

Final Report

report.crosschannelrail.eu



Jon Worth

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Executive Summary

There is considerable appetite for more trains, to more destinations, through the Channel Tunnel. This report sets out what types of trains are suitable for high speed long distance services from London to stations in Continental Europe, what stations beyond those currently served could get direct trains from the UK, and what operators could run those trains.

The report concludes that there are **at least four and maybe even five possible types of train** that could be deployed on these services, in addition to the two existing types operated by Eurostar.

Running **2x 200m long trains coupled together**, rather than a single 400m long unit as Eurostar does currently, poses no problem in principle, but may do in practice, especially when accounting for **Channel Tunnel evacuation rules**. The **problem particularly applies to the double deck Avelia Horizon trains ordered by Eurostar**, and less to other designs.

Re-opening stations that have had Eurostar stops in the past – notably Ebbsfleet, Ashford, Calais-Fréthun and Marne-la-Vallée – is obviously sensible, and is mostly a question of who bears the costs.

Serving new destinations is more complicated, but two Corridors – to **Western Germany** (serving Köln and Frankfurt) and to **Switzerland** (serving Basel and Zürich) – look to be possible in the medium term without major adaptations of stations.

Southern France and Southern Germany (where stations require complex and costly re-building) look to be the most difficult. South Western France and the French Alps are operationally possible, but the question is more whether any operator would try these routes. There is a little potential for more trains to Netherlands.

Among the operators, **Eurostar** is going to run the majority of trains from London to Continental Europe for the foreseeable future, although there are major question marks about the approach of the incumbent operator. **Virgin Trains** – with a clear if limited strategy – is the most likely rival by the early 2030s. **Trenitalia**, as the only potential operator that can overcome the lack of access to Temple Mills depot, should not be ruled out, but might of its own accord opt against London. Despite its radical ideas, **Gemini Trains** looks unlikely to succeed from here, while **Evolyn's** strategy was not clear from the outset. Swiss Federal Railways **SBB** might join in too, but we will only know in 2026 how this could happen, and **Deutsche Bahn** is unlikely to offer direct trains to London in the short to medium term.

Introduction

I, Jon Worth, am the author of this report and initiator of the #CrossChannelRail¹ project.



Like the vast majority of my railway work, this all began with an intellectual itch. Having read so many incorrect news stories about the future of the Channel Tunnel, I set about writing an answer-all-the-questions post about the topic².

Little did I know that 10000 words about the Channel Tunnel – the longest blog post I had ever written – would also turn out to be the most read. There is obviously untapped appetite for public information about this issue.

It was then an easy decision to make: to do a project similar to my existing #CrossBorderRail³ work, and focus on the Channel Tunnel. In the same way as #CrossBorderRail is organised, #CrossChannelRail is crowd funded, and organisationally supported by the Berlin based not for profit MitOst e.V.⁴ The total budget for the project – including all the research work – was €2795 from 71 individual donors. I owe huge thanks to all of them. This funding model means the work is completely independent of any companies within the railway industry, and also independent of all governments (regional, national and EU level).

The main research on the ground was conducted between 16th March and 4th April 2025, with further desk research conducted intermittently between April and November 2025.

Throughout the entire project dozens of people have helped me in a variety of ways – telling me things, sending me articles and data, walking around stations with me, hosting me during my journeys. The report however quotes none of those people in person – to protect their identities and those of their organisations. Wherever possible assertions made in the report are backed up with links to appropriate public sources. Any errors or omissions in this document are my responsibility, and mine alone.

Should additions or corrections be necessary, further versions of the report – explaining those corrections – might be published in future.

1 #CrossChannelRail website: <https://crosschannelrail.eu/>

2 "The future of long distance train services through the Channel Tunnel" 17.01.2024 <https://jonworth.eu/the-future-of-long-distance-train-services-through-the-channel-tunnel/>. Much of the information in that post has now been superseded.

3 #CrossBorderRail website: <https://crossborderrail.eu/>

4 MitOst e.V. has no administrative or legal responsibility for this final report – the entire responsibility for the content is with Jon Worth alone. See the section Legal at the end of the report for more information

Research method

My aim was to assess all of the types of trains that could be used for long distance services through the Channel Tunnel, work out what stations could be served direct from London, and run the rule over the operators (current and future) of those trains.

The research had to be built in this order – as working out what sorts of trains can operate or not is an important limiting factor on what stations can be served and how. And once you know what is possible, operationally, you can then conclude what company or companies would be in a position to operate those routes.

The first stage of the work was research on the ground.

Train types were assessed as a passenger, in as far as possible, by riding the train type where it is in regular service, and using the closest possible equivalent where it is not. Further rolling stock assessment was conducted through desk research, in order to assess likely delivery times and possible other limitations.

I visited all of the stations that could viably be served from London. In total this involved going to 63 stations. Meetings were organised with local experts and activists in as many of these stations as possible, with the aim to understand how the layouts of the stations work, and to understand possible future upgrade works.

Assessment of operators was conducted primarily through meetings and conversations with four of the seven companies covered by the report, and through desk research with the three companies that did not respond to requests for information.

What was not included?

I had to draw a line somewhere, so these are the things that are not covered in the report.

First, I restricted myself to stations up to about 6 hours trip time from London, meaning Berlin, Hamburg, Milano and Barcelona were not included in this research. There might be leisure trip potential to these places, or rolling stock maintenance moves with passengers on board, but even 6 hours is at the upper end of what business passengers are likely to tolerate⁵. Given it is already complicated to run through trains to London, the shorter the route (and hence the maximum passenger potential) the better.

5 "München-Berlin in 4 Stunden: Bahn rechnet mit Verdoppelung der Reisendenzahl" 11.09.2017 <https://www.muenchen.tv/muenchen-berlin-bahn-rechnet-mit-verdoppelung-der-reisendenzahl-235403/> examines the 6 to 4 hour reduction for München-Berlin trips

Second, only high speed daytime trains through the Channel Tunnel were examined. That means no night trains. The economics of night train operation in Europe are generally complicated, even before the difficulties relating to luggage controls and passport checks for the Channel Tunnel are accounted for. Plus all night train designs in Europe are currently locomotive hauled. Locomotive axle loads of 21.5-22.5t pose problems on French high speed lines and HS1 in the UK.

Third, stations in the UK anywhere outside of HS1 are not included (and that includes the former Eurostar terminal at London Waterloo). Loading gauge on the UK's railway network is much more limited than in continental Europe and on HS1, and currently no manufacturer has a rolling stock product for the UK loading gauge, *and* the 55cm and 76cm platform height to serve stations on HS1 and Western Europe⁶. The absence of a future connection between HS1 and HS2, and the congestion of the North London Line, further complicates efforts to serve stations in the UK to the north or west of London. For more background on stations in the rest of the UK, please see Campaign for Better Transport "*Runways to Railways: unlocking the potential of the Channel Tunnel*"⁷.

Fourth, there is no examination of the future of the service for transporting vehicles through the Channel Tunnel, commonly branded as *LeShuttle*, and operated by Getlink. Likewise no extension of any vehicle transport service to any other destination is included.

More generally, stabling and maintenance depot capacity – an issue that has risen in importance throughout 2025 – was not examined in detail in the course of #CrossChannelRail, and could be the subject of a further project in 2026. It is touched upon in various sections of the report.

Track and Channel Tunnel Capacity

There is adequate capacity on all of the most important parts of the track infrastructure for future long distance trains through the Channel Tunnel – HS1 in the UK, the Channel Tunnel itself, LGV Nord in France between the Channel Tunnel and Paris, and HSL 1 between the France-Belgium border and Bruxelles.

Some known track capacity constraints exist – at least at peak times – through Bruxelles, on the LGV Sud Est south east of Paris, between Basel and Zürich, around Frankfurt, around Köln, and through Antwerp.

6 Trains being procured for HS2 are UK loading gauge, but for a platform height of 1115 millimetres and without steps, so cannot be used on HS1 and in Continental Europe without adjustment https://en.wikipedia.org/wiki/British_Rail_Class_895

7 Full report: <https://bettertransport.org.uk/wp-content/uploads/2025/04/Runways-to-Railways-Report.pdf>
Summary: <https://bettertransport.org.uk/wp-content/uploads/2025/04/2025-04-runways-to-railway-summary.pdf>

However this report makes a central assumption: that it is not track capacity on the main lines, but station capacity – both in terms of tracks and platforms in stations, and the (absence of) terminal buildings – that present the most obvious and immediate constraint on future operations. With that in mind, and given the report concludes there are ways around some of the constraints at stations, a possible future follow up research project could examine track capacity in more depth.

But for now assume that track capacity is not where this is all going to succeed or fail.

Rolling Stock

General observations

The two existing train types that operate long distance high speed services through the Channel Tunnel (Eurostar e300 and e320) are both single units, each train type just under 400m. Yet none of the trains that Eurostar or any of its rivals are considering purchasing have this format. Instead trains around 200m length would be purchased, with the opportunity to couple two of them together to make a 400m long formation.

The notion has long persisted that trains must be long single units as cross passages to the service tunnel in the Channel Tunnel are 375m apart, but this is not the case – a 2x 200m formation is permitted in principle⁸. This was the system Deutsche Bahn wanted to use for its planned London trains in the early 2010s, before aborting the plans⁹.

Ordering 200m trains brings numerous advantages. First, all the main manufacturers are offering their high speed trains as 200m units as this fits with operational models on high speed networks elsewhere in Europe. In the case of Alstom Avelia Horizon and Talgo Avril it is hard to envisage how a single 400m version would even be engineered. Second, in the specific case of the Channel Tunnel operations, it allows some stations to be served that could not accommodate a 400m train. And third, it allows a train to be split somewhere en route, to allow one train departing from London to serve multiple destinations.

8 “Change in safety rules opens door to more cross-Channel operators” 18.12.2024, Railway Gazette International <https://www.railwaygazette.com/high-speed/change-in-safety-rules-opens-door-to-more-cross-channel-operators/65571article>

9 “German trains test Channel tunnel route” 19.10.2010, The Guardian <https://www.theguardian.com/uk/2010/oct/19/german-trains-test-channel-tunnel>

Alstom TMST



In service for	Eurostar (8 in service)
Built	1992-1996
Train format	2 power cars, 18 carriages with Jacob's bogies, axles of power cars and first and last trailer bogies powered (12 axles powered)
Electrification systems	25kV ac, 3kV dc, 1.5kV dc
Can operate in	HS1 (UK), France, Belgium
Train length	394m
Seats	758
Also known as	e300, Class 373
Tested	Not tested during this project directly, but I have taken dozens of trips on these trains over the years

The original Eurostar trains, now reaching the end of their lives, and due to be retired by the early 2030s¹⁰. These trains are the only Channel Tunnel trains that are UK loading gauge, but the 750V dc equipment to allow them to serve Waterloo has been decommissioned. There is nowhere that Eurostar could use these trains other than London-Paris, London-Bruxelles, or other destinations in France.

¹⁰ "Eurostar orders double decker trains... but will we see them in the UK? | Ep 108" 30.10.2025, Green Signals podcast – comments by Gareth Williams of Eurostar

Despite the age of the trains, the ride quality of TMST trains remains amazingly good, but – in its single deck variant anyway – this is a design that is no longer manufactured, so there is little to conclude regarding the future of the Channel Tunnel here. And the trains are obviously Channel Tunnel compatible.

The trains are a high floor design – passengers need to climb steps to enter, and wheelchair users need a lift that is present on the platforms of the stations served. There are also no regular bicycle spaces on these trains.

Siemens Velaro

Siemens Velaro - 16 carriage version



In service for	Eurostar (17 in service)
Built	2011-2018
Train format	16 carriages, standard bogies, distributed traction (8 powered carriages (32 axles powered), 8 unpowered)
Electrification systems	25kV ac, 3kV dc, 1.5kV dc Provision to add 15kV
Can operate in	HS1 (UK), France, Belgium, Netherlands Provision to add Germany
Train length	399m
Seats	902
Also known as	e320, Class 374
Tested	31.3.2025, Bruxelles Midi – London St Pancras, Eurostar

The second generation of trains in service for Eurostar. Purchased with the aim of expanding to new destinations that – apart from Amsterdam – did not happen, and instead Velaro trains have been largely used to replace Alstom TMST units. Even though just a decade old, these trains are already showing signs of heavy use inside, and feel worn. The 16 carriage version is obviously Channel Tunnel compatible.

There are some ways these trains could be re-deployed. As they are approved for Netherlands, using them on ex-Thalys non-Channel Tunnel routes for Eurostar is one option, as is using them on routes to other places in France. However with Eurostar purchasing new trains (see below), and the 400m train length being a constraint, I judge it unlikely the provision for 15kV for Germany will ever be added.

The trains are a high floor design – passengers need to climb steps to enter, and wheelchair users need a lift that is present on the platforms of the stations served, and there is also a back-up electric lift on board. There are no regular bicycle spaces on these trains.

Siemens Velaro - 8 carriage version



In service for	Deutsche Bahn (90 on order in latest batch, at least 30 already in service)
Built	From 2021
Train format	8 carriages, standard bogies, distributed traction (4 powered carriages (16 axles powered), 4 unpowered)
Electrification systems	25kV ac, 15kV ac, 3kV dc, 1.5kV dc
Can operate in	Belgium, Netherlands, Germany Provision to add other countries
Train length	200.7m
Seats	439
Also known as	ICE3neo
Tested	27.3.2025, Köln Hbf – Liège-Guillemins, Deutsche Bahn

The latest Deutsche Bahn ICE series – an updated version of the Siemens Velaro of three previous generations used by DB, and similar to Velaro units for railways in Turkey and Egypt. From a passenger point of view these are the best high speed trains operating in Europe currently – quiet, well designed, and with excellent interiors.

The ICE3neo – as currently ordered by Deutsche Bahn – cannot run to London as it lacks the TVM430 signalling system for French high speed lines and the Channel Tunnel, although this could theoretically be added to later batches of the delivery. ETCS (which these trains have) will supersede TVM430 by the mid-2030s at the earliest, so these units in as currently configured are not a short term solution.

Were another company (or Deutsche Bahn itself) to order this train type to be able to operate in the Channel Tunnel, there would likely be no major problem configuring it and approving it for the Channel Tunnel, in a 200m and 2x 200m formation.

The trains are a high floor design – passengers need to climb steps to enter, and wheelchair users need a lift that is present on the platforms of the stations served, and there is also a back-up electric lift on board. These trains do have spaces for regular bicycles.

Siemens Velaro Novo - 7 carriage version



Option to order	Gemini (10 trains)
Built	From 2026 (if ordered)
In service	From c. 2030 (if ordered)
Train format	7 carriages, standard bogies, distributed traction (4 powered carriages (16 axles powered), 3 unpowered)
Electrification systems	25kV ac, 15kV ac, 3kV dc, 1.5kV dc
Can operate in	HS1 (UK), France, Belgium, Netherlands, Germany, Switzerland
Train length	202m
Seats	c. 470

Rather than opt for the standard Velaro, Gemini had an option to order 10 Siemens Velaro Novo trains had it been granted access to Temple Mills depot (see more about Gemini below). Velaro Novo is a combination of the 300km/h+ speed of Velaro, with the longer car body and lighter construction of the Siemens ICE4 in service with Deutsche Bahn. This allows a 200m train to have only 7 rather than 8 carriages, reducing the space lost with doors and gangways and hence increasing the passenger capacity. In common with other Velaro variants there would likely be no major problem approving this train for the Channel Tunnel, in a 200m and 2x 200m formation.

The trains are predominantly a high floor design, but how accessibility would work is not altogether clear. Siemens has engineered low floor sections in the middle of carriages in the Railjet 2¹¹, so step free access into at least one carriage in Velaro Novo could be possible, but that in turn could pose problems regarding evacuation in the Channel Tunnel (see below for more detail on Channel Tunnel evacuation rules). Were an entirely high floor Velaro Novo ordered this would work the same way as existing Velaro designs – steps for passengers, lifts on platforms and back-up lifts on board for wheelchair users. As a new train design post the 2021 change to EU law, any Siemens Velaro Novo would have to have spaces for regular bicycles.

11 "Hurra...die neuen Railjets sind da!" 22.03.2024, ÖBB <https://www.unseroeebb.at/de/artikel/2024/neue-railjets>

Alstom Avelia Horizon



Ordered by	Eurostar (30 ordered, options for 20 more) Evolyn also had an agreement to order this train type (12)
Built	Late 2020s
In service	From 2031
Train format	2 motor cars, 9 short double deck passenger carriages, Jacob's bogies, 8 axles powered
Electrification systems	25kV ac, 15kV ac, 3kV dc, 1.5kV dc
Can operate in	Approval for France currently ongoing, eventually also HS1 (UK), Italy, Belgium, Netherlands, Germany, Switzerland
Train length	202m
Seats	540 (as announced by Eurostar), 600+ (other operators)
Also known as	Celestia, TGV-M
Tested	Not yet in service, so cannot be tested Closest equivalent TGV Duplex tested 16.3.2025, Montbard – Paris Gare de Lyon, SNCF TGV inOui

Alstom's flagship high speed train is an updated version of the TGV Duplex and Euroduplex designs in use since the early 2000s – with shorter power cars and one more carriage allowing for a higher passenger capacity. The first trains of the series are due to enter into service with SNCF in 2026.

The order book is long: SNCF has ordered 115 of the trains, French private company Proxima/Velvet 12 and Moroccan railways ONCF 18, as well as Eurostar's order of 30 (with options for 20). However Alstom's press release about the Eurostar order¹² makes it clear, the SNCF and Eurostar orders come from a joint framework contract, so Eurostar deliveries can start before SNCF deliveries conclude.

Alstom's Jacob's bogie design is certain to lead to a smooth ride, but staircases inside and comparatively few doors and few powered axles lead to slow boarding and more sluggish acceleration than distributed traction designs. This means the trains lend themselves to routes with very few stops.

Disabled access is also complicated with this train design where platforms are 76cm (HS1, Belgium, Netherlands, Western Germany). If the Horizon trains ordered by Eurostar use the same on board lift as the trains ordered by SNCF, this lift would need to be complemented by a manually deployed ramp in stations in these countries. 55cm platforms (France, Switzerland, Italy) pose fewer headaches. As a new train design (post the 2021 change to EU law), any Alstom Avelia Horizon has to have spaces for regular bicycles.

