Boost Update

Dialogue July 2014

Why we're here today– an overview

- Nearly two months ago we launched our commercial Accelerate plans.
- Since then we have been in consultation with you all.
- Thank you for your extensive feedback.
- New Accelerate fibre plans announced are confirmed and are now available for you to order.
- We have listened to your feedback on the Boost copper plans: this afternoon we will take you through the detail you have asked for and address common issues raised.
- We will also describe the changes to our thinking made in response to feedback and our current proposals .
- We continue to welcome feedback and we will keep talking to you.

Thank you for coming today

Context – demerger and our incentives

- One thing that has become clear through this process is a mixed understanding of our incentives.
- Chorus has a unique model, established as a wholesale only infrastructure provider.
- Our success is totally dependent on the success of you, our customers.
- Pricing is no longer driven by a retail-minus construct and competition comes from other network technologies and the LFCs.
- Our incentives are to continually invest in and improve copper and fibre services to meet your needs and the needs of your customers.
- Over and above the basic regulated products, **we are responding to your requests** for innovative new products that provide choice and clear differentiation.
- The Accelerate range of products was designed to do this.

Today's dialogue seeks to

1. Clarify the co-existence of Basic UBA and Boost and the interplay with handovers;
2. Provide proposals for ensuring Basic UBA today is respected and understood;
3. Clarify how we see Basic UBA and Boost fitting together as well as how this supports transition to fibre;
4. Outline the enhancements to the Boost proposals; and
5. Provide a price from 1 December 2014 to deal with the delay in the Commission's FPP timetable that was announced after the consultation on Boost proposals.

The next step for all industry is to provide submissions into the Commission process recently announced, in parallel with continuing to discuss commercial options with us.

Key issues

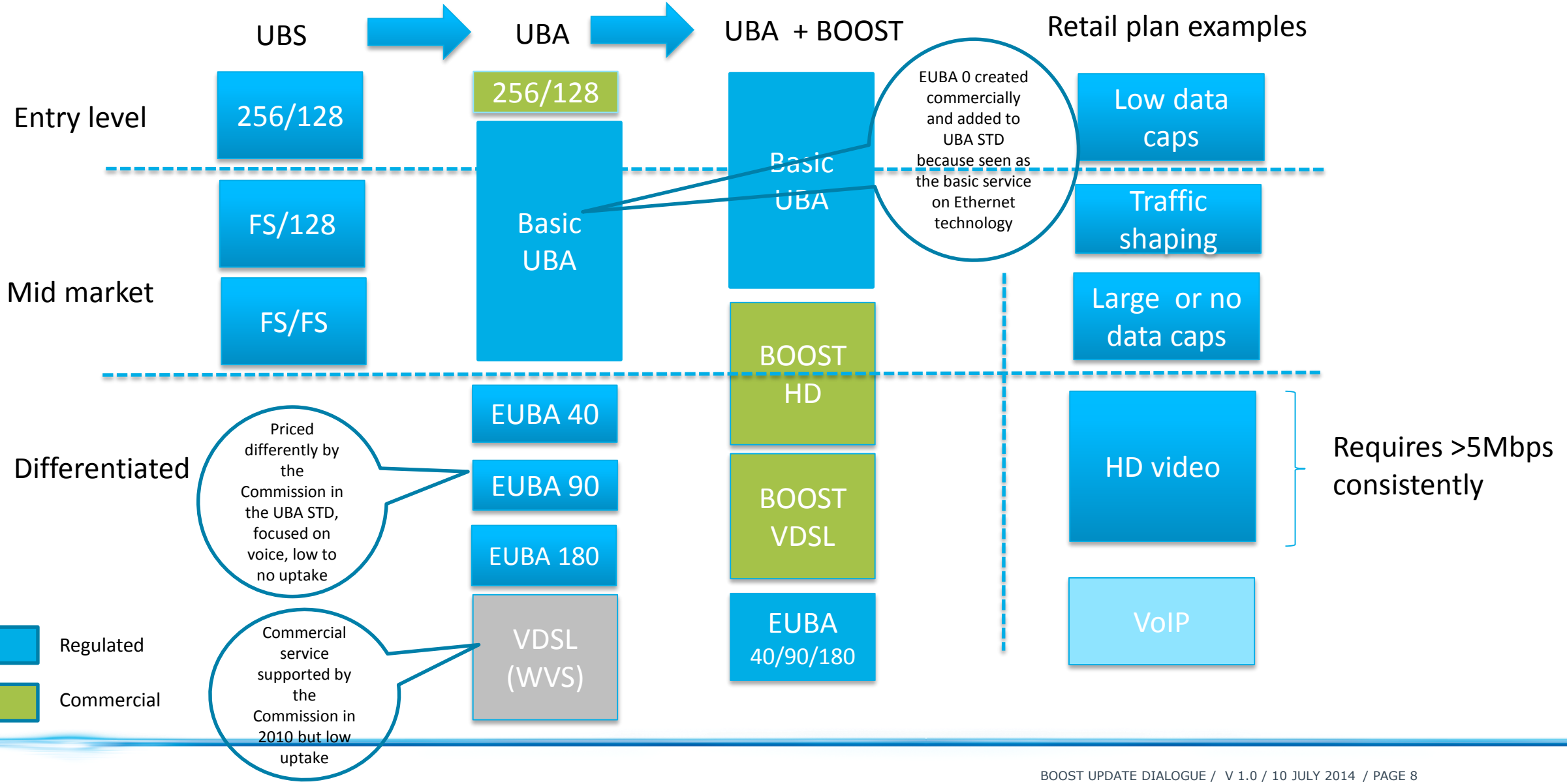
1. How Boost can support innovative market offerings to meet your customers' demand.
2. How commercial solutions sit alongside regulated ones - today and tomorrow.
3. Clarity on today's best efforts Basic UBA (BUBA) and proposed new committed Boost service.
4. Changes made in response to your feedback

How boost can support innovative market offerings to meet your customer demand

Differentiation supports market needs

- Nearly two months' ago, we announced for consultation:
  - New fibre plans (now confirmed); and
  - Committed Boost services that our customers can choose to credibly support new retail offerings, particularly HD video.
- Committed copper services are not available today under the regulated STD.
- The Basic UBA service (the main regulated service taken today) is "best efforts" and not guaranteed.
- Improved Broadband connectivity enables new applications and consequently the world is more about broadband than voice (as compared to when the UBA STD was designed).
- Boost respects and sits alongside the regulated STD designed by the Commission in 2008.
- Without Boost proposals, there would be no committed services available in the NZ market in the period of transition to fibre.

Differentiation is important in the wholesale market



How commercial solutions sit alongside regulated ones – today and tomorrow

We offer wholesale commercial solutions today

- The majority of the market is on Basic UBA (EUBA 0).
- No one is taking EUBA variants in any volume (designed for voice).
- Few are taking the regulated backhaul services.
- Most are taking commercial “backhaul” solutions (TES).
- The 1Gb handover has an STD regulated price.
- Around half the market is on 10Gb non-regulated handovers that have evolved to deal with capability needed as the market has evolved.
- VDSL was added last year in response to commercial requests.
- Boost was released for the same reasons.

- **Tail Extension Service (TES) – a per tail backhaul service**
- **10Gb handovers**
- **Boost HD and Boost VDSL**

Boost is an opportunity to work together to deliver better services

> In today's structurally separated environment, we need:

- Wholesale offerings that evolve to meet market demand;
- Offerings that are sometimes ahead of current end user demand, to enable the next generation of offers to be developed;
- Services that provide the opportunities for you to innovate and differentiate.

> Initial feedback has been positive, supporting commercial services alongside regulated ones.

"Telecom and Vodafone welcomed its announcement. Vodafone New Zealand chief executive Russell Stanners said Vodafone had long argued that the ultimate benefit of investing in fibre was speed and Chorus had listened. Telecom spokesman Andrew Pirie said it was "pleased in principle" with Chorus' proposals, for example with a speed hike for lower-cost ultrafast broadband services. But he said they would also require investment by service providers such as itself."
http://www.stuff.co.nz/technology/60061683/chorus-pledges-to-increase-broadband-speeds.html

Telecom: Andrew Pirie tweet 13 May: "*good to see you looking for commercial solutions rather than staking everything on the regulatory roulette wheel*

A recap of Boost

- Our long term aim, considering our significant investment in a new fibre network, is to see far more content; and other applications delivered over the fixed network. The more the service can be used for; the higher the uptake.
- One of the missing aspects in the New Zealand market to date has been quality online content. Everything that exists today has typically been designed for best efforts delivery over a variable quality service.
- There are arguably many reasons for this, but we have been thinking about what we can do to help.
- We fundamentally have a well engineered, world class copper network than can deliver high value applications. The same equipment and loop length is used in other countries to deliver innovative, high value video-based applications i.e. Belgacom, AT&T, KPN.
- So we have designed Boost to support mass online consumption of high quality video content.
- Video of course can be consumed on Basic UBA service, it's just not guaranteed. Basic UBA will not support simultaneous HD Video delivery to all customers – Boost will.
- The feedback we've had is that if your customers are to pay for high value content, it always needs to work. This is the gap that Boost helps fix.

Boost is differentiated because it is committed, enhanced and all inclusive

> Key feedback we've had is that simple, outcome based pricing and service descriptions are preferred over complicated charges. This is a feature of the Boost HD and Boost VDSL services.

1. **A service commitment ensuring minimum performance:**
   - Minimum downstream/ upstream line speed >6Mbps/ 600Kbps for Boost HD and 10Mbps/ 1Mbps for Boost VDSL;
   - Minimum downstream average throughput of 5 Mbps during a 15 minute period.
2. **Handover location consolidation (to UFB).** No additional charges to bring the service back to key handover points.
3. **Tail Extension Service steps reduced from 8 to 5.**

Boost is differentiated because it is committed, enhanced and all inclusive

4. **Line performance optimisation integrated with our network analyser tools.**

5. **Monthly price includes most applicable installation charges.**

6. **A ‘fibre ready’ in-home install for Boost VDSL.** In Chorus’ UFB coverage areas and include modem install when truck roll required.

