

Submission on the Broadband Investment Initiative

27 April 2009

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DISCLOSURE STATEMENT

The information in this submission is independent. The information is not tailored to benefit any company. The information is provided in the interests of achieving the best outcome for consumers, achieving competition and innovation amongst providers, and in the interests of New Zealand's international competitiveness.

1. EXECUTIVE SUMMARY

1.1. Overview

There are serious flaws with the current proposal that will result in many negative impacts, and possibly make the proposal unviable.

The proposal seems to believe that wholesale unbundled dark fibre is the best method to serve all customers, which is absolutely incorrect. The negative impacts identified in this submission are caused by this, and forcing LFCs to engineer the networks in such a way.

Unbundled dark fibre is only suitable for a small percentage of customers and is completely unsuitable for the remaining customers that make up the vast majority. It is important that this distinction is understood, and that the proposal targets the distinct needs of these two categories of customer.

The first category to consider is the vast majority of customers, which includes 100% of the residential market, and optionally much of the small to medium commercial market. These customers are low value, with identical requirements, and dealt with on a bulk basis. In this category the needs are as follows.

- Customers want competition, a wide selection of services, and innovation of new services. That means the customers should be pre-connected during deployment and that the barriers to providers needs to be very low.
- Customers want to be able to change a service provider with ease, not to be locked into a long term contract, or deal with disruptions and downtime, or truck rolls and field service personnel, or long delays. That means changing service providers must happen in software, as a configuration change.
- Customers in this category are purchasing low value and highly productised services from providers. There is a low margin on the services, and they must be delivered as efficiently as possible.
- Providers do not want to engage in work outside of their core business, such as managing field personnel, truck fleets, and access networks, in order to provide services to these customers.
- Providers want to reach customers over the widest possible area, at lowest possible cost, and to deliver new services without having to surmount obstacles. That means they need equal access to these customers over a shared access network delivered by a neutral party such as the LFC.
- Providers make profits from these customers on the services, which all exist at higher layers. Duplicate access networks only add unnecessary overhead. That means a shared access network is desirable.

The second category includes the business market, particularly large business, government sector, high-tech industry, utilities, and providers such as mobile operators. The customers in this category are high value, receiving a lot of contact from providers, and receiving more customised/specialised services. In this category the needs are as follows.

- Customers in this category want very high bandwidth services, which cannot be economically provided on a shared access network. These are customers that would, in today's terms, typically be requesting connection speeds in excess of 250 Mbps.
- Customers in this category may want services that are only feasible over dark fibre, such as utilities that want to lease dark fibre for a control systems network.
- Providers consider these customers high value, and want a higher level of control over the service delivery. This means providers want dark fibre connectivity from their network to the customer.

The only sensible conclusions to draw are that there needs to be different treatment for the two categories, namely:

- The LFC needs to deploy an open access network to be shared by providers for the purposes of reaching the low value category: residential customers, and optionally small to medium business customers. To avoid conflicts of interest and ensure that access is equal and fair, this open access network must remain structurally separate from any retail provider. It is sensible for it to be deployed by the LFC, which will also have the field service personnel, truck fleets, and so forth to manage the plant, and the ONTs at the customer premise, and so forth, on the scale required.
- The LFC needs to deploy enough additional fibre capacity that it can lease point-to-point fibre for the high value category. This point-to-point fibre can now be spliced in the field between the customer's and service provider's premises. To prevent anti-competitive behaviour, or attempts to lock in segments of the market, this fibre should be provided on a cost-plus basis. This ensures that a provider will not use unbundled point-to-point fibre for low value customers. Beyond this, the LFC should not provide barriers to accessing point-to-point fibre.

1.2. Summary of Findings

The proposal will result, unnecessarily, in the following negative impacts. These can be removed by adopting the key recommendations of this submission.

1. Increased capital and operational costs, making LFCs less viable and resulting in a lower ROI.
2. Increased disruption during construction due to larger amount of outside plant and the associated increase in civil works required.
3. Increased environmental impact due to higher energy use, larger amount of outside plant, and increased civil works.
4. Increased visual pollution due to thicker cables, up to 30 times more roadside cabinets, and up to 20 times more building space.
5. Decreased competition due to increased barriers to providers, such as higher capital and operational costs, dealing with multiple access networks, provider lock-in through contracts, complex and expensive change processes that may require truck rolls, etc.
6. Decreased innovation in services due to these above points.

7. Reduced coverage due to increased capital costs.
8. Slowed deployment due to the increased works required.
9. Likelihood that future regulation is required, due to lack of a neutral, open access network.

1.3. Key Recommendations

The Government must meet the needs of the customers and providers. To achieve this, the following key recommendations should be adopted.

1. Retain independent advisors with technical knowledge of FTTH and experience in the field that can provide neutral and independent advice based on the optimum outcome for customers and providers. The optimum outcome is a produced by the key recommendations below.
2. All wholesale dark fibre must be sold on a cost-plus basis so that there is no cross subsidization from other customers, and so the most efficient network topologies are encouraged.
3. LFCs should only be required to wholesale dark fibre for business and government customers (even this much is unnecessary for small and medium businesses). This way these services can be spliced in the field as point-to-point dark fibre between the customer and the provider without requiring the LFC to build and operate (or lease) expensive facilities, and expend money on increased outside plant.
4. LFCs should deploy and operate an open access network. This open access network is shared by all providers wanting to reach the residential customers, and optionally some small to medium business customer. It provides logical connectivity between the customers and service providers of their choice (this is sometimes referred to as a bitstream service). A point-to-multipoint PON is the most cost effective way to deliver these services to homes, and is the most widely deployed FTTH architecture worldwide. It is flexible, and for residential and small to medium business customers it has no drawbacks over the competing but more expensive point-to-point or home-run architecture.
5. Costs for residential customers on this shared open access network should be flat, regardless of location in the region.
6. LFCs should be encouraged by the CFIC to pre-connect all homes in an area as they deploy this open access network.
7. LFCs are responsible for all passive outside plant, connecting customers to the physical network, the active ONTs at the customer site.
8. LFCs are responsible for operating neutral points of interconnection (POI) in each region, where providers can attach to the open access network in order to easily access customers. There should be a limit on the number of POIs. For example, no more than one POI per 50,000 homes. Too many becomes a barrier to competition and promotes cherry picking. This is overcome by ensuring the POIs service sufficiently large number of customers that any socioeconomic/demographic boundaries are removed.

