FUTURE FACE OF URBAN WATER SERVICES* IN NEW ZEALAND?

A Discussion Document

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*In the context of this paper the terms 'urban water services,' 'water services' and 'reticulated water services' are used synonymously and refer to reticulated drinking water and wastewater infrastructure and associated governance and management. Stormwater services are excluded.

1. Executive Summary

Providers of urban water services in New Zealand face challenges in achieving known standards of best practice mainly because of the system under which they operate. The purpose of this paper is to propose a system in which best practice standards can be more realistically targeted.

Problems and solutions are examined in six areas:

(i) Regulation and Public Policy
Urban water services are mandated under a complex and confusing statutory framework that is not well understood. Public policy assumptions and decisions made in the 19th century, placing these services in the hands of local authorities are probably outdated and should be reviewed.

Other overseas jurisdictions have moved to aggregated stand-alone single purpose entities delivering water services. At the same time, policy and regulation have usually been separated from delivery. Lessons from their experiences can be applied to improve the delivery of water services in New Zealand.

(ii) Governance
Governance is currently provided by elected local councillors in multiple purpose entities, facing competing demands for capital expenditure. Decision making can be influenced by local vested interests, and the popularity of more visible social infrastructure, rather than analysis of the needs of communities for essential, but less visible infrastructure.

(iii) Fragmentation
On a per capita basis, New Zealand has a large number of both water service providers and facilities. The latter in part reflects the geographic make-up of the country. There is significant scope for rationalisation of suppliers and, in some areas, also supplies.

(iv) Performance
Not surprisingly, given these policy settings, performance under the current model is variable. There are examples of both extremely good and substandard performance. There is a long tail of mainly smaller reticulated drinking water suppliers that supply substandard water.

Some smaller communities need water services, but have none; some remain on permanent boil water notices. The current model will not deliver good services overall.

Security of supply is problematic in some areas despite New Zealand's abundant water resource.

The performance of wastewater services is less well known, but available evidence suggests a similar picture to that for reticulated water services.

Asset management is variable. The approach to demand management is variable.

(v) Funding
Funding of water services is not transparent and for capital expenditure is not necessarily secured to maintain appropriate levels of service. Because of the high fixed cost of water services, the burden of meeting accepted service levels is higher per customer in smaller communities. This often results in substandard services.

(vi) Transparency
Domestic customers in non-metered jurisdictions pay for water services through rates. There is little transparency in this method. Customers generally do not know whether there is cross subsidisation between sources of council revenue.

Local councils currently combine monopoly ownership, governance, management, pricing, customer representation and (some) regulation for water services.

As a result accountability is weak and levels of service are inconsistent. The relationship between supplier and customer is an administrative one, rather than being contractually based. For other utilities (e.g. gas, telecommunications, electricity) some of these functions are separated to provide customers with reassurance that they are receiving an appropriate service at an appropriate price. Changing to a contractually based relationship between supplier and customer raises the expectations of both parties.

Other jurisdictions overseas have faced exactly the same problems as New Zealand and found successful solutions by adopting alternative approaches.

Solutions

Common features in jurisdictions that have faced the same problems as New Zealand include:

- removal of water services from local political control, improved governance and larger units of management achieving economies of scope and scale;
- a move to commercial structures;
- high quality regulation; and
- security of funding via direct billing for services rather than via rates or taxes.

A revised model for water services is proposed. Since water services cannot be separated out from the wider question of water governance generally, these of necessity include proposals under both headings.

- One lead government agency should have overall responsibility for water services policy.
- There should be an independent economic regulator for the sector.
- We suggest far fewer water businesses could provide water services for the whole of the country. These should be run on commercial lines. Ownership should be retained in the public domain.
- As with other utility services, funding should be secured directly from customers via fees for service.
- Governance should be via directors appointed on merit, and charged with meeting statements of corporate intent.
- Network pricing would help fund deferred investment and lift the level of service in smaller communities.

These models have been applied successfully in parts of Australia and in several European countries and can be replicated here.

2. Introduction

New Zealand's abundant water resource is widely recognised as giving the country a continuing key strategic advantage.

Our economic model is founded on New Zealand being a sustainable virtual water exporter, through our dependence on agricultural exports, and on tourism which is heavily reliant on natural landscapes and waterways. For many years New Zealand's water resource has been generally taken for granted largely because costs of extraction here are minimal by international standards.

This view is now changing because intensification of land use has caused declining water quality and over-allocation in some areas. Our devolved and fragmented water governance system has resulted in variable management of the resource, and the application of standards, limits and targets to sustainably manage the resource, has been problematic.

