

Tim Davin, Director – Policy, IPENZ

PO Box 12241, Wellington 6144

Email: dir-pp@ipenz.org.nz

Phone: 04 473 2027

Fax: 04 474 8933

FACILITATING THE DEPLOYMENT OF BROADBAND INFRASTRUCTURE

SUBMISSION TO THE MINISTRY OF ECONOMIC DEVELOPMENT

27 NOVEMBER 2009

1. BACKGROUND TO IPENZ

The Institution of Professional Engineers New Zealand (IPENZ) is the lead national professional body representing the engineering profession in New Zealand. It has approximately 11,500 Members, including a cross-section from engineering students, to practising engineers, to senior Members in positions of responsibility in business. IPENZ is non-aligned and seeks to contribute to the community in matters of national interest giving a learned view on important issues, independent of any commercial interest.

2. BACKGROUND TO INGENIUM

INGENIUM is the brand name of the Association of Local Government Engineering New Zealand Incorporated and its membership, comprising mainly engineers, represents the technical/professional engineering expertise that services local authorities in New Zealand. INGENIUM's 900 members comprise mainly staff of local authorities, consultants and contractors who manage and operate the infrastructural assets of local authorities and are responsible for providing the following local authority services: roads, bridges, footpaths, water supply, sewerage, stormwater, land drainage, solid waste and flood protection.

3. EXECUTIVE SUMMARY

IPENZ and Ingenium (“we”) support the government’s intention to deploy ultra-fast broadband, but note that this is a project of major scale and will take a number of years to implement. We do not believe that its deployment should receive special treatment in terms of regulation and should not override many utility protocols and codes of practice that have been derived from experience.

There is clearly an issue with a lack of utility information and one of the contributing factors is the competitive behaviour of some utilities. As these utilities are in a public land, we believe that this is not in the best interests of co-ordinating the activities of utilities.

For practical reasons there will be considerable difficulty in sharing water, wastewater and stormwater pipes, and most of the opportunities for sharing facilities will be with power poles with other utilities that have existing overhead reticulation.

There is considerable concern with proposals for shallow trenching and micro-trenching, and in light of the considerable reservations on the detrimental effect on road pavements and the lack of knowledge of their applicability in New Zealand, it is inappropriate to develop codes of practice for these techniques at this stage.

It is for these reasons that IPENZ and Ingenium are concerned that the estimated costs of the fibre network may have been underestimated in the report for Treasury. The estimates need to take a probabilistic cost-risk estimating approach to include and evaluate contingencies. In this process there needs to be allowance for a significant proportion of installation to be by conventional trenching – significantly greater than the 10 per cent provided for in the Treasury report.

The overhead deployment of broadband, where there is no existing overhead reticulation will always be problematic – this is an issue best dealt with through the Resource Management Act and District Plans, rather than any other forms of regulation. We suggest the National Environmental Standards mechanism to achieve a consistent assessment methodology, and commend a guideline, prepared by New Zealand Utilities Advisory Group, that allows evaluation of the suitability of roads for overhead reticulation, taking into account special amenity or scenic values, and visual absorption capability.

4. GENERAL COMMENTS

4.1 IPENZ SUPPORTS THE BROADBAND OUTCOMES AND THIS INITIATIVE

IPENZ and INGENIUM support government’s objectives to accelerate the roll-out of ultra-fast broadband to 75 per cent of New Zealanders within ten years. In the IPENZ comments on the original initiative it was suggested that there be an additional principle for this GBII – “incentivising innovation”. IPENZ considered that encouraging innovation would ensure that state-of-the-art technology was taken advantage of, the investment would be more cost effective, and would assist in future proofing the investment.

4.2 THIS IS A LARGE-SCALE PROJECT

The scale of this broadband initiative should not be underestimated. Based on the Treasury Report¹ of a total cost of \$3 billion and a weighted average cost of \$69 per metre, it is estimated that it may affect 43,000 kilometres of road – or over 40 per cent of New Zealand roads. Although this figure appears very high – it is clear that the proposal will have profound effects and is likely to have an impact on almost every urban road in New Zealand. We have reservations that the weighted average cost of \$69 per metre may prove to be somewhat lower than the actual outturn cost and discuss this further in section 6.1 below.