9. LFCs are able to provide backhaul from provider premises to these POIs using the wholesale point-to-point fibre.
10. LFCs should ensure that POIs are resilient and that each customer can be accessed from at least two diverse POIs in a region.
11. LFCs must meet certain performance standards (e.g. capacity and availability) and regulatory obligations such as providing for emergency lifelines.
12. The CFIC should set guidelines on approved technology and standards for network topology.
13. LFCs must operate transparently to the customer. All interaction with the LFCs should be via the customer's chosen service providers. The service providers relay appropriate work orders to the LFC for action (adds, moves, changes).
14. LFCs should raise their revenues through charges to the service providers. The LFCs continue to be barred from providing retail services and will be required to permit any service provider meeting reasonable requirements to provide services over their network.
15. For the open access network, no region, or area within a region, should have higher barriers to entry for a provider than any other, beyond the cost-plus requirement for wholesale point-to-point fibre for backhaul to POIs. This must not be allowed to come about as a product of the network design. (It is easy to take action against an LFC that is being unfair because of process or policy issues, it is very difficult and expensive to fix this situation if it is because of intentional or unintentional design issues.)
16. The CFIC should evaluate proposals based on the coverage and timeframes. The CFIC should use the absolute number of homes connected and the number of businesses passed as the metric for this coverage. This should encourage the partner to provide an efficient proposal with rapid deployment.
17. The CFIC should consider the alignment of proposals to each other, and where practical give preference to common architectures and technologies so that no region is significantly different from another. Preferably the CFIC should develop its own, high level preferred architecture that could be adopted by LFCs, to prevent partners from unduly influencing the design in favor of their owners other interests, and prevent disparity between regions.

1.4. Benefits

Adopting the key recommendations of this submission will result in the following benefits.

1. Providers will only need to connect to one access network in order to sell all of their services to all of the residential and small business customers in that region.
2. The reduction in capital costs will mean LFCs can reach more homes and businesses for the same capital outlay.
3. Deployment will be faster, because the network is simplified, the amount of work is reduced, and full use of aerial and micro-trench deployment can be made.

4. Faster uptake will be promoted, because LFCs can deploy the network faster, and will have an incentive to pre-connect homes and small businesses as they deploy the network (it becomes more cost effective for them to do so).
5. The reduced capital and operational costs for the LFC mean a better ROI for potential partners and the Government, without any drawbacks.
6. Providing the single, ubiquitous, open access network makes competition between providers more important. There is no provider lock-in through contracts or delays, conflicts of interests, or disruption to change provider. A service provider is judged on its merits (not contracts or financial clout).
7. Providing this open access network also means that providers can be more innovative in the services they offer. There is no major cost barrier to deploying a new service.
8. Makes for lower capital and operational costs for providers, meaning lower costs to consumers.
9. Providers do not need to branch into fields that are not their core business just so they can reach the customer (i.e. locating equipment in the field, managing field services and truck fleets, etc.). This is left to the LFC which is ideally suited for this.
10. As much as possible, respects existing investment in fibre by competing with that fibre on equal terms (i.e. unbundling only for high value customers, with unsubsidized wholesale costs).
11. Uses less energy and has less environmental impact.

2. ISSUES

The following issues were identified.

Item	Severity	Issue	Impact	Description
1.	High	Significantly more outside plant is required	<p>Increased capital and operational costs</p> <p>Increased environmental impact</p> <p>Increased construction disruption</p> <p>Slowed deployment and uptake</p> <p>Reduced competition</p>	<p>The proposal requires significantly more outside plant be deployed by LFCs because it obligates LFCs to use what is known as a home-run or point-to-point topology. In these topologies one strand of fibre is run from every premise to a cabinet or exchange, where providers locate equipment. This number could be higher in this proposal, as multiple services may need to be delivered over separate fibres.</p> <p>The point-to-multipoint topology recommended by this submission, which would be the logical choice for a shared open access network, uses passive optical splitters to aggregate up to 32 customers on one strand of fibre.</p> <p>This 30-fold increase in fibre optic cable is not insignificant and results in increased capital and operational costs associated with the increase in outside plant, such as trenches, cabinets, and facilities.</p> <p>Point-to-point fibre is still recommended for business customers, but because the vast majority of customers will be residential, building a shared open access network using a point-to-multipoint topology, for those customers, still results in massive reductions in outside plant.</p>
2.	High	Aerial and micro-trench deployment of feeder and distribution cables is unfeasible	<p>Increased capital and operational costs</p> <p>Increased environmental impact</p> <p>Increased construction disruption</p> <p>Slowed deployment and uptake</p>	<p>Aerial and micro-trench deployment of feeder and distribution cables is unfeasible because they are much larger in the home-run/point-to-point topology.</p> <p>This means more, and larger, civil works (trenching and installation of conduits, cabinets, and vaults) are required, resulting in higher costs (capital and operational), increased impact on the environment, and more disruption during construction.</p> <p>Even if the financial and environmental costs are not considered to be a problem, this increased workload will slow deployment and uptake, and the increased capital and operational costs will mean a reduction in competition and innovation.</p>
3.	High	Significant increase in required terminations	<p>Increased capital and operational costs</p> <p>Increased environmental impact</p>	<p>The home-run/point-to-point topology requires a 30 fold increase in fibre optic terminations.</p> <p>Terminating and managing that much fibre becomes problematic. It is</p>

