

'Project of a generation': Grand Paris Express

Philippe Yvin, Chairman of the Management Board at Société du Grand Paris, updated **Murray Hughes** on progress with Europe's most ambitious metro project, the orbital Grand Paris Express, as work gets underway on all sections of Line 15 South.

Few urban transport projects can claim to have the transformative effect anticipated for the Grand Paris Express orbital metro. Described by Chairman of the Management Board of Société du Grand Paris Philippe Yvin as 'the project of a generation', it will have a profound impact on urban development across an area of 140 km². For comparison, central Paris covers about 105 km².

At 200 route-km, Grand Paris Express will double the size of the existing Paris metro, thanks to construction of four new lines and extensions to the existing lines 11 and 14. Largely in tunnel, except for sections of lines 17 and 18, the routes

have been chosen to ensure good connections with suburban rail, metro and tram lines. The result will be an interlinked network of public transport arteries.

GPE lies at the heart of the ambitious Grand Paris project, which represents much more than a transport improvement scheme. It is a massive programme aimed at revitalising the entire region surrounding the French capital through a combination of capital investment and the creation of high-quality transport links. Over the long term the Grand Paris project is expected to boost the area's GDP by about €100bn, not least through construction of around 70 000 dwellings a year for a period of 25 years.

Asked if GPE was a transport project, an economic development project or an answer to social needs, Yvin affirmed that it was 'all three at the same time'. Supporting economic and urban

development and encompassing a social dimension, the project entails the creation of a new transport network with 68 stations forming 'the real backbone of the Grand Paris project'. The Grand Paris *métropole* will become 'an attractive wealth-generating area that can compete with other big cities on the world stage in the years to come'.

Referring to the origins of the project in 2009, Yvin said that Christian Blanc, Secretary of State in Nicholas Sarkozy's government, saw the proposed orbital metro primarily as an economic development tool. This contrasted with the views of the elected mayors in the towns surrounding Paris, whose objective was simply to construct an orbital transport link between key centres (MR 3.12 p23).

In this way rival schemes emerged, one supported by the national government and the other by the Ile-de-France region. There followed a lively national debate which led in January 2011 to the formal announcement of the Grand Paris Express project.

According to Yvin, this 'married the two ambitions', one intended to foster economic development and the other aimed at facilitating the daily life of people across the Paris region. GPE would open up access to suburbs currently lacking public transport and the 68 stations would serve as 'vital nodes where housing and other developments would flourish'.

On August 12-16 contractors worked round the clock to install a prefabricated concrete raft forming the roof of the future Grand Paris interchange station at Fort d'Issy-Vanves-Clamart. Weighing 7000 tonnes and covering 2000 m², the slab was slid into position in a few hours ready for installation of tracks carrying SNCF's Transilien Line N suburban services between Paris Montparnasse and Versailles Chantiers.



Photos: Gérard Rollando





PHILIPPE YVIN CHAIRMAN, MANAGEMENT BOARD
SOCIÉTÉ DU GRAND PARIS

'We expect the first TBM to be completed by the end of the year'

Photo: Genaro Bardy / Société du Grand Paris

When asked how much the project had changed since its conception, Yvin highlighted the terms of the 2011 agreement between the state and the Ile-de-France, which had helped to ensure that the project was 'very stable and supported by a strong consensus'. This applied at the political level, at the social level and in terms of economic development.

Whole project approved

So far, 2017 has been a landmark year for GPE. The declaration of public utility for the final part of the programme was granted on March 28. Covering construction of Line 18, it followed DUPs for Line 17 North on February 14 and Line 15 East on February 13. The first DUP had been for Line 15 South, which was granted in December 2014.

In an assessment of progress to date, Yvin said that the northern extension of Line 14 would be the first part of the project to be finished. Although not complying with the original schedule, the Line 14 project was 'making good progress', with completion 'probably in two to three years'.

Yvin considered the line to be 'very important' because the multiple objectives of the extension included relieving parts of the existing metro and RER networks, especially metro Line 13, where overcrowding is a serious problem. The extension is being constructed in two stages, the first taking the line from Saint-Lazare as far as Mairie de Saint-Ouen, and the second continuing

from there to Saint-Denis Pleyel.