As HS1 and the Channel Tunnel are built to at least UIC loading gauge there is no problem in principle with double deck trains reaching London St Pancras, including stopping at Ashford. But the design of the train with power cars and a problematic door placement could cause headaches for compliance with Channel Tunnel evacuation rules (see below).

12 "Eurostar chooses Alstom for 30 Avelia Horizon very high-speed trains" 22.10.2025, Alstom <https://www.alstom.com/press-releases-news/2025/10/eurostar-chooses-alstom-30-avelia-horizon-very-high-speed-trains>

Alstom Avelia Stream



Ordered by	Virgin Trains (12 ordered)
Built	Late 2020s
In service	2030
Train format	7 carriages, standard bogies, distributed traction (5 powered carriages (but only half the axles on each power car powered, so 10 axles powered), 2 unpowered)
Electrification systems	25kV ac, 3kV dc, 1.5kV dc 15kV ac being investigated
Can operate in	Intention is HS1 (UK), France, Belgium, Netherlands Being investigated for Germany, Switzerland too
Train length	200m
Seats	c. 470
Also known as	Pendolino, post-Pendolino
Tested	Not yet in service, so cannot be tested Closest equivalent ED250 tested 11.6.2025, Gdańsk Wrzeszcz – Warszawa Wschodnia, PKP IC

Alstom’s single deck high speed train family is derived from Italian Pendolino designs from the 1990s and early 2000s, although despite the name the trains will not tilt. However Avelia Stream – as to be ordered by Virgin Trains – has important design

changes compared to its closest cousins, the ED250¹³ in service in Poland with PKP IC and the ETR675¹⁴ in Italy with Italo. Each carriage is to be lengthened 2m, giving a 200m train with 7 carriages, and the speed upped to 300km/h from the current 250km/h. This might also necessitate new air suspension as ED250 and ETR675 have only coil springs.

While the order book at the Savigliano works of Alstom Italy is comparatively short, and Alstom can draw on its French experience to ensure smooth approval of these trains on the French network, Alstom generally does not have a very good record delivering its new trains on time at the moment, regardless of the works where they are manufactured.

The predecessor ED250 is a reasonable enough train, but the standard of all the fittings – door buttons, toilet fittings, overhead racks, seats, lighting – is a little less solid and well thought out than those in a Siemens Velaro. Ride quality is also a bit on the bumpy side, although that would be alleviated if air suspension were fitted.

Like other high floor designs, Avelia Stream is going to need lifts on either platforms or on board, or both, for wheelchair users, and passengers will need to climb steps to board. Place for regular bicycles will have to be provided too as it is a new train design, legally.

13 PKP class ED250 https://en.wikipedia.org/wiki/PKP_class_ED250

14 New Pendolino - ETR675 [https://en.wikipedia.org/wiki/New_Pendolino#ETR_675_\(Italy\)](https://en.wikipedia.org/wiki/New_Pendolino#ETR_675_(Italy))

Hitachi ETR1000



In service for	Trenitalia (at least 50 in service, more on order)
Built	2013 onwards
Train format	8 carriages, standard bogies, distributed traction (4 powered carriages (16 axles powered), 4 unpowered)
Electrification systems	25kV ac, 15kV ac, 3kV dc, 1.5kV dc
Can operate in	Italy, France, Spain Versions for Germany, Austria currently in planning
Train length	202m
Seats	457
Also known as	Frecciarossa 1000, Zefiro V300, ETR 400 (IT), Serie 109 (ES)
Tested	4.4.2025, Paris Gare de Lyon – Lyon Part Dieu, Trenitalia

The workhorse of Italian high speed rail, Trenitalia has continued to order more and more trains of this design, and would have used 10 of these trains for services to London had its bid for access to Temple Mills been successful. The Hitachi ETR1000 is an extremely solid train – well built, quiet, and generally thoughtfully designed. The only major design shortcoming in the trains as currently in service for Trenitalia is the lack of adequate racks for large pieces of luggage, a problem that is easy to remedy. The France-compatible variant has TVM430 (backwards compatible with the older TVM300), allowing the train to operate on all high speed lines in France, and hence is compatible with the signalling used through the Channel Tunnel and on HS1.

The train is a high floor design, meaning a lift on the platform is used for wheelchair users. Steps are needed to enter the train for everyone else. As a train design that pre-dates the new EU law, no ETR1000 currently in service conveys regular bicycles.

Talgo Avril



In service for	Renfe (30 built, not all in service)
Built	2012 onwards
Train format	2 motor cars, 12 short passenger carriages, with single axles between the carriages, 8 axles powered
Electrification systems	25kV ac, 3kV dc, 1.5kV dc
Can operate in	Spain Approval for France currently ongoing
Train length	201.8m
Seats	507 (normally), 581 (all standard class Avlo version)
Also known as	Class 106
Tested	19.3.2025, Madrid Atocha – Barcelona Sants, Renfe Avlo

When Renfe ordered these trains, there was the idea they would one day be used to run to London. Now more than a decade on, the trains are not even cleared to run in France, and their operation in Spain has been beset by problems, most recently cracks to bogies. At the time of writing no future Channel Tunnel operator is considering these trains, and Renfe has scaled back its expansion plans.

The test ride I took on the train leaves me with the impression that these are the worst high speed trains in Europe from a passenger point of view, with the vibration at high speed being unpleasant. Also the 3+2 seating – allowing a high total seating capacity – might make sense for operators, but is uncomfortable for passengers.

The train offers step free access at all doors at 76cm platforms, but would need lifts for wheelchairs on platforms in countries with 55cm platforms (France, Switzerland). As the train was designed prior to the 2021 change of EU law, no Talgo Avril conveys regular bicycles.

Rolling stock and Channel Tunnel evacuation rules

Rules for the evacuation of passengers in the Channel Tunnel make a distinction between a **controlled** and an **uncontrolled stop** of a train in an emergency situation.

How uncontrolled stops are handled has been beset with confusion in the public debate for years. The idea has erroneously persisted that a minimum train length of 375m is required for trains to be allowed to operate, so as to ensure there would always be at least one passenger door close to a cross passage to the service tunnel. But *LeShuttle* truck shuttles (where drivers are sat in a single carriage)¹⁵, and proposed North of London TMST trains¹⁶ and Nightstar night trains¹⁷ have never had 375m between doors. In these cases the walkway along the side of the running tunnel would have to be used.

But train door placement does matter in the case of an evacuation with a controlled stop, albeit in a slightly different way. And that is what is a concern here.

A controlled stop is where the train with the passengers on board is not in an immediately critical situation, and the driver can bring the train to a standstill at a designated place in the tunnel as required. However this includes the case of a power cut, or smoke ingress in the running tunnel from a fire on board another train.

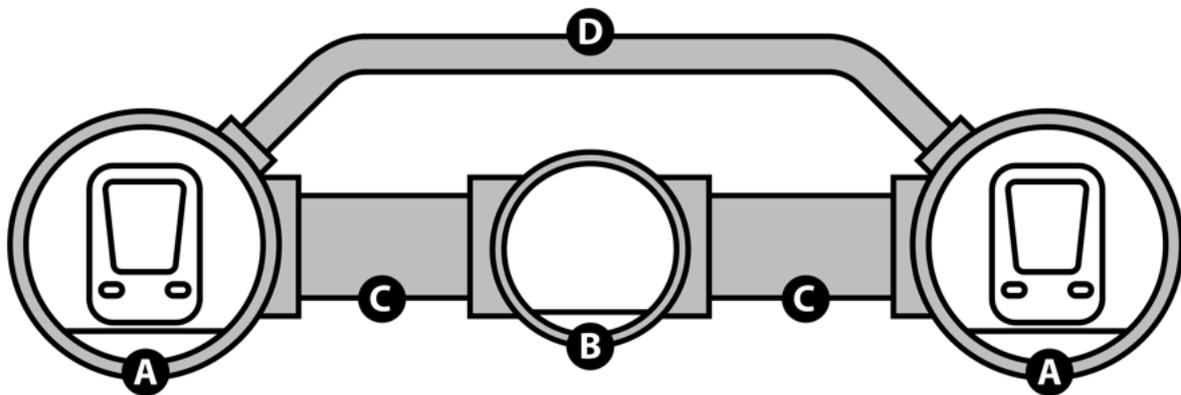
With current rolling stock used through the Channel Tunnel (TMST and 16 carriage Velaro trains) the procedure in the case of a controlled stop means aligning the front

¹⁵ LeShuttle – Freight vehicle shuttle trains https://en.wikipedia.org/wiki/LeShuttle#Freight_vehicle_shuttle_trains

¹⁶ British Rail Class 373 – Types https://en.wikipedia.org/wiki/British_Rail_Class_373#Types

¹⁷ Nightstar (Train) – Rolling Stock [https://en.wikipedia.org/wiki/Nightstar_\(train\)#Rolling_stock](https://en.wikipedia.org/wiki/Nightstar_(train)#Rolling_stock)

passenger door with a cross-passage between the running tunnel and the service tunnel, to allow evacuation through that door. Evacuation can be through another door or doors as well if the safety situation allows, even if those doors are not near a cross passage, but the principle is clear: a one door evacuation is permissible and in some cases necessary or desirable.



A - Running tunnel | B - Service tunnel | C - Cross-passage | D - Piston relief duct

Once the driver has stopped the train aligned with the cross-passage (there are markers in the running tunnel for this purpose), all passengers can be evacuated there. Persons with reduced mobility and wheelchair users can also be evacuated through this one door, and special narrow evacuation wheelchairs are carried on board and can be pushed along the aisle by on-board staff (train managers or catering staff). Wheelchair users' own wheelchairs are likely too wide to pass along the middle aisle of the train, so are left behind.

Existing TMST and 16 carriage Velaro trains have two important common features in this regard: they are single deck trains, with both a level floor inside and continuous aisle throughout the train, allowing passengers and the evacuation wheelchairs to pass along the entire train without restriction.

It is obvious that operating a single 200m unit would comply with these rules (and for any of the 200m train types), as evacuation could be through just one door in these cases. For the Avelia Horizon, without a continuous corridor at the lower level, the evacuation door would have to be the door where wheelchair users are located.

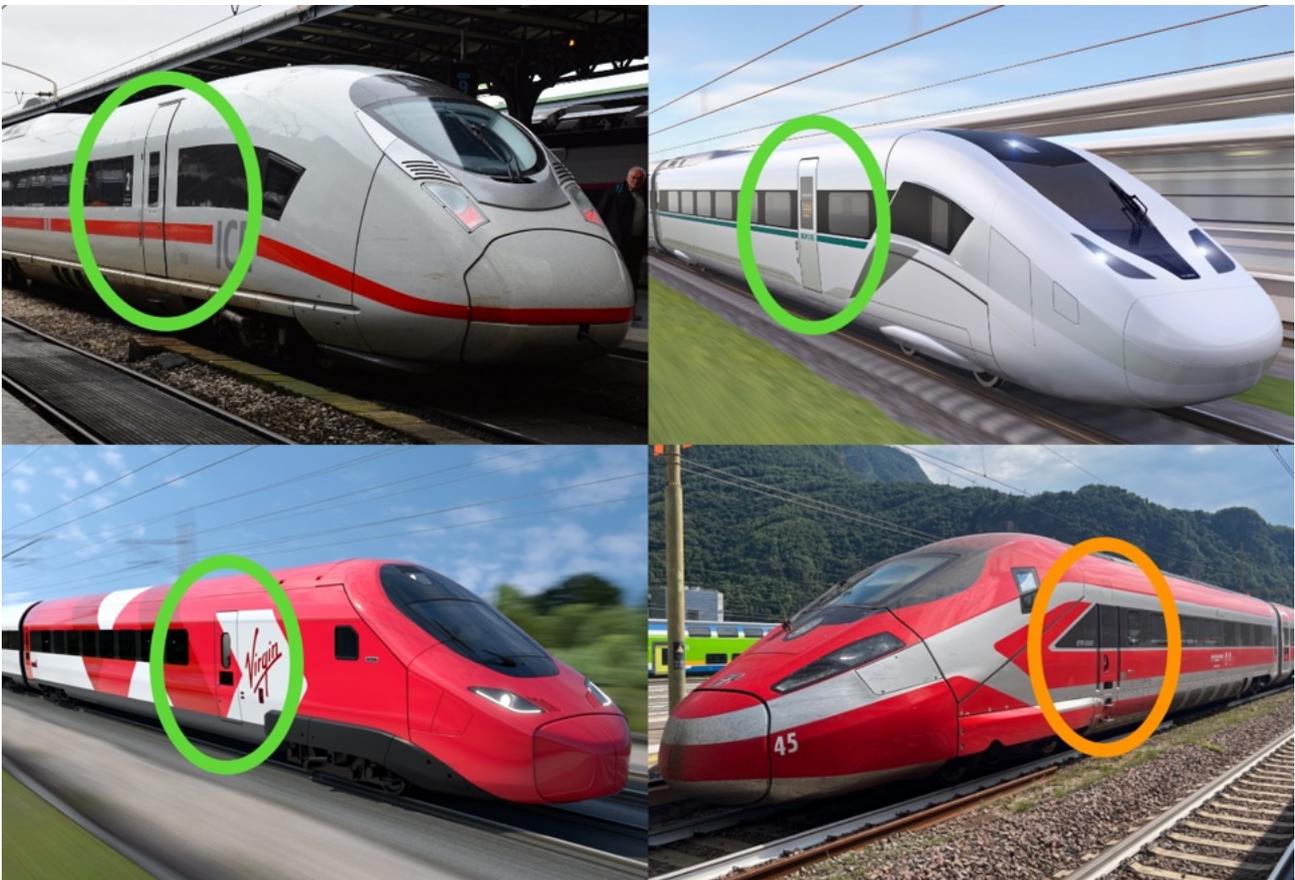
However coupling 2x 200m units together calls this system into question.

In the case of a two unit train formation – were a controlled stop leading to an evacuation is needed in the tunnel – passengers will have to be evacuated from front

and back units separately, as there is no through passage between the two units. Evacuation from one door only is impossible.

Evacuation cross-passages in the Channel Tunnel are on average at 375m intervals. The most obvious solution would be to align a door of the front unit with one cross-passage (+/- 5m) and align a door of the rear unit with the following cross-passage (+/- 5m)¹⁸. This means distance between train doors of 365m to 385m (likely the front door of the front unit and the back door of the back unit).

Train types with distributed traction – Siemens Velaro 8 carriage or Velaro Novo 7 carriage, Alstom Avelia Stream, and Hitachi ETR1000 – have passenger cabins and doors throughout almost the whole length of the unit, including just behind the driver's cab, although in the Hitachi case it is only a service door.



For example in the case of the 8 carriage Velaro in service for Deutsche Bahn as ICE3neo, the distance from the front of the nose to the middle of the first passenger door is 8.4m, meaning the distance between the front door of the front unit to the back door of the back unit is 384.6m – just within the safe limit.

¹⁸ See "Technical Investigation Report concerning the Fire on Eurotunnel Freight Shuttle 7412 on 11 September 2008" for examination of these distances, and the smoke free bubbles in the case of smoke ingress
https://assets.publishing.service.gov.uk/media/5a816aa8e5274a2e8ab53df7/101122_ReportET2010_eurotunnel_eng.pdf

However the Alstom Avelia Horizon and Talgo Avril have power cars at the front and rear of each 200m unit, and in the case of Avelia Horizon the passenger door is at the rear of the first carriage.



The distance from the front of the nose of an Avelia Horizon to the middle of the first door a passenger could access is more than 34m. That means the distance from the first passenger door on the front unit to the back passenger back door on the back unit is just 333m, more than 30m short of the 365m that would be required.

Even if the format of the first carriage could be reversed to put the door at the front of the carriage, the distance from nose to middle of the door would still be 24m, so front door of front unit to back door of back unit would still be only 353m, missing by 12m.

While the front unit could be evacuated directly into a cross passage, the back unit could not. Passengers would need to use the walkway along the running tunnel that currently can be avoided in controlled stop situations. Were the running tunnel filled with smoke this situation is not ideal.

Theoretically there would be other ways to solve this problem, but they each have their own downsides.

Lengthening each unit – making a Avelia Horizon 10 rather than 9 carriages for example – would solve the door placement problem, but would mean two trains would not fit the

platforms in Paris Gare du Nord, where platforms are only just over 400m total length and hard to extend. So this can be ruled out.

Splitting the train in two in the case of a controlled stop could be a solution. The train would be stopped, split, and one half would be moved after the stop. However this would have to function even in the case of a power cut, so would need on board battery packs. But batteries present their own fire risk, and batteries had to be specially designed for existing Channel Tunnel trains even for matters as mundane and low power as emergency lighting. It is unknown if the Avelia Horizon backup battery to move the train¹⁹ would be permitted in the Channel Tunnel.

Alternatively the Channel Tunnel Safety Authority could decide to amend the procedures to suit new train types. Or the manufacturer or operator of a train compliant with the EU Technical Standards of Interoperability could argue that EU law is supreme over national law, and hence the train must be approved. But that would take years to prove, whatever the outcome, and would present the risk of delays approving the train.

Given the very real experience of fires in the Channel Tunnel, especially the 2008 case²⁰ that resulted in the formulation of the evacuation rules as they are currently, there is a genuine issue here that must be adequately addressed before 2 coupled 200m trains can run safely, and the challenge looks especially complicated in the case of the Alstom Avelia Horizon.

Stations

General Considerations

This report makes a central assumption: that the existing legal framework for Channel Tunnel stations **will remain unaltered**.

There are two important components to this regime.

First, it must be possible for all pieces of luggage to be security controlled. While the law does not say that every piece *must* be controlled, only that they can, de facto every piece of luggage for every passenger is checked currently. No operator, either current or future, is going to stop doing that – because even though the law leaves a little room for manoeuvre, the *realpolitik* in the UK does not.

