Network transformation outlook 2023-2028

proximus

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1. Background and Scope of the present document

This document is an update of the document "Network transformation outlook 2022-2027" and has been elaborated to answer the request for information of the BIPT as formulated in "het besluit van de conferentie van regulatoren voor de elektronische communicatiesector van 29 juni 2018 met betrekking tot de analyse van de markten voor breedband en televisieomroep" and in "het besluit van de Raad van het BIPT van 13 december 2019 met betrekking tot de analyse van de markt voor hoogwaardige toegang".

The present document has been constituted to Proximus' best knowledge at present of the future evolutions of its fixed networks taken into account that several matters discussed in the present document are not covered by detailed or final decisions of the management and/or Board of Directors.

The present document contains the relevant information to what transformations in Proximus' fixed network will take place in the coming 5 years that will or might have an impact on the existing wholesale services and wholesale access points.

Most statements in the present document constitute forward-looking statements. These statements may include, without limitation, statements concerning future technological evolutions, decisions and timelines, and statements preceded by, followed by or including the words "believes", "expects", "anticipates" or similar expressions. These forward-looking statements rely on a number of assumptions concerning future events and evolutions and are subject to uncertainties and other factors, many of which are outside our control that could cause actual evolutions to differ materially from such statements.

Data and information in the present document may be subject to re-evaluation, evolution and changes. Proximus cannot guarantee that this information is complete or that no new information will become available with an impact in the coming 5 years.

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This document and the information within are made independently of any form of appeal, present and future, against a decision or a regulatory requirement imposed to Proximus.

2. The Proximus Mantra(+) program

Proximus' Mantra(+) program, in this document referred to as "Mantra" and "Mantra+", aims at adapting and transforming the fixed network of Proximus to the global technological evolution:

- Evolution of the Fixed Voice network and Voice Service Platforms.

- Evolution of network technologies (ATM/SDH, Ethernet) and anticipation of the end of life of multiple legacy technologies.

- Invest in network simplification to reduce OPEX and increase operational efficiency.

The Mantra network transformation process is being carried out in two phases:

- The first phase concerned the building of an MPLS & IP-based network and the porting/implementation of the Proximus product portfolio (retail and wholesale) on this infrastructure.

- In the second phase, the legacy network technologies are subject to consolidation and phasing out in view of optimizing the network infrastructure and deal with the fact that legacy technologies have become obsolete and without vendor support.

The first phase has been finalized. In line with our present expectations, the second phase includes all initiatives aimed at consolidating the customer installed base on the MPLS & IP infrastructure and at reducing the operational complexity of managing several network infrastructures in parallel (one per service). The most important impact still to come is the phasing out of remaining core legacy technologies (PSTN …) and traffic transition to the MPLS & IP-based infrastructure.

The Mantra program has impact on the Wholesale services currently offered by Proximus. Below we summarize the most important impacts still to come:

- **Local Loop Unbundling services**: as additional LEX buildings will be closed, the colocation and services delivered in and from these buildings will have to be terminated and/or migrated to alternative offers.

The Mantra(+) program has a different impact on each of the wholesale customers. In that perspective, Proximus holds, since 2010, recurrent meetings with the wholesale customers in order to:

- Inform the wholesale customers about the products that will be out-phased and about the future products.

- Give them guidance on possibilities for evolution scenarios.

- Discuss with them the lists of impacted lines and create migration plans for these.

The long-term ambition of Proximus is to cover the centre of cities and communes with fiber (see chapter 3), to make in the non-fiberized areas great parts of the copper (feeder) network redundant and to further dispose parts of the total technical surface area mainly located in smaller buildings from mid-2019

onwards. This resulted in the decision to start the related works for "Mantra+" from 2017 onwards with a pilot of 10 buildings, for which the outphasing has been finalized, and the notification of 64 Mantra+ buildings (which is now reduced to 38 buildings still to be outphased - see chapter 6). At that stage, the technology will be located mainly in existing street cabinets, supplemented with newly designed small containers called Optimus containers. Some local nets will not be equipped with an Optimus container but with an OVD (Optische Verdeler), a passive street cabinet that patches the optical fibers to 1 or more neighbouring LEXes. At the beginning of 2022, Proximus decided to outphase also some of its LDCs (referred to as the Lotus Program) (see further in Section 6 on Building Outphasing). 42 LDCs have been outphased until now. The goal is to outphase about 22 LDC's in 2024 and 4 in 2025.

Seen the ongoing fiber roll-out and copper outphasing, Proximus started examining the long-term impact on its network topology (including the technical buildings) as well as the possible impact on the technical specifications of the products and services delivered to alternative operators.

3. Broadband Access Evolution

Preliminary statements in this chapter concern the technologies and services in general in Belgium. Specific circumstances may exist in outphased buildings as described in Chapter 6.

Proximus continues to deploy Fibre-to-the-Curb in selected areas allowing to extend the VDSL2 service coverage.

The impact of this evolution on wholesale access services is twofold:

1. The LEX based unbundling model becomes obsolete (which is confirmed by the fact that certain MDF sites are already closed down or are notified for closure).
2. ADSL(2+) is gradually being outphased in the copper distribution areas served by ROPs with all active customers connectable in VDSL2 and all Living Units at least eligible to ReADSL as an enabler to activate vectoring also in the downstream frequency bands between 552 kHz and 2,2 MHz. The opening of the VDSL2 zones 6 and 7 triggered a list of additional homogenizable ROPs.

3.1 VDSL2 network evolution

VDSL2 coverage

Proximus announced its Broadway plans publicly in 2004 with an initial target coverage for VDSL2 of 46%. This coverage target was progressively increased, so that Proximus has reached by end 2023 an effective service coverage for VDSL2 of 97,5%[1].

Information on a more detailed basis regarding availability is provided if, where and to the extent relevant in the context of the existing wholesale access services.

The coverage as well as the attainable speeds with VDSL2 depend on attenuation and distance. For the current attenuation- and distance limits, please refer to the Bitstream xDSL offer published on Proximus' web site.

Since 2010, the VDSL2 network has evolved significantly, among others with the introduction of DLM, vectoring, extension of VDSL2 zones, increase of down- and upstream speeds etc. and is still evolving.