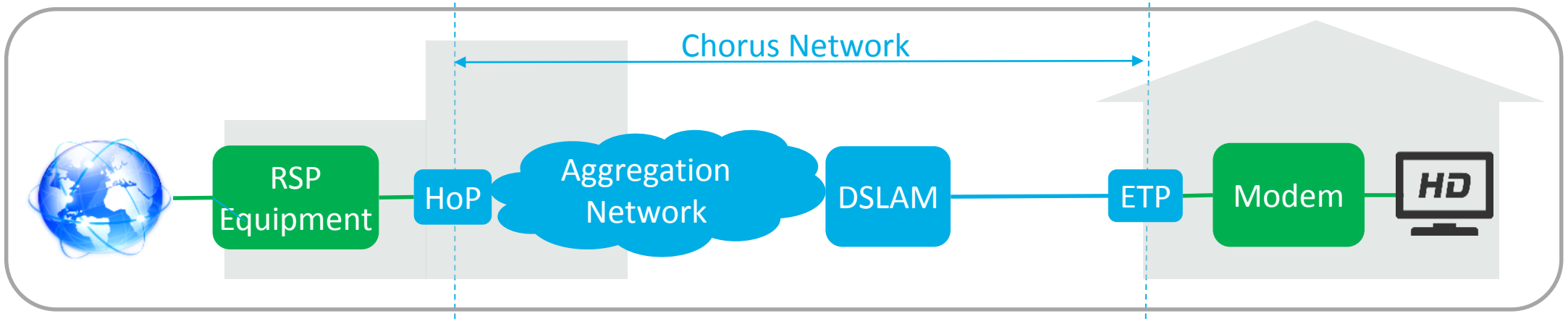
Boost HD service commitment

Market Outcome

Broadband that supports HD Video

Service Commitment

Minimum average throughput of 5Mbps from **H**and**o**ver **P**oint to **ETP**



Operational Commitment

RSP Network*

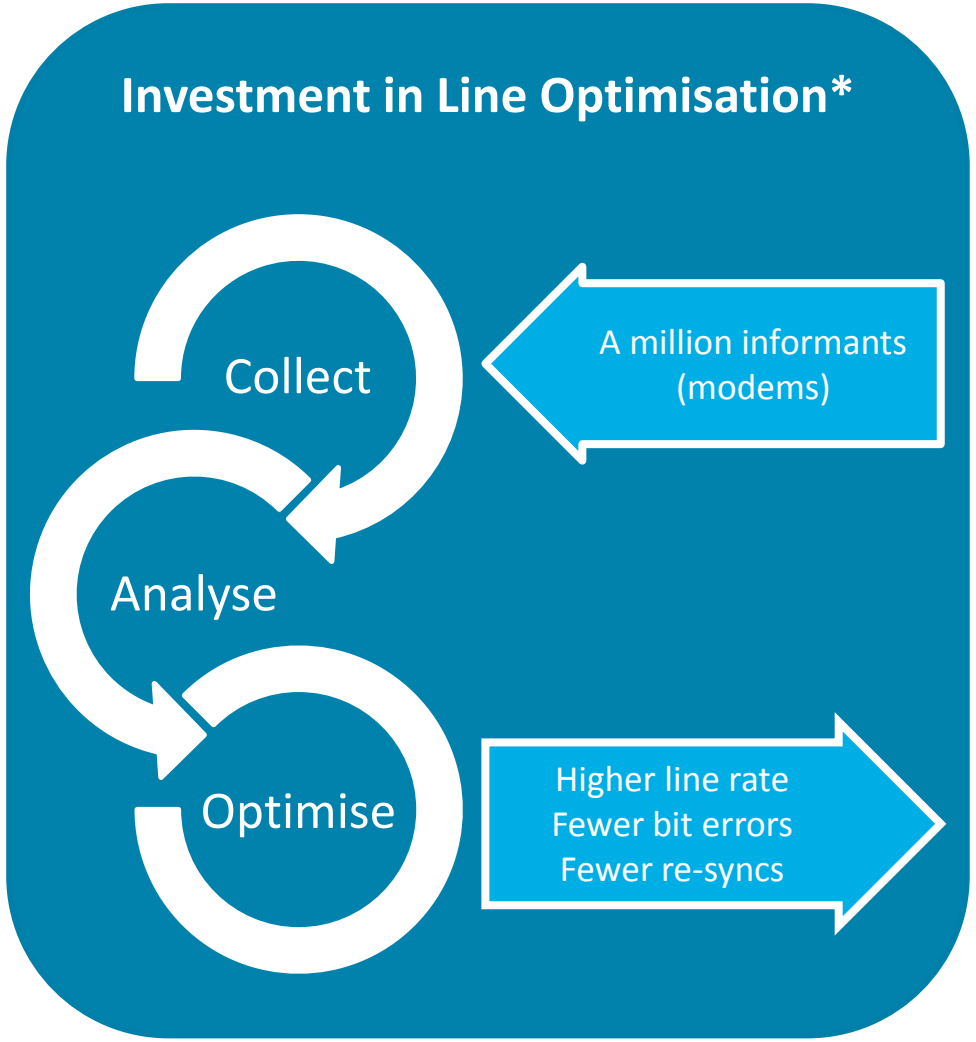
Capacity planned Aggregation Network

Minimum 6Mbps DSL Line Rate

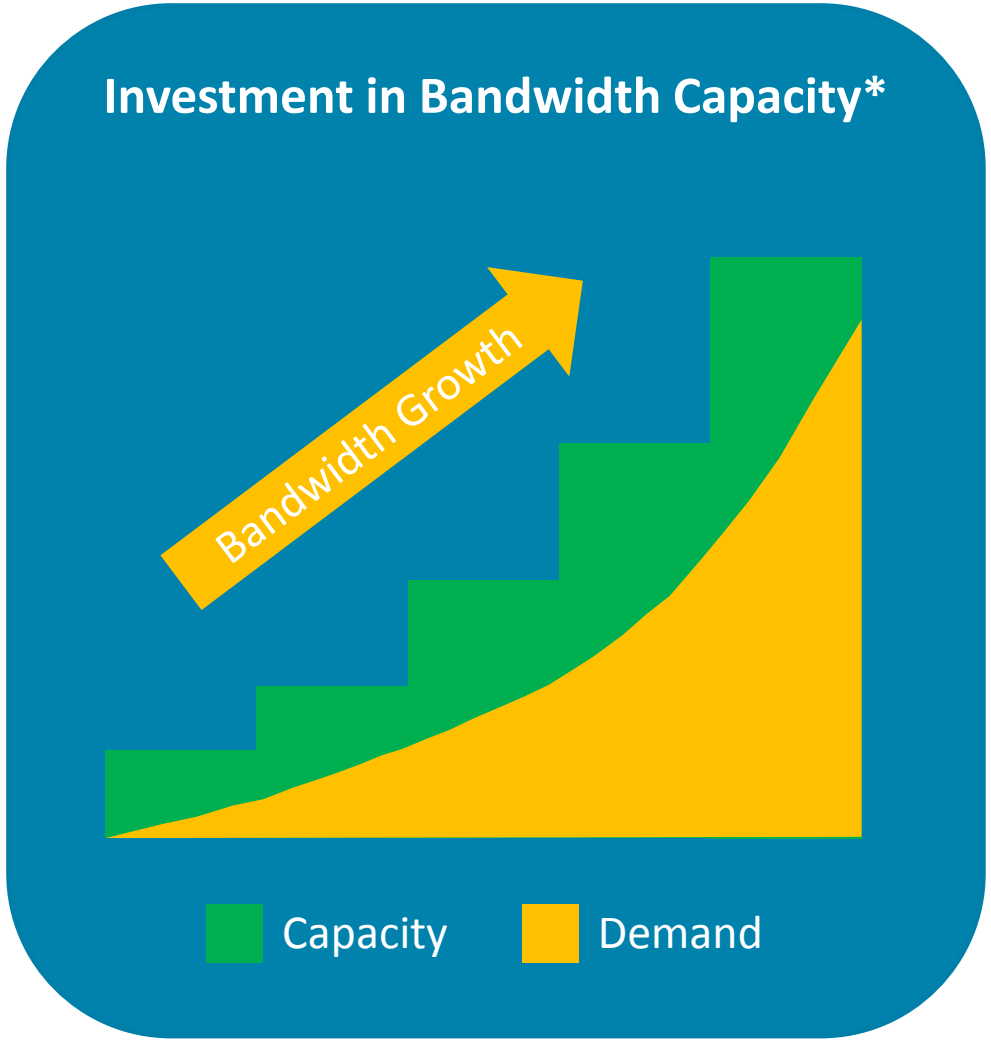
End User Network*

* Commitment excludes issues outside our control e.g. your and your customer and international networks