19 "Nouveau retard pour le TGV-M, une batterie de secours de Saft mise en cause" 12.1.2024, L'Usine Nouvelle <https://www.usinenouvelle.com/article/nouveau-retard-pour-le-tgv-m-une-batterie-de-secours-de-saft-mise-en-causeN2206373>

20 2008 Channel Tunnel fire https://en.wikipedia.org/wiki/2008_Channel_Tunnel_fire

Second, passports/IDs of all passengers must be controlled before a passenger boards a train bound for the UK, and similar happens in reverse – UK exit controls happen at St. Pancras (and eventually Stratford, Ebbsfleet, Ashford), as do Schengen entry controls conducted by French police. This system is likewise not going to change any time soon.

This regime requires UK border control staff to be stationed in France, Belgium and Netherlands currently, and potentially in other countries in the future. This will require changes to the national law of those countries to allow UK law enforcement to be stationed there – likely uncontroversial, but it will still have to be done.

There are general problems with this entire setup: it requires considerable physical infrastructure in stations (terminals, booths, secure platforms) and it is staff intensive, making it costly to run.

I have never been able to find complete information about who pays what to maintain the security and passport regime, and only have odds and ends of leaked information about some stations. To be able to make the case for the re-opening of currently closed stations on Core Routes, as well as a case for new stations that might have only a handful of trains a day, we need a lot more research about the costs and more transparency about who bears those costs.

This report does not generally consider two other oft suggested solutions for these border issues, namely conducting border controls on board a moving train, and “de-training”, where passengers (with their luggage) disembark a train somewhere en route for a security check and passport control.

Passport controls on board are superficially appealing, in that they would partially eliminate the need for expensive and large terminal buildings at stations. Passengers’ bags could be controlled at the entrance to a platform (similar to high speed rail in Spain), and then border police would board a train en route (either somewhere near Paris or in Lille), conduct their controls, and remove any non compliant passengers at Calais-Fréthun just before a train enters the Channel Tunnel. Checks were even done this way in the early years of Eurostar (up until 2000) and TMST trains even have a holding cell for border force purposes. However since then there has been no serious examination of this idea, both in terms of its costs and practicality.

“De-training” was most recently used for Eurostar’s summertime services from Marseille and Lyon to London where passengers disembarked in Lille Europe for controls, making the northbound trip 55 minutes longer than the southbound one. Not only is this system uncomfortable for passengers, it also poses operational headaches – it occupies a platform in Lille Europe (or theoretically Calais-Fréthun) for almost an hour, meaning no other trains can use that platform. And small terminals in both of these stations mean

border and security control throughput is limited. So “de-training” might be acceptable for an occasional tourist service, but is not something to be attempted for regular daily trains.

The case for serving stations beyond the current Core

Routes

The point of this report is to assess what is operationally and practically possible. It is beyond my ability as a sole researcher to conduct an economic impact assessment of each potential extension of routes beyond Bruxelles and Paris.

However the practical case for direct trains to London from more cities in continental Europe is obvious – because of the complexity of changing trains as the alternative to direct trains.

All passengers from Switzerland and Southern Germany to London currently have to transit Paris – with Eurostar trains not departing from the same station as passengers arrive in the French capital. This cross-Paris transfer, especially for families and those not so able to walk, is a major hurdle.

South West France and Southern France to London at least theoretically offer the opportunity to change at Lille Europe rather than transit Paris, but this has its own headaches – TGV service levels to Lille are thin, and the Lille Europe Eurostar terminal is small, meaning the passenger throughput there is limited. You could envisage developing Lille Europe as some sort of more important change for London station, but at the moment it is not that.

Western Germany to London at least offers same station interchange, at Bruxelles Midi, and a terminal of adequate size. But trying to time the connection right – plan in less than an hour, and you might miss the connection, or plan in more and you are left hanging around – is a worry for passengers, although forthcoming EU law amending passenger rights could allay these fears slightly. The unpleasant bunker like terminal at Midi (the worst of the existing terminals) does not help either.

Generally, passengers would sooner be on a direct train that is disrupted than rely on connections in the case of problems, and that speaks in favour of direct trains to London. The repeated statements of both Eurostar and its potential rivals claiming to want to serve new destinations also underline this.

So there is a case for new destinations – this report aims to help establish what is practically possible, and then further work by me and others will be needed to help fill in the gaps in our understanding that this report will reveal.

Political support for route expansion to Switzerland and Germany

In May 2025 a Memorandum of Understanding²¹ was signed between UK Transport Secretary, Heidi Alexander, and Swiss Federal Councillor, Albert Rösti. The agreement will establish a joint working group to work through the barriers to establishing direct connections between the UK and Switzerland, including border control issues and technical standards.

The Department for Transport agreed something similar in July 2025 with Germany. A joint taskforce with the German government will work through the same issues for direct trains to Germany²².

At the time of writing the exact composition of these groups is unknown, and as a result I presume the work has not yet begun in earnest. But that Alexander has managed to get to this stage is welcome, and shows there is also some political commitment to direct trains in Bern and Berlin as well, although likely a little more in Bern due to the greater operational commitment of Swiss railways SBB (see below).

Stations and Corridors

Understanding what stations work for Channel Tunnel services requires two further pieces of information: what sorts of trains could serve those stations (explored above), and what stations can be served by the same train. This section of the report focuses on the latter, by dividing up routes from London into Corridors.

It starts with the Core Routes – London to Bruxelles and Paris. This is expanded with Paris Bypass – the stations on the line that skirts Paris to the east. Then each further Corridor is examined: South West France, Southern France, French Alps, Switzerland, Southern Germany, Western Germany and Netherlands.

21 “Memorandum of understanding between DfT and Swiss Confederation: direct international rail connection” 9.5.2025, Department for Transport <https://www.gov.uk/government/publications/memorandum-of-understanding-between-dft-and-swiss-confederation-direct-international-rail-connection/memorandum-of-understanding-between-dft-and-swiss-confederation-direct-international-rail-connection>

22 “Government agrees landmark plans to lay down the tracks for direct trains to Germany” 17.7.2025, Department for Transport <https://www.gov.uk/government/news/government-agrees-landmark-plans-to-lay-down-the-tracks-for-direct-trains-to-germany>

In the assessment below, stations are organised with those at the end of a Corridor furthest from London first, meaning the order is not an order of priority but is operational.

Station Assessment Criteria

Each station is assigned to one of four categories.



Fulfills requirements – this means that all the infrastructure for Channel Tunnel services is present already (essentially facilities where passengers can have their passports checked and bags scanned, and at least one secure platform where a train can be held). The assessment applies to the physical infrastructure only – some of these stations have no appropriate staff situated there currently.



Minor adaptations – with some minor building works it would be possible for the a station to be used for Channel Tunnel services. Rotterdam Centraal (see below) offers a model for how this could be done, by re-purposing a building for a terminal and using even temporary barriers on a platform to secure it. Importantly no major changes to railway infrastructure would be needed for these stations (no new platforms or re-laying or re-organising of tracks).



Major adaptations – new platforms or re-organisation of tracks would be needed to make a station compatible, making the task harder, more expensive, more complex, or more long term than the case of minor adaptations. But it is still possible to see how the station could be adjusted, given what is currently in place there.



Full scale rebuilding – there is no obvious way for the station to be served without major rebuilding, and that of a serious scale – meaning overpasses or underpasses or major reconstruction of buildings. In some cases this could perhaps be achieved along with other re-building work that is already planned.

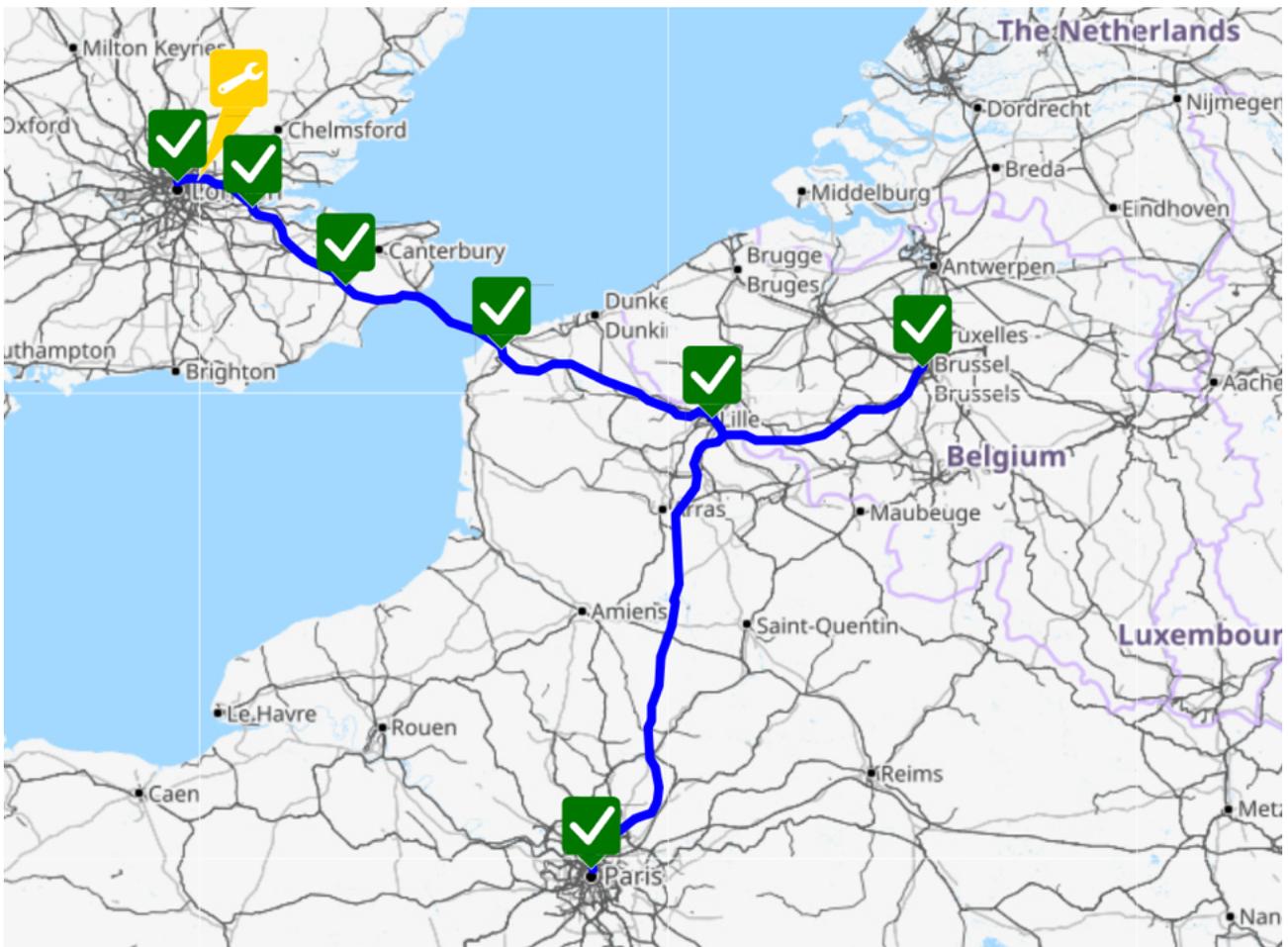
Grey icons indicate a station was assessed, but that it would make more sense to use a nearby station instead.

Full corridors and stations map



Zoomable interactive map: map.crosschannelrail.eu

Core Routes



The most understood part of long distance traffic through the Channel Tunnel, given London, Paris and Bruxelles have been served for thirty years, and the tracks and capital city stations currently used have remained unchanged since 2007. However the main stations are showing the strain – overcrowding of the St. Pancras terminal and, to some extent, the same at Paris Nord, and the bunker like unpleasantness of Bruxelles Midi.

The interplay between the currently shuttered stations in Kent – Ebbsfleet and Ashford – and St. Pancras is too little examined. Kent stations could be used to decrease pressure on the London terminus, as well as helping Kent directly. The conundrum for Stratford is more complicated, and needs further research.

The situation in Hauts de France is not dissimilar to Kent – Calais and towns along the coast would benefit from that station re-opening, and while Lille still has trains, it is less well served than pre-COVID pandemic, lessening the potential to change there for other destinations in France.

The problem of course is that a lack of transparency of the costs of operations of interim stations (especially regarding staffing border control and security check facilities), and the lack of a political framework that would oblige operators to serve interim stations on Core Routes, means that it is all too easy for everyone to avoid responsibility for all of this, and focus on the obviously profitable St. Pancras instead.

Ultimately it is a shortcoming of the #CrossChannelRail project that I cannot provide an answer to the question whether interim stations on Core Routes can be profitably served. All I can obviously state is that, with the partial exception of Stratford, is that all stations on the Core Routes can be practically served.



Paris Gare du Nord

Category: Fulfils requirements

Terminal Capacity: Precise figure unknown, but can accommodate 2 trains/hour (1800 passengers/hour)

City Population: 2,049,000

Metro Population: 13,172,000

Not a pleasant or roomy terminal, and border control inefficiency mean boarding here can often be almost as frustrating at St. Pancras,

with queues stretching out into the concourse. Minor rebuilding of the terminal is due to start soon. 4 secure platforms have enough capacity for Channel Tunnel services.





Bruxelles Midi

Category: Fulfils requirements

Terminal Capacity: 1 train/hour, so est. c. 900 passengers/hour

City Population: 1,250,000

Metro Population: 2,500,000

An underground, low roofed terminal where staff shortages often lead to congestion. A massive Duty Free shop also clogs up the concourse inside, limiting seating space. A new business lounge is being developed. There would be capacity for some more trains here, off peak at least, but this is not a pleasant place to hang around. Two terminus platforms, plus the option to use Platform 3 as through platform to Amsterdam or Köln mean the terminal, rather than platform capacity, pose the main constraint here.



Lille Europe

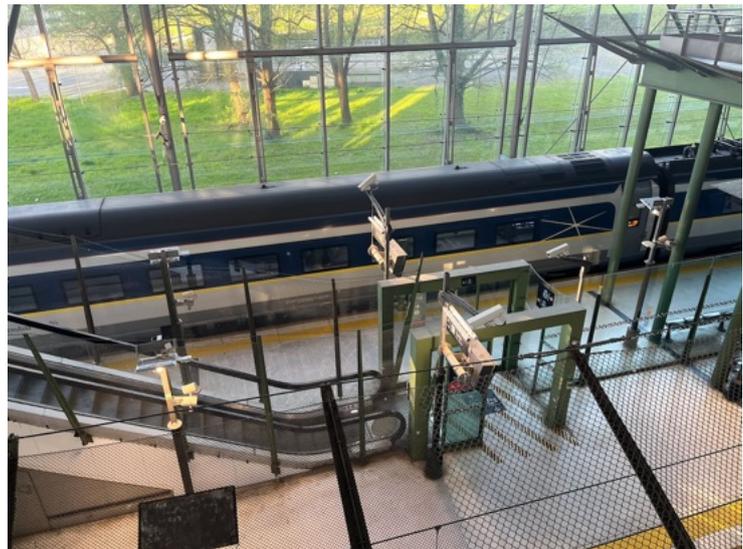
Category: Fulfils requirements

Terminal Capacity: c. 250

City Population: 239,000

Metro Population: 1,515,000

A long, low, concrete bunker kind of a station, through which the wind howls when trains pass. The terminal is also rather small, meaning the proposed solution for trains from the rest of France – to



not have direct trains to London but for passengers to change in Lille – does not really make sense due to the limited capacity of the terminal here. Also, as the station has only 4 platforms (2 eastbound, 2 westbound) the other regularly proposed solution – to disembark trains in Lille for passport controls and bag scans – is also not really an option as a train clogs up a platform. There is undoubtedly more you could do with Lille, not least regarding coordinating timetables between Channel Tunnel trains and services to the rest of France, but it is no panacea.



Calais Fréthun

Category: Fulfils requirements

Terminal Capacity: c. 150

City Population: 68,000

Metro Population: n/a

A modern and airy station, but the check in area for Channel Tunnel trains is tiny, and the area the station serves is small in population terms. Looks to be the station on the Core Routes with the least potential, although TER services both directions along the coast could widen its catchment area.



Ashford Intl

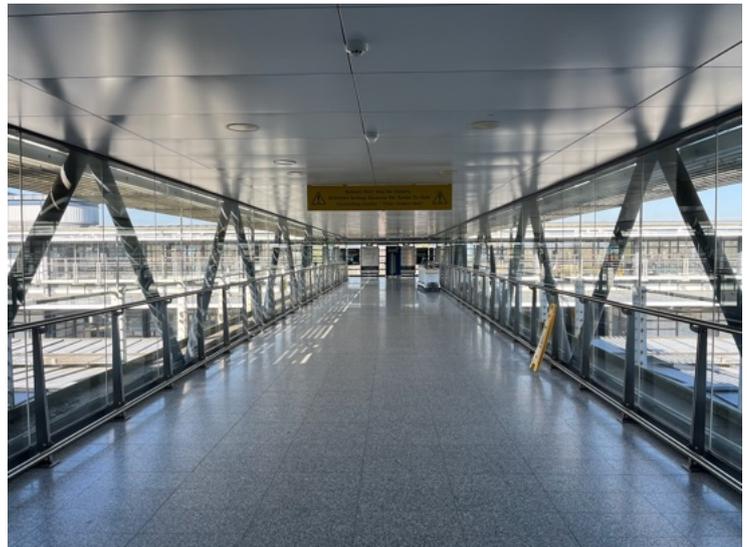
Category: Fulfils requirements

Terminal Capacity: c. 850

City Population: 83,200

Metro Population: 118,000

The nicest terminal there is – light and airy, modern and well designed with capacity for more than 800 passengers. Almost enough to board a full Eurostar. And excellent rail connections with the rest of Kent, and a large car park as well. There would be great potential in re-opening Ashford.





Ebbsfleet Intl

Category: Fulfils requirements

Terminal Capacity: c. 250

City Population: Barely a village, but serves metro area east of London

Metro Population: n/a (hard to determine how many would choose Ebbsfleet over other options)

A massive car park in the middle of nowhere, but it has good rail and road links, and for anyone driving from greater London to take a train to continental Europe then Ebbsfleet offers some opportunities. The terminal however is small, meaning you can fill less than a third of a Eurostar train from this station. Re-opening this might make more obvious economic sense than Ashford, but operationally Ashford obviously has the better terminal and the advantage of being a town itself.



