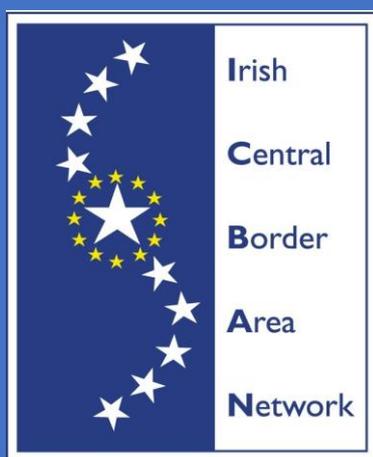


IRELAND'S NATIONAL BROADBAND PLAN: DELIVERING ON THE PROMISE



Prepared by the
Irish Central Border Area Network (ICBAN)
with The Bit Commons

July 2017

*A Guide for
the County
Councils &
Stakeholders
of the Central
Border Region
of Ireland/
Northern
Ireland*

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1.0 EXECUTIVE SUMMARY

- 1.1** The need for internet connectivity improvements has been a priority for the Irish Central Border Area Network (ICBAN) cross-border partnership for some time. On behalf of its member Councils ICBAN has sought to help promote and encourage greater broadband infrastructure investment and delivery, on both sides of the Ireland / Northern Ireland border
- 1.2** Rural broadband is of course a highly emotive issue. In today's advancing world access to reliable telecommunications is becoming an essential part of everyday life. The sparseness of the population together with the additional costs that rural living brings, is competing with other market interests for a timely resolution.
- 1.3** This report examining the Irish National Broadband plan makes 20 recommendations for the five Irish County Council areas within the cross-border partnership. The report focuses mainly on the impact of the National Broadband Plan (NBP) on the five County Councils areas within the Central Border Region (Cavan, Donegal, Leitrim, Monaghan and Sligo) and the status of Mobile Broadband services in the area.
- 1.4** The NBP, despite being written in 2012, is still a promise for the future. This report is therefore written as a guide to support member Councils and other stakeholders in working with government and telecoms providers on broadband infrastructure investments. The promises of the NBP should be embraced, welcomed and supported but the promises also need to be clearly defined and delivered

1.5 Principal Findings

- 1) The ambition of the National Broadband Plan, including the investment levels by partners, must be fully embraced and supported with significant demand aggregation activity.
- 2) The current resourcing suggests delivery in some counties will not be complete until 2025/2026.
- 3) County level targets and milestones should be published.
- 4) Fibre to the Premise in-fill for very rural areas needs to be planned for, with customers needing to make a direct contribution.
- 5) Improvements to Mobile Broadband should be included in a revised National Broadband Plan. This includes revised coverage targets and a revised way of measuring that coverage.
- 6) Upgrades to backhaul to rural masts should be added to the National Broadband Plan.
- 7) Councils should publish planning guidelines (template within) to support a fibre first policy in all new developments, refurbishments and town centre plans.

1.6 Recommendations

A total of 20 Recommendations have been noted within the Report, relating to the two main Sections, and dealing with The National Broadband Plan and Mobile Connectivity respectively. Recommendations have also been raised with regard to a sub-section of the latter concerned with Inadvertent Roaming.

The National Broadband Plan for Ireland

1: Council Broadband Officers obtain confirmation that existing *'efibre'* customers served by a cabinet will be able to upgrade to a direct fibre connection. It would be especially helpful if specific agreement was reached for business customers in any town centre or residing in an adjacent business park.

2: Local Authorities to inform network planners of planning approvals for new builds and refurbishments, with a view to reinforcing the need for direct fibre access. (Annex B includes a UK best practice document on 'Planning Guidelines - The Benefits of Installing High Speed Broadband Infrastructure in New Developments'.)

3: Understand and publish the number of access line upgrades per County, including estimates. Use the enclosed table as a starting position. Report against these numbers on a quarterly basis, including any slippages and reforecasts.

4: As well as publishing the numbers of premises, it is worth publishing an expected investment level by NBP partner. The impact of any changes could then be monitored and published even if this was an indicative number as above. Use Table 1 and 2 as starting points for discussion with NBP Officials.

5. The development and implementation of a demand stimulation plan by each County Council needs to be considered to protect the planned investment. Public sector demand, including public sector employees, should be actively aggregated for this purpose.

6: Given what is being attempted, it is recommended that the five County Councils use this report to obtain clarification of the key deliverables and timescales of the NBP contract when it is awarded. Councils should fully embrace what is a remarkable plan, however, to get the most from the funding being promised it is worth getting a clear view of what will be delivered and when. The enclosed estimates can be used to begin that discussion and to then manage the outcomes and expectations. Publishing the learning and ongoing reporting against what is being delivered would appear essential to establishing an adequate level of transparency.

7: Council Officials, supported by their local Education and Training Boards, should discuss with operators and the appropriate Ministers and government departments, possible resource and training requirements for additional personnel to support the objectives and timescales of the NBP.

8: Agree an investment plan similar to Table 8 with NBP Officials and their chosen partner. Table 8 is an estimate of what is being promised based on the information available.

Review processes permit such plans to be inserted and published as annexes in working agreements.

9: Discuss the need for a variation in connection fees to reflect 'long tails' or long final drops from the splitter. An amount per pole from the final splitter would be beneficial.

10: Integrate as early as possible demand stimulation activity for the most difficult to serve areas. This ought to include some notion of the minimum number of customers needed to justify a fibre extension. The latter could be as little as 2-3km of overhead fibre and splitter which is used to connect as few as 4 premises.

11: Discuss with NBP and ComReg the role of a 'Telephony Sunset Date' as a means to incentivising a deeper fibre rollout. A telephony sunset date is a closure date for a service. Offer NBP partners the opportunity to trial 100% migration from copper cable to fibre access, engaging rural communities in the process.

12: Intra-border backhaul links should be considered as part of the NBP.

Mobile Broadband Connectivity in the Central Border Region

13: County Councils to define 'good' as 98% Mobile coverage, sufficient to support a 2Mbps broadband service indoors and on all A and B roads. Use this definition in communication with ComReg, NBP Officials and industry. Invite comment and welcome improvements.

14: Councils to invite operators to respond to meeting a 98% coverage plan outlining the number of additional masts and the incremental cost of meeting the above coverage target.

15: Use the information gleaned from Recommendation 14 to discuss 1) coverage in areas where fibre may not reach, given the budgets available, and 2) the possibility of planning to use Mobile Broadband resources as a substitute for fixed in defined locations.

16: County Councils to request clarification as to whether backhaul to all County mast sites is included in the NBP work schedule, or is featured in the plans of mobile operators.

17: In the planning application for mast sites, request a copy of the radio plan for the site and a statement of the planned coverage improvement in the context of recommendation 12.

Mobile Services and Inadvertent Roaming in the Central Border Region

18: The issue of reducing inadvertent roaming could be added to the proposed engagement on improving coverage to 98%.

19: Councils from both sides of the border should collaborate on these site specific issues.

20: The specifics on changes to roaming charges could also be reported upon during the engagement with network operators.

A Glossary of Terms used in the Report is included in Annex A.

2.0 INTRODUCTION

2.1 CONNECTIVITY IN THE IRISH CENTRAL BORDER REGION

- 2.1.1 The need for internet connectivity improvements has been a priority for the Irish Central Border Area Network (ICBAN) cross-border partnership for some time. On behalf of its member Councils ICBAN has sought to help promote and encourage greater broadband infrastructure investment and delivery, on both sides of the Ireland / Northern Ireland border. Within ICBAN's EU funded cross-border strategy, the 'Regional Strategic Framework for the Central Border Region' (RSF)¹, the ambition was established for an 'Accessible and Connected Region', whereby all citizens, from both sides of the border, would be able to avail of a high quality internet service.
- 2.1.2 Rural broadband is of course a highly emotive issue. In today's advancing world access to reliable telecommunications is becoming an essential part of everyday life. The sparseness of the population together with the additional costs that rural living brings, is competing with other market interests for a timely resolution. It is ICBAN's belief that solutions must reach all communities in the Region, including not-spot areas. After all rural citizens have the same needs and rights to demand a service comparable to urban dwellers elsewhere on the island.
- 2.1.3 This report draws on specialist technical expertise from The Bit Commons and provides pragmatic practical solutions to the challenge of delivering the National Broadband Plan² (NBP) in individual counties, in this case across five counties of the border region. A profile of the Principal Author, Mr Mike Kiely of The Bit Commons is included as Annex C.
- 2.1.4 This perspective on Ireland's hugely ambitious broadband plan is written following publication of ICBAN's second report, 'Fibre at a Crossroads – Part II', into what have been good, but nevertheless incomplete upgrades of connectivity in Northern Ireland (NI). The 'Fibre at a Crossroads' reports³ provide a perspective on events explaining why so many have been excluded when so much subsidy has been made available and the challenges ahead to improve transparency and accountability in NI.
- 2.1.5 This report is focused on the area known as the Irish Central Border Region (and encompasses the County Councils of Cavan, Donegal, Leitrim, Monaghan and Sligo), and is very different, in that it attempts to comment on plans which to a large part have yet to occur.

¹ <http://www.icban.com/The-RSF/Download-the-Regional-Strategic-Framework>

² <http://www.dccae.gov.ie/en-ie/communications/programmes-and-schemes/Pages/National-Broadband-Plan.aspx>

³ Summary Part I Report is available at <http://www.icban.com/Home/News/Fibre-at-a-Crossroads-Summary>
For further information or copies of both complete reports please contact ICBAN

2.2 PURPOSE OF THIS REPORT

2.2.1 The NBP, despite being written in 2012, is still a promise for the future. This report is therefore written as a guide to support member Councils and other stakeholders in working with government and telecoms providers on broadband infrastructure investments. The promises of the NBP should be embraced, welcomed and supported but the promises also need to be clearly defined and delivered.

2.2.2 This report, in quantifying the promises being made, provides a list of recommendations to help County Councils set targets and deliverables and thus shape the Irish Broadband Plan to the needs of their communities.

In that respect therefore the report examines two aspects of connectivity in the 5 County Council areas:

1. the promises being made to deliver fibre access upgrades
2. the status and role of mobile connectivity and how upgrades to infrastructure supporting mobile connectivity need to be included in the works for the NBP.

2.2.3 The latter is important for the border counties given what is:

- an indifferent service
- exacerbated by the existence of the border itself
- and the practice of tolerating inadvertent roaming created by the current licensing practice.

2.2.4 A good outcome for this report will be if the five County Councils can gain sufficient confidence and insight to document the promises and secure the upgrades being promised. Keeping the promises in place and securing it from the telecoms providers is thus key. Contained within the report are also additional mobile related requests to be made of the NBP, and of ComReg, the Regulator, with respect to licensing and how coverage is measured and reported upon.

2.2.5 It will be the case that government and the contractor appointed for the NBP will have much to ask of County Councils; simplified or no planning; road closure procedures and reduced fees; along with a degree of pressure to be more accommodating than a neighbouring County. The competition to be accommodating can be heightened if human resources are constrained and where the delivery promise is flexed across counties. The latter must be set in the context of the scope and level of ambition and the complexity of upgrading infrastructure, where little maintenance and few upgrades have occurred for some time.

2.2.6 The report has been shaped by some simple testing against the existing commercial plans, where even the simplest reprioritisation request for business customers could not be met (example of Harte Peat based along N54 in Clones, Co. Monaghan). Subsequent conversations with those supplying manpower to broadband infrastructure projects suggests there will be significant resource constraints and thus delays, caused by switching available resources from commercial activity to

meet any contractual obligations for rural upgrades. Resource is a commercial weapon, as is the allocation of resource where it is in short supply.

2.2.7 The report uses Eir's plans as the default focus, simply because these are more visible. The findings of this report can therefore also be applied to SIRO and ENET.

2.2.8 It must be appreciated that any doubts about how the NBP might be delivered need to be expressed carefully. The ambition and the ground work set for the NBP is enormous. It is taking Fibre to the Premise (FTTP) deeper than any other commercial plan in Europe, if not the world. The doubts, while needing to be expressed, are best considered locally in the context of a relationship building and development process. It is important for Councils to monitor broadband delivery in terms of local interests. It is equally as important to understand and help aggregate the take-up levels needed to support a provider's commercial objectives or to assist in securing more resources, in a 'working together' approach. These are not currently in a County Council's terms of reference but it is considered that they should be.

2.3 STRUCTURE OF THE REPORT

2.3.1 There are two key sections to the Report, one focusing on the deliverability of the National Broadband Plan and the second on mobile broadband connectivity in the Central Border Region. Interspersed throughout these sections are a series of 20 Recommendations which provide pragmatic opportunities for County Councils to engage with government departments and telecoms providers in realising and delivering on the NBP.

3.0 THE NATIONAL BROADBAND PLAN IMPACT ON THE BORDER REGION

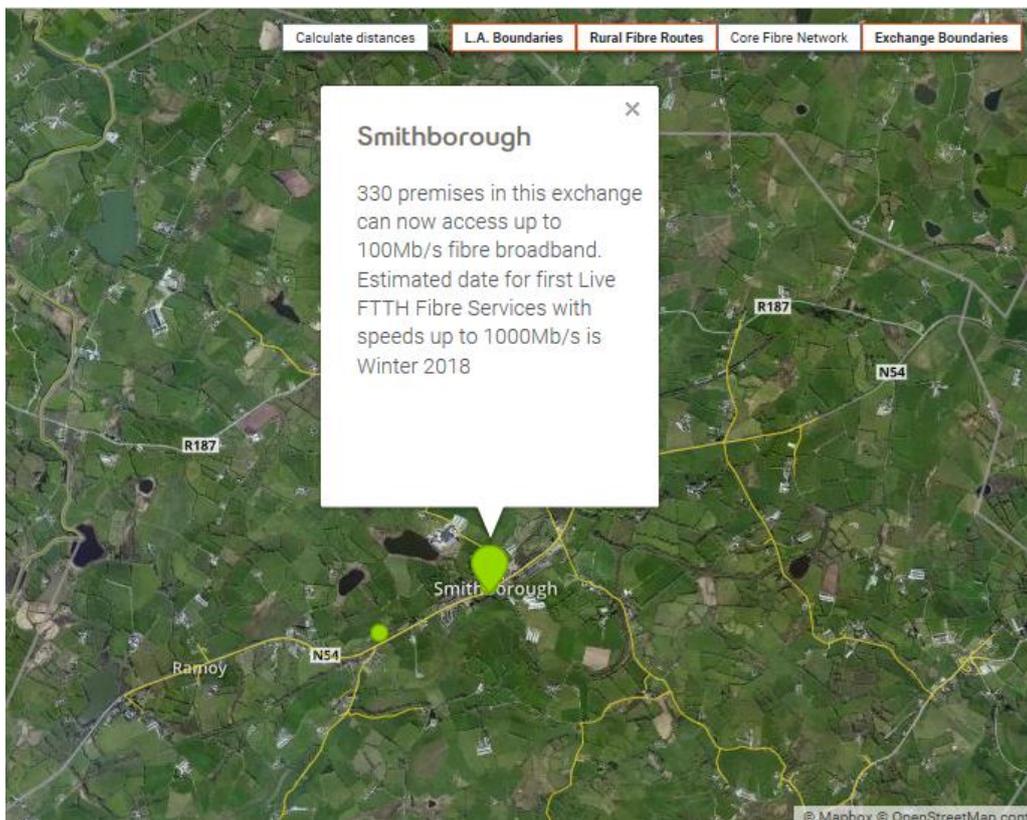
3.1 KEY ELEMENTS OF THE NATIONAL BROADBAND PLAN

- 3.1.1 This is a Government wide initiative to deliver high speed broadband services to all businesses and households in Ireland. The NBP defines high speed broadband as a minimum speed of 30Mbps download and 6Mbps upload. There is likely to be a heavy emphasis on direct fibre connections or FTTP in the Plan.
- 3.1.2 The Government is offering some €175m and the expecting matched funding is for a further c.€175m for the intervention area.
- 3.1.3 The intervention area for the Governmental initiative is now some 500,000 premises, with the Government having accepted Eir's plans to deliver an additional 300,000 premises. This brings Eir's total to 1.8m-1.9m premises across the state.
- 3.1.4 Potentially the final 500,000 premises, supported by a fund of €350m, will equate to an investment of €700 per premise.
- 3.1.5 The programme is to be completed by 2022.
- 3.1.6 Two promises need to be tied down:
- 1.) Eir's promise to deliver 1.8m-1.9m premises and the associated investment
 - 2.) The government's contracting of one of three shortlisted operators, Eir, SIRO, or ENET to deliver the final 500k premises across the state under the NBP.
- 3.1.7 The efficacy of the commercial promise by Eir needs to be examined, as it now also defines the remaining intervention area.
- 3.1.8 The practical impact of the National Broadband Plan targets needs to be examined when applied to the Border Counties. This will be considered in the next section.

3.2 THE NATIONAL BROADBAND PLAN WHEN APPLIED TO THE CENTRAL BORDER REGION

- 3.2.1 The Irish National Broadband strategy states the following aims:
- 50% of the population have access to 70Mbps-100Mbps services by 2015
 - 40Mbps or more is accessible by a further 20% of the population and potentially as much as 35% around smaller towns and villages. This is targeted for 2018.
 - 30Mbps available to everyone by 2020.
- The first two objectives are to be delivered commercially, the final to be delivered by the NBP.
- 3.2.2 This gives rise to the question: do the current commercial plans mean 50% of the population in border towns have access to 70Mbps-100Mbps services now?

- 3.2.3 First of all, it is important to state that customers should have the chance to order what they need at an affordable price, so the right to order a service by those who want it or need it is thus the objective, as opposed to some artificially imposed target. So the strategy needs to be judged against that standard.
- 3.2.4 When the Broadband strategy and targets were written in 2012 it was assumed that 70-100Mbps would be direct fibre connections and that 30Mbps-70Mbps would be met with VDSL or wireless solutions with a degree of satellite. So the 70-100Mbps would likely be urban in nature and cover Cable TV and Fibre to the Premise (FTTP) services.
- 3.2.5 Technology has since moved on and VDSL performance has been boosted by vectoring⁴, which permits the FTTC solution to support up to 100Mbps where conditions permit. As an example, for Smithborough, Co. Monaghan, Eir share the following map of services.



The yellow dots represent the cabinet and the yellow lines represent the fibre extension work as a part of the incremental 300k commercial premises planned by Eir. The two cabinets shown support 330 premises.

- 3.2.6 This commercial investment needs to be applauded - as such deployments in NI are significantly subsidised, while fibre extensions are being largely withheld at the same time.

⁴ Vectoring is a noise cancellation process in using higher frequencies to improve signalling. It helps sustain higher bandwidth.

3.2.7 In the context of the Plan and the economic development of the area it is important to determine whether those attached to a cabinet can also order a direct fibre connection.

Recommendation 1: Council Broadband Officers obtain confirmation that existing 'efibre' customers served by a cabinet will be able to upgrade to a direct fibre connection. It would be especially helpful if specific agreement was reached for business customers in any town centre or residing in an adjacent business park.

3.2.8 It would be difficult to declare the National Broadband Plan a full success unless customers who are too far from a cabinet in the early footprint can order a direct fibre service. This is not specific to the NBP but would be if the 2012 plan is refreshed.

3.2.9 If a comparison is made for all the Counties of this Region then the following emerges in Table 1 on the delivery against the first objective of the NBP - 50% of the population have access to 70Mbps-100Mbps services by 2015.

Table 1: Up to 100Mbps

	Total Premises	Commercial Premises	% Up to 100Mbps
Cavan	42,143	17,664	42%
Donegal	101,184	34,105	34%
Leitrim	22,263	7,949	36%
Monaghan	32,845	12,505	38%
Sligo	39,978	19,625	49%

3.2.10 Table 1 illustrates that the first objective of the NBP is not meeting the target of 50%. It will be substantially less than the numbers quoted but it is significant for rural towns. It is important to acknowledge the progress but at the same time work towards securing the right to order direct fibre connections based on a reasonable request. This ought to be less of an issue in Ireland where Eir and SIRO are so focused on direct connections, but the matter is not tied down in any legal or regulatory process. Securing the right to order a direct fibre service ought to be included in a revised NBP therefore.

3.2.11 Table 2 examines the second objective of the NBP - to extend access for 40Mbps coverage to a further 20% of the population by 2018 (i.e. accumulated 70% target when taken with 50% target in Table 1 above). The number in Table 2 combines the commercial footprint delivery from Table 1 above with the planned additions for 40Mbps.

Table 2: Eir Total 'Fibre Rollout' (FTTC and FTTP) against National Target of a combined 70%

	Total Premises	Eir 2018 Target	Premises = to or > than 40Mbps
Cavan	42,143	24,993	59%
Donegal	101,184	58,402	58%
Leitrim	22,263	10,945	49%
Monaghan	32,845	17,053	52%
Sligo	39,978	25,592	64%

3.2.12 It can be seen that none are at 70% target yet but it is nevertheless impressive as all the additions will have direct fibre connections, by virtue of Eir's commitment to FTTP.

