

**Annex 4 of ComReg
Document Number 20/06**



**Geographic Analysis of
MI WHQA markets in
Ireland **Final Report 2020 –
Non-confidential version****

ComReg Document No. 20/06a

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S.A.S. au capital de 200 000 €
RCS Paris B 394 948 731

24 January 2020

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1 Introduction

1.1 Regulatory framework and project objectives

In August 2016, ComReg published a Consultation and Draft Decision¹ ('2016 Consultation') on its Market Review for Wholesale High Quality Access (WHQA) at a Fixed Location (Leased Lines). In its analysis, ComReg has identified the following three, separate, WHQA markets:

- (a) A low Bandwidth Traditional Interface ('TI') WHQA Market consisting of all wholesale leased lines carried over analogue, digital and TDM technology interfaces with bandwidths $\leq 2\text{Mb/s}$, with this market being national in its geographic scope (the 'Low Bandwidth ('LB') TI WHQA Market');
- (b) A High Bandwidth TI WHQA Market which consists of all wholesale leased lines provided over a TDM interface with bandwidths $> 2\text{Mb/s}$, with this market being national in its geographic scope (the 'High Bandwidth ('HB') TI WHQA Market'); and
- (c) A Modern Interface ('MI') WHQA Market consisting of all wholesale leased lines of any bandwidth carried over modern technology interfaces such as Ethernet, xWDM and other high bandwidth interfaces, with this market being national in its geographic scope (the 'MI WHQA Market').

The above markets are collectively referred to as the 'Relevant WHQA Markets'.

In terms of the Significant Market Power ('SMP') assessment in the Relevant WHQA Markets, ComReg's preliminary findings in the 2016 Consultation were as follows:

- (a) Eircom is likely to have SMP in the Low Bandwidth TI WHQA Market;
- (b) No undertaking is likely to have SMP in the High Bandwidth TI WHQA Market; and
- (c) No undertaking is likely to have SMP in the MI WHQA Market.

Following the SMP assessment, ComReg proposed to broadly maintain the set of remedies in place for the Low Bandwidth TI WHQA Market. With respect to the High Bandwidth TI WHQA Market and MI WHQA Market, ComReg proposed to withdraw existing regulatory obligations given its preliminary finding that no SP has SMP.

ComReg then received a number of comments from the industry to its 2016 Consultation and decided to perform further geographical analysis regarding the level of competition in different areas of the country.

Consequently, ComReg mandated TERA Consultants (TERA) and its mapping experts Geocible, to carry out a mapping exercise to assist ComReg with an assessment of competitive conditions in the MI WHQA Market in Ireland, based on an analysis of the geographic differences in the conditions of competition for the supply and demand for MI WHQA services in Ireland. This analysis was also used to inform the competition assessment of the relevant MI WHQA markets. In detail, the analysis consists in:

- (a) Mapping all relevant fixed fibre networks and parsing of these between backhaul and local access network;
- (b) Significant geocoding exercise (connected premises and forecast databases)

¹ ComReg 16/69

- (c) Assessing if similar conditions of current and forecast supply and demand existed across geographic units; and
- (d) Assessing the market shares of Service Providers (SPs) for the chosen sub-national geographic areas based on connected premises (for provision of MI WHQA services).

1.2 Previous work and objectives of the current report

In 2017, TERA and Geocible carried out a first analysis which provided an assessment of competitive conditions in the Irish MI WHQA market for 2016 (i.e. based on 2016 input data from operators). The results of this work were used as an input to a Further Consultation and Draft Decision on the market review for WHQA issued published by ComReg in February 2018 (the '2018 Consultation')². The related methodology and results were detailed in an appendix to the 2018 Consultation (the '2018 Tera Report')³.

The present report describes the similar work carried out based on operators' data for 2017 and 2018, taking into account operators' submissions to the 2018 consultation.

Indeed, on foot of the 2018 Consultation, some adjustments were made to the original algorithm used in the 2018 Tera Report, in order to address issues raised by the respondents and other evidence gathered by ComReg.

Consequently, the present document not only presents the updated results for 2017 and 2018, but also describes the new algorithm on which these results are based as well as some new input data and modified parameters and criteria on which this new algorithm is based. ComReg explains in detail in its discussion on the Geographic Market Definition, Section 6 of its decision, how these modifications were arrived at.

In addition, the present report describes some changes to the 2018 Tera Report due to various errors in the inputs used to run the then algorithm and in the algorithm itself, which were discovered after the publication of the 2018 Tera Report. The present report describes those changes and assesses their impact on the results contained in the 2018 Tera Report.

It should be stressed that these errors have no bearing on the new modified analysis and have been rendered immaterial by the adoption of the updated algorithm.

1.3 Structure of the report

The present report is structured as follows.

Section 2 describes the errors discovered in the 2018 Tera Report, the related adjustments that were brought to remedy and eliminate these errors, and the impact on the results for on the 2016 data used in the 2018 Tera Report.

Section 3 describes the new approach that was used for 2017 and 2018 (and rerun for the 2016 data) compared to the approach originally used for 2016, and explains the reasons for the different adjustments made.

Section 4 describes the results of the work for 2016, 2017 and 2018.

² ComReg 18/08

³ ComReg 18/08a

2 Review of the 2016 analysis

2.1 Reasons for reviewing the 2016 analysis

While carrying out an inspection of the data to be used as part the analysis for the years 2017 and 2018, the 2018 Tera Report was found to contain some errors.

The first one concerned the use of imprecise fibre networks maps provided by operators for 2016 and used as an input of the algorithm. After receiving similar data for 2017 and 2018, it appeared that the mapping data received from some operators for 2016 contained some minor inaccuracies. For example, some overhead network assets (which are not available to directly connect customers) were included in local distribution network data but should have been allocated to core network. Similarly, some operators' point-to-point rented fibre which is used solely to fulfil core network requirements (and contractually limited from breakout to connect customers) was incorrectly included as fully owned native network assets in their 2016 mapping data sets.

The second issue concerned the 2016 connected premises data provided by some operators used as an input data to the algorithm. These contained some duplicated elements that were not detected. A deduplication process was therefore required which also necessitated further checking and clarification with operators.

The third and final issue concerned a detail in the algorithm itself. The algorithm that was retained as the basis of the competitive conditions assessment was the result of an extensive process, during which several variations of the algorithm were tested and analysed. While the version of the algorithm described in the 2018 Tera Report is indeed the version of the algorithm that was selected, the corresponding results that were displayed in the 2018 Tera Report were actually the results of an earlier iteration of the algorithm. The algorithm which the published maps was based on differed from what should have been published in two ways:

- (a) First, the “potential demand” database used to produce the published results was not the “15K organisations” subset of the Eurocode list of 300K non-residential premises, as stated in the report, but rather the whole set of 300K non-residential premises, which led to include in the competition assessment a large majority of business premises that are not likely to require any MI WHQA service in the long term (such as farms, small businesses and sole traders, small retail outlets, etc.).
- (b) Second, the version of the algorithm for which the results were mistakenly published, started with an initial query regarding whether the Small Area intersects with a Business Park⁴ connected to at least 2 networks or ENET CMAN, instead of a query related to the intersection between the Small area and 2 networks or ENET CMAN. By doing so, the published results used the Business Parks data as an input, but this was not stated in the 2018 Tera Report.

TERA and Geocible have updated the required data sets and rerun the algorithm as detailed in the 2018 Tera report.

⁴ The definition of a business park is provided in section 3.2.2

2.2 Impact assessment of the adjustments

In order to assess the impact of the different adjustments presented in the previous section, we started from the results presented in the 2018 Tera Report, and adjusted different parameters in the following order:

1. Corrections of operators' mapping errors in their inputs
2. Use of deduplicated premises instead of duplicated premises
3. Use of the 15K organisations database instead of 300K organisations database
4. Remove the use of the business parks in the algorithm.

The other criteria and the sequencing of the algorithm remained identical to that run previously i.e. distance criterion of 100 metres and proportionality criterion of 75% was used.

The 2018 report presented 3 048 Small Areas in Zone A (high alternative network density area) and 15 593 Small Areas in Zone B (low alternative network density area).

The correction of operators' mapping errors in their inputs leads to the removal of 142 Small Areas from the 3 048 Small Areas in Zone A (-4.7%) and the addition of them to the Zone B (+0.9%), resulting in 2 906 Small Areas in Zone A and 15 735 Small Areas in Zone B.

Using deduplicated premises in addition to the previous correction leads to an additional 32 Small Areas to the previous 2 906 Zone A Small Areas (+1.1%) and removal of them from Zone B (-0.2%), resulting in 2 938 Small Areas in Zone A and 15 703 Small Areas in Zone B.

The figure below shows the revised number of premises used in this report compared to the 2018 TERA Report.

