

Briefing for the Public Accounts Committee

25 March 2019

Introduction

Key updates in relation to the National Broadband Plan and the Metropolitan Area Networks are set out below (and reference, as appropriate, information provided by the Department to the Committee in the period since December to date).

National Broadband Plan

The National Broadband Plan (NBP) aims to ensure that every home, school and business in Ireland has access to high speed broadband. This is being achieved through a combination of:

- commercial investment across Ireland; and
- a State intervention in those areas where commercial operators acting alone are unlikely to invest. These are primarily rural areas.

Ireland's rural-urban divide presents a challenge in providing a future proofed, long term solution for the people and businesses in the Intervention Area, which encompasses:

- almost 540,000 premises
- 1.1 million people (23% population)
- 100,000 enterprises (including 56,000 farms (68% national total) and 44,000 businesses – mostly small and micro
- 674 Primary Schools
- 96% of land area
- 100,000km of road network.

Ireland's low rural population density contrasts with its high urban population density rates. According to the CSO¹, with an average population density of only 70 persons per km², Ireland has one of the lowest population densities in Europe. Density can be as low as 27 persons per km² in rural areas. The EU average is 117 persons per km².

Ireland has an unusual 'ribbon pattern' distribution of premises - only 16% of all premises in rural areas are within a 1.5km radius of village centres.

¹ <https://www.cso.ie/en/releasesandpublications/ep/p-cp2tc/cp2pdm/pd/>

According to ComReg² :

- 37% of the Irish population lives on 96% of the landmass of Ireland
- 76% of Ireland is covered by forests or farmland
- 71.8% of the houses in rural areas are categorised as “one-off houses”, and
- Ireland’s road network density per population is twice the EU average.

According to Eurostat, Ireland has the highest rural to urban proportion in the EU 28, with 72.5% rural regions compared to 27.5% urban regions.

High Speed Broadband Map

As part of the NBP, the Department undertook a comprehensive analysis and mapping process of high speed broadband availability across the country. The Department then developed an interactive High Speed Broadband Map (www.broadband.gov.ie) which identifies locations and premises as being either served by the commercial sector or requiring State intervention under the NBP.

The Map was first published in November 2014. In March 2015 a request was issued for supplementary information to operators on their Next Generation Access (NGA) broadband plans up to the end of 2020. This information further developed the understanding of where high speed broadband services were available and where plans existed for further deployment. The Map was re-issued in December 2015 with the most up to date view, at that time, of various operator plans. At this point the intervention area was identified for the purposes of procurement. The intervention area contained 757,000 premises at that point.

The NBP procurement process allows for changes to the Map over the coming years in the event that new commercial plans are announced, or where planned commercial investment has not materialised. This process was set out in 2015 on the Department’s website before the procurement process commenced.

The Department continually monitors the deployment of commercial operators’ services to ascertain where anticipated commercial investments are realised and where they are not due to issues that might arise during deployments.

In April 2017 the Department published an updated High Speed Broadband Map. This took account of commercial operator plans which had not materialised and new developments since the publication of the Map, notably the Commitment Agreement signed by eir with the Department to deploy high speed broadband to approximately 300,000 premises in rural Ireland.

² Improving connectivity in Ireland: Challenges, solutions and actions, ComReg page 103

Detailed assessments of the eir 300,000 premises rollout plan were conducted by the Department and its advisors and significant engagement was conducted with the European Commission and ComReg to ensure ongoing compliance with State Aid Guidelines. More detailed information in relation to the assessment of eir's rural deployment plan was provided to the Committee as part of correspondence dated 16 January 2019 (ref: PAC32-I-1219 and PAC32-I-1225) and 12 February 2019 (PAC32-I-1281).

At this stage, as a result of additional monitoring of commercial plans, the Department added a further 84,500 premises to the NBP State Intervention Area where plans previously submitted failed to materialise. This amended the intervention area to 540,000 premises.

Since the April 2017 update, the Map is updated on a quarterly basis to reflect progress passed under the eir Commitment Agreement to rollout to 300,000 rural premises by the end of 2018.

As of end February 2019, eir had passed 230,506 (76.7%) of the 300k premises under the Commitment Agreement signed with the Department in April 2017. Eir expects to pass all 300,000 by mid-2019.

A copy of the latest version of the High Speed Broadband Map, along with county statistics and a number of county maps are included in **Appendix 1**.

The recent announcements by operators signalling their intent to continue to invest in the provision of high speed communications infrastructure in Ireland, is welcome. Continued commercial investment in parallel to the progression of the State's Intervention, is important.

In order for premises to be removed from the State intervention area, a commercial operator must make a submission to the Department outlining its plans and commitments to provide premises with a high speed broadband service. This is consistent with the State aid rules applying to State interventions. Any such submission must satisfy the criteria published in 2015 before the NBP procurement process commenced.

Increases in speeds and data usage in broadband

ComReg's Quarterly Report for Q4 2018 signalled continued growth in both availability and take up of high speed broadband, key points as follows:

- Fibre to the Premises (FTTP) customers have increased to over 90,642 which is an increase of 20.3% on the previous quarter and an increase of 128.9% year on year, albeit from a low base
- In Q4 2018 an average fixed broadband subscriber used 170GB of data per month. This was a 17% increase from the same quarter in 2017. An average mobile customer used 6.4GB per month

- 77.2% of all fixed broadband subscriptions in Ireland are now high speed, with 29.6% achieving speeds of 100Mbps or more
- Ireland's household broadband penetration rate is 88%. This is higher than the EU28 average of 86%.

A significant statistic emerging from ComReg's report is not only the dramatic percentage take up of fibre by subscribers when it becomes available, but the significant increase in data demand.

Technology

As required by the State Aid Guidelines for Broadband, the procurement process must adopt a technology neutral approach, with no one technology preferred (fibre, fixed wireless, cable etc). Any solution could be proposed, provided it was capable of meeting defined minimum standards and was future proofed to cope with incremental upgrades over the course of the contract.

The minimum standards set out in the 2015 Intervention Strategy were, *inter alia*, a minimum of 30 Megabits per second download, a minimum of 6 Megabits per second (Mbps) upload and service availability of at least 99.95% of the time

It is worth noting that the European Commission published an updated strategy in 2016, "*Connectivity for a European Gigabit Society*" which sets a vision of Europe where availability and take-up of very high capacity networks enables the widespread use of products, services and applications in the Digital Single Market, which includes access to connectivity offering at least 100 Mbps for all European households. It confirms and builds upon the previous broadband objectives for 2020, to supply every European citizen with access to at least 30 Mbps connectivity. In addition, the Commission proposes that by 2025, all schools, transport hubs and main providers of public services, as well as digitally intensive enterprises should have access to internet connections with download/upload speeds of 1 Gigabit of data per second.

All bidders in the procurement proposed predominantly FTTP (Fibre to the Premises) solutions. As a result, the basic NBP wholesale entry product will be 150Mbps download speed, with speeds of up to 1 Gigabit available to businesses. This ensures additional capacity can be added over time at low incremental cost. It also enables maximum re-use of existing pole and duct infrastructure across the country.

It is, however, likely that for a small percentage of premises which are the most remote and difficult to reach that a wireless solution may be used to connect those premises. The amount of premises to be provided by a wireless solution will be determined on an area by area basis during deployment.

4G/5G

There has been some commentary regarding the potential use of 4G or 5G mobile technology as an alternative solution to the NBP. Industry commentary suggests that 4G and 5G should be seen as complementary to fixed broadband networks and not an alternative. ComReg recently produced a report on connectivity³ in Ireland which included the following key points in relation to the cost and challenge of extending mobile coverage on a near universal basis:

- increasing geographic outdoor mobile coverage of 30 Mbps to 99.5% geographic coverage would cost approximately €1.8 billion and require almost 6,000 new mast sites
- identifying a suitable location, acquiring rights, getting planning permission and building a new mast typically takes 2 years and can be met with objections from local stakeholders
- operators today deploy about 50 new sites each year (urban and rural). It would not be feasible to construct 6,000 new sites in any short time frame.

The Department also conducted research on 4G/5G technology which concluded that 4G and 5G networks will:

- provide a complementary service to the NBP high speed broadband service (indoor suitable for home or business use)
- require a significant amount of fibre to effectively deliver mobile services, which will be made available by the NBP State intervention
- (through commercial operators) continue to target the most densely populated locations with their commercial rollouts.

Fixed Wireless

An example of the challenges presented by a fixed wireless deployment is outlined in **Appendix 2**. In this example, it is possible to see the difficulties of providing a high quality, high speed, consistent broadband service to all premises in an area covered by a fixed wireless operator, even in an optimum scenario with an elevated site. Further detail is provided in the explanatory note in **Appendix 2**.

International comparisons of broadband deployment

Internationally, many European countries have continued with deployment of FTTP, notably Scandinavia, Portugal, Spain and France. Major commercial operators in Germany, Italy, Netherlands and Switzerland are all pursuing fibre technology. Up to now, the UK has pursued a mainly Fibre to the Cabinet (FTTC) rollout however more recently the UK Government and regulator Ofcom have moved towards a policy to stimulate a “full-fibre”

³ Improving connectivity in Ireland: Challenges, solutions and actions, ComReg 103

deployment i.e. to stimulate FTTH. The UK has a target for 15 million premises to be connected to full fibre by 2025, with nationwide coverage by 2033⁴.

NBP Expenditure to date

Total expenditure in relation to the National Broadband Plan since 2013 to mid-March 2019 amounts to **€25.413 million** (inclusive of VAT). This expenditure includes the cost of corporate and economic advice, technical support and network design, the cost of legal and environmental advice. These services were procured by way of competitive tender and necessary to assist the Department with the procurement process, in particular the extensive dialogue with Bidders and the drafting of the NBP Contract.

⁴ <https://www.gov.uk/government/publications/future-telecoms-infrastructure-review>

Metropolitan Area Networks

MANs Infrastructure

The State, with the support of the European Union, invested in the provision of 88 wholesale, open access fibre networks in 94 regional towns and cities under the Metropolitan Area Networks (MANs) Programme. The MANs were constructed in two phases in the 2000s - 28 MANs were completed under Phase I and 60 MANs (covering 66 towns) under Phase II of the Programme.

A map of Ireland showing the location of the MANs is set out below, while further detail can be found on the Department's [website](#)⁵, and an interactive map of MANs coverage is available on enet's website at <https://www.enet.ie/coverage.html>.

