

# BRUSSELS METRO TO GROW ... AS PRE-METRO SHRINKS

by Geoffrey Skelsey

The recent announcement that preliminary work was to start on the extension of Brussels Metro line 3, and the conversion to Metro operation of the existing tram-worked pre-metro line, makes it timely to review the story of the line, and of the pre-metro concept. This will be the latest development in a conversion programme which began in 1976 on line 1, followed in 1988 on line 2.

## THE BIRTH OF THE 'PRE-METRO'.

The pre-metro is often thought to have originated in Belgium and (West) Germany, but it is a sad reflection on a lack of impetus in British transport projects that amongst the earliest formulations of a system of tram subways linking segregated suburban feeder lines occurred in Leeds and Glasgow around the end of the Second World War. The Leeds transport manager, W. Vane Morland, after pre-war study tours in Sweden and Boston, drew up proposals in 1944 for intersecting tunnels below the city centre leading to a network of high-quality suburban tramways (or 'light rail lines' as they would now be called). The city went some way towards achieving the second part of the project, with 'express' tramways extending east and south of the city, and other planned, some of which were completed as late as 1949. Exploratory work was undertaken by the City Engineer, including trial borings for tunnels extending east-west and north-south, with a two-level interchange station below City Square.

In 1948 Eric Fitzpayne, Glasgow's enterprising transport manager, produced similar plans, with the important addition of proposals to reuse underexploited local railways with tram-type vehicles. Some subways were also proposed, together with new segregated tracks along the median strips of new highways. One such line was completed in 1949, with extension of the tramway to Blairdardie.

All these proposals foundered over a lack of political direction and shortage of funds, but it is known that Fitzpayne's report circulated in Western Europe, including in Köln, and possibly in Brussels, where similar studies into the further development of the extensive tramway system began in 1963. These recommended a reduction in the tram network but upgrading of a core web of the busiest lines. Construction of the new system would be gradual and incremental, with each tunnel section, as it was completed, used at first for a 'pre-metro' service of tramcars, and only later upgraded to heavier operation. The infrastructure would be designed for Metro use, although temporarily fitted out for tramway standards, for example in respect of power supply, signalling, platform height, and vehicle width. The object was steadily to develop a high capacity transport system with city centre tunnels and upgraded suburban tramways, so that the benefit of investment was experienced sooner and more widely. (It should be stressed that the 'pre-metro' concept was not to be confined to tunnelled sections: segregated suburban tracks of equivalent capacity and quality were also envisaged). This policy took effect in Brussels between 1969 and 1988, and in Antwerp from 1975 to the present. Finally, lengths of tunnel could be brought into operation successively as they were completed, using temporary ramps at the completion of each phase of construction, thus bringing progressive relief from surface traffic congestion. The sequential opening and up-grading of the Brussels 'inner ring' subway in five stages between 1970 and 1988 exemplifies this concept. Such eventual upgrading of tram subways to Metro operation was widely advocated at this period, but conversion of Line 1 of the Brussels system in 1976 was the first after 1950 (in Stockholm) to actually take effect. The table shows the dates of the various pre-metro sections, and the way in which they were successively converted to full Metro operation.

Line No.	Section	Length km	Stations	Opened as pre-metro	Converted to Metro
–	<i>Gare du Midi area</i>	0.75	1	1957	–
1	Schuman – Ste-Catherine	2.76	6	1969	1976
2	Namur – Madou (Petite Ceinture)	2.12	4	1970	1988
5	Meiser – Diamant (Grande Ceinture)	1.08	1	1972	–
2	Madou – Rogier (Petite Ceinture)	1.13	2	1974	1988
5	Diamant – Boileau (Grande Ceinture)	1.50	3	1975	–
-	Montgomery loop	0.20	1	1975	–
3	Nord – Lemonnier	2.97	6	1976	–
2	Louise station	0.55	1	1985	1988

-	Simonis station and approaches	0.50	1	1986	1988 (part)
3	Midi – Albert	2.99	4	1993	–



**Left:** A Brussels PCC-type four axle tramcar stands in Luxembourg station (later renamed 'Trone') on a trial run late in 1970, as final preparations are made for the inauguration of this section of the 'belt line' pre-metro. Visible are several features of interim tram operation, including the overhead line power supply, the lowered sections of the platforms to facilitate tramcar boarding, and the ramp for the train protection system in the foreground. All these would be altered during conversion to metro operation

in 1988, and similar changes will be made to stations on the present line 3.

**Photo: Geoffrey Skelsey collection**

## PRE-METRO TO METRO

The Brussels Metro as it exists in 2018 comprises an east-west line and two easterly branches, an inner-'belt' line following part of the old city circumference, and two westerly branches linked to both principal routes. Since completion of the 'semi-circle' in 2006 services have interworked between the previously separate lines, not always with trouble-free results. The north-south line 3 is at present tram worked.