Figure 1 – Impact assessment of the changes brought to 2016 results (cumulated impact)
 [X PARTIALLY REDACTED]

Service providers	Input premises		Deduplicated premises		Fixed dedup. premises	
	Old	New	Old	New	Old	New
Airspeed	[X ██████]	██████	██████	██████	██████	██████
BT	[X ██████]	██████	██████	██████	██████	██████
COLT	[██████]	██████	██████	██████	██████	██████
EIRCOM RETAIL	[X ██████]	██████	██████	██████	██████	██████
EIRCOM WHOLESALE	[X ██████]	██████	██████	██████	██████	██████
ENET CMAN	[X ██████]	██████	██████	██████	██████	██████
ENET UMAN	[X ██████]	██████	██████	██████	██████	██████
ENET OTHER	[X ██████]	██████	██████	██████	██████	██████
ESBT	[X ██████]	██████	██████	██████	██████	██████
EU	[██████]	██████	██████	██████	██████	██████
GTT	[X ██████]	██████	██████	██████	██████	██████
Host Ireland	[X ██████]	██████	██████	██████	██████	██████
Magnet	[X ██████]	██████	██████	██████	██████	██████
Three Ireland	[X ██████]	██████	██████	██████	██████	██████
Verizon	[██████]	██████	██████	██████	██████	██████
Viatal	[X ██████]	██████	██████	██████	██████	██████

Virgin Media	[< []	[]	[]	[]	[]	[]
Vodafone	[< []	[]	[]	[]	[]	[]
TOTAL	12,932	10,690	12,413	10,393	9,791	6,779

Source: Geocible and TERA Consultants analysis

In addition, using the 15K organisations subset database instead of the 300K organisations database leads to the addition of 948 Small Areas to the previous 2 938 Zone A Small Areas (+32.3%) and their removal from the Zone B (-6%), resulting in 3 886 Small Areas in Zone A and 14 755 Small Areas in Zone B.

Finally, removing the use of business parks from the algorithms leads to the removal of 38 Small Areas from Zone A (-1%) and their addition to Zone B (+0.3%), which finally gives a new total of 3 848 Small Areas in Zone A, and 14 793 Small Areas in Zone B.

The impact of these changes on the results of the algorithm are summarized in the table below.

Figure 2 – Impact assessment of the changes brought to 2016 results (cumulated impact)

Scenario (adjustments to the base case)	Zone A			Zone B		
	Change	Count	Percentage	Change	Count	Percentage
Initial figures from the 2018 Report	-	3 048	16.4%	-	15 593	83.6%
Plus correction of Premises and networks data	- 142	2 906	15.6%	+142	15 735	84.4%
Plus premises deduplication	+32	2 938	15.8%	-32	15 703	84.2%
Plus 15K organisation instead of 300K	+948	3 886	20.8%	-948	14 755	79.2%
Plus Business Parks removal: Final figures	-38	3 848	20.6%	+38	14 793	79.4%

Source: Geocible and TERA Consultants analysis

As a result of these adjustments, of the 18 641 Small Areas in Ireland, 3 848 Small Areas were identified as being Zone A), while 14 793 Small Areas are Zone B, as presented in the maps below (figures 3 and 4).

In comparison, the same methodology applied to the previous dataset led to 3 048 small areas in Zone A and 15 593 Small Areas in Zone B. Therefore, the corrections described previously lead to the cumulative addition of 800 Small Areas to the Zone A (+26.2%) and from the reduction of the Zone B by -5.1%, this impact being mainly due to the now use of the 15K organisations data base.

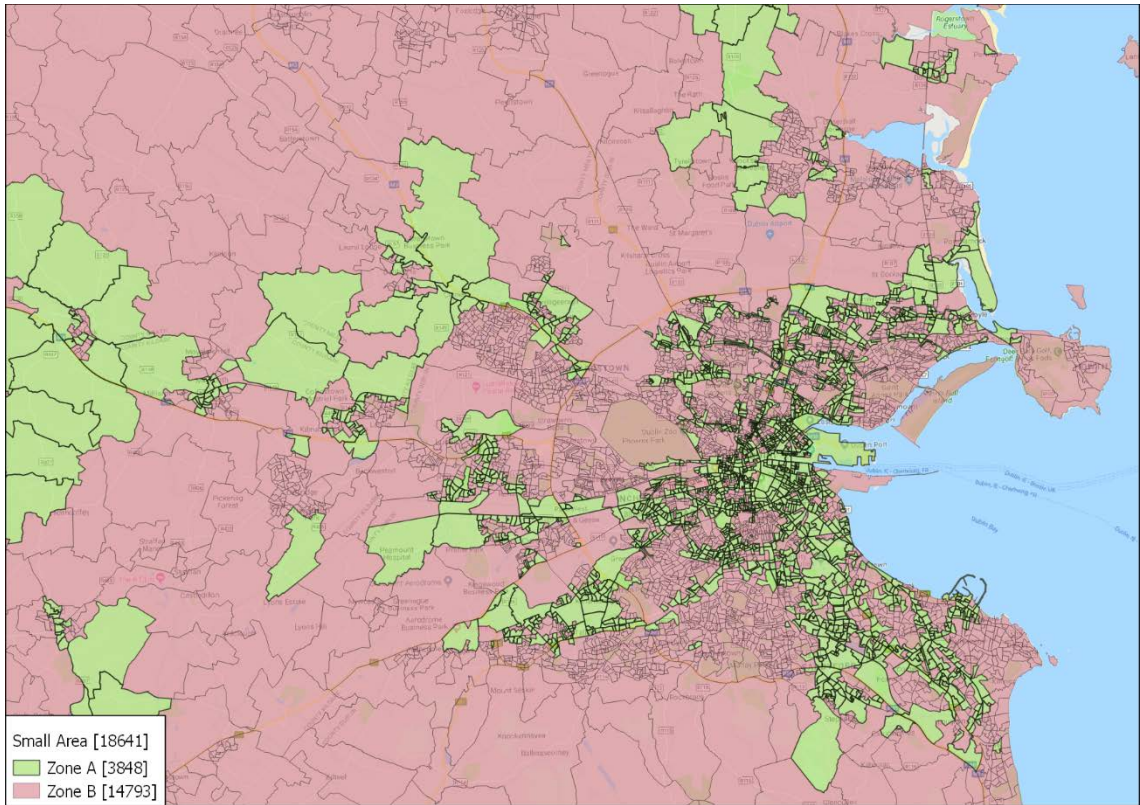
Based on these new figures, the table below presents the original and new market shares per operator and per Zone of alternative network density.

Figure 3 – Impact assessment on operators’ market shares in Zone A and Zone B
[X PARTIALLY REDACTED]

Service providers	Zone A Market shares			Zone B Market shares		
	Original	Corrected	Difference	Original	Corrected	Difference
Airspeed	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
BT	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
COLT	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
EIRCOM RETAIL	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
EIRCOM WHOLESALE	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
ENET CMAN	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
ENET UMAN	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
ENET OTHER	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
ESBT	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
EU	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
GTT	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Host Ireland	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Magnet	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Three Ireland	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Verizon	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Viatel	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Virgin Media	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
Vodafone	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]	[X ██████]
TOTAL	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%

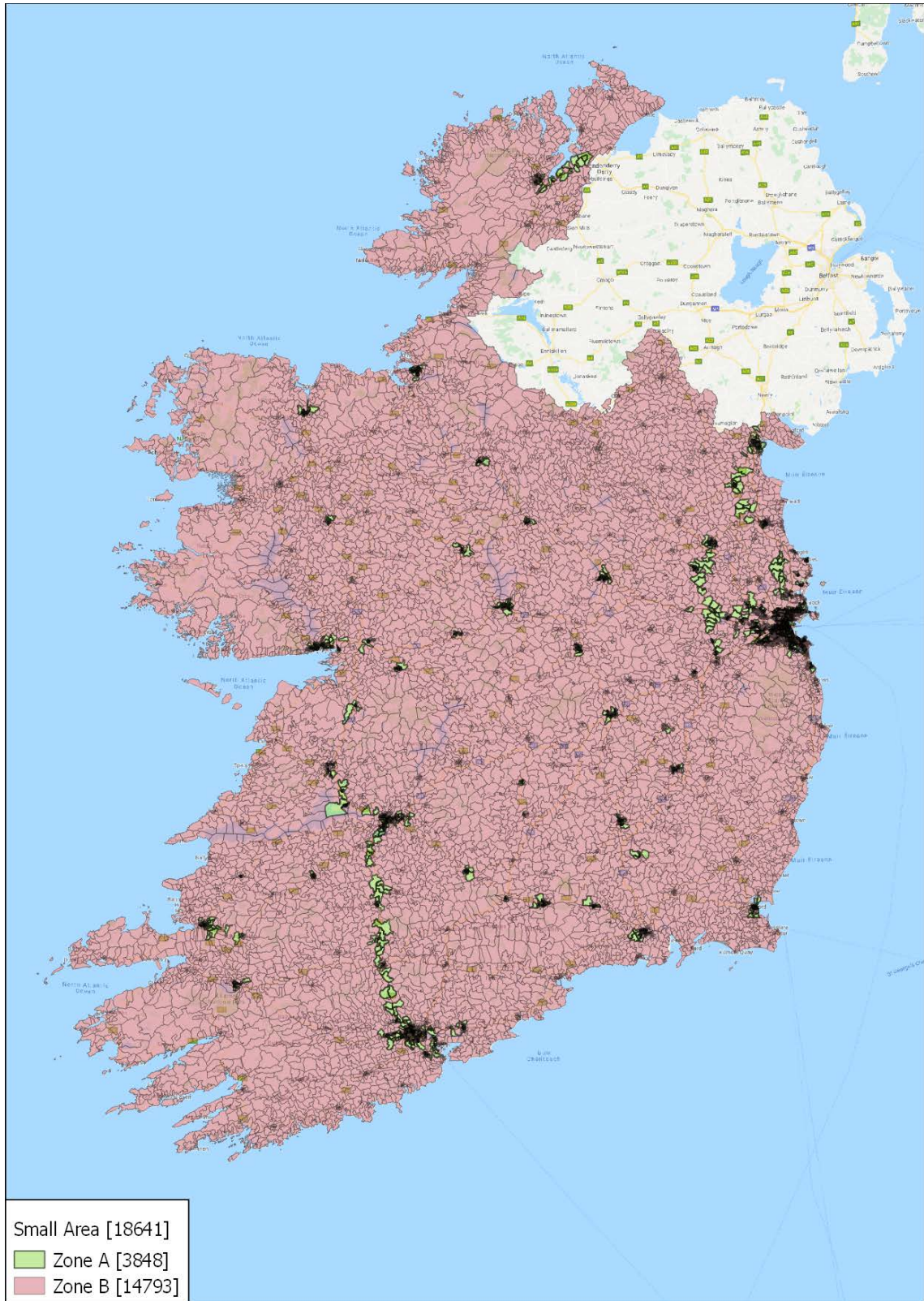
Source: Geocible and TERA Consultants analysis