Stratford International

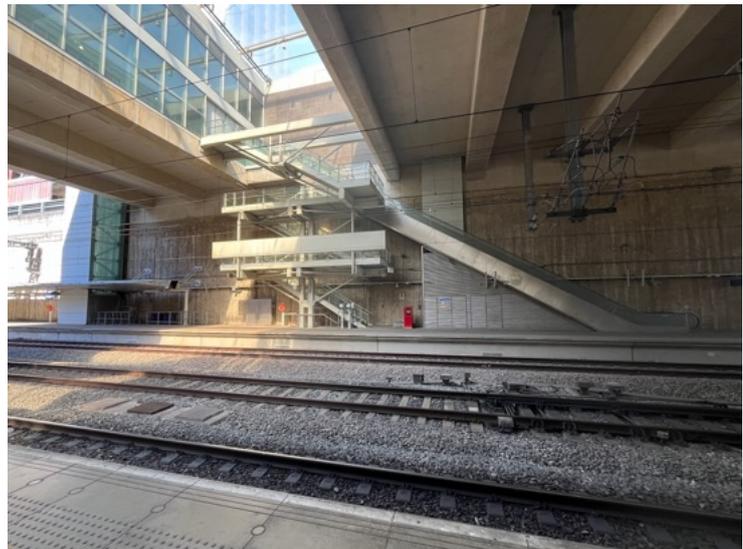
Category: Minor adaptations

Terminal Capacity: Assumed to be c. 250

City Population: 8,866,000

Metro Population: 14,900,000

The big unknown. Never intended as a stop for trains to St. Pancras, but for trains to northern England (that never materialised), the station nevertheless has 2 400m long platforms that are secure, and the main infrastructure to serve them – lift, steps and escalator from a building above, although a terminal there was never fully equipped. The track layout means starting or ending services at Stratford is complicated – it is impossible to reverse trains there. However excellent public transport links speak in its favour. It is no surprise that Eurostar rivals are looking at it, but how serving it would work is not immediately obvious.





London St. Pancras Intl

Category: Fulfils requirements

Terminal Capacity: 1800 passengers/hour, to be upped to 2700 passengers/hour

City Population: 8,866,000

Metro Population: 14,900,000

An amazing station, but one not without its problems. At peak times the station cannot process more than 2 full Eurostar trains an hour



through the terminal, while the 5 platforms for Channel Tunnel services have space for a lot more trains than currently operate. HS1 is working on a plan to boost throughput, and having looked at those plans processing three full trains an hour (2700 passengers) looks to be viable short term. Ideas to boost capacity to 5000 passengers an hour are going to require more major re-engineering of the station. So any short term boost to capacity beyond 2700 passengers per hour would likely need some examination of other stations along the Core Route in the UK as well.

Stations on the Core Routes Corridor that were ruled out



Paris Gare de l'Est

Category: Major adaptations

City Population: 2,049,000

Metro Population: 13,172,000

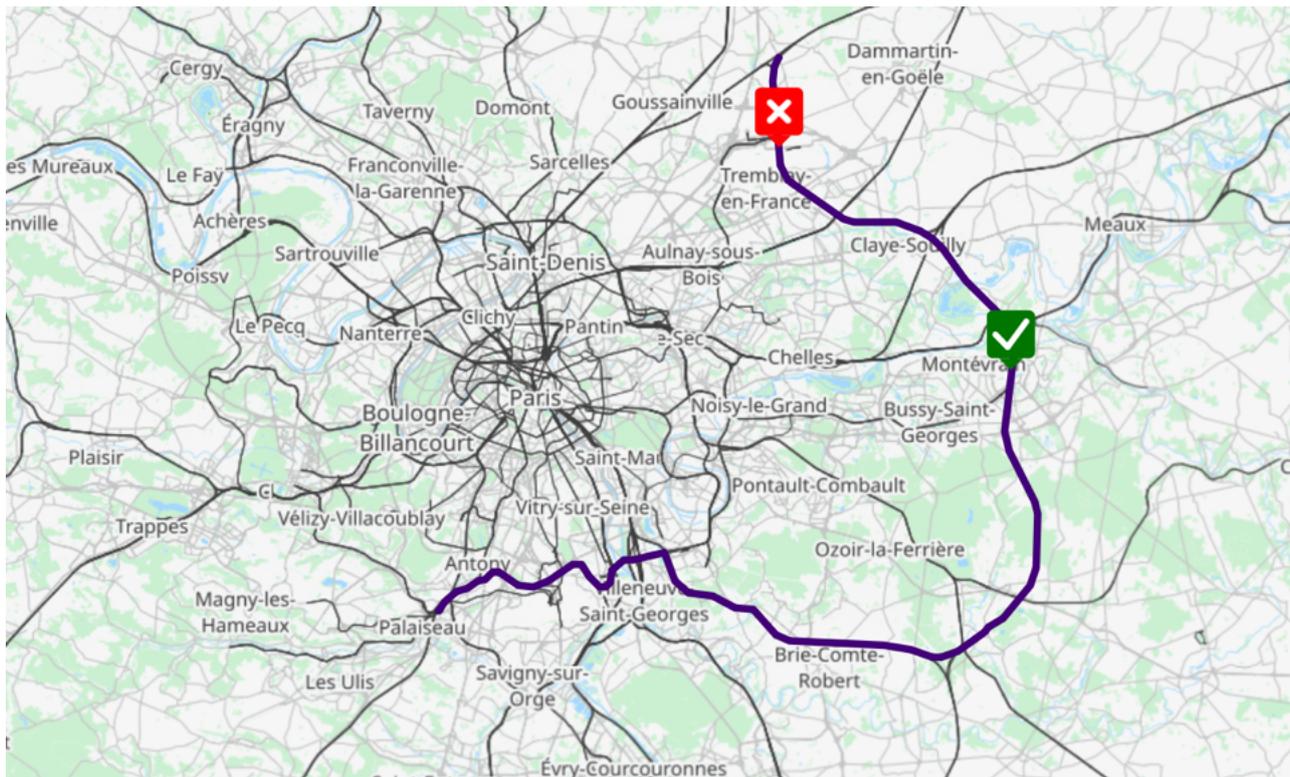
Briefly examined as an alternative to Paris Nord, given the cramped nature of the terminal at Nord. The ongoing building of a connecting chord from the lines into Nord with the lines into Est could open it up.



However Est presents its own

problems – the station is less crowded than Nord, but there is no easy or obvious way to secure platforms or build a sort of terminal, and few of its platforms are the requisite 400m length. Maybe in the very long term it might make sense to serve.

Paris Bypass



Routes to South West France, Southern France and French Alps, and Genève in Switzerland, would all use the whole Paris Bypass route. Trains to Basel and Zürich in Switzerland could use all or only the Charles de Gaulle part of it, and trains to Southern Germany would use only the Charles de Gaulle part. And Marne-la-Vallée as a starting point for trains to London is also possible.



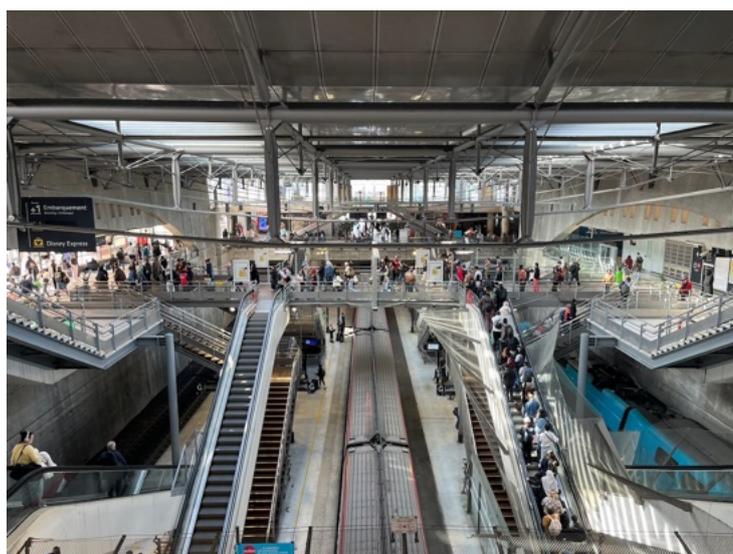
Marne la Vallée-Chessy

Category: Fulfils requirements

Terminal Capacity: Unknown, but small (max 200 pax), but passengers can wait on the comparatively enclosed platform as well while border procedures are conducted for those arriving later

City Population: 282,000

Metro Population: Seine-et-Marne: 1,421,000



A cleverly designed station (although a bit confusing for passengers) with 1 secure platform that can be used to turn around trains, or used for through trains from the south. And a terminal that was used for passengers to/from Disneyland but has not been served since before the COVID pandemic. The limited capacity of the terminal means this station is not some sort of panacea, but there could be ways to deploy it as part of a wider strategy.



Aéroport Charles de Gaulle

Category: Full scale rebuilding

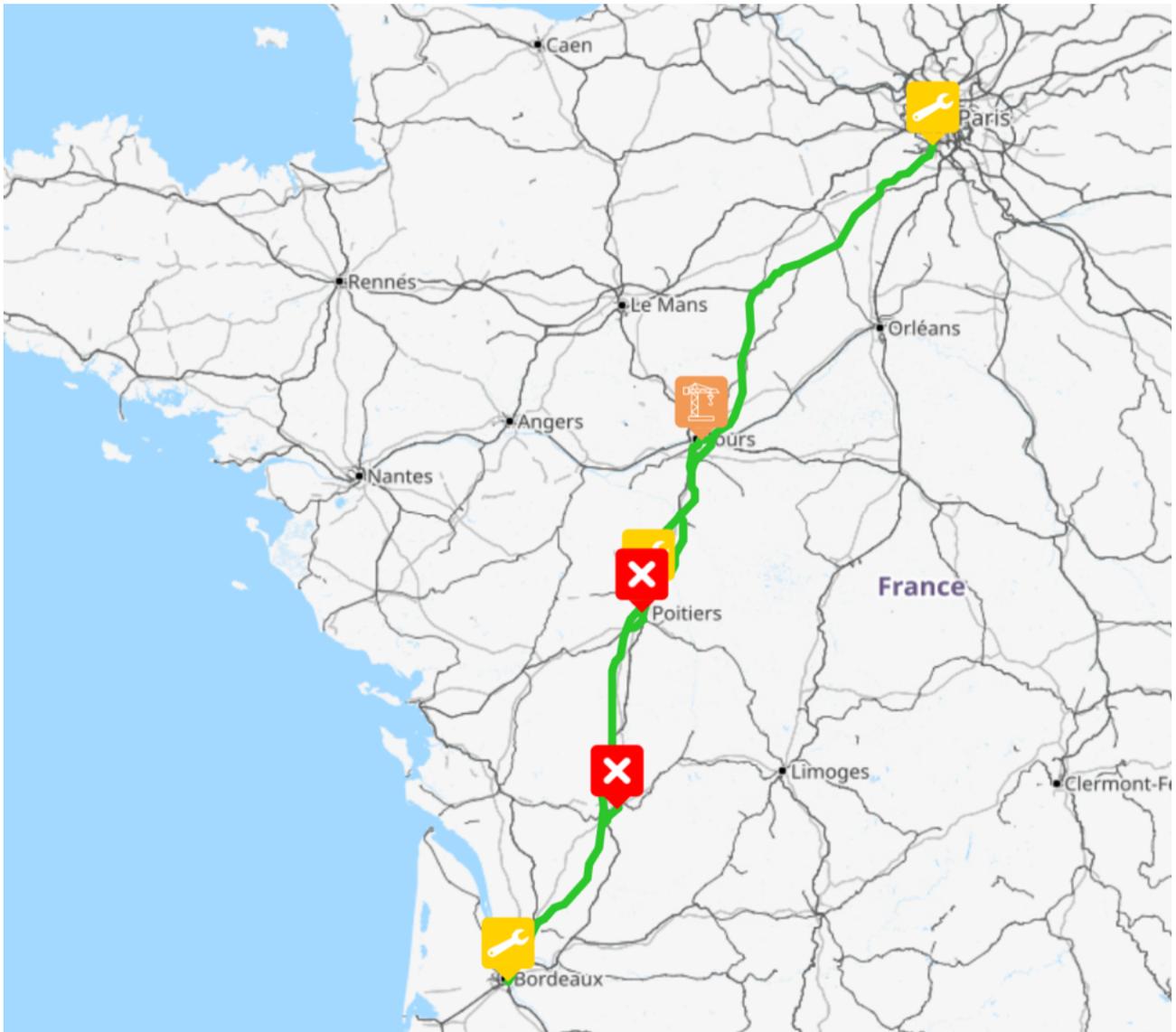
City Population: n/a

Metro Population: 13,172,000

A TGV station at the airport, with 4 platforms (2 northbound, 2 southbound), and busy and congested currently due to building works to accommodate trains from Amiens at the station. However there is no obvious way the station could be adapted for Channel Tunnel services, and even now the station is bursting at peak times. The format of the building and entrances to the platforms makes this a hard one.



South West France



A London-Bordeaux service would be operationally possible, but the issue is more about what (cannot) be served in between. All interim stations are either impossible, or ill situated, meaning Bordeaux and Massy TGV would likely be the only places served. Would London – Marne-la-Vallée – Massy – Bordeaux be adequately appealing?



Bordeaux St. Jean

Category: Minor adaptations

City Population: 265,000

Metro Population: 1,376,000

Platform 1 is already cordoned off – with a kind of wire fence, c. 1.2m high, as a means to control access to the platform for TGV services.

There is space on the first floor of the cavernous station building for a terminal. Sweep the platform, and bring passengers down to board, similar to Rotterdam Centraal – and it works. And St. Jean is amazing – one of Europe's great stations.

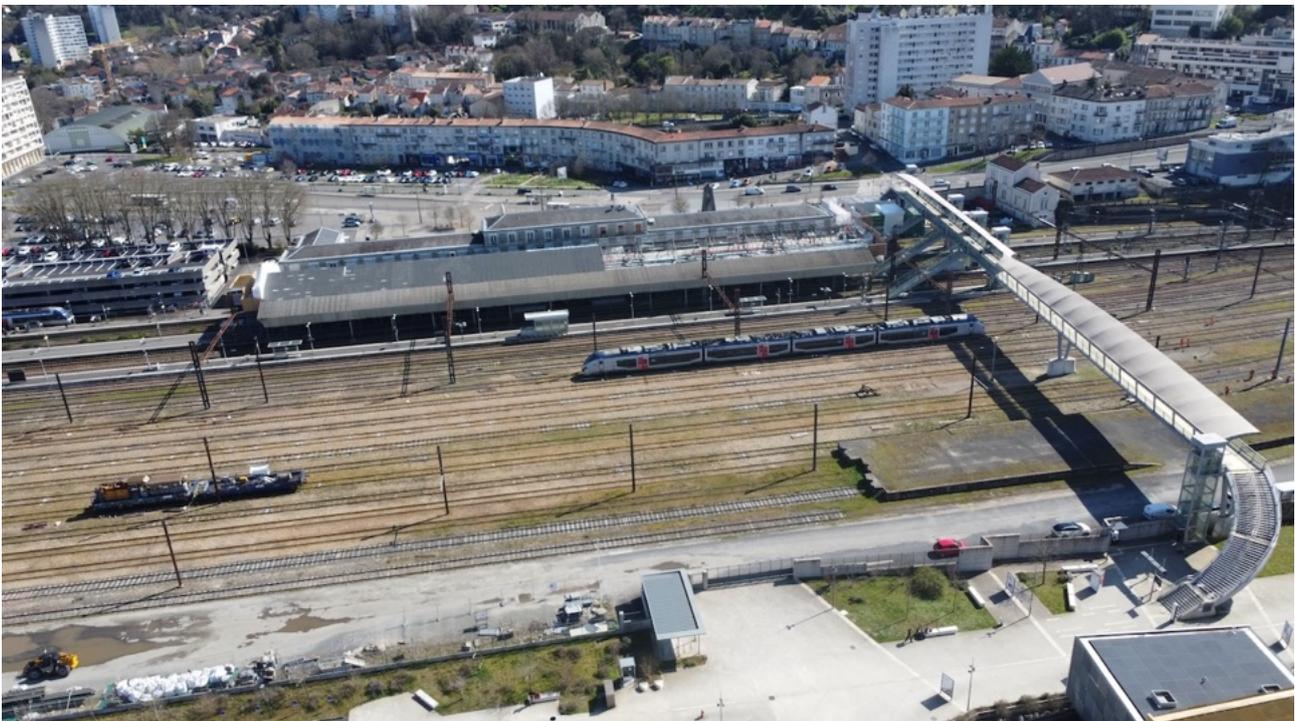


Angoulême

Category: Full scale rebuilding

City Population: 41,000

Metro Population: n/a



The station itself is small and cramped, although there would be space for more platforms in what are now seldom used good sidings beside the platforms. But that would need a major upgrade of the station.



Poitiers

Category: Full scale rebuilding

City Population: 89,000 (Poitiers)

Metro Population: n/a

An awful station – a cheap upgrade in the 1990s to make it accessible has left it with narrow and windswept platforms, and cramped passenger areas. It cannot be served by Channel Tunnel trains without a major rebuild (that it needs anyway).



Futuroscope

Category: Minor adaptations

City Population: 89,000 (Poitiers)

Metro Population: n/a

Station obviously designed for more passengers than it currently serves. Massive cavernous building, deserted half the year, under used even when the theme park is open. Could be adapted reasonably easily for Channel Tunnel trains, but is on the slow track north of Poitiers, so is only of very limited use.





Saint-Pierre-des-Corps

Category: Major adaptations

City Population: 139,000 (Tours)

Metro Population: n/a

There is adequate space on the north side of the tracks (pictured) at this station to allow a further platform to be built for Cross Channel trains, and there would be space in the main station building for a terminal. However it would require considerable investment to complete.



Massy TGV

Category: Minor adaptations

City Population: 50,000

Metro Population: 1,300,000
(Essonne)

A long concrete bunker of a station, with access at one end. And with relatively few TGV services serving those two platforms in the bunker. Good public transport connections. Could be adapted reasonably easily for Channel Tunnel services, with the north-east platform temporarily secured while passengers descended from a terminal.