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			<p>Reduced competition</p> <p>Severely increased management complexity</p> <p>Increased facilities sizes</p> <p>Provider lock-in</p>	<p>much more expensive to do initially and maintain and manage. It also requires significantly more facilities space.</p>
4.	High	Larger facilities are required	<p>Increased capital and operational costs</p> <p>Increased environmental impact</p> <p>Increased visual pollution</p> <p>Slowed deployment and uptake</p> <p>Opposition from residents</p>	<p>Because of the increased number of terminations, larger facilities are required.</p> <p>A facility serving 10,000 homes must terminate at least 10,000 fibres, and potentially permit the installation of equipment providing up to 10,000 ports. This equates to approximately 35 racks, 15 termination racks, and 20 equipment racks, which must be in a climate controlled area. The minimum size for such a facility is about 70 square meters, and there must be one of these per every 10,000 homes.</p> <p>By using the recommended point-to-multipoint topology to build a shared open access network, the same facility must terminate less than 350 fibres and provide 350 ports. This can be done on two to three racks depending on the equipment used. This whole area of 10,000 homes can then be served by four roadside cabinets or one small telecommunications hut.</p> <p>Because point-to-point fibre is then only used in fewer cases, for high value customers, it can be spliced in the field between the customers and providers, much as it is today.</p> <p>This means the proposal requires up to a 20 fold increase in space and accompanying land requirements over what is actually necessary to satisfy the needs of both customers and providers.</p> <p>These buildings are very expensive to both build and operate. A city such as Christchurch with 135,000 homes would require 13 to 15 of these large facilities around the city, each costing millions of dollars. There is also the added deployment delay caused by having to build these appropriate facilities.</p>
5.	Medium	Increased power consumption	<p>Increased capital and operational costs</p> <p>Increased environmental impact</p>	<p>There can be as much as a 30 fold increase in the power consumption from the equipment supporting a home-run/point-to-point topology. This comes from the increased number of cabinets, larger facilities, increased amount of equipment, and in this proposal also the duplication of that equipment.</p>

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6.	Low	Increased visual pollution	Opposition from residents	The home-run/point-to-point topology increases visual pollution. This results from the hugely increased number of cabinets. In the case of aerial deployment, thicker cables. And, the larger facilities, with their associated security fences, cameras, and blank, featureless, exteriors.
7.	High	Multiple services require multiple fibres and multiple ONTs	<ul style="list-style-type: none"> Disruptive to customers Duplicated equipment Reduced competition Reduced innovation in services Increased capital and operational costs Provider lock-in Increased visual pollution Increased management complexity 	<p>The proposal may create the situation where multiple services may need to be deployed over multiple fibres. This increases the cost to deliver a service to a customer.</p> <p>In this case there is increased disruption to the customer as they have to deal with visits from different technicians, and may have to put up with multiple ONTs installed on their premise, each costing them time and money, visual pollution on the side of their house, and so forth.</p> <p>This situation only occurs because of the belief that an unbundled physical layer is the best approach for all customers. With a shared open access network, recommended in this submission, each service would be delivered over the same infrastructure, and arrive as a separate port on the ONT at the customer premise. There is no non-contrived technical requirement that exists for not delivering services over a shared infrastructure.</p>
8.	High	Decreased resiliency	<ul style="list-style-type: none"> Decreased service quality Increased capital and operational costs Service disruptions Decreased service quality 	<p>Providing resiliency in the home-run/point-to-point topology is more difficult and expensive.</p> <p>When a feeder or distribution cable is cut it is more difficult and takes longer to repair because of the 30 fold increase in fibre density. This naturally means increased operational costs and more disruption to customers.</p> <p>To achieve resiliency in the case where fibre runs to customers are backhauled to an exchange, now requires that two fibres from every single premise for each service running to two diverse exchanges. This is a large increase, where an exchange previously terminated 10,000 fibres, it must now terminate 20,000. The amount of fibre that needs to be deployed has just doubled over the already massive amount required in the non-resilient scenario. This further doubles the amount of space needed in the facilities, and, so on.</p> <p>Quite simply, it dramatically increases costs and the only conclusion is that resiliency would not be provided against cable cuts or exchange failures in this scenario.</p>

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				<p>In the scenario where equipment is field located in roadside cabinets the situation does improve, but it is still reduced over that of the recommended solution.</p> <p>In the case of the recommended solution this can be overcome much more effectively. First the problems described are fixed faster reducing the need to provide resiliency. Second the increase in facilities size and number of fibres is not so dramatic because the amount required is already so small. Finally when providing resiliency the only non-economical part to make resilient is the final customer drop of between 15 and 50 metres. In the best case for the home-run/point-to-point that part is the distributor back to the cabinet, up to 2 kilometres.</p>
9.	High	Allowing multiple access networks within each region	<ul style="list-style-type: none"> Increased capital and operational costs Increased environmental impact Increased construction disruption Slowed deployment and uptake Reduced competition Increased management complexity Reduced flexibility for customers Increased facilities sizes Disruptive to customers Duplicated equipment Reduced innovation in services 	<p>The proposal encourages the construction of multiple proprietary access networks and mistakenly believes this is the best outcome for competition.</p> <p>This creates obstacles for providers, and will reduce competition and innovation of new services. In order to reach customers a provider must either build its own proprietary access network or negotiate access to multiple proprietary access networks. In either there are significant additional complexities and costs are unnecessarily increased.</p> <p>There is no incentive for a provider of retail services to allow other providers to use its network.</p> <p>Changing from between providers on different networks will require longer lead times, involve more disruptions, and cost more, as a truck must be rolled to physically disconnect and reconnect the customer to the new network. There is also no incentive for the provider to cooperate. This means that the new provider must lease a new fibre, requiring it to be spliced by the LFC, and a new ONT to be installed at the customer's premise, before the old provider relinquishes the old fibre.</p> <p>In the future this situation will likely require some level of intervention in the form of building an open access network or regulation of existing proprietary access networks.</p> <p>This situation creates confusion for customers which will worry about being locked into contracts, future churn fees, etc.</p>