Figure 4 – Map of Zone A and Zone B Small Areas in Greater Dublin Area for the year 2016 after adjustments implementation



Source: Geocible and TERA Consultants analysis

Figure 5 – Map of Zone A and Zone B Small Areas in Ireland for the year 2016 after adjustments implementation



Source: Geocible and TERA Consultants analysis

3 Description of the new approach for 2017 and 2018

3.1 Reasons for adopting of a new methodology

As mentioned in the introduction, an amended approach was considered to assess the competitive conditions in the MI WHQA Market in Ireland for 2017 and 2018.

The first reason for adopting a new methodology is **the availability for 2017 and 2018 of a new type of geographic unit, the Workplaces Zone**, which was not available when the 2018 Tera Report was written.⁵ This new geographic unit, described in the next section, is focused on businesses: as such, it is much better suited to mapping demand for business connectivity services than Small Areas which are based on residential premises.

As a consequence of the change in the geographic unit on which the algorithm is based, the whole sequence of queries used to assess the competition level of each geographic unit was reviewed. In particular:

- The sequence of the tests have been changed so that each geographic unit is initially interrogated for the presence of connected premises and then subsequently examined with the distance and proportionality criteria.
- The geographic unit on which the algorithm is based is now the Workplaces Zone(s) (WPZ(s)), instead of the small area (see section 3.2.1);
- The new algorithm includes some queries based on the business parks, in order to identify those business parks which are overlapped by WPZs which contain at least one connected premises and where the business parks were intersected by 2 or more alternative network (see section 3.2.2).
- The new algorithm identifies “islands” of low alternative network density, i.e. low alternative network density WPZs surrounded by high alternative network density WPZ, and considers them as high alternative network density areas too (see section 3.3).

The new algorithm is fully detailed in section 3.5.

The second reason that led to review the approach was the need to address some issues raised by the respondents to the 2018 consultation in their Submissions, as well as to address some concerns from ComReg, Geocible and TERA regarding the robustness of some of the parameters of the algorithm such as **the issues with potential demand**. In particular, when implementing the 2017 and 2018 data in the algorithm, it appeared that the new MI WHQA demand that arose between 2016 and 2018 (i.e. the newly connected premises in 2017 and 2018) was not reflected in the 15K organisation database which was used to assess the potential demand (see Figure 9 below), i.e. there was a very low matching rate between the 15K organisation data base and the newly connected premises database.

In 2016, the 15K organisation database was established based on a cross-comparison between lists of large companies and lists of organisations, which then allowed a subset of 15K organization to be derived which could eventually represent potential demand.

It was therefore natural to try to replicate this process with 2018 data: using similar cross-comparisons, a subset of 10K organisations was established. This list of 10K organisations

⁵ Whorkplace Zones were made available by the Central Statistics Office in 2018, following the 2016 Census.

contained only the name and address of the organisations, since no other data was available with a sufficient level of quality (activity code not systematically filled, no data available on the size or the membership of a group).

However, in practice, using such a list did only make sense if 2016 potential demand was effectively reflected in either 2018 connected premises or 2018 potential demand. Indeed, this would reflect a logical evolution of demand, and would justify *a posteriori* the use of the 15K database in 2016 to estimate potential demand.

In order to further assess the efficacy of the 15K organisations database as a relevant proxy for 2016 potential demand, various tests were therefore carried out, to first cross-compare 2016 potential demand with 2018 potential demand, and then 2016 potential demand with 2018 Connected Premises.

Numerous cross-comparison approaches were tested (based on names, names and addresses, geolocalisation). Unfortunately, due to the low level of quality of the operators' data associated with each organisation, these tests were not able to identify 2016 potential demand within the 2018 demand or newly Connected Premises with a sufficient degree of certainty.

Because of this lack of robustness, neither approach was deemed to be a suitable proxy for potential demand. As a consequence, it was necessary to review the overall approach in order to ascertain if removing the potential demand test would have a significant effect on the final outcome.

The effect of removing the potential demand was measured by running an algorithm with and without queries on potential demand. This exercise shows that of the total of 7,219 Workplace Zones, 134 (1.9%) switch from Zone A to Zone B, while 379 (5.3%) switch from Zone B to Zone A. In total, this leads to a net increase of 245 workplaces Zones in Zone A, which represents an 11,6% increase of Zone A Workplace Zones and a 4.8% decrease of Zone B Workplace Zones. Those figures are detailed in the table below.

Figure 6 – Impact on the count of Zone A and Zone B Workplace Zones of removing potential demand from the algorithm

	With Potential Demand Total Count	Without Potential Demand				Total count
		WPZ remaining in Zone A	WPZ remaining in Zone B	WPZ switching from Zone A to Zone B	WPZ switching from Zone B to Zone A	
Zone A	2,111	1,977			379	2,356
Zone B	5,108		4,729	134		4,863
Total	7,219					7,219

Source: Geocible and TERA Consultants analysis

In addition to these changes in the algorithm, three additional adjustments were decided by ComReg as a result of its consideration of issues raised by Respondents to the 2018 Consultation:

- The radial distance threshold between connected premises of a given geographic unit and the network, which was used at some point to determine the levels of supply and demand of a Small Area (see Figure 9 below), and which is now used to determine the level of supply and demand of a Workplace Zone (see Figure 13 in section 3.4), was shortened from 100m to 50m.
- Premises connected to the ENET CMAN network which represented the publicly owned infrastructure managed by enet were previously treated as being equivalent to two privately owned alternate networks, which was reflected in the queries of steps 1, 3 and 5 of the previous algorithm, as shown in the figure below. In the new algorithm, premises connected to the ENET CMAN are now considered to be equivalent to only one AN⁶. ENET CMAN is therefore treated as any other alternate network in the new algorithm (see section 3.4).

Further details on the justifications of such adjustments can be found in ComReg main decision document which is being published alongside this report.

The effect of treating CMAN as one privately owned alternate network instead of two was measured by running two versions of a similar algorithm with the CMAN parameter set to 1 and 2. This exercise shows that of the total of 7,219 Workplace Zones, 338 (4.7%) switch from Zone A to Zone B. Those figures are detailed in the table below.

Figure 7 – Impact on the count of Zone A and Zone B Workplace Zones considering CMAN as 1 or 2 alternate networks from the algorithm

	With CMAN=1 Total Count	With CMAN=2				Total count
		WPZ remaining in Zone A	WPZ remaining in Zone B	WPZ switching from Zone A to Zone B	WPZ switching from Zone B to Zone A	
Zone A	2,735	2,735			338	3,073
Zone B	4,484		4,146	0		4,146
Total	7,219					7,219

The effect on market shares is provided in the table below.

⁶ The algorithm allows toggling of CMAN=1 or 2 AN.

Figure 8 – Impact on Market shares considering CMAN as 1 or 2 alternate networks from the algorithm [PARTIALLY REDACTED]

Operator	Zone A						Zone B					
	CMAN = 1		CMAN = 2		Evolution		CMAN = 1		CMAN = 2		Evolution	
	3	%	Vol	%	Vol	%	Vol	%	Vol	%	Vol	%
Airspeed	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
BT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Colt	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Eircom Retail	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Eircom Wholesale	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Cman	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Uman	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Other	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
ESBT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Eunet	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
GTT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Host Ireland	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Magnet	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Siro	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Three Ireland	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Verizon	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Viatel	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Virgin	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Vodafone	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Zayo	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total	4950	100,0%	5514	100,0%	564	11%	3523	100,0%	2959	100,0%	-564	-16%

3.2 Description of the new geographic objects used in the algorithm

3.2.1 A new geographic unit: the Workplace Zones

As explained in the previous section, the geographic unit used as the basis of the algorithm is now the “Workplace Zone” unit instead of the “Small Area”⁷.

“Workplace Zones”⁸ is a segmentation of the Irish territory made available by the Central Statistics Office in 2018, which is focused on working locations instead of residencies. While Small areas are based on where people reside, and might contain no or few businesses, Workplace Zones are based on where people spend their day (i.e. work), and are designed to include at least 3 Workplaces. Workplace Zones are a function of Small Areas and were built by the CSO from amalgamating or splitting Small Areas, leading to a total of 7,219 Workplace Zones.

This geographic unit respects the criteria required by ComReg as detailed in Section 6 of the paper:

- The area needs to be sufficiently small to be considered as homogeneous in terms of competition;
- The boundaries of the areas must be transparent and non-arbitrary;
- The operator networks can be mapped onto them.

