hamn (inner tracks)–Järna. Crossing points² however, are located at the branch stations Flemingsberg och Järna. In order to avoid capacity losses, trains that are driven on different tracks, but which lack contact points with each other, make joint use of train path channels where this is possible³.

On the stretch of line south of Stockholms central, the structure of the bottleneck plan allows a total of 28 pre-planned train path channels based on the following distribution:

- 16 train paths to and from the inner tracks on adjacent four-track stretches
- 12 train paths to and from the outer tracks on adjacent four-track stretches.

3.5.3.5 Stockholm central

In order to achieve better utilisation of the track capacity at platforms, special planning conditions apply for Stockholm central. These concern primarily passenger traffic, but the capacity available on the platform tracks is also an important precondition in order for the flow of goods trains and other movements to be able to function efficiently without stopping. It is above all the platform capacity for Tracks 3–12 and 17-19, E6–E7 and C2–C4, but also the capacity for turning trains in Karlberg that are the limiting factors.

The traffic at Stockholms central is divided into three groups, with in part different preconditions:

- through-trains
- turning trains from the south
- turning trains from the north.

The planning assumptions apply during peak traffic; at other times, exceptions can be made from them in order to meet specific wishes.

Through-trains

Through-trains are trains that pass Tracks 10–19, with or without stopping. Regional and interregional trains normally operates on track 10-12 and 17-19, commuter trains normally operates on track 13-16 until Citybanan starts to operated.

Since platform capacity is limited the possibilities for long stops are few. For regional and interregional trains are the stopping times restricted in length to ten

² Crossing points in this context are understood to be points/switch connections where trains are allowed according to plan to be led over from an inner track to an outer track, and vice versa.

³ An example of jointly utilised train path channels is to operate on the stretch Södertälje centrum–Järna (inner tracks) to Mölnbo and Södertälje syd–Järna (outer tracks) towards Nyköping in the same time window.

minutes. The purpose is to be able to utilise each track for a train every 15th minute and to anyway have a certain margin of time between trains. During off-peak traffic, exceptions can be made for fulfilling special wishes, for example night trains with lay-overs, equip delayed trains and at events. For commuter trains are the stopping times restricted in length to four minutes.

Coupling and uncoupling of railcar trains

The coupling together of railcar trains should be avoided during peak traffic periods and should only be carried out on tracks with centrally-located intermediate signals (Tracks 8–10 and 12–19). The changing of train parts between different tracks may only be performed during off-peak traffic since shunting movements consume capacity in one of the most sensitive parts of the station.

Trainset changes

In peak traffic, only safety-related trainset changes are allowed to be made at Stockholms central. Trainset changes require more track, and the risk of causing disruption to other traffic is therefore substantial.

Turning trains from the south

Turning trains from the south consist primarily of regional and inter-regional trains. These trains arrive on Tracks 17–19 and continue after the stop via E-Group to Karlberg where turning takes place on Track M, D1 or D2. After turning, the trains are driven via C-Group to Tracks 10–12. Since the capacity is restricted for most of these track groups the stopping times for respective groups should be minimised.

Turning on platform tracks that requires right-hand track use when approaching or departing from Stockholms central is only allowed during off-peak traffic and on Saturdays and Sundays to a limited extent. This procedure assumes that no train path channels in the opposite direction of operation are put into use. For the rest of the time, the following time frames shall be applied for turning trains from the south.

Railcar train and loco-hauled train with driving trailer/two locomotives / (SMS train)

Activity	Time frame
Stop at Stockholms central (Arrival Tracks 17–19)	≤ 10 minutes
Stop at Norra Bantorget (Service Tracks E6–E7)	≤ 20 minutes
Holding/turning at Karlberg (Track M, D1 or D2)	≤ 20 minutes ⁴
Stop at Norra Bantorget (Service Tracks C2–C4)	≤ 30 minutes
Stop at Stockholms central (Departure Tracks 10–12)	≤ 10 minutes

Loco-hauled train

Locomotive terminal looping at Stockholms central/Norra Bantorget is only allowed during off-peak traffic or in connection with traffic disruptions. At other

⁴ When Tracks M, D1 and D2 are occupied at the same time

times, loco-hauled trains are turned at Hagalund if the period between arrival at and departure from Stockholms central exceeds 120 minutes (time for reprovisioning added in certain cases).

Those times that are allowed for terminal looping take place at E Group followed by a reversing movement to Karlberg with the same time as for railcar trains (see table above).