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10.	High	Increased costs to service providers	Reduces competition Reduces innovation in offered services Reduced uptake	In order to reach customers providers must deploy access networks, this requires duplicated equipment and effort, locating equipment in the field, managing field personnel, potential civil works, and etc.
11.	High	Slowed uptake	Slowed uptake Reduced viability	<p>Uptake is increased by making the choice simple for customers and creating the conditions that make it attractive for an LFC to connect homes during deployment.</p> <p>A customer should only have to connect to one network in order to have immediate and equal access to all providers within the region. This way the customer does not have to fear choosing the wrong network, or paying some extra fee for being an early adopter, or being locked in to a contract with a provider who is bundling services with the connection to their proprietary network.</p> <p>Once the customer is connected by the LFC to the open access network, they can safely be disconnected from the legacy copper network in the confidence that they are always on, with no contracts to worry about. This is certainly more attractive than having to make a choice on the right access network to attach to. Or being told to wait for the market to decide which network is the right network.</p> <p>Also consider that in areas with FTTH it would be cheaper for service providers to stop offering legacy copper options, and switch to only offering fibre options, if the LFC has an incentive to connect homes as they deploy.</p>
12.	Medium	Does not permit the use of RF overlay	Increased costs to service providers Decreased service offerings Increased cost of television services Slowed uptake Customer dissatisfaction Reduced competition	<p>TV is important for attracting customers, but the proposal does not support RF overlay.</p> <p>IPTV delivery has been improving but it is still not as cost effective as RF overlay for the majority of customers and providers, and comes with management difficulties.</p> <p>Many homes are wired for RF, and providing RF overlay can be done very simply on a point-to-multipoint open access network. This provides crystal clear reception from free-to-air and pay-TV providers alike without new set-top-boxes or major overhauls of the providers' delivery systems.</p> <p>IPTV can continue to evolve as it becomes more scalable. The future of IPTV is most likely to be one where it is delivered over the Internet, like Apple TV and YouTube, rather than as a distinct provider on the access</p>

Item	Severity	Issue	Impact	Description
				network.
13.	High	Cherry picking	<p>Reduced competition</p> <p>Slowed uptake</p> <p>Customer dissatisfaction</p> <p>Requirement for future regulation</p>	<p>The proposal does not require the LFC to deploy a shared open access network that is neutral and ubiquitous within the region. Without this network providing equal access to customers, the socioeconomic and demographic boundaries will remain in place. This will cause providers to cherry pick those areas that are likely to be more profitable, and customers in some areas will have reduced choice.</p> <p>This arises because of the belief that unbundled dark fibre is the best fit for all customers. If the recommendations of this submission were followed the LFC would deploy an open access network to be shared by providers. By providing regional points of interconnection to this open access network the geographic location of a customer is made irrelevant, and providers will treat all customers equally.</p>

3. COMMENTS ON PAPER

The following comments are provided, as requested.

No.	Paragraph	Comment
5.	<p>The initial goal is to make fibre available to “priority users” such as businesses, schools and health services, plus green field developments and certain tranches of residential areas, within the first six years of operation, and the secondary goal is to make fibre available to 75% of the population within ten years.</p>	<p>The timeframe of 10 years is too slow compared to other countries undertaking similar deployments. This slow deployment timeline also makes it less clear what investments should be made. Either the plan is to transition customers to fibre, or not. If it is then it makes no sense for a company, such as Telecom, to invest in legacy copper upgrades which will have a limited lifespan. Thus it is important that the deployment be handled as quickly as possible. It is perfectly feasible to have 75% conversion of brownfields within five or six years.</p>
14.	<p>The intention is that each LFC will operate purely as a “fibre infrastructure carrier”, providing wholesale access to dark fibre, and optionally providing other wholesale services³. It will not provide retail services.</p> <p>Footnote 3. For example, a bitstream service. This refers to a managed, end-to-end wholesale IP transport service which does not require the wholesale customer to install its own active electronics. Compared to dark fibre, it is less flexible and the wholesale customer has less control over its management. These sorts of services may be attractive for telecommunications providers who cannot readily achieve the scale to justify investment in active electronics.</p>	<p>LFCs must not provide retail services. But they should provide a neutral open access network. The dark fibre model proposed is flawed for the majority of customers.</p> <p>An LFC should not be required to provide wholesale dark fibre simply because a provider requests it, it should only do so if the open access network is insufficient for the customer’s and provider’s needs. In this case the open access network is sufficient for all residential customers, and most business customers. The easy split is to make two categories, and dark fibre is wholesaled for business customers only (although a provider can still use the open access network for these customers if it wishes). This dark fibre should then be spliced as a point-to-point service in the field, between the customer and the provider’s premises, when required.</p> <p>It is very important then that this wholesale dark fibre is not cross subsidised by other customers, that is, it should be reflective of the actual costs to deploy that fibre between those locations.</p> <p>If the provider wants to provide a low margin service, that is the point of the shared open access network.</p> <p>Regarding footnote 3, it is silly to say that this wholesale open access network is less flexible. Yes it is, but the point is that dark fibre is overkill for greater than 95% of all customers. For these customers a shared service is actually more attractive as it lowers costs, increases competition and innovation, and has proven to be flexible enough for all the services that are now being delivered at layer-3 and higher.</p>
15.	<p>For any given LFC, the LFC will be governed by a Board representing the CFIC and the partner’s shareholdings. LFC’s objective will be to deploy fibre in the relevant region, and to sell dark fibre services and other approved wholesale services that accelerate the delivery of competitive retail broadband services.</p>	<p>If acceleration of competitive retail broadband services is a goal, the best way to achieve it is through the deployment of a shared open access network, and structuring it so pre-connecting homes and small businesses as part of the deployment. This is the only way to permit all providers to have equal access to all customers within each region, and remove any conflicts of interest.</p>