3.2.2 An additional geographic object: the Business Parks

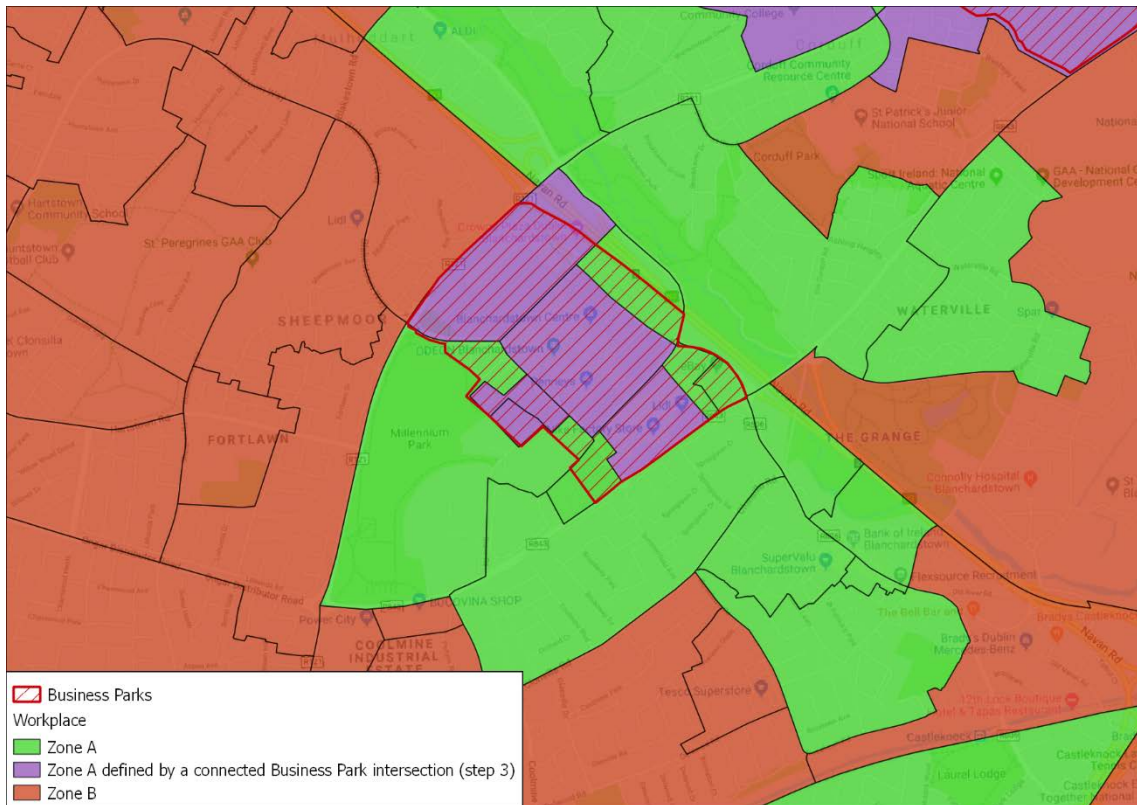
An additional geographic object was also introduced in the new algorithm: the “Business Parks”. While ComReg analysed Business Parks in the 2016 Consultation and Tera considered them for the 2018 analysis, they were found to be unsuitable as a geographic unit for analysis due to the fact that large proportion of demand for MI WHQA arises outside of Business Parks.

However, they are useful when used to complement WPZs to address a specific issue which arose with conducting the analysis described here. The updated mapping exercise (using 2018 data), when initially undertaken using the WPZs (which were smaller in business areas than SAs) in combination with the reduced 50m distance criterion, uncovered an issue whereby even Business Parks with many alternative networks present, returned anomalous results. In some circumstances, Business Parks containing multiple networks and connected premises were returning results that indicated that the WPZs in these Business Parks were of low-density infrastructure.

⁷ The new algorithm was also run based on Small Areas, in order to make some comparison with the 2016 exercise.

⁸ <https://www.cso.ie/en/census/census2016reports/Workplacezonesand1kmpopulationgrids/>

Figure 10 – Example of a Workplace Zone resulting as having a low alternative network density while intersecting a well supplied Business Park



Source: Geocible and TERA Consultants analysis

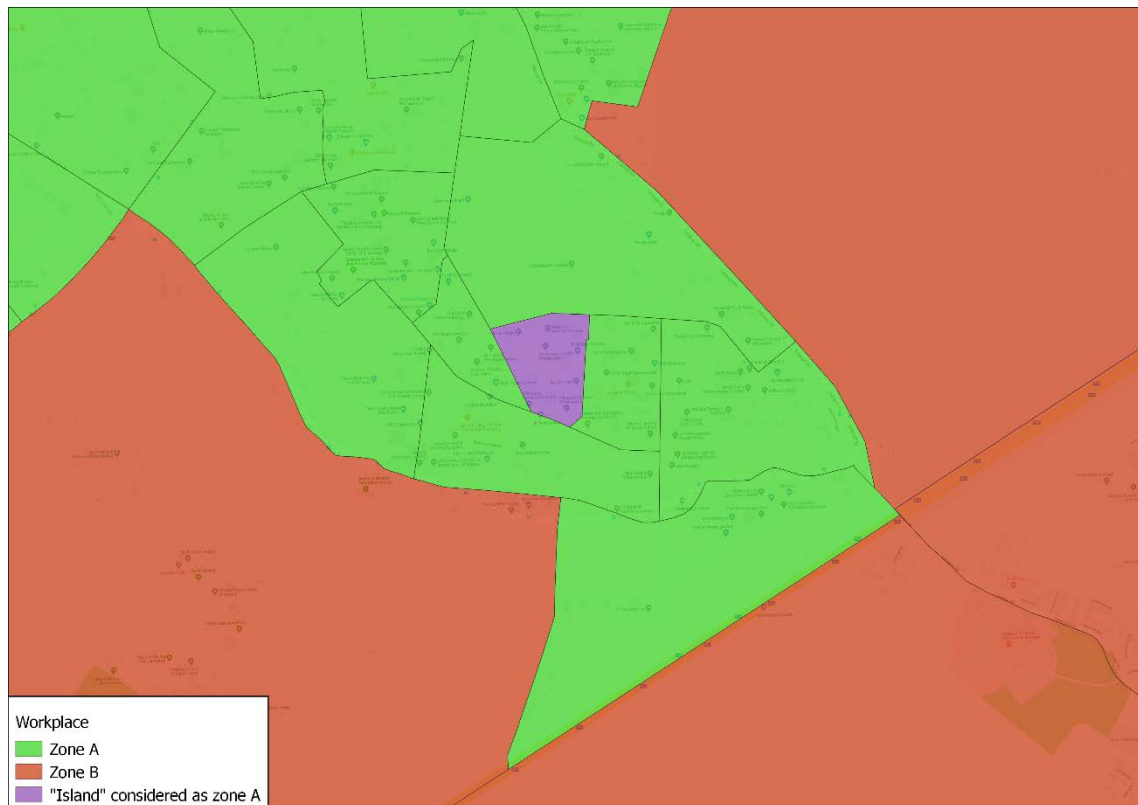
Tera understands that as Business Parks are privately owned, once access to a business park has been established by a Service Provider, the rules to expanding within these parks are different to those that apply on public roadways. Hence, in order to address this issue, it was decided to interrogate Business Parks for overlaps with WPZs which contained more than one connected premise. When the WPZs overlap Business Parks which are also intersected by two or more alternative networks, they are then considered as having a high alternative network density.

3.3 The infilling of “islands”

While Workplace Zones are particularly adapted to business oriented geographical analysis (as explained in section 3.2.1), they still result in issues of contiguity whereby relatively small WPZs can have a different designation than all the surrounding adjacent WPZs.

In order to mitigate the impact of this contiguity issue, an additional step is carried out in the algorithm, aiming at remedying this problem.

The figure below shows an occurrence of such situation.

Figure 11 – Example of an “island” of low density of alternative network

Source: Geocible and TERA Consultants analysis

When such a situation occurs, it was considered appropriate to perform an “infilling of islands” in order to more realistically reflect the competitive conditions in these locations, which also improved the geographic contiguity of the various markets

However, in order to ensure that the infilling only occurred where it can be considered reasonable that the conditions of competition in that ‘island’ are sufficiently homogenous with all the adjacent WPZs, a criterion was introduced to ensure that such “infilling of islands” is limited to ‘islands’ of no greater than approximately the average size as its neighbours WPZs (i.e. not more than 20% larger than the average of adjacent WPZs).

The asymmetrical nature of this approach is common in “spatial smoothing” methods. In the same way as energy always spread from a hot environment to a cold environment, and not the opposite, the competitive nature of an area can “spread” from a set of competitive Workplaces to adjacent non-competitive Workplaces. Indeed, while an “empty” Workplace Zone could in theory contain some network and connected premises with a small adjustment of its boundaries (i.e. the “propagation” of supply and demand), at the opposite it is not reasonable to simulate the “spreading” of a lack of network and connected premises towards areas where such networks and/or premises or effectively existing.