Following separate public procurement processes, two Concession Agreements for a Management Services Entity to manage, maintain and operate the MANs were awarded to enet in 2004 (Phase 1 MANs) and 2009 (Phase 2 MANs). The Concession Agreements were for an initial term of 15 years, and each Agreement provided for an option to extend for a further 10 years.

The MANs do not deliver telecoms services directly to end customers on their own; service providers connect their own networks to the MANs infrastructure (in the form of ducts, fibre cables, serviced co-location facilities and access to backhaul networks) and make broadband services available to their end customers. In this way, the MANs facilitate service providers in offering high speed broadband to their retail customers without each having to build their own networks in these city and town centres across Ireland.

Currently, 86 MANs are "lit", (i.e. the fibre is live and in use by service providers), with Knock MAN being lit on 14 March 2019, leaving the 2 MANs in Belmullet and Banagher not yet in use. The take up of the MANs infrastructure depends on the level of demand in particular towns, and this can be related in part to the size of the town.

Some 70 service operators are using the MANs infrastructure in connection with the provision of fixed and mobile broadband services to over one million citizens and business end customers, which include domestic fixed and mobile customers, State entities, educational institutions, SMEs, industrial estates and multinationals. enet has, to date, increased the overall footprint of the MANs network of 1,100kms by some 30%. This extended fibre is owned by the State.

⁵ <https://www.dccae.gov.ie/en-ie/communications/topics/Broadband/metropolitan-area-networks/Pages/Metroplian-Area-Networks.aspx>



Extension of the Concession Agreements

In 2016, the Department concluded its internal review of the MANs Programme, the purpose of which was to inform the Department's decision on the future of the MANs and whether to extend the existing agreements at the end of the initial term of the Concession Agreements or retender for a new Concessionaire. External advice was sought from Norcontel and a redacted copy of their report was provided to the Committee in correspondence dated 13 March 2019.

Detailed information notes on the extension and the Department's rationale for same has been provided to the Committee (Refs PAC32-I-1219 dated 16 January 2019 and PAC32-I-1324 dated 13 March 2019). Having regard to the analysis conducted by the Department and informed by the Norcontel report, the preferred option and recommendation was to extend the current Concession Agreements to provide that they expire on the same date in 2030, viz. a 10 year extension to the MSE I Agreement and 6 year extension to the MSE II Agreement.

The benefits of extending the MANs Agreements (which was achievable through the existing contractual provisions and change control mechanism) to make them co-terminus in 2030 include:

- Telecoms operators have certainty of the availability of the MANs infrastructure for the foreseeable future in drafting their own investment plans in regional Ireland. This was important at a time of dynamic change in the market
- The MSE is in a position to respond to the developments which were expected over the next 10 years if the MANs were to remain competitive and relevant. Norcontel advised that if both contracts were re-tendered together it should be in 2030 so that there would be no reduction in investment and diversion of focus of the MSE during the critical period of expansion of fibre networks
- On the contrary, there would be limited incentive by the MSE to invest in the absence of an extension to 2030 and this would have a negative, knock-on effect in any retender/sale process as the current and future value of the asset to prospective bidders would be negatively impacted.

Prior to finalising the contract extension, the Department re-negotiated the terms and conditions to further improve the financial terms of the contract for the State.

The current Agreements cannot be extended beyond March 2030 and a decision will be taken in advance of this date on the State's future role in the MANs.

ComReg's review of enet's compliance with its obligations

The Department's correspondence dated 13 February 2019 (Ref. PAC32-I-1219) provided a redacted copy of Analysys Mason's report of its review of pricing and access arrangements for the MANs, and advised that the recommendations were being implemented by enet.

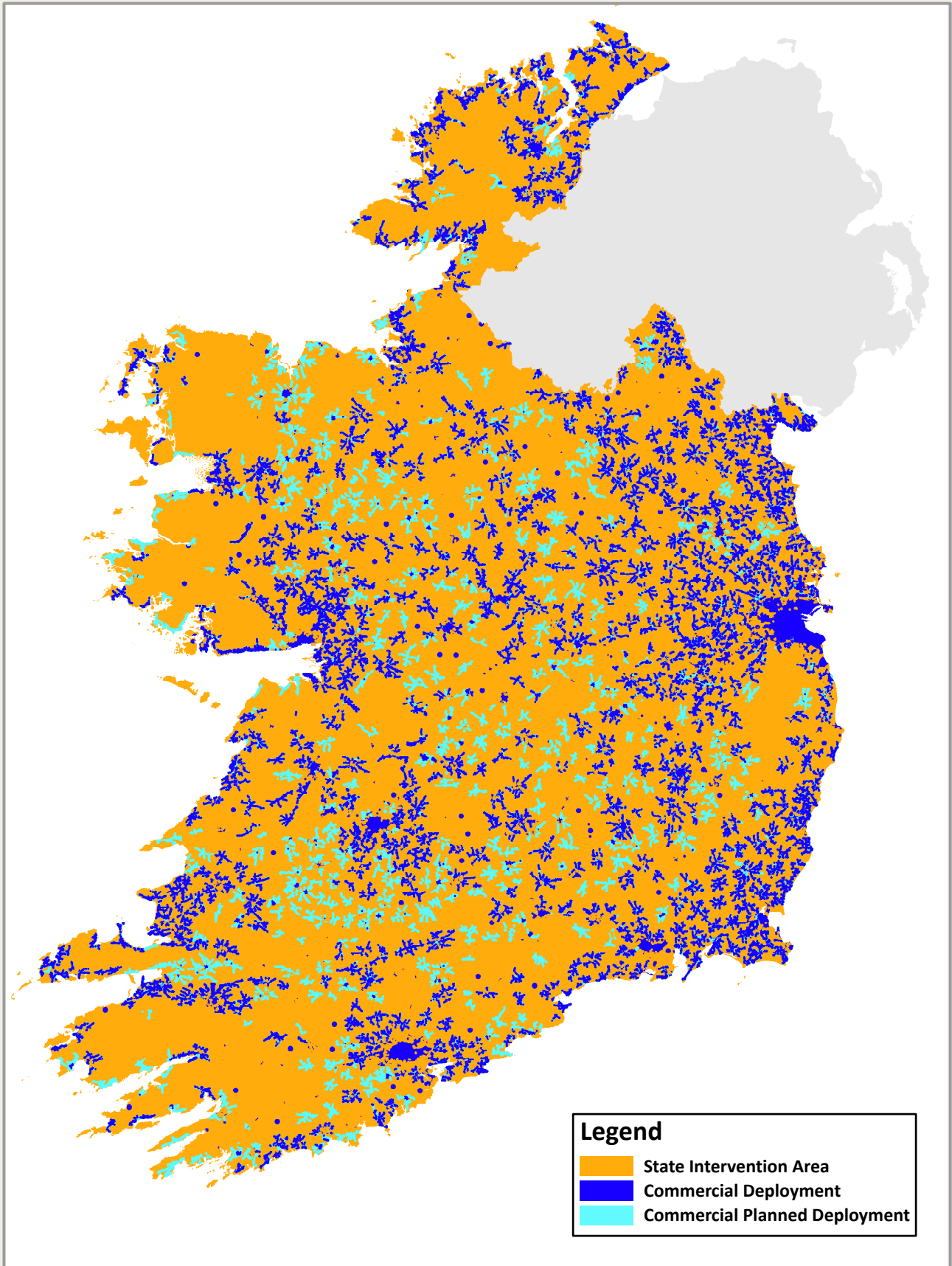
ComReg is currently making arrangements to engage advisors to assist it in carrying out the review requested by the Minister of enet's compliance with its obligations under the agreed Code of Practice. ComReg expects to complete the full review later this year.



High Speed Broadband Map Q4 2018

National Broadband Plan

National



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High Speed Broadband Map

County Coverage Statistics Q4 2018

County Name	Total Number of Premises	AMBER Premises Intervention Area	BLUE Premises Commercial Operators	LIGHT BLUE Premises Planned Rural Deployment*
Carlow	27,994	7,875	18,052	2,067
Cavan	42,110	16,995	23,951	1,164
Clare	68,689	23,359	41,742	3,588
Cork	269,952	74,820	184,183	10,949
Donegal	101,830	34,107	65,212	2,511
Dublin	604,412	10,551	593,585	276
Galway	135,118	39,185	88,483	7,450
Kerry	89,458	28,706	54,952	5,800
Kildare	92,235	13,885	77,589	761
Kilkenny	48,001	17,996	27,201	2,804
Laois	39,253	12,772	24,415	2,066
Leitrim	22,338	11,297	9,583	1,458
Limerick	97,568	21,878	67,821	7,869
Longford	22,308	8,193	12,401	1,714
Louth	61,034	8,660	51,993	381
Mayo	83,465	36,843	38,862	7,760
Meath	86,021	20,256	63,370	2,395
Monaghan	33,035	15,733	16,543	759
Offaly	36,966	12,387	22,485	2,094
Roscommon	39,089	18,469	17,618	3,002
Sligo	40,092	14,314	23,722	2,056
Tipperary	83,963	30,250	45,693	8,020
Waterford	61,624	16,589	43,646	1,389
Westmeath	44,397	11,963	30,891	1,543
Wexford	82,535	21,761	59,620	1,154
Wicklow	64,876	14,437	48,880	1,559
Total	2,378,363	543,281	1,752,493	82,589

*These figures represent planned rural deployment and will reduce once premises are passed.