Rapid progress is also being made with Line 15 South linking Pont de Sèvres with Noisy-Champs. Yvin noted that the final civil engineering contracts for the 33 km line had been let on July 3, taking the total value of contracts for Line 15 South to €3.7bn. By September there were due to be 45 active worksites along the whole route, he said, with 14 out of the 16 stations under construction.

Olympic ambition

Next on the agenda was the southern extension of Line 14 towards Orly airport, Yvin continued. After that would come Line 16, now known as the Olympic line. Yvin explained that under the Paris bid to host the 2024 Olympic Games, many of the venues would be located along this route to the east of the Paris conurbation, 'so this line is very significant'.

The northern terminus of Line 16 will be located at Saint-Denis Pleyel, where four Grand Paris Express lines will converge. This will generate around 250 000 passengers a day, and Yvin expects the station construction contract to be let next year.

Other lines were still at the stage of technical studies, Yvin affirmed. Nevertheless, a general contractor had been appointed in each case, and work should start on all remaining lines between mid-2018 and mid-2019. This means that work will be in progress on the entire project by 2020.

On time and on budget

Was the project running to time and to budget? 'Everything is looking good at the moment', came the reply, but Yvin cautioned against over-optimism, pointing out that technical issues may arise once the tunnelling programme commences.

Under an agreement announced by the then Prime Minister Jean-Marc Ayrault on March 6 2013, the government had reaffirmed its commitment to complete the entire project (panel, p25). Despite this apparent certainty over funding, the direction of Emmanuel Macron's government is firmly on renovation rather than new projects. Would this affect the Grand Paris Express programme?

Table I. Grand Paris Express metro lines

Line 14 Northern extension	
Route	Saint-Lazare – Mairie de Saint-Ouen – Saint-Denis Pleyel ¹
Length	5.8 km + 1.7 km, all in tunnel, 5 stations
Cost	€1.38bn ²
DUP	October 2012
Opening	2020
Line 14 Southern extension	
Route	Olympiades – Orly
Length	14 km in tunnel, 7 stations, of which 5 interchanges
Population served	260 000
Traffic	300 000 journeys a day
DUP	July 2016
Cost	€2.14bn
Opening	2024
Line 15 South	
Route	Pont de Sèvres – Noisy-Champs
Length	33 km in tunnel, 16 stations, of which 13 interchanges
Population served	1 090 000
Traffic	300 000 journeys a day
Cost	€5.7bn
DUP	December 2014
Opening	2022
Line 15 East	
Route	Saint-Denis Pleyel – Champigny Centre
Length	23 km in tunnel; 12 stations, of which 11 interchanges
Population served	675 000
Traffic	300 000 journeys a day
Cost	€3.5bn
DUP	February 2017
Opening	First phase 2025, second phase 2030
Line 15 West	
Route	Pont de Sèvres – Saint-Denis Pleyel
Length	20 km in tunnel; 9 stations, of which 8 interchanges
Population served	800 000
Traffic	600 000 journeys a day
Cost	€3.0bn
DUP	November 2016
Opening	Pont de Sèvres – Nanterre La Folie 2025; Nanterre La Folie – Saint-Denis Pleyel 2027
Line 16 ¹	
Route	Saint-Denis Pleyel – Noisy-Champs (7.1 km shared section with Line 17 Saint-Denis Pleyel – Le Bourget RER)
Length	21.8 km in tunnel, 7 stations, of which 5 interchanges
Population served	800 000
Cost	€3.49bn ³
DUP	December 2015
Opening	2023
Line 17 South ¹	
Route	Saint-Denis Pleyel – Le Bourget RER
Length	27 km in tunnel, 9 stations (7.1 km shared section with Line 16 Saint-Denis Pleyel – Le Bourget RER)
Line 17 North	
Route	Le Bourget RER – Le Mesnil-Amelot
Length	14 km in tunnel, 5.5 km elevated, 5 stations
Population served	245 000
Traffic	16 000 to 18 000 journeys a day
Cost	€1.7bn
DUP	February 2017
Opening	Le Bourget RER – Roissy CDG Airport 2024; Roissy CDG Airport – Le Mesnil-Amelot 2030
Line 18	
Route	Orly Airport – Versailles Chantiers
Length	35 km, of which 14 elevated, 10 stations, of which 3 interchanges
Population served	335 000
Traffic	100 000 journeys a day
Cost	€2.7bn
DUP	March 2017
Opening	Orly – CEA Saint-Aubin 2024; CEA Saint-Aubin – Versailles-Chantiers 2030
Line 11 extension	
Route	Mairie des Lilas – Rosny-Bois-Perrier (Phase 1) Rosny-Bois-Perrier – Noisy-Champs (Phase 2)
Length	6 km + 10 km, 6+3 stations
Traffic	85 000 journeys a day ⁴
Cost	€1.3bn ⁴
DUP	May 2014
Opening	2022