3.4 Description of the input data used in the algorithm

The spatial queries that were run for the final algorithm were:

- For each Workplace Zone (total: 7219):
 - Count how many premises of each operator are contained inside the Workplace Zone.
 - determine if at least one relevant business park intersects it;
 - count how many networks intersect or touch the Workplace Zone;
 - determine a neighbourhood table of each Workplace (see tests 4 and 6)
- For each MI connected premises of each operator (total: 8,473),
 - Determine in which Workplace Zone it is situated;
 - Determine which networks - if any – are closer than 50m.
- For each Business Parks, count how many networks intersect it (total: 287);

All this information and all different “objects” (Workplaces, business parks, premises...) were stored in a unique ‘access’ database. A unique file allows users to run spatial queries and perform other data manipulations. The table below lists the different datasets produced and loaded into the Access Database.

Figure 12 – Details of stored datasets

Object	Description
Business Parks	List of Business Park polygons based on OpenStreetMap
Premises	List of Premises by operator and with restructured addresses
Workplace Zones	List of Workplace provided by CSO based on the Census 2016
Networks	Maps of the AN SP Networks

Source: Geocible and TERA Consultants analysis

3.5 Description of the new algorithm

This section describes the new algorithm that was used to identify areas where conditions of competition were considered to be relatively homogenous.

Step 1: In a first step, the algorithm determines whether there is at least one Connected Premise present in a Workplace Zone. Depending on the result of this initial query, then two different sequences of queries are run.

Sequence 1: there is at least one connected premise in the Workplace Zone

Step 2: In case there is at least one connected premise in the Workplace Zone, the algorithm determines whether at least 75% of connected premises within the Workplace Zone are located in a range of 50 meters from at least 2 AN SP networks. In such case, the Workplace Zone is designated as Area “A1”

1 177 Workplace Zones are identified in this category.

Step 3: Business Parks – where the Business Park criterion (See paragraph 3.2.2) is met. In such case, the Workplace Zone is designated as Area **A2**

333 Workplace Zones are identified in this category.

Step 4: Islands – where the Island criterion (See paragraph 3.3) is met. In such case, the Workplace Zone is designated as Area **A3**

72 Workplace Zones are identified in this category

Finally, all Workplace Zones which contain at least one connected premise but for which the sequence of previous queries has led to negative answers are considered as low alternative network density Workplace Zones, and designated as Area “**B1**”

1 998 Workplace Zones are identified in this category

Sequence 2: there is no connected premise in the Workplace Zone

Step 5: in case there is no connected premise in the Workplace Zone, the algorithm determines whether the Workplace Zone intersects with at least 2 networks. In such case, the Workplace Zone is designated as Area “**A4**”.

1 141 Workplace Zones are identified in this category.

Step 6: Islands criterion is met

Designated as Area “**A5**”.

12 Workplace Zones are identified in this category.

Finally, all Workplace Zones which do not contain any connected premise but for which the sequence of previous queries has led to negative answers are considered as low alternative network density Workplace Zones, and designated as Area “**B2**”.

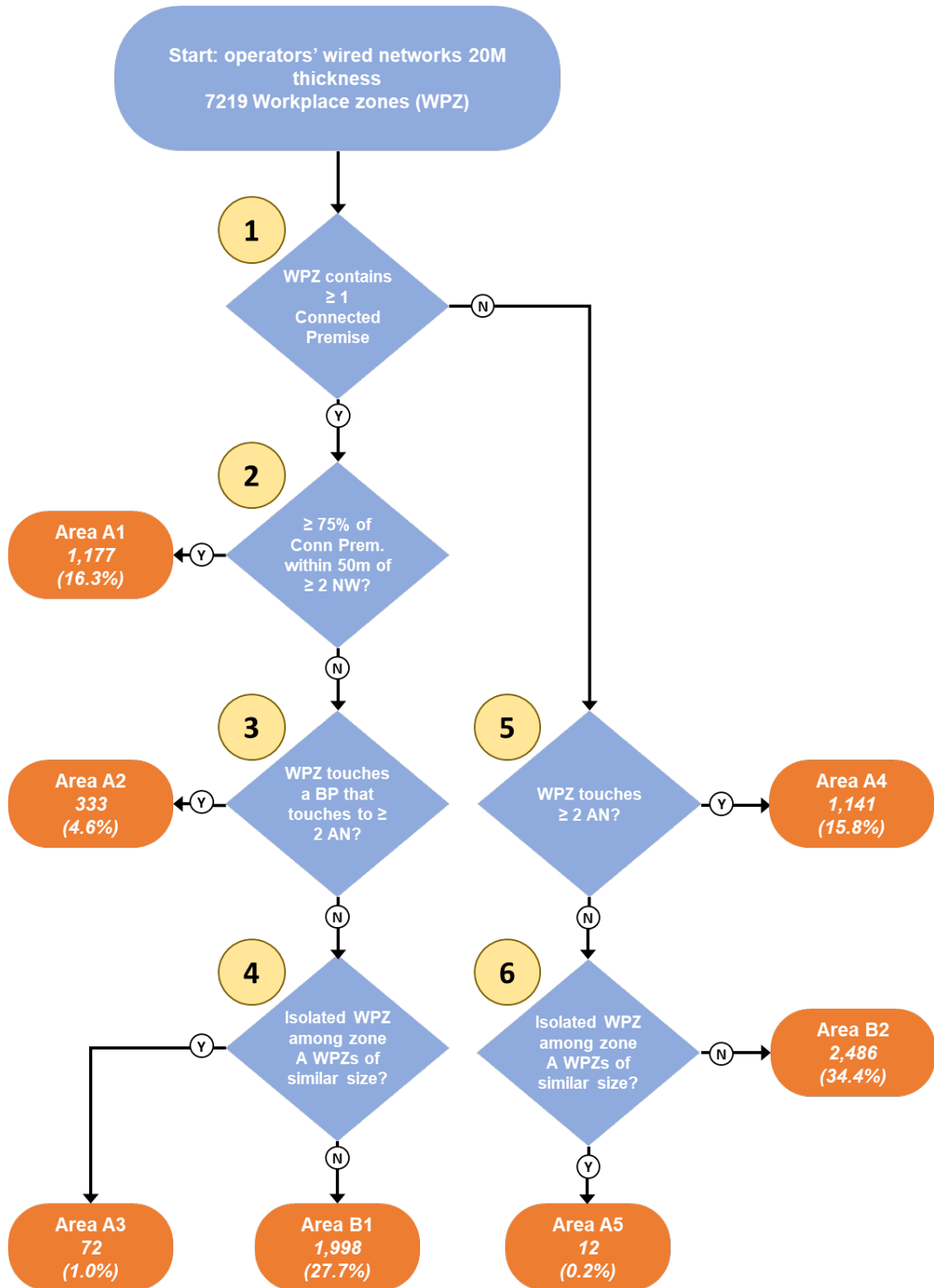
2 486 Workplace Zones are identified in this category

The flowchart in next page summarizes this algorithm, which leads to identify five different types of high alternative network density Workplace Zones (Zone A1 to Zone A5) and two different types of low alternative network density areas (Zone B1 and Zone B2).

Due to the similar conditions of competition found in the various Areas, those seven different types of Zones were consolidated into four areas in of the results (areas 1, 2, 3 and 4):

- Area 1 corresponds to Areas A1, A2 and A3;
- Area 2 corresponds to Areas B1;
- Area 3 corresponds to Areas A4 and A5;
- Area 4 corresponds to Area B2.

Figure 13 - New algorithm



Source: Geocible and TERA Consultants analysis

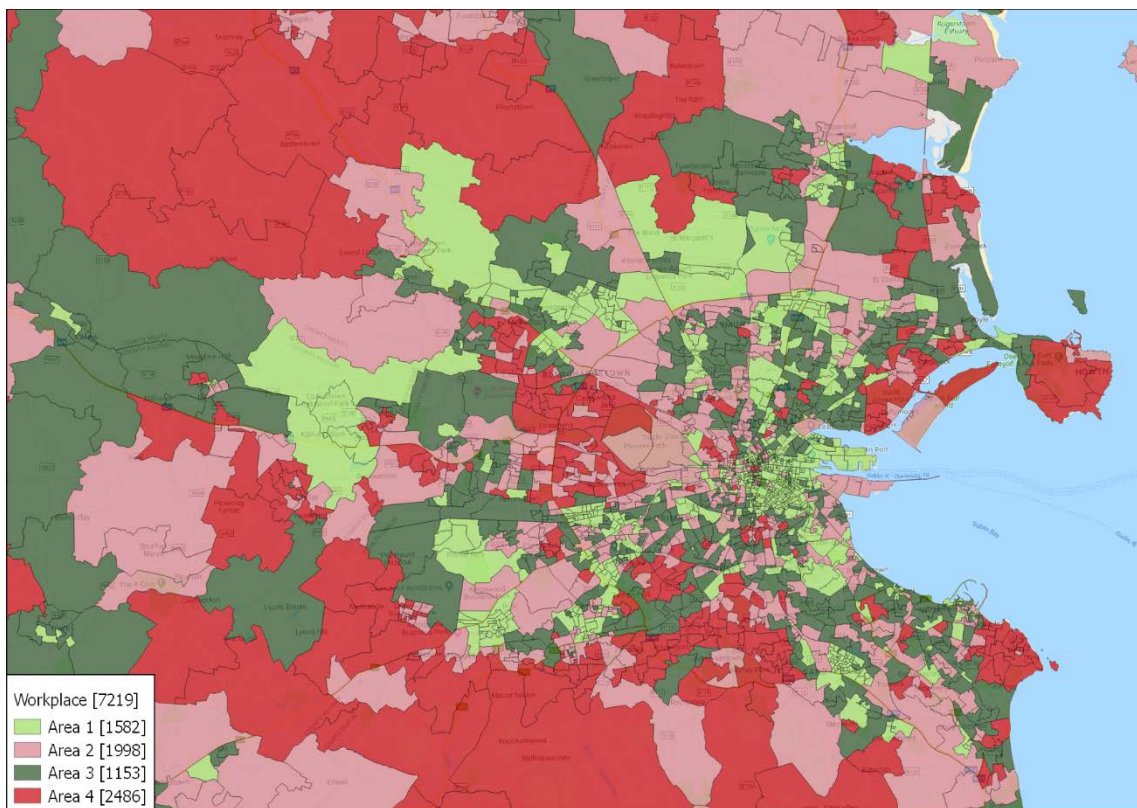
4 Results

4.1 Identification of Zones

The algorithm described in the previous section leads to map the country into 4 areas.