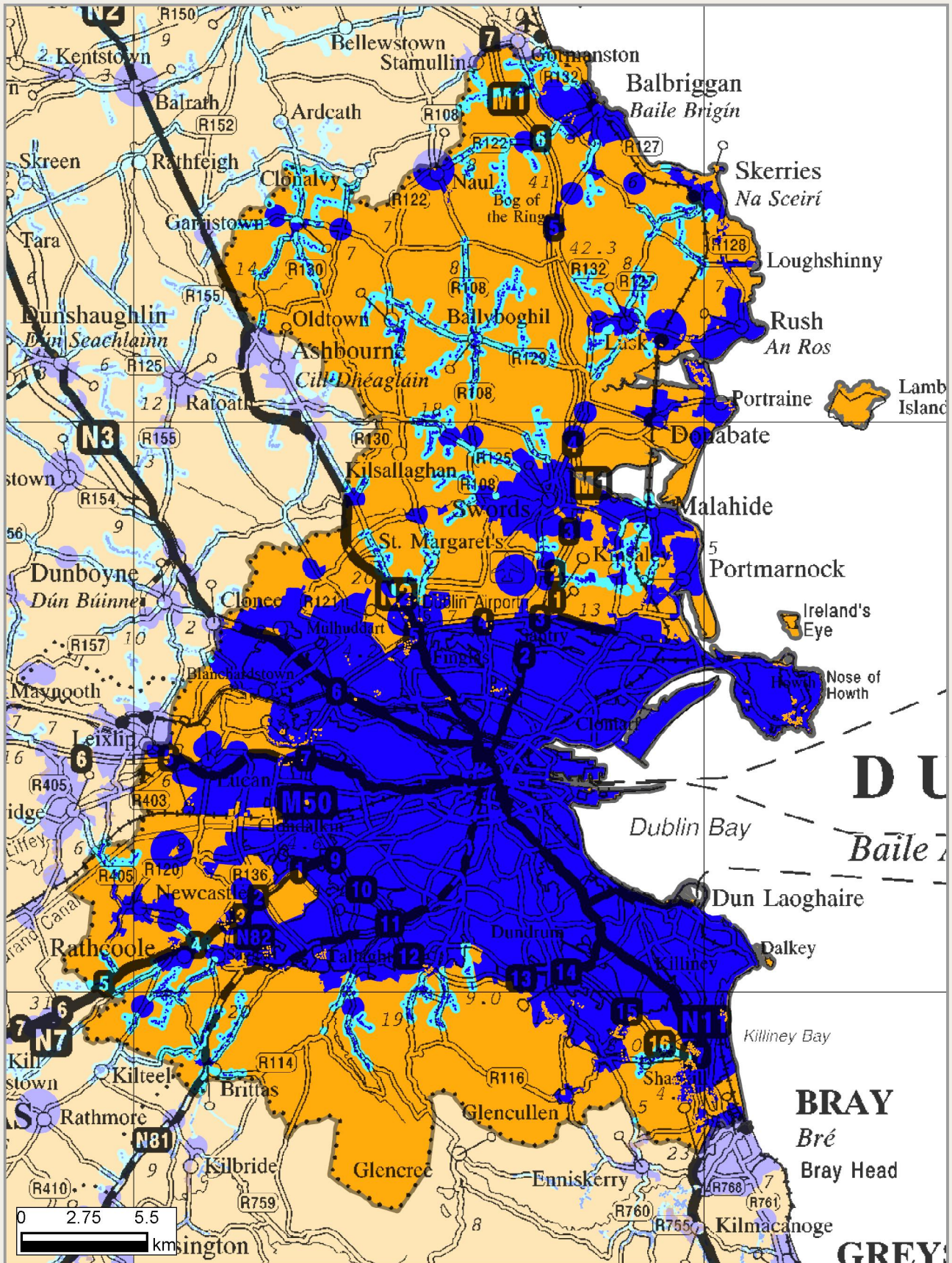
For further information see www.broadband.gov.ie or www.dccae.gov.ie





High Speed Broadband Map Dublin

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Total Number of Premises in Dublin	604,412
State Intervention Area	2%
Commercial Deployment	98%
Commercial Planned Deployment	0%

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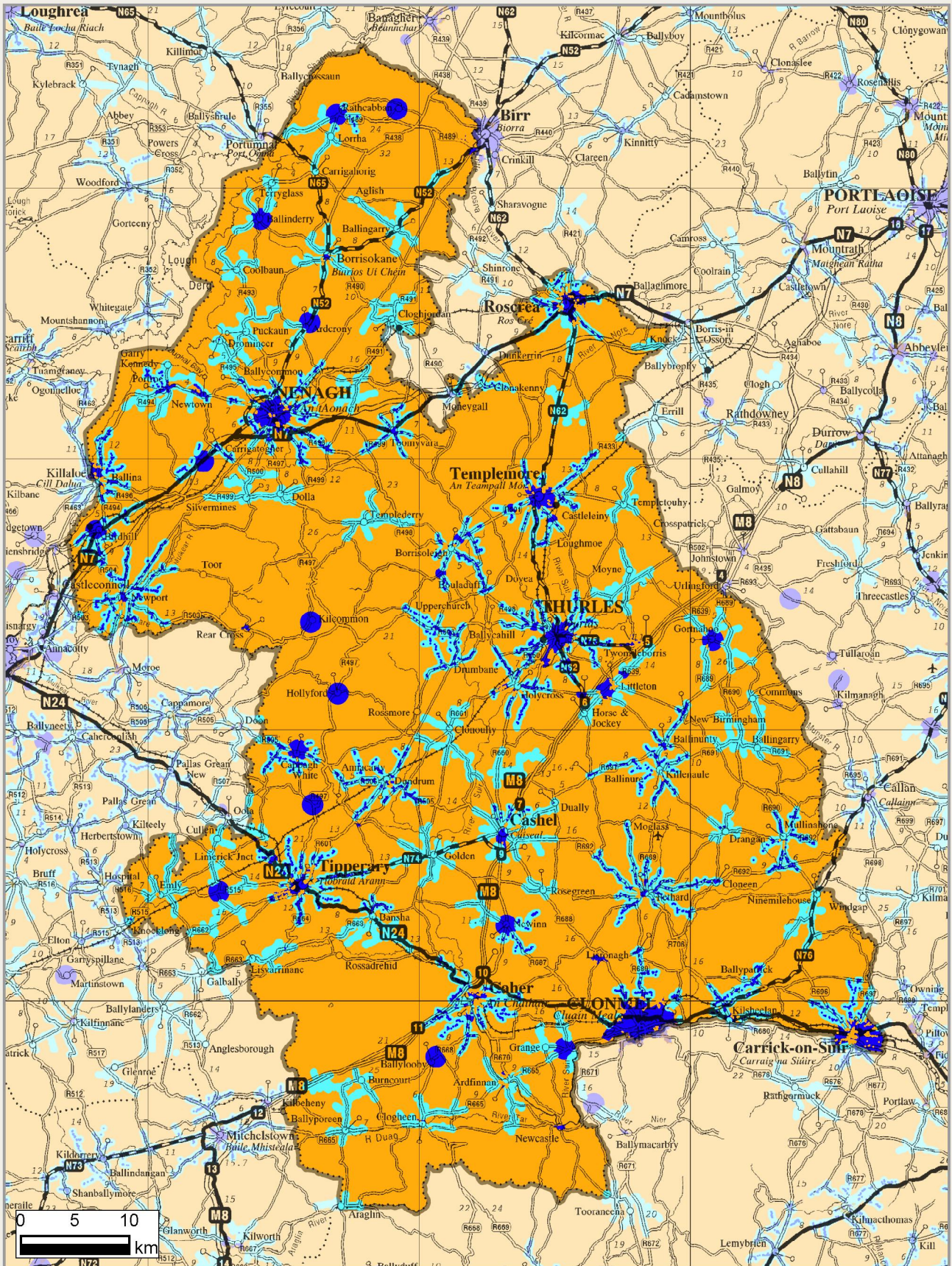


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High Speed Broadband Map Tipperary

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Total Number of Premises in Tipperary	83,963
State Intervention Area	36%
Commercial Deployment	54%
Commercial Planned Deployment	10%

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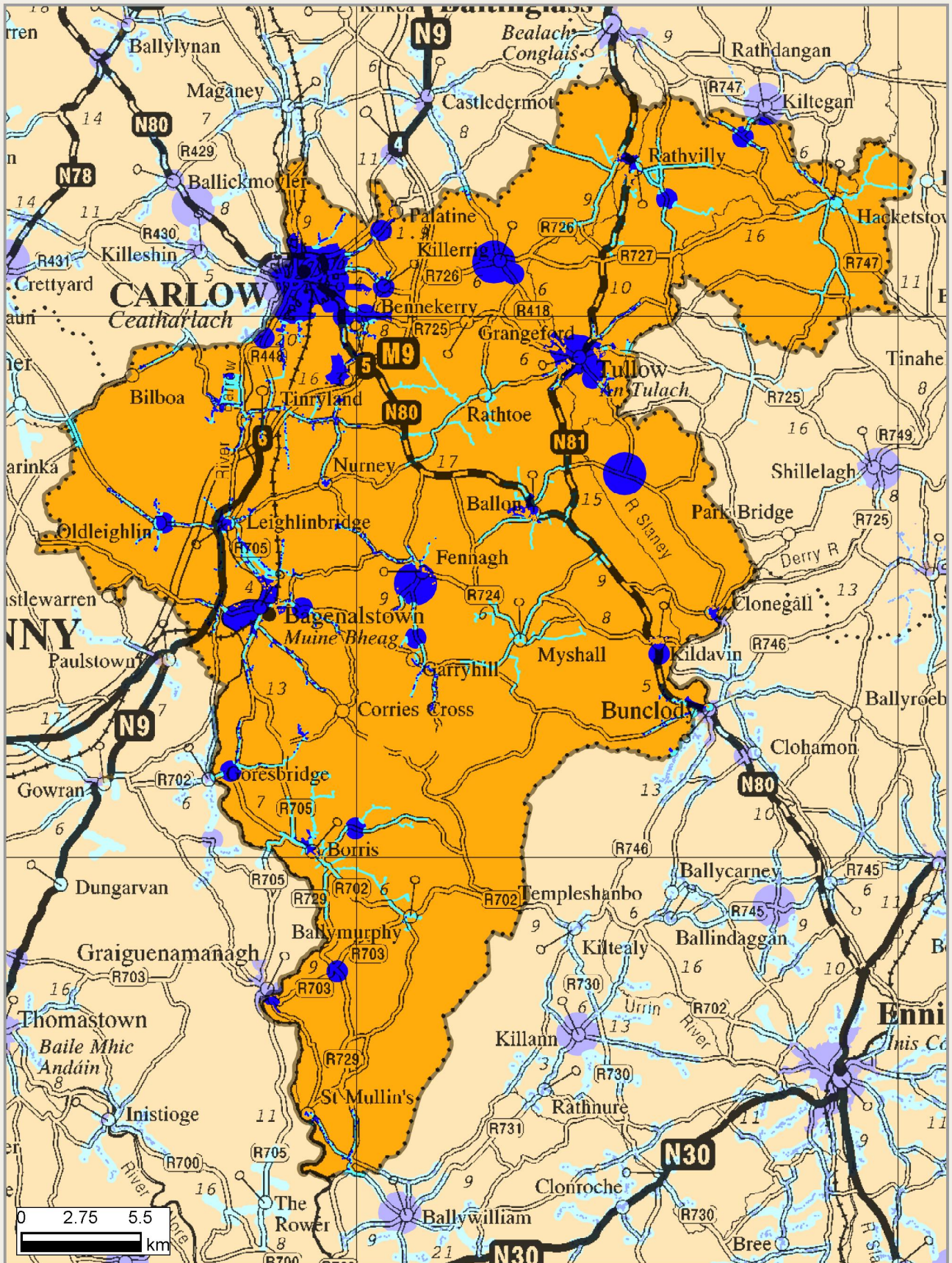


