Telework Investigation – Infrastructure and Telecommunications Audit

Discussion

The majority of residents of the Wellington Region have access to some form of high-bandwidth connection. Furthermore, such access is growing rapidly at the moment with networks, capabilities, and services under continual review and upgrading.

Access to such bandwidth is, however, dependent upon a variety of things:

- The quality of installed cables could be a problem anywhere in the region – particularly where older copper cable is involved and where Telecom is yet to upgrade its exchanges to the newer digital standards. (Even where Telecom's infrastructure is totally up-to-date, the quality of domestic telephone cable installation can also create problems.)[1]
- Where users are dependent upon satellite or terrestrial radio wave connections, atmospheric conditions, tall trees, or neighbouring buildings could all reduce the available bandwidth.[2]
- Pricing plans for high-bandwidth solutions could be unaffordable for many potential users.
- Locations further than a few kilometres from a Telecom exchange will be restricted to wire-less access, which could be unpredictable and could also pose some restrictions. Users may need to change their ISP, for example.
- The installation plans for those who are installing fibre networks tends to favour those areas with a higher concentration of business premises or suburbs with a high population and/or higher than average socio-economic standing.

Notwithstanding these comments, a number of conclusions from this analysis are particularly relevant to our objective of developing a traffic elimination (or reduction) strategy based on telework:

- Virtually all residents in the region are able to access bandwidth of between 20kbps and 40kbps.[3] This is adequate for many telework tasks (email, simple Internet access, and simple file transfer).
- The majority of residents in urban, suburban, peri-urban and rural support 'communities' are able to access bandwidth of 64kbps or more, making more sophisticated file transfer and remote access solutions accessible.
- A significant number of residents are able to access speeds in excess of 1.5Mbps, making video-conferencing and other high-end telework applications possible.
- Virtually all employers' premises in Wellington and the Hutt Valley have access to bandwidth of 1.5Mbps or more. Employers and managers sometimes suggest that

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[1] Within some communities line quality can also affected by interference from other electrical equipment. Electric fences can be a problem in farming communities, for example.

[2] Radio interference can also be a problem – particularly where newer, stronger transmitters interfere with existing transmission facilities.

[3] Naturally, access to such connections will depend on the resident having access to a computer and the skills required to operate it. For employees to whom telework is relevant, this is not likely to be an issue. Areas of lower socio-economic standing are likely to need telecentres or similar to provide both access and skill training for residents. (The same could apply to rural residents who might not have computers of their own or who have connection problems.)

telework is not accessible to them because the bandwidth they think they need is not available. This analysis shows that this is not necessarily the case. The available bandwidth is more than adequate for most telework and remote access tasks.

- Most rural communities could have access to some form of high-bandwidth although this is unlikely to be from residences. Telecentre access points in specific locations may be required.
- It is perhaps paradoxical that the shorter the commute, the more bandwidth is available. Those with longer commutes (i.e. those who are prime targets for trip reduction strategies) have less choice in terms of high-bandwidth connections.
- The willingness of bandwidth providers to customise solutions and respond to market demands should not be overlooked.

Conclusions

This phase of Wellington Regional Council's TDM project set out to identify:

- the region's ability to support e-commerce and telework-related services,
- possible locations for future telecentre and 'tele-city' developments, and
- areas and corridors that are particularly important for such developments.

Infrastructure

The overview of telecommunication services available in the Wellington Region shows that most areas of the region have access to adequate telecommunication services. High-bandwidth options are available to most major population centres and to most employers and 'information providers'[4]. Where such options are not available to individual residences, there are locations in most communities from which telecentres could provide the required access. The region is well served by bandwidth suppliers and appears capable of supporting the full range of e-commerce and telework-related applications, including those that address the goal of trip elimination and reduction.

Locations for telework-related developments

There are many possible target areas for telework-related developments, including future telecentre and tele-city developments. One of the primary qualifications in selecting such areas and communities is the size of the resident population – the more people in an area, the greater the community's contribution to commuting flows, in general and the more sustainable telecentres and related developments become.

Most of the most populous areas (defined solely by screen lines) are large and cover a wide range of different communities. Detailed planning for telecentres and related developments based on these areas would be ill advised. Smaller Communities have been defined, based on their geography and existing community centres and facilities.

Although population is a major criterion for successful telework-related developments, it is not the only one. The population's awareness of telework and telecentres, socio-economic factors, the occupation of residents, the number who already work at home, and the availability of suitable premises could also be relevant.

Detailed analysis of many of these factors would best be left until a specific trip elimination project is considered. However, the occupational mix of residents has a more immediate relevance in the context of telework-driven traffic demand management.