From mid-2020 onwards, most newly installed ROPs (mainly in white zones) are equipped with new DSLAM equipment (7363 MX-6). This new equipment contains a new line card, i.e. the RDLT-G card of Nokia and consolidates all DSLAM functionalities (logic, processing, management functionalities) completely in the ROP. It will also support the future 35Mhz technology (see below). The introduction of this new DSLAM equipment is considered as a major network upgrade with the associated implications on OLO CPE operators' roles and responsibilities. The gradual volume mass migration of the current DSLAM

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[1] The current VDSL2 provisioning speeds range from 70 Mbps (vectoring zone 1) downstream to 8 Mbps (vectoring zone 7) and can increase through the DLM-process from up to 16,5 Mbps (in legacy zones 4 and 5), 30 Mbps in vectoring zones 6 & 7 to up to 100 Mbps (in vectoring zone 1).

equipment in the existing ROPs, implying a short service interruption, will most likely not start in 2024 since the main investment fixed access priority is FTTH. The planning of these volume mass migrations will depend on the renewal needs of the current VDSL2 platform and the need for bit rates above the current 17 MHz potential, taking into account the FTTH roll-out (to avoid double investments). Once the planning is stable, the volumes will be communicated timely. Such migrations have already taken place in a small scale in the course of 2022 and 2023 to further finetune the IT deliveries, the logistics and the migration processes of the new DSLAM equipment. The coming years such small scale migrations will continue for tactical reasons (deploy the 2 x MX-6 solution to solve ROP saturations or to solve fiber saturations as the MX-6 solution consumes less fiber than the existing SBREM vectoring solution) and for IT regression test purposes.

Proximus is further upgrading its VDSL2 network by gradually starting the commercial activation of vectoring from LEX and LDC in up to about 200 LEXes and LDCs. In the period 2022 - 2023, vectoring has been deployed in 111 LEXes and Proximus has planned to deploy vectoring in roughly an additional 50 LEXes and LDCs in 2024. This increases the bandwidth to the end-users that are connected to a LEX or LDC and allows Proximus to replace in the concerned locations the old NVLT-D line card, as the latter does not support vectoring. Note that this maximum potential of up to about 200 LEXes and LDCs excludes LEXes and LDCs that are in scope of the planned FTTH footprint or in the scope of Mantra+ and Lotus.

In addition, Proximus could implement solutions to further upgrade its VDSL2 network. In this respect, the following solutions are considered :

- Solutions that do not require the new MX-6 technology:
  - Increased broadband internet speeds for relatively long vectored lines on non homogenized ROPs.
  - Improve the provisioning profile of certain lines. This started in 2023 and will continue in 2024.
  - Potentially revise the provisioning rules (attenuation and distance rules). The feasibility of this still requires assessment.

- Solutions that require the new MX-6 technology and 35 MHz / LR VDSL2 capable CPE :
  - VDSL2 35 MHz which has been tested with field trials, to further increase downstream speed through the use of the spectrum to 35 MHz. VDSL2 35 MHz would be enabled on the new VDSL2 platform as described above. The commercial activation of 35 MHz on MX-6 sites by end 2024 (respecting the regulatory lead times) is not excluded, but unlikely due to the relatively low current footprint of ROPs with MX-6 technology. However, the technical 35 MHz activation pilot will continue in 2024, without immediate impact on the services. If the commercial activation would be decided, it would be considered as a major network upgrade. Proximus will then timely adapt the Bitstream xDSL reference offer, the UNI specification as well as the OLO-CPE test plan in order to make sure that alternative operators can also benefit from this new 35 MHz VDSL2 technology when launched. Operators using an existing OLO-CPE that may be 35 MHz compatible will have to recertify these CPEs conform the OLO-CPE test plan (that will be updated for 35 MHz VDSL2). It is important to note that the existing 17,6 MHz capable

CPEs are expected to still function in 17,6 MHz VDSL2 profiles with the new MX-6 platform.

- "Long Reach" VDSL2: the potential of this standard has been technically assessed, but no further steps are planned.
- In LEX/LDC where vectoring is active and where no ADSL1 / ADSL2+ customers are present, Proximus is considering a pilot to extend the vectoring on VDSL2 lines in the frequency band between 552 kHz and 2,2 MHz (similar to homogenized ROPs, this would become a homogenized LEX/LDC).

3.2   Physical Access Network Evolution

As Proximus deployed a fibre network to the vicinity of the Street Cabinet (KVD, Borne), by installing Remote Optical Platform units (ROPs) next to those Street Cabinets from which broadband- and voice services are provided, the MDF functionality in the Local Exchange (LEX) will be lesser and lesser used.

Therefore, as part of its roll-out, Proximus is able to dismantle a number of the local exchange buildings. Hence the current colocation and unbundling services at the LEX will be terminated or largely reduced, pursuant the regulatory framework as defined in the relevant regulated reference offers and the respective contracts.

In order to support the long-term target of the disappearance of the MDF functionality in the Local Exchange building (LEX), Proximus might reduce renewal investments in the copper feeder network by gradually outphasing copper feeder cables if and where they must be renewed (e.g. triggered by roadworks or cable damage).

The figure below gives an overview of the most important elements in the new access network, as well as the respective elements.
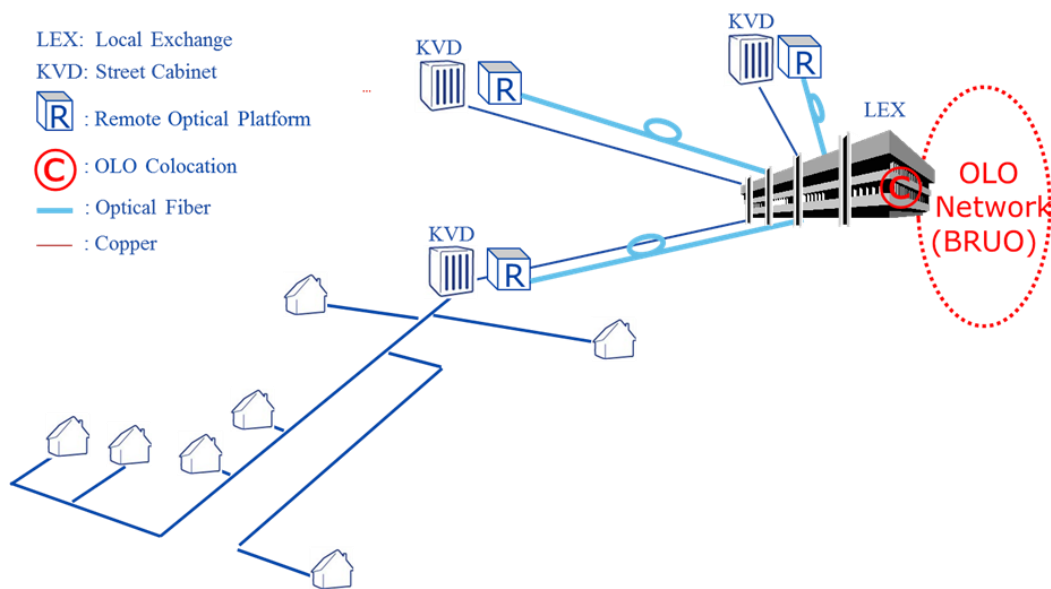
Figure 1: Physical Access Network Evolution

3.3 Wholesale Broadband VDSL2

The Bitstream VDSL2 service allows the alternative player to connect its end-users onto the Proximus network at a Proximus Service PoP using VDSL2 technology. The end-to-end transport between the end-user and the beneficiary is based on Ethernet.