3.2.13 It is worth noting that those served by existing cabinets will have access to a lesser service, in comparison to those who will benefit from the next tranche of work and who secure what will be a future-proofed service.

3.3 EIR'S 300,000 PREMISE PROMISE AND THE COMMITMENT AGREEMENT

3.3.1 Eir's promise to build an all-fibre access network to some 1.8m-1.9m premises is an unprecedented commitment by an EU telecoms provider. The Commitment Agreement to include an extra 300,000 premises to the original plan is attached as Annex D. It covers the additional 300,000 premises as shown in the blue lines, demonstrating where Eir intend to build. Figure 1 is an example for Co. Monaghan from Open Eir's online map.

Figure 1: Eir Extended Plan for Monaghan



3.3.2 The Agreement between Eir and the Department addresses the following concern under paragraph 5:

“The Minister believes that if Eir’s plans are not implemented fully and in a timely manner this carries a risk that the Minister’s NBP policy objectives will not be achieved”.

The Agreement is important as it defines terms like ‘passed’, ‘connected’ ‘non-standard connections’, ‘failure to connect’ and the roll out schedules. There is a project plan with milestone dates. There are also references to Internet Service Provider (ISP) forecasts shaping some of the rollout.

3.3.3 It can act as a template for not just how the additional 300,000 premises will be managed but the definitions are then likely to be extended to the 500,000 premises set in the NBP. Note, as Eir removed 300,000 from the intervention area an additional 84,000 were added back, as other commercial plans had not materialised to support this claim.

3.3.4 Under 5.1.1 of the Agreement there is a note that Eir is committing a minimum amount per County, *“the total minimum allocated capital investment in euro (€) that Eir commits to invest for each county of Ireland within the Eir Deployment Area from the Effective Date to 31 December 2018”.* This is not published but there are

premise counts available on separately published national broadband plan material⁵. The total figures for the 5 Council areas are used in Table 2 above. Eir investment can be estimated per County and this can be used to progress discussions and transparency.

3.3.5 The breakdown by County area in Table 2 is derived proportionally from Table 3 below, which is from the Agreement and the questions contained therein.

Table 3: Roll-out Agreement

	Submission date by which Eir shall submit the supplement	Quarter covered by Eir submission	Required Number of Upcoming Premises for that Quarter
1	1 May 2017	1 Oct 2017- 31 Dec 2017	31,000
2	1 August 2017	1 Jan 2018 - 31 Mar 2018 1 Apr 2018 - 30 Jun 2018 1 Jul 2018 - 30 Sep 2018 1 Oct 2018 - 31 Dec 2018	38,000
3	1 November 2017	1 Apr 2018 - 30 Jun 2018	44,000
4	1 February 2018	1 Jul 2018 - 30 Sep 2018	44,000
5	1 May 2018	1 Oct 2018 -31 Dec 2018	42,575

3.3.6 These five quarters add to 199,575 rather than the 300,000 that is agreed. A further 100,000 premises are later shown in the Agreement. This extra 100,000 is accounted for in work which began in October 2016.

3.3.7 In practical terms there are many loop holes to a full completion but the intent is clear. For rural areas while there is a total commitment to meet the overall plan number, this reduces to 75% for the actual Eircodes or the associated premises referenced. The interaction between the specific Eircode and the Backstop⁶ plan then needs to be understood. There is an additional cost for premises needing non-standard connection charges, that are more than 50m from a distribution node. For example, as mentioned in Section 2.2.6, Harte Peat in Clones was 250m from a distribution node and would be levied additional costs.

3.3.8 The remedy for failure to deliver is the readmission of premises back into the intervention area. This is not perfect but it shows the complexity in getting the job done in rural areas.

⁵ County statistics <http://www.dccae.gov.ie/documents/County%20Statistics.pdf>

⁶ Backstop describes the base case or minimum case.

3.3.9 Unfortunately information on Eircodes by County is not published. The fact it exists and is available to be used in some form is significant as it permits counties to have a good understanding of what is being planned by quarter.

3.3.10 There is a special provision for new build areas which are in addition to the NBP. The process by which this gets updated is important for Local Authorities to understand. It would serve local authorities well to agree a process where all planning approvals are notified to telecoms providers for fibre planning purposes.

Recommendation 2: Local Authorities to inform network operators of planning approvals for new builds and refurbishments, with a view to reinforcing the need for direct fibre access. Annex B includes a UK best practice document on 'Planning Guidelines - The Benefits of Installing High Speed Broadband Infrastructure In New Developments'.)

3.3.11 NBP Officials have published a very useful premise plan on a County by County basis, detailing quantities for commercially funded, the additional Eir plan and that which is to come from the NBP. For the 5 County Council areas the totals are per the published Plan. (Quarterly numbers / Milestone Dates per County have been added by the author to provide a helpful measurement for monitoring progress.)

Table 4: Eir's Additional Contractual Commitment for 300K Premises (indicative)

Milestone Date	Required No of passed premises ⁷	Cavan ⁸ Premises	Donegal Premises	Leitrim Premises	Monaghan Premises	Sligo Premises
31-Dec-16	10,000	244	808	100	151	199
31-Mar-17	30,000	731	2425	299	454	596
30-Jun-17	30,000	731	2425	299	454	596
30-Sep-17	31,000	756	2506	309	469	615
31-Dec-17	31,000	756	2506	309	469	615
31-Mar-18	38,000	927	3072	379	575	754
30-Jun-18	44,000	1073	3557	439	666	873
30-Sep-18	44,000	1073	3557	439	666	873
31-Dec-18	42,575	1038	3442	424	644	845
Total	300,575	7,329	24,298	2,997	4,548	5,966
Proportion of Eir 300k		2.44%	8.08%	1.00%	1.51%	1.99%
Proportion of County		17.39%	24.01%	13.46%	13.85%	14.93%
Indicative Qtr delivery⁹		814	2700	333	505	663

3.3.12 The benefits of this Agreement in terms of FTTP availability, should be visible to each County now.

⁷ As per Eir Commitment Agreement. See Annex D

⁸ Pro-rata per County as inferred from Commitment Agreement.

⁹ Indication of capacity to deliver quarterly.

3.3.13 A number of premises per County / per Quarter has been estimated by the author. This is for discussion and represents a quarterly delivery capability proportional to the published Agreement. It ought to represent a good test as to whether the resources are on the ground to meet the current Agreement. It can act as a test as to how well prepared telecoms providers are for the NBP project, which will either follow this project or work in parallel.

Recommendation 3: Understand and publish the number of access line upgrades for each County, including estimates. Use the above table as a starting position. Report against these numbers on a quarterly basis, including any slippages and reforecasts.

3.3.14 By way of illustration it is worth showing the basics. The Eir wholesale pricelist¹⁰ is 74 pages long. There is a great deal of variation but the underlying incremental yield relating to access is simple enough to show. Wholesale monthly rates need to be reasonable and for the purposes we can ignore the multitude of variations and seek a common monthly yield for an FTTP connection. This uses a monthly yield of €25 and we assume the wholesale connection covers those elements.

3.3.15 From international references we can assume Eir is willing to invest €300 per customer passed or €500 per connected customer. 'Premise passed' is defined up to a splitter on a distribution pole. 'Connected customer' adds the final drop wire at a further £200 a connection. It is worth examining the impact of take-up levels at 20% and 40% to see the importance of take-up.

Table 5: Illustration of 20% Take-up¹¹ for NBP Bidder

20% take up	Cavan	Donegal	Leitrim	Monaghan	Sligo
Premises passed	7,329	24,298	2,997	4,548	5,966
Capex incl. conn.	€2,491,860	€8,260,980	€1,018,640	€1,546,320	€2,028,780
Customers	1,466	4,859	599	910	1,193
Rental income (A)	€439,740	€1,457,820	€179,760	€272,880	€358,020
Capex return p.a. (B)	€409,377	€1,357,161	€167,348	€254,038	€333,300
Operational Costs p.a. (C)	€73,290	€242,970	€29,960	€45,480	€59,670
Contribution to other costs (A-(B+C))	-€42,927	-€142,311	-€17,548	-€26,638	-€34,950

3.3.16 At 20% take-up, Eir is unlikely to be making a contribution to other costs. While the likely slowness and patchiness of the rollout will vex customers, the economics of the case are hugely dependent on take-up.

¹⁰ Wholesale prices are available to ISPs, who then add components like a router, and content to be sold as a package to end users.

¹¹ Assumed 7 year payback and a 15% cost of capital.

Table 6: Illustration of 40% Take-up for NBP Bidder

40% take up	Cavan	Donegal	Leitrim	Monaghan	Sligo
Premises passed	7,329	24,298	2,997	4,548	5,966
Capex incl. conn.	€2,785,020	€9,232,860	€1,138,480	€1,728,240	€2,267,460
Customers	2,932	9,719	1,198	1,819	2,387
Rental income (A)	€879,480	€2,915,640	€359,520	€545,760	€716,040
Capex return p.a. (B)	€457,539	€1,516,827	€187,036	€283,925	€372,511
Operational Costs p.a. (C)	€73,290	€242,970	€29,960	€45,480	€59,670
Contribution to other costs (A-(B+C))	€348,651	€1,155,843	€142,524	€216,355	€283,859

3.3.17 At 40% the contribution is building and further build can be self-funding.

3.3.18 While there will be much emphasis on the planning, the real driver is demand. Anything a local authority can do to help secure demand will pay dividends, for example, incentives for employees and their families. Early adoption by the Council itself and other public bodies will have a profound impact on the business case to build more. However, any promotional efforts need to be aligned with an operator's ability to deliver. The poorer the existing service, the higher the demand will be. It will not be uncommon for take-up to be more than 50% in areas with existing poor service.

Recommendation 4: As well as publishing the numbers of premises, it is worth publishing an expected investment level by NBP partner. The impact of any changes could then be monitored and published even if this was an indicative number as above. Use Table 1 and 2 as starting points for discussion with NBP Officials.

Recommendation 5: The development and implementation of a demand stimulation plan by each County Council needs to be considered to protect the planned investment. Public sector demand, including public sector employees, should be actively aggregated for this purpose.

3.4 ESTABLISHING A TIMELINE FOR THE FINAL 500K PREMISES UNDER NBP

3.4.1 If no additional changes were to be made and the same delivery capability profile (solutions and resource) was sustained then the following timeline can be developed for completion of the rural programme. This has been kept purposefully simplistic to help inform discussion. It is also independent of Eir, as the contracting resource constraints are likely to be common for all.

Table 7: Applying Eir Quarterly Delivery Profile to NBP volumes

Premises by County	Cavan	Donegal	Leitrim	Monaghan	Sligo
NBP intervention area	17,150	34,105	11,318	15,792	14,386
Quarters to deliver	21	13	34	31	22
Est Completion date	q1 2023	q1.2021	q2.2026	q3 -2025	q2-2023

3.4.2 Using the same delivery profile for each County an estimate can be made of how long it would take to complete the NBP. Without increases in delivery resources, the NBP cannot be effectively delivered by 2022. Therefore, at the very minimum the matter needs discussion, so that a common set of expectations can be agreed against a 2020 or 2022 deadline.

3.4.3 Any divergence in terms of delivery timescale from the current contractual Agreement is likely to expand exponentially into the NBP areas which are more difficult to serve. The latter can be dealt with by lowering expectations and changing the mix of technical solutions, from fibre, to fixed wireless, to mobile, to satellite. It can also be addressed by adding resource to the plan. Resource is the issue here rather than budget, provided the demand aggregation is driven. Attaching fibre cables to poles and inserting fibre cables into existing duct is a manpower intensive activity, where manpower accounts for at least 80% of the cost.

Recommendation 6: Given what is being attempted, it is recommended the five County Councils use this report to obtain clarification of the key deliverables and timescales of the NBP contract when it is awarded. Councils should fully embrace what is a remarkable plan, however, to get the most from the funding being promised it is worth getting a clear view of what will be delivered and when. The estimates in Table 7 can be used to begin that discussion and to then manage the outcomes and expectations. Publishing the learning and ongoing reporting against what is being delivered would appear essential to establishing an adequate level of transparency.

Recommendation 7: Council Officials, supported by their local Education and Training Boards, should discuss with operators and the appropriate Ministers and government departments, possible resource and training requirements for additional personnel to support the objectives and timescales of the NBP.

3.5 HOW MUCH FTTP CAN BE DELIVERED IN THE NBP AREAS?

3.5.1 The NBP plan does not explicitly state FTTP but uses the EU target of 30Mbps, therefore gaining commitments for FTTP will be problematic. The 30Mbps can be blagged with offers using satellite, fixed wireless and even mobile broadband using customer premise equipment to boost the signals available. The following proportionate funding profile ought to be available to each County for the fixed part of the programme and has been worked up by the authors as a helpful guide. The

'amber premises' refers to the intervention area defined by the Irish Government and based on its 'intervention map'.

Table 8: Illustration of NBP Budget and Matched Funding for 'Amber Premises'

National Broadband Plan for the five Border Counties – Budgets					
	Cavan	Donegal	Leitrim	Monaghan	Sligo
NBP intervention area (amber premises)	17,150	34,105	11,318	15,792	14,386
NBP proportional budget ¹²	€5,539,450	€11,015,915	€3,655,714	€5,100,816	€4,646,678
est. NBP partner matched funding ¹³	€8,575,000	€17,052,500	€5,659,000	€7,896,000	€7,193,000
Total Budget	€14,114,450	€28,068,415	€9,314,714	€12,996,816	€11,839,678
Potential Budget per premise	€823	€823	€823	€823	€823

3.5.2 A budget of €823 per premise passed is significant, but it is unlikely to be sufficient to support 100% FTTP. This is also dependent on the government being able to agree and hold the contracted provider to invest at a high level. While much can be done with €823 per premise passed, there will be much pressure to make do with in-fill solutions. The following recommendations are therefore to be considered by the County Councils.

Recommendation 8: Agree an investment plan similar to Table 8 with NBP Officials and their chosen partner. Table 8 is an estimate of what is being promised based on the information available. Review processes permit such plans to be inserted and published as annexes in working agreements.

Recommendation 9: Discuss the need for a variation in connection fees to reflect 'long tails' or long final drops from the splitter. An amount per pole from the final splitter would be beneficial.

Recommendation 10: Integrate as early as possible demand stimulation activity for the most difficult to serve areas. This ought to include some notion of the minimum number of customers needed to justify a fibre extension. The latter could be as little as 2-3km of overhead fibre and splitter which is used to connect as few as 4 premises.

Recommendation 11: Discuss with NBP Officials and ComReg the role of a 'Telephony Sunset Date' as a means to incentivising a deeper fibre rollout. A telephony sunset date is a closure date for a service. Offer NBP partners the opportunity to trial 100% migration from copper cable to fibre access, engaging rural communities in the process.

3.5.3 This analysis suggests the €175m is divided proportionally, where there may be the case that the border region should get more because of rural characteristics and challenges.

¹² NBP budget is a proportion of the €175m NBP pot available.

¹³ It is assumed NBP can negotiate a €500 commercial investment per premise as per commercial build assumption.

3.5.4 There is nothing in the NBP which creates more links between the handover points (aggregation points) north of the border with those south of the border. This should be discussed on the basis of both establishing resilience and more efficient routing, including the routing of mobile traffic. Some of the service issues suffered by mobile users are caused by the distance to a service providers' home register site where a customer's account details are stored. The addition of more routing options permits improvements to the service. The location of handover points are not published, but links between Monaghan and Armagh, Letterkenny to Derry-Londonderry, Strabane to Lifford, Carrick-on-Shannon to Enniskillen, as examples, could be considered.

Recommendation 12: Intra-border backhaul links should be considered as part of the NBP.

3.5.5 Consideration of these intra backhaul links can also be used for Mobile Broadband.

4.0 MOBILE BROADBAND CONNECTIVITY IN THE CENTRAL BORDER REGION

4.1 MOBILE CONNECTIVITY – A PERSPECTIVE

- 4.1.1 The status of mobile connectivity in Ireland like many EU countries is in a state of great flux. Those in charge of regulation have written rules largely understood by themselves and a few in industry. This defines the service as a mobile cellular service focused on handling calls between cells and doing all the clever things necessary to facilitate that function. In addition, the radio spectrum is to be licenced to those willing to pay the most for the privilege and then effectively rationing the use of the spectrum. In the meantime, the internet and the smartphone have been invented and both create enormous challenges in terms of scale and expectations of the user experience. In this new world the radio spectrum is a bountiful gift of nature which should be utilised and not rationed.
- 4.1.2 The current version of the National Broadband Plan and indeed the work of ComReg and the Taskforce for Mobile do nothing to address or reconcile the fundamental gap in expected outcomes.
- 4.1.3 In a world where mobile and fixed networks are converging around a common set of internet technologies, including the communication protocols to carry data, it is unusual that the National Broadband Plan does not reference mobile broadband and the growing trend towards convergence of service. Laptops and smartphones all have multiple radios including wifi and blue tooth, which they use to 'grab' or 'catch' any connectivity they can. At least 13% of households do not have a fixed line, as mobile connectivity is sufficient for some to make do without a fixed line.
- 4.1.4 There is now a gulf between the regulations used to licence operators and the growing expectations and reliance by users that their smartphones are connected and will work reliably.
- 4.1.5 The regulations under which licences are granted are written around how engineers and radio planners would have perceived a mobile service to work in the late 1980's. Although a relatively short time ago, this predated the widespread adoption of the internet and the invention of handheld computing devices such as the smartphone. This gap has remained because licensing spectrum is a lucrative way of raising tax, and it is difficult to challenge such revenue streams for Government.

4.2 ROLL-OUT AND COVERAGE REQUIREMENTS

- 4.2.1 The ComReg assessment of coverage¹⁴ is written in self-congratulatory terms. The basic coverage requirement¹⁵ is outlined in the report per operator and is stated as follows:

¹⁴ Assessment of Mobile Network Operators' Compliance with Licence Obligations (Coverage) Winter 2016

¹⁵ <http://www.irishstatutebook.ie/eli/2012/si/251/made/en/print>

“The Licensee shall ensure the attainment of, and maintain, a coverage level of at least 70% of the population within 3 years of the Licence Commencement Date as set out in the Licence”.

4.2.2 This references a 70% minimum coverage which is very low, when contrasted with more typical coverage obligations of 95-98%. The process of measurement is by measuring field strength, where coverage is measured as the availability of the required field strength in 95% of the area covered by a mast, 95% of the time. A 70% coverage obligation with 95% coverage in each cell, 95% of the time, when converted into an engineered design mean your services is engineered to work statistically 63% of the time.

4.2.3 This leads to this summary report completed by ComReg (Table 9) where all obligations can be described as met.

Table 9: From ComReg Coverage Report (as per Footnote 14)

	GSM1800	UMTS2100	LUL/LTE(800/1800)	LUL/GSM(900/1800)	LUL/3G(900)
Meteor	N/A	>90%	>70%	>90%	>70%
3IHL No. 1	N/A	>90%	>70%	N/A	>70%
3IHL No. 2	>70%	>90%	>70%	>90%	>53%
Vodafone	>53%	>90%	>70%	>90%	>90%

4.2.4 The report assumes some basic understanding of the different mobile standards, GSM, UMTS, LTE and the frequencies supporting those services (900Mhz, 1800 Mhz, 2100Mhz). Unfortunately greater than 90% coverage or greater than 70% in 95% of the areas measured 95% of the time can create a poor service; where good enough is defined as where your device works 63% of the time. This might have been acceptable when mobile telephony was first introduced but now there are actually more active mobile devices than there are people. These measures are not tied to an expected user experience.

4.2.5 The columns refer to frequency type - LTE (800/1800) refers to Long Term Evolution (or 4G) at frequencies using 900Mhz and 1800 Mhz. Mhz or Megahertz is the number of wavelengths. The lower the wavelength e.g. 900Mhz the further it will travel (radiate) and the more likely it is to penetrate a wall as opposed to having the energy reflected or absorbed. A service using 900Mhz spectrum is more widely used in rural areas, with fewer cells. 1800 and 2x00 Mhz is used to add incremental capacity in a smaller cell.

4.2.6 The associated measurement of download speeds were only taken at 55 locations, so the sample for a national measurement suggests the coverage obligations have not been written to support a national data transport infrastructure but a mobile service pre-dominantly engineered to support what was a mobile voice service.