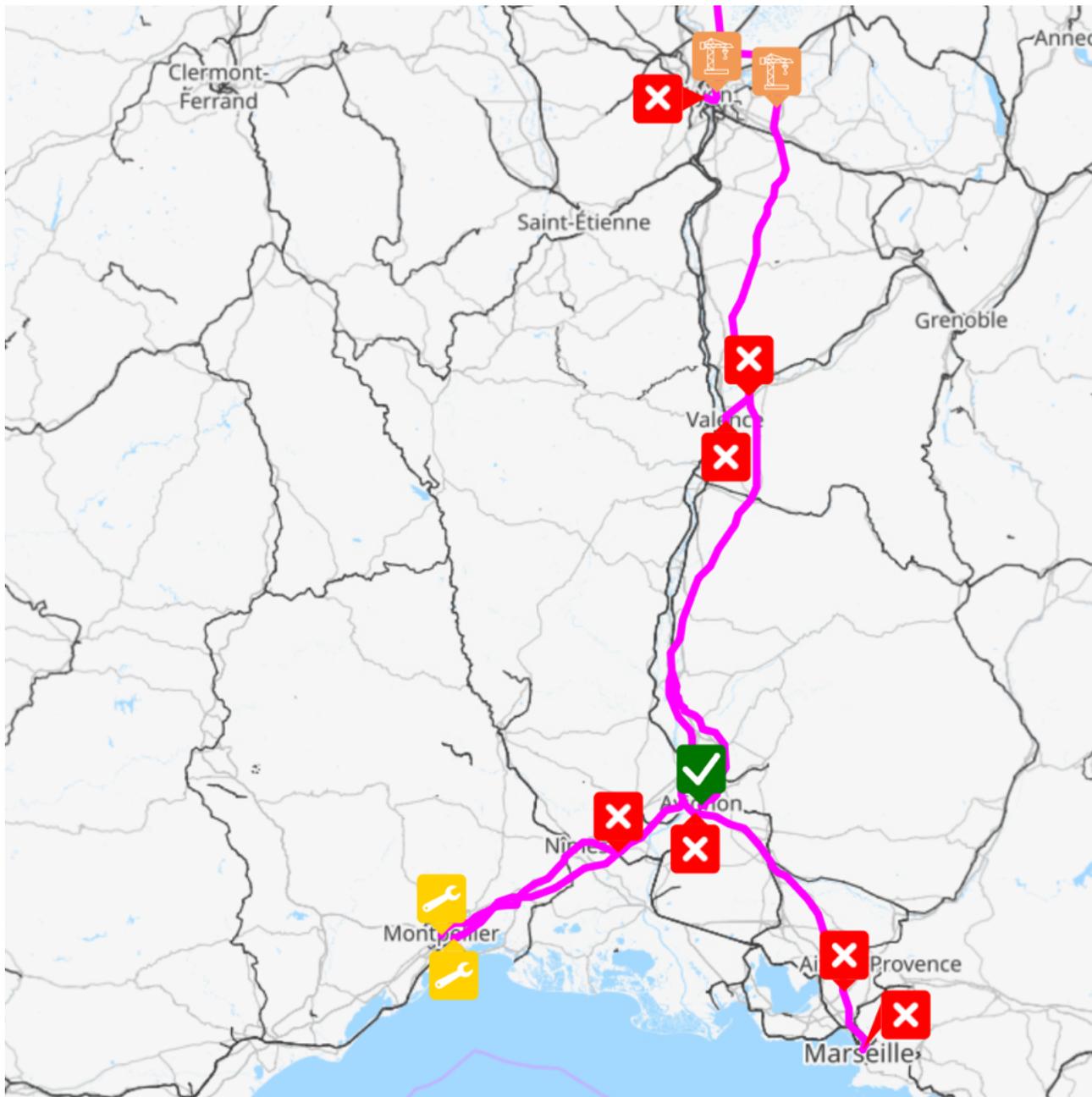


Locations on the South West France Corridor for further investigation

Pont de Rungis

This station – on the line between Massy TGV and the high speed bypass line east of Paris – is to be rebuilt as an Orly Airport long distance station. But I have not yet been able to visit it. With the connection with the airport, and a metro into Paris, it could be more compelling than Massy TGV.

Southern France



Passengers dreaming of services from London to the Mediterranean, or even to Lyon, are going to have to dream a bit longer. Nothing along this Corridor is easy, meaning the only solution short term would be “de-training” somewhere en route to London, if some operator wanted to offer a seasonal tourist service. Any more than this needs major investments. While either Montpellier or Avignon could work separately, running to either without interim stops is not likely to be economic. The absence of an obvious solution in Lyon is the biggest hurdle overall.



Montpellier St. Roch

Category: Minor adaptations

City Population: 317,000

Metro Population: 813,000

No secure platform currently, but making Platform A (north side) secure, Bordeaux style, would not be hard – you would need to add some fencing at the ends of the platforms. A building for boarding passengers to wait is not easily available though, so it is not obvious where passengers would wait for their London bound service.



Montpellier Sud de France

Category: Minor adaptations

City Population: 317,000

Metro Population: 813,000

Platform E north side is secured already, and there is even a kind of waiting room you could re-purpose. But the track layout does not easily work – arriving trains would terminate at Platform B (south side) but there is no way to then get a train to Platform E, without going 28km to Sète and stabling and reversing there.





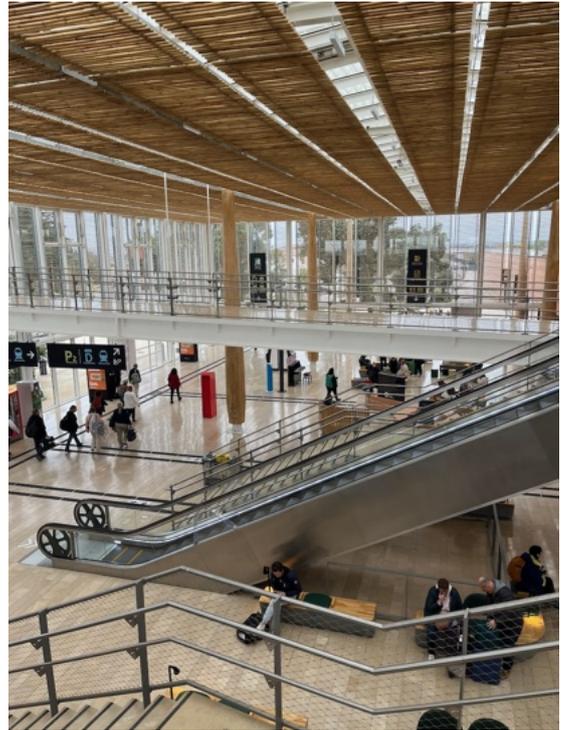
Nîmes Pont du Gard

Category: Full scale rebuilding

City Population: 150,000

Metro Population: n/a

Only one platform each side on the high speed line, no obvious way to secure these platforms. As TGV stations go, this is a really nice one – airy and quite well connected. Just a pity that passengers to London are not going to get to ever use it!



Marseille St. Charles

Category: Full scale rebuilding

City Population: 887,000

Metro Population: 1,888,000

The platforms at the sides you could theoretically secure are too short, at least for 400m long trains. And all the 400m platforms are in the middle and there is no obvious way to secure them, and entrances to platforms are too cramped and platforms too narrow. The only way to make St. Charles compliant would be to plan this as part of the ongoing reconstruction of the station where through tracks are going into a tunnel. But that is a medium to long term option – there is no solution available short term.





Aix-en-Provence TGV

Category: Full scale rebuilding

City Population: 148,000

Metro Population: n/a

A TGV station with only one platform in each direction – these platforms are exposed and hard to secure, and there being multiple entrances.

Capacity at the station would be low in any case.



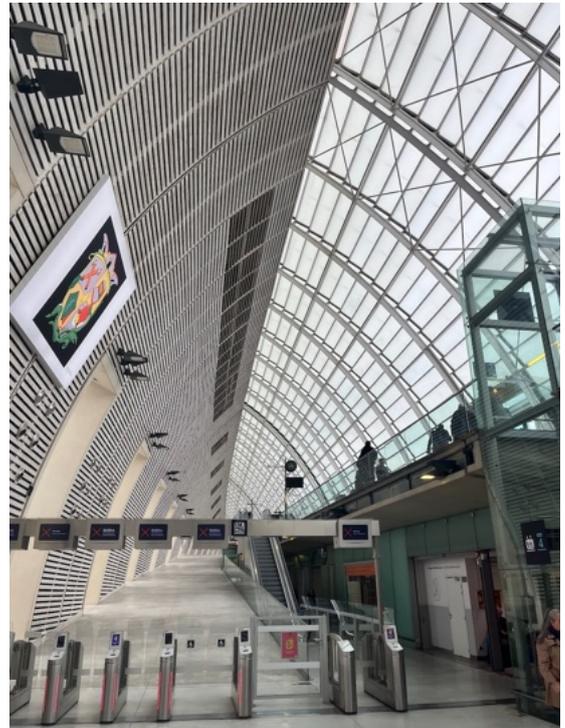
Avignon TGV

Category: Full scale rebuilding

City Population: 92,000

Metro Population: 337,000

Only two platforms to serve the high speed line (one in each direction), and they are busy with trains already. Securing the entrances and exits to the platforms would be complicated due to the format of the building (as shown).





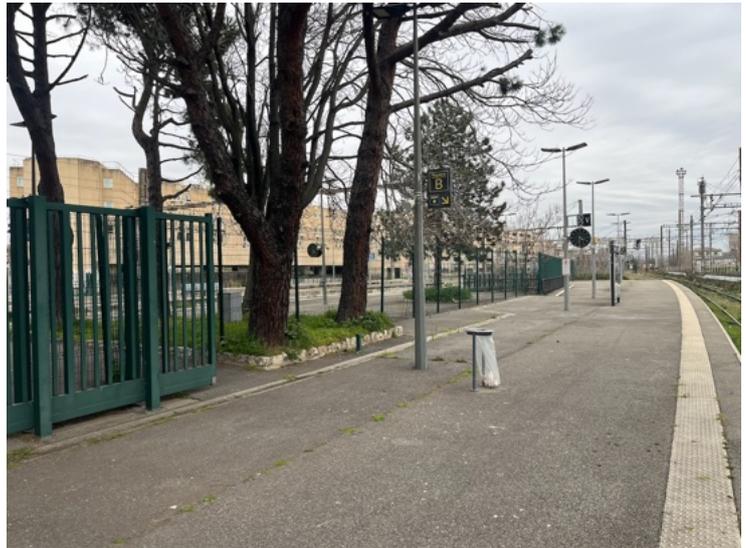
Avignon Centre

Category: Already compliant

City Population: 92,000

Metro Population: 337,000

Strictly speaking, yes, this station is compliant – it has a secure platform (Platform 1) and Eurostar trains have served it before. But that was before the Lyon-Marseille high speed line was completed, so trains ran on 40km of old line to reach the station. There is no way to connect onto the high speed line at Avignon TGV from here, and the station is small and cramped and has no parking space. So while the station is technically compliant, I can see no reason why any operator would want to serve it.



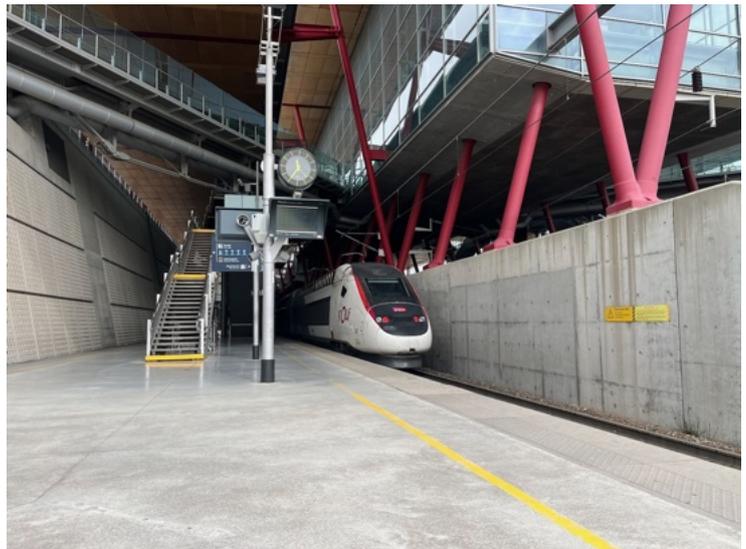
Valence TGV

Category: Full scale rebuilding

City Population: 64,000

Metro Population: n/a

Only one northbound platform, and that has a multitude of entrances and exits, and some of the escalators go down from outside the building. No obvious way to secure this, and even if you did, securing the platform long enough could be complicated.





Valence Ville

Category: Full scale rebuilding

City Population: 64,000

Metro Population: n/a

Checked as an alternative to Valence TGV and it is no better. It has narrow platforms, and the single platform on the station hall side (west) is needed to access the underpass to other platforms. There is no way to fix this one easily.



Lyon Perrache

Category: Full scale rebuilding

City Population: 521,000

Metro Population: 2,309,000

Less crowded and busy than Lyon Part Dieu, this is a nice old station at platform level, surrounded by big roads and a concrete bus station (partially undergoing renovation). But there is no way to secure a platform.





Lyon Part Dieu

Category: Major adaptations

City Population: 521,000

Metro Population: 2,309,000

Space for a terminal could be found on the second floor of the new shopping centre, city side of the station. But there is no obvious way to secure a platform without causing major disruption to other trains. The only solution would be to add an extra platform alongside an existing track on the west side of the station (pictured), between that track and the shopping centre, but this would need some construction works.



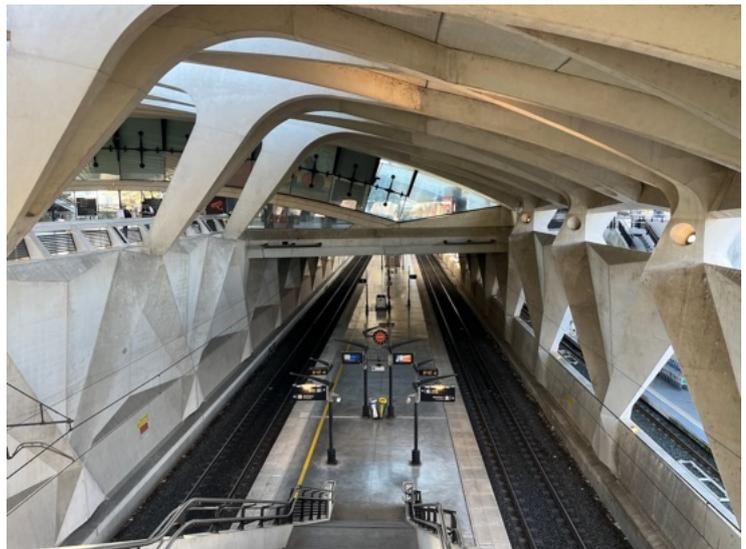
Lyon-Saint-Exupéry TGV

Category: Major adaptations

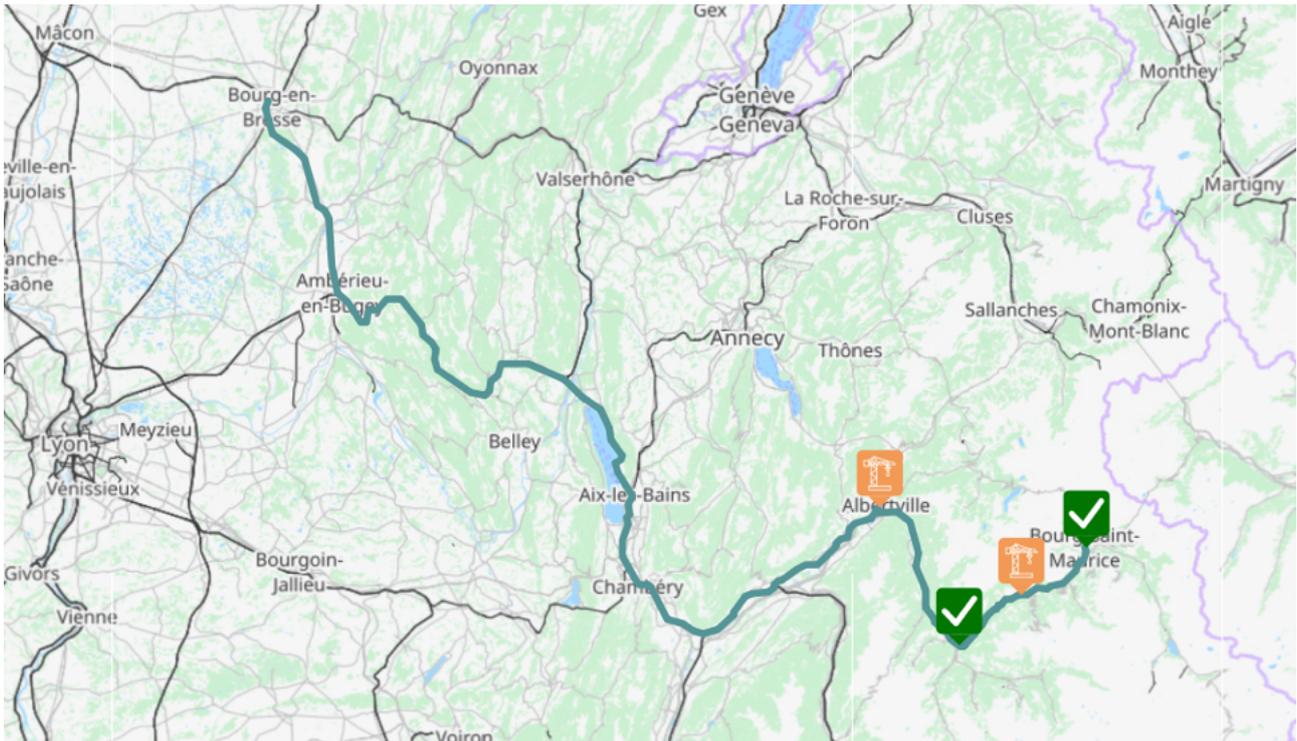
City Population: 521,000

Metro Population: 2,309,000

A Calatrava designed TGV station, with a nice large area for passengers to wait, and wide platforms. But there are many entrances to these platforms and no simple way to secure them. Of the three Lyon stations it is probably the easiest to fix, as you could just about imagine how a Bordeaux St. Jean style barrier along the middle of the platform could work, with some glass barriers to secure escalators and steps.