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High Speed Broadband Map Carlow

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Total Number of Premises in Carlow	27,994
State Intervention Area	28%
Commercial Deployment	65%
Commercial Planned Deployment	7%

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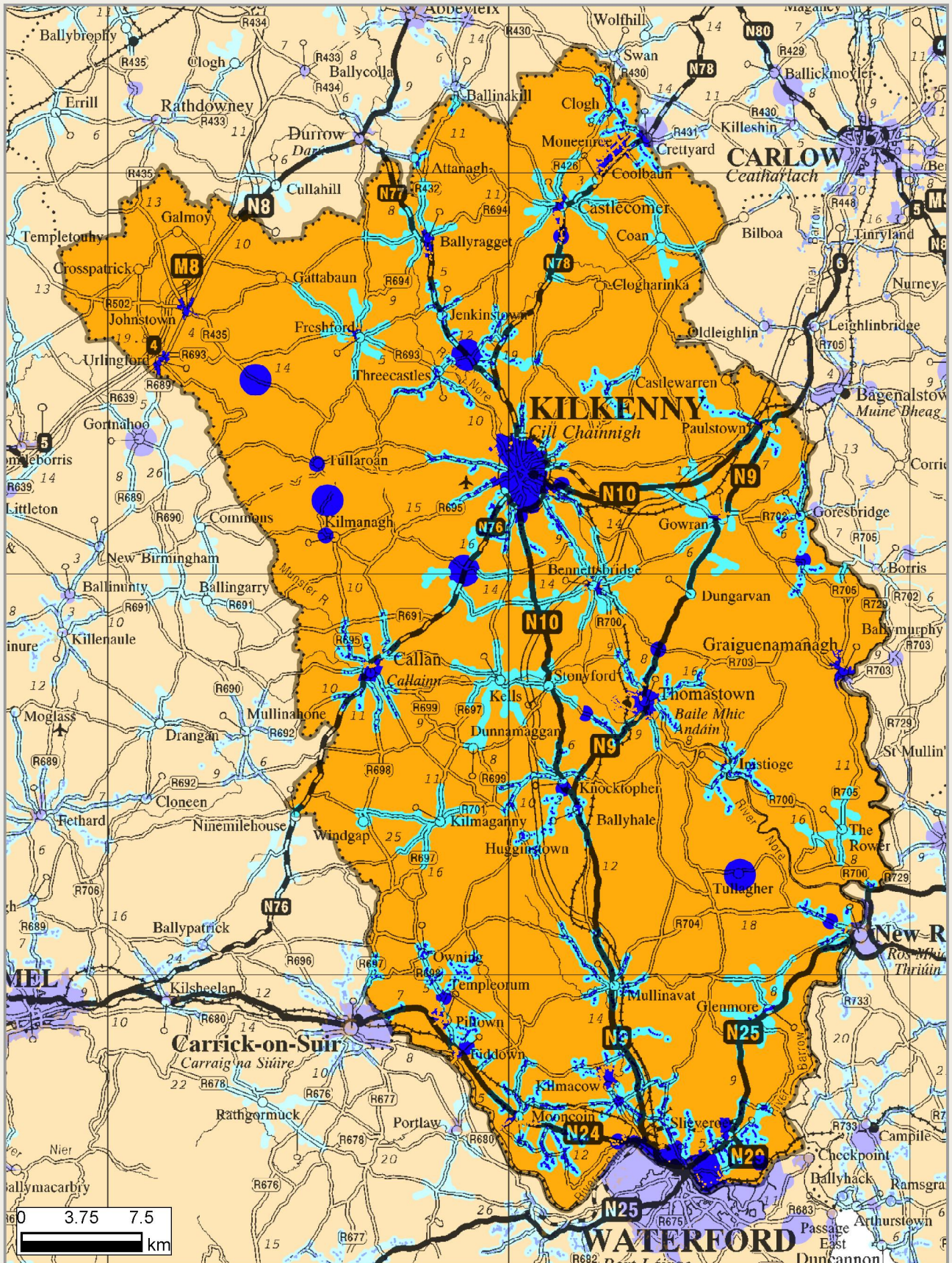


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High Speed Broadband Map Kilkenny

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Total Number of Premises in Kilkenny	48,001
State Intervention Area	37%
Commercial Deployment	57%
Commercial Planned Deployment	6%

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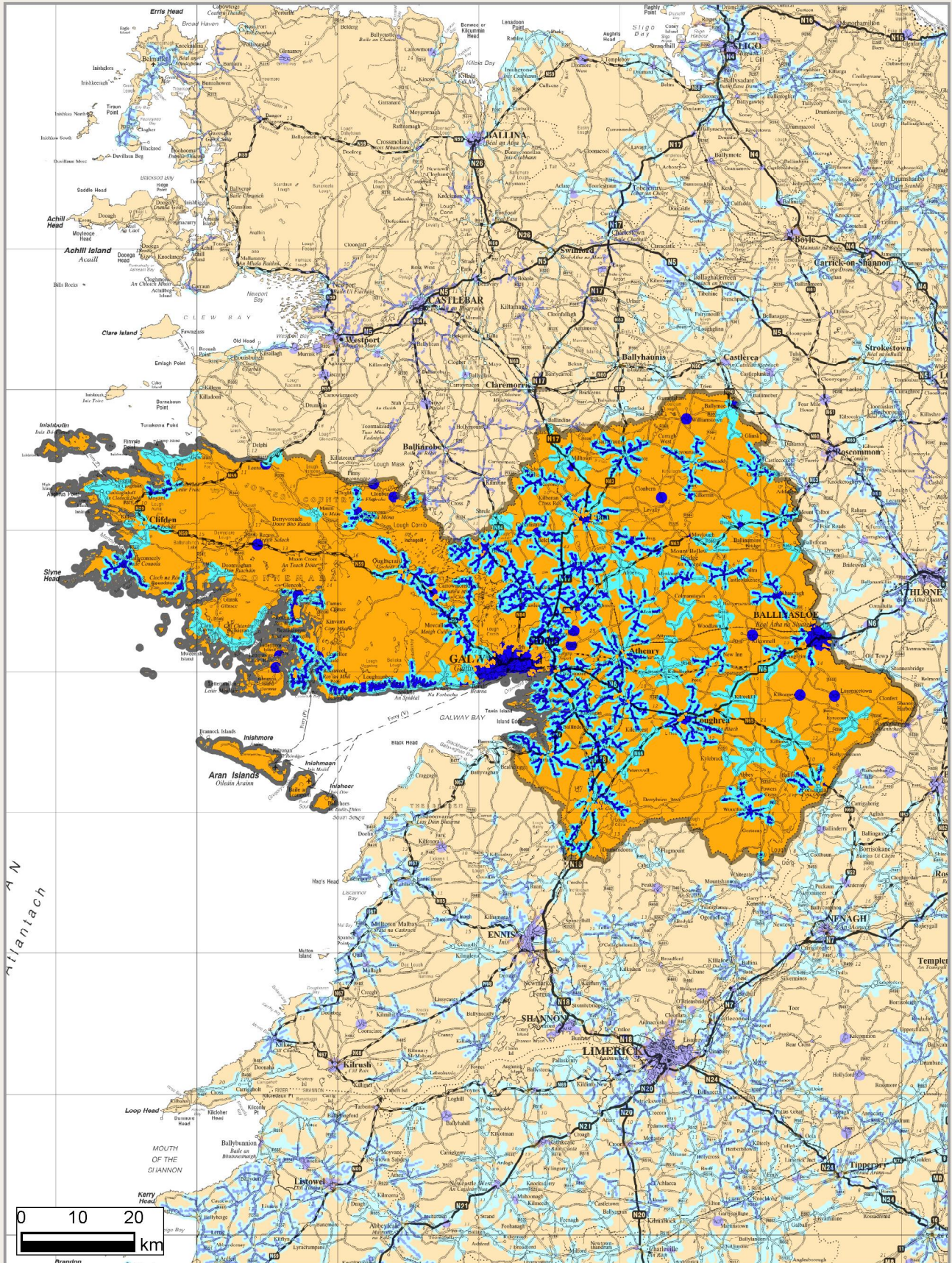


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High Speed Broadband Map Galway

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Total Number of Premises in Galway	135,118
State Intervention Area	29%
Commercial Deployment	65%
Commercial Planned Deployment	6%