How we plan to meet our service commitment



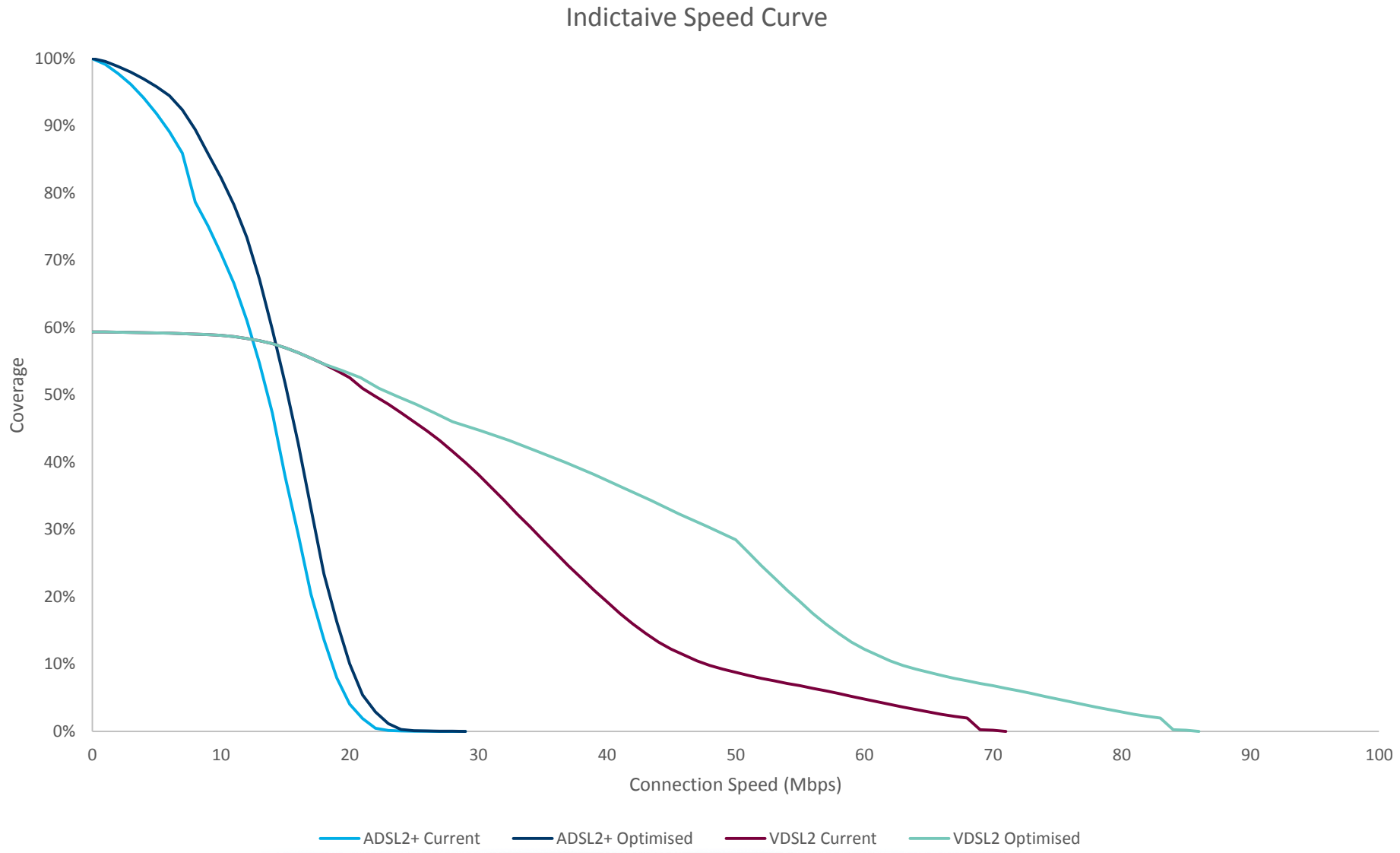
*Powered by 5530 Network Analyser



*Powered by Alcatel-Lucent 7950XSR, 16Tbps Core Ethernet Switch

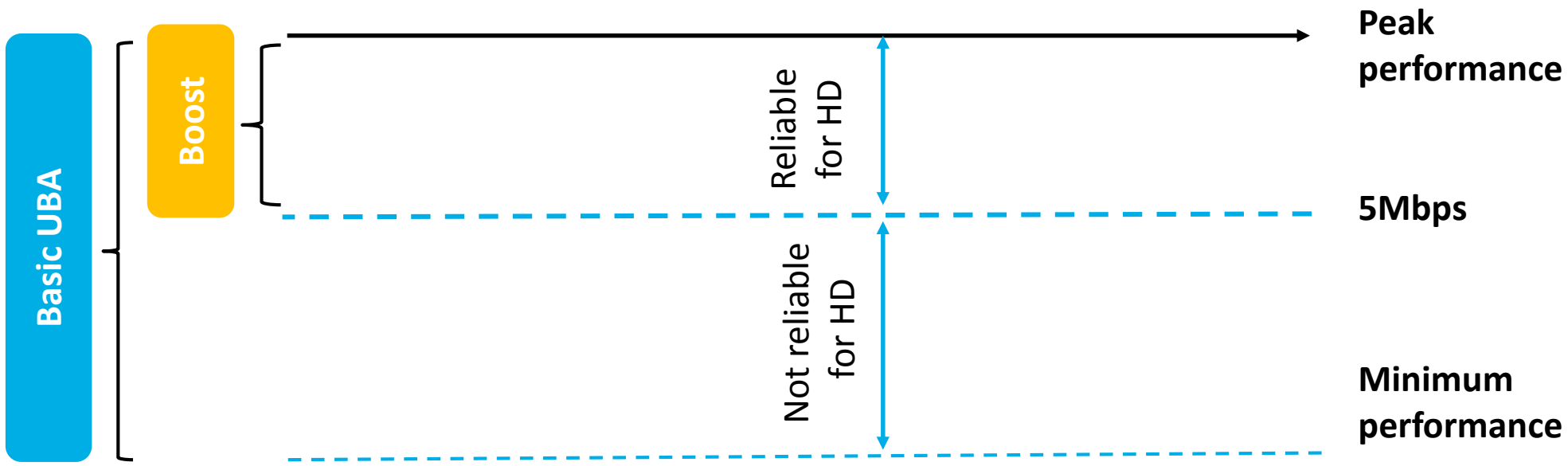
Speed and throughout commitment

- Line speed improvements. Investment in improved line profiles, especially for VDSL.
- Traffic management in shared elements of aggregation network:
  - Capacity planning to meet the high demands of video
  - Differentiated transport class proposed – i.e. differentiated from Basic UBA.



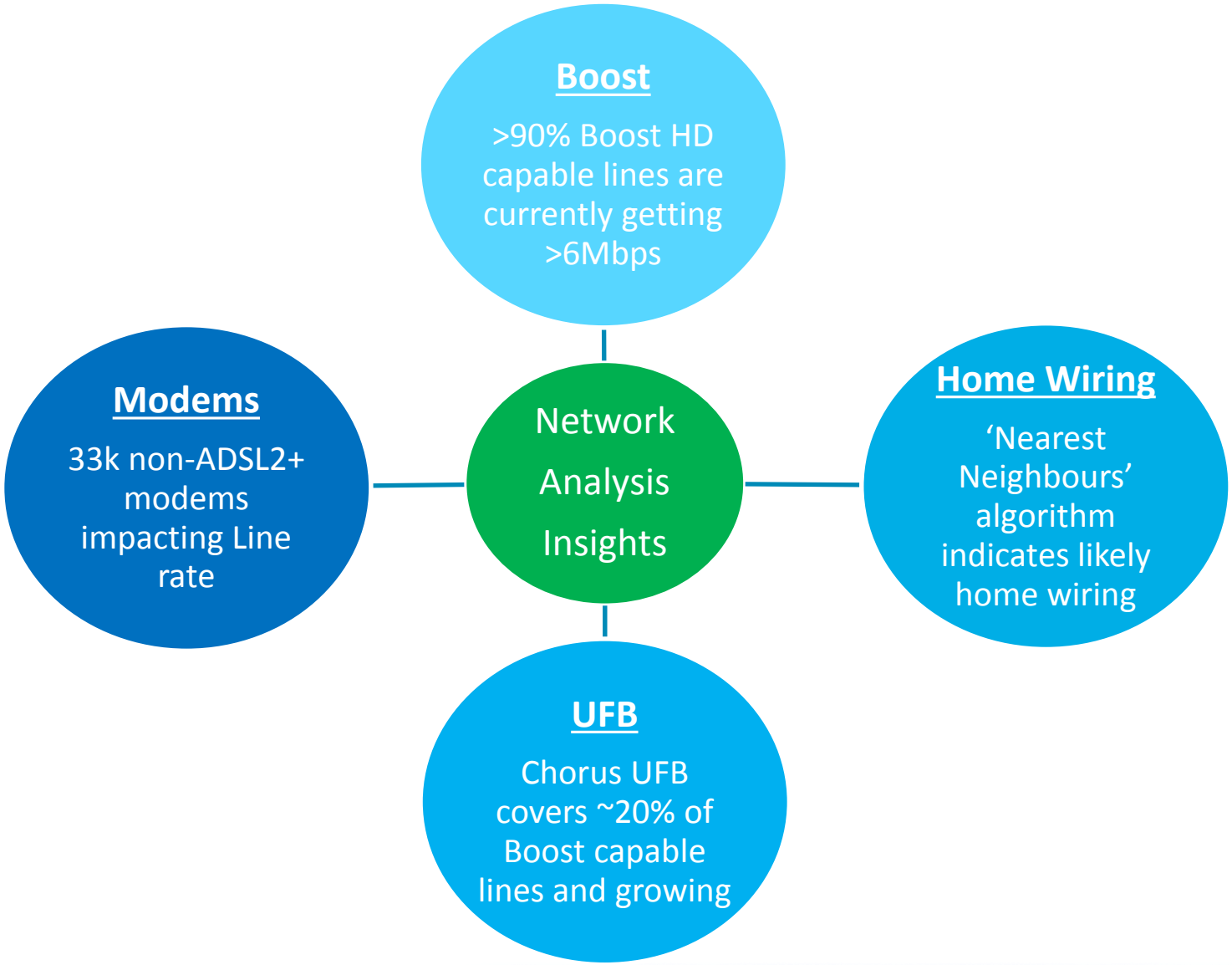
Boost HD Service commitment

> Line speed improvements. Investment in improved line profiles (especially for Boost VDSL).



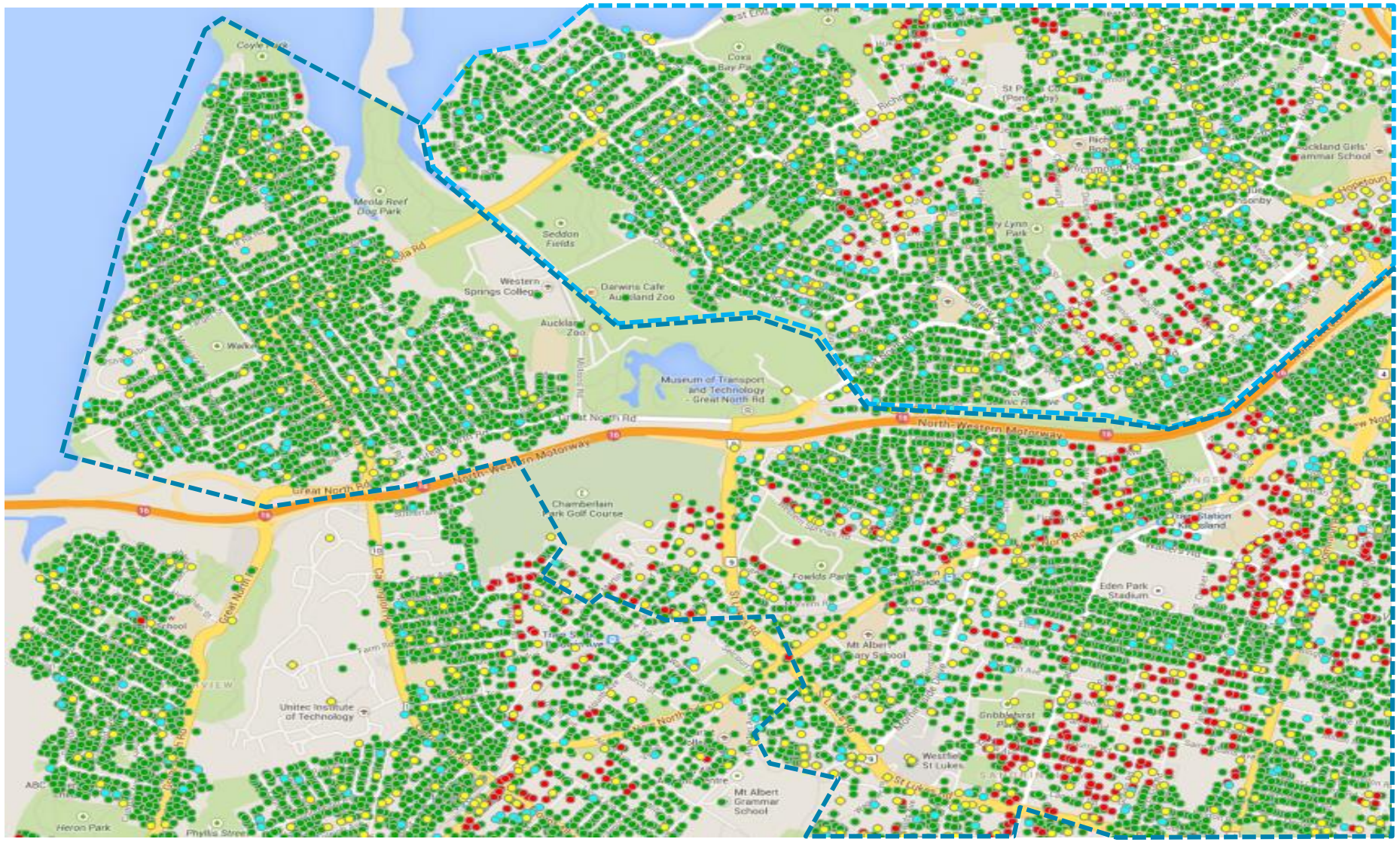
The service commitment will give you confidence to market HD services – the key change is from what the service often can achieve to what it always can achieve

Our rich network information can help you



We can identify premises not achieving commitment

- >6 Mbps
- < 6Mbps
- Home Wiring
- Modem



- - - UFB Year 1-3

- - - UFB Year 4-5

* Home wiring is indicative

What our service commitment means

We will

- Roll a truck at our cost to investigate speed faults below the target rate.
- Fix line (on the assumption that it is economic to repair) to restore service.

We won't

- Fix speed faults below target rate where:
  - Poor home wiring is the cause - but we can include this as a paid for option.*
  - Out of date / old modems is the cause.
  - Fibre is currently available as an alternative.