French Alps



Eurostar used to run seasonal trains to the French Alps, and two stations that have secure platforms are still available to use. The question here is whether any operator – Eurostar or a rival – would have an interest in seasonal services like this in the future.



Bourg St. Maurice

Category: Fulfils requirements

Terminal Capacity: No real terminal – board a train that is waiting in the platform

City Population: 7,000

Metro Population: n/a

All the bag scan and border facilities are still present at Bourg St. Maurice, and there are two secure platforms (one could be used for stabling). There is also a bridge from the funicular railway to the ski resorts into the station. The capacity would not be large – you basically board a train waiting to depart – but it does work.





Aime La Plagne

Category: Major adaptations

City Population: 4,400

Metro Population: n/a

Eurostar ski trains used to stop at Aime La Plagne en route towards Bourg St. Maurice, but not en route towards London. This is because the basic station is nowhere close to adequately equipped for

Channel Tunnel trains. The low, non disabled accessible, platforms are exposed, and there is no underpass. But the station might be re-built as part of preparations for the 2030 Winter Olympics and the construction of a new cable car from Aime, possibly allowing a secure platform to be built if anyone wanted to.



Moûtiers

Category: Fulfils requirements

Terminal Capacity: No real terminal – there is one small room to wait, otherwise passengers wait on the platform (under a canopy)

City Population: 3,500

Metro Population: n/a

Like Bourg St. Maurice this one is still ready to operate. Bag scan

machines and passport booths are still present in the old station building, although there is little room to wait there. On a busy day in winter passengers would be waiting outside in the cold before a train to London would arrive. But formally it complies.





Albertville

Category: Major adaptations

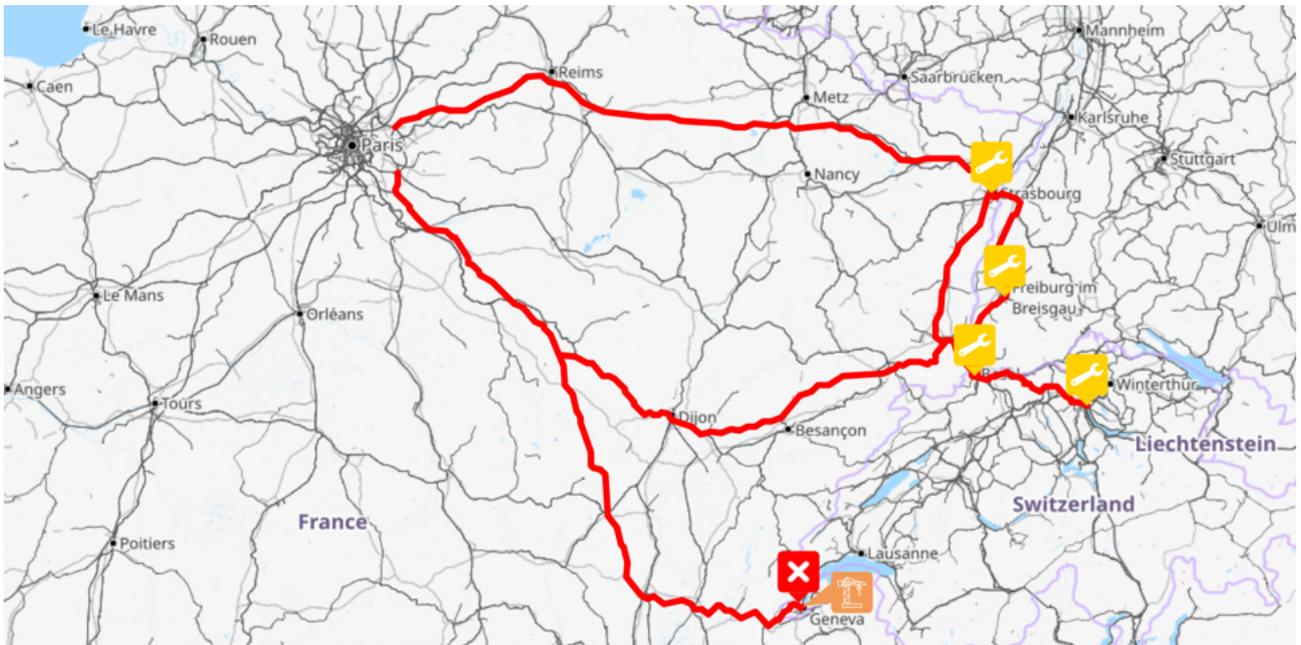
City Population: 19,700

Metro Population: 40,700

Trains to/from Bourg St. Maurice have to change direction in Albertville, so a stop is necessary anyway. The problem is that the station looks to have been renovated on the cheap for the 1992 Winter Olympics, and then nothing done to it since. The underpass doesn't have a lift, and the platforms are too low. There would be space for more platforms, and for a London terminal, but these would have to be where good sidings are currently located next to the station.



Switzerland



The most complicated Corridor in terms of routing trains. From Genève trains would eventually end up on LGV Sud Est line the Paris Bypass (see above), but the foreseen redevelopment of Genève station renders that a difficult option, short term. The interesting options are instead at Zürich and Basel, where solutions for 200m trains are possible in each case. From Basel trains could head via Mulhouse and Dijon (without stops) and onto LGV Sud Est and the Paris Bypass, head via Strasbourg (with a stop), or

reverse in Basel and head via Freiburg and Strasbourg (with stops), and then take LGV Est, joining the Paris Bypass south of Charles de Gaulle Airport.

The public reaction to ideas to connect Switzerland are generally positive, and – unlike in Germany – there is some sort of systematic public debate about international rail expansion or not. The main opponents of plans for Switzerland-London trains – the commentators Kaspar P. Woker, Peider Trippi and Kurt Metz²³ – raise valid questions about the hurdles such services would have to overcome, but their idea to use Lille for changing trains is only a partial answer (as this report demonstrates above).



Genève

Category: Major adaptations

City Population: 201,000

Metro Population: n/a

Platforms 6 and 7 for trains to France are semi secured anyway, as customs controls happen for passengers exiting these platforms. But these platforms are to be rebuilt as part of wider reconstruction of the station, so it is currently unclear how it could work to run Channel Tunnel trains from Genève.



23 "Schweiz: Nach London direkt im Zug – chancenlos!" 10.06.2025, LOK Report
<https://www.lok-report.de/news/europa/item/59042-schweiz-nach-london-direkt-im-zug-chancenlos.html>



Zürich HB

Category: Minor adaptations

City Population: 415,000

Metro Population: n/a



Platform 18 (north side, street level) could be used with minor adjustments. A fence can be raised from the ground (this exists already). There is a large room, currently used as an exhibition space, on the in between floor underground that could be used as a terminal, with a nearby escalator and lift up to the platform. It would be a bit of a messy solution, but you can see how it would work in a way similar to Rotterdam. It would likely only work for a 200m train, not 400m.



Basel SBB

Category: Minor adaptations

City Population: 177,000

Metro Population: n/a

A complicated station. Platforms 30-34 could be deployed for trains towards Mulhouse but are narrow and very low, and rather exposed, and are due to be rebuilt. Platform 4 could be used towards Freiburg in Germany and there is even a

possible terminal space for either of these (pictured). The problem is that through running Zürich - Basel - Mulhouse could only possibly be done at the new platform 19 on the opposite (south) side of the tracks, but there it is not obvious what space would function as a terminal there, or how exactly you would secure the platform. There is also an old underpass under the whole station that could theoretically be deployed somehow.



On balance, two options seem viable: coupling a 200m train from Zürich to a further 200m train in Basel SBB station, and running via Freiburg and Strasbourg, or starting a 200m train in Basel SBB and coupling it to 200m from Zürich somewhere en route west, such as Basel St. Johann or St. Louis.



Freiburg (Brsg.) Hbf

Category: Minor adaptations

City Population: 236,000

Metro Population: n/a

Platform 8 – opposite side from the station building – could reasonably easily be secured for Channel Tunnel services, but is long enough only for 200m trains. A variety of buildings could be investigated as

a terminal along that side of the station. And yes, this Freiburg is not in Switzerland, but could be a place trains to/from Switzerland stop en route, and cannot easily be combined with any other destinations in Southern Germany.





Strasbourg

Category: Minor adaptations

City Population: 292,000

Metro Population: 861,000

A major and positive discovery. Platform 1 could be adapted in the same way as Bordeaux St. Jean, with a barrier or fence along the middle of the platform. The platform is wide enough to do this, and long enough for 400m trains.

And the former Salon Grand Voyageur on the platform could be used as the terminal.



And yes, Strasbourg is not in Switzerland, but could be a place trains to/from Switzerland or Southern Germany (see below) stop en route.

Stations on the Switzerland Corridor that were ruled out



Genève Aeroport

Category: Full scale rebuilding

City Population: 201,000

Metro Population: n/a

Four platforms underground and no way to easily secure them. Track layout inconvenient too. If Genève is to be served, it will not be here but elsewhere.

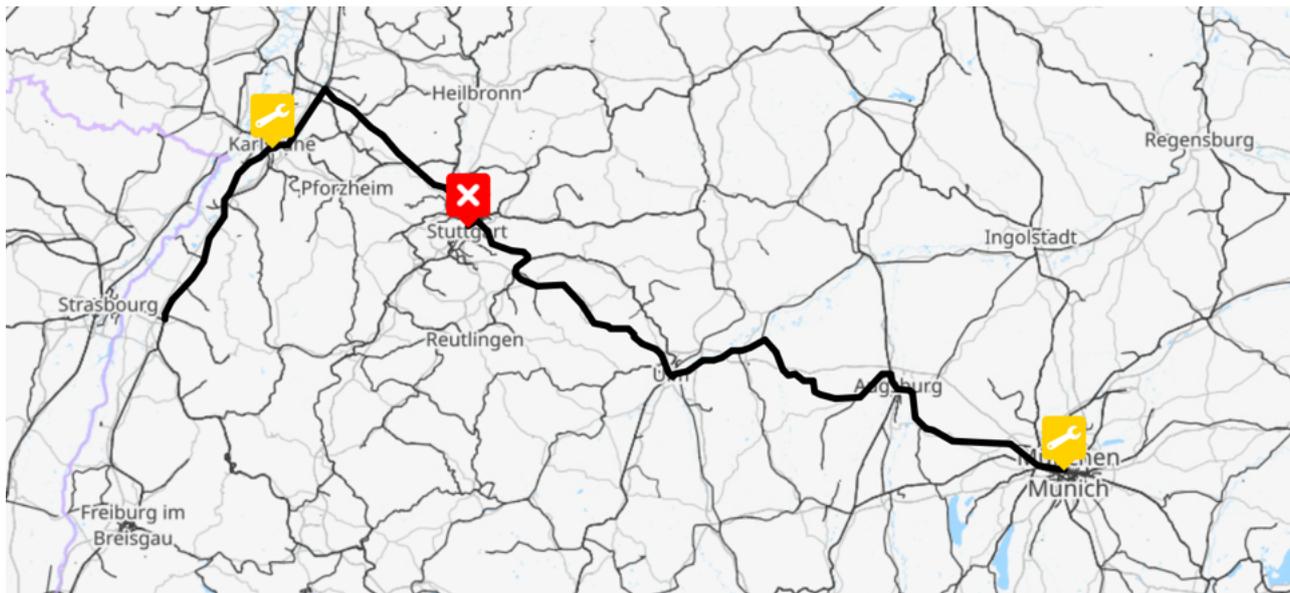


Locations on the Switzerland Corridor for further investigation

Alternative Genève locations

In a number of press articles about Switzerland-London direct trains, alternative terminal locations in Genève have been mentioned, usually around Lancy and Genève-Stade. I have not been able to visit these locations yet to check them. Once I have had the opportunity to do this, an updated version of this report will be published.

Southern Germany



Everything revolves around Stuttgart. Because that looks impossible, I can see no way to make this Corridor work. It would not make sense to only stop at Karlsruhe and München, not least as München is at the upper end of what would be desirable in terms of trip times. Strasbourg (covered in the Switzerland corridor above) could be additionally served en route to Southern Germany.



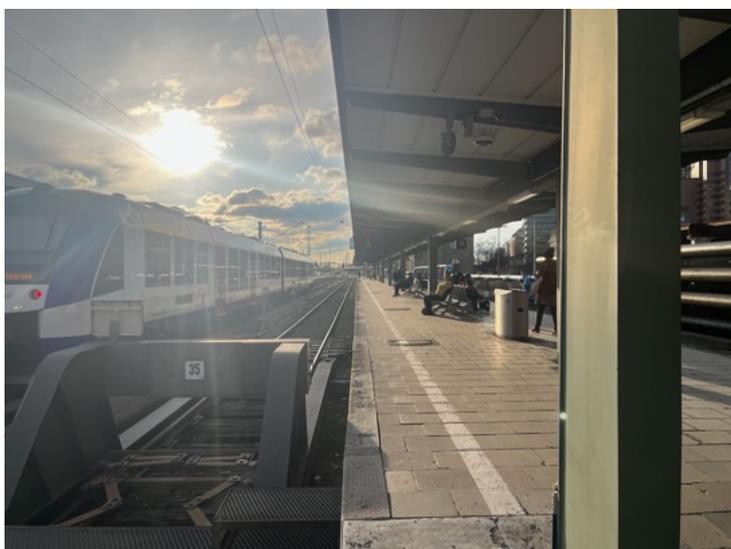
München Hbf

Category: Minor adaptations

City Population: 1,510,000

Metro Population: 5,991,000

The two “Flügelbahnhöfe” – the sort of side stations – could be adapted for 200m long trains, and on the north side space found for a terminal. The station is undergoing major rebuilding currently, but you can see how it could function.





Stuttgart Hbf (Stuttgart21)

Category: Full scale rebuilding

City Population: 633,000

Metro Population: 5,465,000

The current 16 platform above ground terminus station is being replaced with an 8 platform underground through station. This underground station is likely at capacity from the moment it opens. And with all platforms having tracks on both sides, and no account of trains to London having been taken in the design,

Stuttgart cannot be served from London from the new platforms. There is currently a debate as to whether some part of the above-ground station could be maintained, but whether that is realistic and if any of those platforms could be used for trains to London is unknown.



Karlsruhe Hbf

Category: Minor adaptations

City Population: 309,000

Metro Population: n/a

At the north end of the platforms there are service ramps and a service tunnel that could be used to access one of the platforms, likely on the east side of the station (furthest from the building) - the station is rather over-sized, so there would be platform capacity.



Stations on the Southern Germany Corridor that were ruled out



München Ostbahnhof

Category: Minor adaptations

City Population: 1,510,000

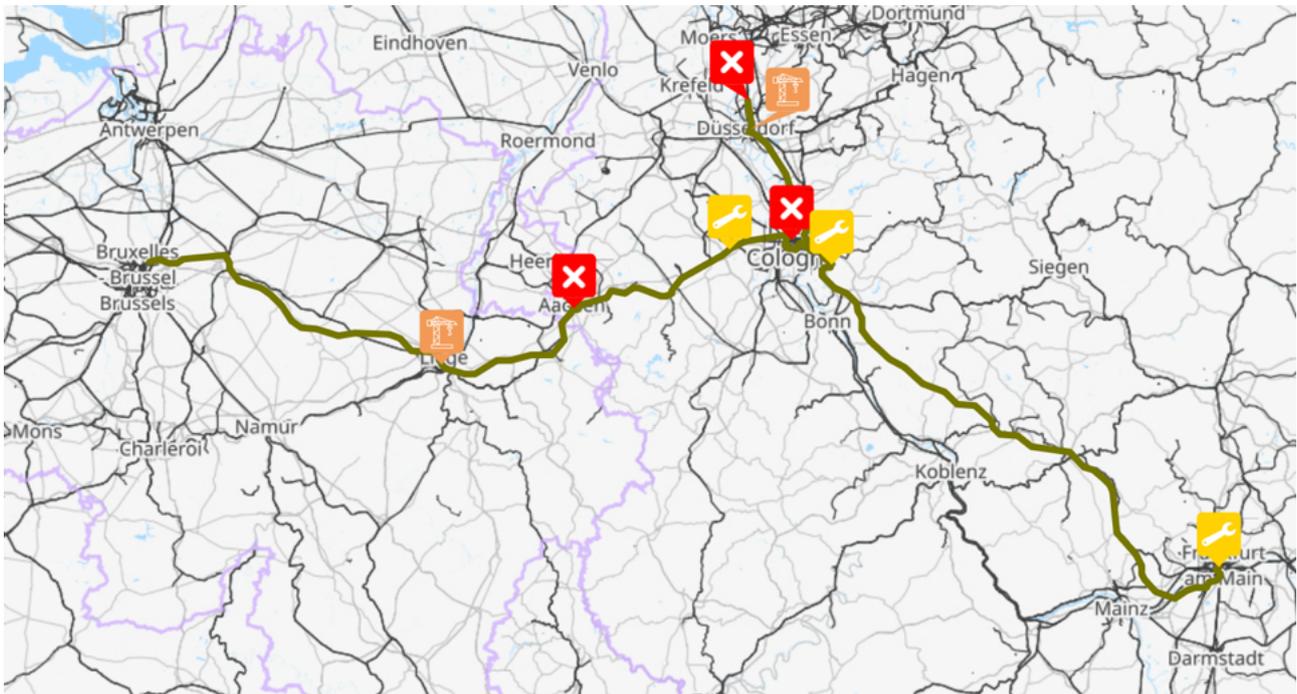
Metro Population: 5,991,000

Unlike München Hbf, München Ost would have space for a 400m long train, on the south side where the Motorrail terminal used to be. But this is currently a building site due to the new S-Bahn line construction. Once that is

complete, space could be found for a terminal. But as München Hbf could be served, there is no need to serve Ostbahnhof.



Western Germany



This Corridor is potentially the biggest prize of all – large cities with big surrounding urban areas. But it was the corridor that was the hardest to work out. Düsseldorf has to be eliminated, short term, as does Köln Hbf. But there is a model – using trains in a 2x 200m formation – to be able to serve both Frankfurt and Köln, but in the latter serving either Köln/Bonn Flughafen or Horrem rather than Hbf.