The extension of vectoring on VDSL2 lines in the frequency bands between 552 kHz and 2,2 MHz is not compatible with the delivery of ADSL1 and ADSL2+ services from those ROPs. As a result, from 01/07/2017 for ADSL2+ and from 01/02/2018 for ADSL1 :

- Ordering of new ADSL1 or ADSL2+ products is not possible anymore for endpoints which are located in copper distribution areas in which all active customers are connectable in VDSL2 and all Living Units at least eligible to ReADSL.

Reach Extended ADSL2 services are opened on all ROPs which support "ADSL from ROP" or which have been homogenized (meaning sub 2,2 MHz vectoring has been activated).

The speed of VDSL2 lines which are not equipped with a VDSL2 CPE which is at least "vector-friendly" at the moment of the activation of vectoring on the ROP concerned will be reduced to a Fall-back speed as defined in the Bitstream VDSL2 reference offer.

The Ethernet backbone investments project (introduced in chapter 2) - which aims at gradually replacing the current Ethernet aggregation/core networks - added a third option called "Single VLAN" to the current Bitstream VDSL2 and Bitstream Fiber GPON reference offers on top of the existing options "Shared VLAN" and "Dedicated VLAN". No plans to outphase these existing options have been developed yet.

3.4   Fiber To The Home

At the end of 2016, Proximus announced an investment of € 3 billion in the coming 10 years to accelerate the roll-out of Fiber in Belgium aiming at covering the centres of cities and communes, through deployment both on the façade of buildings and in certain sections in underground ducts.

In 2021, Proximus also set up a cooperation/co-investment with other partners for fiber roll-out, via 2 joint ventures: Fiberklaar in Flanders and Unifiber in Wallonia. The objective is to have 4.2 million homes and companies connected to fiber by end of 2028, representing a coverage of at least 70% of Belgium.

In 2022, Proximus set up a joint venture called "Glasfaser Ostbelgien" (GO Giber), a public-private partnership with the German-speaking Community and Ethias. Its objective is to connect almost all of the 40.000 homes and businesses in this region, including the so-called "white zones".

In June 2022, Proximus signed a Memorandum of Understanding with a consortium of Belgian financial partners to explore a possible extension of the fiber coverage to 95% of Belgian premises, mainly in less densely populated and rural areas. The term of the MoU (originally end of June 2023) has meanwhile been extended.

Proximus is also contemplating the potential of cooperating with other operators to deploy fiber, following the BIPT communication of October 2023 in that respect.
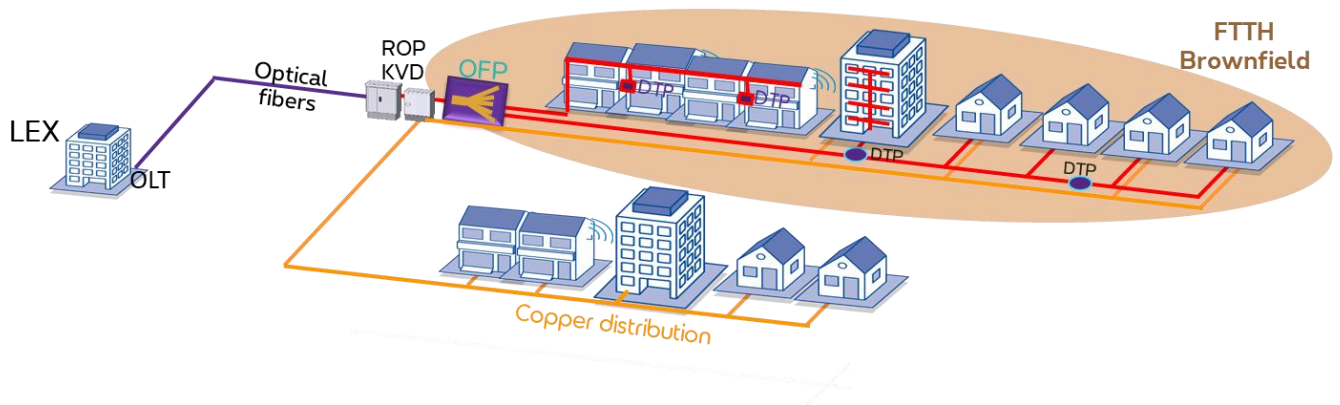

Figure 2: FTTH network

In the coming years, Proximus will continue to fully fiberize dense and medium-dense city areas, starting with a progressive roll-out. An overview of all cities where fiber roll-out is started or announced to be started can be found on:

https://www.proximus.be/en/id_cr_fiber_cities/personal/orphans/fiber-to-your-home/the-future-comes-to-your-city.html

In such areas, migrations from copper to fiber will take place progressively following the full fiber coverage of the relevant geographic areas which will be notified for the copper plant outphasing (see also Chapter 7). Proximus also continues to deploy FTTH in industrial zonings and in new residential zonings.

In 2014, Proximus presented its first commercial wholesale FTTH offer. In November 2018, a Bitstream Fiber GPON offer was presented in line with the Broadband market decision of 29 June 2018.

Proximus notifies its wholesale fiber customers and the BIPT on the planned network extensions of the fiber deployment progressively along the project:

- Twice a year, Proximus communicates the Fiberhoods for which the construction started to the BIPT and the wholesale customers.
- A stop service of all copper based services in these Fiberhoods is communicated to the BIPT and the wholesale customers conform the timings as defined by the BIPT. An overview of all Fiberhoods for which copper outphasing is planned can be found in Chapter 7.

With the exception of high-speed digital services such as LAN Extension Solutions (BLES), Optical Network Services (ONS) and a set of Bitstream services, only IP-based services will remain available in FTTH areas.

After an initial introduction in 2022, XGS-PON (10Gbps) is now available across the complete PON network.