No.	Paragraph	Comment
		<p>The objective of the LFC should be to deploy an open access network as described in the executive summary and to wholesale point-to-point dark fibre to providers when their needs cannot be met by the open access network.</p>
20.	<p>With the aim of reducing the cost of network deployment, it is proposed that officials (led by the Ministry of Economic Development) will be directed to report back on how best to facilitate access to and use of:</p> <ol style="list-style-type: none"> fibre cable deployment on telephone and electricity poles; local authority-owned passive infrastructure such as ducts; micro-trenching; and fibre-optic cable “drops” from the street-side into customer premises. 	<p>Aerial and micro-trench deployment is unfeasible for the wholesale home-run dark fibre model proposed because the fibre count is increased.</p> <p>It is also likely that existing ducts etc. will be too small or too full to be of use in this case. With the point-to-multipoint network recommended for all residential users, this reduces fibre counts dramatically (up to 30 times less), and thus can easily be deployed aerially without visual pollution, or in micro-trenches, or even in ducts that have limited available space.</p> <p>Access to existing ducts, such as those of Telecom, may be something for the CFIC to consider when selecting partners.</p>
23.	<p>The main risks in this proposal are that:</p> <ol style="list-style-type: none"> there could be insufficient viable proposals, because the Crown offer is not sufficiently attractive; the selection and negotiation process could be complex and difficult; proposals could involve some overbuild (duplication) of existing fibre networks; the business case for LFCs is expected to improve over the long term but there is a risk that some LFCs could fail to become profitable; there is the potential that Telecom would be required, pursuant to the Operational Separation Undertakings⁴, to make investments that it would not otherwise make, given the government’s investment in a new fibre network; there could be opposition to the proposal by existing telcos; and the proposed funding could be insufficient to meet the coverage target, and that there is pressure for the government to increase its contribution. 	<p>Fails to identify the following risks.</p> <ul style="list-style-type: none"> Interference and sabotage, and other anti-competitive behaviour Disinformation by existing providers The potential for a provider under this model to capturing the market and for us to be back at square one Cheery picking by providers, leading us to be back at square one <p>Regarding a), there should be viable proposals if the open access network option is taken. It is quite feasible to produce adequate ROI on this type of network with the Government’s proposed investment arrangement.</p> <p>Regarding b), this is exactly why the CFIC should be able to go-it-alone in an area if it finds no suitable partners. The business case is viable for it to do it.</p> <p>Regarding c), this is mitigated to some degree by a shared open access network for residential customers, meaning that the wholesale dark fibre can then compete for the high value customers on an equal basis with any providers of existing infrastructure. The point is that now all providers can access fibre for these high value customers. But those with existing fibre will still enjoy the benefits of reduced costs by virtue of the fact that they have their own existing fibre which has already been partially amortised. It may also be an incentive for those with existing fibre to hand some portions of it over to an LFC in return for a share in the LFC if they believe it is unwise to keep it separate.</p> <p>Regarding d), the business case is viable from the outset in the case of a single shared open access network. In this scenario it is cost effective to connect homes as the network is deployed, effectively causing service providers to immediately start offering</p>

No.	Paragraph	Comment
		<p>services over the open access network, and customers selecting new services are immediately on the fibre.</p> <p>Regarding e), these requirements should be removed as the fibre is deployed in an area. It becomes redundant and more expensive to keep the copper network, and it is not necessary when an open access network is deployed.</p>
27.	<p>The government wishes to create a step-change in broadband by delivering on an aspirational goal of achieving ultra-fast broadband for the majority of New Zealanders. This is a key part of the government’s wider strategy to increase New Zealand’s global competitiveness, particularly compared to other OECD countries. A comparison of the status quo versus a fibre-to-the-home scenario is set out in the Appendix.</p>	<p>This goal is jeopardised by the proposal, which is not in line with the deployments in Asia, Australia, North America, and Europe, which all predominantly make use of a shared open access network, the majority of which use point-to-multipoint PON and recognise the need for open access networks.</p>
28.	<p>The government’s goal for broadband investment is to accelerate the roll-out of ultra-fast broadband to 75% of New Zealanders⁷, concentrating in the first six years on priority broadband users such as businesses, schools and health services, plus green field developments and certain tranches of residential areas. This is referred to as the government’s objective in this paper.</p>	<p>This is enhanced by the recommendation in this submission, which enables providers to hook up homes and make them ready during the deployment process, rapidly speeding adoption at a much reduced cost. In fact, under the recommendation in this submission there is no real need to target these schools and health services first as the timeframes for complete brownfields deployment can be reduced significantly.</p>
30.	<p>The achievement of this objective will be consistent with the following principles:</p> <ul style="list-style-type: none"> a) making a significant contribution to economic growth; b) neither discouraging, nor substituting for, private sector investment; c) avoiding entrenching the position, or ‘lining the pockets’, of existing broadband network providers; d) avoiding excessive infrastructure duplication; e) focussing on building new infrastructure, and not unduly preserving the ‘legacy assets’ of the past; and f) ensuring affordable broadband services. 	<p>Regarding c), the proposal does exactly this. It creates a scenario where those with the most existing capital or infrastructure, or smartest marketing and legal team, are likely to benefit the most. It does not create an equal playing field. And equal playing field requires an open access network arrangement.</p> <p>Regarding d), the proposal creates a situation in which there will be a lot of duplicate infrastructure. There will be a lot of unnecessary outside plant (fibre, cabinets, ducts, etc.) deployed to support the prescribed network architecture, and duplication of electronic equipment, which is simply unnecessary to support the needs of the vast majority of customers and providers.</p> <p>Regarding e), the proposal prescribes a legacy architecture, where telecommunications is about physical connectivity. The services that people are competing for now and into the future have all moved into the higher layers, layer-3 and above. Therefore the architecture should reflect this, by enabling as much competition and innovation at these layers as possible. Instead the architecture reflects the existing unbundled copper loop, only with fibre optic cable. This could require regulation in the future to ensure that providers with access network equipment on that fibre unbundle at the logical layer.</p> <p>Regarding f), the proposal takes the needs of the high value customers, perhaps less than 2% of the market, and then tries to apply the solution for these customers to the rest of the low value market. This is not the way to ensure affordable broadband for</p>