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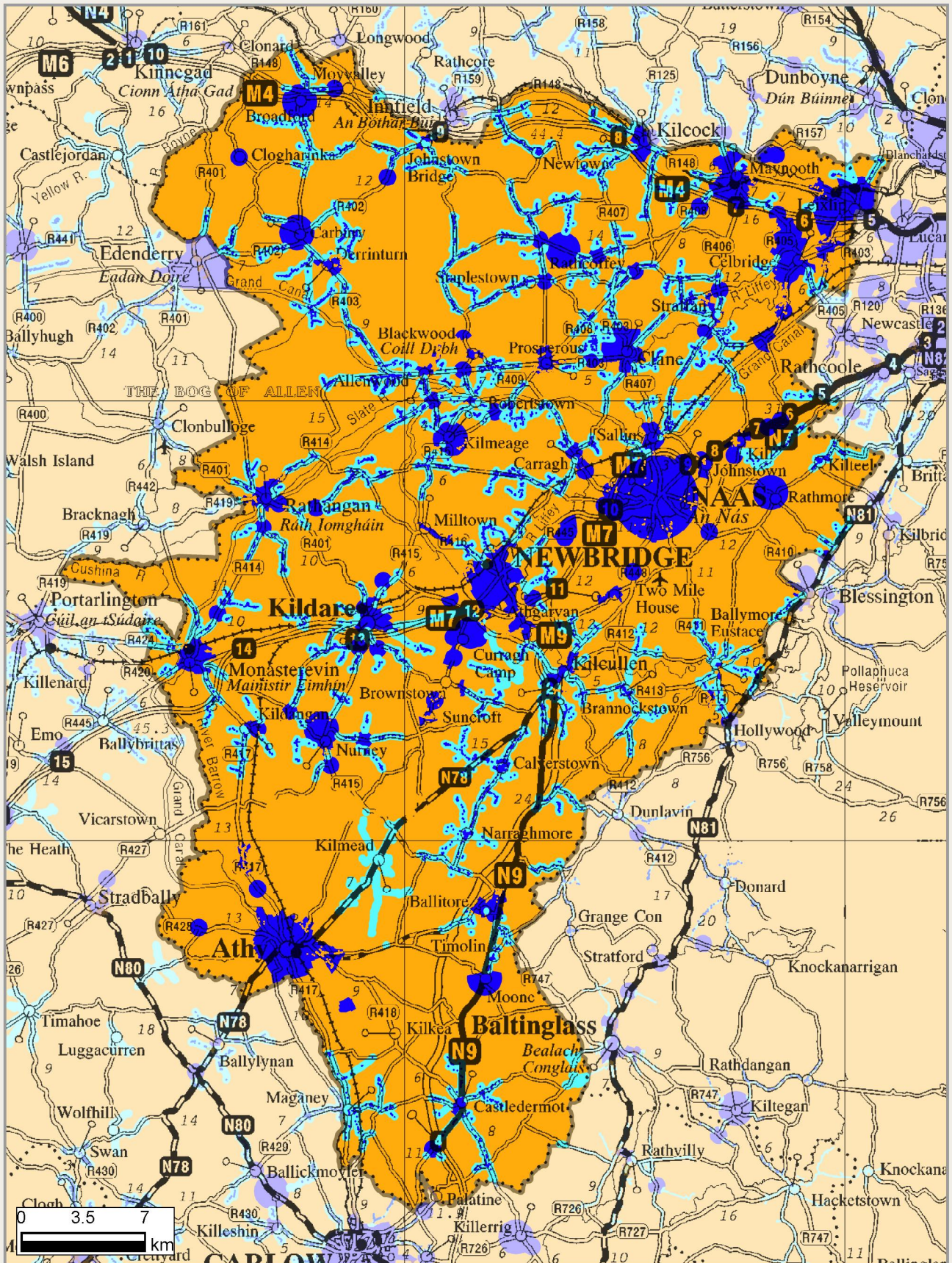


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High Speed Broadband Map Kildare

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Total Number of Premises in Kildare	92,235
State Intervention Area	15%
Commercial Deployment	84%
Commercial Planned Deployment	1%

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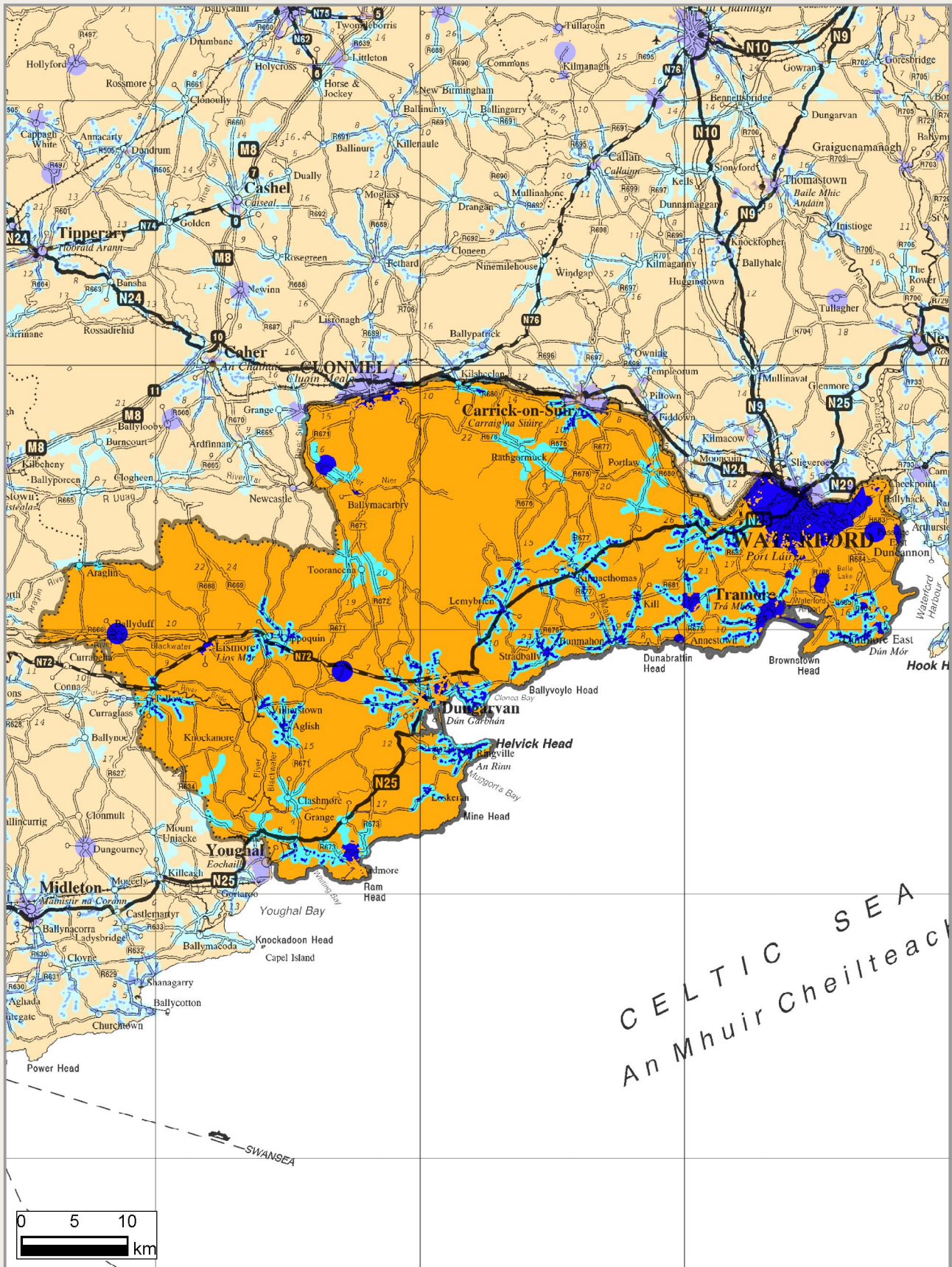
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Waterford

County

Q4 2018



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Total Number of Premises in Waterford	61,624
State Intervention Area	27%
Commercial Deployment	71%
Commercial Planned Deployment	2%

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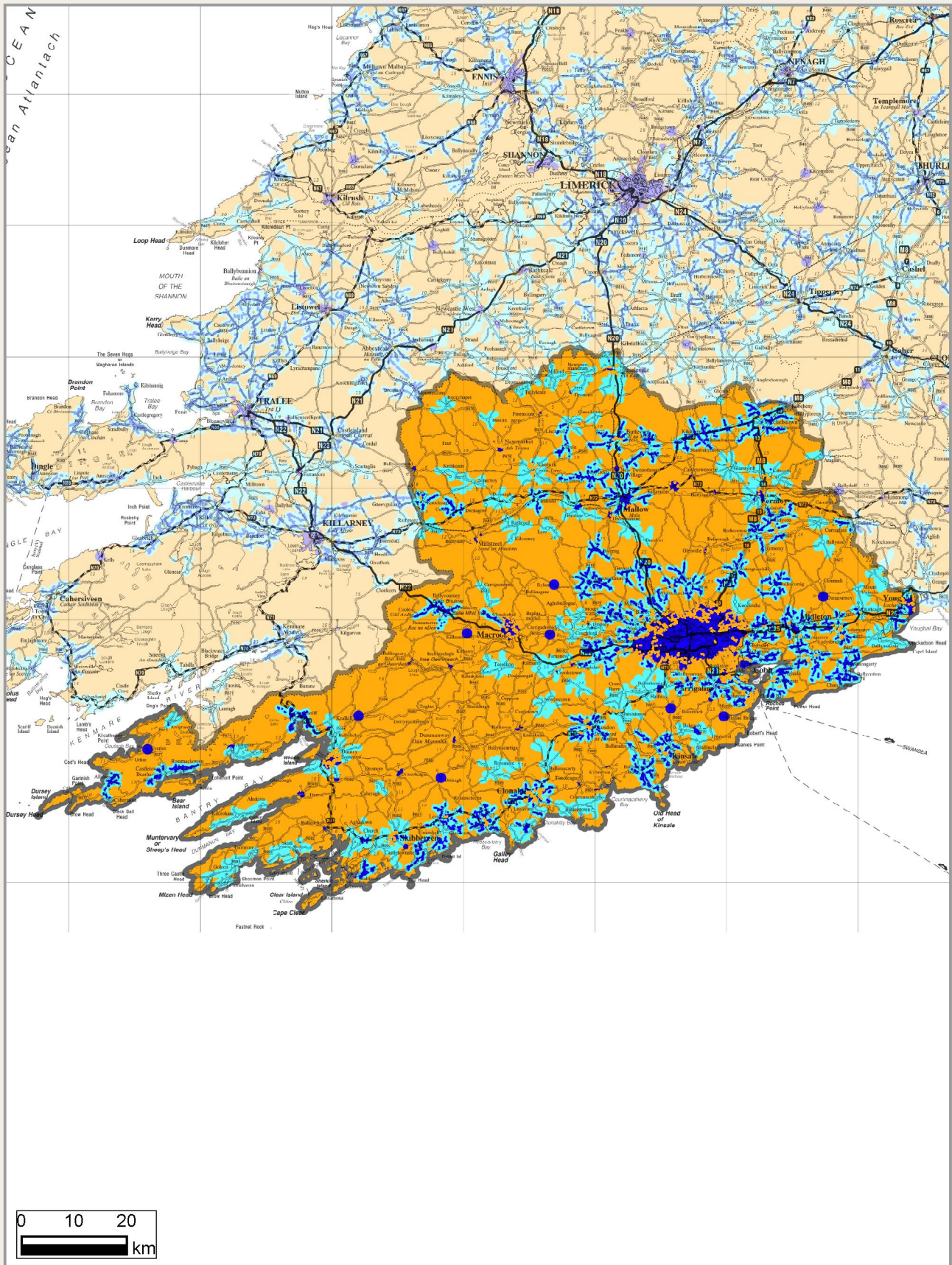
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High Speed Broadband Map Cork

Q4 2018

County



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Total Number of Premises in Cork	269,952
State Intervention Area	28%
Commercial Deployment	68%
Commercial Planned Deployment	4%