4.3 BROADBAND SHOULD NOT HAVE SPECIAL TREATMENT

There is a general theme in this discussion document that as broadband is being supported by government funding it should have access to a legislation and regulation that gives it preferential treatment compared to other infrastructure. While we fully support the need to increase broadband speeds and penetration – this initiative should not over-ride many of the practices and protocols that control infrastructure generally. An example is the suggestion that fibre be nationally mandated for all new subdivisions whereas services in subdivision have never been nationally mandated. Recently, in the Ministerial Review of Electricity², it was suggested that electricity was “special” and “the

¹ Fibre to the Premise Cost Study, the Treasury, Dr Murray Milner, February 2009

² Improving Electricity Market Performance, Volume 1, Ministry of Economic Development, August 2009

RMA should give specific consideration to better processes for small and large-scale generation”.

Such approaches are contrary to the theme of the Infrastructure Bill which seeks to achieve a nationally consistent and even-handed approach to infrastructure.

4.4 BROADBAND IS NOT A SHORT-TERM PROJECT

Similarly there are a number of proposed interventions in the form of regulatory control, information, consultation and education that are discussed in this discussion document but are dismissed because it is not practical to implement them in a short time frame.

The current initiative, which is large in scale, will take a number of years to implement and ongoing broadband development will continue for many years after the current government-funded initiative has expired. Therefore interventions, especially those that are going to influence the take-up of services and therefore the success of this initiative, need to be considered in the context of a long time frame.

5. ACCESS TO SUPPORT STRUCTURES AND SERVICES – DISCUSSION DOCUMENT SECTION 2

5.1 SUPPORT STRUCTURES – SECTION 2.3

5.1.1 Information on existing support structures

In reviewing the information in the discussion document on support structures it is clear that there is insufficient information on numbers of poles and ducts – particularly those of utility companies. Since the commercialisation of many of these services, we are concerned that at least some of these companies have insufficient “as-built” information on the numbers and location of these structures and are unwilling to share this information with others for commercial reasons. This is despite the fact that most of these services are on public land – legal road. We believe that utility companies should be required to maintain “as-built” information and this information should be in the public domain. The argument that this information is commercially sensitive does not have much weight as the assets are on and in public land. Such information is important to promoting ongoing co-ordination of utilities in the wider public interest.

5.1.2 Access to other organisation’s support structures

It is highly likely that local fibre companies (LFCs) and other telecommunications companies will want access to other telecommunications companies’ structures and those of electricity companies. It is noted that the discussion document points out that, in the past, competitive tensions have prevented sharing of support structures between rival telecommunications operators. Thus conventional commercial arrangements and control by the anti-competitive provisions of the Commerce Act have proven to be inadequate mechanisms. We believe that regulations will need to be introduced to ensure sharing of support structures by telecommunications operators.

The provisions of the Infrastructure Bill will provide criteria for reasonable conditions for impacts on other utilities, and these criteria may be useful for the new regulations. These criteria could also be useful framework for a guideline or code that could be developed for sharing arrangements for overhead reticulation and ducts between telecommunications providers.

Regarding access to local government pipes, irrespective of the enthusiasm of the local government sector to support broadband improvements, in many cases it is difficult to

share space in drinking water, wastewater, stormwater pipes and culverts, and with “lamp posts”.

Drinking water pipes are pressurised, have many valves and fire hydrants, and hence the installation of a cable is impractical. With sewer pipes, there are considerable health issues for maintenance workers and sewer pipes requires smooth surfaces to avoid build up of material and fats. To highlight this, smooth surfaces are given particular attention in manholes where manual concrete work is required. A cable would be a cause of many blockages. Sewer pipes in most urban situations are smaller in size – 150-millimetre diameter, and there are relatively few 225-millimetre and larger diameter sewer pipes unless they are trunk mains. Therefore they are more prone to blockages. It is not relevant to refer to the Parisian sewer systems – the sewer systems in these major cities of the world serve population densities that far exceed those in New Zealand – our sewerage systems are at a much smaller scale.