- 4.2.7 These key numbers do not reflect the growing expectations of users which is that their devices work, not 63% of the time but all the time, and with sufficient resources available to function well.
- 4.2.8 By contrast the report by the Taskforce for Mobile Voice and Broadband¹⁶ commissioned by the Government produced a list of some 40 recommendations to improve mobile voice and broadband coverage. There was a significant focus on: strategic planning (6 recommendations); planning and licensing (7 recommendations); access to Infrastructure (14 recommendations); consumer Issues (9 recommendations, including reference to a coverage map on recommendation 29); network improvement (4 recommendations including recommendation 37 on the use of repeaters). Repeaters are typically an aerial installed in a premise and used to make more of the signal available.
- 4.2.9 The latter suggests the shortcomings of the existing service are recognised, but the report fails to reconcile the shortcomings of the service with the underlying licence conditions. Indeed the action plans ignore the licenses and regulation and in so doing miss the opportunity to define the role of Mobile Broadband Networks in the National Broadband Plan.
- 4.2.10 The role of Mobile Broadband is not defined adequately and this is a significant gap in the NBP. It does not question the licensing arrangements supporting a service definition which predates the internet and the smartphone.
- 4.2.11 In the context of a guide for Local Councillors and Broadband Officers, how therefore is this to be interpreted and acted upon?
- 4.2.12 The Taskforce document does not address the minimum coverage obligation (70%) and how it is measured (95% of a space, 95% of the time). The various challenges being focused upon are that the planning issues are the fault of the local authorities, the consumer issues are down to the consumer buying the wrong handset and network improvement issues are the responsibility of the operator. But apart from more coverage, how do we define an adequate customer experience? The following focuses on what can be done in local areas and what could be fixed as part of locally defined plans.

4.3 IMPACT OF MOBILE ON LOCAL COUNCILS

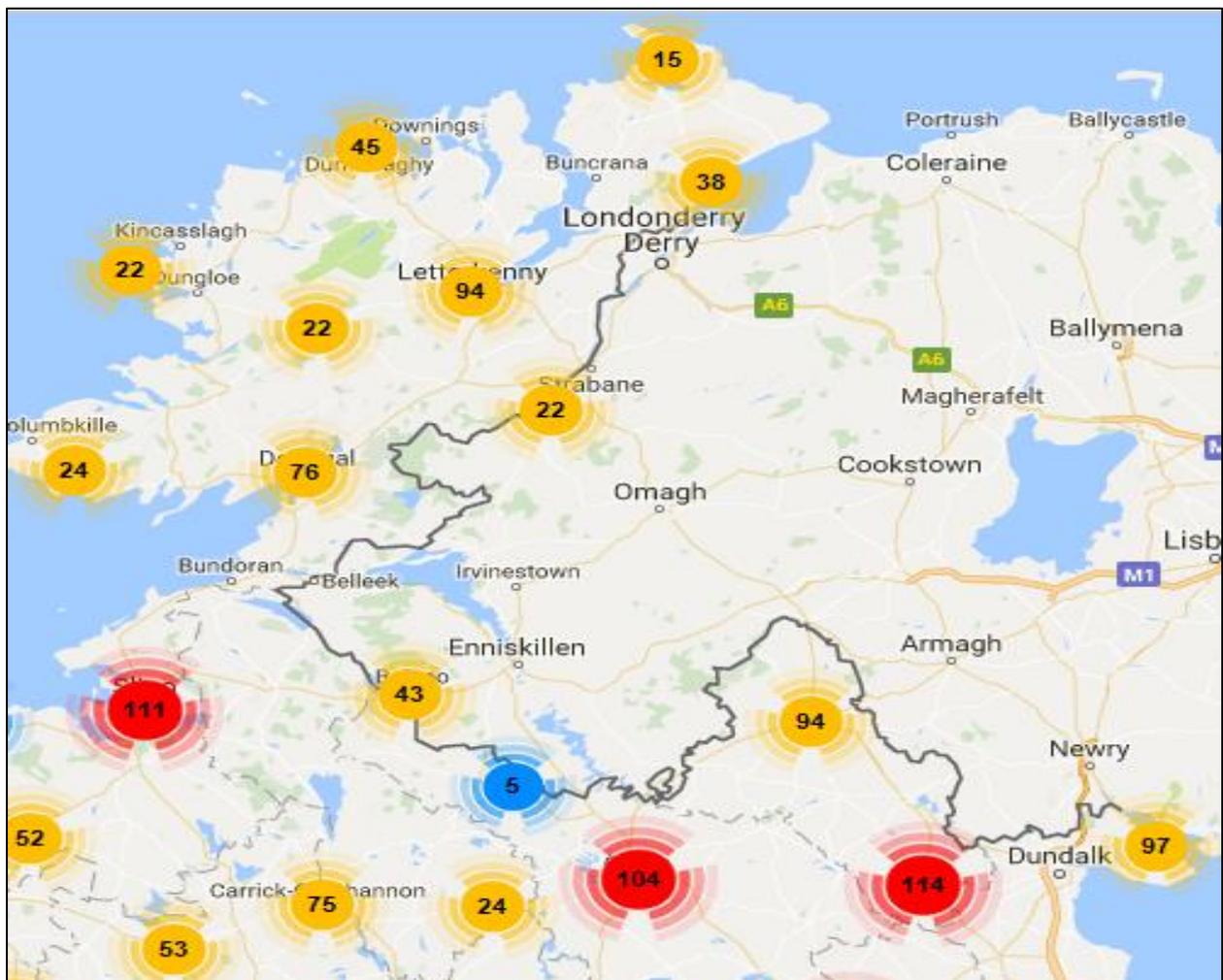
- 4.3.1 Local Councils still need some reference points for what 'good' looks like, how to work towards that better outcome, and how to measure any progress.
- 4.3.2 Before referencing any measures, the basics should be understood. How many mobile masts are in a County? Have they got adequate backhaul? Can plans be made to get fibre access to those masts? Where is coverage weak? Are more masts needed? Or is improved radio planning with better backhaul provision needed? Who pays when the operators have paid some c.€800m for licences with lightly defined

¹⁶ <http://www.dccae.gov.ie/documents/Taskforce%20Report.pdf>

coverage obligations? What is the role of improved mobile broadband in the NBP delivery plan for each County? Given the budget constraints, are plans needed for mobile broadband assets in some areas? Should this be considered within the NBP contract or elsewhere?

- 4.3.3 The good news is that there are many assets already in place.
- 4.3.4 ComReg has produced a very good site viewer¹⁷ showing mast sites and installation locations. Councils can locate, count and list key assets in their areas.
- 4.3.5 It should be noted that the numbers underneath the wireless icons do not represent individual sites but are the number of installations supporting equipment from several providers which may share a site. It is possible to have multiple array installations at a single site.

Figure 2: Top Level View of Site and Installation Locations¹⁸



¹⁷ <http://siteviewer.ComReg.ie/#site/DL027/55.2865035122/-7.1655483571/1/Site%20DL027>

4.3.6 Using as an example Malin Head, Co. Donegal, there is a significant amount of detail including information on the operator, the person managing the site and the Equivalent Isotropically Radiated Power (EIRP) range permitted.

Figure 3: Malin Head Installations, not Sites

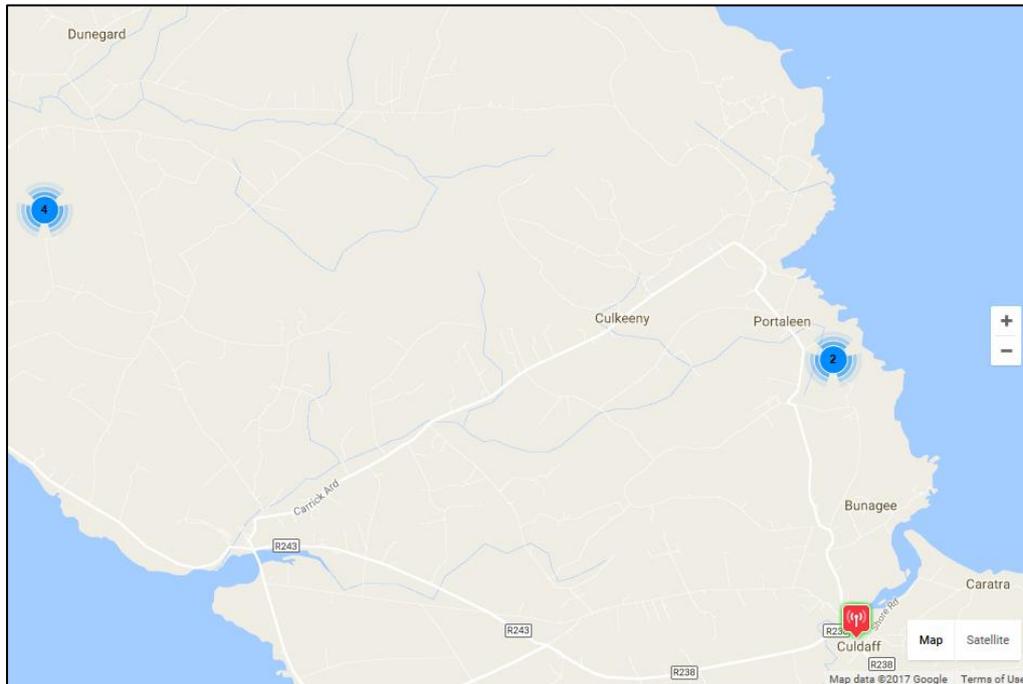
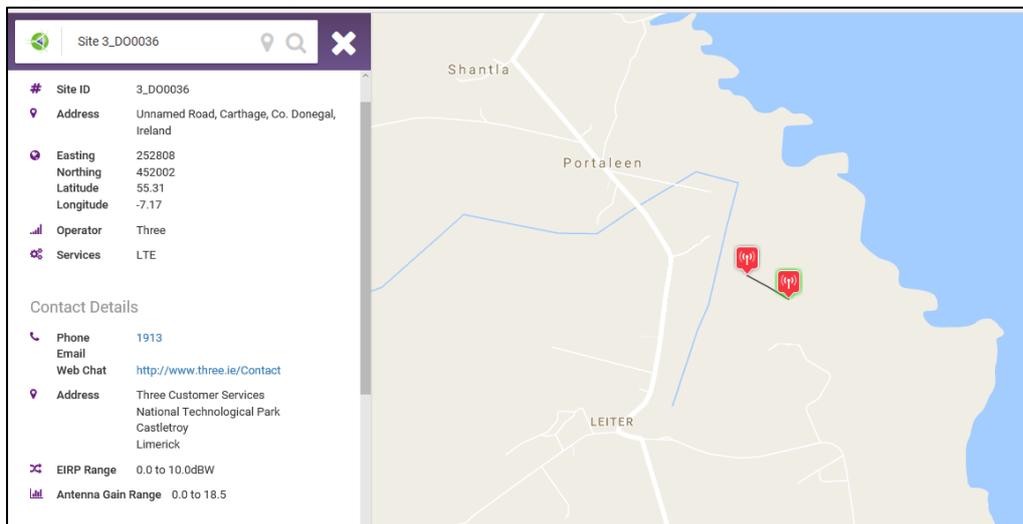


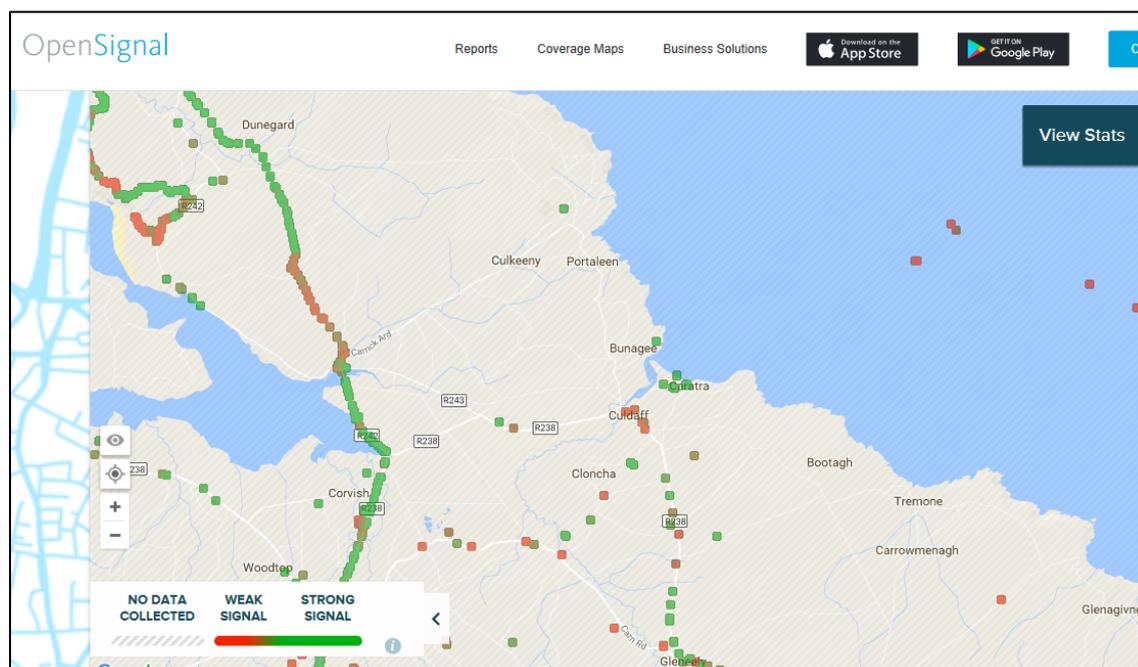
Figure 4: Malin Head (Portlawn), 1 mast – 2 antenna arrays for three



4.3.7 This does not detail the coverage available.

The best available on this specific matter is openly sourced data and available from Opensignal.com. This is reliant on people collecting data using the Opensignal application at their own cost.

Figure 5: Opensignal Coverage for Same Area



4.3.8 It should be noted that those trying to fish off-shore are struggling to make phone calls using their 4G devices. 2G is more likely to work, while in the 3G spectrum auctions the focus for regulators has been on auction yield for the spectrum available (e.g. c.£800m in fees paid by operators), rather than writing a more demanding coverage specification for some of the spectrum available.

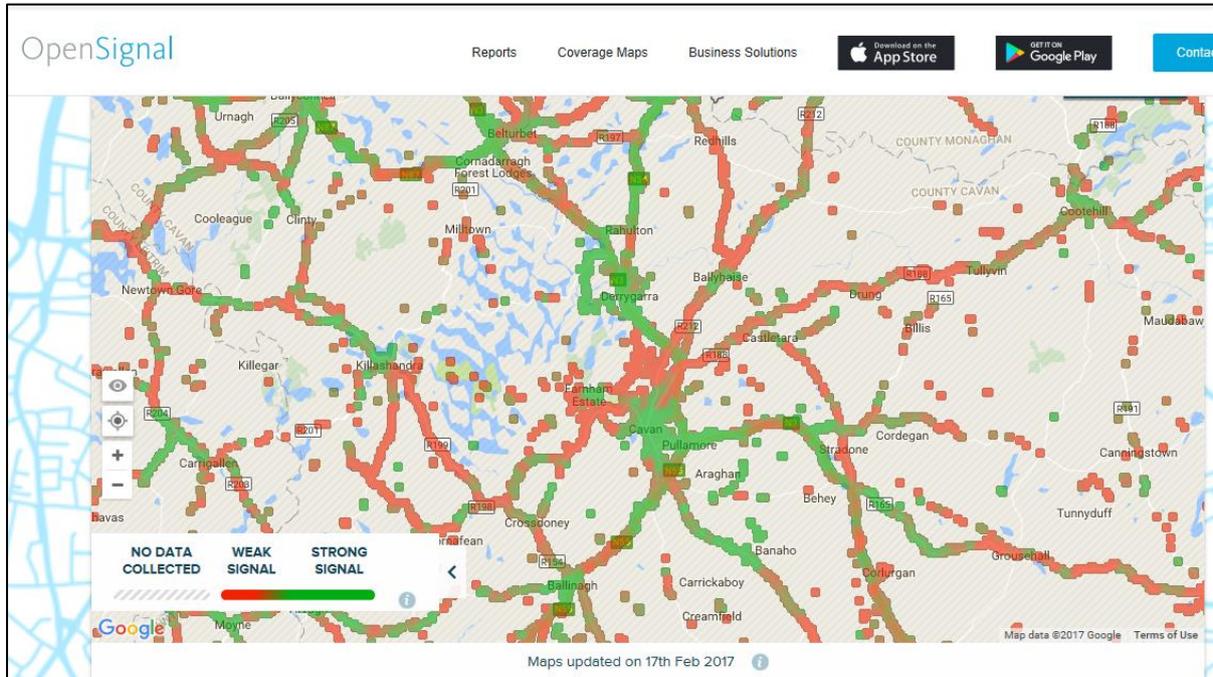
4.3.9 When studying the licence agreements a mast count by frequency, operator and County can be conducted. The locational mapping of eastings and westings are available for each site permitting them to be identified on Google maps for instance.

Table 10: Mast Site Count by County, Operator and Frequency

Siteviewer	Cavan	Donegal	Leitrim	Monaghan	Sligo	Total Irl sites	Source
Mast sites per MLU							
Meteor 900Mhz	20	32	6	23	28	1328	MLU1005
Meteor 1800Mhz	0	0	0	0	0	290	MLU1005
Three 900Mhz	26	59	17	17	24	1229	MLU1006
Three1800Mhz	26	59	17	17	24	1229	MLU1006
Vodafone 800MHz	0	0	0	0	0		MLU1007
Vodafone 900Mhz	49	62	23	38	31	1751	MLU1007
Vodafone 1800Mhz	5	17	0	8	5	862	MLU1007

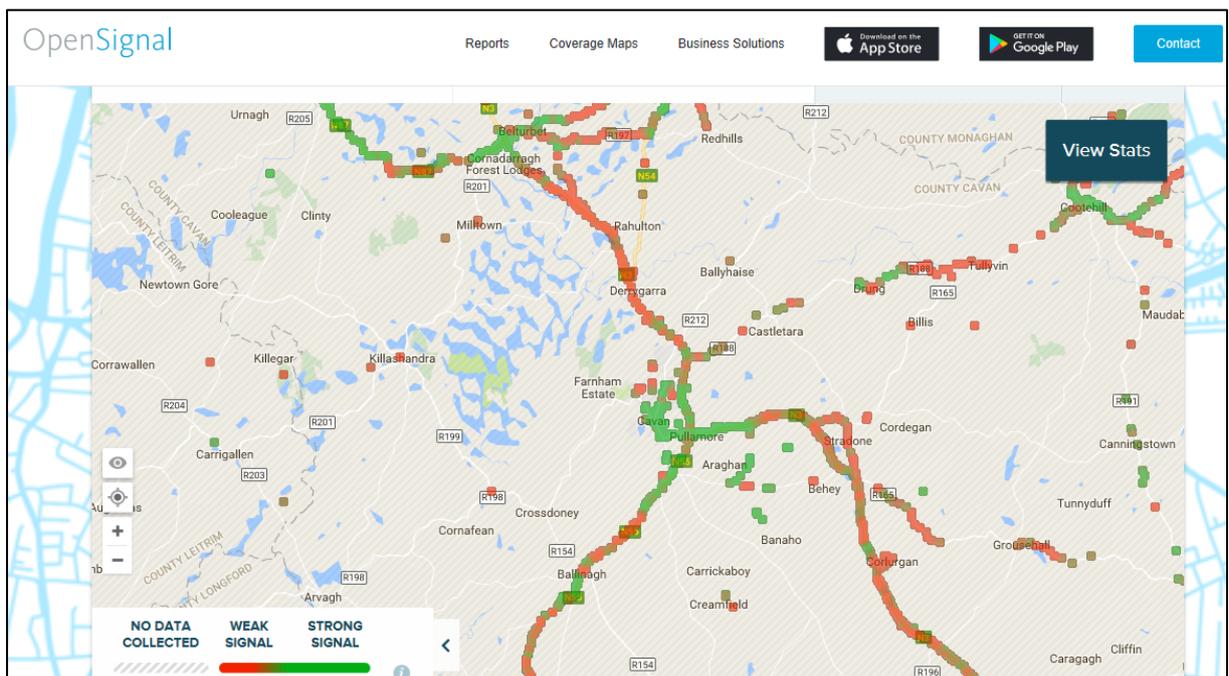
4.3.10 One matter to note is that by deploying 20 sites in Cavan, Meteor can meet its national coverage obligations, while Vodafone have 49 sites using 900Mhz spectrum for the same space. This suggests more granularity is needed when setting coverage obligations.

Figure 6: Vodafone Cavan Coverage as Collected by Users



4.3.11 The power of user collected data is that it reflects actual user experience in an everyday setting. The amount reflects a reasonably indifferent service, but this is better than what users are collecting for Meteor in Figure 7 below.