On 25 May 2021, Proximus demonstrated as the first operator in the world the capabilities and the performance of Nokia's 25G-PON technology in a live network (in Antwerp). Deployment of this technology in the PON network is not yet planned and will be market driven.

4. Data and Capacity Services

Preliminary, statements in this chapter concern the technologies and services in general in Belgium. Specific scenarios may exist in outphased buildings as described in chapter 6.

Bandwidth demand is ever increasing in today's data networks and these same networks are evolving more and more towards Ethernet. The SDH outphasing has been finalized in March 2024.

Ethernet over copper (EFM) is not a future proof technology. A stop sell of new EFM lines in the upcoming period is being assessed. Today there are however no concrete plans to outphase this technology in the coming years.

5. Voice Interconnect Evolution

In 2023, all remaining legacy ISDN-BA lines were migrated from S12 to other solutions. The last ISDN-PRA's still using the SDH network, were migrated in 2024.

Proximus completely stopped the CS and CPS services at 16 January 2023 after preliminary communication to the remaining CPS/CS operators.

A gradual migration towards voice over broadband services will further reduce the use of PSTN services emulated via Access Gateway (AGW) and the long term replacement strategy of the Access Gateway requires forced migrations of remaining PSTN services as from 2020.

The migration from TDM to VoIP interconnection was finished end of 2023. New voice interconnections to the fix or mobile network of Proximus are based on VoIP interconnection.

6. **Building Outphasing**

The Building Outphasing is an essential component of the Proximus Mantra and Mantra+ Programs. **A list of 65 Mantra buildings was initially identified** for closure between 2012 and 2021, and communicated to the market. In this initial plan, some large buildings were excluded, due to their technical complexity. The building outphasing plan has evolved to a lower number of buildings, but puts more focus on the large buildings. 22 Mantra buildings have been outphased until now.

With regards to the Mantra+ Program, 74 local nets (including 10 pilot nets) were initially identified for which the main building would be emptied, of which 30 have been executed in the meantime. Due to the acceleration of the fiber roll-out as announced by Proximus in 2020 (cfr. supra), the Mantra+ planning has been updated significantly and reduced to 38 buildings still planned to be outphased until 2026.

With regards to the Lotus Program, 42 LDCs have been outphased until now. The goal is to outphase an additional number of 22 in 2024 and 4 in 2025. Note that the impact of the outphasing of these LDCs on the alternative operators is very limited: only Bitstream xDSL lines are connected to these buildings, and these will be migrated to ROPs in the neighbourhood of the LDC. The table 1 below summarizes the current building outphasing planning of the "Mantra+" program in the period 2024-2026. The table 2 summarizes the building outphasing planning in the framework of the Lotus program for the year 2024 and 2025. **These plannings are only indicative and still subject to changes**.

Table 1: building outphasing planning of the Mantra/Mantra+ program

End of Service Delivery	Local Net	Phase Out Year	Address, Nr	City
30/06/2024	41ENG0	2024	Rue Maréchal Foch, 2	ENGIS
30/06/2024	03MEE0	2024	Meerlesesweg, 57	MEER
30/06/2024	15PUT0	2024	Pachtersdreef, 24A	PUTTE
30/06/2024	11ALK0	2024	Stationsstraat, 126	ALKEN
30/06/2024	14BAL0	2024	Rijsberg, 39	BALEN
30/06/2024	65JUR0	2024	Rue du Moustier	JURBISE
30/06/2024	71FOS0	2024	Rue des Remparts, 5	FOSSES-LA-VILLE
30/06/2025	03KON0	2025	De Villermonstraat 15 - 17	KONTICH
30/06/2026	10BEA0	2026	Route de Beauvechain, 27	BEAUVECHAIN
30/06/2025	11HEU0	2025	Pastoor Paquaylaan, 131	HEUSDEN

End of Service Delivery	Local Net	Phase Out Year	Address, Nr	City
30/06/2025	14OTU0	2025	Steenweg op Mol, 152	OUD-TURNHOUT
30/06/2025	15WEE0	2025	Vredeslaan, 82	WEERDE
30/06/2025	41MIC0	2025	Rue de la Paix, 29	MICHEROUX
30/06/2025	52WAA0	2025	Dommelstraat	WAASMUNSTER
30/06/2025	59OUD0	2025	Kasteeldreef, 2c	OUDENBURG
30/06/2025	71SOL0	2025	Rue Emile Vandervelde, 2A	SOLRE-SUR-SAMBRE
30/06/2025	80VIE0	2025	Rue de l'hôtel de Ville	VIELSALM
30/06/2026	89LNK0	2026	Dorpstraat, 20	LANKLAAR
30/06/2025	84BUR0	2025	Route de Lesterny, 3b	Bure
30/06/2026	51DIK0	2026	Oostvesten, 10	Diksmuide
30/06/2026	91WAC0	2026	Walderdonk, 103	Wachtebeke
30/06/2026	03KAL0	2026	Bareelstraat, 2	Kalmthout
30/06/2026	16VEL0	2026	Graafschaplaan, 27	Veltem-Beisem
30/06/2026	02LAS0	2026	Route de l'Etat, 166	Lasne
30/06/2026	10GLI0	2026	Chaussée de Namur, 84	Glimes
30/06/2026	41ROT0	2026	Rue Bellaire, 18A	Rotheux
30/06/2026	86DUR0	2026	Chainrue, 52	Barvaux-sur-Ourthe
30/06/2026	58VEU	2026	Pannestraat, 1	Veurne

In 2027, the next buildings are planned to be outphased: 02ROD0, 11GRE0, 11MEE0, 11ZOU0, 14VEE0, 15SCH0, 41FEX0, 5OZEE0, 69HAV0, 82YVO0.