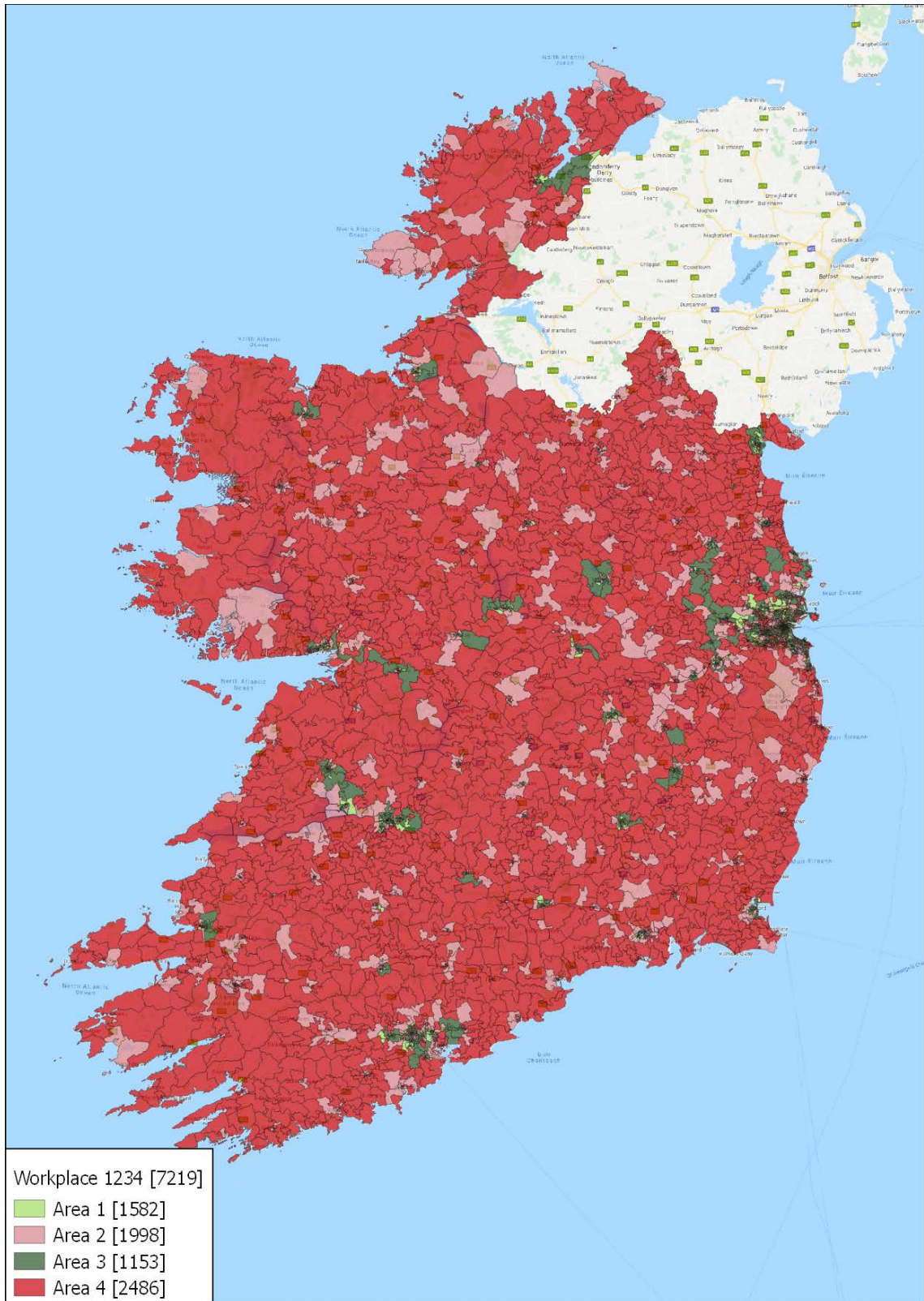
- 1 582 Workplace Zones are in Area 1, which corresponds to high alternative networks density zones containing at least one connected premise. Area A1 is comprised of Areas A1, A2 and A3 in Figure 13 above.
- 1 998 Workplace Zones are in Area 2, which corresponds to low alternative networks density zones containing at least one connected premise. Area A2 is comprised of the single Area B1 in Figure 13 above.
- 1 153 Workplace Zones are in Area 3, which corresponds to high alternative networks density zones which do not contain any connected premise. Area A3 is comprised of Areas A4 and A5 in Figure 13 above.
- 2 486 Workplace Zones are in Area 4, which corresponds to low alternative networks density zones which do not contain any connected premise. Area A4 is comprised of the single Area B2 in Figure 13 above.

Figure 14 – Map of Workplaces Zones per area (1, 2, 3 and 4) in Greater Dublin Area



Source: Geocible and TERA Consultants analysis

Figure 15 – Map of Workplaces Zones per area (1, 2, 3 and 4) in Ireland



Source: Geocible and TERA Consultants analysis

4.2 Market shares per Zone

The tables below provide the market shares per operator in each type of area using the new algorithm.

Figure 16 - Market shares of connected premises (Wired MI connected premises) per type of area – 2018 figures [X PARTIALLY REDACTED]

Operators	Area 1		Area 2		Area 3		Area 4	
	Percentage of connected premises	Volume of Connected Premises	Percentage of connected premises	Volume of Connected Premises	Percentage of connected premises	Volume of Connected Premises	Percentage of connected premises	Volume of Connected Premises
Airspeed	[█████]	█████	█████	█████		0		0
BT	[X █████]	█████	█████	█████		0		0
COLT	[X █████]	█████	█████	█████		0		0
EIRCOM RETAIL	[X █████]	█████	█████	█████		0		0
EIRCOM WHOLESALE	[X █████]	█████	█████	█████		0		0
ENET CMAN	[X █████]	█████	█████	█████		0		0
ENET UMAN	[X █████]	█████	█████	█████		0		0
ENET OTHER	[X █████]	█████	█████	█████		0		0
ESBT	[X █████]	█████	█████	█████		0		0
EU	[█████]	█████	█████	█████		0		0
GTT	[X █████]	█████	█████	█████		0		0
Host Ireland	[X █████]	█████	█████	█████		0		0
Magnet	[█████]	█████	█████	█████		0		0
Siro	[█████]	█████	█████	█████		0		0
Three Ireland	[X █████]	█████	█████	█████		0		0
Verizon	[X █████]	█████	█████	█████		0		0
Viatel	[X █████]	█████	█████	█████		0		0
Virgin Media	[X █████]	█████	█████	█████		0		0
Vodafone	[X █████]	█████	█████	█████		0		0
Zayo	[X █████]	█████	█████	█████		0		0
Total	100%	4,950	100%	3,523		0		0

Figure 17 – Evolution of Zone A and B⁹ market shares in Wired MI connected premises
[x PARTIALLY REDACTED]

Operators	Zone A (Areas 1+3)			Zone B (Areas 2 + 4)		
	2016	2017	2018	2016	2017	2018
Airspeed	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
BT	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
COLT	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
EIRCOM RETAIL	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
EIRCOM WHOLESALE	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
ENET CMAN	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
ENET UMAN	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
ENET OTHER	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
ESBT	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
EU	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
GTT	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Host Ireland	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Magnet	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Siro	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Three Ireland	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Verizon	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Viatel	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Virgin Media	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Vodafone	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Zayo	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]	[x ██████]
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Total volume of Wired MI Connected Premises	4,152	4,488	4,950	2,627	2,853	3,523

⁹ In theory, Areas 3 and 4 Connected Premises volumes for 2016 and 2017 should be equal to zero, as per 2018. However, we are using 2018 maps retrospectively which have some element of new network rollout hence, previous years will show some market shares in these areas. Furthermore, premises that previously were serviced by MI WHQA may no longer be so.