No.	Paragraph	Comment
		this market.
31.	The rationale underlying the government’s proposed investment approach is that, where public funding is invested in telecommunications infrastructure, the government should direct that investment to areas where the market is not likely to deliver on commercial terms ⁸ .	The market unlikely to deliver an open access network that is neutral to all providers because it is generally not in the interests of a provider to wholesale this access to its competitors, especially if a provider with a lot of capital is able to beat the market and capture a large percentage of the market, and lock-in its subscribers. It is also not likely that a company, specifically interested in deploying a structurally separate open access network will find the business case viable when faced with multiple proprietary access networks reducing the market share on such a low margin service. The result will be multiple proprietary access networks with a range of different providers on each, additional, unnecessary overhead on the services as a result, and anti-competitive behaviour that in the future may require regulation.
33.	Against this background, the Minister has concluded that the government investment of \$1.5 billion should be focussed on achieving widespread roll-out of the fibre-optic network infrastructure, sufficient to provide “dark fibre” and potentially other approved wholesale broadband services.	This should include the shared open access network as outlined. This will reduce costs and make the deployment faster and more efficient, therefore reaching more users for less money.
34.	“Dark fibre” refers to fibre optic cable which has been laid in the ground (or on poles) but which has not yet been made active. Fibre is made active by adding optical electronics at each end, to provide a working service. ISPs and other telecommunications providers can purchase access to dark fibre, add their own electronics, and then use it to provide a retail service. This is referred to as “lighting” the fibre. In very simple terms, this is the most “raw” access to the underlying infrastructure, and provides the best competition outcomes because the wholesale customer has full control and flexibility and has the ability to innovate in downstream services. However, there may be benefits from the provider itself lighting some fibres and providing a managed wholesale “bitstream” type of service, to enable improved economies for its wholesale clients.	It is simply <i>untrue</i> to say this provides the best competition outcomes. It provides the worst competition outcomes for the vast majority of customers, the entire residential and small to medium business market.
35.	The government’s approach will encourage the development of a widespread wholesale market for the provision of “dark fibre” network access services. The government investment will be in fibre networks that will operate only at the wholesale level, selling “dark fibre”-based services enabling telecommunications providers to design and specify their own downstream services. This approach will ensure that all decisions regarding active network technology options are left to private sector investors.	This proposal does not encourage a wholesale market for dark fibre networks. It builds a wholesale provider of dark fibre, but there is no incentive for anyone else to deploy their own fibre in competition with this provider. If there were incentive to have multiple dark fibre providers of this scope, then there would certainly be incentive for a single provider to deploy dark fibre without Government involvement. And clearly that is not going to happen or this proposal would not exist. There can only possibly be a few networks built on such dark fibre, as there is no margin to be made on this. Hence why customers are best served when there is a shared open access network, and they are not locked into providers.

No.	Paragraph	Comment
38.	<p>This approach will also minimise market distortion from government involvement. The new network is intended to provide a service to the telecommunications industry, rather than compete directly with it. The new network will provide dark fibre services to any ISP or telecommunications service provider, and will be operating as an infrastructure 'utility' at the passive level of the market. The aim is to provide a new fibre platform upon which service providers can develop their own services and create unique, innovative offerings.</p>	<p>The goals of the Government are not to provide services to the telecommunications industry (i.e. give them a hand-out). The goals, as written in the proposal are meant to be to improve New Zealand competitiveness and economy through access to modern, high speed broadband, and the services that can be built over that.</p> <p>This last statement is ignorant. Services are being developed at the higher layers today. The days of circuit oriented services are long over and suggesting these need to be deployed at the physical layer suggests that multiple services will require multiple fibres. Has anybody bothered to cost this and understand the consequences? Are customers meant to have three different ONTs on the side of their house now? Is the amount of outside plant now going to be up to 90 times that which is necessary to meet the objectives (if all point-to-point)? Of course not, because that just cannot work. So the innovation does not come at the physical layer, it comes higher, at layer 3 and above. Hierarchy exists for a reason.</p>
44.	<p>While the \$1.5 billion investment is primarily driven by public policy objectives, it will also have a commercial focus. Thus, a key feature of this approach is that the government's financial contribution will be by way of an investment, as opposed to being by way of a grant or suspensory loan. The primary objective is to accelerate the roll-out of additional fibre, but the government also intends to take a share of the benefits in the event that any of the fibre operations become highly profitable in the future.</p>	<p>Wait on, so the Government is happy to create a monopoly and then let it become highly profitable? If the fibre operations become highly profitable in the future does not the Government have an obligation to ensure that prices are reduced? Surely given the Government is creating a monopoly it needs to police itself somewhat in this regard. The whole point of this is to allow competition. If prices to providers are high, this reduces the competition from them, and innovation of services, and what their customers can afford. This is completely contrary to the objectives.</p>
46.	<p>The intention is that each LFC will operate as an "infrastructure carrier", providing wholesale access to dark fibre, and optionally providing wholesale services⁹. LFCs will not provide retail services. This will ensure service providers can access dark fibre on an open and transparent basis.</p> <p>Footnote 9. For example, a bitstream service. This refers to a managed, end-to-end wholesale IP transport service which does not require the wholesale customer to install its own active electronics. Compared to dark fibre, it is less flexible and the wholesale customer has less control over its management. These sorts of services may be attractive for telecommunications providers who cannot readily achieve the scale to justify investment in active electronics.</p>	<p>Footnote 9 suggests that having multiple access networks is a good thing and to be encouraged. Yet it is contrary to previous statements against duplication of infrastructure and so forth. The reality is, as proven by the current scenario with unbundled copper in New Zealand and Australia, that very few providers are large enough to deploy their own active electronics, and that doing so is only necessary because there is not a neutral access network providing fair access. So the reality is these services will be attractive to the majority of service providers, but there is nothing in the proposal to require that these services be neutral, or provide low barriers to access, etc.</p>
47.	<p>All LFCs will be required to adhere to common technical and commercial standards in key areas such as open access, equivalence and interconnection (in particular, interconnection at neutral points of presence¹⁰).</p> <p>¹⁰ The phrase "neutral points of presence" refers to physical interconnection points which are open to any network provider. The aim will be to ensure that the networks built by the different LFCs will interconnect with all other network providers, and with</p>	<p>So does an LFC need to provide home-run fibre to neutral POPs? How many POPs per number of homes? If it is one per 300, it is hardly accessible for most providers, if it is one per 10,000, then things are more accessible but the capital and operational costs for the LFC have just ballooned enormously. Not to mention environmental costs, visual pollution, deployment time, etc.</p>