Table 2: building outphasing planning of the Lotus program

End of Service Delivery	Local Net	LDC name	Phase Out Year	Address, Nr	City
2024	03ESS0	03EHL	2024	Heikantstraat, 146	Essen

End of Service Delivery	Local Net	LDC name	Phase Out Year	Address, Nr	City
2024	03SHO0	03VEN	2024	Venstraat, 12	Schoten
2024	03SHI0	03ZOL	2024	Antwerpsedreef, 1	Zoersel
2024	10LIM0	10LI1	2024	Avenue des Pléiades	Limal
2024	10LLN0	10MOR	2024	Rue de Monts-St-Guibert	Ottignies
2024	10JOD0	10PIE	2024	Rue du Cimetière	Pietran
2024	10JOD0	10SJG	2024	Chaussée de Tirlemont	Saint-Jean Geest
2024	10WAV0	10WAE	2024	Avenue Marivaux, 18	Wavre
2024	14TUR0	14OOS	2024	Polderstraat, 90	Oud-Turnhout
2024	15MEM0	15MED	2024	Korte Heistraat, 6	Mechelen
2024	56DOT0	56DO1	2024	Rue du centre, 53	Leers Nord
2024	61BAS0	61LON	2024	Longchamps, 629	Longchamps
2024	63VIR0	63GER	2024	Route de Meix, 38	Gerouville
2024	63ARL0	63HE2	2024	Route de Neufchateau	Heinsch
2024	63VIR0	63LAM	2024	Rue de l'Anglissant	Lamorteau
2024	63VIR0	63LAT	2024	Rue Baillet-Latour	Latour-Virton
2024	64ROE0	64LR1	2024	Rue de la Liberté	Le Roelx
2024	64LAL0	64LV8	2024	Rue Liébin	Houdeng-Aimeries
2024	65GIV0	65GI1	2024	Rue Wauters	Haulchin
2024	84JEM0	84CHF	2024	Route de Marche, 27Z	Rochefort
2024	91LOK0	91LO1	2024	Voshol	Lokeren
2024	91GBR0	91MLK	2024	Hundelgemsesteenweg	Merelbeke
2025	54NIN0	54APL	2025	Hellestraat, 6	Appelterre-Eichem
2025	61LIN0	61RDU	2025	Rue de Transinne, 49	Redu
2025	68LES0	68LS3	2025	Chaussée Victor Lampe	Ollignies
2025	91WAC0	91KWL	2025	Kattenhoekstraat	Sint Kruis Winkel

Note that those dates are end of services delivery dates for **all** lines; which of course requires a progressive migration to get them all migrated in due time. No services need to be migrated to an alternative solution in the framework of the Lotus program.

The following services will have to be migrated to alternative solutions before the end of service delivery date of the outphased building where they are currently in service:

Table 3: Services to be migrated to alternative solutions.

Product type
Co-location and co-mingling in current buildings
Explore EFM (or E-line EFM or NGLL EFM)
BRUO (RC and SP) [a]

[a] Not applicable in copper zones for OLOs with a valid contract for co-mingling in the new Atropos room.

As mentioned in different chapters higher in this document, certain Product types are or will be the subject of a global outphasing with "Stop service" dates that might precede notified "end of service delivery dates" of outphased buildings.

In order to avoid newly installed services to be migrated shortly later, Proximus sends yearly to each Wholesale customer a notice of "**Stop sell**" pursuant to the information delays contractually specified. Similarly, for each outphased building, Proximus will send to each Wholesale customer present in the concerned local net a **notice of service suspension** ("Stop Service") pursuant to the information delays contractually specified for each impacted service, as well as a list of circuits impacted and of possible service alternatives.

7. **Copper outphasing**

Proximus' goal is to fully outphase the copper network (feeding and distribution) in the areas (fiberhoods) where FTTH is deployed in both its own footprint and the footprint of the Joint Ventures. **All services provisioned on copper** will have to be migrated to alternative solutions (cfr. table 4) before the end of service delivery date of the fiberhood where they are currently in service.

The table 5 summarizes the current copper outphasing planning until mid 2026 as officially notified to the market. **This planning is only indicative and still subject to changes[2]**. Operators that signed a GPON NDA can obtain on request the preliminary copper outphasing planning for all fiberhoods where the fiber roll-out started but for which copper outphasing is not notified yet.

Note that at this stage, no generalized copper outphasing is foreseen in FTTB[3] zones, but exceptions are possible.

Table 4: Services to be migrated to alternative solutions mainly include:

Product type
Explore EFM (or E-line EFM or NGLL EFM)
BRUO (RC and SP)
All commercial xDSL based services
All Bitstream xDSL based services
PSTN on AGW

Table 5: Copper outphasing planning

End of Service Delivery	Fiberhood
30/06/2024	W01-C-Deurne-FH10
30/06/2024	W01-C-Deurne-FH11
30/06/2024	W01-C-Gent-FH14
30/06/2024	W01-C-Gent-FH15
30/06/2024	W01-C-Roeselare-FH05

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[2] Roadworks in parts of a planned Fiberhood might for example lead to an accelerated copper outphasing in the impacted parts of the concerned Fiberhood.

[3] FTTB = Fiber to the Business: industrial zones and buildings with a high concentration of business customers.

30/06/2024	W02-D-Evere-FH01
30/06/2024	W02-D-Leuven-FH01
30/06/2024	W03-C-Liege-FH04
30/06/2024	W03-C-Aalst-FH01
31/12/2024	W01-C-Gent-FH05
31/12/2024	W03-C-Aalst-FH02
31/12/2024	W03-D-Mechelen-FH01
31/12/2024	W02-D-Leuven-FH03
31/12/2024	W02-D-Evere-FH02
31/12/2024	W03-C-Charleroi-FH10
01/01/2025	RW_Ieper_Paddevijverstraat_Reconversie bedrijventerrein Ieperleekanaal. - FASE 2 - AO
31/01/2025	W01-C-Gent-FH17
31/01/2025	W03-C-Koekelberg-FH01
31/01/2025	W03-C-Koekelberg-FH02
31/01/2025	W04-C-Evere-FH05
31/01/2025	W01-C-Namur-FH03
31/01/2025	W03-C-Liege-FH07
28/02/2025	W03-D-Kortrijk-FH01
28/02/2025	W02-D-Hasselt-FH07
28/02/2025	W03-D-Hasselt-FH04
28/02/2025	W01-C-Deurne-FH12
28/02/2025	W03-C-Vilvoorde-FH04
28/02/2025	W03-C-Vilvoorde-FH03
28/02/2025	W03-C-Schaerbeek-FH04
28/02/2025	W03-C-Anderlecht-FH05
28/02/2025	W03-C-Anderlecht-FH06
28/02/2025	W01-C-Namur-FH04
31/03/2025	W01-C-Gent-FH16
31/03/2025	W03-C-Antwerpen-Oost-FH21
31/03/2025	W01-C-Deurne-FH13
31/03/2025	W02-D-Uccle-FH01
31/03/2025	W03-C-Uccle-FH03
31/03/2025	W03-C-Ixelles-FH14
31/03/2025	W01-C-Charleroi-FH02
31/03/2025	W03-C-Liege-FH06
31/03/2025	W03-C-Liege-FH05
30/04/2025	W02-D-Hasselt-FH02
30/04/2025	W01-C-Deurne-FH14
30/04/2025	W03-D-Mechelen-FH03
30/04/2025	W02-D-Uccle-FH02