Figure 7: Meteor, Cavan Coverage as Collected by Users



4.4 SO WHAT?

- 4.4.1 'So what' is a fundamental question. It asks, what is 'good', what is needed, what is a reasonable outcome and how can this be obtained.
- 4.4.2 A telecommunications administrator will say that the 70% coverage obligation is met and there is competition. A Dublin economist will suggest moving business from rural Donegal to Letterkenny as 'more rural' is not viable for a mobile operator to offer a service. An alternative view is that electromagnetic spectrum is a bountiful gift of nature and the decision to optimise auction yield is a means of creating scarcity from a profoundly plentiful resource.
- 4.4.3 Table 9 is an illustration of how licensed spectrum is unused. A 70% coverage obligation is a licence to create a poor indifferent service. The Regulator will say competition will lead to better service, but competition is stifled by an oligopolistic behaviour, where operators begin to instinctively game the regulatory process and reference one another's service as good enough.
- 4.4.4 There are two approaches to tackling the matter but some notion of 'good' needs to be agreed. A good outcome could be a single operator agreeing a 95%-98% coverage obligation for all premises where indoor reception supports 2Mbps broadband service. This would be done in exchange for a reduction in auction fees or a slice of the NBP funds where FTTP cannot be delivered.
- 4.4.5 In addition it could be suggested that by adding repeaters or home antennas, a 30Mbps service could be planned in locations where the NBP fixed line plan is unlikely to reach due to the impracticalities of distance and funding.
- 4.4.6 A 98% indoor premise coverage target (2Mbps -85dBm¹⁹) will pose the following questions of each operator: what additional resources would be needed to meet that target in each County; and what are the costs of doing so. This could be quantified in terms of incremental masts needed.
- 4.4.7 It is not clear from the Mobile Taskforce report what quantifiable goal is being pursued, but the above proposal, which can be modified could act as a template to be further changed if a consensus emerges.
- 4.4.8 The challenge at a County level is to get the NBP for fibre access aligned with Mobile Broadband plans, such that the Mobile assets and spectrum can be used to in-fill where it is impractical to bring fibre access.
- 4.4.9 The above discussion can be progressed by asking the NBP Officials and operators to identify where fibre services are unlikely to be delivered given what is known today. This suggests the following recommendations.

¹⁹ -85dBm – describes a signal to noise ratio, or signal strength necessary to support a connection that permits a flow of 2Mbps.

Recommendation 13: County Councils to define 'good' as 98% Mobile coverage, sufficient to support a 2Mbps broadband service indoors and on all A and B roads. Use this definition in communication with ComReg, NBP Officials and industry. Invite comment and welcome improvements.

Recommendation 14: Councils to invite operators to respond to meeting a 98% coverage plan outlining the number of additional masts and the incremental cost of meeting the above coverage target.

Recommendation 15: Use the information gleaned from Recommendation 14 to discuss 1) coverage in areas where fibre may not reach, given the budgets available and 2) the possibility of planning to use Mobile Broadband resources as a substitute for fixed in defined locations.

Recommendation 16: County Councils to request clarification as to whether backhaul to all County mast sites is included in the NBP work schedule, or is featured in the plans of mobile operators.

Recommendation 17: In the planning application for mast sites, request a copy of the radio plan for the site and a statement of the planned coverage improvement in the context of Recommendation 12.

4.5 MOBILE SERVICES AND INADVERTENT ROAMING IN THE BORDER REGION

- 4.5.1 Mobile services in the five Council areas are further complicated by the existence of inadvertent roaming.
- 4.5.2 The removal of border posts has had a profound impact on creating what can be described as a sense of normality. For those visiting the border area one of the most unusual experiences is the sound of a smartphone notification that it is moving across an invisible border. This is normally preceded by some indifferent service and poor reception. The badly named 'inadvertent roaming' triggers some complex charging process no different to having landed in any European airport.
- 4.5.3 The regulators describe this as 'inadvertent roaming' and suggest customers should be careful and understand their packages. This is the current status and while many charges will disappear thanks to the EU Roaming initiative, the underlying problem remains. There are packages that make it easy to roam through what are not one but multiple electromagnetic fields (up to 50m high) which create their own borders by rubbing against each other, thus cancelling each other's usable signal. Spookily, between these border electromagnetic fields each have their own dead zones where your device will not work – an artificially created electronic desert where your device loses its identity. A landowner could 'inadvertently roam' on their own land on a daily basis.

- 4.5.4 Creating electromagnetic clouds for each frequency type on each side of the border is quite clever radio engineering. The engineers belonging to the mobile companies are indifferent to borders but need to comply with the licence conditions associated with the radio spectrum they use and the licence fees they pay the regulator.
- 4.5.5 The spectrum in Ireland is sold through auction by ComReg in Dublin and these receipts are handed to Treasury. The radio spectrum used in NI is sold through auction by Ofcom (the UK regulator) and the auctions' yields are deposited in the UK Treasury. Taxing the right to radiate air is a good source of tax revenue that is little understood. Establishing an electromagnetic border with its dead zones is left to engineers to work out the detail. Engineers are forced to create 'not spots' which give rise to in nature's terms a deeply artificial border where the laws of physics fail, like a farm animal failing to appreciate lines on a map. The radio engineer whose company is multi-national in nature has little appreciation of borders, unless imposed. The radio engineer needs to plan two networks using exactly the same equipment with a little gap in between. The network architecture needs to design facilities to a handover from one cell to another and the billing platform needs to be informed of the event so it can be rated. The radio engineering element is a non-intuitive activity. It is not sensible in terms of building an efficient network but it is something they get used to doing and is a novelty that needs to be accommodated in their work. They work hard to eliminate dead spots and the actual border they create will be the subject of some insider humour. Change the direction of the antenna, the power applied and you change the 'border'.
- 4.5.6 The electromagnetic spectrum is a gift of nature - it is the mechanism which permits and includes visible light. This mechanism has been adapted by man and used to encode all communications. Electromagnetic waves were first used commercially in radio communications by Marconi. Our use and exploitation continues to exceed our understanding of nature's gift. Our taxing of nature's gift, using spectrum auctions is therefore awkward and crude, and it can be argued, out of date.
- 4.5.7 Spectrum auctions are a way of taking what is a naturally abundant resource and granting a licence to a company to use it or indeed not use it but control its use. In simple terms an electromagnetic wave is generated when a copper antenna is heated in a way to generate a signal, a wave consisting of a stream of electrons at a particular frequency, and transmitted in a particular direction. Through the licencing process you grant the right to create, use and leave unused a capacity to develop and send a radio signal. It is not uncommon for companies to sit on spectrum holdings without using them. Creating scarcity (the absence of coverage) from abundance is an outcome of this process. The sale of radio spectrum in two neighbouring administrations then demands the creation of an electromagnetic border. This point is important because the electromagnetic border is a product of the spectrum licensing regime. The engineered electromagnetic border is a product of the licensing process. Any restriction created is artificial rather than natural and thus the licences can be changed to meet the needs of the people living in an area.

- 4.5.8 Traditionally the high auction fees are driven by few obligations in terms of coverage and tolerating high roaming charges. The economists who specialise in optimising auction yield see coverage obligations and cross-border working as inhibitors to spectrum auction yield, something the market should work out for itself, or something politicians can make additional policy adjustments under pressure from an organised electorate. The lack of coverage obligations encourages the market to charge what it can and hence roaming over borders becomes one means of recovering those spectrum fees. The capacity to charge someone travelling to Paris or Berlin is then applied in the same manner to someone travelling between Carrick-on-Shannon and Enniskillen. Within this licensing process the notion of radio spectrum as a gift of nature is lost. The counter position is the use of wifi access where the spectrum used is the same as that used in microwave ovens, so it cannot be licensed and therefore it can be accessed and used without a roaming charge.
- 4.5.9 The EU has been active in attempting to reduce roaming charges. The dance between national regulators and the European Commission is a little complex. The freedom to raise roaming costs comes from National Regulators charged with maximising auction yield and attaching as few conditions as possible to the spectrum they sell. The removal of roaming costs by the EU from June 2017 in the 'Roam Like At Home' legislation is being welcomed, however users still need to be aware and check their package for any other related or unclear costs which might still arise. For example, those on contracts are likely to be able to find a package to include roaming while those on 'pay as you go' packages are still likely to incur additional charges. There are also implications for out of bundle usage and certain specific territories. Then there is inadvertent roaming with the same operator (Vodafone) with radio towers on both sides of the border and inadvertent roaming between radio towers belonging to two different operators, e.g. EE and Meteor. The long-term implementation with regard to the UK remains to be resolved, with no clear indication of what will be in place once the UK officially leaves the EU in 2019.
- 4.5.10 The approach by regulators tends to accept the dead zones and inadvertent roaming as 'normal', where users are expected to make themselves aware of how their device is set up. It is argued that it is the user's fault if they do not make themselves aware of the peculiarities of coverage, roaming, their package and the details of how to change the settings on their device.

4.6.1 ADDRESSING INADVERTENT ROAMING LOCALLY

- 4.6.1 This section looks at ways to reduce the instances of inadvertent roaming, in the context of the previous section on how indifferent service might be improved overall. It is proposed to include such proposals within the broader matter of improving coverage.
- 4.6.2 It is probably best to first identify an estimated number of mast sites in the border area engaged in hand calls off (signalling associated with a call as it is passed from cell to cell) to an adjacent cell. Table 11 refers to the number of mast sites counted within 15km of the border.

Table 11: Border Mast Site Locations by County (within 15km of the border)

Adjacent Rol County	est. Border Mast Sites – Ireland County	est. Border Mast Sites – NI County	Adjacent NI County
Donegal	5	2	Londonderry
Donegal	11	5	Tyrone
Donegal	8	3	Fermanagh
Leitrim	7	5	Fermanagh
Cavan	18	7	Fermanagh
Monaghan	8	3	Fermanagh
Monaghan	10	5	Tyrone
Monaghan	25	8	Armagh

- 4.6.3 These are quite manageable numbers, which facilitates review with radio engineers planning at a local level. As part of the recommended engagement to achieve 98% coverage, the question of inadvertent roaming and how to minimise it at these locations could be addressed as well. It may be a matter of adjusting power or antennas to reduce the problem.
- 4.6.4 It suggests that the planning for any additional masts should include coverage maps and steps taken in the planning process to reduce inadvertent roaming.
- 4.6.5 There is likely to be a need to provide customers with a means of reporting inadvertent roaming so specific locations can be addressed.

Recommendations 18: The issue of reducing inadvertent roaming could be added to the proposed engagement on improving coverage to 98%.

Recommendation 19: Councils from both sides of the border should collaborate on these site specific issues.

Recommendations 20: The specifics on changes to roaming charges could also be reported upon during engagement with network operators.

ANNEXES

ANNEX A: GLOSSARY OF TERMS

4G - 4th generation of mobile services. The significance of 4G is the switch to a reliance on the same internet protocols (IP) as used on the fixed network. It means our voice and data calls are being transported more efficiently and thus more cheaply. The efficiency in measures in the number of bits per hertz which can be carried on a radio wave.

4G Coverage Obligation - UK Parliament voted in record numbers for a 98% coverage obligation by premise (95% coverage obligation by devolved nation). This approach could be copied to suit the needs of Irish Mobile users.

ADSL - asynchronous digital subscriber line. The subscriber line is your phone line. Digital is confusing as it is Digital Encoding on a wave, and Asynchronous refers to the decision that the available frequencies are divided so more devoted to downloading than uploading. ADSL is best regarded as a standard defined the use of high frequencies over copper to send and receive data.

xDSL – as above but we use different letters like V (Very) to describe to use of different frequencies or more frequencies or higher frequencies. The frequencies used are set by body called NICC.

Bluetooth - is a wireless technology standard for exchanging data over short distances from fixed and mobile devices.

Broadband – a term which references a broad band of high radio frequencies used to send and receive signals over a copper line.

ComReg – The Irish regulator with a multitude of tasks, varying from being spectrum auctioneer, to independent competition regulator, to consumer protection, to enforcer of communication licences.

Connectivity – is a generic term to describe two devices which connect together using whatever medium is available. It gently alludes to the fact that all connectivity occurs at the speed of light without trying to explain the term 'throughput'. It also represents the idea that your Connectivity relates to what you need at the time and it is shared by those around you.

Economic Gaming of Costs / 'Gaming' – In a regulated environment like utilities, abstract models are used to model costs and returns. The economic gaming of costs refers to the practice of using such models to optimise a commercial position.

FTTC - Fibre to the cabinet. In simple terms it is a cabinet with fibre coming in and copper going out, with some electronics in the middle that gather, process and distribute signals to from the premises connected. A cabinet needs to be powered to perform all the processing of data through that point.

FTTP - Fibre to the premise. This represents a direction fibre connection between a premise and a handover point located in a large telephone exchange. It would typically permit you to remove your telephone line. It comes in two forms. Large telephone companies like BT would typically use an architecture allowing the fibres on route to be shared so the size of the fibre bundles are minimised. Smaller companies prefer to provide discrete fibre connections for each customer. The pros and cons of each are not the subject of this report.

Internet Service Provider (ISP) – a company that provides Internet services, including personal and business access to the internet.

Megabit/Gigabit/Terabit – Megabit refers to 1,000,000 bits, while Gigabit, 1,000,000,000 bits and Terabit 1,000,000,000,000 bits. Often used to provide an indication of speed, it is more accurately described as the 'throughput'. The data is download is encoded into a digital form and transported as bits.

Roaming (Inadvertent Roaming) – occurs when the signal from your domestic network is weak or unavailable and your phone picks up a stronger signal from a mast in another jurisdiction, for example in border regions or travelling abroad. In these cases, rather than paying domestic rates, mobile phone users are charged more international roaming rates.

Satellite –is an option available for those who cannot access traditional fixed-line based broadband services. It uses a satellite dish to provide access services.

Superfast – a meaningless term but it is being associated with greater than 24Mbps throughputs of service. It means you can receive service from a fibre connected cabinet or a fixed wireless connection, or a satellite. It marks an upgrade but how much an upgrade depends how close you are to a cabinet and the detail of any agreement you sign.

Throughput – This is the technically correct way to describe the volume of data being sent and received using the available mediums such as copper (radio waves over copper - electrons), radio waves (electrons) or fibre (a flow of photons). Although more accurate advertisers prefer 'Superfast' because, while wrong, it is easier to sell.

VDSL – Very high bit rate Digital Subscriber Loop. This is a technology which permits the data transmission over existing telephone lines.

Wifi - a facility allowing computers, smartphones, or other devices to connect to the Internet or communicate with one another wirelessly within a particular area.

Wireless - using radio, microwaves, etc. (as opposed to wires or cables) to transmit signals used in broadcasting and computer networking etc.

ANNEX B: PLANNING GUIDELINES

These are best practice documents used and implemented in Great Britain originally. Northern Ireland's District Councils in the Central Border Region have been recommended to adapt and adopt these and we would encourage the same now of the Irish County Councils in the Region. These need to be designed to reflect statutory considerations in Ireland and ultimately communicated on the planning section of Council websites. They can also be printed out and sent to developers.

DRAFT - THE BENEFITS OF INSTALLING HIGH SPEED BROADBAND INFRASTRUCTURE IN NEW DEVELOPMENTS

Planning Guidelines for Broadband

Purpose of this Document

This document aims to highlight the benefits to developers of installing high speed broadband infrastructure in new developments. This forms part of the ICBAN Report on 'Infrastructure Solutions for High Speed Internet in the Central Border Region'. Comment and feedback is welcomed from the ICBAN member Councils.

The document provides some background on national policy and local aspirations for future broadband provision, the current "gap" between aspirations and reality at present and some helpful information and guidance on key aspects of the installation and ownership of broadband infrastructure. It also looks at the issue of future-proofing broadband provision in new developments.

Context

Access to broadband is a vital component of infrastructure in today's world. It is key to growing a sustainable local economy, vital for education and home working and an increasingly central part of community cohesion and resilience, particularly in rural areas. In addition, Local Authorities are increasingly reliant on digital infrastructure to provide services and interact with their customers.

Local Planning Authorities have a pivotal role to play in encouraging developers to 'future-proof' their developments by installing direct fibre access, wherever possible.

In addition to the reputational and wider economic benefits of ensuring that residents are able to access high speed broadband when they move into new developments, there is also the issue of avoiding the costs and frustrations to occupiers of future retrofitting if the infrastructure is not fit for purpose.

Enhanced broadband provision also has the potential to reduce the need for road, rail and air travel. Developers are key in determining how projects shape an area; therefore, the planning of telecommunications infrastructure in relation to development is vital.

National Policy and Guidance

The Government recognises that, reliable broadband internet access is essential for homes throughout the country to benefit from online services, and for UK businesses to compete globally. It aims to achieve a transformation in the country's broadband access, with everyone in the UK able to

access broadband speeds of at least 2 megabits per second (Mbps) and 95% of the UK receiving far greater speeds (at least 24Mbps) by 2017 and is also exploring options to extend the benefits of fast broadband to remaining areas. This is being executed by overlaying optical fibre over the existing telephone network. The closer fibre is brought to a development, the better the service. Direct fibre access is the most future proof option.

The National Planning Policy Framework (NPPF), which came into force in 2012, recognises the importance of infrastructure in delivering sustainable economic growth, and states that 'the development of high speed broadband technology and other communications networks also plays a vital role in enhancing the provision of local community facilities and services' (Paragraph 42). It also states that 'in preparing Local Plans, local planning authorities should support the expansion of electronic communications networks, including telecommunications and high speed broadband' (Paragraph 43).

Local Position

Although Government and the NPPF both support and encourage the inclusion of high speed broadband, there are no statutory requirements which support this aspiration. BT has discretion in what it offers and thus achieving the most future proof options has a longer planning cycle even though the long term costs are at best neutral or not cheaper for the newer technology.

From 2017 EU Legislation will specify that new build and major renovations of buildings will need to be high speed ready, however, exemptions will be allowed for historic buildings, holiday homes or where the cost to do this would be disproportionate, meaning that smaller and rural developments are likely to be excluded.

Traditionally building regulations state the minimum requirement and the current DCLG consultation R 1 consultation states 'at least 30Mbps'. This is problematic as BT can offer their legacy copper access and then request subsidies or direct payments for overlaying fibre to street cabinets, so the copper access offered meets the minimum requirement. There have been examples across the UK where developers have been approached for payments for adding additional cabinets once the original cabinet of typically 288 customers has been filled. This should not be occurring if competition was working and where BT is claiming it is investing £3bn in this infrastructure.

There are a number of options which Local Authorities (LAs) can adopt to encourage and support high speed broadband provision in new developments.

These include incorporating objectives and policies to support Broadband in local plans; referencing the issue in pre-application discussions and adding it to planning application validation lists as a consideration.

The inclusion of broadband in these policies and strategies ranges from a desire to grow the rural economy of the area, improve accessibility, reduce carbon emissions through the need to travel and improving social inclusion. However, none of these policies are mandatory and therefore cannot compel developers to install high speed broadband infrastructure on new developments.

While the Council will do all it can to encourage local developers to opt for future proof connectivity, we must also acknowledge that Planning Law, which is focused on land use and Building Regulations which are focused on minimum safety conditions and standards, are not a substitute for the regulator Ofcom, acknowledging in the form of appropriate market definitions the need to encourage BT to deliver the most efficient future proof access solution. This is especially the case given the more future proof solutions are cost neutral. To that end the Council will work with other stakeholders to make our views known to Ofcom and government. Any changes will also need to support a pro-competitive delivery of fibre access. The market is unlikely to achieve this on its own.

Benefits and Opportunities

The key benefits in ensuring that planned development is 'future proofed' by providing high speed broadband infrastructure include:

1. As the take-up of broadband and associated data services has increased, it has become apparent that people will demand a data service with a property as a matter of course, considering it as important as other utilities.
2. Superfast speeds are increasingly important to prospective home buyers, and homes without broadband could be worth as much as 20% less than comparable properties with a good connection (1).
3. Given the market demand for broadband, and the fact that costs per unit for larger sites are usually cost neutral, it makes good business sense to ensure that new developments include high speed broadband infrastructure as a matter of course. Some developers are already recognising this and have publicly stated that they will install high speed broadband in all of their developments. Others are already implementing the practice.
4. Not only can developers who provide these services use them as a promotional tool, they will also avoid the negative reputational impacts of customers complaining in the press if their new home is not able to support high speed broadband.
5. Estate agents also report that an increasing number of buyers are willing to pull out of a deal if broadband is not available in that area. The property search website rightmove.co.uk has added a broadband speed checker to every one of its listings, alongside details of transport links and schools (2).
6. If broadband installation is integrated into the planning of developments as early as possible, it may be possible to mitigate costs of installation through electricity and broadband cables sharing the same infrastructure assets, routes or networks. Potential savings of 16-26% could be achieved where existing infrastructure is used to rollout broadband (3). From 2017, EU legislation will mean that network operators (e.g. telecoms, power, water) will have an obligation to offer access to their infrastructure if a reasonable request is made.
7. On more rural or isolated developments where the cost-per-site for other technologies will be over a few hundred pounds, it may be worthwhile considering the option of installing satellite broadband. The recent roll-out of more powerful equipment and use of higher frequencies now mean that an effective service can be offered at a reasonable subscription and competitive connection cost-per-site. Options include a mix of Satellite Distribution Nodes and individual Direct to Home technologies which can be deployed depending on the layout and geography of the area. The Superfast Satellite for Communities: the BDUK Pilot Project (Feb 2015) report provides further details of these options

1 <http://www.theguardian.com/technology/2014/mar/02/fast-broadband-vital-to-homebuyers>

2 <http://www.theguardian.com/technology/2014/mar/02/fast-broadband-vital-to-homebuyers>
3 <https://www.london.gov.uk/sites/default/files/London%20Infrastructure%20Plan%202050%20Consultation.pdf>

Working with a Network Provider

Given the sometimes complex nature of installing broadband in new developments, and the lead in times required, it is recommended that developers work with a network provider from the early stages of planning a development.