Similarly, stormwater pipes and culverts, although generally larger in size to cater for peak flows, carry significant debris loads in flood and do not function well with obstructions. Abandoned sewer, stormwater and gas pipes haven proven to be a very useful routes, but these are not very common.

Regarding lamp posts or streetlight standards, usually their only functions are to support a lantern outreach arm, and this is served by underground reticulation and they are thus not suitable for overhead reticulation. This is both in terms of their structural design and the introduction of overhead reticulation where there is none now. This is discussed further in section 5.3.2 below.

Access to Crown-owned structures should also be made available to LFCs and other telecommunications companies, on conventional commercial terms under the provisions of the Commerce Act. This could be supported by codes of practice and regulated cost input methodologies as discussed in section 5.3.1 below. The provisions of the Infrastructure Bill should improve access to the support structures of the Crown-owned structures of the New Zealand Transport Agency, Transpower, Kordia and KiwiRail.

5.2 SUPPORT SERVICES – SECTION 2.4

5.2.1 Inter- and intra-regional fibre backhaul

We do not support the view that LFCs are likely to have a reasonable competitive choice of backhaul providers for intra-regional backhaul in Auckland, Wellington, Christchurch, Hamilton and Nelson. Telecom is likely to be the only provider with existing fibre access in these cities – for example TelestraClear and Citylink tend to only cover the CBDs. Telecom may not be willing to provide backhaul in the form (dark fibre) that the LFCs are seeking and this would force the LFC to construct its own backhaul and to overbuild the incumbent’s facilities.

Regarding inter-regional backhaul there will be insufficient competition in many regions. Accordingly both LFCs and other telecommunications companies will want access to existing inter-regional backhaul networks to support their fibre-access services.

5.2.2 In-house ducting and wiring

There is a real risk that many houses and commercial premises will not be fibre-ready. This cost will need to be met by the building owner and the building owner will need to weigh up the cost of upgrading the service or maintaining the status quo. If they wish to upgrade the service they need to be offered the opportunity to have their premises upgraded by competitive providers. Some LFCs and telecommunications providers may also want to offer this service, but they should not be the only providers available.

5.3 MEASURES FOR FACILITATING ACCESS TO SUPPORT STRUCTURES – SECTION 2.5

5.3.1 Facilitating access to telecommunications, electricity and gas company support structures

IPENZ supports the development of codes of practice for sharing of facilities including the Telecommunications Carrier's Forum Co-siting Code for support structures, the Broadband Friendly Protocol and the National Code of Practice for Utilities Access to Transport Corridors. In addition, these could be supported by equivalent provisions to Section 54 to 54X of the Commerce Act and Section 52P including input methodologies for evaluating allocation of common costs. This will provide transparency of the charges that one of these utilities might impose on an LFC or other telecommunications companies

5.3.2 Facilitating access to council-owned infrastructure

The discussion document devotes a section to council-owned lamp posts – this is a confusing term and for clarity these should be referred to as streetlight standards. Streetlight standards owned by councils are devoted solely to an outreach arm and lantern and this is usually where electricity and telecommunication are underground and the streetlight standard is served by underground electricity, that is, there is no overhead reticulation.

Most poles in roads are devoted to electricity and telecommunications, and these poles often have a streetlight outreach arm and lantern attached. These poles are usually owned by the lines company and the outreach arm and lantern are, more often than not, owned by the council. There are also situations where there is no overhead reticulation along the street, but there are power poles serving individual house connections. This is often where the lines company and telecommunications company may have undergrounded their reticulation along the street, but the householder has not paid for undergrounding the reticulation to the house. Again these poles are usually owned by the lines company – not the council.

Therefore this section on council-owned streetlight standards seems to be suggesting the installation of electricity and telecommunications where there is no existing overhead reticulation and councils are rightly concerned at this prospect – rather than concerned about the sharing issue. This issue is an amenity issue, not an access issue, and is more appropriately dealt with under the Resource Management Act and District Plan provisions. This is discussed further in Section 7 below. It should be noted that in the past, TelstraClear have generally installed overhead reticulation where that is the existing arrangement for other utilities, and has installed reticulation underground if that is the prevailing practice.