No.	Paragraph	Comment
	each other, to exchange data traffic.	
58.	<p>The overriding objectives of LFCs will be as follows:</p> <ul style="list-style-type: none"> a) to maximise the availability of additional fibre infrastructure to potential end-users and retail service providers within the relevant region; b) to comply with the matters agreed between the CFIC and the partner in the shareholders agreement; and c) subject to (a) and (b) above, to operate on a commercial basis. 	<p>These need to be changed to something like the following:</p> <ul style="list-style-type: none"> a) Provide a neutral open access network infrastructure to be shared by providers, for the purposes of providing broadband services to residential and small to medium businesses. This open access network will meet certain performance obligations set out by the CFIC, such as bandwidth, QoS obligations, and availability. b) Provide point-to-point dark fibre services for those customers and services for which the shared neutral access network is insufficient, such as very high bandwidth users, providers themselves, mobile backhaul, utilities, and other general customers that are considered high value to a provider.
59.	<p>It is expected that the specific commercial objectives for each LFC will be contained in a shareholders agreement entered into at the time of establishing the LFC. The agreement will cover matters such as:</p> <ul style="list-style-type: none"> a) coverage targets; b) capital requirements; c) performance milestones; and d) profit policy. 	<p>LFCs should be required to essentially compete with each other, by requiring them in their charters, or wherever appropriate, to meet benchmarks that are set by the LFC industry as a whole. So if a majority of LFCs in the country have done an upgrade to 10GE PONs or WDM PONs for their shard open access network, or start offering 1 Gbps services to homes, then it becomes obligatory for the remaining LFCs in the country to upgrade and meet this benchmark. This way no region is left behind for too long.</p>
71.	<p>The process will be aimed at both:</p> <ul style="list-style-type: none"> a) selecting a partner proposing the maximum amount of additional fibre infrastructure in return for concessionary government investment; and b) leveraging the maximum amount of private co-investment possible in the circumstances. 	<p>The metric for selection of the partner should not be the amount of fibre infrastructure but the coverage. Coverage should be defined as the number of homes and businesses passed. As discussed there are two categories of customer, residential, and commercial, the coverage for these can then be defined separately.</p>
78.	<p>The criteria the CFIC must apply when selecting proposals will be as follows:</p> <p>Selection criteria</p> <p>The proposal that is likely to best achieve the government’s objective, taking into account:</p> <ul style="list-style-type: none"> a) the “additionality” of the proposal, defined as: <ul style="list-style-type: none"> i. the number of potential end-users¹⁶ able to benefit from new fibre who cannot readily access¹⁷ existing fibre¹⁸; plus ii. the number of potential end-users able to benefit from new fibre who, while able to access existing fibre, cannot do so on competitive terms¹⁹; 	<p>Regarding footnote 20, this is false. The competition outcomes are less favourable in a scenario without a neutral open access network to which all providers have fair and equal access. This is the same scenario that providers find themselves in today, where because it is so costly to deploy equipment into Telecom’s exchanges, or to perform mid-loop unbundling, they are at the behest of Telecom’s wholesale bitstream services, and those of its competitors. Because they also provide retail services there are conflicts of interest. This has required that these services have been regulated. There is nothing in the proposal suggesting that this will happen, and since it can be easily avoided at that outset it is foolish not to. So to avoid it, a shared, neutral, open access network that is structurally separate from retail providers (i.e. has no incentive to favour any providers) is the best option for competition.</p>

No.	Paragraph	Comment
	<p>b) proposed capital structure:</p> <ul style="list-style-type: none"> i. amount of new capital invested by the partner; ii. amount of capital sought from the CFIC; and iii. proposed shareholding; <p>c) commercial viability of the proposal and assessment of the business case;</p> <p>d) ability of proposed network topology to support unbundled fibre access²⁰;</p> <p>e) track-record of the partner; and</p> <p>f) the CFIC’s target of achieving a roughly proportionate spread of the available government funds across regions, and its ability to be flexible regarding the time span across which it spends the funding.</p> <p>Footnote 16. This includes any residential, commercial, health, education or other government end-user.</p> <p>Footnote 17. For these purposes, “readily access” means being able to obtain a fibre connection, as part of a current retail or wholesale offering.</p> <p>Footnote 18. “Existing fibre” includes the fibre extensions Telecom is required to deploy pursuant to its Operational Separation Undertakings (http://www.chorus.co.nz/enhancing-the-broadband-network). As a requirement of the Operational Separation Undertakings, Telecom will be ensuring that 60% of existing PSTN lines will be capable of 20Mbps, 84% will be capable of 10Mbps, and 89% will be capable of 5Mbps, by 31 December 2011.</p> <p>Footnote 19. In general terms, it is expected that overbuild by an LFC can be avoided by accessing the existing fibre for the relevant network segments. However, where such access cannot be gained, then some overbuild may be necessary. The intention is that, in that case, the overbuild will count towards the “additionality”.</p> <p>Footnote 20. Some network topologies (for example Point-to-Point optical networking) support more favourable competition outcomes than others (for example xPON) due to the ability to unbundle individual fibres, and so will be treated more favourably in the assessment process.</p>	
79.	<p>The government expects initial proposals to provide coverage to a substantial proportion of designated health and education end-users²¹ within the region, plus concentrated business areas (taking into account the criteria above regarding overbuild).</p> <p>Footnote 21. Further work will be required to define which institutions and entities fall within “designated health and education end-users”.</p>	<p>There is already significant fibre infrastructure in these areas. The real need is to ensure this fibre is being provided at a reasonable rate (i.e. that there is competition), and to reach those areas not served by fibre.</p> <p>If it is only these organisations that need to be reached then it could be done for much less than \$1.5 billion. But reaching the homes is the costly and most difficult part, that once done effectively reaches all of these organisations as a by product (i.e. the fibre to</p>