Identifying the contribution each area or community makes to commuting flows will help us define where further effort should be focused.

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[4] Information providers include all organisations that provide information to residents. Government departments, libraries, educational institutions, information centres and many sales organisations all fit under this heading.

Important areas and corridors

This report's conclusions relating to commuting flows, in brief, are:

- Single-occupant cars are a major target for telework-related approaches.
- Traffic flows within Wellington City and out-bound from Wellington's CBD need to be considered in addition to those that enter the city.
- The two most important contributors of trips towards Wellington are State Highway 1, and south and east Wellington. The amount of traffic leaving Eastbourne/Wainuiomata appears particularly important.
- Employers and information providers in the CBD and Lower Hutt/Petone need to be encouraged to provide telework for their staff and to support tele-city type approaches that could reduce the need for residents to travel to these areas.
- Telework strategies should be targeted at residents of Eastbourne/Wainuiomata, south and east Wellington and the northern areas on the State Highway 1 corridor. In addition, a number of specific communities could be focused on due to their high percentage of SOC commuters. Such communities include:
  - Te Marua, Mangaroa, Cloustonville, and Akatarawa;
  - Tawhai; Kelson, and Belmont;
  - Normandale, Mangaraki, and Korokoro;
  - Seatoun;
  - Pauatahanui, Endeavour, Resolution, Discovery, Adventure, and Paremata-Postgate;
  - Haywards-Manor Park;
  - Pencarrow and Eastbourne;
  - Churton and Grenada; and
  - Emerald Hill and Maoribank.

Moving forward

In general, telework initiatives (targeting individual teleworkers) should focus on Communities with a higher than average number of potential teleworkers, a higher than average number of SOC commuters, and a reasonable to high availability of high-bandwidth solutions. The communities that qualify under these criteria are:
- A18C   CBD
- A09C8   Woburn, Waiwhetu, Moera, Gracefield
- A09C7   Waterloo, Hutt Central
- A14C2   Normandale, Mangaraki, Korokoro
- A14C1   Kelson, Belmont
- A06C4   Miramar
- A09C5   Naenae West, Boulcott-Avalon
- A15C1   Rangoon Heights, Khandallah
- A02C5   Linden, Greenacres, Tawa
- A07C4   Island Bay East, Melrose, Newtown East
- A04C2   Ohariu, Johnsonville, Raroa
- A04C1   Paparangi, Newlands
- A15C2   Ngaio, Awarua
- A16C   Wadestown and Wilton-Otari
- A02C4   Titahi Bay, Onepoto, Elsdon-Takapuwahia, Porirua Central
- A05C   Makara through Karori

Telework initiatives targeting employers and information providers should be focused on Areas that attract most trips and have a high availability of high-bandwidth solutions. These areas are:

- Areas 15-18   Central Districts,
- Area 09   Tawhai to Moera,
- Area 14   Kelson to Petone Central

Telecentres would best be located in Communities with a higher than average percentage of SOC commuters, higher than average population, and relatively low availability of high-bandwidth solutions for residents[5]. The communities that qualify under these criteria are:

- A02C2   Pauatahanui, Endeavour, Resolution, Discovery, Adventure, Paremata-Postgate
- A01C3   Otaihanga, Paraparaumu, Raumati, Maungakotukutuku
- A02C3   Ascot Park, Waitangirua, Papakowhai, Cannons Creek, Porirua East, Ranui Heights
- A05C   Makara through Karori
- A02C4   Titahi Bay, Onepoto, Elsdon-Takapuwahia, Porirua Central
- A16C   Wadestown and Wilton-Otari
- A04C1   Paparangi, Newlands
- A04C2   Ohariu, Johnsonville, Raroa
- A07C4   Island Bay East, Melrose, Newtown East
- A10C03   Masterton, Ngaumutawa

Tele-city developments would be most successful in Areas with higher than average population, a higher than average number of residents who work from home already, a higher than average number of potential teleworkers, and a reasonable to high availability of high-bandwidth solutions. Such areas are:

- Area 09   Tawhai to Moera
- Area 07   South East Wellington
- Area 15-18   Central Districts
- Area 02   Plimmerton to Tawa South
- Area 01   Otaki to Pukerua Bay

Phase F of this project will spell out the components of these four 'campaigns', incorporate the results of earlier phases of this project and draw it all together to create an integrated Action Plan upon which detailed ATR proposals can be developed.

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[5] It is likely that bandwidth availability for residents will increase over coming months and years, particularly where there is a growing population with a high socio-economic standing. Most suppliers, however, are reluctant to specify when or if their coverage will expand, for commercial reasons.