Frankfurt am Main Hbf

Category: Minor adaptations

City Population: 773,000

Metro Population: 5,604,000

Platform 23 on the north side of the station (pictured), or possibly Platform 1 on the south side, could comparatively easily be secured, and used by 200m long trains (the 400m platforms in Frankfurt are in the middle and are not easy to secure). The DB owned building next to Platform 23 could be used as a terminal. The solution is not ideal, due to the 200m constraint, but short term it would be workable if some operator wanted to try it.



Düsseldorf Flughafen

Category: Full scale rebuilding

City Population: 631,000

Metro Population: 11,300,000

At first glance this looks possible – there is an extra platform with space for tracks. But this area is to be used for S-Bahn trains in the future, leaving no obvious place for either a platform or terminal for Channel Tunnel trains.





Düsseldorf Hbf

Category: Major adaptations

City Population: 631,000

Metro Population: 11,300,000

City (west) side of Platform 4 there are some spare tracks, and space. But this part of the station is to be rebuilt for an improved S-Bahn service, and nothing has been foreseen for Channel Tunnel trains.

So some major works, at least to

platforms and perhaps also to tracks, would be needed here. However unlike Köln Hbf, the station is massive and the area comparatively unconstrained.



Köln/Bonn Flughafen

Category: Minor adaptations

City Population: 1,087,000

Metro Population: 8,711,712

The best option in Köln, short term. Two platforms in each direction, but comparatively few trains, and easy space for a terminal in the -1 level of the airport building just to the north of the station. A Bordeaux St. Jean style fence or barrier would be needed along the platform to prevent Channel Tunnel and S-Bahn passengers from mingling, but platforms are wide enough to do this quite easily. Solution would be that 1

200m train from Frankfurt (Main) Hbf would couple with a second 200m train here, and then go across the Südbrücke (so avoiding Köln Hbf altogether) and onwards towards Aachen and Bruxelles.





Köln Hbf

Category: Full scale rebuilding

City Population: 1,087,000

Metro Population: 8,711,712

While you can – just about! – imagine how a Rotterdam Centraal style solution (close a platform temporarily) could work on Platform 1 at Köln Hbf, the problem then is with paths out of the platform.



Platform 1 is on the south (city) side, while tracks to Aachen and onwards to Bruxelles are on the north side – so any departing train would have to cross 6 live tracks at one of Germany's most congested stations. Attempting this would be foolhardy, and any such service would be beset by delays. Reducing the capacity of the station for other trains is not politically feasible, and a major rebuild of the station – due to its constrained site and the Hohenzollernbrücke – impossible. So, if Köln is to be served, it will not be here.



Horrem

Category: Minor adaptations

City Population (Köln): 1,087,000

Metro Population: 8,711,712



A quite far out suburb of Köln, but unlike other possible stations it is obvious to see how a Channel Tunnel terminal could be built here. Between the parking on the north side of the tracks and the loop track off the main line there is space for an extra platform, and a (temporary?) terminal could be built on the edge of the car park. RE and S-Bahn trains provide onward connections. Horrem is the best station to investigate in the Köln area if using the Köln/Bonn Flughafen proves impossible.



Aachen Hbf

Category: Full scale rebuilding

City Population: 253,000

Metro Population: n/a

The station is small and cramped, and at the moment has only one underpass that could not be secured. There are plans for a second underpass, but even then it is hard to see how this one could be made to work.



Liège Guillemins

Category: Major adaptations

City Population: 195,000

Metro Population: n/a

An amazing Calatrava designed station, but none of the platforms are obviously easy to secure, and there is no easy location for a terminal either. Although given the station is oversized for the city, perhaps some solution could be found if necessary.

As Liège is less than an hour from Bruxelles and trains to the Belgian capital are regular, it might make most sense for passengers to simply change onto Channel Tunnel services at Bruxelles Midi. And yes, Liège is in Belgium, but would be served by trains to Western Germany, hence is listed as part of that corridor.



Stations on the West Germany Corridor that were ruled out



Frankfurt am Main Flughafen Fernbahnhof

Category: Major adaptations

City Population: 773,000

Metro Population: 5,604,000

As Frankfurt (Main) Hbf works, that means trying to adapt Flughafen station is probably not going to be necessary. The platforms are wide enough to be able to put a

dividing glass barrier or fence along them (Bordeaux St. Jean style), but working out where to put a terminal is complex – there is only limited space in the interim level between platforms and concourse. Ultimately Hbf is a better bet.



Köln Süd

Category: Major adaptations

City Population: 1,087,000

Metro Population: 8,711,712

Köln Süd would have space for extra platforms for Channel Tunnel trains, but is due to be rebuilt as part of plans to improve Köln's S-Bahn. There are no plans to make the station Channel Tunnel compatible as part of the re-build, and other Köln stations are hence a better bet.





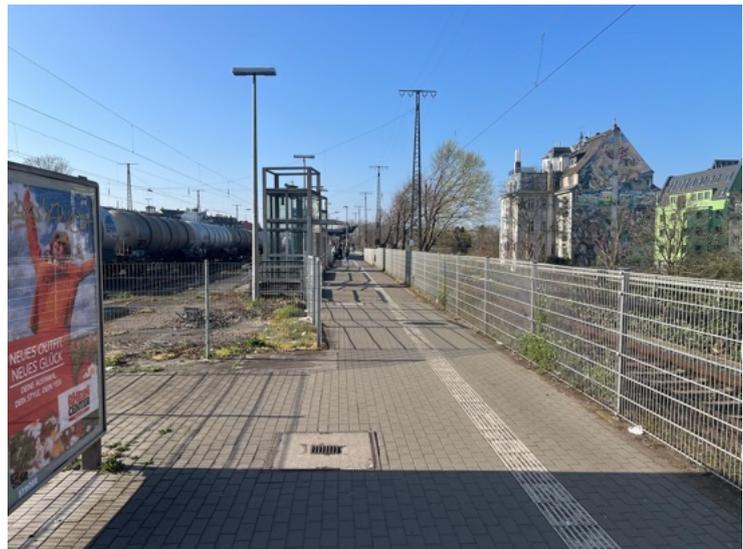
Köln West

Category: Major adaptations

City Population: 1,087,000

Metro Population: 8,711,712

The situation in Köln West is very similar to Köln Süd. Existing platforms are basic, and while there is space for more platforms, the current focus is on the development of S-Bahn lines. A route from a building you could use as a terminal is more obvious here than at Süd, but – at least short term – other Köln stations are a better option.



Köln-Müllheim

Category: Major adaptations

City Population: 1,087,000

Metro Population: 8,711,712

There would be space for a terminal here somewhere, but the station has been paid so little attention over the years that it is not even disabled accessible currently. Regardless of any future for Channel Tunnel trains, the station needs major attention.





Köln Messe/Deutz

Category: Full scale rebuilding

City Population: 1,087,000

Metro Population: 8,711,712

More platform space than Hbf, but a single underpass and narrow and exposed platforms, and no obvious place for a terminal. Only in the very long term might there be opportunities here.



Köln-Ehrenfeld

Category: Full scale rebuilding

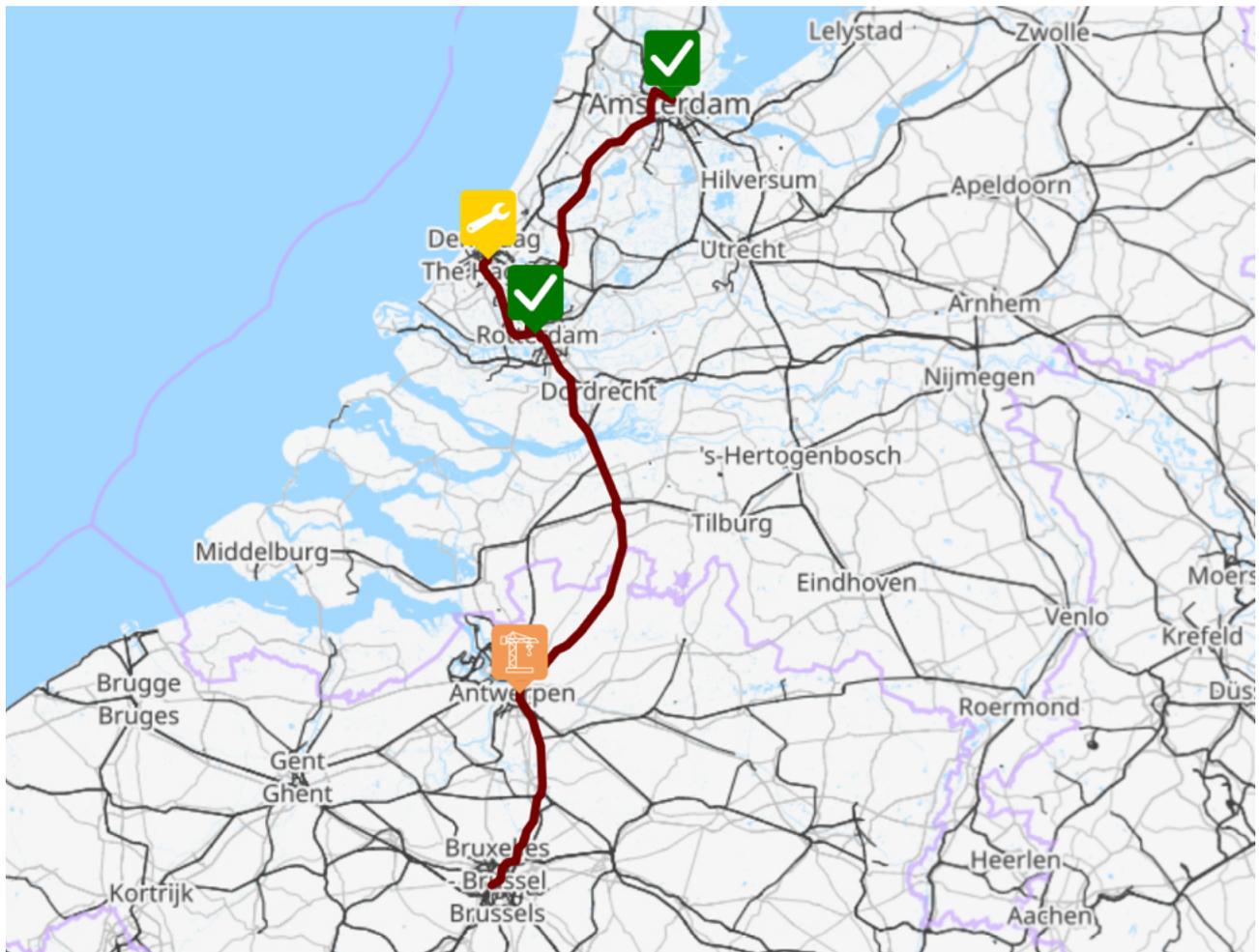
City Population: 1,087,000

Metro Population: 8,711,712

Checked as an alternative to Köln Hbf. Site is very constrained on both sides – no way to make this work.



Netherlands



The only permanent route expansion since the launch of Eurostar in the 1990s, the Netherlands Corridor offers the potential to serve large cities and the most densely populated parts of the Netherlands. However a small underground terminal in Amsterdam, a tiny one in Rotterdam, and complex rebuilding in Antwerpen were it to be served, mean running significantly more trains is fraught with difficulties. Den Haag HS offers a simple expansion opportunity, especially for new entrants.



Amsterdam Centraal

Category: Fulfils requirements

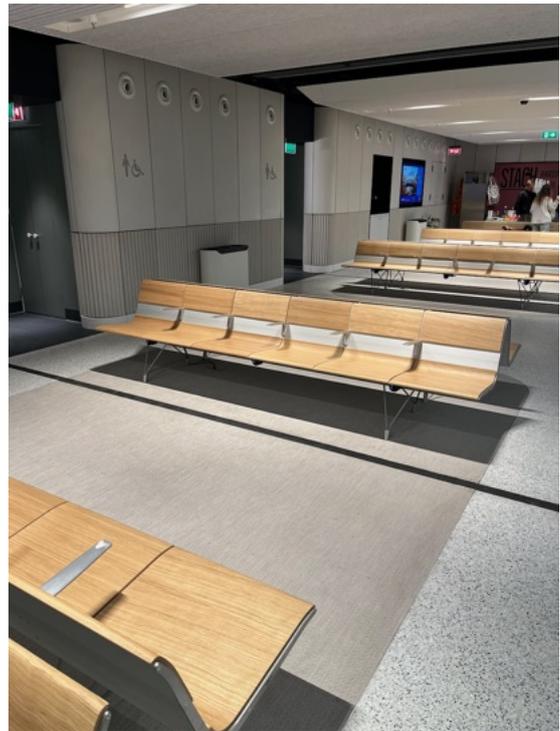
Terminal Capacity: 700

City Population: 934,000

Metro Population: 2,481,000

A freshly renovated underground terminal which has been built well, making it airy and more pleasant to use than Bruxelles Midi. Capacity is around 700 passengers – more than $\frac{3}{4}$ of a 400m long train.

However the terminal cannot process passengers especially quickly, so at the moment the de facto maximum is 1 train every 2 hours, posing a limit on possible expansion of this route.



Den Haag HS

Category: Minor adaptations

City Population: 549,000

Metro Population: 2,390,000 - inc.

Rotterdam

A possible option to overcome the capacity constraints at Amsterdam Centraal would be to start/end a 200m train in Den Haag instead of in Amsterdam.



Platform 1 – which is not quite 400m long – could reasonably easily be secured in a similar way to Rotterdam Centraal. The Royal Waiting Room (or buildings beside it) could then be adapted as the terminal.



Rotterdam Centraal

Category: Fulfils requirements

Terminal Capacity: 165

City Population: 664,000

Metro Population: 2,390,000 - inc. Den Haag



An ingenious solution that could be deployed at other stations. What was foreseen as an office block has been turned into the terminal. 10 minutes before the train arrives the platform – which is otherwise used for regular trains – is secured, with a combination of permanent and temporary barriers, and security staff positioned at appropriate locations (inc. on the opposite side of the train from where passengers board). When the train arrives passengers descend from the terminal and board the train. However just 165 passengers can board at a time – as the terminal is small and has limited capacity.



Antwerpen Centraal

Category: Major adaptations

City Population: 565,000

Metro Population: 1,230,000

Eurostar trains from Amsterdam pass through the low level of this amazing station without stopping, but it is hard to see how the station could be adapted – you would need to put permanent barriers along the platforms, and somehow find a way to get passengers to those platforms – it is not obvious how this



could easily be done. Plus with Bruxelles just 40 minutes away, the case for doing so looks quite weak – just go to Bruxelles and change.

And yes, I know Antwerpen is not in Netherlands, but it would be served by trains to Netherlands, hence why it is listed here.

Stations on the Netherlands Corridor that were ruled out

 **Amsterdam Zuid**
Category: Full scale rebuilding

City Population: 934,000
Metro Population: 2,481,000

Checked as an alternative to Centraal. Small station with good public transport connections, but noisy and constrained on both sides by motorways. No obvious way to use this as an alternative to Centraal at present. The station is to undergo major rebuilding to be completed sometime after 2035, so in the long term there might be an opportunity to move services here, but not currently.



 **Schiphol**
Category: Full scale rebuilding

City Population: 934,000
Metro Population: 2,481,000

Eurostar trains pass through without stopping, but the underground airport station is congested and each platform has many escalators that would all need to be secured. Only with major renovation works would it work out, and the case is weak anyway as it is so close to Amsterdam.



Operators

Eurostar

Operates	Core Routes, Netherlands
Stated expansion	Genève (Switzerland), Frankfurt (Western Germany)
Former routes	French Alps, Marne-la-Vallée (Paris Bypass), Avignon Centre (Southern France), Lyon and Marseille (Southern France, with “de-training”)
Attitude to interim stations	Not keen. Officially has not ruled out serving Ebbsfleet, Ashford, Calais-Fréthun again, but has no concrete plans. Serves Lille, but sees little opportunity for expansion there
Significant non-Channel Tunnel routes	Ex-Thalys routes – Amsterdam-Bruxelles-Paris and Köln-Bruxelles-Paris, stated expansion Amsterdam-Genève
Existing fleet	Alstom TMST (8) Siemens Velaro 16 carriage (17) Alstom PBA and PBKA (26) – 200m trains from the 1990s for non-Channel Tunnel routes
On order	Alstom Avelia Horizon (30, option for 20 more)
Maintenance	Temple Mills (London), Le Landy (Paris), Forest (Bruxelles) Stabling in Amsterdam and Köln
Company ownership	Eurostar Group SNCF Voyageurs (55.75%) CDPQ (19.31%) NMBS/SNCB (18.5%) Federated Hermes Infrastructure (6.44%)

It is hard to work out what Eurostar does from here, given the company has said so many contradictory things over the past 18 months. Having stated it would invest in new trains, by the time it finally did make that investment decision it was too late to prevent the Office of Rail and Road from deciding there was space at Temple Mills depot and allocating that to Virgin Trains (see below).

While Eurostar CEO Cazenave has as recently as October 2025 re-stated that the company aims to transport 30 million passengers by 2030²⁴, the Avelia Horizon trains will only be on the tracks from 2031 as that type of train has the longest delivery backlog

24 “Eurostar boss Gwendoline Cazenave plots expansion with a Michelin-star menu” 17.10.2025, The Times
<https://www.thetimes.com/business-money/companies/article/eurostar-boss-gwendoline-cazenave-plots-expansion-with-a-michelin-star-menu-b50wpg8x6>

(despite Cazenave saying the opposite to the FT²⁵). And having ordered only 30 new trains, with an option for 20 more, but with 32 life expired TMST, PBA and PBKA trains to replace (and you need 2 Horizon to adequately replace a single TMST), even maintaining current levels of service looks to be a stretch.

Given the potential headaches getting Avelia Horizon approved to run through the Channel Tunnel (see above), and the limited luggage space on double deck trains, it is even questionable whether the train order is the right one, although as a SNCF dominated company, ordering anything not built in France would have been a non-starter, politically, and Alstom has nothing else it could offer from French factories.