No.	Paragraph	Comment
		reach homes will run past all of these organisations).
88.	There will be no restrictions or requirements on pricing of any services provided by LFCs. Pricing will be determined by commercial decisions of the LFCs' Boards.	There must be pricing controls. For example, cross subsidisation must absolutely not be permitted! The majority of customers are low value, and require cheap access to services. They should not be required to cross subsidize the high value users. The architecture required by this proposal appears to effectively require this cross subsidisation. To avoid it means avoiding home-run fibre for these users and just splicing point-to-point for the high value customers in the field as needed.
90.	In order to stimulate take-up of services offered over the new fibre networks, the government will continue to facilitate the readiness of all public sector agencies, and in particular the health and education sectors, to take full advantage of fibre network services.	It does not take much to stimulate uptake. By having the LFCs deploying a shared open access network and pre-connecting homes as they go, the uptake will occur naturally at satisfactory levels.
97.	<p>Environmental and access issues</p> <p>Existing infrastructure (above and below ground) can be a valuable part of future fibre deployment, and its availability can reduce the cost of network deployment. Deployment and use of such infrastructure is governed by several pieces of legislation (for example the Resource Management Act 1991, the Telecommunications Act 2001, the Electricity Act 1992 and the Local Government Act 2002) and regulations. It is proposed that the Ministry of Economic Development, in consultation with the Ministry for the Environment, the Department of Internal Affairs and The Treasury should be directed to report back on how best to facilitate access to, and use of:</p> <ul style="list-style-type: none"> a) fibre optic cable deployment on telephone and electricity poles; b) local authority-owned passive infrastructure such as ducts; c) micro-trenching; and d) fibre optic cable "drops" from the street-side into customer premises. 	What about actual environmental issues? Energy consumption and the like.
102.	The main risk is that there could be insufficient viable proposals, because the Crown's offer is not sufficiently attractive – due to not offering a guaranteed return to partners ²³ , difficulties in obtaining capital in the current environment, or because the business case is too weak (for example if the price that would have to be charged to consumers to achieve a satisfactory return is significantly greater than the resulting value derived by consumers, take-up will likely be deterred).	This risk can be significantly reduced by allowing LFCs to target the two categories of customers separately. The shared open access network targeting the vast majority of customers, which are low value and have similar requirements: residential and small business. And, wholesale point-to-point fibre for the high value customers: the large business, high tech industry, government sector, etc.
103.	(ii) Telecom potentially lowering its prices on a street-by-street basis where new fibre is deployed.	Under the model recommended by this submission, this is actually an incentive for the LFC to pre-connect homes as they deploy in an area. Immediately providers in that area will stop offering their services over copper, and choose the more cost effective and future proofed option. Telecom will still be prevented from anti-competitive behaviour,

No.	Paragraph	Comment
		i.e. lowering its prices below cost.
105.	The selection of partners and preferred projects could be complex and difficult. It will be difficult to compare unlike proposals, such as regional and multi-regional proposals, proposals with and without 'staging' and proposals with differing capital structures and requirements.	This is why the CFIC needs to retain advisors with expert knowledge and experience on this subject. The possible outcomes are not that complex; there are only a few possible permutations that are efficient. This is why this submission makes the recommendation it does, because it is the most efficient way to achieve the goals.
106.	In addition, there is an increased risk of 'rent seeking' (bids above cost) occurring within a regional tender process of this type – particularly in smaller regions, where competition may be more limited.	The CFIC, if it is appropriately staffed, will be able to understand the costs to deploy in an area, and therefore how much of this 'rent seeking' is going on. It can choose to negotiate a lower price with the partner, or require another partner from another region to also deploy in this smaller region as part of its agreement. The CFIC should be allowed, and unafraid, to pursue a deployment on its own (much as the Australian Government). This is not complex, and ultimately if the industry does not want to be involved on fair terms, the Government should make sure regions get what they need.
111.	There is the potential that Telecom could be required, pursuant to the Operational Separation Undertakings, to make investments that it would not otherwise make given the roll-out of new fibre. As noted above, Telecom is required to extend fibre into its network and to shorten the copper loop lengths to certain agreed targets by December 2011. Telecom will be providing ADSL2+ and VDSL224 services.	Telecom should choose to be given a share in the LFC in return for turning over these investments. Where possible the CFIC should coordinate and plan the deployment so that Telecom does not build this infrastructure in areas that will soon be covered by FTTH. Increasing the deployment speed by using a point-to-multipoint topology to build a shared open access network for these residential users also makes it easier to release Telecom from such obligations earlier.
4.	Note that the rationale underlying the government's approach is to direct its investment only to areas where the market is not likely to deliver on commercial terms;	The market is not likely to deliver an open access network on commercial terms, and ignoring this problem by not requiring LFCs to build a shared open access network is likely to require future investments or regulation.
5.	Note that, when the focus is on investment in a fibre-optic telecommunications network, the most significant capital investment is in the roll-out of the passive network infrastructure;	Yes. But the amount of capital investment in that passive network infrastructure varies greatly depending on the design requirements for it. The current design requirements lean towards home-run fibre, which adds significant capital (and operational) expense over point-to-multipoint topology. It is important to understand this, and that this is not necessary to meet the actual needs of customers and providers.
19.	Agree that all LFCs will be required to adhere to common technical and commercial standards in key areas such as open access, equivalence and interconnection (in particular, interconnection at neutral points of presence);	This concept of the neutral points of presence is poorly defined. How many POPs per number of homes? Is the desire for home-run fibre from every home all the way back to these POPs? The impacts of this are serious, and it is completely unnecessary.