30/04/2025	W05-C-StGillisVorst-FH02
30/04/2025	W03-C-Etterbeek-FH02
31/05/2025	W01-C-Gent-FH02
31/05/2025	W01-C-Roeselare-FH03
31/05/2025	W03-C-Antwerpen-Oost-FH24
31/05/2025	W01-C-Deurne-FH02
31/05/2025	W01-C-Gent-FH01
31/05/2025	W01-C-Roeselare-FH02
31/05/2025	W03-D-Mechelen-FH02
31/05/2025	W03-C-Anderlecht-FH02
31/05/2025	W03-C-Koekelberg-FH05
31/05/2025	W06-C-Soignies-FH01
31/05/2025	W03-C-Schaerbeek-FH05
30/06/2025	W03-C-Gent-FH18
30/06/2025	W03-C-Etterbeek-FH01
30/06/2025	W03-C-Vilvoorde-FH05
30/06/2025	W03-C-Oostende-FH04
30/06/2025	W03-D-Kortrijk-FH03
30/06/2025	W03-C-Liege-FH08
30/06/2025	W03-C-Berchem-FH01
30/06/2025	W06-C-Soignies-FH02
30/06/2025	W03-C-Berchem-FH05
30/06/2025	W03-C-Anderlecht-FH01
30/06/2025	W04-C-Evere-FH04
30/09/2025	W03-C-Antwerpen-Oost-FH26
30/09/2025	W03-D-Kortrijk-FH02
30/09/2025	W03-C-Aalst-FH03
30/09/2025	W03-C-Antwerpen-Oost-FH27
30/09/2025	W01-C-Namur-FH01
30/09/2025	W03-C-Gent-FH24
30/09/2025	W03-C-Liege-FH09
30/09/2025	W03-C-Charleroi-FH11
30/09/2025	W03-C-Etterbeek-FH04
30/09/2025	W03-C-Berchem-FH04
30/09/2025	W03-C-Koekelberg-FH04
30/09/2025	W03-C-Anderlecht-FH10
30/09/2025	W06-C-Soignies-FH03
31/10/2025	W01-C-Deurne-FH01
31/10/2025	W03-C-Vilvoorde-FH01
31/10/2025	W03-C-Oostende-FH05
31/10/2025	W03-C-Aalst-FH04
31/10/2025	W03-C-Knokke-Heist-FH11

31/10/2025	W03-C-Gent-FH21
31/10/2025	W03-C-Etterbeek-FH05
31/10/2025	W03-C-Charleroi-FH19
31/10/2025	W03-C-Anderlecht-FH03
31/10/2025	W03-C-Knokke-Heist-FH12
31/10/2025	W05-C-Linkeroever-FH02
31/10/2025	W03-C-Ixelles-FH08
31/10/2025	W06-C-BraineLeComte-FH02
30/11/2025	W06-C-BraineLeComte-FH01
30/11/2025	W03-C-Vilvoorde-FH02
30/11/2025	W03-C-Vilvoorde-FH91
30/11/2025	W03-C-Berchem-FH02
30/11/2025	W04-C-Evere-FH03
30/11/2025	W02-C-Bruxelles-FH19
30/11/2025	W03-D-Brugge-FH02
30/11/2025	W05-C-Brugge-FH11
30/11/2025	W07-C-Liege-FH35
31/01/2026	W03-C-Vilvoorde-FH07
31/01/2026	W05-F-A3_1180_Avenue Hamoir_12
31/01/2026	W01-F-A3_1000_Rue des Sables_23 25 27_Rue Saint Laurent_16
31/01/2026	W01-F-A3_1070_avenue Jean Sibelius_20
31/01/2026	W01-F-A3_1070_avenue Marius Renard_27
31/01/2026	W01-F-A3_1070_avenue Marius Renard_31 33 35 37 39
31/01/2026	W01-F-A3_1070_avenue Marius Renard_41 43
31/01/2026	W01-F-A3_1070_avenue Marius Renard_45 47
31/01/2026	W01-F-A3_1070_avenue Marius Renard_49 51
31/01/2026	W01-F-A3_1070_avenue des immortelles_1 3
31/01/2026	W01-F-A3_1070_Avenue des Dauphinelles_9 11 13
31/01/2026	W01-F-A3_1070_Clos des Asters_7 8
31/01/2026	W01-F-A3_1070_avenue Docteur Lemoine_1 3 5
31/01/2026	W01-F-A3_1070_avenue Docteur Lemoine_7 9 11
31/01/2026	W01-F-A3_1070_Boulevard Joseph Bracops_201 203 205 207
31/01/2026	W01-F-A3_1070_rue de lorphelinat_30 30A

31/01/2026	W01-F-A3_1080_Boulevard Edmond Machtens_90 92 94 96 98
31/01/2026	W01-F-A3_1080_Boulevard Edmond Machtens_89 91
31/01/2026	W01-F-A3_1080_Boulevard Edmond Machtens_93 95
31/01/2026	W01-F-A3_1080_Boulevard Edmond Machtens_97 99
31/01/2026	W01-F-A3_1080_Boulevard Edmond Machtens_101
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31/01/2026	W01-F-A3_1080_Quai des Charbonnages_68 76
31/01/2026	W01-F-A3_1070_Rue de la laiterie_115 117
31/01/2026	W01-F-A3_1070_Rue de la Semence_1 3
31/01/2026	W01-F-A3_1090_Avenue de lArbre Ballon_20 22
31/01/2026	W01-F-A3_1090_Avenue de lArbre Ballon_26 28
31/01/2026	W01-F-A3_1070_rue des goujons_59 61 63
31/01/2026	W01-F-A3_1070_avenue Guillaume Stassart_1 3
31/01/2026	W01-F-A3_1070_avenue Marius Renard_2 4
31/01/2026	W01-F-A3_1170_Avenue des gerfauts_2 4
31/01/2026	W01-F-A3_1170_Avenue de la Heronniere_98 100
31/01/2026	W01-F-A3_1170_Avenue de la Heronniere_102 104
31/01/2026	W01-F-A3_1170_Avenue de la Heronniere_90 92
31/01/2026	W01-F-A3_1160_Avenue de la houlette_76 78
31/01/2026	W01-F-A3_1160_Rue des pecheries_105 107
31/01/2026	W01-F-A3_1170_Rue des pecheries_79 81 83 88
31/01/2026	W01-F-A3_1170_Rue Louis Ernotte_60 62 64
31/01/2026	W01-F-A3_1080_Boulevard Louis Mettewie_42 44 46 48 50
31/01/2026	W01-F-A3_1200_rue Konkel_210 212
31/01/2026	W01-F-A3_1170_Avenue des gerfauts_6 8 10
31/01/2026	W01-F-A3_1080_Avenue du Sippelberg_4 6 8