5.2 Counts of premises near alternate SP networks

The connected premise's proximity of 50 Metres to each operator's network:

Figure 19 Counts of connected premises near alternative networks [x PARTIALLY REDACTED]

Operator	Zone A		Zone B		Zones A and zone B	
	Vol Premises near alternative SP ¹⁰	% Premises near Alternative SP	Vol Premises near alternative SP	% Premises near Alternative SP	Vol Premises near alternative SP	% Premises near Alternative SP
Aurora	[x]	[]	[]	[]	[]	[]
BT	[x]	[]	[]	[]	[]	[]
Colt	[x]	[]	[]	[]	[]	[]
Enet UMAN/Other	[x]	[]	[]	[]	[]	[]
Enet CMAN	[x]	[]	[]	[]	[]	[]
ESBT	[x]	[]	[]	[]	[]	[]
EU	[x]	[]	[]	[]	[]	[]
GTT	[x]	[]	[]	[]	[]	[]
Magnet	[x]	[]	[]	[]	[]	[]
Siro	[x]	[]	[]	[]	[]	[]
Verizon	[x]	[]	[]	[]	[]	[]
Viatel	[x]	[]	[]	[]	[]	[]
Virgin Media	[x]	[]	[]	[]	[]	[]
Vodafone	[x]	[]	[]	[]	[]	[]
Zayo	[x]	[]	[]	[]	[]	[]
Total Near	4,599	92.9%	2,092	59.4%	6,691	79.0%
Total Far	351	7.1%	1,431	40.6%	1,782	21.0%
Total	4,950		3,523		8,473	

Source: Geocible and TERA Consultants analysis

e.g. [x] connected premises are considered close to Aurora's network, this represents [x] of all connected premises. 79.0 % of 8,473 connected premises are close to at least one network.

¹⁰ One premises may be near several networks

5.3 Circuits geocoding

The Geocoding of circuits for the years 2016 and 2017 was done in a similar way as the geocoding of premises detailed in the 2018 report, using the Google geocoding API tool.¹¹ The quality of the SPs data allowed circa 73% of circuits for the years 2016 and 2017 to be allocated between Zone A and Zone B, the addressing data for the remainder being of such poor quality that it was impossible to distinguish in which Zone these customer premises were located.

However, the geocoding of the circuit addresses did not require the same degree of accuracy as that required for Connected Premises as this exercise did not require any distance measurements of the relevant address to ANs. The objective was simply to distinguish whether each circuit address was contained within Zone A or Zone B. Hence, an address for Co. Cavan did not require any further analysis as all of the area of Co. Cavan was in Zone B. This also applied to some Zone A address where for instance, some Business Parks or “main street” of a town were entirely contained within Zone A. If a circuit address was that of such a Business Park, it was unnecessary to identify the precise location of the Customer Premises within the park or on the main street.

Figure 20 – Zone A and Zone B market shares in circuits and premises [PARTIALLY REDACTED]

Operator	Zone A				Zone B			
	2016's circuits		2017's circuits		2016's circuits		2017's circuits	
	Vol	%	Vol	%	Vol	%	Vol	%
Airspeed	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
BT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Colt	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Eircom	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Cman	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Uman	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Enet Other	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
ESBT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
EUNET	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
GTT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Host Ireland	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Magnet	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Siro	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Three Ireland	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Verizon	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Viatel	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Virgin	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Vodafone	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Zayo	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total	5,912	100.0%	6,570	100.0%	2,485	100.0%	2,786	100.0%

Source: Geocible and TERA Consultants analysis

¹¹ A usable 2018 dataset was not available for 2018 at the time that this exercise was undertaken

5.4 List of Business parks

ID_BP	Name
CARL_001	Strawhill Industrial Estate
CARL_002	Barrowside Business Park
CARL_003	St. Patricks College
CARL_004	Kernanstown Industrial Estate
CARL_005	Institute of Technology
CLAR_001	Smithstown Industrial Estate
CLAR_002	Shannon Free Zone
CORK_001	Mallow Road Industrial Area
CORK_002	Kilnap Business & Technology Park (part of Mallow Rd. Industrial Area)
CORK_003	Kilbarr Business & Technology Park
CORK_004	Hollymount Industrial Estate
CORK_005	Hollyhill Industrial Estate
CORK_006	EMC Campus, Ballincollig (IDA Industrial Estate, Barnagore)
CORK_007	Ballincollig Technology Park
CORK_008	Barrack Square, Ballincollig
CORK_009	IDA Cork Business & Technology Park, Model Farm Road
CORK_010	Cork Institute of Technology
CORK_011	University Technology Centre, Curraheen Road
CORK_012	UCC Cork (Main & West Campuses)
CORK_013	Wilton Shopping Centre
CORK_014	Cleve Business Park, Ballintemple
CORK_015	Tivoli Industrial Estate
CORK_016	Riverview Business Park, Mahon
CORK_017	Mahon Industrial Estate
CORK_018	Heritage Business Park, Mahon, Cork (part of Mahon Industrial Estate)
CORK_019	Longmahon Technology Park
CORK_020	Voxpro Campus, Mahon
CORK_021	National Software Campus, Mahon
CORK_022	City Gate Business Park
CORK_023	Mahon Point Shopping Centre
CORK_024	Eastgate Business Park, Little Island
CORK_025	Cork Plastics Campus, Little Island
CORK_026	Wallingstown Industrial Area, Little Island
CORK_027	Waterfront Business Park, Little Island
CORK_028	Euro Business Park, Little Island
CORK_029	Little Island Industrial Estate
CORK_030	IDA Business & Technology Park, Carrigtwohill
CORK_031	South Cork Industrial Estate
CORK_032	Youngline Industrial Estate, Pooladuff
CORK_033	Sitecast Industrial Estate, Togher
CORK_034	Pooladuff Industrial Estate
CORK_035	Leghanamore Industrial Estate

ID_BP	Name
CORK_036	Forgehill Industrial Estate
CORK_037	Metro Business Park, Ballycurreen Road
CORK_038	South Link Park,
CORK_039	Ballycurreen Industrial Estate
CORK_040	Cork Airport
CORK_041	Cork Airport Business Park
CORK_042	Pfizer, Ringaskiddy
CORK_043	Port of Cork Deepwater Berth, Ringaskiddy
CORK_044	Jannsen, Ringaskiddy
CORK_045	Novartis, Ringaskiddy
CORK_046	Raheen East Industrial Area, Ringaskiddy
CORK_047	Ringport, Ringaskiddy
CORK_048	DePuy, Ringaskiddy
CORK_049	Hovione Loughbeg, Ringaskiddy
CORK_050	GlaxoSmithKline, Ringaskiddy
CORK_051	Kilnagleary Business Park, Carrigaline
CORK_052	Estuary Industrial Estate, Carrigaline
CORK_053	Carrigaline Industrial Estate, Carrigaline
DONE_001	Pine Hill Industrial Estate
DONE_002	Letterkenny Office Park, Windy Hall
DONE_003	IDA Business & Technology Park
DONE_004	Ballyraine Industrial Estate
DONE_005	Letterkenny Institute of Technology
DUBL_001	Turvey Business Park
DUBL_002	Redleaf (Roseville) Business Park
DUBL_003	Swords Business Park
DUBL_004	Airside Retail & Business Park, Swords
DUBL_005	Dublin Airport
DUBL_006	North Ring Business Park, Santry D.9
DUBL_007	Dublin Airport Business Park, Santry D.9
DUBL_008	Woodford Business Park D.9
DUBL_009	Furry Park Industrial Estate, Santry D.9
DUBL_010	Airport Business Campus, Santry D.9
DUBL_011	Airways Business Park, Santry, D.9
DUBL_012	Clonshaugh/Willsborough Business Park D.17
DUBL_013	Northwood Business Park, Santry, D.9
DUBL_014	Northern Cross, Malahide Road D.17
DUBL_015	Dublin City University Glasnevin Campus D.9
DUBL_016	Dublin City University Saint Patrick's Campus D.9
DUBL_017	Dublin City University All Hallows Campus D.9
DUBL_018	Dublin City University, Mater Dei Campus D.3
DUBL_019	DIT Bolton St. D1
DUBL_020	DIT College of Catering and Tourism, Cathal Bruagh St. D.1
DUBL_021	East Point Business Park D.3
DUBL_022	Dublin Port D.1

ID_BP	Name
DUBL_023	Docklands Innovation Park, East Wall Road, D.3
DUBL_024	I.F.S.C. D.1
DUBL_025	Dublin Docklands (Northside D.1)
DUBL_026	Dublin Docklands (Southside D.2 & D.4)
DUBL_027	Grand Canal Square, D.2 (part of South Docklands)
DUBL_028	Trinity Technology and Enterprise Campus D.2
DUBL_029	Trinity College, Dublin D.2
DUBL_030	RIAM Westland Row, D.2
DUBL_031	IDA Centre, Newmarket, D.8
DUBL_032	National College of Art & Design, Thomas Street D.8
DUBL_033	Dublin Institute of Technology, Faculty of Business, Aungier St. D.2
DUBL_034	RCSI St. Stephens Green D.2
DUBL_035	Dublin Institute of Technology Kevin Street Campus D.8
DUBL_036	CDETB Camden Row D.8
DUBL_037	Dublin Institute of Advanced Studies, Burlington Rd D.4
DUBL_038	IPA (Institute of Public Administration) Landsdowne Rd. D4
DUBL_039	Radio Telefis Eireann Montrose Campus, Donnybrook D.4
DUBL_040	University College Dublin (Belfield Campus) D.4
DUBL_041	Glenview Industrial Estate, Herbeton Drive, D.8
DUBL_042	Goldenbridge Industrial Estate D.8
DUBL_043	Park West Business Park D.22
DUBL_044	Nangor Road Business Park, Nangor Road D.12
DUBL_045	Riverview Business Park, Nangor Road D,12
DUBL_046	John Kennedy Industrial Estate D.12
DUBL_047	Old Naas Road Industrial Area, Bluebell D.12
DUBL_048	Naas Road Industrial Park, Old Naas Road D.12
DUBL_049	Aldi (and adjacent commercial areas), Long Mile Road, D.12
DUBL_050	Robinhood Industrial Estate D.12
DUBL_051	Lwr. Ballymount Business Area, Nth.D.12
DUBL_052	Lwr. Ballymount Business Area, Sth.D.12
DUBL_053	Ballymount Drive Business Area D.12
DUBL_054	Western Parkway Business Centre D.22
DUBL_055	Westway Business Centre, Ballymount D.12
DUBL_056	Ballymount Cross Industrial Estate D.22
DUBL_057	Crosslands Business Park, Ballymount D.22
DUBL_058	Crossbeg Industrial Estate, Ballymount D.22
DUBL_059	Westgate Business Park, Ballymount D.22
DUBL_060	M50 Business Park, Ballymount, D.22
DUBL_061	Fashion City, Ballymount D.22
DUBL_062	Cookstown Industrial Estate, Tallaght D.24
DUBL_063	Belgard Retail Park, Belgard Rd. D.24
DUBL_064	Institute of Technology, Tallaght D.24
DUBL_065	The Square, Tallaght, D.24 (Inc. Belgard Squares)
DUBL_066	Grangecastle Business Park
DUBL_067	Kilcarberry Business Park D.22