Taking into account that councils do not own power poles, and streetlight standards (lamp posts, council owned) do not carry overhead reticulation – paragraphs 107 to 114 are meaningless. If there are such things as council-owned poles that support overhead reticulation then we do not support amending the definition of road, and prefer the second option of amending Section 135 of the Telecommunication Act with a section specific to poles, allowing access subject to reasonable conditions. This would extend the consistency arrangements in the Infrastructure Bill.

5.3.3 Facilitating access to other organisations' support structures

In general, access to Crown-owned structures should be on the same basis as other providers of support structures – supported by codes of practice and regulated cost-input methodologies. Crown-owned structures should not have any special exemptions.

Regarding new housing developments, broadband services are now becoming an essential element of modern life, but we have reservations with the proposal for central government to nationally mandate developers to lay fibre infrastructure in roads in greenfield developments (it is the premise-owner's choice to have a telephone service or not).

There is no national legislation that requires subdividers to reticulate greenfield developments with telecommunications, electricity, water, or wastewater in roads. In some circumstances it is more appropriate for houses to be served by roof water (rather than water reticulation, and septic tanks (rather than sewerage reticulation). Councils have the discretion to require the installation of these services under the Resource Management Act 1991 and that is the general practice – but do not require these services in specific situations. Therefore, it seems inappropriate to require that broadband should be treated differently – that is, be mandated at the national level rather than the existing practice of mandating this at the local level where appropriate.

The hope is that most councils would require this as part of their district plan (developed through a comprehensive community consultation process), and if not, subdividers would install broadband in order for them to be able to market their sections. We believe it is inappropriate for government to nationally regulate this for broadband.

5.4 MEASURES FOR FACILITATING SUPPORT SERVICES – SECTION 2.6

We support the non-regulatory measures including star-based rating tools, extension of the Telecommunications Carriers Forum Code of Practice which recommends retrofitting, and education of the building and construction sector, consumers, building users and building owners.

6. ACCESS TO LAND – DISCUSSION DOCUMENT SECTION 3

6.1 ACCESS TO LAND – SECTION 3.2

It is noted that the existing statutory provisions for private land (section 120 of the Telecommunications Act 2001) and legal road (section 135) provide adequate powers to enter land and maintain lines. These powers will be enhanced with the passing of the Infrastructure Bill.

The discussion document devotes several paragraphs to the issue of shallow trenching, micro-trenching and aerial deployment. This document seems to be unjustifiably dismissive of the concerns of local authority roading staff on the detrimental impact of shallow trenching and micro-trenching on pavement serviceability and pavement life.

There is the statement that “in reality this position of councils may not be fully justified” and quotes the Treasury Report (February 2009) prepared by Murray Milner (a well-respected telecommunications expert). Of course, the contrary argument is that the supportive comments for micro-trenching in this report are not fully justified. The following discussion attempts to shed some light on this “justification” of the concerns on the effects of deployment of broadband in road pavements.

The concern with shallow trenching is that all existing services are generally laid at a minimum depth of 600 millimetres (mm). This depth has been arrived at over many years of experience of both utilities and local authorities.

It is noted that the new National Code of Practice developed by the Utilities Advisory Group includes a risk assessment of the depth of underground utilities. During regular pavement maintenance activities (e.g. potholes, strengthening), pavements are often disturbed to depths exceeding 300mm – the depth proposed for shallow trenching. In

addition, due to a greater emphasis on sustainability and reduced availability of virgin aggregates around New Zealand, existing pavements are increasingly being recycled in place. This recycling involves large, high-powered milling machines grinding up the pavement, typically to depths of 250mm or more and adding a modifier (such as bitumen or cement) during the in-place recycling and mixing. As the records of actual road pavement thicknesses in New Zealand are often non-existent or inaccurate, the recycling process could easily exceed the proposed depth of shallow trenches.