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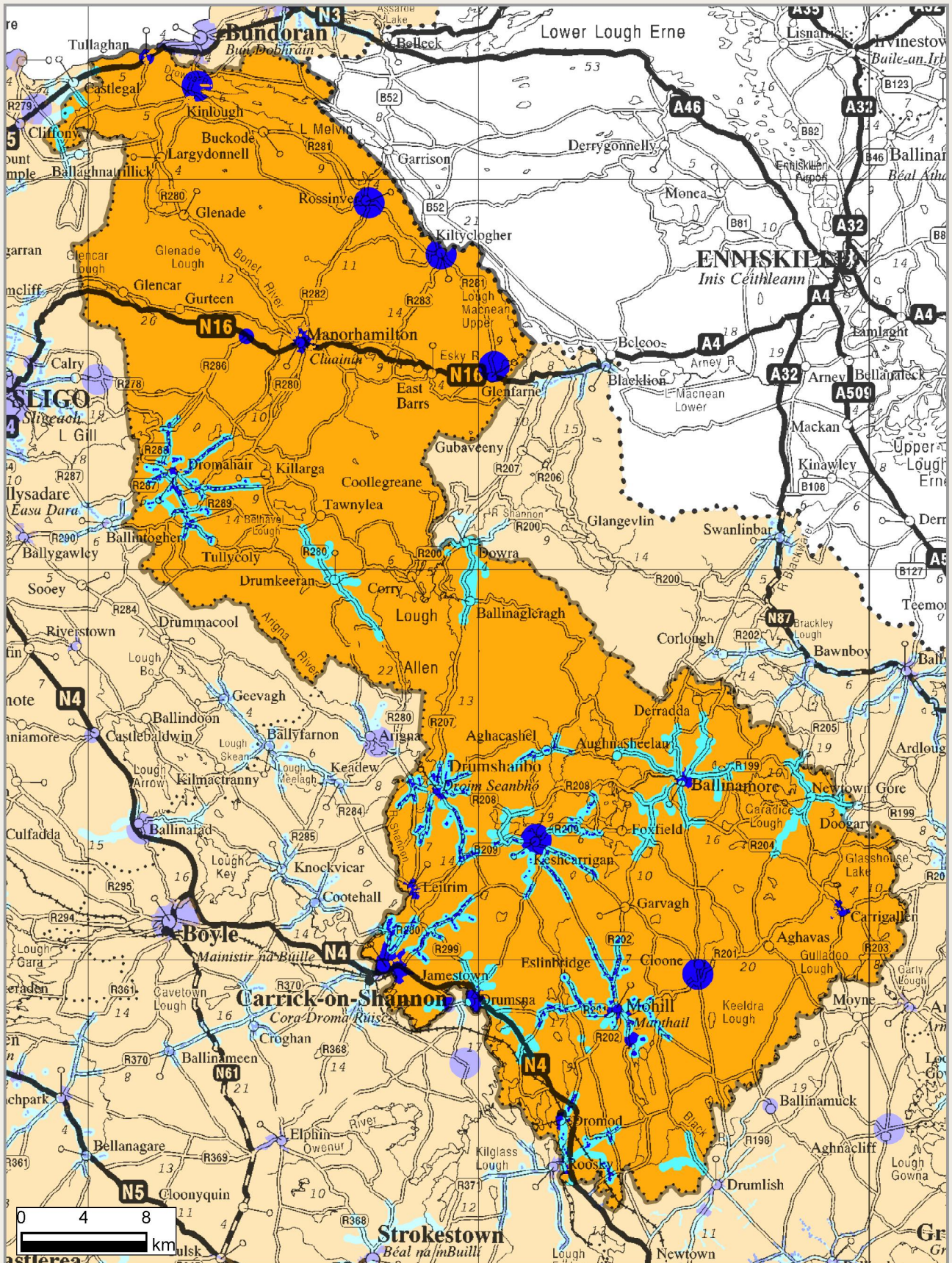


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High Speed Broadband Map Leitrim

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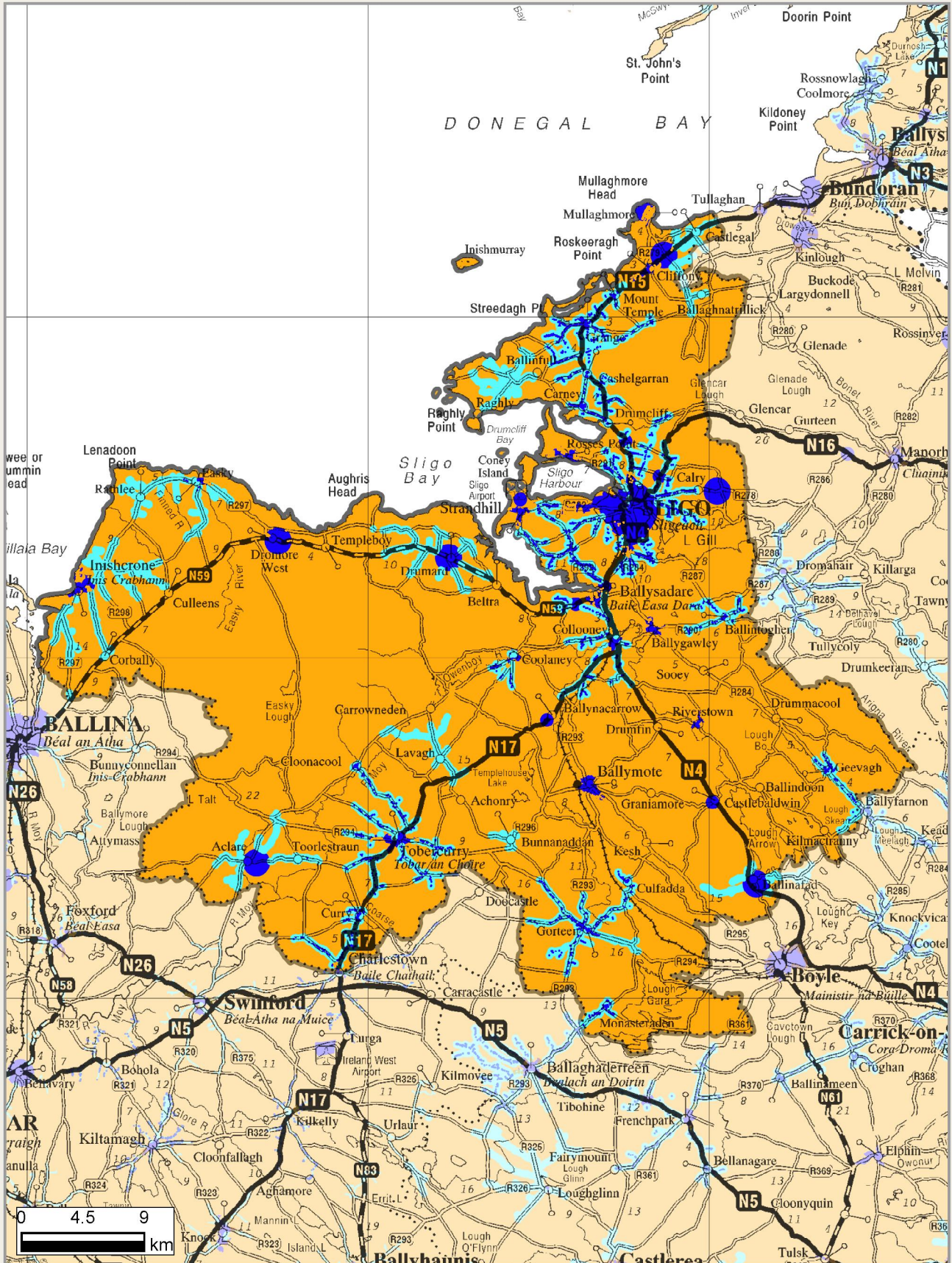
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Total Number of Premises in Leitrim	22,338
State Intervention Area	51%
Commercial Deployment	43%
Commercial Planned Deployment	6%

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Total Number of Premises in Sligo	40,092
State Intervention Area	36%
Commercial Deployment	59%
Commercial Planned Deployment	5%

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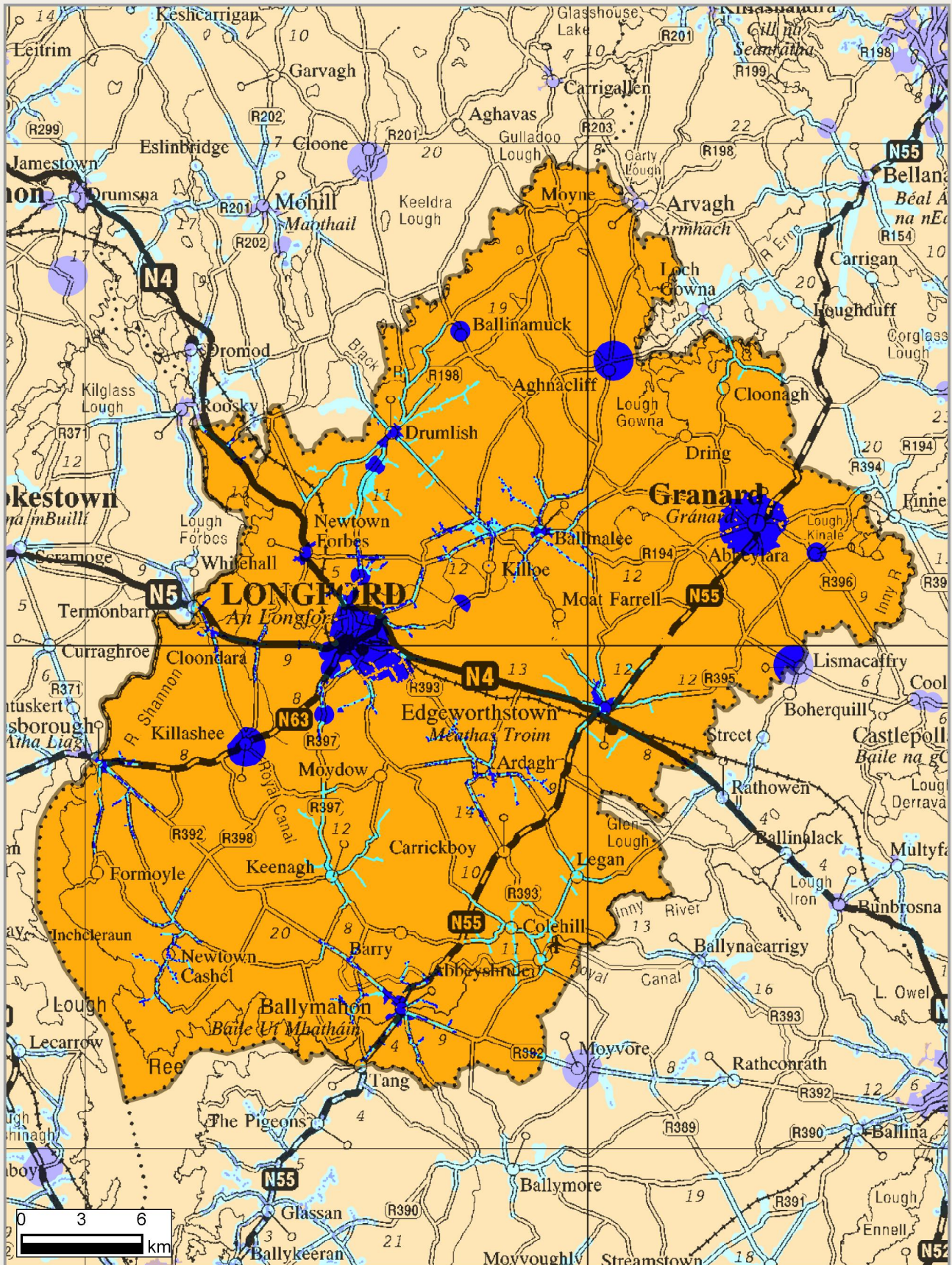