While Eurostar is expanding a little to Amsterdam (5 trains a day from December 2025²⁶, and I would not be surprised to see this climb to 6 or 7 in the next few years), further expansion plans are at best vague. Of the two stated planned destinations, Frankfurt makes more sense than Genève, but there is no detail in public as to how either would be served, and both would need the new Avelia Horizon trains in service²⁷. Re-starting summertime trains to Southern France (complete with “de-training”) and ski trains from London to the French Alps would both be operationally possible, but would go against the big cities only strategy Eurostar has pursued in recent years.

A more limited view of what is possible in the future might be understandable given Eurostar’s precarious financial state post-COVID²⁸, but Eurostar’s unwillingness to contemplate the re-opening of Ebbsfleet and Ashford has left its political position weakened, and floating the idea of judicial review of the ORR Temple Mills decision within hours of it being announced²⁹ was not a good PR move.

Planned since 2019, agreed in 2022, and implemented from 2023³⁰, Eurostar’s merger with Thalys still feels like a work in progress. The Channel Tunnel and non-Channel Tunnel routes operate largely separately, and the absence of rolling stock that can serve all destinations post-merger has not helped, and whatever synergies there could be between both sides of the operation have yet to be seen for passengers. At least staff across the entire company now have the same uniforms³¹.

25 “Eurostar places €2bn order for double-decker trains” 22.10.2025, Financial Times <https://www.ft.com/content/ecefe123-8b26-4be4-b2ce-73ee140286fa>

26 “Fifth Daily Eurostar Between the Netherlands and London Starting December 2025” 10.07.2025, NS International <https://www.nsinternational.com/en/news/fifth-daily-eurostar-netherlands-london>

27 Genève station can be reached with 25kV train currently, but given the station is to be rebuilt and an alternative location in Genève would likely be needed short to medium term, I cannot see how you can avoid needing a 15kV train to serve it

28 “Eurostar Group returns to growth and prepares for the future” 27.06.2023, Eurostar https://mediacentre.eurostar.com/mc_view?article_id=ka43z000000buh1AAA

29 “Eurostar mulls High Court bid to thwart Richard Branson” 01.10.2025, The Times <https://www.thetimes.com/business-money/companies/article/eurostar-mulls-high-court-bid-to-thwart-richard-branson-zhnck07vk>

30 “Eurostar - Thalys merger completed” 13.5.2022, International Railway Journal <https://www.railjournal.com/passenger/high-speed/eurostar-thalys-merger-completed/>

Virgin Trains

Intends to operate	Core Routes, Netherlands – from 2030
Stated expansion	Hopes to extend the network to “across France and into Germany and Switzerland”
Attitude to interim stations	Open to serving Ebbsfleet and Ashford if the financial conditions are right, no info about Calais-Fréthun or Lille
Significant non-Channel Tunnel routes	None
Intention to order	Alstom Avelia Stream (12)
Maintenance	Temple Mills (London)
Company ownership	VTE Holdings Limited Virgin Group, backed by Equitix and private equity group Azzurra

Despite Richard Branson promising to “bring some Virgin magic to the cross-Channel route”³² it is unclear whether the company really offers something magical. For the successful Virgin Trains bid for access to maintenance capacity at the Temple Mills depot in East London was characterised by caution – propose an operational model that would fit within the operational constraints imposed by the limited spare capacity of that depot. Virgin’s submission to ORR was also exemplary in its clarity – you could believe the company can do what it says.

The operational plan is clear enough: compete against Eurostar on Core Routes, offering a slight differentiation of service. Virgin’s single deck Stream trains will be airier and roomier than Eurostar’s future double deck fleet, and as boarding will be quicker as well that leaves Virgin better placed to serve Ebbsfleet and Ashford, and corner that niche.

Running to Amsterdam is known to be possible, but the limited throughput of terminals on the Netherlands Corridor (especially Amsterdam Centraal) mean running a train more than every two hours is close to impossible, and Eurostar has most of the existing slots. With it still not being confirmed whether the Avelia Stream trains will have 15kV for Germany and Switzerland, how expansion to those countries would work is unclear, although there is of course a rationale for not trying to accomplish too much too quickly.

31 “Eurostar unveils first new Uniform in over a decade: Heritage with a European twist” 30.10.2025 https://mediacentre.eurostar.com/mc_view?language=uk-en&article_id=ka4W50000000WXIYAM

32 “Branson promises ‘Virgin magic’ to shake-up cross-Channel train services ‘for good’” 30.10.2025, Railway Gazette International <https://www.railwaygazette.com/passenger/branson-promises-virgin-magic-to-shake-up-cross-channel-train-services-for-good/69867.article>

Further risks for Virgin include legal action from Eurostar over access to Temple Mills, the absence of any clarity about maintenance locations anywhere else, and delivery delays for the Stream trains from Alstom – a heavily customised design.

Having said all of that, Virgin is in pole position to be the first rival to Eurostar since the Channel Tunnel opened. The plans are eminently achievable, at least for London-Bruxelles and London-Paris.

Trenitalia

Intends to operate	Core Routes (Paris first, nothing about Bruxelles)
Stated expansion	Other destinations in France and Italy – Lyon, Marseille and Milano mentioned
Attitude to interim stations	Publicly open to serving Ashford, no info about Ebbsfleet or Calais-Fréthun. Open to serving Lille
Significant non-Channel Tunnel routes	High speed operations in France (Paris-Lyon-Marseille) and France-Italy (Paris-Milano). Further high speed operations in Italy and Spain (Iryo joint venture)
Fleet	Hitachi ETR1000 (50 in service, 30 on order, 10 intended for London services but unclear if a new order or from existing fleet)
Maintenance	Application to use Temple Mills (London) rejected, heavy maintenance could be conducted in Milano
Company ownership	Trenitalia France Part of FS Group, owned by the Italian state

Trenitalia suffered an obvious setback in its international expansion when ORR decided in favour of Virgin Trains for access to Temple Mills, and the question then is: what does the company do now?

Having sorted out its Frecciarossa product nationally, succeeding despite competition from private rival Italo, it expanded to serve Milano-Paris, before then going further into Spain in the Iryo joint venture and most recently rivalling SNCF on routes within France (Paris-Lyon and Paris-Marseille).

As the only one of the potential short term rivals to Eurostar with its own maintenance facilities set up (heavy maintenance, even for the France fleet, is done in Milano), Trenitalia is well placed to overcome the Temple Mills setback, and attempt to run to London anyway.

The long established and solid relationship between the company and manufacturer Hitachi, and the existing framework to deliver more ETR1000 trains, means Trenitalia could even be ready to start operations before Virgin's Avelia Stream trains are delivered.

Trenitalia's focus on Paris only on the Core Routes makes sense, given the company's established presence in France. However Lyon and Marseille – due to the constraints at those stations (see above) – make little sense for route expansion, while Milano is a trip of almost 9 hours from London. However one train a day to Milano, essentially as a stock move to the maintenance facility (albeit with passengers on board) and with "de training" in Lille in the opposite direction, might make some operational sense. Given Hitachi also has a maintenance facility in Ashford, there might even be a way to somehow use that to Trenitalia's advantage, or explore building something new in France.

However there remains this nagging impression in my mind that Trenitalia is not *really* committed to London. Trenitalia was the last of the potential rivals to Eurostar to declare anything publicly, and somehow needed some persuasion from Evolyn to even join in (although despite a Memorandum of Understanding³³ between the two, both firms submitted bids for Temple Mills access separately).

You could also reverse the question: where else could Trenitalia deploy a fleet of excellent 300km/h trains? And at least one answer to that would be on the Amsterdam-Bruxelles-Paris route, not least as through the acquisition of Qbuzz the company has a presence in Netherlands³⁴. The passenger potential might be lower than to London, but so too is the technical complexity – no Channel Tunnel, no passport controls or security checks.

So at the moment we do not know enough, publicly anyway, to assess what Trenitalia is going to do next.

33 "FS Group: plan to launch a new High-Speed link between London and Paris" 8.4.2025, FS Group <https://www.fsitaliane.it/en/media/press-releases/2025/4/8/fs-group-high-speed-london-paris.html>

34 "Trenitalia punta sui servizi alta velocità tra Francoforte e Amsterdam" 27.11.2023, Ferrovie.it <https://www.ferrovie.it/portale/articoli/14383>

Gemini Trains

Intends to operate	Core Routes, Köln (Western Germany)
Stated expansion	Unknown
Attitude to interim stations	Open to re-opening Ebbsfleet and using Stratford rather than St. Pancras as the terminus in London. No position on Ashford, Calais-Fréthun or Lille
Significant non-Channel Tunnel routes	None
Intended order	Siemens Velaro Novo (10)
Maintenance	Unknown, application for access to Temple Mills (London) rejected
Company ownership	Gemini TOC Limited Rolling stock finance from Rock Rail Co-branding with Uber

While Virgin Trains played it safe, Gemini were the radicals – proposing to not serve St. Pancras at all, and instead use Stratford as their London terminal. A tie up with Uber made Ebbsfleet (rather than Ashford) a logical interim stop, being close to the M25 motorway. Even the choice of rolling stock was bold – Gemini wants to be launch customer for the new Siemens Velaro Novo. Köln was most often mentioned as the favoured destination for route expansion.

But for ORR did not believe Gemini could deliver, and – unlike Trenitalia – the absence of alternative maintenance facilities and other routes they could pursue, means for Gemini it looks like it is Channel Tunnel routes or nothing. The company has stated that it intends to continue³⁵, but how that can work from here is not at all obvious.

35 *"Gemini Trains still hopes to exploit Channel Tunnel capacity"* 30.10.2025, Railway Gazette International
<https://www.railwaygazette.com/passenger/gemini-trains-still-hopes-to-exploit-channel-tunnel-capacity/69864.article>

Evolyn

Intends to operate	Core Routes (Paris first)
Stated expansion	Netherlands, and hopes to expand more in future, no detail given
Attitude to interim stations	Stated position in favour of serving Ashford, although not initially. No position on Ebbsfleet, Calais-Fréthun or Lille known
Significant non-Channel Tunnel routes	CMC Group has rail operations in Spain and Germany, but not in the high speed segment
Intended order	Alstom Avelia Horizon (12)
Maintenance	Unknown, application for access to Temple Mills (London) rejected
Company ownership	Evolyn Mobility Ltd CMC Group (Cosmen Family)

The most difficult of the rival bids to understand. If the Cosmen family wanted to enter the high speed rail market, why do it here, on the most complicated route of all? And then there was the potential tie up with Trenitalia, that did not materialise. And a back and forth with Alstom about procurement of trains (or not)³⁶, although some framework for the same sort of Avelia Horizon trains Eurostar will order made it into the company's submission to ORR.

In the end, all of this probably does not matter – Virgin Trains has the access to Temple Mills and, unlike Gemini, if Evolyn has any ideas that other companies would like to adopt, I am not sure what they are.

³⁶ "Alstom statement on Evolyn Press Release issued on October 11" 13.10.2023, Alstom <https://www.alstom.com/press-releases-news/2023/10/13102023-alstom-statement-evolyn-press-release-issued-october-11>

SBB

Already in 2023 there were notions that Swiss Federal Railways (SBB) was open to the idea of direct trains to London, from the CEO no less³⁷, with the discussion driven mostly by the high numbers of flights from Swiss airports to the UK. Throughout 2025 how SBB could approach this task has become progressively clearer – up to 40 high speed trains are to be procured through a leasing firm, and four leasing firms have pre-qualified³⁸.

Based on what SBB states – that trains would run in Switzerland (obviously!), Italy, France and could be used as far as Barcelona and London – this is going to mean 4 voltage trains. And while it is not stated, that these would be 200m units is a fair assumption. All of the rolling stock types stated above, except Talgo Avril, and possibly adding Swiss manufacturer Stadler with a 300km/h Giruno³⁹, could fit the bill. Maintenance would also not pose a major problem, as SBB's trains would be maintained in Switzerland.

Given that SBB has partnerships with all its neighbouring railways, most likely this would be the model for London too. Eurostar has stated it wants to run to Genève, but has said nothing about Basel or Zürich, and my assessment would be SBB would be keener on the latter two (passenger potential is higher, short term stations are easier to equip). There is also the not insignificant issue of stops – or not – heading through France, with Marne-la-Vallée and Lille obvious options, and Strasbourg an interesting addition to pursue.

However despite their public commitment to state-owned railways cooperating, SBB and the SNCF-dominated Eurostar are not the most obvious bedfellows. Eurostar's attention to the biggest of the big cities only, timetable organised to ensure trains run only when they can be completely full, and shunning connecting trains, is the very opposite of SBB's devotion to clock face timetables, connections, and serving smaller places. Plus were SBB to opt for a manufacturer other than Alstom for its high speed fleet there could be some potential tension with their traditional partners in France.

The conclusion here is clear: SBB means business, and throughout 2026 we will begin to discover more about how their rolling stock order will develop. Only in the later 2020s will we know whether London will happen for sure, or if the trains to be ordered will be deployed elsewhere.

37 "Wann kommt die direkte Zugverbindung nach London?" 11.12.2023, aboutTravel <https://abouttravel.ch/reisebranche/wann-kommt-die-direkte-zugverbindung-nach-london/>

38 "Internationaler Verkehr: SBB strebt Beschaffung von Hochgeschwindigkeitszügen an" 12.03.2025 and updates, SBB <https://news.sbb.ch/medien/artikel/135243/internationaler-verkehr-sbb-strebt-beschaffung-von-hochgeschwindigkeitszuegen-an>

39 "Crossing borders at high speed: SMILE" Stadler <https://www.stadlerail.com/en/solutions/rolling-stock/mainline-smile>

Deutsche Bahn

“Traffic between London and the mainland via the Eurotunnel remains of fundamental interest to Deutsche Bahn” is a fair summary of the company’s position⁴⁰, but Germany’s state owned railway company is not willing to commit to much more than that. That DB has no suitable rolling stock for services to London is strictly speaking true today (see Siemens Velaro 8 carriage version above). ETCS on high speed lines in northern France and on HS1 is due to be installed in the mid-2030s, meaning DB’s trains would theoretically be compatible from then onwards.

A related question is whether DB would work in cooperation with Eurostar or alone, were it to step up its plans. In June 2025 when Eurostar stated it intended to run to Frankfurt, DB signalled it was open to cooperation⁴¹. However DB’s relationship with Eurostar is complicated, given DB ICEs essentially compete with ex-Thalys Eurostar trains between Köln and Bruxelles.

Deutsche Bahn’s position today is different in important respects to the situation fifteen years ago when it ran a test train to London. Its international expansion plans are more modest, but its fleet of internationally compatible high speed trains (with the excellent Siemens Velaro ICE3neo Class 408 replacing the unreliable Class 406) is much larger than it was then.

The question here then is mostly about attitude – does Deutsche Bahn want to step up and run to London? At the moment, short term, the answer looks to largely be no. Were I in their shoes I would not either.

40 *“Mit dem ICE nach London: Bahn hat großes Interesse – was jetzt passieren muss”* 16.12.2024, 24 Rhein <https://www.24rhein.de/leben-im-westen/verkehr/europa-deutsche-bahn-ice-eurotunnel-london-koeln-nrw-plaene-verkehr-bahnreisen-92777220.html>

41 *“Direktverbindung von Deutschland nach London”* 9.6.2025 Deutsche Bahn, Web Archive <https://web.archive.org/web/20250609200022/https://www.deutschebahn.com/de/konzern/Aktuelles/Aktuelle-Statements-12829716>

List of terms

Alstom – the French train manufacturer, previously known as GEC Alsthom. Rather than use Alstom and GEC Alsthom interchangeably, I refer to Alstom throughout.

Bogie – two rail axles on a frame, attached to a rail vehicle by a pivot. High speed rolling stock has either standard bogies underneath carriages, or Jacob's bogies that are specially mounted between carriages rather than under them.

Distributed traction – trains where motors and electrical equipment are arranged under the floor of passenger carriages, rather than in power cars or locomotives at the end(s) of trains.

ETCS – European standardised signalling system, steadily replacing national legacy signalling systems on high speed lines.

HS1 – more completely known as High Speed 1, previously known as Channel Tunnel Rail Link (CTRL), is the high speed railway line between London and the Channel Tunnel. It is operated by HS1 Ltd, recently rebranded as London St. Pancras Highspeed.

HSL1 – the high speed line between the France-Belgium border near Lille, and south of Bruxelles.

LGV – French term for a high speed line. They are named according to their direction relative to Paris. LGV Nord is the high speed line from the edge of Paris, north of Gare du Nord, and the Channel Tunnel.

Loading gauge – the maximum physical dimensions of a train (height, width), determined so as to ensure trains can pass bridges and tunnels and align with platforms. The loading gauge is smaller on railways in the UK than in Continental Europe. The latter is also termed UIC Gauge. HS1 however uses UIC Gauge, not UK loading gauge.

TVM430 – the French legacy cab signalling system for high speed lines, in use on LGV Nord, HS1 and through the Channel Tunnel. Due to be phased out by c. 2035. It is a newer version of TVM300, likewise a France-specific high speed cab signalling system.

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In report sections "Rolling Stock – Siemens Velaro" and "Rolling stock and Channel Tunnel evacuation rules" (same photo used twice)

Velaro Novo high-speed train. Source: © Siemens AG, press image.

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In report section "Rolling Stock – Alstom Avelia Horizon"

Eurostar Celestia train at London St-Pancras International station .

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In report section "Rolling Stock – Alstom Avelia Stream" and "Rolling stock and Channel Tunnel evacuation rules" (same photo used twice)

Computer rendering of Virgin Trains' future Avelia Stream. © VTE HOLDINGS.



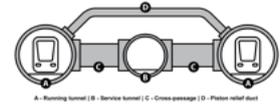
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February 19, 2018

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In report section "Rolling stock and Channel Tunnel evacuation rules" Le TGV M à la gare de Lyon lors de sa présentation le 31 juillet 2023.

Rémi Simonnin

July 31, 2023

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[https://commons.wikimedia.org/wiki/File:TGM_M_%C3%A0_gare_de_Lyon_\(3\).jpg](https://commons.wikimedia.org/wiki/File:TGM_M_%C3%A0_gare_de_Lyon_(3).jpg)



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August 5, 2013

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