If your customers' line does not meet the commitment

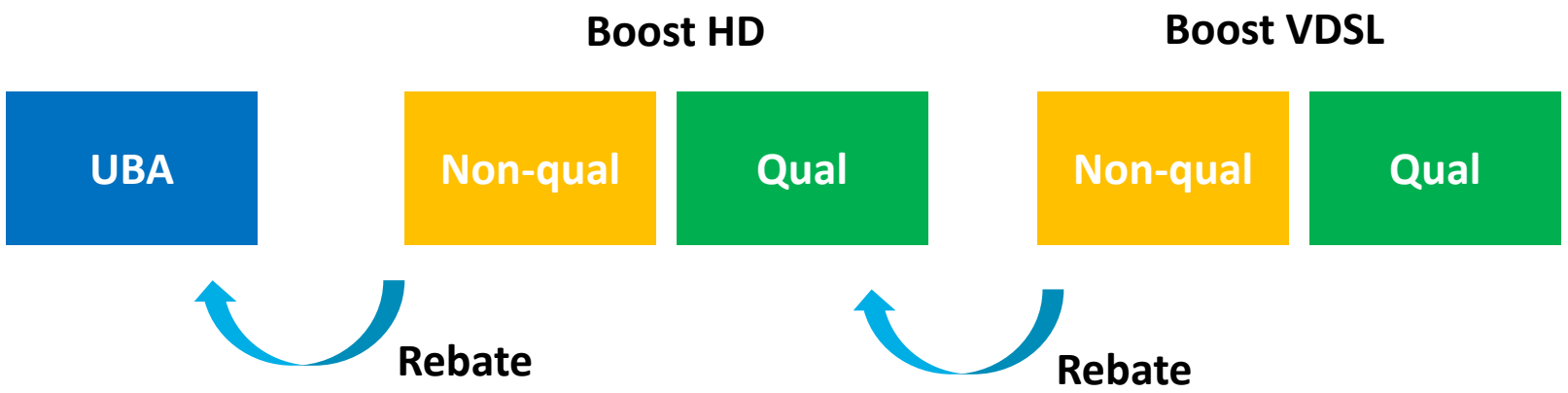
- If the reason is because our network is not able to deliver the expected performance (i.e. the loop is too long) we will credit back the difference between the Boost price and the regulated UBA price.

- If the reason is due to poor wiring or old modem, we will not provide a credit, but will provide a list of the lines where we believe this is an issue.

* For Boost VDSL, home wiring is included, so this will only be an issue for Boost HD

Qualifying and non-qualifying rebates

- Lines that do not meet the Boost service commitment level will be described as non-qualifying.
- In the case of non-qualifying you will have the choice of keeping a line on your requested Boost service as a non-qualifying line or to move it back to the next qualifying service.
- Non-qualifying lines will be rebated back to the next qualifying service;
  - Eg a non-qualifying Boost VDSL connection would be rebated back to the Boost HD price if the preference was to leave it on VDSL.
- The status of lines will be identified to you in advance of any migrations and any change of status will be advised with one month's lead time.



Handover simplification

- Fibre is requiring increasing magnitude growth in bandwidth.
- We see that many RSPs have invested significant amounts in POPs and resources in getting to the new UFB handover locations.
- Chorus believes that these make sense to be the new location for high bandwidth copper services.
- As part of Boost Chorus is aligning the handover locations to the UFB handover locations, we will zero rate any appropriate tail extension costs within that coverage area back to the nominated major handover points (this means that within metro, within province the first step will have no charge).

Tail Extension to be aligned to UFB major POI's

North Island	
Area	**Major POI(s)**
1	WR
2	AK, GLF
3	HN
4	TG
5	RO
6	WHK
7	TPO
8	GS
9	NA/HBN
10	NU
11	WG
12	PM
13	LVN
14	MS
15	PRM
16	WN/PRO

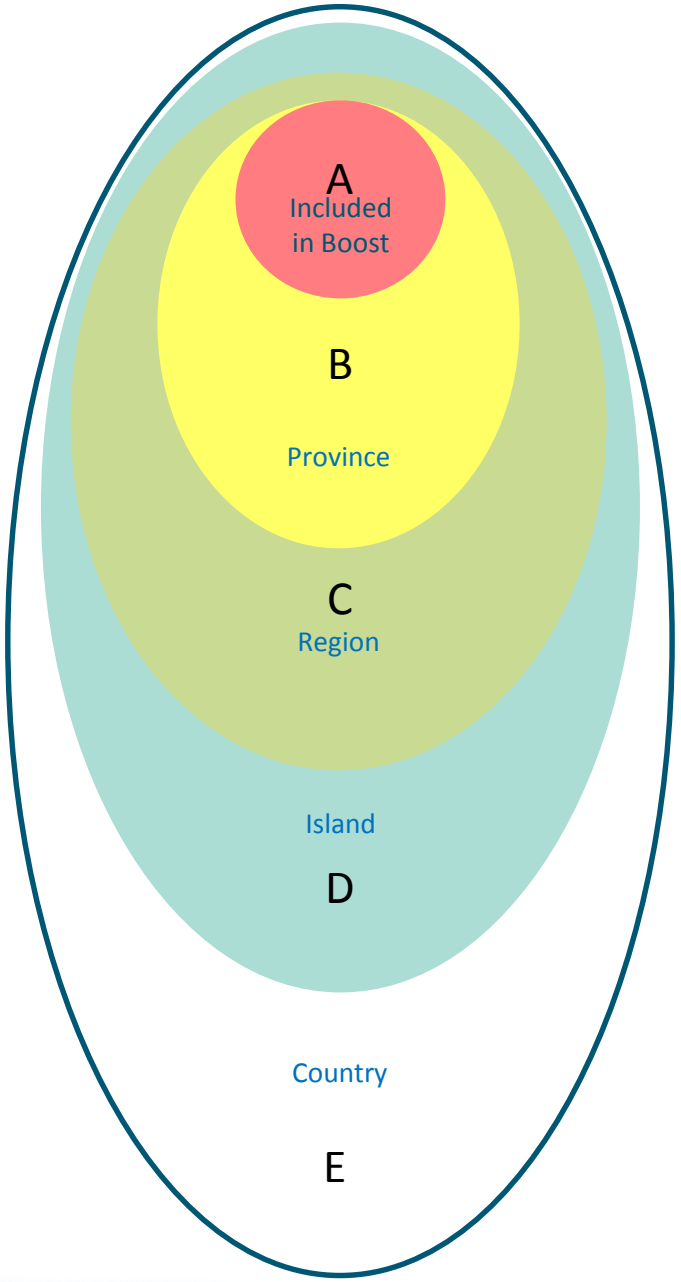
South Island	
Area	**Major POI(s)**
17	NN
18	BM
19	GM
20	CH
21	AR
22	TU
23	OU
24	QST
25	DN/SOD
26	IN

- The major POIs are the locations where UFB and RBI services are handed over
- 26 Cities, 30 Major POIs
- Chorus intent is for these major POIs to also be the primary locations for handing over Boost services

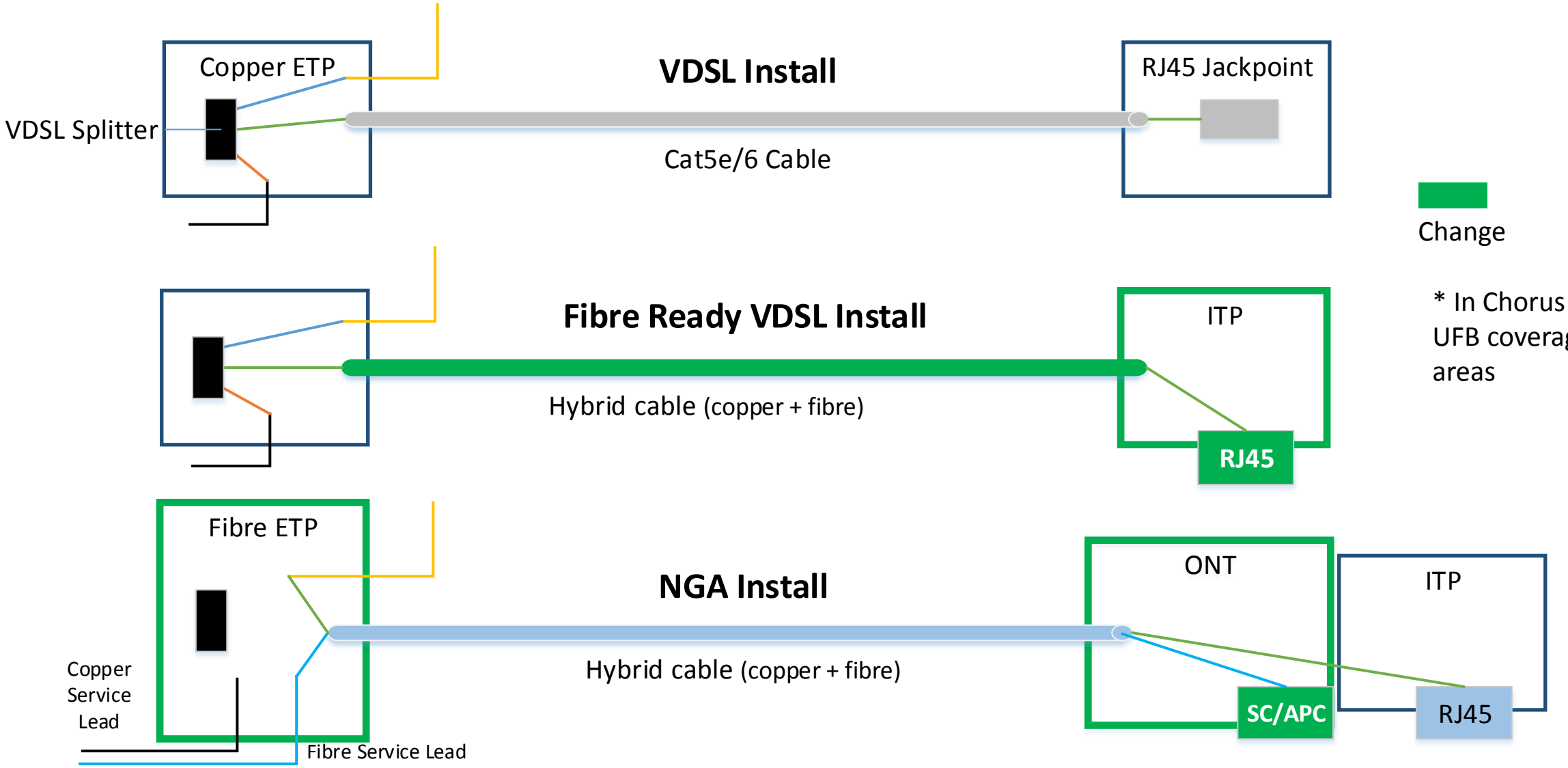
A simplified step model for Tail Extension

5 tiers of geographic coverage with one TES step for backhaul between sites within each geographic tier

- **A Step = intra-metro**
  - Applies to any-to-any UBA CA's within metro area. 6 metro areas AK, HN, TG, NA/HBN, WN, CH
  - Price reflects relatively low cost of switching traffic within urban area e.g. relative price ratio = 1 (although included in Boost pricing)
- **B Step = intra-province**
  - Applies to any-to-any UBA CA's within local province served by UFB candidate area i.e. 27 provinces
  - The metro areas are a subset of their respective province
  - Price reflects cost of transporting traffic between towns e.g. relative price ratio = 2
- **C Step = intra-region**
  - Applies to any-to-any UBA CAs within larger region (nominally based on RENs) i.e. 5 regions
  - Price reflects the higher cost of longer transport routes around regions e.g. relative price ratio = 3
- **D Step - intra-island**
  - The regions within each Island
  - Price reflects the higher cost of longer transport routed up/down each island e.g. relative price ratio = 4
- **E-Step – Inter-island**
  - Price reflects high cost of getting across Cook Strait e.g. relative price ratio = 5+



A fibre ready inside install for Boost VDSL*



Clarifying Basic UBA (BUBA) and Boost

Basic UBA and the regulated STD

- Questions have been raised about what the Basic UBA service is or how it performs today.
- What your customer receives at any point in time is “best efforts”;
  - This makes it subject to all the normal issues that dictate end to end performance; the home network, our network, your national network, your international capacity, various peering arrangements and the performance of the end server.
- We cannot measure end user experience in this environment for Basic UBA.
- Basic UBA has a minimum throughput specification defined in the STD as 32kpbs.
- However, we deliver vastly more at the wholesale level today as acknowledged by you.
- Examples of this can be seen in the latest published TrueNet data.