31/01/2026	W01-F-A3_1200_rue Konkel_214 216
31/01/2026	W01-F-A3_1200_rue Konkel_218 220
31/01/2026	W01-F-A3_1020_Avenue Mutsaard_75 77
31/01/2026	W01-F-A3_1080_Boulevard Louis Mettewie_85 95
31/01/2026	W01-F-A3_1000_Square Ambiorix_30
31/01/2026	W01-F-A3_1140_Rue Stroobants_60 62
31/01/2026	W02-F-A3_1070_Rue A. Willemyns_158-160-162-164-166
31/01/2026	W02-F-A3_1070_Rue Van Soust_113 115 117 119 121 123 125 127 129 131 133
31/01/2026	W02-F-A3_1080_Rue Louis Corhay_48
31/01/2026	W02-F-A3_1000_Rue du Heysel_134 136 138 140 142 144
31/01/2026	W02-F-A3_1000_Rue EugÃ¨ne Hubert_7 9 11
31/01/2026	W02-F-A3_1000_Bld. Emile Bockstael_5 7_Rue DieudonnÃ© LefÃ¨vre 219
31/01/2026	W02-F-A3_1000_Rue Gustave Schildknecht_33
31/01/2026	W02-F-A3_1000_Square Marguerite_42
31/01/2026	W02-F-A3_1070_Parc du Peterbos_10 11 16 17 18
31/01/2026	W02-F-A3_1080_Rue Nicolas Doyen_30 Rue DEnghien 40-42
31/01/2026	W02-F-A3_1080_Rue Van Kalck_Rue de la FraÃ®cheur_Rue de la melopÃ©e
31/01/2026	W02-F-A3_1080_Avenue de Roovere_10 12
31/01/2026	W02-F-A3_1080_Avenue de Roovere_14 16
31/01/2026	W02-F-A3_1000_Rue du Craetveld_137 139
31/01/2026	W02-F-A3_1000_ChaussÃ©e dAnvers_61 63
31/01/2026	W02-F-A3_1200_Avenue Gilbert Mullie_28 30 32 34
31/01/2026	W02-F-A3_1200_Avenue Gilbert Mullie_25
31/01/2026	W02-F-A3_1200_Place de la Sainte Famille_20
31/01/2026	W02-F-A3_1070_Rue du Sillon_140 142 144 146
31/01/2026	W02-F-A3_1190_Avenue des Sept Bonniers_136-144
31/01/2026	W02-F-A3_1080_Boulevard Louis Mettewie _73-83
31/01/2026	W02-F-A3_1080_Boulevard Louis Mettewie_67-71
31/01/2026	W02-F-A3_1090_Avenue Guillaume De Greef_400-499

31/01/2026	W02-F-A3_1090_Avenue Guillaume De Greef_200-299
31/01/2026	W02-F-A3_1090_Avenue Guillaume De Greef_100-199
31/01/2026	W02-F-A3_1120_Rue de Beyseghem_117 119 121_Avenue de Versailles_133 135
31/01/2026	W02-F-A3_1180_Avenue Jean et Pierre Carsoel_131 133
31/01/2026	W02-F-A3_1070_Rue du Sillon_96-98-100
31/01/2026	W05-F-A3_1060_CHEE_FOREST_CANADA_FRANQUI
31/01/2026	W05-F-A3_1070_Rue Puccini 113_Anderlecht
31/01/2026	W05-F-A3_1080_Rue des Quatre-Vents_137 139 141
31/01/2026	W05-F-A3_1080_Rue J-B Decock_48 50 52
31/01/2026	W05-F-A3_1090_Rue Eugène Toussaint 79-89
31/01/2026	W05-F-A3_1210_Avenue Georges Petre_1_Chaussée de Louvain_173
31/01/2026	W05-F-A3_1000_Rue des Petits Carmes 24C
31/01/2026	W05-F-A3_1080_Square Edmond Machtens_17 18 19 20
31/01/2026	W05-F-A3_1030_Rue de Potter_Rue dAerschot_Rue dHoogvorst_Rue de Brab
31/01/2026	W05-F-A3_1030_Rue Iwan Gilkin_Av. E.Zola_Av.Pr.Elisabeth
31/01/2026	W05-F-A3_1030_Rue E Fiers_AV L BERTRAND_RUE KESSELS
31/01/2026	W05-F-A3_1030_Rue J.Destrée_Rue A.Marbotin_Rue du Tilleul_Rue J.Wauters
31/01/2026	W05-F-A3_1030_Av. Maréchal Foch_Av.Voltaire_Rue C.Simoens_Rue des ailes
31/01/2026	W05-F-A3_1030_R.Goossens_R. G.Eenens_Ch.Haecht_R_ Verwee
31/01/2026	W05-F-A3_1070_Rue E. Rostand_R. L. De Swaff_R. Van Soust_Av.De Scheut
31/01/2026	W05-F-A3_1070_Rue de linstruction_Rue Bara_Rue Rossini_Rue Brogniez
31/01/2026	W05-F-A3_1170_R. des BEGONIAS_R. du GRUYER_ R. des CEDRES
31/01/2026	W05-F-A3_1060_R. A.Breart_R. de Savoie_R. A. Diderich_Av. J.Lambeaux
31/01/2026	W05-F-A3_1030_Rue du Saphir_Av. Milcamps_Ch. de Louvain_Av. E.Plasky