The first section of tunnel to be started was the main east-west line (originally line 1), badly needed both to avoid congestion in the narrow streets of the old city at the western end, and at the eastern end to handle heavy traffic associated with European Communities developments around Schumann.

Next came the 'belt' (then line two), the inner peripheral line following the route of the old city walls around part of the centre. Although most tram tracks here had been relocated onto side reservation, services were subject to incessant interruption at the many light-controlled cross streets. Fulfilling the purest form of 'pre-metro' theory, the subways here were built in short sections over 18 years, with temporary ramps linking to existing surface sections.

Line 3 followed the most prestigious north-south streets of the modern city, the succession of boulevards which had replaced the noxious River Senne in the nineteenth century as part of a vast drainage and sewerage project (akin to Bazalgette's in London). The line served the Stock Exchange, the Opera House, major departmental stores and hotels, and linked the two main railway stations. At its southern end the new tunnel joined the tramway tunnels built in 1957 around the Gare du Midi, and a succession of flat junctions and foot crossings here kept speeds low and limited the capacity of the whole line. However, in 1993, a substantial tunnelled extension was opened further southwards to link to two suburban branches.

Lastly line 5 was an outer peripheral line in the north-east sector of the city, and although planned to form part of a more extensive section was never extended.

Under the original concept conversion to Metro operation was always envisaged over an extended period, and indeed line three has operated as part of the tramway system for over 40 years. Line 1, on the other hand, was converted before the originally intended date – it was urgently in need of capacity enhancement as a result of the rapid growth of the European institutions and their associated enterprises. As operated, originally with single-unit tramcars, the service could not cope with the traffic offering.

The conversion of line two was also brought forward, partly for political reasons and partly to avoid the need for new and larger tramcars necessary to handle the traffic (as part of the Metro it could draw on the existing pool of rolling stock).

## **THE NORTH-SOUTH AXIS**

Line 3 retained its traditional form of operation, and it is worth noting the advantages of this. Although full Metro operation on lines 1 and 2 offered improvements in speed and capacity, this was at the expense of a more dispersed service network: trams were able to feed into the tunnels from three or more suburban destinations, whilst the majority of Metro passengers had to change modes at least once: the time and inconvenience that took offset the benefit of faster trains. A series of reviews reaffirmed tram operation of line 3, recommending simplification of the service pattern so as to link it with segregated surface tracks, as well as the procurement of much larger and faster trams. This took effect from 2006.

However, over the ensuing years, massive commercial developments around the main line stations at either end of the trunk section, as well as a steady increase in traffic interchanging with trains, again overloaded the service.

## **THE FUTURE**

A decision on the core section was announced by the Capital Region Government on 26 March 2015. Line 3 was to be converted to automated Metro operation, with a 5 km north-easterly extension diverging from the present route at Gare du Nord. Construction was to begin in 2019, using a boring machine to lessen surface disturbance.

Six closely-spaced intermediate stations are planned, at Place Liedts, Place Collignon, Place Verboekhoven, Square François Riga, Rue du Tilleul, and Place de la Paix, each mainly built by a combination of cut-and-cover and enlargement of the bored tunnels. The technique meant that the line did not have to be built below a main highway. The northern terminus will be at Bordet SNCB station, with a surface extension beyond to a new depot within the STIB's existing Haren complex. Schedule speed on the whole line would be 30 km/h, and there would be a peak service of 20 trains an hour.

The existing section of route would be adapted, much as previous pre-metro conversions had been, but major works will be needed at Gare du Midi to by-pass the 1957 subways and to connect with the existing deep level tunnels below the railway station. Albert station at the southern end was built in 1993 with future tram termini in mind and incorporates unused additional levels to accommodate trams on existing feeder services.

As with line 2 some 20 years earlier, this outcome has not been accepted without criticism. At present tram services serve two destinations at the northern end and three at the south. Only one of these will continue to be served directly and all other passengers will have to change.

In 2018 planning work was proceeding, subject both to public inquiries and public opposition to some proposed surface works. These are pushing the expected completion date away, and opening is not now expected before 2028.

## **CONCLUSION**

The pre-metro concept flourished during the extended upgrading of existing tramways, notably in Belgium and Germany (there were a few British undertakings which might also have followed suit). In some cases, notably Antwerp, Köln, Hannover, and Stuttgart, the principle of tram or light rail operation in this form has continued to this day. Elsewhere, such plans were abandoned (as in Vienna), or have been gradually been carried through to their original conclusion as full Metro lines.

The conversion of line 3 in Brussels, not without controversy, is the latest example, and its completion in about ten years' time will see the end of the pre-metro in the city centre, with only the eastern outer peripheral line surviving in that form. But the Brussels tramway system itself goes from strength to strength, with several current line extensions, a new fleet of cars, and ever-increasing passenger numbers. It is now fulfilling a different purpose.

*The author's comprehensive study of Metro and pre-metro installations in Belgium will be published by the LRTA later in 2018.*