BT Openreach and Virgin Media are the two main providers in the UK and offer advice if you are planning a new development. Other local providers are also available.

Our developers experience of the established processes is at best indifferent and the Council will continue to seek from Network Providers a consistent process, consistent with delivering future proof options. In the interim we will share with our developers best practice and best contacts as these emerge on a case by case basis.

As part of this review process we have asked vendors to provide our developers with the appropriate contacts.

In the first instance developers in our areas should notify company representatives and notify them of their developments and need for connectivity. We are confident if contacted early, Developers will increase the chances of the competitive process delivering a good outcome.

BT have reviewed their process. The following changes are being introduced by BT and now need testing by developers.

The journey for developers starts here; <http://www.newdevelopments-openreach.co.uk/>

The site is due to include a new Connectivity Assessment Tool which looks at the size of the development and BT's existing assets.

There will also be a rate card for FTTC/P for developers to understand unit cost

The latter is new and need testing. We will update once BT has explained the relationship between this rate card and the existing offer to fund duct for telephony.

The Distribution Network

Another key issue that should be considered is that service delivery depends on "end-to-end connectivity", (i.e. a connection from the broadband supplier right through to the device situated within the home) and therefore needs both parts of the distribution system. The Government has produced detailed guidance on the installation of such infrastructure in new domestic developments which can be found in the document PAS 2016:2010 Next Generation Access for New Build Homes Guide.

In our response to the CLG consultation we are recommending the PAS 2016:2010 is updated to allow for the future proof solutions and not to be limited by the 'at least 30MBps'. The new guidelines are expected to be applicable from January 1st 2017 and so we will continue to press government for these changes to be made.

The BT Rate Card for supporting FTTP in new developments.

The following is subject to change as it has been learned that developments of more than 100 premises are now free. Note in addition to this BT and Virgin have deals where they pay the developer a fee per premise, £140 has been quoted.

Developer contribution for fibre broadband infrastructure outside of existing coverage

Note: no charges apply on sites below 100 premises where a new site is deemed to be within existing Fibre Broadband Infrastructure coverage. New Infrastructure is required to serve New Sites of 100 or more new homes in all cases.

New Site Band	Per Premise Developer Contribution*
2-4	£6,668 (4 premises) to £13,442 (2 premises)
5-9	£2,905 (9 premises) to £5,314 (5 premises)
10-14	£1,830 (14 premises) to £2,604 (10 premises)
15-19	£1,321 (19 premises) to £1,701 (15 premises)
20-24	£1,024 (24 premises) to £1,250 (20 premises)
25-29	£829 (29 premises) to £979 (25 premises)
30-39	£669
40-49	£497
50-59	£415
60-69	£335
70-79	£276
80-89	£231
90-99	£196
100-109	£167
110-119	£144
120-129	£124
130-139	£107
140-149	£92
150-174	£72
175-199	£48
200-224	£30
225-249	£16
250+	No Charge

ANNEX C: PROFILE OF THE PRINCIPAL AUTHOR

Mr. Mike Kiely, Founder of The Bit Commons, has spent most of his working life in the communications industry. He had a 22 year career in BT rising to senior ranks in the BT Consumer Division. He had a broad range of experiences from launching BT Call Answer 1571, to dealing with complex regulatory issues like local loop unbundling and carrier pre-selection. His particular strength is leading teams solving complex issues.

He worked for the UK Government (DCMS, BDUK) between April 2010 and September 2012 where he contributed to the UK National Broadband Strategy, BDUK's technical requirements and the formulation of the 4G coverage obligation. His time at BDUK included with Cumbria County Council, using the communities in Eden to assist in defining the fibre extensions referenced the BDUK requirements.

Since leaving DCMS in 2012, he has helped organisations and local authorities in procuring optical fibre networks, championing and defining the passive infrastructure access model. This includes pro-competitive open access networks in Perseverance Works, Shoreditch and Colchester Town Centre.

In 2016, he was engaged by ICBAN to advise on technical solutions which could help address the challenges of fibre connectivity gaps in the Northern Ireland Council areas of the Central Border Region. This led to the completion of the 'Fibre At A Crossroads – Part I' report. A second and follow-up report: 'Part II' was completed with ICBAN for the Northern Ireland Council areas in June 2017. This report examines in detail the £60 million of government financial investments and match funding involved.

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AGREEMENT

BETWEEN

THE MINISTER FOR COMMUNICATIONS, CLIMATE ACTION AND ENVIRONMENT

("Minister")

AND

EIRCOM LIMITED

("eir")

IN RELATION TO

NATIONAL BROADBAND PLAN – COMMERCIAL DEPLOYMENT COMMITMENT

EXECUTION VERSION

THIS AGREEMENT IS MADE THE DAY OF 20____ (the "Effective Date").

BETWEEN:

- A. **THE MINISTER FOR COMMUNICATIONS, CLIMATE ACTION AND ENVIRONMENT** of 29 Adelaide Road, Dublin 2, Ireland D02 X285 (the "Minister"); and
- B. **EIRCOM LIMITED**, registered under the laws of Jersey (Incorporation number 116389) and registered as a branch in Ireland (registration number 907674) and having its branch office address at 1 Heuston South Quarter, St. John's Road, Dublin 8, Ireland D08 A9RT ("eir"),

(collectively the "**Parties**" or individually a "**Party**").

RECITALS

1. The National Broadband Plan ("**NBP**") is a Government policy initiative, being implemented through the Minister, which aims to deliver High Speed Broadband Services to every citizen and business in Ireland. This is being achieved through a combination of accelerated commercial investment by telecoms operators, and a proposed State intervention to provide High Speed Broadband Services to those parts of Ireland where the commercial sector has, to date, not had concrete plans to invest.
2. The Minister's proposed strategy for the NBP envisages that, in areas where private operators do not have concrete plans to invest in building backhaul and an appropriate High Speed Broadband Services network, the Government, through the Minister, will invest in the build of such infrastructure to facilitate the provision of High Speed Broadband Services over this infrastructure.
3. The High Speed Broadband Map, showing the areas where the Minister intends to intervene and those areas where the Minister intends to forebear from intervening, was consulted on and most recently published by the Minister's Department in 2015.
4. eir has informed the Minister that it plans to deploy backhaul and a High Speed Broadband Services network commercially to a proportion of the Intervention Area, requesting that the Minister forebear from intervening in those areas where eir plans to deploy commercially.
5. The Minister believes that if eir's plans are not implemented fully and in a timely manner this carries a risk that the Minister's NBP policy objectives will not be achieved.
6. Due to these exceptional circumstances and the strategic importance of the NBP to the Minister and the citizens of Ireland, the Parties now wish to enter into this Agreement to record eir's commitment to commercially deploy a High Speed Broadband Services network as set out in this Agreement in the eir Deployment Area by the applicable Milestone Dates, and to record the Minister's related obligations.

NOW IT IS AGREED BY EACH PARTY AS FOLLOWS:

1 DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, unless otherwise stated:

“Agreement” means this agreement, including the Recitals, Schedules and Appendices.

“Associated Company” means:

- (a) in respect of any company, a company which is a subsidiary, a holding company or a company which is a subsidiary of a holding company of that relevant company; or
- (b) any legal entity established for the purpose of bidding, contracting or providing the services, products and network under the NBP State intervention,

and includes, as the context so admits or requires, any one, more or all of them from time to time.

“Binding Guidance” means any guidelines, recommendations, policies, codes of conduct, codes of practice or instructions of any Regulatory Body with which the Minister, his Department or eir is required to comply in connection with the eir Deployment Area or this Agreement (and includes, as the context so admits or requires, any one, more or all of them or any part or parts of any one, more or all of them).

“Confidential Information” means:

- (a) all information of whatever nature relating to a Party which has been or is disclosed to the other Party or to which the other Party has been or is given access to or which comes to the other Party's attention, whether oral, written, graphic, photographic, visual or electronic, or in any other form whatsoever;
- (b) analyses, pricing information, compilations, studies, notes, reports, presentations and any other documents prepared by a Party, its officers, employees, professional advisers and agents, which contain or otherwise reflect or are generated from any such information as is specified in subparagraph (i) above; and
- (c) subject to clause 11.6, the contents of this Agreement.

“Connect” or **“Connected”** means in respect of a Premises, when Premises Connected is achieved in respect of that Premises.

“Delay” means any delay or postponement in eir successfully Passing a Premises located in the eir Deployment Area by the applicable Milestone Date and/or Connecting a Premises located in the eir Deployment Area by the applicable time specified in this Agreement.

“Delivery Point” means the location of a single mailbox or another place to which posted mail is delivered as identified in the GeoDirectory database. For the

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avoidance of doubt, a building or property may have multiple delivery points including residential and/or commercial delivery points.

"Department" means the Department of Communications, Climate Action and Environment, or its successor.

"Distribution Point" means a point on the physical access network where equipment is installed to provide a physical connection to a network termination unit at the end user's premises.

"Dispute" means any dispute, difference of opinion or disagreement between the Parties arising out of, in connection with or relating to this Agreement (including as to its existence, interpretation, operation, termination or performance) in any way (though eir may not dispute any matter or thing as to which the decision of the Minister or Minister's Representative under this Agreement is, pursuant to the provisions of this Agreement, (a) final and conclusive; (b) not subject to the Dispute resolution procedure or (c) subject to the Minister's discretion).

"Effective Date" has the meaning given on page 2 of this Agreement.

"Eircodes" means the postcode system available from the person appointed by the Minister to design, operate and maintain the Irish postcodes system and included in the GeoDirectory as at 30 June 2016.

"eir Deployment Area" means:

- (a) the 300,575 Premises identified in Annex 1 to Schedule 1 as at the Effective Date; and
- (b) the areas identified in Annex 4 to Schedule 1 where New Build Premises are situated,

and includes, as the context so admits or requires, any or all of them or any part or parts, of any or all of them.

"eir Deployment" means the build and commercial deployment of High Speed Broadband Services by eir in the eir Deployment Area, in accordance with the eir Project Plan and this Agreement.

"eir NGA Plan File" means the file issued by eir on a monthly basis to industry, as required by the Regulator, which indicates eir's most up to date information relating to the availability of eir's High Speed Broadband Services and forecasted dates for future developments, and includes the file known as the Advance Pre-Qualification File.

"eir Project Plan" means eir's project plan for the eir Deployment and all annexes which is attached as Schedule 1 to this Agreement, and as is supplemented or changed from time to time during the Term in accordance with clause 6 (eir Project Plan and Milestone Dates).

"eir Representative" means the person or persons notified to the Minister (or such substitute or substitutes) as may be appointed by eir pursuant to the provisions of clause 13 (Representatives).

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“Environmental Information Regulations” means the European Communities (Access to Information on the Environment) Regulations together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government department in relation to such regulations.

“FOI Act” means the Freedom of Information Act 2014 and any subordinate legislation made under that Act together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government department in relation to such legislation.

“GeoDirectory” means the source of location information, provided by and available from An Post GeoDirectory DAC, as at 30 June 2016, that identifies the location of Premises.

“High Speed Broadband Map” means the 'National Broadband Plan Map' published by the Minister, as the Minister may update and publish from time to time during the Term.

“High Speed Broadband Services” means next generation access broadband services providing a minimum of 30 Mbps downlink and 6 Mbps uplink.

“Initial Term” means three years from the Effective Date.

“Initial Premises” has the meaning given in clause 6.1.2.

“Insolvent” means if a Party is bankrupt, has a petition presented for its winding up, has a liquidator appointed to it or has a receiver or an examiner appointed to it or over part or all of its assets or enters into a composition with its creditors (save for the purposes of a bona fide reconstruction or amalgamation on terms approved in advance by the other Party), and/or the Party is unable to pay its debts as they fall due within the meaning of section 509 of the Companies Act 2014 (or if any event similar to the foregoing occurs in any other jurisdiction).

“Intervention Area” means an indicated area and/or Premises on the High Speed Broadband Map where the Minister intends to intervene as part of the NBP, as that area is updated by the Minister from time to time.

“Law” means any law applicable in Ireland and includes without limitation, common law, statute, statutory instrument, proclamation, by-law, directive, constitutions, decision, regulation, regulatory policy, rule, order, notice, rule of court, instruments, any interpretation of law or finding contained in any judgments given by a court or tribunal of competent jurisdiction in respect of which the period for making an appeal has expired and which has not at any relevant time been reversed or modified, Legal Requirements, delegated or subordinate legislation or notice of any Regulatory Body.

“Legal Requirements” means:

- (a) the requirement of any Law;
- (b) Binding Guidance;
- (c) Regulator Decisions; and/or

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- (d) any direction, decision, designation, condition, instruction, authorisation, requirements or rule of the Regulator or any other Regulatory Body which has jurisdiction with regard to eir, High Speed Broadband Services or any aspect of the eir Deployment.

"Milestone Date" means the date by which eir commits to Pass each Premises as set out or referred to in the eir Project Plan (and includes, as the context admits or requires, any one, more or all of them).

"Minister's Representative" means the person or persons notified to eir (or such substitute or substitutes) as may be appointed by the Minister pursuant to the provisions of clause 13 (Representatives).

"NBP" has the meaning given to it in Recital 1.

"Network Touch Point" means the point of connection on the network (whether a pole or duct) located on public property on the curtilage of the Premises.

"New Build Premises" means Premises located in the areas identified in Annex 4 to Schedule 1, which are not included in the GeoDirectory database as at 30 June 2016 but are subsequently included within later publications of the GeoDirectory database.

"Non-Standard Connection" means a physical connection drop where either:

- (a) in order to Connect the Premises, new infrastructure is required to be provided on the private part of the Premises, where the Premises is located 50m or further beyond the Network Touch Point; or
- (b) the Premises is located 50m or further beyond the Network Touch Point, served by existing infrastructure on the private part of the Premises that is not usable (for example, there is a blocked duct on the private property part of the Premises) and this has to be remediated in order to Connect the Premises.

"Pass" or **"Passed"** means, in respect of a Premises, when Premises Passed is achieved in respect of that Premises.

"Premises" means a Delivery Point.

"Premises Connected" means when a wholesale High Speed Broadband Services product is available at a Premises that is Passed and where the network termination device located in the end user's Premises is installed, tested and commissioned and is able to carry live traffic and which requires, in particular:

- (a) in the case of a wireline network, that a fixed cable infrastructure has been deployed between the network termination device located in the end user's Premises and the Distribution Point of the fixed network; and
- (b) in the case of a wireless network, that a fixed wireless external antenna has been deployed between the network termination device located in the end user's Premises and the Distribution Point of the wireless network.

"Premises Connection Request" means a request or order to Connect a Premises that is received from a Service Provider with all relevant fields correctly

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completed on the unified gateway order management and fault handling system described at www.openeir.ie/support/unified_gateway.

"Premises Passed" means for:

- (a) a wireline network, when a Premises for which the wireline network has a Distribution Point sufficiently close to that Premises such that High Speed Broadband Services can be provisioned for that Premises; and
- (b) a wireless network, when a Premises for which the wireless network has sufficient signal quality for that Premises such that High Speed Broadband Services can be provisioned for that Premises,

and eir has listed the status of the Premises as 'ready for order' on the eir NGA Plan File.

"Publicly Available Website" means www.openeir.ie, as that website address is updated from time to time;

"Published Connection Charge" means the relevant charge to Connect a Premises which is published in section 4.1 (NGA Bitstream Plus Charges) of eir's reference offer "open eir Bitstream Price List" located on eir's Publicly Available Website as at the Effective Date and as is updated from time to time or, if the charge to Connect a Premises is otherwise directed or determined by the Regulator or a court from time to time, such charge as directed or determined by the Regulator or a court.

"Regulator" means the body responsible for regulating the Irish electronic communications market from time to time, which at the Effective Date is the Commission for Communications Regulation.

"Regulator Decisions" has the meaning given in clause 10.1 (Regulator Decisions).

"Regulatory Body" means a government department and Irish and EU regulatory, statutory and other entities, committees and bodies (excluding the Minister and his Department) which, under Law, are entitled to regulate, investigate, audit, monitor or influence the matters dealt with in this Agreement or any other affairs of the Minister.

"Required Number of Upcoming Premises" means the number of Upcoming Premises eir is committing to Pass in a Quarter, as set out in the table in clause 6.2.

"Service Provider" means a retail service provider or a wholesale service provider (and includes, as the context so admits or requires, any one, more or all of them from time to time) which has a service provider contract with eir or an Associated Company of eir under their reference offers.

"Standard Connection" means a physical connection drop that is not a Non Standard Connection.

"Quarter" or **"Quarterly"** means each consecutive three month period, commencing on 1 January, 1 April, 1 July and 1 October in any year.

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“**Upcoming Premises**” has the meaning given in clause 6.2.1.

“**Working Day**” means any day of the week, except Saturday, Sunday, public holidays or bank holidays in Ireland.

“**2010 WPNIA Decision**” means ComReg Decision D05/10 (Market Review: Wholesale (Physical) Network Infrastructure Access (Market 4)) Document number 10/39, dated 20 May 2010.

“**2011 WBA Decision**” means ComReg Decision D06/11 (Market Review: Wholesale Broadband Access (Market 5)) Document number 11/49, dated 8 July 2011.

“**2013 NGA Decision**” means ComReg Decision 03/13 (Next Generation Access (NGA): Remedies for Next Generation Access Markets) Document number 13/11, dated 31 January 2013.

“**2016 WFAS Decision**” means ComReg Decision D03/16 (Pricing of eir’s Wholesale Fixed Access Services) Document number 16/39, dated 18 May 2016.

1.2 In this Agreement, unless otherwise stated:

- 1.2.1 any reference to a statute shall, unless the context otherwise requires, be construed as a reference to that statute as from time to time amended, consolidated, modified, extended, replaced or re-enacted together with any secondary legislation made thereunder as from time to time amended, consolidated, modified, extended, replaced or re-enacted;
- 1.2.2 save as otherwise provided herein, any reference to a section, clause, paragraph or sub-paragraph shall be a reference to a section, clause, paragraph or sub-paragraph (as the case may be) of this Agreement and any reference in a clause to a paragraph or sub-paragraph shall be a reference to a paragraph or sub-paragraph of the clause or paragraph in which the reference is contained unless it appears from the context that a reference to some other provision is intended;
- 1.2.3 any reference to any document includes that document as amended, replaced or supplemented from time to time;
- 1.2.4 any reference to a "person" includes any person, firm, company, governmental or other legal entity and its successors, personal representatives and permitted assigns;
- 1.2.5 unless the context otherwise requires, words importing the singular include the plural and vice versa, words importing the masculine include the feminine and vice versa and words importing persons include corporations and vice versa;
- 1.2.6 the headings in this Agreement are inserted for convenience of reference only and shall not be considered a part of, or affect the construction or interpretation of this Agreement;
- 1.2.7 where this Agreement contemplates that the Minister, may elect, grant, determine, approve, consent, agree, nominate, decide, specify or

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consider any matter or thing, the Minister may make such election, grant, determination, approval, consent, agreement, nomination, specification, decision or consideration in and at its absolute discretion without being required to give reasons, unless and only to the extent this Agreement expressly requires otherwise in a specific case;

- 1.2.8 any reference to the statutory duties, powers or functions of the Minister is a reference to such duties, powers or functions (including discretions) from time to time and include any common law duties, powers and functions (including discretions);
 - 1.2.9 the term "holding company" has the meaning given to it in section 8 of the Companies Act 2014 and the term "subsidiary" has the meaning given to it in in section 7 of the Companies Act 2014; and
 - 1.2.10 terms such as "including", "in particular", "such as", and "for example" are not to be read as exhaustive, or to limit, but may extend the generality of the provisions to which they relate.
- 1.3 Except as provided for elsewhere in this Agreement, this Agreement represents the entire understanding of the Parties concerning its subject matter and overrides and supersedes all prior promises, representations, understandings, arrangements, practices, agreements, letters of intent, proposals or heads of agreement concerning the specific subject matter of this Agreement, which are hereby revoked by mutual consent of the Parties and upon which the Parties confirm they have not relied and in respect of which they confirm they have no remedies (provided that nothing in this clause 1.3 shall operate to limit or exclude any liability for fraudulent misrepresentation).
- 1.4 In the event of any conflict, inconsistency or ambiguity arising between the provisions of this Agreement, then (save as expressly provided elsewhere in this Agreement) the order of precedence shall be as follows:
- 1.4.1 Clauses 1 to 16 and the Recitals; and
 - 1.4.2 Schedule 1 (eir Project Plan) and its Appendices.