1. The Mairie de Saint-Ouen – Saint-Denis Pleyel extension of Line 14, Line 16 from Saint-Denis Pleyel to Noisy-Champs and Line 17 South from Saint-Denis Pleyel to Le Bourget RER are for legal purposes considered to be a single route.
2. Saint-Lazare – Mairie de Saint-Ouen only
3. The figure of €3.49bn covers the Line 14 extension from Mairie de Saint-Ouen to Saint-Denis Pleyel, Line 16 and Line 17 South.
4. Mairie des Lilas – Rosny Bois-Perrier.



PARIS Progress

Yvin considered that the project was secure, not just because of the 2013 agreement. He believed that 'we are in a different situation', corresponding precisely with the Macron government's desire to improve day-to-day transport.

The GPE programme was closely linked to upgrades and extensions of the existing metro and RER networks, again suggesting alignment with Macron's criteria. The specific funding formula adopted for Grand Paris Express — loans or

grants plus a combination of taxes on commercial properties, a special infrastructure tax and a levy on network operators — also meant that in financial terms 'we are fairly independent of the annual budget decision'.



Rolling stock order next year

In January 2015 rolling stock supplier Alstom received an order for 217 Type MP14 rubber-tyred trainsets for Lines 1, 4, 6, 11 and 14. At the time the order was reported as including options

for trains for Lines 15, 16, 17 and 18. Given that the trains for the four new Grand Paris Express lines will differ in key respects, was this correct?

'No, the contract will be completely separate', Yvin replied. The trains for

lines 15, 16 and 17 would be 2800 mm wide and would require an overhead power supply. 'Tenders are being looked at now, and the aim is to award the contract in spring 2018', he said.

The trains for Line 18, however, will be different again. They will have a third rail power supply 'because overhead wires would not sit well with long sections of viaduct on this line'. The Line 18 fleet will also be narrower than the trains for the other three lines, more closely resembling the conventional Paris metro design. Trains for all four lines will have steel wheels whereas the 2015 order was for rubber-tyred stock.