The concerns with micro-trenching (which may or may not be shallow) are that the pavement integrity is damaged. A pavement's inherent strength is derived from particle interlock distributing vehicle loads to lower layers. Secondly, it is very difficult to adequately backfill and compact the micro-trench to restore pavement homogeneity. Thirdly it can be very difficult to water-proof a micro-trench – pavements in New Zealand are sealed to retain the strength of the basecourse layers and the subgrade (the foundation or underlying subsoils on which the road is built).

Pavements in New Zealand vary in thickness from 200mm on a high-quality subgrade, but are more typically 300 to 600mm thick. Layers consist of the basecourse layer (approx 200mm of high-quality material) and sub-base layers of varying thickness of lower-quality materials.

The depth of the pavement is dependent upon the quality of the subgrade – weaker subgrades requiring thicker pavements to distribute the wheel loads. Moisture intrusion into the pavement causes significant deterioration and often leads to premature failure so the surfacing (water-proofing) is typically 25-mm-thick asphalt or a thin chip seal. These types of flexible pavements are very cost effective and suitable for New Zealand's lower heavy traffic volumes.

It is accepted that there needs to be some innovative approaches to these issues. This should not be a contest between the roads and telecommunications. There are legitimate concerns on both sides of the issues that need to be worked through. There are some interesting developments on alternative undergrounding techniques. We are aware that trials of shallow trenching consisting of a 300-mm deep, 100mm/150mm-wide trench with a concrete backfill are being considered in Wellington, but they have not yet commenced. Also, directional drilling has had mixed success in New Zealand. Some councils have had success, and some have had difficulty in the variability of subsoils – varying from soft clays, silts and volcanic ashes to rock of various strengths.

It should also be recognised that roads consist of pavements usually eight to 12 metres wide (the carriageway) in a legal road width of 20 metres. Therefore there is often the opportunity to install cables underground in footpaths and berms. We have been advised of examples where the existing kerb and channel has been replaced with new kerb and channel with two to 32-mm ducts attached to the inside face (on the footpath side). In this way the ducts are unobtrusive and are unlikely to be damaged by roading and other utility activities.

Regarding aerial deployment, this is an amenity issue and is appropriately dealt with under the Resource Management Act and District Plans. It is up to communities to decide on the balance between the benefits on improved broadband service against the visual impact of overhead reticulation and the additional cost. It has become practice to allow overhead reticulation where there are existing overhead services and to not allow it where all existing services are underground. This is not an unreasonable approach. We are not aware if this form of restriction has been tested in the Environment Court – but this is the right mechanism and forum to weigh up these competing interests.

On the other hand, fibre is often unobtrusive compared to electricity cables and in many cases can't be seen from the ground. There are also innovative ways of installing

overhead reticulation, including using verandas. These are frequently used in rural towns.

It is for these reasons that IPENZ and Ingenium are concerned that the estimated costs of fibre network may have been underestimated in the report for Treasury discussed earlier. Estimates the deployment need to be prepared in a lot more detail than in this report, using the expertise of roading and engineering professionals. The estimates need to take a probabilistic cost-risk estimating approach (this is a well-developed estimating methodology) to include and evaluate contingencies, the costs of consents and designations for cabling, cabinets and other structures, along with other factors. In this process there needs to be allowance for a significant proportion of installation by conventional trenching.

6.2 MEASURES FOR FACILITATING ACCESS TO LAND – SECTION 3.3

IPENZ and INGENIUM generally support the approach of not using legislative vehicles to improve access to land and to use non-legislative means such as promoting best practice and codes of practice.

It is noted that utilities do not have powers to enter private land to install new network assets with the consent of the owner. This should not be over-ridden as it is an issue of fundamental property rights.

There is a proposal in the discussion document to introduce a rule for councils to require companies to make an offer to network operators to take advantage of that opening – to mandate works co-ordination in favour of LFCs. We suggest that if the Ministry of Economic Development (MED) pursue this option, this trenching option should be required of all utilities and the offer to share the trench should be open to all utilities, not just LFCs. To achieve this it could be undertaken by adding another item under the reasonable conditions provisions under all the relevant utility legislation, not just the Telecommunications Act 2001.