End user experience today – TrueNet report

Technology	ISP Name	Advertised Speed	Livepage Total Sec	9pm Mb/s	Speed Min/Max	Testpage Total Sec	Latency total ms*	Best Region DNS
ADSL	Orcon	FS/FS	4.8		90%	2.6	341	13
	Vodafone	FS/FS	5.1		95%	2.1	313	12
	Slingshot	FS/FS	4.2		94%	2.3	312	14
	Xnet	FS/FS	5.5	8	94%	2.9	327	
	Telecom	FS/FS	5.0		95%	3.9	356	14
	Snap	FS/FS	5.6		96%	3.8	341	8
	Flip	FS/FS	3.6		96%	2.4	297	
VDSL	Telecom	FS/FS	3.3		95%	3.2	292	
	Snap	FS/FS	2.9		95%	1.9	287	
	Orcon	FS/FS	3.2	23	95%	2.0	287	
	Slingshot	FS/FS	3.4		93%	1.7	309	
	Vodafone	FS/FS	2.7		96%	0.9	276	
Cable	Vodafone	10Mb/100Mb	3.4	104	77%	1.3	272	
	Vodafone	2Mb/15Mb	3.4	16	93%	1.3	264	
Fibre	Orcon	50Mb/100Mb	2.1	66	86%	1.6	265	
	Snap	50Mb/100Mb	2.3	79	93%	1.8	283	
	Orcon	10Mb/30Mb	2.1	29	86%	1.6	275	
	Snap	10Mb/30Mb	2.3	27	98%	1.8	280	

TrueNet describe their methodology https://www.truenet.co.nz/how-does-it-work that they test based on what we would describe as normal "web browsing".

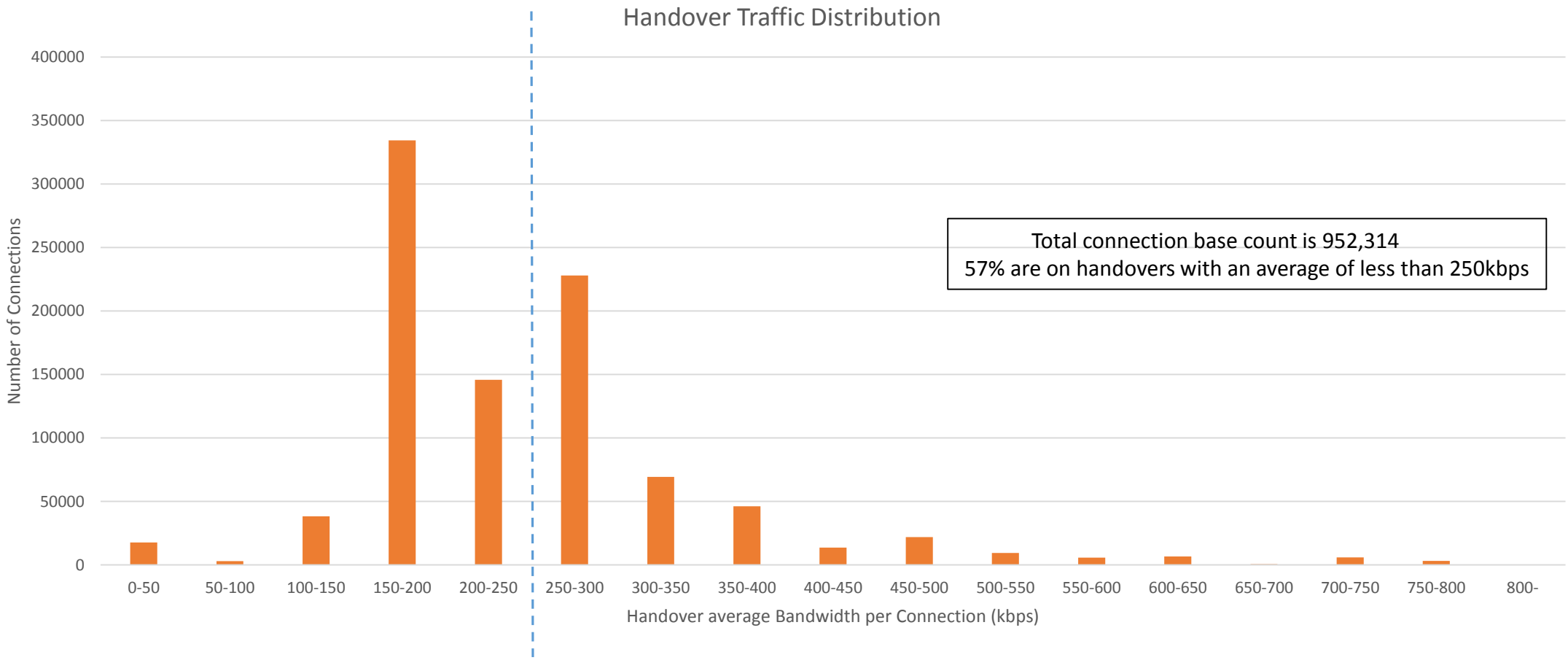
*"Our testing is based on simple concepts that mirror users' experience to the maximum extent possible, eg we use a test website that is the weighted average size of the top ten NZ Hitwise sites. We download a random file that behaves like a typical file download, say a data, music or movie file"**

*The file download sizes are 300kbps for ADSL and 1Mbps for VDSL. Again these are typical web browsing like uses.

https://www.truenet.co.nz/articles/may-2014-broadband-report

> The report shows that your customers get a very good experience for web browsing using Basic UBA (as that is the predominant use).

Average Basic UBA over Ethernet bandwidth per connection histogram



Total base count is 952,314

57% are on handovers with an average of less than 250kbps

Defining the Basic UBA service

- Because Chorus does not deliver the end to end service and only provides a part of it, it is challenging to define what Chorus should provide in order to deliver the Basic Service in accordance with the STD .
- Chorus can control the amount of bandwidth that is allocated in its network at the handover point.
- To provide a definition of the Basic UBA Service, Chorus proposes to traffic manage the network so that there is always 250kbps of bandwidth available times the number of circuits.
- This, today, gives the very good TrueNet results we see, and it will continue to do so for the applications that TrueNet test which Chorus believes provides a good view of what an end user should expect to use the Basic UBA service for.
- Chorus does acknowledge that the 250kbps will not be suitable for a provider that wishes to offer / encourage High Definition video streaming at prime time.
- High demand for high definition content all at the same time requires much more than 250kbps.
- For this application, Chorus has developed the Boost range, where Chorus will commit a minimum 5Mbps throughput for each circuit.

Traffic management proposal for Basic UBA over Ethernet

- We propose that a traffic management policy is applied of 250kbps x number of customers (slightly above today's average observed across all handovers) that will ensure that:
  - Today's service levels are held, providing certainty to our previous statements that it does not intend to reduce to the minimum throughput; and
  - In contrast to today, you will get the same consistent service at each handover. This is also more equitable and is consistent with an open access approach.

- This proposal is consistent with Basic UBA ATM handovers which are already being managed in this way.

- We propose to therefore introduce traffic management for Basic UBA over Ethernet from 1 September.

- We expect that handovers higher than the 250kbps would be ideal candidates for Boost. However we acknowledge that you may choose to keep them on the Basic UBA service. In that case, any handover that is in excess of 250kbps x number of users will be managed down gradually over a six month period.

- The minimum size of any handover is 50Mbps.

Traffic management proposal for Basic UBA over Ethernet

- The Basic UBA STD regulates the service not the network management (so long as the service specifications are met). We seek feedback on this network management proposal to provide greater definition and certainty on today's Basic UBA service.

- We note that the uncertainty that has raised questions are unique to New Zealand's Basic UBA Service. In almost every other country in the world, services are "network managed" by speed limits/variants (akin to Chorus' fibre services). Our research internationally from Point Topic looked at 2,986 residential tariffs collected across 90 countries, 97% advertised a defined speed as opposed to how UBA services are specified in NZ. By defined speed we mean that the service had a actually speed level eg, 2Mbps, 10Mbps etc.
  - More detail is outlined in Appendix B

- The next slide shows how this additional definition provides clarity and how it services market needs. Boost is "akin" to the High Priority EUBA variants in the UBA STD but broadband, rather than voice, focused in light of bandwidth growth and evolving market needs.

Summary of key differentiated features

	UBA	Boost HD	Boost VDSL
Availability	100% of DSL capable lines	~90% of DSL lines	~60% of DSL lines
Minimum line synch rate (pre qual)	BUBA: 64kbps synch rate requirement	6Mbps downstream / 600kbps upstream	12Mbps downstream / 1Mbps upstream
Min throughput	99% probability of a 32kbps average over 15mins	5Mbps commitment over 15mins	10Mbps commitment over 15mins
Traffic management	**Basic UBA over ATM**: 150kbps (75kbs current average) **Basic UBA over Ethernet**: 250kbps (200kbps current residential average) **x number of customers**	None applied	None applied
Handover locations	90	26	26
Tail extension steps	8	5	5
Tail extension Traffic class	Best Efforts	Differentiated	Differentiated
Home wiring	Uses existing	New composite cable installed ETP to modem if site visit ordered	New composite cable installed ETP to modem as standard
Assure	Truck roll can be ordered by RSP, no fault found may apply	Truck roll at no charge if service commitment not met	Truck roll at no charge if service commitment not met
Installation	Remote $15.85, non-site $73.51, site visit $169.73, modem install $38.01	Remote & non-site and basic modem install included. Site visit charged if applicable.	All install charges included in offer (fibre ready)

Price comparison table

		Basic UBA	EUBA 40	EUBA 90	EUBA 180	Boost HD	Boost VDSL
Throughput	Low priority commitment	Min of 32kbps	Min of 32kbps	Min of 32kbps	Min of 32kbps	Min of 5Mbps	Min of 10Mbps
	High priority commitment	0	40kbps	90kbps	180kbps	0	0
Monthly charge		$34.44	$36.77	$37.34	$38.37	$39.99***	$44.99***
Installation Charges **(where applicable)**	Remote connect* (25% of installs**)	$15.85	$15.85	$15.85	$15.85	Included	Included
	Non site visit* (46% of installs**)	$73.51	$73.51	$73.51	$73.51	Included	Included
	Site visit* (29% of installs**)	$169.73	$169.73	$169.73	$169.73	$169.73*	Included
	Modem install*	$38.01	$38.01	$38.01	$38.01	Included	Included
	Interleaving toggle*	$15.85	$15.85	$15.85	$15.85	Included	Included

* Only applicable if required ** Industry average *** Subject to FPP outcome

When will Boost pricing commence?

- 1 Sept – Boost will be in soft launch only and charged at current EUBA and VDSL prices
- 1 Dec – new price points will take effect for Boost services.
- There is a proposed adjustment mechanism. The default is that the 1 December price is backdated to what the new price would be.