3.7
€bn

TOTAL VALUE OF CONTRACTS FOR LINE 15 SOUTH

Operating tenders

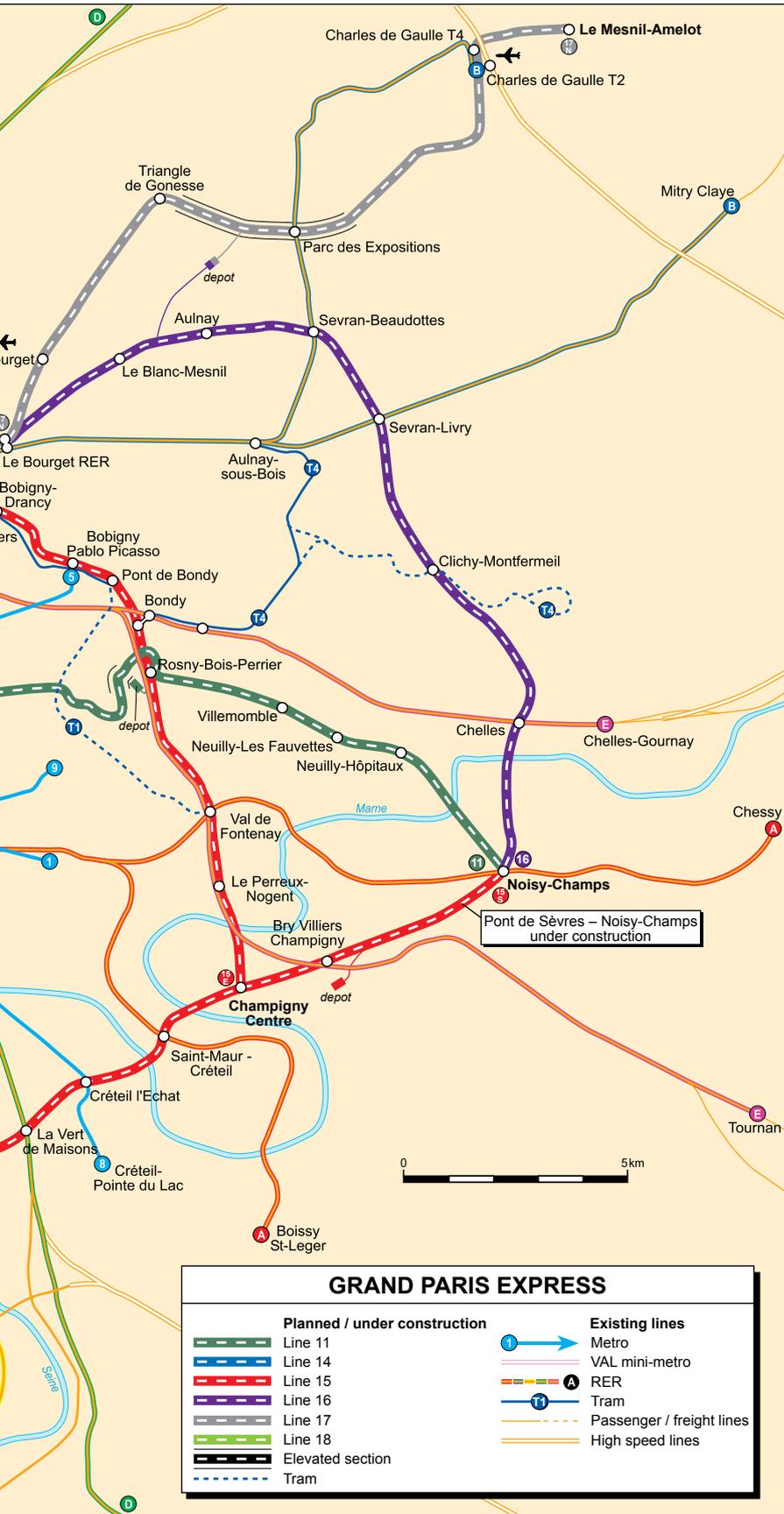
Line 15 South is expected to open in 2022. This prompted a question about when tenders for operation would be called. And would separate tenders be let for operators of the different lines?

'This is not our call', Yvin said. 'The operating tenders will be awarded by transport authority STIF [now Île-de-France Mobilités], and at the moment there is no decision'.

Did the same apply to the Line 14 extensions, construction of which is being jointly managed by Société du Grand Paris and RATP? Line 14 was an exception, Yvin explained, because RATP operates the existing line. It will therefore have rights to operate the extensions to the north and south, at least initially.

First TBM

Asked what further major developments could be expected during the rest of 2017, Yvin said that the next big event would be the launch of the first tunnel boring machine. This is now being assembled, he said, 'and we are expecting it to be complete about the end of the year'. It will be used to cut the Line 15 South tunnel between Champigny et Villiers-sur-Marne, and as many as 10 TBMs will be needed to complete the line; one of them will be used twice to bore a second section of the alignment. ■



FINANCE

Funding package

Under the 2013 agreement which 'redefined' the Grand Paris Express project, the government included a proviso that the original cost of around €30bn be cut to €22-625bn. This was sufficient to pay for construction of lines 15, 16, 17 and 18, plus the Mairie de Saint-Ouen – Saint-Denis Pleyel and the Olympiades – Orly extensions of Line 14. Société du Grand Paris is contributing a further €2.9bn towards related projects, taking the total cost to €25-525bn at 2012 prices.

The €2.9bn includes €798m towards the cost of the Saint-Lazare – Mairie de Saint-Ouen extension of Line 14, €450m for upgrades to the existing metro network, €1bn for the westward extension of RER Line E, €300m for extension of metro Line 11 from Mairie des Lilas to Rosny-sous-Bois and €352m for upgrades to RER Lines A, B, C and D. ■