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31/01/2026	W05-F-A3_1020_Rue Steyls_Rue E.Delva_Av. P.Bols_Rue Fontaine
31/01/2026	W05-F-A3_1210_Rue Verbist_Bd des 4 journÃ©es_Rue de la ferme_Av.Jottrand
31/01/2026	W05-F-A3_1090_Av. C. de Wiart_R. Vanderperren_R. J-B. Serkeyn_Bd Belgica
31/01/2026	W05-F-A3_1210_R. Van Bemmel_R. potagÃ¨re_R. St. Alphonse
31/01/2026	W05-F-A3_1070_Ch.de Ninove_R.des tournesols_Av.des Menestrels_R.de la c
31/01/2026	W05-F-A3_1060_R.lhotel des monnaies_R. de la croix de pierre_R. du mÃ©ta
31/01/2026	W05-F-A3_1090_Av. Firmin_Av.de L.Mirepoix_Rue E.Faes_Bd de Smet Naeyer
31/01/2026	W02-F-A3_1070_Av. Dr. Zamenhof_10 12 14 16 18 20 22
31/01/2026	W05-C-Leuven-FH16
31/01/2026	W03-C-Gent-FH22
27/02/2026	W01-I-A3_1082_Avenue Charles-Quint_584
27/02/2026	W02-I-A3_1140_Rue de Geneve_175
27/02/2026	W04-F-A3_1080_Rue du Paruck_35-39
27/02/2026	W04-F-A3_1080_Rue des Fuchsias 17 19 23-29
27/02/2026	W04-F-A3_1080_Rue des Fuschias_30-42
27/02/2026	W04-F-A3_1080_Rue des Fuschias_46 48 50 52 54 56 58
27/02/2026	W04-F-A3_1080_Avenue du ChÃ¢teau_25-29
27/02/2026	W04-F-A3_1081_Av. de la Basilique_370-384_Av. Pantheon_100-101-102-103
27/02/2026	W03-F-A3_1000_Rue Saint-Laurent_2
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27/02/2026	W03-F-A3_1000_Rue de Laeken_152-162
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27/02/2026	W03-F-A3_1000_Rue du MarchÃ© aux Porcs_12-30
27/02/2026	W03-F-A3_1000_Rue de la Tribune_10
27/02/2026	W03-F-A3_1000_Rue du FossÃ© aux Loups_28
27/02/2026	W03-F-A3_1050_Galerie Louise_43B
27/02/2026	W07-C-Namur-FH20

27/02/2026	W03-C-Antwerpen-West-FH03
27/02/2026	W03-C-Oostende-FH01
27/02/2026	W03-C-Gent-FH27
27/02/2026	W04-C-Gent-FH30
27/02/2026	W06-C-Bouge-FH01
31/03/2026	W03-C-Etterbeek-FH06
31/03/2026	W06-C-Seraing-FH04
31/03/2026	W06-C-Onhaye-FH01
31/03/2026	W03-D-Sint-Niklaas-FH01
31/03/2026	W03-D-Sint-Niklaas-FH02
31/03/2026	W03-C-Oostende-FH02
31/03/2026	W03-C-Gent-FH25
31/03/2026	W03-C-Liege-FH11
31/03/2026	W03-C-Charleroi-FH12
31/03/2026	W03-C-Charleroi-FH18
31/03/2026	W03-C-Hasselt-FH08
31/03/2026	W06-C-Seraing-FH01
31/03/2026	W03-C-Oostende-FH14
31/03/2026	W05-C-Machelen-FH01
30/04/2026	W03-I-A3_1140_Rue Carli_1
30/04/2026	W03-C-Gent-FH26
30/04/2026	W03-C-Antwerpen-West-FH06
30/04/2026	W03-C-Antwerpen-West-FH07
30/04/2026	W03-C-Antwerpen-Oost-FH19
30/04/2026	W03-C-Antwerpen-Oost-FH18
30/04/2026	W04-C-Aalst-FH06
30/04/2026	W03-C-Ixelles-FH16
30/04/2026	W04-C-Gent-FH31
30/04/2026	W03-C-Anderlecht-FH07
30/04/2026	W03-C-Ixelles-FH03
31/05/2026	W03-C-Oostende-FH09
31/05/2026	W03-C-Antwerpen-West-FH01
31/05/2026	W03-C-Gent-FH20
31/05/2026	W03-C-Aalst-FH05
31/05/2026	W03-C-Antwerpen-West-FH02
31/05/2026	W03-C-Liege-FH10
31/05/2026	W03-C-Charleroi-FH14
31/05/2026	W03-C-Berchem-FH03
31/05/2026	W03-C-Ixelles-FH15
31/05/2026	W03-C-Charleroi-FH07
31/05/2026	W07-C-Liege-FH36
31/05/2026	W05-C-Linkeroever-FH01

31/05/2026	W07-C-Liege-FH38
30/06/2026	W00-F-A3_1000_Rue De La Bonte_1 3
30/06/2026	W00-F-A3_1060_Chaussee De Charleroi_24 26
30/06/2026	W00-F-A3_1180_Avenue Den Doorn_1 5
30/06/2026	W00-F-A3_1070_Avenue Jean Sibelius_22 30
30/06/2026	W00-F-A3_1070_Square Albert 1_15 28
30/06/2026	W00-F-A3_1070_Square Albert 1_1 14
30/06/2026	W00-F-A3_1200_Place Du Tomberg_2 3
30/06/2026	W00-F-A3_1090_Avenue Charles Woeste_288 310
30/06/2026	W00-F-A3_1190_Rue Cervantes_2 14
30/06/2026	W00-F-A3_1030_Avenue De La Brabanconne_80 80A
30/06/2026	W00-F-A3_1160_Boulevard Du Souverain_384
30/06/2026	W00-F-A3_1140_Avenue Henry Dunant_42 44
30/06/2026	W05-C-Merksem-FH03
30/06/2026	W06-C-Seraing-FH07
30/06/2026	W03-C-Oostende-FH08
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30/06/2026	W01-C-Roeselare-FH01
30/06/2026	W02-D-Leuven-FH02
30/06/2026	W01-C-Namur-FH08
30/06/2026	W03-C-Antwerpen-West-FH08
30/06/2026	W03-C-Antwerpen-Oost-FH16
30/06/2026	W01-C-Namur-FH09
30/06/2026	W03-C-Ixelles-FH01
30/06/2026	W03-C-Ixelles-FH17
30/06/2026	W03-C-Ixelles-FH18
30/06/2026	W04-C-Gent-FH29

As mentioned in different chapters higher in this document and in the footnote of Table 4, certain product types are or will be the subject of a global outphasing with "Stop service" dates that might precede notified "end of service delivery dates" in fiberhoods.

In order to avoid newly installed services to be migrated shortly later, Proximus sends yearly to each Wholesale customer a notice of "**Stop sell**" pursuant to the information delays contractually specified. A change of this "Stop sell" approach is currently under investigation and will be communicated timely when decided. Similarly, for each fiberhood, Proximus will send to each Wholesale customer present in the concerned fiberhood a **notice of service suspension** ("Stop Service") pursuant to the information delays

contractually specified for each impacted service, as well as a list of circuits impacted and of possible service alternatives.

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