Changes made in response to feedback

VDSL

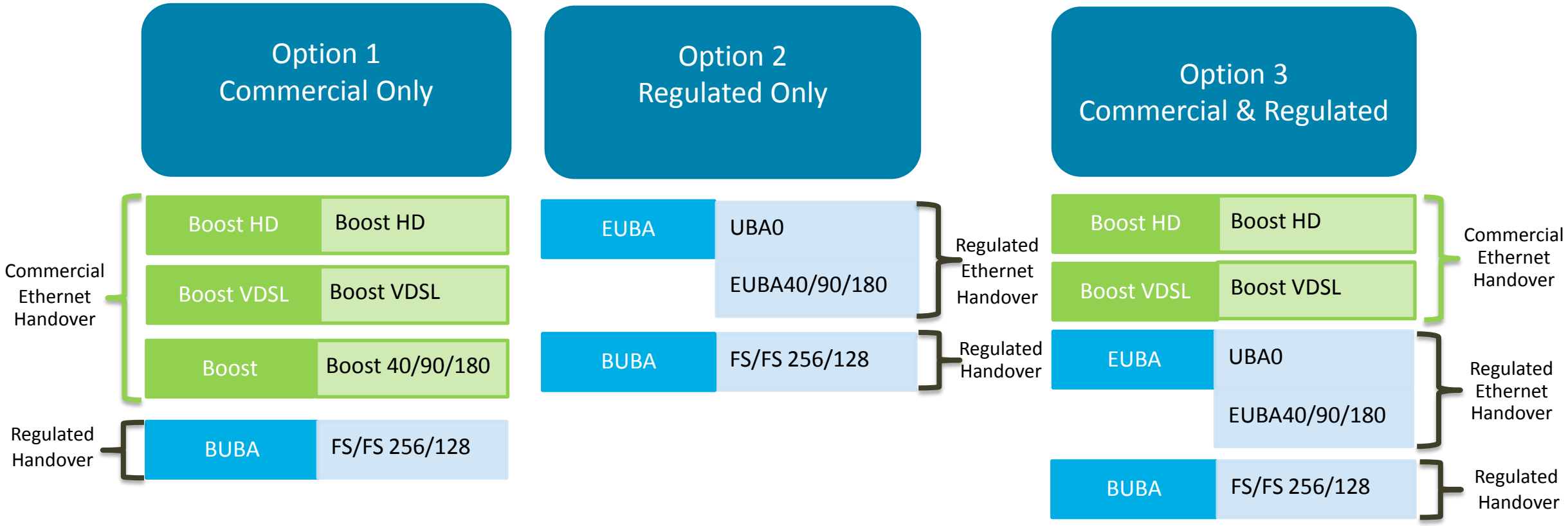
- We have had considerable feedback on the status of VDSL.
- Many of you have had significant market success with VDSL services and were concerned that the proposed changes would require you to commit to Boost or go through extensive network engineering steps.
- This was not the intention of the initial release and we're happy to clarify.
- Our current thinking is that Boost VDSL could be purchased without requiring a Commercial Handover. This means that VDSL can still be offered without having to create to handovers or consume Boost HD.
- The 10Mbps throughput commitment will not be provided if you choose to have Boost VDSL delivered over a Basic UBA Handover.
- Further details about VDSL are in appendix A.

Handovers

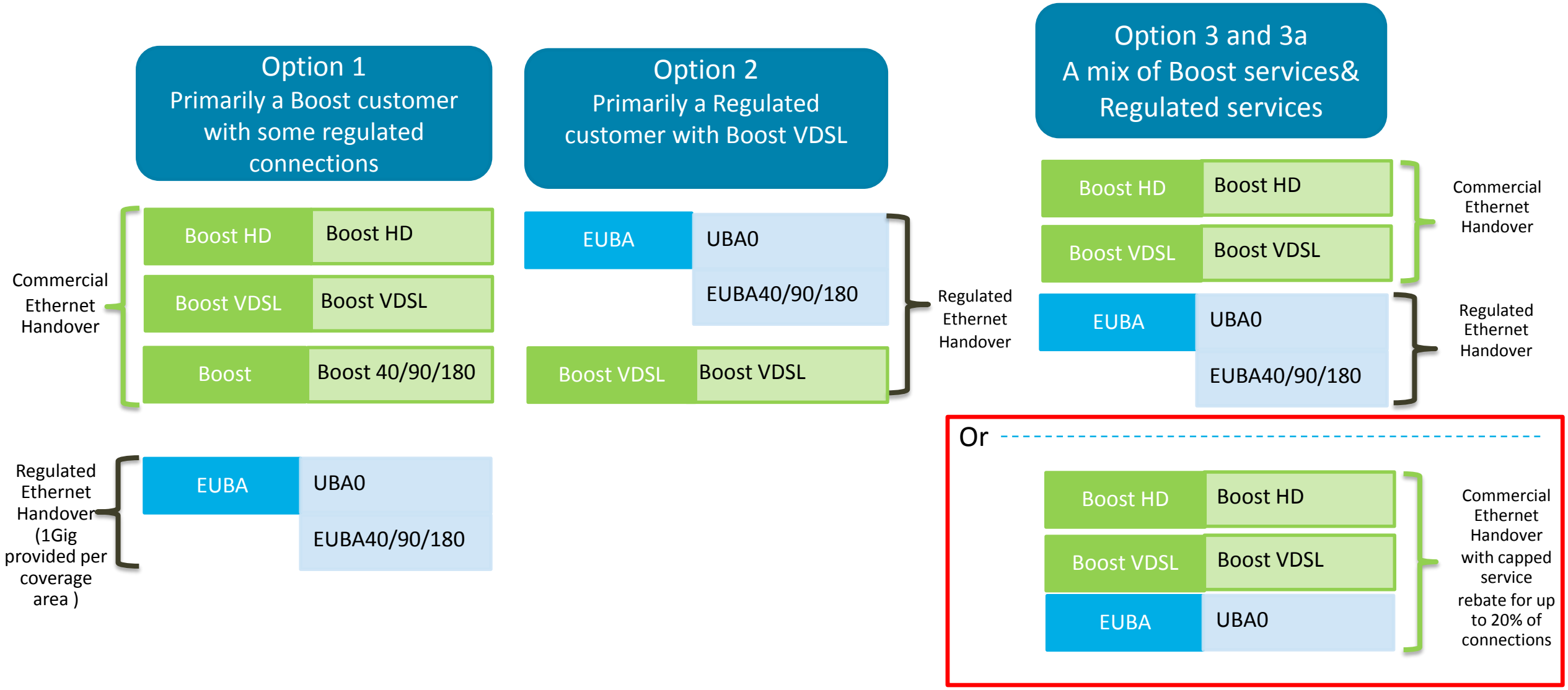
- When we originally announced Boost we outlined our initial thinking before feedback from customers. Specifically we said that Boost would require:

  - A separate Ethernet handover for Boost services;
  - This meant that from 1 September new handovers would be required or that all circuits are migrated to Boost;
  - The options presented were:
    - All services regulated;
    - All services Boost;
    - Mix of handovers;
    - 2nd Handover in any location, if Boost Preferred, would be free.

Original handover options presented



Current thinking on handovers based on feedback



Further possible handover options

- Consuming Option 3 (from the previous slide), a mix of commercial and regulated services, could present challenges for you, as it could be required to meet the low / entry level end of the market.

- We believe that two variations to these options could assist:

  1. Allowing Boost VDSL to be delivered to a Regulated / Basic UBA handover. In this case the Basic traffic management will be active, but new and separate handovers are not required.*
  2. Capped Service Rebate: Chorus and each RSP agree a portion of your customer base that are low/entry level customers:
     - Up to a maximum of 20% of lines (otherwise it would be more efficient to run separate handovers).
     - Subject to agreeing a suitable criteria and reporting process between Chorus and individual RSP.
     - Capped Service Lines would be rebated back to the regulated UBA price.

- In addition, for Boost Preferred customers a 1Gig Ethernet handover could be offered at each of the 26 coverage areas with no charges for the handover for regulated UBA services. Further work needs to be done on what a “Boost Preferred” customer is. This is designed to address customers, who predominantly take Boost services, but the threshold is yet to be defined.

* Note, in this scenario, we could not offer the service commitment.

Migrations from Basic UBA to Boost

- Bulk migrations by handover are easy.

- Chorus will provide at no cost a migration from Basic UBA handover to a Boost Handover;
  - Easy to take the new service from 1 September.

- Chorus will provide at no cost a migration from a Boost handover back to a UBA handover. We will provide this for a minimum of 6 months after the FPP, and final pricing, is known;
  - Easy to move back should regulatory circumstances change.

- Individual circuit by circuit migrations will incur the costs associated with each service;
  - Migrating to UBA will be at the determined connection charges. This may include any unrecovered connection charges;
  - Migrating to Boost will be at the listed price (i.e. free).

What happens next?

- We’re still committed to launch dates and we’ve had positive support from a number of customers .
- We’re asking for your support for the concept of commercial services that supplement the regulated Basic UBA. Chorus feels that having the flexibility to offer improvements to what is the minimum is part of a healthy and innovative industry.
- We’re still in consultation and are open to ideas and other concepts that we could add to Boost that would provide more value to Service Providers.

Appendix A - VDSL and Basic UBA

Interplay of the introduction of VDSL and the UBA STD

> The UBA STD is DSL technology neutral. ADSL, ADSL2+ or VDSL technology may be used to deliver the BUBA STD service so long as the metrics outlined in the service description are met.

> In the Commission's decision regarding Telecom's WVS in 2010, the Commission determined that:

- *"Decision 611 sets out the price and non-price terms for the services defined in the decision. It requires Telecom to deliver those services (BUBA and three variants of EUBA) where Telecom has ADSL or ADSL2+, or any future version of DSL coverage. This requirement is, and was intended to be,* ***neutral in terms of the form of DSL service provided****.*

- *The intent of the STD is clear. Telecom must provide access to BUBA and EUBA in with the terms of the STD.* ***The DSL technology which Telecom elects to use to deliver BUBA and EUBA is a decision for Telecom alone****. There is no compulsion on Telecom to use VDSL to deliver the regulated BUBA and EUBA services, except where they have chosen to make it the* ***only*** *DSL technology available in an exchange or cabinet to deliver the regulated service.*

- This does not mean, however, that Telecom cannot develop other services using VDSL technology and offer those services commercially. Decision 611 relates only to services described in that decision, and the applicability of that decision will turn on the nature of the service being delivered, not the technology used to deliver it."[emphasis added]

Background to introduction of VDSL as a stepping stone to fibre

- Telecom's former wholesale VDSL service (WVS) was unsuccessful, with low uptake.
- On 15 May 2013 Chorus announced the introduction of VDSL technology into the Basic UBA (BUBA) product family. VDSL technology was available from 7 June 2013.
- Prior to that release there was extensive consultation with customers. Discussions were also held with Crown Fibre Holdings, MBIE and the Commission.
- Chorus then elected to introduce VDSL technology as part of the BUBA product family under the UBA Standard Terms Determination. Pricing was aligned with the current EUBA0 wholesale price with additional features.

Transition from VDSL technology to fibre

- The range of stakeholder and customer consultation prior to the announcement occurred because Chorus views VDSL as a stepping stone towards the transition to fibre in Chorus' UFB areas. That consultation was designed to assist Chorus in balancing the views and needs of all stakeholders, the current regulatory regime and the UFB contracts.

- Chorus consulted on, and included, key business rules in the announcement on 15 May 2013 and subsequent documentation with customers.

- Following that consultation to use VDSL technology to deliver BUBA (EUBA 0) Chorus provided customers with "Information about Chorus VDSL".