It should be recognised that the opportunities to share trenches are, in practice, few and far between. As each utility has different maintenance needs, different priorities and business drivers, the chances of being able to share a trench in the same place and at the same time are low. That is not to say that these opportunities should not be maximised – the Utilities Advisory Group model of a local Partnering Agreement, which promotes co-ordination between utilities and councils through liaison meetings and the sharing of information and work programmes, is a very useful tool to encourage this.

We do not support amending the definition of road to include lamp posts, but do support amending the definition of road to align with the Electricity Act 1992 and the Gas Act 1992 and the Local Government Act 1974, for consistency.

Regarding non-legislative mechanisms, we generally support the development of codes of practice. However, in light of the considerable reservations of roading engineers (the people with the expertise) on the detrimental effect of shallow trenching and micro-trenching, and the lack of knowledge of their applicability on New Zealand road pavements, it is inappropriate to develop codes of practice for these techniques at this stage.

In the discussion of development contributions and the definition of network infrastructure, what is distinctive about this list in the Local Government Act 2002 (roads, water, wastewater and stormwater) is that these are assets that become vested in the council. This is an entirely appropriate context for development contributions. (In essence, the infrastructure installed by a developer is a development contribution in kind). By way of illustrating this there is no mention of electricity lines or gas reticulation.

Therefore it is not appropriate to include telecommunications in the definition of network infrastructure as they are not vested infrastructure.

7. RESOURCE MANAGEMENT ACT – DISCUSSION DOCUMENT SECTION 4

It is noted in the discussion document that all councils (100 per cent of the 30 surveyed) do not require a consent for underground installation, and 71 per cent require a consent for new overhead reticulation. The issue of overhead reticulation is one of tension between national consistency (supported by providers and it seems by the MED), and local situations and community preferences – which are equally valid.

It is agreed that a Resource Management Act (RMA) amendment would elevate broadband above all other issues and is inappropriate – the RMA is an effects-based approach. Similarly, a National Policy Statement (NPS) might not meet the test of national significance. Essentially, broadband rollout is a regional and local form of infrastructure partly funded nationally – it is quite different from electricity transmission (which does have an NPS). NPSs also only set out objectives and policies – so would not achieve the consistent approach being sought.

A National Environmental Standard (NES) on the other hand could lead to a consistent approach, but could be quite prescriptive. Overhead broadband reticulation is very different in nature to the current telecommunication assets that have NESs, that is, different to radio-frequency fields, roadside cabinets, noise from roadside cabinets, and masts and antennas. Overhead reticulation has a major visual amenity impact, which is a subjective issue, unlike the other telecommunication NES issues and their impacts.

On the other hand, an NES could provide a consistent approach and methodology for assessing consent applications, obtaining community input – without being prescriptive on the merits or otherwise of overhead reticulation. The MED suggests that a time frame of two years is too long for this option – we disagree with this short-term approach.

On balance IPENZ and INGENIUM prefer a NES mechanism to achieve a consistent assessment approach.

Regarding non-regulatory approaches NZUAG has had in place for at least five years a guideline – Utilities and the RMA. It specifically discusses overhead reticulation issues and considers this in the context of concepts such as roads with special amenity or scenic values, essential above ground facilities, and visual absorption capability. Consideration of these matters rapidly leads to the conclusion that one national solution for broadband overhead reticulation is not appropriate for all situations.

8. TERMINOLOGY

There is terminology used in this discussion document that should be addressed as follows:

- Local Council – the term should be Territorial Authority (TA) as per the Local Government Act 2002
- Curb – the term should be kerb
- Road reserve – the term should be legal road. There are road reserves under the provisions of the Reserves Act 1977 and these are special purpose reserves and include other reserves such as drainage reserves. This road reserve provisions of the Reserves Act are seldom used, and to avoid confusion it is suggested that MED should use the term legal road.
- Lamp-post – the term for poles supporting streetlight lanterns is streetlight standards. Other poles are usually referred to as power poles.

9. CONCLUSION

IPENZ and INGENIUM appreciate the opportunity to make this submission and is able to provide further clarification if required.

Tim Davin

Director – Policy, IPENZ