ID_BP	Name
DUBL_068	Profile Park D.22
DUBL_069	Baldonnell Business Park, Naas Rd
DUBL_070	Citywest Business Park D.24
DUBL_071	Stillorgan Industrial Park D.18
DUBL_072	Sandyford Industrial Estate D.18
DUBL_073	Central Park, Leopardstown, D.18
DUBL_074	Mountain View Business Park, Leopardstown, D. 18
DUBL_075	South County Business Park, Leopardstown D.18
DUBL_076	Deansgrange Business Park
DUBL_077	Dun Laoghaire College of Art & Design
DUBL_078	The Park, Carrickmines D.18
DUBL_079	Cherrywood Business Park D.18
DUBL_080	Bristol Myers Squibb, Cruiserath D.15
DUBL_081	Blanchardstown Corporate Park D.15
DUBL_082	College Business & Technology Park, Blanchardstown D.15
DUBL_083	Institute of Technology Blanchardstown D.15
DUBL_084	Blanchardstown Business & Technology Business Park D.15
DUBL_085	IDA Ballycollin Business Park D.15
DUBL_086	Northwest Business Park D.15
DUBL_087	Millennium Business Park Blanchardstown D.15
DUBL_088	Rosemount Business Park, Blanchardstown D.15
DUBL_089	Keypoint Business Park Blanchardstown D.15
DUBL_090	Stadium Business Park, Blanchardstown D.15
DUBL_091	Premier Business Park, Blanchardstown D.15
DUBL_092	Damastown Industrial Park D.15
DUBL_093	Plato Business Park, Mullhuddart D.15
DUBL_094	BASE Enterprise Park, Mullhuddart D.15
DUBL_095	Damastown Technology Park, Damastown Wa k D.15
DUBL_096	Kepak, Damastown D.15
DUBL_097	Blanchardstown
DUBL_098	Dublin Airport Logistics Park
GALW_001	IDA Loughrea Business and Technology Park
GALW_002	East Point Business Park
GALW_003	Raheen Industrial Estate
GALW_004	Ballinasloe Enterprise & Technology Centre
GALW_005	Westside Shopping Centre
GALW_006	Westside Enterprise Park
GALW_007	University College Galway Campus
GALW_008	Liosban Industrial Estate, Tuam Road
GALW_009	Mervue Industrial Estate
GALW_010	Galway Financial Services Centre, Moneenageisha
GALW_011	IDA Business Park, Dangan
GALW_012	Ballybane Industrial Estate
GALW_013	Ballybrit Industrial Estate
GALW_014	Cityeast (Business Park, Ballybrit)

ID_BP	Name
GALW_015	Ballibrit Industrial Estate Upper
GALW_016	Galway/Mayo Institute of Technology (GMIT), Dublin Road
GALW_017	Parkmore Industrial Estate
GALW_018	Galway Technology Park
GALW_019	Briarhill Business Park
GALW_020	Oranmore Business Park
GALW_021	Deerpark Industrial Estate, Oranmore
GALW_022	Westlink Industrial Park. Oranmore
KERR_001	Clieveragh Business Park
KERR_002	Monavalley Industrial Estate
KERR_003	IT Tralee & Kerry Technology Park
KERR_004	Tralee Business Park, (Clash Business Park)
KERR_005	Woodlands Industrial Estate
KERR_006	Ballyspillane Industrial Estate
KILD_001	Colinstown Industrial Park
KILD_002	Colinstown Business Park
KILD_003	Ryebrook Business Park
KILD_004	Liffey Park Technology Campus
KILK_001	Hebron Industrial Estate
KILK_002	Cillin Hill (Retail & Business Park)
KILK_003	Ormonde Business Park
KILK_004	Kilkenny Industrial and Business Park, Purcellsinch
KILK_005	Kilkenny Retail & Business Park
KILK_006	Kilkenny Business & Technology Park, Loughboy
KILK_007	Danville Business Park
LAOI_001	Portlaoise College
LAOI_002	Kea-Lew Business Park
LAOI_003	Clonminam Business Park
LAOI_004	Portlaoise Retail Park
LAOI_005	Lismard Business Park
LIME_001	Limerick IT
LIME_002	UL Limerick
LIME_003	Plassey park Industrial/Commercial Parks
LIME_004	Cook Ireland, Castletroy
LIME_005	Vistakon, Plassey
LIME_006	Cornacree Business Park, Dock Road
LIME_007	Limerick Docks, Dock Road
LIME_008	Mary Immaculate College, SCR
LIME_009	Limerick Enterprise Development Partnership, Roxboro
LIME_010	Galvone Industrial Estate
LIME_011	Crossagalla Business Park
LIME_012	Ballysimon North
LIME_013	East Link (& Monaclione Business) Parks, Ballysimon
LIME_014	Ballysimon South
LIME_015	Garryglass Industrial Estate, Ballysimon

ID_BP	Name
LIME_016	City East Retail Park, Ballysimon
LIME_017	Crescent Shopping Centre, Dooradoyle
LIME_018	Raheen Industrial Estate
LIME_019	Annacotty Business Park
LONG_001	N4 Retail & Business Park
LONG_002	Longford Business & Technology Park, Lisnamuck
LONG_003	IDA Business & Technology Park, Ballinalee
LONG_004	Townspark Industrial Estate
LOUT_001	Northlink Retail Park
LOUT_002	Coes Road Industrial Estate
LOUT_003	The Brewery Business Park
LOUT_004	Dunda k IT
LOUT_005	Finnabair industrial Park (IDA Business Park)
LOUT_006	Xerox Business Park
LOUT_007	Donore Road Industrial Estate
LOUT_008	Newgrange Business Park
MAYO_001	Ballina Beverages Campus
MAYO_002	Hollister Business Park, Rehins
MAYO_003	IDA Business Park
MAYO_004	Claremorris Retail Centre
MAYO_005	Clar Industrial Estate
MAYO_006	Lakeside Retail Park
MEAT_001	Ballmoral Industrial Estate
MEAT_002	Mullaghboy Industrial Estate
MEAT_003	Beechmount Industrial Estate
MEAT_004	Navan Business and Technology Park, Athlumney
MEAT_005	Oaktree Business Park
MEAT_006	Facebook Clonee Datacentre
MEAT_007	Dunboyne Business Park
MEAT_008	Bracetown Business Park
OFFA_001	Axis Business Park
OFFA_002	Burlington Business Park
OFFA_003	Srah IDA Business & Technology Park
OFFA_004	Central Business Park, Clonminch Road
ROSC_001	IDA Business & Technology Park
SLIG_001	Finisklin Industrial Estate
SLIG_002	Sligo Institute of Technology
TIPP_001	Ard Gaoithe Business Park
TIPP_002	Cashel Road Industrial Estate
TIPP_003	Carrigeen Business Park
TIPP_004	Gurtnafleur Business Park
WATE_001	Waterford Institute of Technology, West Campus
WATE_002	Westside Business Park
WATE_003	Waterford Business Park, Cork Road
WATE_004	Waterford Industrial Estate, Cork Road

ID_BP	Name
WATE_005	Cleaboy Business Park
WATE_006	Waterford Institute of Technology, Cork Road Campus
WATE_007	Six Crossroads Business Park
WATE_008	Kingsmeadow Business Park
WATE_009	Tramore Road Business Park
WATE_010	Ardkeen Shopping Centre
WEST_001	Monksland Industrial Area
WEST_002	Westpoint Business Park, Tuam Road
WEST_003	Cornamaddy Business Area (Dept. of Education & Science & Covidien sites)
WEST_004	Blyry Industrial Estate
WEST_005	Athlone Institute of Technology
WEST_006	Athlone Business & Technology Park, Garrycastle
WEST_007	Mullingar Business Park
WEST_008	Lough Sheever Corporate Park
WEST_009	Robinstown Business Park
WEXF_001	Ardcavan Business Park
WEXF_002	Whitemill Industrial estate
WEXF_003	Kerlogue Business Park
WEXF_004	Kerlogue & Stanfield Business Area
WEXF_005	Wexford Business and Technology Park