- The aspiration was to provide for a market mechanism to facilitate transition from copper to fibre in the absence of a clearly communicated copper to fibre migration policy and uncertainty around the relative copper and fibre prices. This is a dynamic environment both in terms of VDSL uptake emerging since Chorus introduced it and the introduction of Ultra-Fast Broadband.

Transition from VDSL technology to fibre

- Similar to EUBA variants in the STD, VDSL technology is only available on a subset of lines as compared to ADSL and ADSL2+.

- Chorus' announcement on 15 May 2013 said that Chorus VDSL would be offered as part of the BUBA product family under the UBA Standard Terms Determination. To the extent that Chorus is delivering VDSL under the STD, it is bound by the STD. But to the extent that Chorus elects to only deliver the UBA STD service over ADSL technology, then its VDSL service is not bound by the STD.

- Based on the Commission's UBA benchmarking price review decision (Decision [2013] NZCC 20), Chorus has also been assuming that the benchmarked price does not take account of the service delivered by Chorus today, including VDSL – see in particular paragraphs 151 to 153.

VDSL clarification and proposals

- The potential grandfathering or withdrawal of VDSL technology from being used to deliver the UBA STD service does not mean that it is certain that VDSL will be grandfathered or removed at this time. Chorus is consulting with customers and we are keen to hear the Commission's views through its process.

- The Informer was intended to be early notice in line with a prior commitment to give customers six months' notice of any such proposal. This enables feedback in parallel with the New UBA Variants' consultation processes.

- In the event that the Commission remains of the view that VDSL is not required for the BUBA STD service (so long as minimum specifications are met), under the Boost proposals VDSL would remain a choice available in the market. The Boost VDSL proposal would include a service commitment which is not available for BUBA on any form of DSL technology today.

- RSPs could, for example, choose to move end users to new Boost products, and their choices and feedback will inform what impact (if any) there might be. If RSPs and end users choose a committed Boost service, they would receive a better service than today's uncommitted internet grade BUBA service for the same or lower price than they pay today.

Appendix B – Traffic management

Network management provides greater definition and shows that the low to mid end of the market continues to be catered for by Basic UBA and the high to very high end to be catered for by Boost

	Low – 20%	Mid – 40%	High – 25%	Very High – 15%	Average	Source
Residential broadband data cap	15% (less than 20 GB)	46% (20 to less than 50GB)	20% (50 to less than 100GB)	19% (100GB or more, incl. uncapped)		Stats NZ ISP Survey, June 2013
Estimated data usage	10GB	30GB	60GB	80GB	41GB	Chorus estimate, mid 2014 (based on aggregate traffic data)
People per dwelling	23% (1 person)	34% (2 people)	32% (3-4 people)	12% (5+ people)	2.77 people (total NZ usually resident population/occupied dwellings)	Census 2006 (Census Usually Resident Population Count; Dwelling Type by number of Usual Residents)
Connected devices per household	15% (1 device)	44% (2-4 devices)	25% (5-7 devices)	17% (8+ devices)		IDC Consumerscape March 2014
Activity profile	Emails, browsing, social networking	Streaming music and video – single stream, standard definition	Streaming music and video – up to 2 streams, high definition	HD video, real time gaming, cloud services, peer-to-peer file transfer, 3+ simultaneous users		Chorus estimate (based on Stats NZ Household Use of ICT Survey 2012; IDC Consumerscape survey March 2014)
Estimated peak bandwidth BH = (8.30-9.30pm)	20kbps	120kbps	360kbps	640kbps	200kbps (BUBA /EUBA 0 residential) 150kbps (BUBA over ATM)	Chorus estimate (average value is actual Chorus data for mid 2014; others are estimates)

UBA

Boost

Appendix C - Google video report

Clarity over what the Google video report means

- There have been questions about the recent Google Video report as to what is delivered today.
- YouTube clients (the app embedded in you computer's browser) have a quality setting which defaults to "auto". When videos are watched, the TCP/IP throughput performance is monitored by the app and the quality setting is adjusted between:
  - - LD (Low Definition) = below 360p = less than 1Mbps
  - - SD (Standard Definition) = 360p and 480p = 1 - 1.5Mbps
  - - HD (High Definition) = 720p and 1080p = 2 - 3.5Mbps

- The http://www.google.com/get/videoqualityreport/ verifies your internet access service as HD if >90% of youtube videos "auto selected" to 720p or higher over a 30 day period.
- Services like Netflix and PremierLeaguePass use more conservative codecs, so HD requires around 3.5 - 4.5 Mbps. Netflix specifically recommends a 5Mbps internet connection to get HD. Boost is pitched right to cover all HD service providers.
- The Basic UBA service is likely to get HD qualified on the assumption that YouTube access is suitably distributed at peak time; i.e. only 1 in 10 end users are watching a HD YouTube session at exactly the same time.
- Boost will ensure that, provided the line is a qualifying line, that the Chorus network will support simultaneous use by all customers at the same time in watching HD video.

Appendix D - Segmentation of retail broadband tariffs globally

A review of internationally published data from Point Topic

Global tariffs are defined by speed / user experience

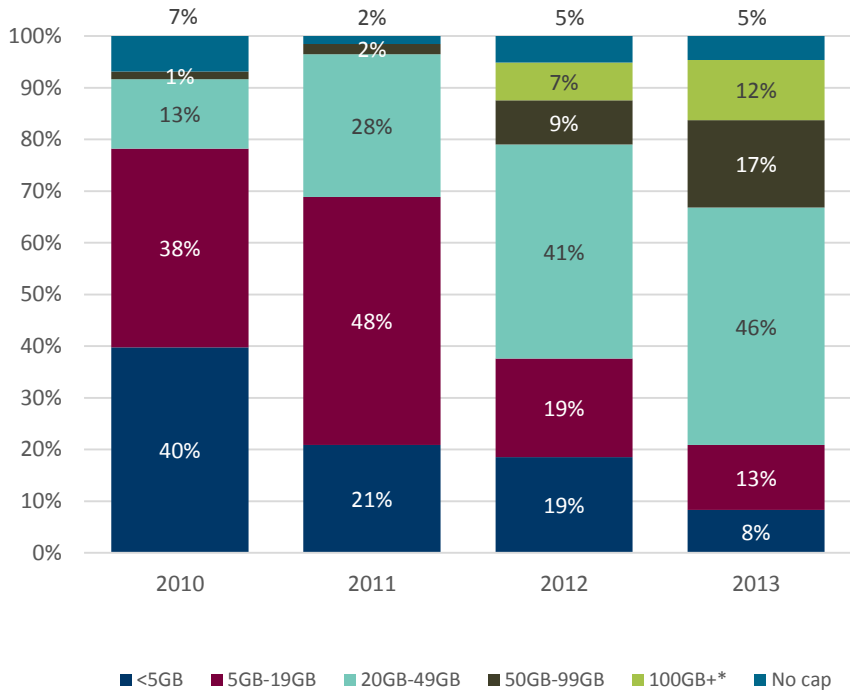
- Broadband segmentation in New Zealand has traditionally centred around a data cap
  - Copper broadband is promoted as offering the fastest speed capable on the user's line
  - Prices vary, based on the size of the data cap and potential add-ons (e.g. phone, voice minutes)

- Data caps are increasing or now being removed entirely

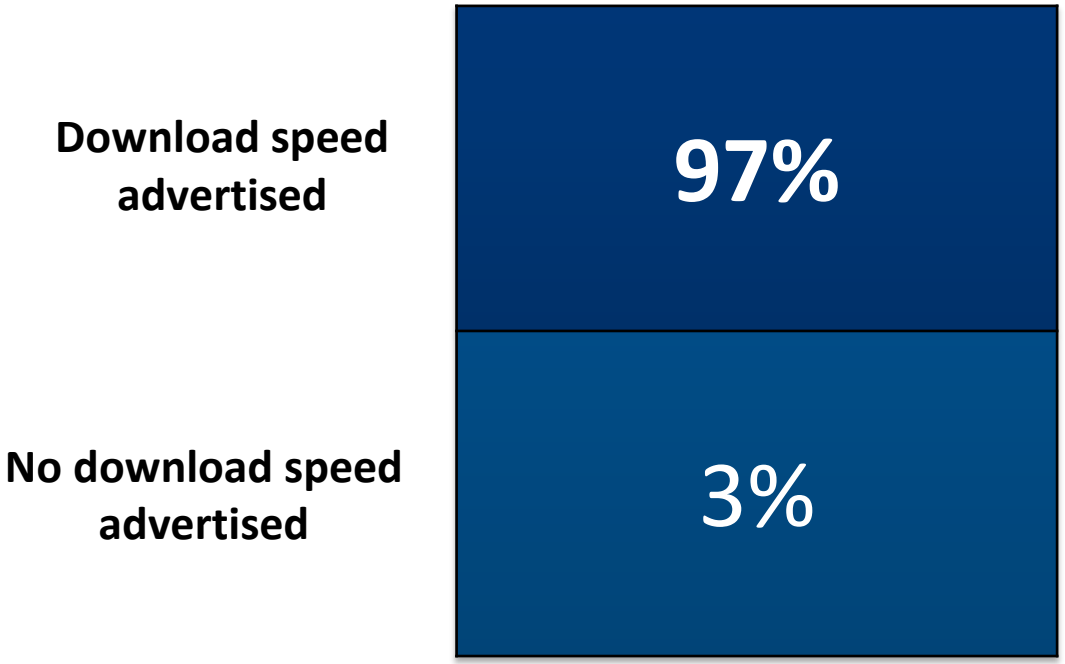
- Internationally it is more common to differentiate broadband packages by speed/bandwidth (Mbps) and offer unlimited data usage.
  - In Q4, 2013 a global review of *5,228 global broadband plans shows 96% were sold on speed or inherent capability
  - Only 17% had an associated data cap