2 COMMENCEMENT AND DURATION

- 2.1 This Agreement commences, and takes legal effect, on and from the Effective Date, and unless terminated earlier in accordance with the terms of this Agreement, continues in full force and effect for:
- 2.1.1 the Initial Term; and, if applicable,
 - 2.1.2 a Term Extension made in accordance with clause 2.2,
- (collectively, the "**Term**").
- 2.2 The Minister may, at his option, elect prior to the expiry of the Initial Term or a Term Extension, to extend this Agreement (on the same terms and conditions of this Agreement) beyond the Initial Term for a further period or periods of up to one year each, by written notice to eir (each a "**Term Extension**").

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2.3 Without limiting clause 12.4, this Agreement will expire and terminate on the expiry of the Term.

3 EIR DEPLOYMENT

3.1 For and in consideration of the Minister discharging his obligations described in clauses 3.2 and 3.3 below, eir agrees to complete the eir Deployment in accordance with the eir Project Plan and this Agreement in a manner that meets all Milestone Dates.

3.2 The Minister agrees to forbear from intervening in the eir Deployment Area, subject, at all times, to eir complying with its obligations under this Agreement.

3.3 The Minister agrees to amend the Intervention Area (as that area is identified as at the Effective Date in the version of the High Speed Broadband Map which was consulted on and most recently published by the Minister's Department in 2015) to reflect the eir Deployment Area, subject, at all times, to eir complying with its obligations under this Agreement.

3.4 Both Parties will act reasonably and in good faith in relation to their rights and obligations under this Agreement and in connection with the eir Deployment.

3.5 Both Parties acknowledge and agree that this Agreement is separate to, and independent from, the outcome of any tender or other bidding process related to the NBP State intervention.

4 EIR'S COMMITMENTS

4.1 eir represents, warrants and undertakes to the Minister that:

4.1.1 each Quarter during the Term, it shall Pass all Premises in the eir Deployment Area that it has committed to Pass under the eir Project Plan for that Quarter;

4.1.2 subject to clause 6.4 and subject to where the Minister amends the eir Deployment Area in accordance with clause 9.3, by 31 December 2018, it shall Pass all of the 300,575 Premises, as set out or referred to in Annex 1 of the eir Project Plan;

4.1.3 subject to clauses 4.2 to 4.5, at all times during and after the Term, in relation to the Premises (excluding New Build Premises) in the eir Deployment Area which are Passed and for which eir has received a Premises Connection Request ("**Requested Premises**"):

(A) all of the Requested Premises will be Connected; and

(B) at least 95% of the Requested Premises will be Connected at the Published Connection Charge; and

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- (C) for at least 95% of the Requested Premises, the first connection to achieve Premises Connected at the Premises will be completed within 20 Working Days of the date the Premises Connection Request is received for a Passed Premises;
- 4.1.4 subject to clauses 4.2 to 4.5, at all times during and after the Term:
- (A) it shall Pass all New Build Premises in the eir Deployment Area within a commercially reasonable time of the date the New Build Premises is added to the GeoDirectory database; and
 - (B) in relation to New Build Premises in the eir Deployment Area which are Passed and for which eir has received a Premises Connection Request ("**Requested NB Premises**"):
 - (i) at least 95% the Requested NB Premises will be Connected at the Published Connection Charge; and
 - (ii) all of the Requested NB Premises will be Connected within three months of the date eir received the Premises Connection Request or, if exceptional construction or build activity is required in respect of specific Requested NB Premises, those specific Requested NB Premises will be Connected within a commercially reasonable time;
- 4.1.5 it shall undertake the eir Deployment in accordance with this Agreement and all Legal Requirements that eir is subject to;
- 4.1.6 it shall provide other commercial operators with access to the active and passive infrastructure and network in the eir Deployment Area in accordance with all Legal Requirements that eir is subject to;
- 4.1.7 it shall co-operate with the Minister, the Department, their respective personnel and any third parties which any of them may engage in connection with (a) the eir Deployment and (b) the NBP insofar as it is relevant to this Agreement; and
- 4.1.8 it shall keep its Publicly Available Website up-to-date in connection with the progress of the eir Deployment to the satisfaction of the Minister, including:
- (A) without limiting paragraph (B) below, within a reasonable time following the Effective Date, publishing the eir Project Plan on its Publicly Available Website, excluding any Eircode information which eir is not licensed to publish and any specific information on the timing by which Premises shall be Passed (provided that all Eircode and timing information shall promptly be provided to the Minister);
 - (B) pursuant to section 4 (Communications) of Schedule 1, operating and maintaining on its Publicly Available Website an interactive online service which allows members of the public

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to determine if and when their Premises will be Passed by eir, including by searching by Eircode

- (C) updating its Publicly Available Website to reflect any supplements or changes to the eir Project Plan and Milestone Dates agreed with the Minister under this Agreement within a reasonable time of those supplements or changes being agreed; and
- (D) pursuant to section 4 (Communications) of Schedule 1, operating and maintaining a facility with a view to promptly facilitating and enabling the Minister and the Minister's Representative to answer questions raised by the public or its stakeholder groups on individual orders for High Speed Broadband Services in connection with the eir Deployment.

4.2 Where eir offers to Connect a Premises at the Published Connection Charge but the end user at the Premises requests that eir carry out a more expensive form of connection than an aerial pole physical connection drop, or the form of connection the end user requests requires additional works (for example, the end user requests an underground duct is installed when eir has offered an aerial pole physical connection drop), eir shall still be obliged to Connect that Premises but: (a) the specific Premises affected shall not count towards the Minister's calculation of the number of Premises that eir has failed to Connect at the Published Connection Charge pursuant to clause 4.1.3(B) or 4.1.4(B)(i), and (b) eir shall not be in breach of clause 4.1.3(A) if the end user at the specific Premises affected does not agree to pay eir's reasonable costs in excess of the Published Connection Charge.

4.3 Where a Service Provider has:

- 4.3.1 provided eir with a materially inaccurate advance forecast of the number of Premises Connection Requests for a Quarter; or
- 4.3.2 not provided eir with any advance forecast of the number of Premises Connection Requests for a Quarter,

in a manner such that the Service Provider is in breach of the forecasting provisions agreed between eir (or an Associated Company of eir) and the Service Provider in their respective Service Provider contract, eir shall promptly agree with the Service Provider a proposed reasonable extension of time by which such Premises Connection Requests for the specific Premises affected shall be met in order that eir can achieve Premises Connected. eir shall promptly inform the Minister's Representative of the extension and the expected time period to resolve. The Minister or the Minister's Representative shall not unreasonably withhold consent to granting eir an equivalent and proportionate extension of time under this Agreement which reflects the agreement with the Service Provider in respect to eir's obligation to Connect the Premises concerned. eir shall Connect the specific Premises affected within the extended time period granted by the Minister, but the specific Premises affected shall not count towards the Minister's calculation of the number of Premises that eir has failed to Connect within the applicable time period stipulated in clauses 4.1.3(C) or 4.1.4(B)(ii).

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- 4.4 The Minister shall grant eir an extension of time in respect of eir's obligation to Connect a specific Premises within the time period stipulated under clauses 4.1.3(C) or 4.1.4(B)(ii) where:
- 4.4.1 the end user at the specific Premises affected requests an appointment date for Connection that is later than 20 Working Days after the date the Premises Connection Request is received by eir; or
 - 4.4.2 the end user at the specific Premises affected is not present at the agreed appointment date for Connection or eir's access to the specific Premises affected is not allowed by the end user or a third party, provided such appointment date and time has been agreed in a reasonable period in advance with the end user; or
 - 4.4.3 the specific Premises affected requires a Non Standard Connection; or
 - 4.4.4 the end user at the specific Premises affected requests that eir carry out a more expensive form of connection than an aerial pole physical connection drop or the form of connection the end user requests requires additional works (for example, the end user requests an underground duct is installed when eir has offered an aerial pole physical connection drop); or
 - 4.4.5 it is necessary to delay the Connection appointment on material health and safety grounds related to personnel carrying out the Connection on behalf of eir at the end user's Premises, such as an unsafe working environment in relation to the Connection at the Premises.

In each case, the Minister or the Minister's Representative shall grant eir an extension of time which shall expire at the new revised appointment date eir agrees with the Service Provider, provided that eir shall use reasonable endeavours to ensure that such revised appointment date is no later than 10 Working Days from the previously agreed appointment date. eir shall still be obliged to Connect the specific Premises affected within the extended time period, but the specific Premises affected shall not count towards the Minister's calculation of the number of Premises that eir has failed to Connect within the applicable time period stipulated in clauses 4.1.3(C) or 4.1.4(B)(ii).

- 4.5 Without limiting eir's other obligations under this Agreement, eir shall keep up-to-date and auditable records in respect of all relevant correspondence, contracts, proof of eir's attendance at an appointment (for example, photos), materials and other supporting information in respect of clauses 4.2 to 4.4 for a period not being less than 6 months after the date Premises Connected has been achieved at the specific Premises affected. eir shall provide any such records to the Minister or the Minister's Representative on request for review at the subsequent monthly or Quarterly progress meetings under clause 7 of this Agreement.

5 EIR ALLOCATED CAPITAL INVESTMENT

- 5.1 On or before the Effective Date, eir shall provide the Minister, to his satisfaction, with a complete and accurate written proposal providing:
- 5.1.1 the total minimum allocated capital investment in euro (€) that eir commits to invest for each county of Ireland within the eir Deployment Area from the Effective Date to 31 December 2018; and

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5.1.2 a detailed breakdown of eir's minimum allocated capital investment in euro (€) that eir commits to invest for each county of Ireland within the eir Deployment Area for each of the following periods:

- (A) from the Effective Date to 30 June 2017;
- (B) from 1 July 2017 to 30 September 2017;
- (C) from 1 October 2017 to 31 December 2017;
- (D) from 1 January 2018 to 31 March 2018;
- (E) from 1 April 2018 to 30 June 2018;
- (F) from 1 July 2018 to 30 September 2018; and
- (G) from 1 October 2018 to 31 December 2018.

6 EIR PROJECT PLAN AND MILESTONE DATES

6.1 The initial eir Project Plan attached as Schedule 1 to this Agreement sets out:

6.1.1 the Premises and the list of Eircodes of Premises in the eir Deployment Area where the status on the eir NGA Plan File is stated as 'ready for order' as at the Effective Date;

6.1.2 the Premises and the list of Eircodes of Premises in the eir Deployment Area that eir commits to Pass up to and including 30 June 2017 ("**Initial Premises**");

6.1.3 the applicable Milestone Dates for each individual Premises within the Initial Premises;

6.1.4 a network design document specifying the proposed technical solution covering the Premises, as may be updated from time to time in accordance with this Agreement; and

6.1.5 a list of sub-milestones and dates by which eir shall complete each of these sub-milestones in respect of the Initial Premises.

6.2 eir shall submit, each Quarter, written supplements to the eir Project Plan to the Minister for his review, which shall set out:

6.2.1 a list of Premises and the Eircodes of the Premises in the eir Deployment Area that eir commits to Pass during the following Quarter ("**Upcoming Premises**");

6.2.2 the applicable Milestone Dates for each individual Premises within the Upcoming Premises; and

6.2.3 the dates by which eir shall complete each of the sub-milestones in respect of the Upcoming Premises,

and eir shall submit this information to the Minister on or before the applicable date set out in the following table:

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#	Submission date by which eir shall submit the supplement	Quarter covered by eir submission	Required Number of Upcoming Premises for that Quarter
1.	1 May 2017	1 October 2017 – 31 December 2017	31,000
2.	1 August 2017	1 January 2018 – 31 March 2018	38,000
3.	1 November 2017	1 April 2018 – 30 June 2018	44,000
4.	1 February 2018	1 July 2018 – 30 September 2018	44,000
5.	1 May 2018	1 October 2018 – 31 December 2018	42,575

- 6.3 Without derogating from its obligations under clause 4.1, eir may during the Term, acting in good faith, propose reasonable changes to the eir Project Plan. eir must promptly submit the proposed change, along with all supporting information, for the Minister's consideration. However, collectively all changes proposed by eir during the Term must not, in aggregate, impact more than 10% of the total Premises within the eir Deployment Area as at the Effective Date.
- 6.4 If the Minister, in his discretion, approves eir's submission under clauses 6.2 or 6.3 (or if he approves eir's revised submission under clause 6.5) he shall notify eir and the information in eir's submission shall be incorporated in and made a part of the eir Project Plan in Schedule 1 of this Agreement.
- 6.5 If the Minister (or the Minister's Representative), in his discretion, considers that any submission eir makes, or change eir proposes, under this clause 6 is inadequate or not acceptable for any reason, for example, because:
- 6.5.1 it is insufficiently detailed, accurate or complete to be capable of proper evaluation;
 - 6.5.2 the Milestone Dates or sub-milestone dates are unsatisfactory or the eir Deployment will take too long to complete;
 - 6.5.3 the actual number of Upcoming Premises for a Quarter is below the Required Number of Upcoming Premises set out in the table in clause 6.2; and/or
 - 6.5.4 implementing the supplements to the eir Deployment Plan will lead to a Delay or is reasonably likely to lead to a Delay,
- the Minister may:
- 6.5.5 reject eir's submission; or
 - 6.5.6 direct eir to, in an efficient and timely manner, provide all further information or clarifications the Minister requires and/or to resubmit eir's submission in a form that is satisfactory to the Minister.
- 6.6 Any decision the Minister makes under this clause 6 is final and conclusive.

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7 PROGRESS MEETINGS AND REPORTING BY EIR

- 7.1 eir acknowledges that accurate information, provided in a timely manner, is critical to the Minister being able to monitor the progress and implementation of the eir Deployment.
- 7.2 eir shall attend meetings with the Minister or the Minister's Representative during the Term in accordance with section 3 (Review Meetings) of Schedule 1.
- 7.3 Without limiting eir's reporting obligations under section 2 (eir Deployment Reporting) of Schedule 1, within 10 Working Days of the end of each Quarter during the Term, eir shall submit to the Minister a written progress report of the progress of the eir Deployment containing the following information:
- 7.3.1 the number of orders received from Service Providers in each month of that Quarter in respect of the eir Deployment Area;
 - 7.3.2 the Eircodes of all Premises added to the eir NGA Plan File as ready to order during that Quarter;
 - 7.3.3 the Eircodes of all Premises Passed by eir in that Quarter;
 - 7.3.4 eir's progress of the actual eir Deployment achieved versus the eir Deployment Plan and eir's progress against each Milestone Date and sub-milestone during that Quarter;
 - 7.3.5 a detailed breakdown of the Eircodes of the Premises in the eir Deployment Area for which eir has met, and has not met, the applicable Milestone Date to Pass during that Quarter;
 - 7.3.6 a detailed breakdown of the Eircodes of the Premises in the eir Deployment Area for which a Premises Connection Request has been placed in that Quarter:
 - (A) which were Connected at the Published Connection Charge, and which were Connected at a connection charge other than the Published Connection Charge; and
 - (B) which were Connected within 20 Working Days of the date the request was received, and which were not; and
 - (C) which were not Connected in that Quarter, despite a Premises Connection Request.
 - 7.3.7 any other evidence, either documentary or demonstrative, as the Minister may in his discretion require, relating to the implementation of the eir Deployment. eir shall fully cooperate with the Minister in such request and promptly provide all reasonably requested further information or clarification accurately and in an efficient and timely manner.
- 7.4 Unless otherwise agreed in writing by the Minister, for the period of twenty five (25) years following the end of the Term ("**Post Term Reporting Period**"), eir shall continue to submit to the Minister at the end of each Quarter a written progress report containing the following information:

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- 7.4.1 the number of orders received from Service Providers in each month of that Quarter in respect of the eir Deployment Area; and
- 7.4.2 a detailed breakdown of the Eircodes of the Premises in the eir Deployment Area for which a Premises Connection Request has been placed in that Quarter:
- (A) which were Connected at the Published Connection Charge, and which were Connected at a connection charge other than the Published Connection Charge; and
 - (B) which were Connected within 20 Working Days of the date the request was received, and which were not; and
 - (C) which were not Connected in that Quarter, despite a Premises Connection Request.

The Parties agree that in respect of any claim that the Minister may have against eir in connection with an obligation of eir under clause 7.4 which arises during the Post Term Reporting Period, the limit per claim under the indemnity in clause 9.1.10 will be reduced to [REDACTED] in respect of that claim only and the total cap under the indemnity in clause 9.1.10 will be reduced to [REDACTED] in respect of all such claims.

8 EIR NOTIFICATION OF DELAY AND BACKSTOP PLAN

- 8.1 If, at any time during the Term, eir becomes aware that a Delay will (or is likely to) occur, it shall promptly and without delay notify the Minister of the fact of the Delay, the reasons for the Delay, the consequences of the Delay for the rest of the eir Deployment, and how eir proposes to mitigate the Delay.
- 8.2 Without limiting clause 8.1, if a Delay with respect to eir's obligation to Pass the specific Premises that eir has identified by Eircode and committed to Pass in a Quarter pursuant to the eir Project Plan is likely to continue for a period of six months after the applicable Milestone Date, eir shall, no later than the date that is five months after the applicable Milestone Date, submit a detailed remedial plan (including timeframes) to the Minister setting out the measures to be taken by eir to Pass, by a specified date (or dates) agreed on a case-by-case basis in the Backstop Plan (each a "**Backstop Date**"), all of the specific Premises eir has identified by Eircode and committed to Pass in a particular Quarter that are the subject of the Delay (each a "**Backstop Plan**"). A Backstop Date shall in no event be later than 30 June 2019. The proposed Backstop Plan and Backstop Dates, and any amendments to them required by the Minister, shall be agreed in writing by the Parties (and shall not apply until so agreed). The agreement of a Backstop Plan shall not be treated as a change to the eir Project Plan for the purposes of clauses 6.3 and 9.

9 MINISTER'S RIGHT TO CHANGE INTERVENTION AREA

- 9.1 If:
- 9.1.1 by:
 - (A) 31 March 2017 eir has not Passed:

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- (i) 100% of the Required Number of Upcoming Premises it has committed to Pass under the eir Project Plan by that date (regardless of the cause); or
- (ii) at least 70% of the specific Premises it has identified by Eircode and committed to Pass under the eir Project Plan by that date (regardless of the cause),

and that Delay continues for a period of six months after the applicable Milestone Date; or

(B) by 30 June 2017 eir has not Passed:

- (i) 100% of the Required Number of Upcoming Premises it has committed to Pass under the eir Project Plan for that Quarter (regardless of the cause); or
- (ii) at least 75% of the specific Premises it has identified by Eircode and committed to Pass under the eir Project Plan for that Quarter (regardless of the cause),

and that Delay continues for a period of six months after the applicable Milestone Date; or

(C) by the end of any Quarter subsequent to 30 June 2017 eir has not Passed:

- (i) 100% of the total aggregate number of Required Number of Upcoming Premises it has committed to Pass under the eir Project Plan from the Effective Date up to and including the end of that Quarter (regardless of the cause); or
- (ii) at least 75% of the specific Premises it has identified by Eircode and committed to Pass under the eir Project Plan for that Quarter (regardless of the cause),

and that Delay continues for a period of six months after the applicable Milestone Date; or

9.1.2 eir has not Passed (regardless of the cause) 100% of the specific Premises that eir has identified by Eircode and committed to Pass in a Quarter pursuant to the eir Project Plan ("**Specific Premises**") by the applicable Backstop Date relating to those Specific Premises, as set out in a Backstop Plan agreed in writing by the Parties; or

9.1.3 subject to clauses 4.2 to 4.4, at the end of a Quarter eir is in breach of all or any part of its Connection commitments under clause 4.1.3; or

9.1.4 subject to clauses 4.2 to 4.4,, eir is in breach of all or any part of its commitments for New Build Premises under clause 4.1.4; or

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- 9.1.5 eir fails to submit, to the Minister's satisfaction, complete, accurate and comprehensive information:
- (A) within 10 Working Days after the applicable submission date set out in the table in clause 6.2; or
 - (B) within 10 Working Days after the date of a request by the Minister under clause 6.5.6; or
- 9.1.6 the Minister (or the Minister's Representative) under clause 6.5 rejects eir's submitted supplements or proposed changes to the eir Project Plan; or
- 9.1.7 supplements to the eir Project Plan (including any of the Milestone Dates or sub-milestone dates) have not been submitted for approval by the Minister under clause 6.4 within 20 Working Days after the applicable submission date set out in the table in clause 6.2; or
- 9.1.8 the Minister terminates the Agreement (in whole or in part) under clause 12,

then the Minister may:

- 9.1.9 in his discretion:
- (A) intervene in the eir Deployment Area in relation to any Premises affected in connection with or that is the subject of any of clauses 9.1.1 to 9.1.8 ("**Affected Premises**"); and/or
 - (B) change the High Speed Broadband Map to incorporate back within the Intervention Area either some or all of the Affected Premises and/or some or all of the Premises not yet Passed by eir within the eir Deployment Area; and/or
 - (C) invite a third party operator to complete deployment of backhaul and a High Speed Broadband Services network to either some or all of the Affected Premises or some or all of the Premises not yet Passed by eir within the eir Deployment Area,

and the Minister may act or omit to act in accordance with clause 9.1.9 any number of times, including in individual stages, successive stages, cumulatively, or by any combination of the foregoing; and/or

- 9.1.10 in his discretion require eir to reimburse the Minister on an indemnity basis for any reasonable costs, expenses and charges that the Minister suffers or incurs arising out of, or as a consequence of, any Delay and/or the Minister acting under clause 9.1.9, which shall be limited to [REDACTED] per claim (and up to a maximum of [REDACTED] in aggregate).