Turning trains from the north

Turning trains from the north consist primarily of regional and inter-regional trains. These trains arrive on Tracks 1–8 in order to reduce the sensitivity to disruption of traffic on Tracks 10–12. The possibilities for the efficient and flexible operation of this part of the station is restricted by a number of factors:

- Tracks 1–2 are only available for Arlanda Express airport shuttle services.
- Platform length varies significantly from track to track.
- The possibility for looping on Track 3 is lacking, and is very limited on Track 8.
- The possibility for simultaneous entry and exit varies between tracks.
- Movements to and from Track 8 (north side) is dependent on the traffic on Tracks 10–12. Operations on Track 8 should therefore be limited and must be coordinated with the traffic to Tracks 10–12.

In order to make it possible for sufficient track capacity to be offered, the following time frames shall be applied for turning trains coming from the north.

Railcar train and loco-hauled train with driving trailer/two locomotives / (SMS train)

Activity	Time frame
Stop at Stockholms central without reprovisioning (Tracks 1–8)	≤ 20 minutes
Stop at Stockholms central with reprovisioning (Tracks 1–8)	≤ 30 minutes

Loco-hauled train

The stopping time for loco-hauled trains with terminal looping is max. 30 minutes at Stockholms central. Locomotive loop turning, however, cannot always be performed according to wishes for example during peak traffic. In certain cases looping is impossible because the tracks are too short.

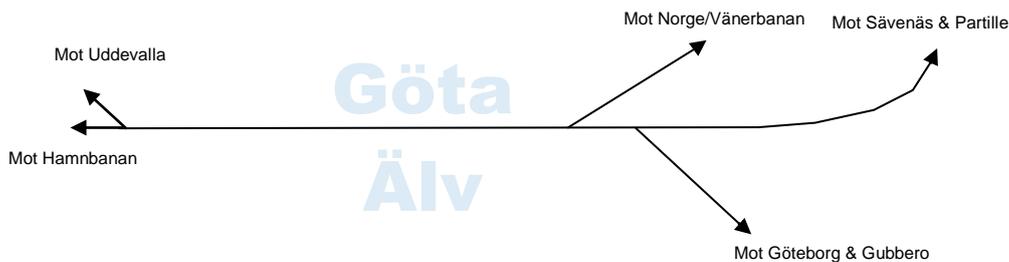
Hamnbanan

Göteborgs hamnbana, which is included in the bottleneck pans, even though this in its entirety is considered to be located within the operational sites Göteborg Kville, Pölsebo and Göteborg Skandiahamnen, is in practice a single-track line with densely positioned signals in order to provide ample capacity for trains that are driven in the same direction, but not for oncoming traffic. Göteborgs hamnbana has sufficient capacity to cope with four trains per hour and direction. In addition to these eight trains, one additional train can also run on one of the sub-stretches to/from Pölsebo every hour.

Marieholmsbron

The stretch of line from Göteborg Kville over the Göta älv at Marieholmsbron has three different destination points:

- Göteborg Marieholm for trains to Norway /Vänerbanan
- Gustavsplatsen for trains to Sävenäs and Västra stambanan
- Olskrokskrysset for trains to Göteborgs central and Gubbero (Västkustbanan and Kust till kust-banan).

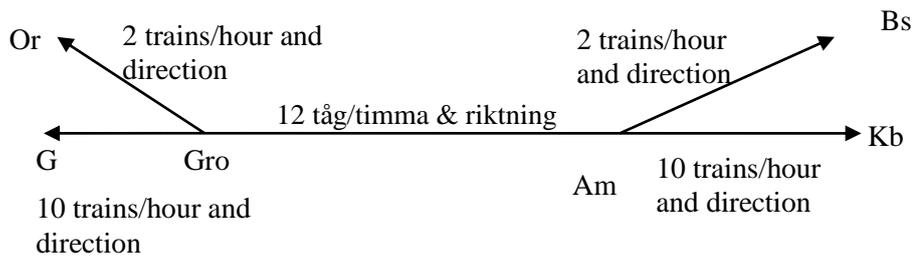


On the stretch Göteborg Kville–Olskroken/Göteborg Marieholm, there is room for four freight trains and two passenger trains per hour and direction. This makes it possible to operate half-hourly services on Bohusbanan and that the freight traffic on Göteborgs hamnbana can be offered at least one train path per direction and hour via Olskroken to/from each route and to Sävenäs Marshalling Yard

Marieholmsbron is openable for shipping along Göta älv. In general, rail traffic has precedence over boat traffic.

Gårdatunneln (Gubbero–Almedal)

On the sub-section Gubbero–Almedal, there are a total of 12 bookable train paths per hour and direction. These divide up in Gubbero towards Göteborg C and towards Olskroken. In Almedal, the train paths are divided up towards Kungsbacka and Borås, respectively (see figure).