** Point Topic Broadband Tariff Database 2013*

Data caps - NZ broadband lines



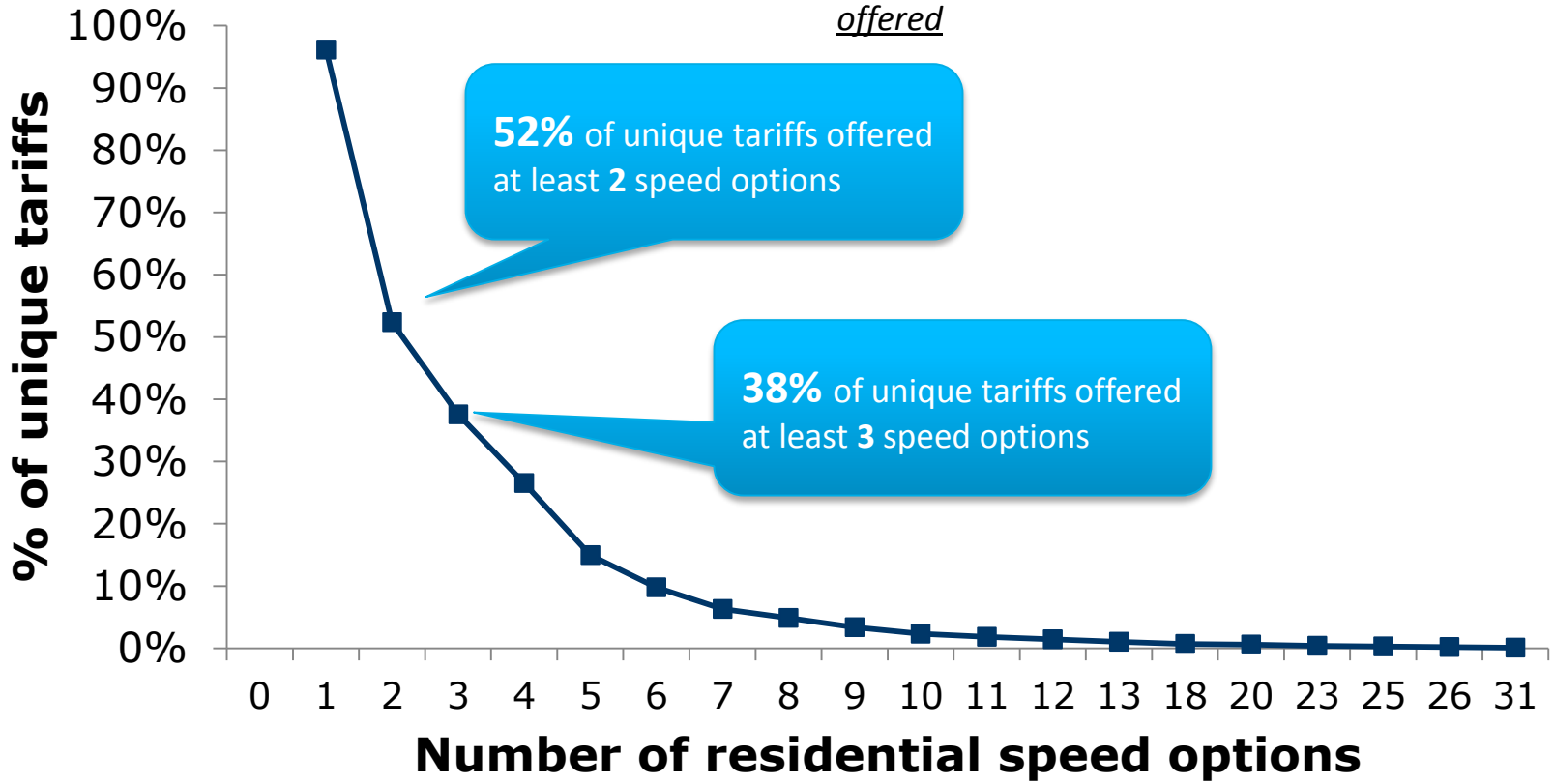
The majority of global tariffs reviewed advertised capability



- Of 2,986 residential tariffs, 97% advertised speed. 80% did not have a data cap
- Residential download speeds offered range from 160kbps to *2Gbps across all access technologies (copper, fibre, cable)

Majority of international providers offer at least 2 speed based options

***All access technologies**: number of different residential broadband speed options offered*

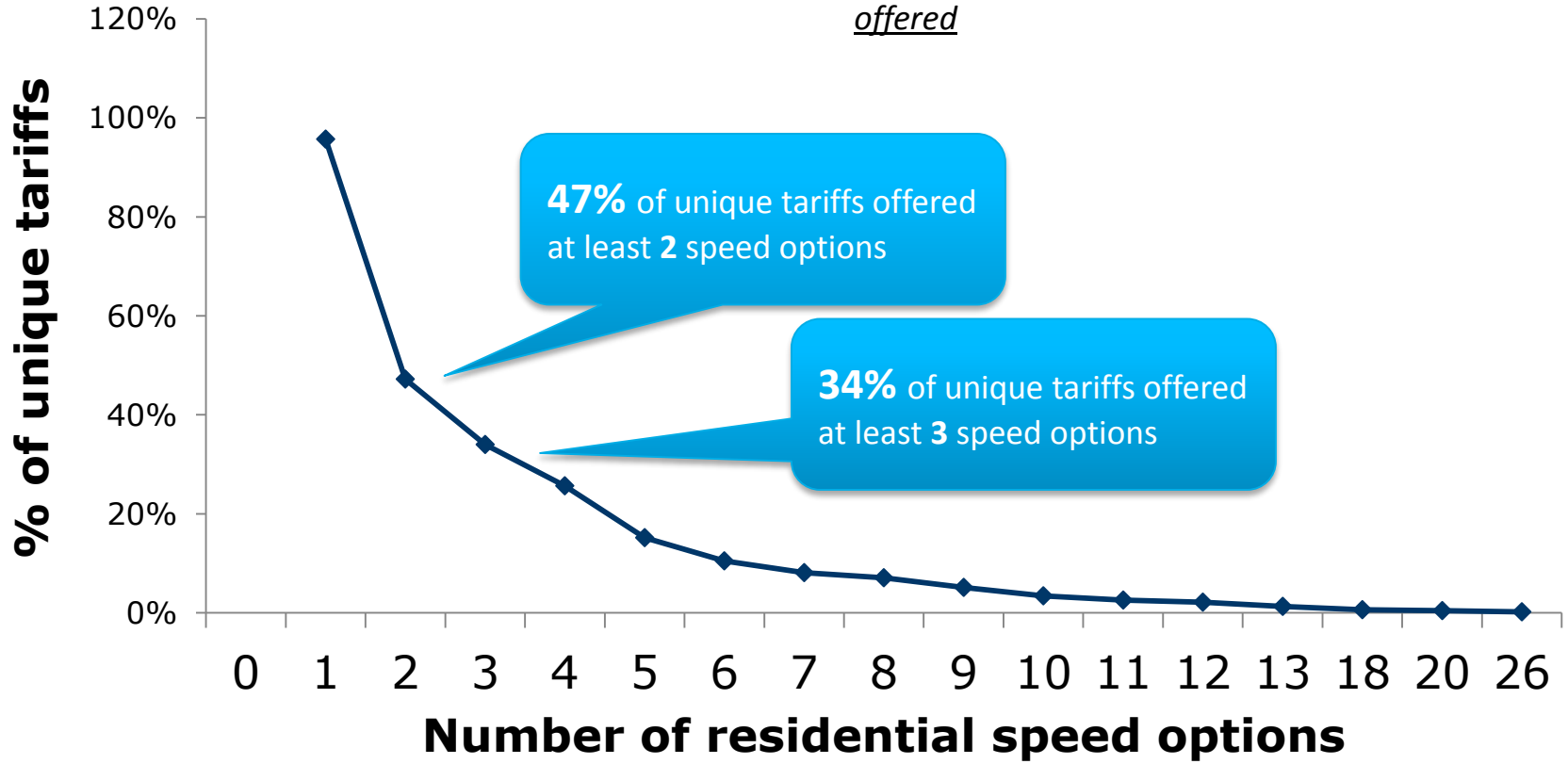


- Unique tariffs are classed as those that have the same operator and access technology but different speed options may be offered.
- Includes all residential broadband technologies

Source: Point Topic Broadband Tariff Database 2013

A third of international residential copper plans have 3 or more speed options

***DSL access technologies**: number of different residential broadband speed options offered*

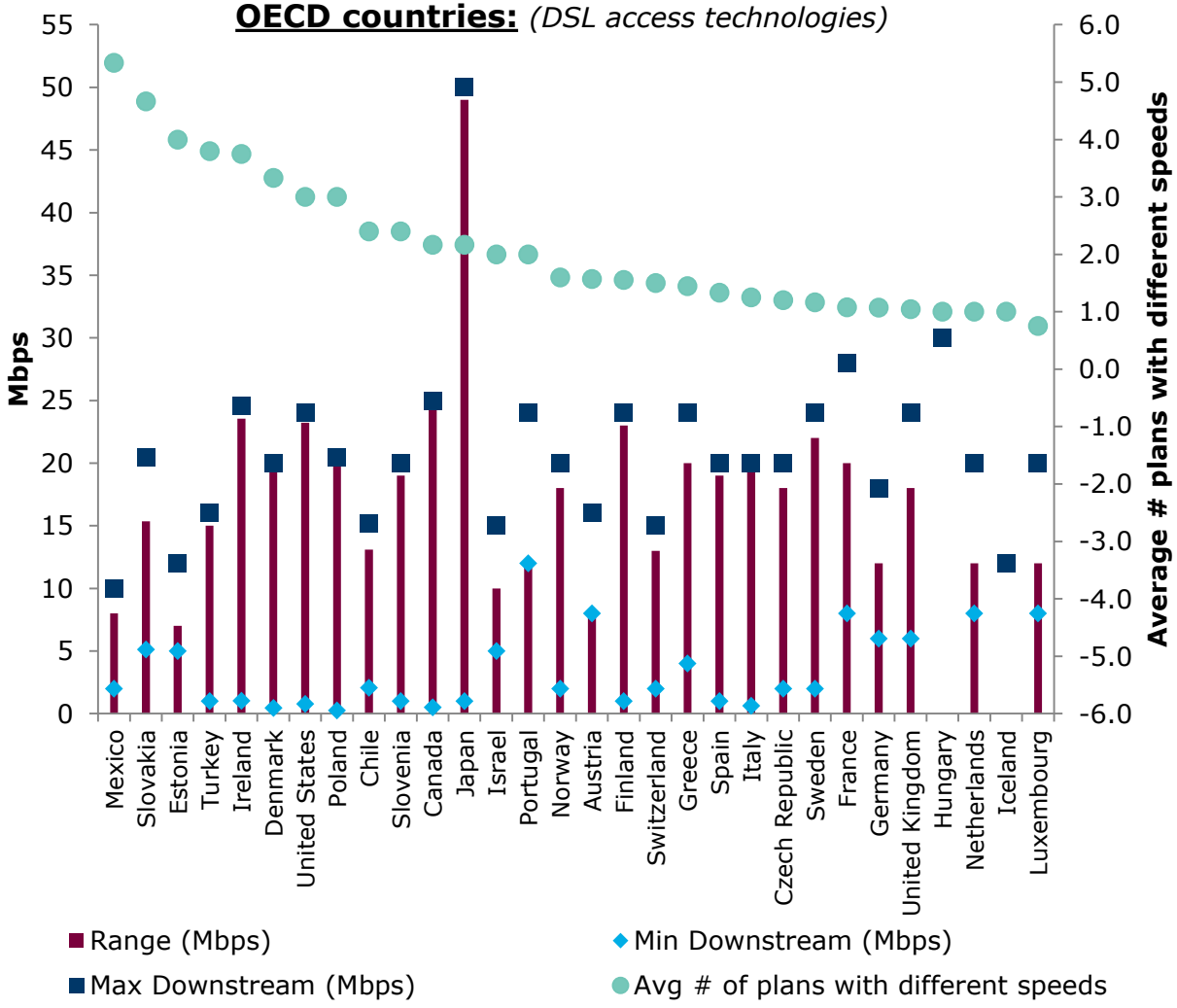


- Unique tariffs are classed as those that have the same operator and access technology but different speed options maybe offered.
- Includes only DSL-based technologies. Includes VDSL

Source: Point Topic Broadband Tariff Database 2013

OECD countries have low bandwidth options over ADSL services

Range of download speed options available across OECD countries: *(DSL access technologies)*



Note: *NZ, Aus, Korea did not have any DSL based plans with advertised speeds in the Point Topic database*

- 16 of the 33 OECD countries have operators providing DSL broadband plans at 2Mbps or less.
  - Includes Demark, Sweden, Finland, Spain, Ireland, Canada, US, Japan
  - 11 countries have broadband tariffs at 1mbps or less.
- 26 of the 33 OECD countries provide more than 1 speed option for residential tariffs
  - This excludes VDSL-only services, which would increase the number of speed options available
  - (Note: Japanese services are labelled as ADSL but at 50Mbps are likely to be VDSL)

Source: Point Topic Broadband Tariff Database 2013