- 9.2 If the Minister exercises his rights pursuant to clause 9.1, eir must continue to fully comply with its Connection commitments under clauses 4.1.3 and 4.1.4 in respect of the Premises that it has Passed and in respect of those Premises which remain to be Passed by eir under this Agreement, aside from the specific Affected

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Premises falling within clause 9.1.9(C) in respect of which the Minister has exercised his rights under that provision.

9.3 The Minister may not invoke clause 9.1 in respect of specific Premises where eir fails to successfully Pass the Premises because there is an existing High Speed Broadband Services network built, or being built, by another commercial operator that is not an Associated Company of eir, or another commercial operator that is not an Associated Company of eir has independently developed concrete plans to build a High Speed Broadband Services network in that area. In such cases, but only if requested by the Minister, eir must provide written evidence of the existence of the other commercial operator's deployment (or planned deployment) to the reasonable satisfaction of the Minister. Once the Minister is satisfied he may agree to amend the eir Deployment Area accordingly.

9.4 For the avoidance of doubt:

9.4.1 the decisions of the Minister under clause 9 are final and conclusive;

9.4.2 the Minister may only invoke clause 9.1 acting in a reasonable and proportionate manner, taking into account both the magnitude of any Delay and all the circumstances surrounding any breach or default by eir;

9.4.3 if the Minister intervenes in relation to any of the Affected Premises pursuant to clause 9.1, eir shall not be required to indemnify the Minister in respect of any State aid that the Minister pays to any third party operator to complete the Affected Premises; and

9.4.4 nothing in this clause 9 (apart from clause 9.1.9(C) but then only to the extent of the specific Affected Premises in respect of which the Minister has exercised his rights under that provision),

relieves eir from its obligations to complete the remainder of the eir Deployment or from any other liability or obligation under this Agreement.

10 REGULATOR DECISIONS

10.1 eir acknowledges and agrees that the eir Deployment and all products and pricing that eir offers to supply over any fibre backhaul and High Speed Broadband Services network forming part of the eir Deployment Area are, without limitation, subject to:

10.1.1 the 2010 WPNIA Decision, as amended by the 2013 NGA Decision;

10.1.2 the 2011 WBA Decision, as amended by the 2013 NGA Decision;

10.1.3 the 2016 WFAS Decision;

10.1.4 any amendments, corrections, revocations, revisions or updates the Regulator makes after the Effective Date to the decisions referred to in clauses 10.1.1 to 10.1.3; and

10.1.5 any decision issued by the Regulator after the Effective Date requiring eir to comply with or adhere to particular conditions or requirements in relation to:

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- (A) access to;
- (B) the price of; and/or
- (C) the product and service performance specification, performance levels and/or other requirements and characteristics of,

an electronic communications product, network or service in the eir Deployment Area.

(the “**Regulator Decisions**”).

11 CONFIDENTIALITY

11.1 Except to the extent set out in the provisions of this clause 11 or to the extent disclosure is expressly permitted elsewhere in this Agreement, a Party shall:

11.1.1 treat the other Party's Confidential Information as confidential and keep it secure and safeguarded accordingly; and

11.1.2 not disclose the other Party's Confidential Information to any other person without the other Party's prior written consent.

11.2 Each Party shall:

11.2.1 ensure that other Party's Confidential Information is used only for the purposes of this Agreement; and

11.2.2 promptly notify the other Party in writing if it suspects or becomes aware of any unauthorised access, copying, compromise, use or disclosure in any form of any of the first Party's Confidential Information.

11.3 This clause 11 shall, subject to clause 11.4, not apply to the extent that:

11.3.1 such disclosure is a requirement of Irish Law placed upon the Party making the disclosure, including any requirements for disclosure under the FOI Act or Environmental Information Regulations;

11.3.2 such information was in the possession of the Party making the disclosure without obligation of confidentiality prior to its disclosure by the information owner;

11.3.3 such information was obtained from a third party without obligation of confidentiality;

11.3.4 such information was already in the public domain at the time of disclosure otherwise than by a breach of this Agreement or other duty of confidentiality; or

11.3.5 it is independently developed without access to the other Party's Confidential Information.

11.4 If eir is required by Irish Law to make a disclosure of the Minister's Confidential Information, eir shall:

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- 11.4.1 take reasonable steps to limit the extent of the Confidential Information being disclosed;
 - 11.4.2 as soon as reasonably practicable and to the extent permitted by Irish Law notify the Minister of the full circumstances of the required disclosure including the relevant Law and/or Regulatory Body requiring such disclosure and the Confidential Information to which such disclosure would apply; and
 - 11.4.3 assist the Minister in taking steps to prevent or reduce the extent of the Confidential Information to be disclosed.
- 11.5 Nothing in this Agreement prevents the Minister from disclosing eir's Confidential Information:
- 11.5.1 to the Regulator;
 - 11.5.2 pursuant to the Minister's rights under clause 4.1.8 of this Agreement, except that the Minister right is subject always to the restrictions in clause 4.1.8(A);
 - 11.5.3 in the case of the Minister or the Regulator, to the European Commission in connection with State aid or any related investigation;
 - 11.5.4 to the Oireachtas and Oireachtas Committees or if required by any Oireachtas reporting requirement;
 - 11.5.5 to any consultant, professional adviser, or other person engaged by the Minister or Regulator for any purpose in relation to this Agreement or the performance of its functions and duties under Law, on terms no less stringent than those placed on the Minister under this clause 11;
 - 11.5.6 for any examination or report by the Office of the Comptroller & Auditor General or Public Accounts Committee relating to the efficiency, economy, and effectiveness with which the Minister has used its resources; or
 - 11.5.7 for the purpose of public consultation or publishing information, updates or reports about the eir Deployment (other than financial and/or economic information relating to eir which eir, acting reasonably, indicates is commercially sensitive information) as the Minister may deem appropriate from time to time.
- 11.6 Despite any other provision of this Agreement, eir consents to the Minister publishing to the general public this Agreement (including the eir Project Plan and all of its Annexes) in its entirety but with any 'exempt records' (as that term is defined in the FOI Act) redacted. The Minister shall determine whether any of the content of this Agreement is exempt from disclosure in accordance with the FOI Act. The Minister may consult with eir to inform its decision regarding any redactions but shall have the final decision in its discretion. eir shall assist and cooperate with the Minister to enable the Minister to publish this Agreement.
- 11.7 eir acknowledges and agrees that a breach of this clause 11 may cause irreparable harm to the Minister, for which monetary damages would be inadequate, and that the Minister shall be entitled to the remedies of injunction,

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specific performance and/or other equitable relief for any threatened or actual default of this clause 11.

12 TERMINATION

12.1 If a Party commits a material breach of this Agreement and does not remedy the breach within 30 days of receiving a notice to do so, then the other Party may terminate this Agreement.

12.2 Without prejudice to its rights under clause 12.1, the Minister may terminate this Agreement (in whole or in part) at any time immediately:

12.2.1 if required by Legal Requirements; or

12.2.2 if eir suffers, or the Minister reasonably believes that eir is about to suffer, an Insolvency Event.

12.3 The Parties' rights of termination are exhaustively set out in this clause 12.

12.4 Notwithstanding the expiry or termination of this Agreement for any reason:

12.4.1 clauses 4 (eir's Commitments), 7.4 (Progress Meetings and Reporting by eir), 9 (Minister's Right to Change Intervention Area), 11 (Confidentiality), 15 (Disputes) and 16 (General) continue in full force and effect; and

12.4.2 eir acknowledges and agrees that the Minister may monitor and take enforcement action in respect of eir's compliance with any or all of eir's obligations under this Agreement that continue after the end of the Term.

13 REPRESENTATIVES

13.1 The Parties agree that:

13.1.1 the Minister shall throughout the Term appoint a Minister's Representative; and

13.1.2 eir shall throughout the Term appoint an eir Representative,

who shall have authority to act on behalf of the respective Party on the matters set out in, or in connection with, this Agreement.

13.2 eir shall ensure that the eir Representative is sufficiently senior within its organisation and is granted sufficient authority by eir, to ensure full cooperation in relation to the operation and the management of this Agreement.

13.3 eir shall ensure that the eir Representative is available on request for consultation and engagement with the Minister and/or Minister's Representative on Working Days throughout the Term. The Minister may require specific eir personnel to consult and attend meetings with the Minister and/or Minister's Representative. For example, the eir Director of Field Operations and the eir representative with overall responsible for the eir Deployment Plan are required to attend the meetings under clause 7.2.

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- 13.4 The Minister shall notify eir of the identity of the initial Minister's Representative within five Working Days of the Effective Date. The Minister may, by written notice to eir, revoke or amend the authority of the Minister's Representative or appoint a new Minister's Representative. If, at any time, there is no Minister's Representative, the Minister may carry out the functions that would otherwise be performed by the Minister's Representative.
- 13.5 The Minister and Minister's Representative is entitled to treat any act of the eir Representative in connection with this Agreement as being expressly authorised by eir without any requirement to determine whether any express authority has in fact been given.
- 13.6 Except as notified by the Minister to eir in writing, eir is entitled to treat any act of Minister's Representative in connection with this Agreement as being expressly authorised by the Minister without any requirement to determine whether any express authority has in fact been given.
- 13.7 The Minister is entitled from time to time to appoint any person or persons to act on behalf of the Minister's Representative either generally in respect of this Agreement or specifically in respect of any particular clause and any act of such person within the scope of their authority constitutes, for the purposes of this Agreement, an act of the Minister's Representative.
- 13.8 eir shall send all requirements and correspondence in relation to this Agreement to the Minister's Representative or their nominee.
- 13.9 Any decision by the Minister's Representative is specific to the circumstances to which it relates, and does not bind or limit the Minister or Minister's Representative in respect of any other decision to be made by the Minister or Minister's Representative in the same or similar circumstances or otherwise.
- 13.10 The Minister's Representative is entitled to consult anyone he or she considers appropriate in connection with the discharge of his or her duties in relation to this Agreement.

14 NOTICES

- 14.1 Any notice under or in connection with this Agreement must be in writing in the English language and must be delivered by hand or sent by pre-paid registered or recorded delivery post to the Party intended to receive the notice at its address set out in clause 14.2.
- 14.2 Any notice is deemed to have been duly given and received
- 14.2.1 if delivered by hand, when left at the address referred to in clause 14.3;
or
- 14.2.2 if sent by mail within Ireland, two days after posting it to the address referred to in clause 14.3.

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14.3 Each Party's address for service is:

	Minister	eir
Address:	29 Adelaide Road Dublin 2 Ireland D02 X285	1 Heuston South Quarter St John's Road Dublin 8 Ireland D08 A9RT
Addressed to:	Minister's Representative	Company Secretary and to the eir Representative
With a copy to:	Assistant Secretary General of the Department	Managing Director of open eir

14.4 A Party may, by written notice, notify the other of any change to its address for service.

15 DISPUTE RESOLUTION

15.1 The Parties shall use all reasonable endeavours to settle promptly any Dispute between them as soon as possible:

15.1.1 in good faith;

15.1.2 acting reasonably; and

15.1.3 in accordance with the procedure set out in this clause 15.

15.2 For the purpose of this clause 15, a Dispute shall be deemed to have arisen when a Party serves on the other Party a notice in writing stating the nature of the Dispute.

15.3 Any Dispute between the Parties shall be resolved by reference to the dispute resolution escalation procedure outlined below:

Stage	Representative
1	The Minister's Representative and eir Representative (or a nominee of either of them).
2	Reference to a representative of the Minister and eir who both hold a more senior position than the Minister's Representative and eir Representative (or a nominee of either of them).
3	Reference to the Minister and eir's chief executive (or a nominee of either of them).
4	The Courts of Ireland.

15.4 The Parties agree that if a Dispute is not resolved within a period of ten Working Days of the referral of such Dispute to any stage, as set out above, such dispute

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shall be escalated to the next stage. All periods specified in this clause 15 shall be extendable by mutual written agreement.

- 15.5 eir may only commence Court proceedings for the determination of a Dispute after the Dispute has been referred to stage 4 and it is apparent that the Parties are unable to resolve the Dispute.
- 15.6 During any Dispute, the Parties agree that they shall continue their performance of their obligations under this Agreement.
- 15.7 Nothing contained in this clause 15 restricts the Minister's freedom to commence legal proceedings where such proceedings are required urgently to protect any rights in Confidential Information or to otherwise prevent the threat of irreparable harm.

16 GENERAL

- 16.1 Without prejudice to clause 6.4, this Agreement may only be varied by written agreement by the duly authorised Minister's Representative and eir Representative.
- 16.2 Each Party shall bear its own costs and expenses in relation to the preparation, execution and implementation of this Agreement including all costs, legal payments and other expenses so incurred.
- 16.3 This Agreement may be executed in any number of counterparts, each of which, when executed, is an original. Those counterparts together make one instrument. This Agreement shall only be binding when it is signed and delivered by both Parties.
- 16.4 Nothing in this Agreement is intended to constitute a joint venture, fiduciary relationship or an agency, partnership or trust, and no Party has authority to bind any other Party.
- 16.5 Subject to clauses 4.1.8 and 11, no media releases, public announcements nor public disclosures relating to this Agreement or its subject matter, including but not limited to promotional, advertising or marketing material, may be made by either Party without the prior written consent of the other.
- 16.6 Each Party will from time, to time upon the request of the other Party, execute any additional documents and do any other acts or things which may reasonably be required to implement the provisions or the purposes of this Agreement.
- 16.7 Neither Party is entitled to novate, assign, transfer or otherwise dispose of this Agreement (in whole or in part), nor any of its rights or obligations under it, to any extent without the prior written consent of the other Party.
- 16.8 If any provisions of the Agreement is held by any court of competent jurisdiction or other competent authority to be unenforceable, illegal or void in whole or in part, then such part may be severed by the relevant court or competent authority from the remainder of the Agreement which will remain in full force and effect to the fullest extent permitted by Law.

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- 16.9 A right created by this Agreement may only be waived in writing by the Party giving the waiver, and the failure to exercise or any delay in exercising a right or remedy provided by this Agreement or by law does not waive the right or remedy.
- 16.10 Unless a right or remedy of the Minister is expressed to be an exclusive right or remedy, the exercise of it by the Minister does not limit or affect the Ministers' other rights and remedies under this Agreement or Law.
- 16.11 The rights and remedies of the Minister provided by this Agreement are cumulative and, except to the extent expressly provided otherwise in this Agreement, are not exclusive of any right or remedy of the Minister provided at Law or in equity or otherwise under this Agreement.
- 16.12 This Agreement and all non-contractual obligations arising from or connected with them shall be governed by and construed in accordance with, and all Disputes between the Parties arising out of or in any way relating to this Agreement or any Disputes between the Parties in any way connected with the subject matter of this Agreement (whether contractual or non-contractual) shall be governed by, the laws of Ireland. Each Party submits to the exclusive jurisdiction of the Irish Courts. Nothing contained in this clause shall limit the right of the Minister to bring enforcement proceedings in another jurisdiction on foot of an Irish Order or to seek interim, protective or provisional relief in the courts of another jurisdiction.

In **WITNESS WHEREOF** the Parties have signed this Agreement as a Deed on the date first above written.

SCHEDULE 1- EIR PROJECT PLAN

1. PROJECT PLAN**1.1 Scope**

- 1.1.1 This Schedule sets out eir's project plan for the eir Deployment.
- 1.1.2 The complete list of existing Premises that eir has committed to Pass under this Agreement is set out in Annex 1 to this Schedule 1.
- 1.1.3 The list of Premises that eir has committed to Pass under this Agreement during each month of the Term is set out in Annex 2 to this Schedule 1.
- 1.1.4 The eir Project Plan shall be supplemented in writing each Quarter in accordance with clauses 6.2 to 6.6 of the Agreement.

1.2 Quarterly Milestone Dates

- 1.2.1 Subject to the terms of the Agreement, as at the Effective Date the Minister has confirmed that eir has met Milestone 1 and the Minister's decision is pending on whether eir has met Milestone 2. Subject to the terms of the Agreement, on and from the Effective Date eir shall meet the Milestones 3 to 9, as set out in the table below:

Milestone Number	Quarter	Milestone Date	Required Number of Premises that eir shall Pass in that Quarter by the Milestone Date	Cumulative Number of Premises
1	1 October 2016 – 31 December 2016	31 December 2016	10,000	10,000
2	1 January 2017 – 31 March 2017	31 March 2017	30,000	40,000
3	1 April 2017 – 30 June 2017	30 June 2017	30,000	70,000
4	1 July 2017 – 30 September 2017	30 September 2017	31,000	101,000
5	1 October 2017 – 31 December 2017	31 December 2017	31,000	132,000
6	1 January 2018 – 31 March 2018	31 March 2018	38,000	170,000
7	1 April 2018 – 30 June 2018	30 June 2018	44,000	214,000
8	1 July 2018 – 30 September 2018	30 September 2018	44,000	258,000
9	1 October 2018 – 31 December 2018	31 December 2018	42,575	300,575

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1.3 Sub-milestone Definitions

The following sub-milestone definitions are used in the eir Deployment:

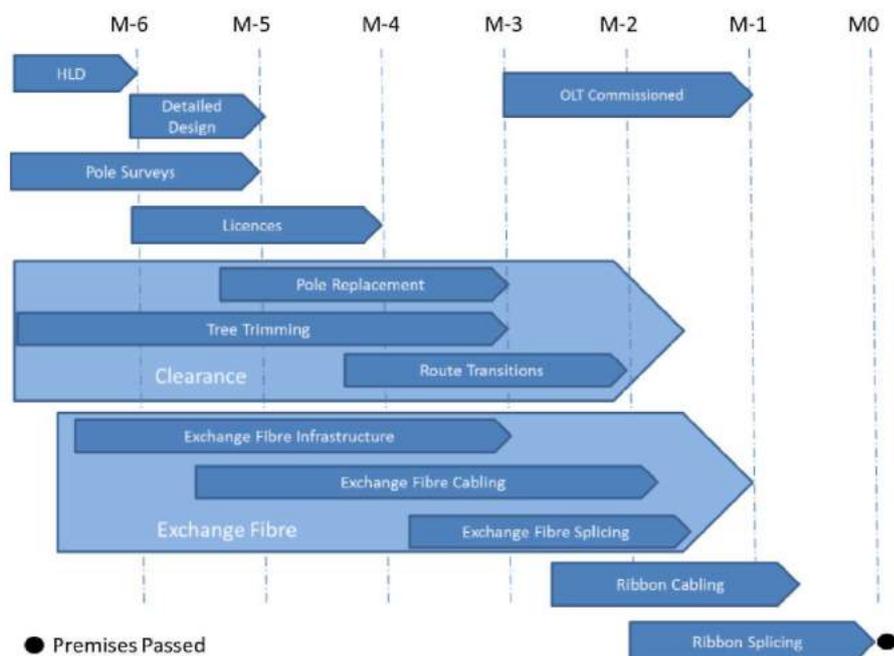
- 1.3.1 **ODN HLD** - the high level design (HLD) for the optical distribution network (ODN). This shall be done at an exchange level. This activity is completed on an exchange area basis.
- 1.3.2 **Detailed Design** - completion of detailed design activity required to install the necessary infrastructure up to the Fibre Distribution Point (FDP) for a Premises. This detailed design includes bill of materials, work instructions, drawings and splicing matrices. This activity is completed on a ribbon basis, including all infrastructure network elements enabling connectivity from the OLT to the Premises' serving Fibre Distribution Point (FDP).
- 1.3.3 **Pole Survey** - completion of pole testing activities to identify poles that need remediation in advance of aerial cable erection. This activity is completed on an exchange area basis.
- 1.3.4 **T1/T2 Licence Approvals** – agreement with the relevant local authority for the implementation of a streamlined licensing agreement to excavate roadway/footway/verge to facilitate the installation of new underground infrastructure where applicable and/or to clear blockages encountered during sub-ducting/cabling of existing underground infrastructure. This activity is completed on an exchange area basis.
- 1.3.5 **Tree Trimming** - completion of all tree trimming activity necessary to facilitate aerial cable erection. This activity is completed on an exchange area basis.
- 1.3.6 **Pole Replacement** - completion of the replacement of poles identified as part of the Pole Survey as requiring remediation in advance of aerial cable erection. This activity is completed on an exchange area basis.
- 1.3.7 **Route Preparation - Transitions** - completion of sub-duct installation in underground sections that are located in the midst of aerial cable routes. This activity is completed on an exchange area basis.
- 1.3.8 **Clearing and Preparation** - completion of all three sub-milestones set out in sections 1.3.5 - 1.3.7 above. (i.e. Tree Trimming, Pole Replacement and Route Preparation – Transitions).
- 1.3.9 **OLT commissioned** - completion of the installation and commissioning of Optical Line Terminal equipment in the exchange and all associated core IP and core transmission that serves the fibre-to-the-home/eVDSL distribution network for a particular Premises. This activity is completed per exchange.
- 1.3.10 **Exchange Feeder Fibre** - completion of the following three separate tasks. All tasks, and completion of this sub-milestone is tracked at an exchange basis:
 - Exchange Subduct – completion of the provision of feeder fibre subducting from the ODF within the exchange to the point where the individual ribbons commence.