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High Speed Broadband Map Longford

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Total Number of Premises in Longford	22,308
State Intervention Area	37%
Commercial Deployment	56%
Commercial Planned Deployment	8%

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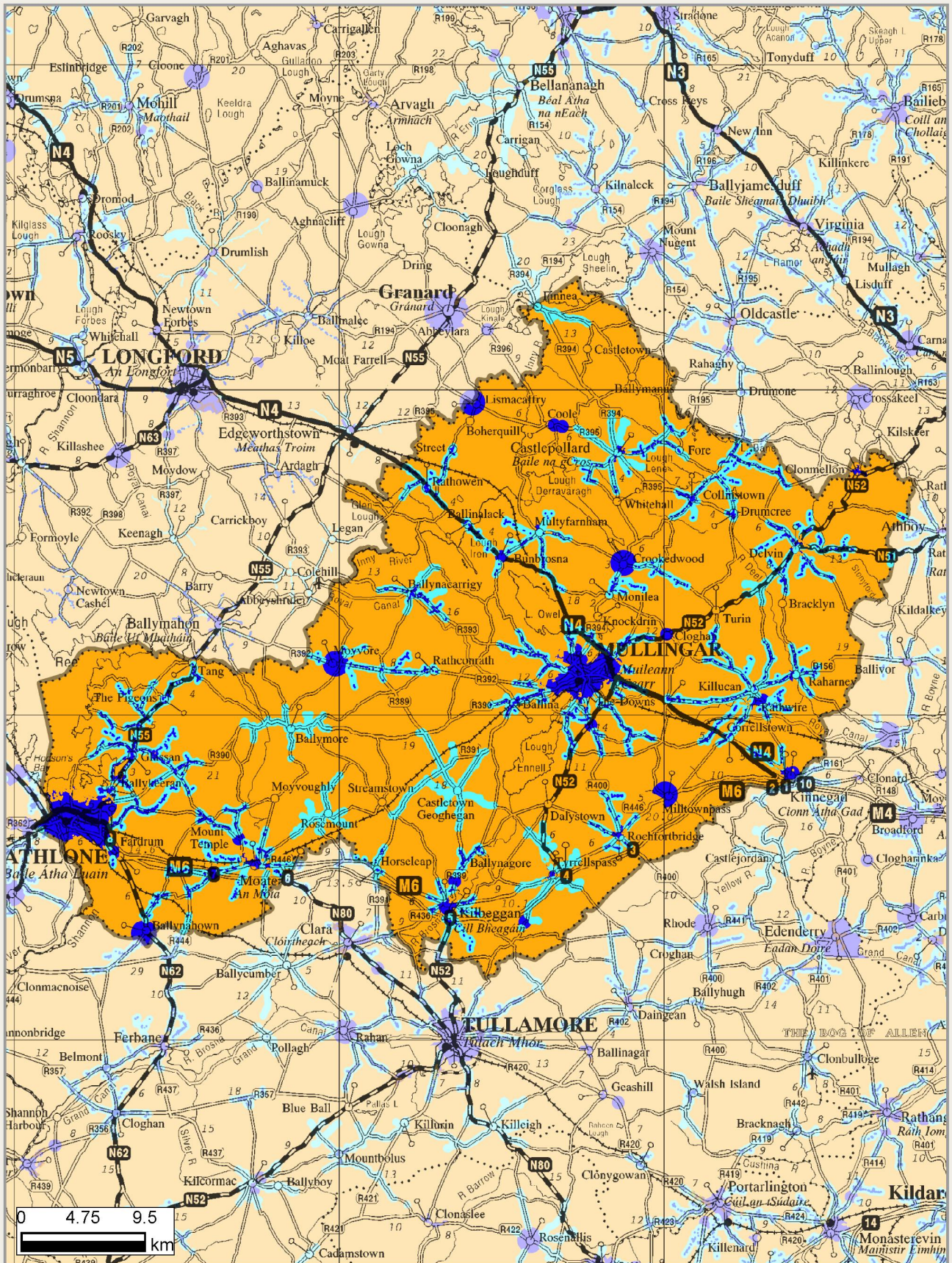


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High Speed Broadband Map Westmeath

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Total Number of Premises in Westmeath	44,397
State Intervention Area	27%
Commercial Deployment	70%
Commercial Planned Deployment	3%

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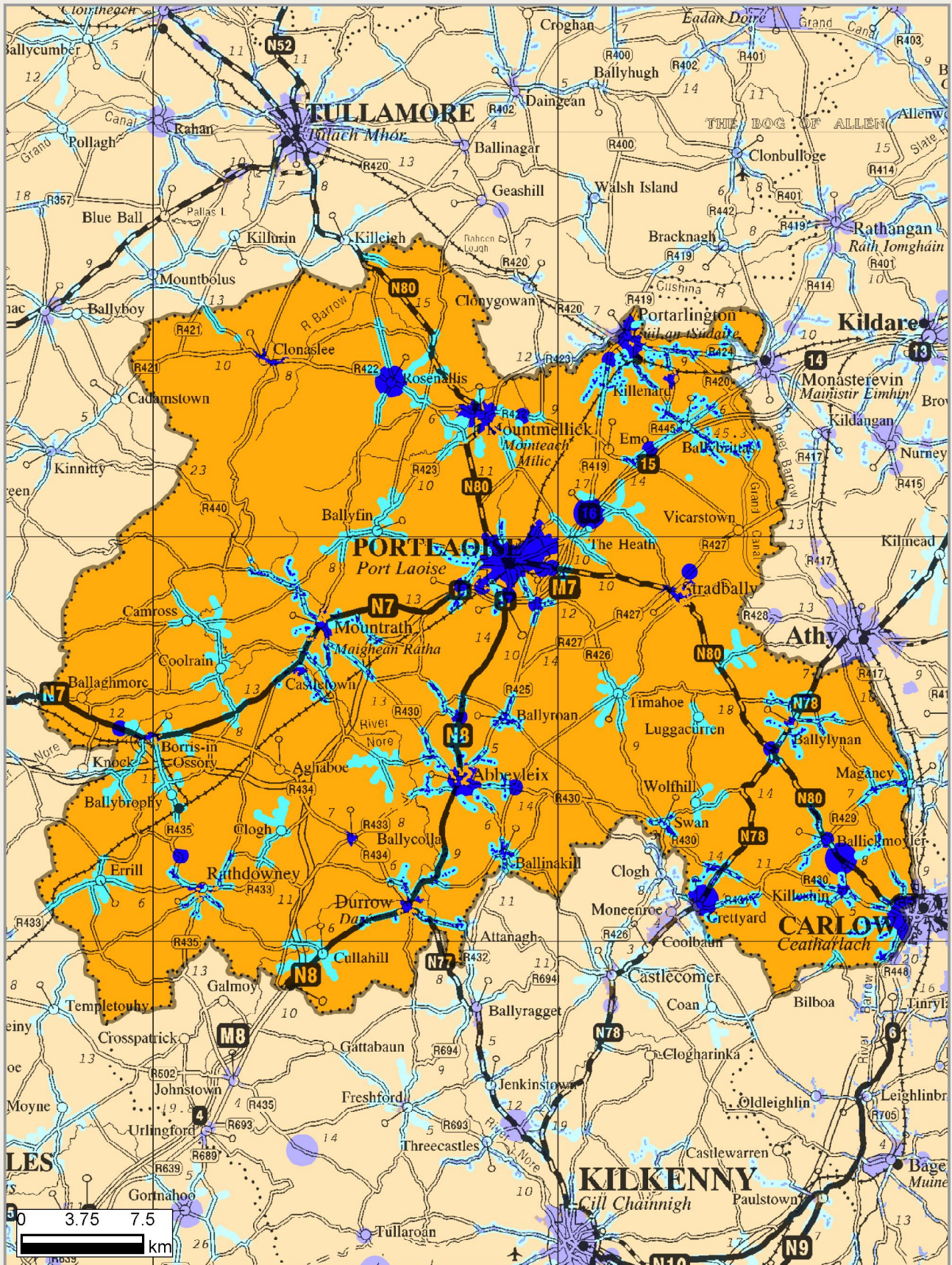
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Laois

County

Q4 2018



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Total Number of Premises in Laois	39,253
State Intervention Area	33%
Commercial Deployment	62%
Commercial Planned Deployment	5%