3.5.4.3 Göteborgs central

General

Göteborgs central is a terminus with two double-track connections to Olskroken and to Gubbero. In addition, there is a single-track connection with a low speed that is used by mail trains, for shunting and, in exceptional cases, by other traffic. Adjacent to the platform tracks there is a holding rail yard and a depot with a cleaning hall and two different service halls for vehicles.

The rail yard has low-speed operations. The capacity is determined in the first place by the number of crossing trains and shunting routes.

Subdivision of platform tracks

In order to create the highest possible capacity, the platform tracks must be used on the basis of a certain pattern in order to avoid crossing train paths between the different lines. Trains that arrive from a certain line may not for the same reason depart towards another line unless the situation is studied in each individual case. The best flow is achieved by using the track groups in accordance with the following table, which was also a precondition when drawing up the bottleneck plans.

Track group	Comprises tracks	Used to/from
A	1–7	Västra stambanan
B	8–10	Norway/Vänerbanan, Bohusbanan
C	11–16	Västkustbanan, Kust till kust-banan

Intervals between trains on platform tracks

The trains have predetermined departure and arrival times at Göteborgs central every fifth minute. This interval is determined by the fact that it takes about 4.5 minutes from the departure of a train until the next train can arrive as a consequence of intersecting train paths at the terminus rail yard.

Shunting

During the peak traffic periods (06.00–08.00 hours and 16.00–18.00 hours), shunting can only take place after special consideration in each individual case. Each shunting movement shall then be placed on an equal footing with a train movement in a corresponding track section. In order for shunting to be possible, a train path shall thus be unused so that the shunting movement can use the interval in time that will thereby be made available

3.5.5 Malmö area



3.5.5.1 Coordination with Danish stretch of line

For Öresundsförbindelsen (the Öresund link), the selected train path channels are coordinated so that they also serve on the connecting Danish section from Peberholm to København H (passenger traffic) and the border station Padborg (freight traffic).

3.5.5.2 Character of trains on different sub-sections, stopping scenario, etc.

On the stretch of line Lund- Hässleholm, extensive track engineering works are intended to be carried out, which requires the need for additional time for several of the coming timetables. The extent of the additional time will be specified before each timetable.

The fast trains on Södra Stambanan normally make stops in Hässleholm, Lund, Malmö central, Triangeln and Hyllie. Between Hässleholm and Lund, trains can make stops at one or two intermediate stations if the performance of the train is sufficient to meet the stipulated time in Hässleholm, or *alternatively* (whenever possible) leave earlier from Hässleholm (odd trains) or arrive later (even trains).

On Väst kustbanan, in the same way trains normally make stops at Helsingborg and Landskrona.

On the stretch of line Hässleholm–Malmö Marshalling Yard, the slower trains are divided into trains that are assembled for 100 km/h, 90 km/h and 80 km/h, respectively. On the stretch Malmö Marshalling Yard–Peberholm, all paths can be used by train sets that have been assembled for 80 km/h.

For the stretch Malmö central–Hyllie (Citytunneln)–Lernacken only a small number of vehicle types are driven owing to the tunnel restrictions. Since all these vehicles are of the “fast” category, there are no slow train paths on this stretch of line.

For the stretch of line Malmö Marshalling Yard–Fosieby–Lernacken, there are only slow paths since most of the stretch is only operated by freight trains.

3.5.5.3 Train paths for restoration

For the stretch of line Lund–Malmö–Hyllie, there are 1–2 restoration paths per hour and direction. These shall in the normal case be vacant or *alternatively* time for them is created in some other way and then in the first instance that one train path is left vacant, for example because no-one has applied for it.

3.5.5.4 Malmö central

In order to achieve better utilisation of the track capacity at platform tracks, special planning conditions apply for the through-tracks 1–4 at Malmö central. These tracks shall be used on the basis of the following principles:

- Trains shall be through-trains, i.e. not have Malmö central as their final or outgoing station.
- The composition of the train shall not be changed, for example in the form of the coupling on or uncoupling of a trainset(s)
- The stopping time shall be between two and four minutes.

These planning conditions apply for the larger part of the traffic day. Certain exceptions can be made, in the first place during off-peak traffic (approximately 19.00–06.00 hours), to fulfil special wishes.

Switching between train track and depot means in most cases crossing movements, and shall be minimised in peak traffic.

3.5.5.5 Helsingborg Central

Platform tracks are optimised for train lengths of up to 160 m. Train paths that are included in the bottleneck plan do not permit general operation with trains that are longer than 160 m. The possibilities to conduct operations using long trains are studied in the timetable process in each individual case.