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- Exchange Cabling – completion of the provision of feeder fibre cabling from the exchange to the point where the individual ribbons commence.
 - Exchange Splicing – completion of the splicing of the fibre cable from the exchange to the point where the individual ribbons commence.
- 1.3.11 **Ribbon Cabling** - completion of ribbon cabling from the beginning of a fibre ribbon to the FDPs located on that ribbon. This cabling does not include the fibre cabling from the exchange to the beginning of the individual ribbons, which can be in-situ from a previous fibre deployment or is provided separately on an exchange basis if not in-situ
- 1.3.12 **Ribbon Splicing** - completion of ribbon splicing on all the ribbon cabling installed including the erection and splicing of the FDPs. This activity is completed on a ribbon basis.
- 1.3.13 **APQ File for Premises Passed** - each individual Premises is loaded onto the advance pre-qualification file (APQ) when it is confirmed that the Premises is passed from the Fibre Distribution Point. This confirms that a Premises is passed from the FDP through the ODN back to the OLT and service can be connected on receipt of an order.

1.4 Phases for sub-milestones

The diagram below illustrates the sequence in which eir shall phase each sub-milestone in order to allow eir to meet each Milestone Date:



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1.5 Sub-milestone completion dates

1.5.1 In respect of the Initial Premises, eir shall complete the sub-milestones in accordance with the following table:

Milestone:	Sub-milestone	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
		March '17 40,000	ODN HLD	40,000	40,000	40,000				
	Detailed Design	40,000	40,000	40,000						
	Pole Surveys	40,000	40,000	40,000						
	TI/T2 Approvals	40,000	40,000	40,000						
	Tree Trimming	40,000	40,000	40,000						
	Poles Replacement	40,000	40,000	40,000						
	Route Preparation - Transitions	39,000	40,000	40,000						
	Clearance & Preparation	39,000	40,000	40,000						
	OLT commissioned	40,000	40,000	40,000						
	Exchange Fibre	25,000	35,000	40,000						
	Ribbon Cabling	25,000	35,000	40,000						
	Ribbon Splicing	20,000	30,000	40,000						
	Premises Passed	20,000	30,000	40,000						
Milestone:	Sub-milestone	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
		June '17 30,000	ODN HLD	30,000	30,000	30,000	30,000	30,000	30,000	
	Detailed Design	30,000	30,000	30,000	30,000	30,000	30,000			
	Pole Surveys	30,000	30,000	30,000	30,000	30,000	30,000			
	TI/T2 Approvals	30,000	30,000	30,000	30,000	30,000	30,000			
	Tree Trimming	30,000	30,000	30,000	30,000	30,000	30,000			
	Poles Replacement	29,000	30,000	30,000	30,000	30,000	30,000			
	Route Preparation - Transitions	-	10,000	20,000	30,000	30,000	30,000			
	Clearance & Preparation	-	10,000	20,000	30,000	30,000	30,000			
	OLT commissioned	27,000	30,000	30,000	30,000	30,000	30,000			
	Exchange Fibre			8,000	30,000	30,000	30,000			
	Ribbon Cabling			8,000	18,000	30,000	30,000			
	Ribbon Splicing	-	-	-	8,000	18,000	30,000			
	Premises Passed	-	-	-	8,000	18,000	30,000			
Milestone:	Sub-milestone	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
		September '17 31,000	ODN HLD	29,000	31,000	31,000	31,000	31,000	31,000	31,000
	Detailed Design	10,000	20,000	30,000	31,000	31,000	31,000	31,000	31,000	31,000
	Pole Surveys	14,000	24,000	31,000	31,000	31,000	31,000	31,000	31,000	31,000
	TI/T2 Approvals	5,000	15,000	25,000	31,000	31,000	31,000	31,000	31,000	31,000
	Tree Trimming	10,000	31,000	31,000	31,000	31,000	31,000	31,000	31,000	31,000
	Poles Replacement	-	9,000	19,000	29,000	31,000	31,000	31,000	31,000	31,000
	Route Preparation - Transitions	-	-	-	-	11,000	21,000	31,000	31,000	31,000
	Clearance & Preparation					11,000	21,000	31,000	31,000	31,000
	OLT commissioned	-	11,000	24,000	31,000	31,000	31,000	31,000	31,000	31,000
	Exchange Fibre						10,000	20,000	31,000	31,000
	Ribbon Cabling						10,000	20,000	31,000	31,000
	Ribbon Splicing	-	-	-	-	-	-	10,000	20,000	31,000
	Premises Passed	-	-	-	-	-	-	10,000	20,000	31,000

1.5.2 In respect of the Upcoming Premises, eir shall complete the sub-milestones by the dates set out in the written supplements to the eir Project Plan that the Minister approves under clause 6.4 of the Agreement.

1.5.3 eir's Representative shall report to the Minister on a monthly basis in accordance with section 2.3 of this Schedule regarding eir's progress against each of the sub-milestones.

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1.6 Sub-milestones volumes

eir's overall project level plan showing the aggregate sub-milestone volumes required to complete eir Deployment by the Milestone Dates is as follows:

Activity	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
ODN HLD	99,000	109,000	119,000	129,000	141,000	154,000	167,000	180,000	193,000	207,000	222,000	237,000
Detailed Design	80,000	90,000	100,000	110,000	120,000	131,000	144,000	157,000	170,000	183,000	198,000	212,000
Pole Surveys	84,000	94,000	104,000	114,000	124,000	134,000	144,000	157,000	170,000	183,000	195,000	208,000
T1/T2 Approvals	75,000	85,000	95,000	105,000	115,000	125,000	135,000	145,000	157,000	170,000	183,000	196,000
Tree Trimming	80,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	145,000	170,000	195,000	220,000
Poles Replacement	69,000	79,000	89,000	99,000	109,000	119,000	129,000	139,000	149,000	162,000	175,000	187,000
Route Preparation - Transitions	39,000	50,000	60,000	70,000	81,000	91,000	101,000	112,000	122,000	132,000	145,000	158,000
Clearance & Preparation	39,000	50,000	60,000	70,000	81,000	91,000	101,000	112,000	122,000	132,000	145,000	158,000
OLT commissioned	67,000	81,000	94,000	108,000	122,000	135,000	149,000	163,000	177,000	190,000	204,000	218,000
Exchange Fibre	30,000	40,000	48,000	58,000	70,000	80,000	90,000	101,000	111,000	121,000	132,000	144,000
Ribbon Cabling	30,000	40,000	48,000	58,000	70,000	80,000	90,000	101,000	111,000	121,000	132,000	144,000
Ribbon Splicing	20,000	30,000	40,000	48,000	58,000	70,000	80,000	90,000	101,000	111,000	121,000	132,000
Premises Passed	20,000	30,000	40,000	48,000	58,000	70,000	80,000	90,000	101,000	111,000	121,000	132,000

Activity	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
ODN HLD	251,000	266,000	281,000	295,000	300,575	-	-	-	-	-	-	-
Detailed Design	227,000	242,000	256,000	271,000	286,000	300,575	-	-	-	-	-	-
Pole Surveys	221,000	234,000	246,000	259,000	272,000	284,000	297,000	300,575	-	-	-	-
T1/T2 Approvals	209,000	222,000	235,000	248,000	261,000	274,000	287,000	300,575	-	-	-	-
Tree Trimming	250,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	300,575	-	-	-
Poles Replacement	200,000	213,000	226,000	238,000	251,000	264,000	276,000	289,000	300,575	-	-	-
Route Preparation - Transitions	171,000	185,000	200,000	215,000	229,000	244,000	259,000	273,000	288,000	300,575	-	-
Clearance & Preparation	171,000	185,000	200,000	215,000	229,000	244,000	259,000	273,000	288,000	300,575	-	-
OLT commissioned	231,000	245,000	259,000	273,000	286,000	300,575	-	-	-	-	-	-
Exchange Fibre	157,000	170,000	185,000	199,000	214,000	229,000	243,000	258,000	273,000	287,000	300,575	-
Ribbon Cabling	157,000	170,000	185,000	199,000	214,000	229,000	243,000	258,000	273,000	287,000	300,575	-
Ribbon Splicing	144,000	157,000	170,000	185,000	199,000	214,000	229,000	243,000	258,000	273,000	287,000	300,575
Premises Passed	144,000	157,000	170,000	185,000	199,000	214,000	229,000	243,000	258,000	273,000	287,000	300,575

2. EIR DEPLOYMENT REPORTING

2.1 Quarterly Deliveries Record

2.1.1 Within 10 Working Days of the end of each Quarter, eir shall submit to the Minister's Representative a report, in a format to the satisfaction of the Minister's Representative, showing the Premises Passed during that Quarter. Such report will be able to be searched by Eircode.

2.1.2 The format for this report is set out below and shall be referred to in monthly reports as 'Month Year Annex 2 Report'.

GeoDirectory BUILDING ID	EIRCODE	Res Del Pts	Comm Del Pts	Total Del Pts	Exch Code	Exchange Name	On Pre_qual	Milestone Date Actual
XXXX		1	0	1	XXX	XXXXX	1	XXX

2.2 Quarterly Milestone Status

eir shall complete the following table and submit it Quarterly as part of the monthly report that eir is required to provide the Minister under clause 7.3 of the Agreement. This table will demonstrate eir's ability to meet its committed Milestone numbers for Premises Passed:

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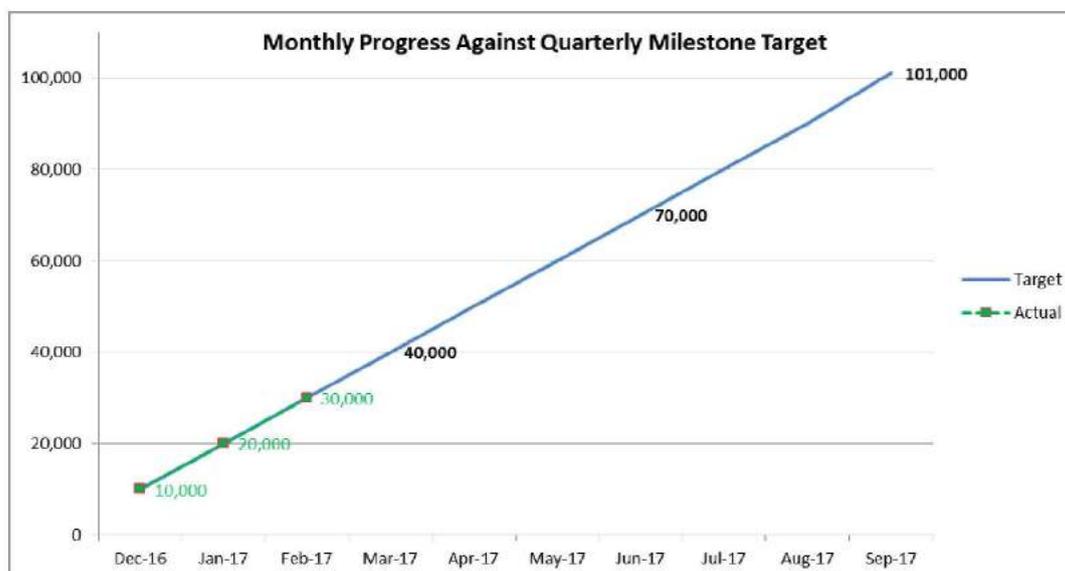
Milestone Date	Required Number of Premises eir shall Pass	Actual Number Premises Passed by eir during that Quarter	Cumulative Number of Premises Passed by eir to date
31st December 2016	10,000		
31st March 2017	30,000		
30th June 2017	30,000		
30th September 2017	31,000		
31st December 2017	31,000		
31st March 2018	38,000		
30th June 2018	44,000		
30th September 2018	44,000		
31st December 2018	42,575		

2.3 Monthly progress reports

2.3.1 Within 5 Working Days of the end of each calendar month, eir shall submit to the Minister's Representative a report, in a format to the satisfaction of the Minister's Representative, showing eir's progress towards completing each sub-milestone, eir's progress towards achieving each Milestone Date, the progress of the actual eir Deployment achieved versus the eir Deployment Plan during the previous month.

2.3.2 eir shall report on the progress of the overall eir Deployment against the eir Project Plan, the progress of the Milestones against the eir Project Plan and the progress against each Quarterly plan. Without limiting section 2.3.1 of this Schedule, example extracts from the monthly progress report are set out below:

(A) Page 1 – An overview of Premises Passed versus the target



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2.4 Reports on Order and Premises Connection Requests

2.4.1 Within 24 weeks from the Effective Date, eir shall submit monthly and Quarterly (as required) the following information as part of the reports that eir is required to provide the Minister under this Agreement:

- (A) Report A - the number of orders and number of Premises Connection Requests that eir has received from Service Providers in that month (in respect of the monthly reports) and in each month of that Quarter (in respect of the Quarterly reports); and
- (B) Report B - for all Premises Connection Requests that were completed in the previous month, a report detailing eir's achievement and non-achievement of Premises Connected under clauses 4.1.3(B) and 4.1.3(C) of the Agreement; and
- (C) Report C - a list of all Premises which were not Connected in that in that month (in respect of the monthly reports) and in that Quarter (in respect of the Quarterly reports), despite a Premises Connection Request; and
- (D) Report D - eir will report qualitatively and, where appropriate quantitatively, on operational in life issues experienced by Service Providers describing any material issue a Service Provider has with its use of the High Speed Broadband Services or difficulties a Service Provider has with placing an order(s) and the remedial action eir is taking with that Service Provider pursuant to the service improvement plan agreed with the Service Provider.

3. REVIEW MEETINGS

3.1 Monthly Review Meetings

3.1.1 The eir Representative shall meet with the Minister's Representative each calendar month during the Term (or at another frequency the Minister's Representative specifies).

3.1.2 The purpose of the meeting is to review eir's monthly reports, allow eir to explain the progress of the eir Deployment against each project deliverable, any issues that eir is encountering in connection with the eir Deployment, exceptions and associated risks and overall progress of the eir Deployment.

3.1.3 This meeting will be conducted within 5 Working Days of the production of eir's monthly report.

3.2 Quarterly Review Meetings

3.2.1 The eir Representative shall meet with the Minister's Representative each Quarter during the Term (or at another frequency the Minister's Representative specifies).

3.2.2 The purpose of the meeting is to review and discuss eir's Quarterly report, eir's performance of its obligations under this Agreement and the progress of the eir Deployment against the eir Project Plan and applicable Milestone

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Dates, including, for example, reviewing the actual eir Deployment achieved versus the eir Deployment Plan.

3.2.3 At the Quarterly meeting the parties shall also review and agree on a plan to address the queries from the public received in the previous Quarter pursuant to section 4 (Communications) of this Schedule.

3.2.4 This meeting will be conducted within 5 Working Days of the production of eir's Quarterly report.

4. EIR DEPLOYMENT COMMUNICATIONS

4.1 eir Interactive Online Service

4.1.1 Within four weeks from the Effective Date, eir shall operate and maintain on its Publicly Available Website an online lookup service which members of the public may access to determine if their Premises is included in the eir Deployment and the forecast date for when their Premises will be Passed by eir.

4.1.2 Initially this service will be searchable using an Eircode and shall return the following information to a user;

- "Your Premises is included in open eir's 300k broadband plan".
- "You should be able to order High Speed Broadband Services from a Retail Service Provider in [*stated time period*]".

4.1.3 If the Premises of the user conducting the search has been Passed, the following information will also be available;

- "High Speed Broadband Services are available in your area and you can now order from a Retail Service Provider".

4.1.4 Throughout the Term eir may enhance the online lookup service to improve the experience to members of the public or to increase the specificity of the response information. For example, eir may enhance the service to allow search using address and/or telephone number. In the event that eir changes the timing by which it will Pass specific Premises it may also include written updates describing the delay and eir's plans to address any Delay for impacted Premises. It may also increase the number and type of response available to members of the public, including reference to future areas where it shall offer High Speed Broadband Services. These changes will be shared with the Minister in advance to allow coordination of any communication between the parties.

4.2 Queries From the Minister

4.2.1 Under this Agreement, eir shall operate and maintain a facility with a view to promptly facilitating and enabling the Minister and the Minister's Representative to address questions raised by the public or its stakeholder groups regarding High Speed Broadband Services within the eir Deployment.

4.2.2 eir and the Minister shall agree reasonable forecasts for the volumes of such public queries on a Quarterly basis.

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- 4.2.3 At the Quarterly meetings under section 3 (Review Meetings) of this Schedule, the parties shall review and agree a plan to address frequently submitted public queries of a comparable nature received in the previous Quarter.

4.3 Process To Answer Queries From The Public

- 4.3.1 Within 10 Working Days of the Effective Date, eir shall establish a dedicated eir Deployment email account where nominated stakeholders within the Minister's Department can submit questions concerning High Speed Broadband Services in connection with the eir Deployment. eir shall monitor this account between 9.00am and 6.00pm on Working Days and log queries that require action. The email query submission shall contain the information contained within the template set out in Annex 3.
- 4.3.2 eir shall provide an acknowledgement of receipt of the query within 2 Working Days and provide a tracking reference number to be associated with that query.
- 4.3.3 eir shall provide a response (or resolution) within 10 Working Days of its receipt of the completed public enquiry assistance form from the nominated stakeholders within the Minister's Department.
- 4.3.4 eir shall ensure that the team nominated to investigate and respond to the query has full access to all necessary areas of eir's and eir's Associated Companies' businesses, including network design, core networks, fixed access build, field engineering and fixed access delivery teams.

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Annex 1 to Schedule 1 – List of Premises and Eircodes (Not publicly published under clause 4.18(A))

The Parties agree that the List of Premises and Eircodes that comprises this Annex 1 to Schedule 1 is included in an electronic file called '*Annex 1 (List of Eircodes) - eir DCCAE Commitment Agreement.xls*' that is saved onto 3 x USB memory sticks. The Minister shall be in possession of one identical copy of the USB memory stick containing this file at the time the Minister signs and delivers this Agreement as a Deed, and eir shall be in possession of two identical copies of the USB memory stick containing this file at the time eir signs and delivers this Agreement as a Deed, and the Parties agree that such file shall be incorporated into and form part of this Agreement.

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Annex 2 to Schedule 1 – List of Premises eir shall Pass each month (Not publicly published under clause 4.18(A))

The Parties agree that the List of Premises eir shall Pass each month that comprises this Annex 2 to Schedule 1 is included in an electronic file called '*Annex 2 (Monthly Premises List) - eir DCCAE Commitment Agreement.xls*' that is saved onto 3 x USB memory sticks. The Minister shall be in possession of one identical copy of the USB memory stick containing this file at the time the Minister signs and delivers this Agreement as a Deed, and eir shall be in possession of two identical copies of the USB memory stick containing this file at the time eir signs and delivers this Agreement as a Deed, and the Parties both agree that such file shall be incorporated into and form part of this Agreement.

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Annex 3 to Schedule 1 – Public Enquiry Assistance Form End user Information

Contact name	
Contact number	
Customer address	
Customer Eircode	

Nature of Query

Fibre Rollout		Connection Order	
Retail Service Provider (RSP) (where applicable)			

Detailed description of query

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Annex 4 to Schedule 1 – New Build Premises Areas

The Parties agree that the description of the New Build Premises Areas that comprises this Annex 4 to Schedule 1 is included in an electronic file called '*Annex 4 (New Build Premises Area) - eir DCCAE Commitment Agreement.xls*' that is saved onto 3 x USB memory sticks. The Minister shall be in possession of one identical copy of the USB memory stick containing this file at the time the Minister signs and delivers this Agreement as a Deed, and eir shall be in possession of two identical copies of the USB memory stick containing this file at the time eir signs and delivers this Agreement as a Deed, and the Parties both agree that such file shall be incorporated into and form part of this Agreement.

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EXECUTION PAGE

SIGNED and delivered as a deed by
the authorised representative of the
**THE MINISTER FOR
COMMUNICATIONS, CLIMATE
ACTION AND ENVIRONMENT**
by
in the presence of:

SIGNATURE of the authorised
representative of the Minister

Witness Signature

Print Name

Print Address

Witness Occupation

GIVEN under the common seal of
EIRCOM LIMITED and delivered as a
deed in the presence of:

Signature of Richard Moat (CEO)

Witness Signature

Signature of Huib Costermans (CFO)

Print Name

Print Address

Witness Occupation