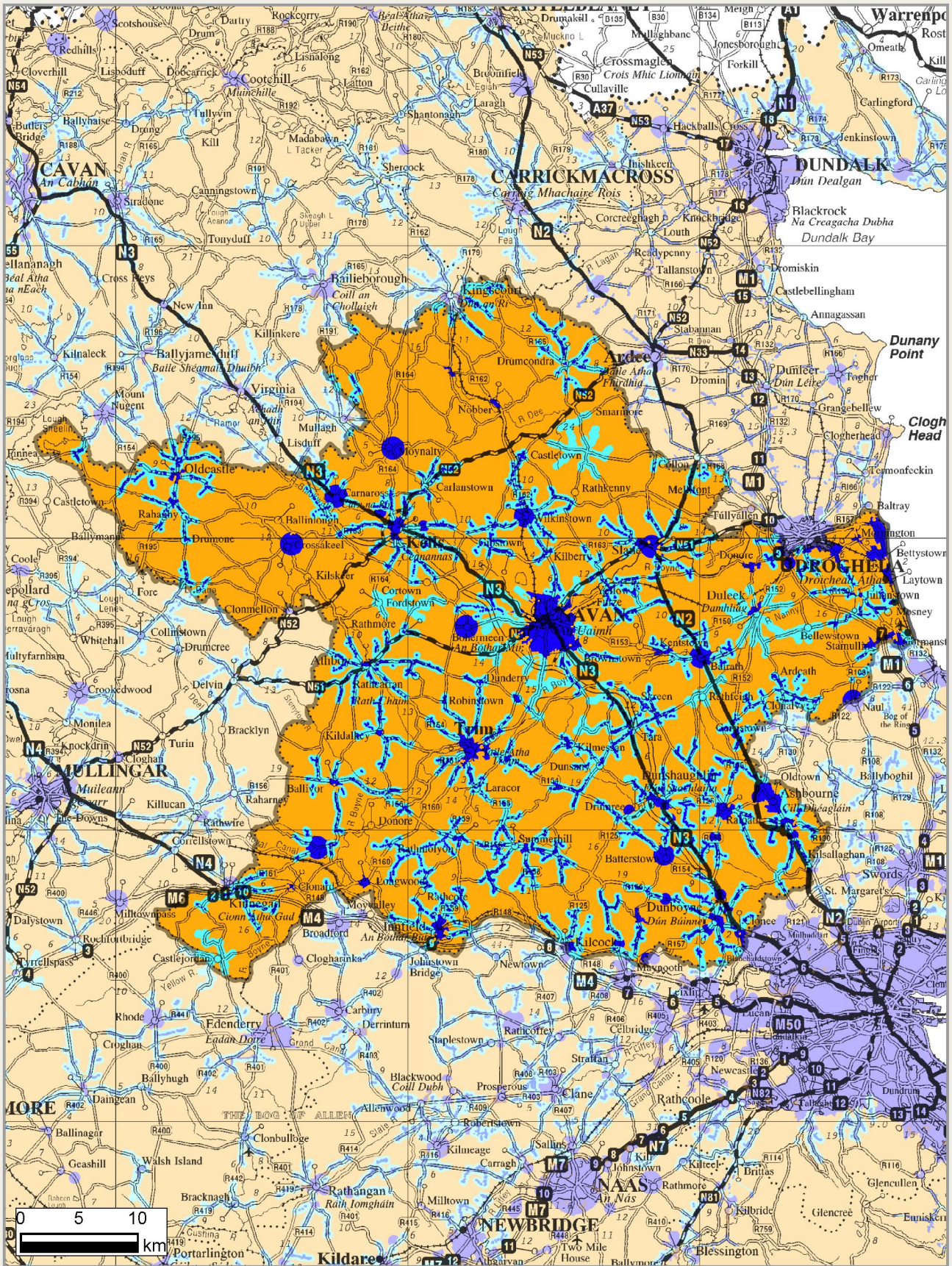
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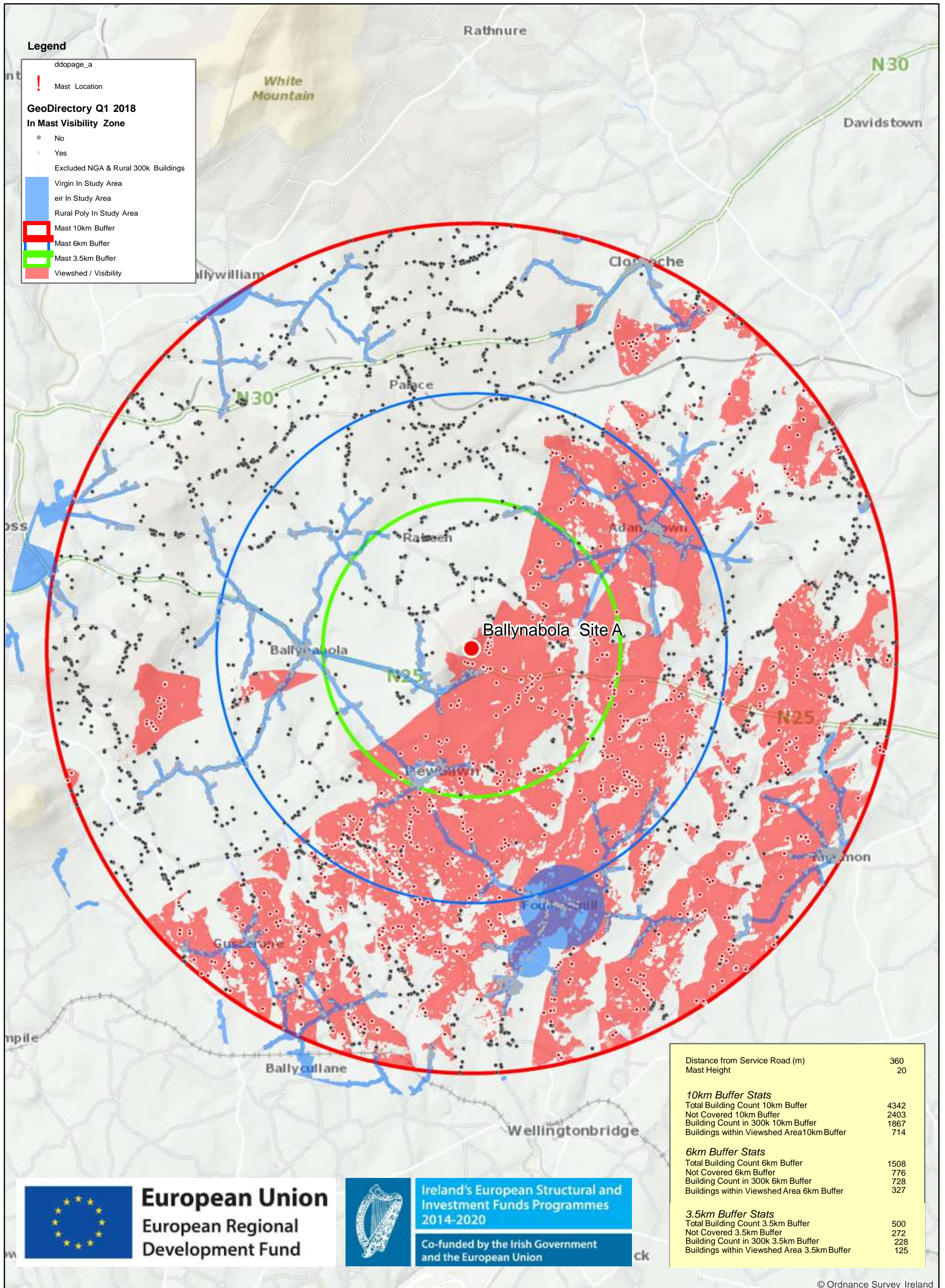
Total Number of Premises in Meath	86,021
State Intervention Area	23%
Commercial Deployment	74%
Commercial Planned Deployment	3%

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Ballynabola_Site A



Legend

ddopage_a

- ! Mast Location

GeoDirectory Q1 2018

In Mast Visibility Zone

- No
- Yes
- Excluded NGA & Rural 300k Buildings
- Virgin In Study Area
- eir In Study Area
- Rural Poly In Study Area
- Mast 10km Buffer
- Mast 6km Buffer
- Mast 3.5km Buffer
- Viewshed / Visibility

Distance from Service Road (m)	360
Mast Height	20
10km Buffer Stats	
Total Building Count 10km Buffer	4342
Not Covered 10km Buffer	2403
Building Count in 300k 10km Buffer	1867
Buildings within Viewshed Area 10km Buffer	714
6km Buffer Stats	
Total Building Count 6km Buffer	1508
Not Covered 6km Buffer	776
Building Count in 300k 6km Buffer	728
Buildings within Viewshed Area 6km Buffer	327
3.5km Buffer Stats	
Total Building Count 3.5km Buffer	500
Not Covered 3.5km Buffer	272
Building Count in 300k 3.5km Buffer	228
Buildings within Viewshed Area 3.5km Buffer	125



Explanatory Note for Accompanying Cover Plots

Site Names: Ballynabola_SiteA Co. Wexford

There is an existing high site located outside the village of Ballynabola, Co Wexford. The high site is situated in the middle of low lying pastureland; the elevated site should provide optimum coverage for the surrounding areas.

The analysis provided on separate pages illustrates the radio coverage pattern taken from two separate sites located on Carrickbyrne Hill.

Ballynabola_SiteA map

The **red coverage area** shows the area that is visible by direct line of sight from the mast location, at a height of 20m above ground. This would be a typical height that a network operator would install their equipment. Typically the higher the equipment is installed the better the potential coverage, however there may not be space available on the mast at the desired height.

The **red dots** on the map represent premises in the Intervention Area have a direct line of sight to the mast. Fixed Wireless Access (FWA) technology required a direct line of sight from the equipment located on the mast to the fixed antenna installed at the premises. The fixed antenna is typically installed at a height of 5-6 metres for a bungalow. The black dots represent premises in the Intervention Area that are not visible from the mast. The coverage plot follows the contours of the terrain, there are no buildings or vegetation considered which can further alter the coverage pattern.

There are **black dots** located to the west and northwest of the mast. The line of sight to these premises is being obscured by Carrickbyrne Hill and therefore outside the visibility of the mast i.e. there is no clear line of sight. There are also areas to the east and south that are in shadow these are caused by small bumps and dips in the contours of the land.

The **blue coverage area** represents the commercial areas including the eir 300k ribbons.

Challenges

1. The challenge with FWA is providing complete coverage to all premises within a specific area. A large number of sites would be required in a given area to ensure that blanket coverage is provided.
2. A large number of sites pose challenges for site acquisition; the option would be to lease equipment space on existing sites or the build of new sites (requiring planning permission from the local authority).
3. Getting electricity and backhaul fibre to new high sites
4. In addition to coverage challenges of the FWA, the capacity of the FWA cell itself is shared amongst all the connected end users of the cell. Therefore the more concurrent users on the FWA cell, the lower the overall performance of each end user i.e. lower speeds. This could be mitigated by limiting the FWA cell to a maximum number of end users in order to provide a better customer experience. Again this would result in more FWA cell sites being required.