Our best performers compare well with services offered in other jurisdictions overseas, but a fragmented approach has led to uneven management of this infrastructure. Some communities, which should be reticulated, lack water services. Well performing urban water services are a subset of good water management generally.

Reform of water governance generally has been on the public policy agenda for almost a decade. The previous government attempted reform under the sustainable water programme of action, but these attempts failed. Policy initiatives for the current government aimed at improved management were set out in a Cabinet paper in April 2009[1].

Two recent public policy initiatives have brought water services into focus.

Firstly, in its report[2] the Land and Water Forum recommended inter alia in recommendations 50 and 51 that: *"The way water services infrastructure is managed and organised should be investigated to consider the potential benefits of rationalisation. This includes the possibility of a national regulator with oversight of pricing and performance issues. Subsequently, the issue of volumetric metering and direct billing should be worked though collaboratively with stakeholders."*

The Government is considering these along with other recommendations from the Forum. It is likely to make decisions on these two recommendations in 2012.

Secondly, earlier this year the Minister of Local Government announced a review[3] of local government. His *'Smarter Government, Stronger Communities: Towards Better Local Governance and Public Services'* paper sets out a work programme aimed at reviewing the funding, structure and function of local government, the relationship between local and central government, and the potential applicability of the Auckland unitary council model in other metropolitan centres. Public consultation on this initiative will start in 2012, with legislation being introduced in 2013, and implementation scheduled for 2014.

The purpose of this paper is to develop a Water New Zealand position to feed into both of the aforementioned initiatives. Water New Zealand welcomes current initiatives on reticulated water services. Such moves cannot be separated out from water management issues generally.

Our view is that the current governance model for reticulated water services, like that of water management generally, can be significantly improved.

3. Previous Attempts at Reform

The appropriate shape of reticulated water services in New Zealand has been the subject of discussion by officials in recent years.

It was intended that further reform of this industry would follow the extensive local government amalgamations in 1989[4]. This has not occurred.

In 1998 the Ministry of Commerce commissioned a report on the nature of the three water services, which resulted in a Cabinet decision to undertake a major review of the sector and terms of reference for a review were drawn up. However in November 1999 the Government changed, and the review was put on hold until the intentions of the new Government were known and twelve years later the review has not progressed.

More recently in 2000, the Parliamentary Commissioner for the Environment in the preface to a paper entitled *Aging Pipes and Murky Waters: Urban Water Systems for the 21st Century*[5], noted:

"I believe industry and community evidence indicates that the 'model' has now reached the end of its design life. Further incremental tinkering with the current systems, without going back to first principles of community water and wastewater needs relevant to the 21st century, will simply mean the necessary changes will be harder to achieve and more costly at some time in the future."

Since then there has been little or no progress.

4. History of Water Services in New Zealand

Historically, reticulated water services have been provided in the main by local government, empowered under numerous acts and regulations of national and local application. The exception has been in some of the larger metropolitan areas where, prior to 1989, water and drainage services were supplied by special service entities (Water and Drainage Boards). Local Government reforms in 1989 disestablished all these (with exceptions in Auckland) and made water and drainage the responsibility of local government.

The history of special service entities in New Zealand is instructive in this context. For example the Christchurch Drainage Board was the first body of its type in New Zealand, formed in 1875 by a special Act of Parliament, "The Christchurch District Drainage Act 1875," to provide for the drainage of the City of Christchurch and surrounding districts. A subsequent statute allowed the Board to raise loan money.

A separate drainage board was set up because the Christchurch area was split among a number of local authorities which could not agree on urgent action needed to solve the area's drainage problems. The Christchurch Board was in existence for 114 years prior to amalgamation with the Christchurch City Council in November 1989.

N.B. This mirrored the solution applied to London's drainage problems after the 'big stink' of 1858. Various commissions had sat in London over the previous 20 years considering solutions to the city's drainage problems. It was not until rationalisation of separate drainage bodies into the Metropolitan Board of Works that a unified whole-of-London approach was able to be applied.

The Auckland Metropolitan Drainage Board and its predecessor, the Auckland and Suburban Drainage Board, formed in 1908, repeated the pattern of rationalisation of separate drainage authorities.

The Auckland and Suburban Drainage Board was established in 1908 to incorporate the Hobson Bay Watershed Sewage Board (formed about 1900) and the Arch Hill Gully Drainage Board (formed 1903). The Board then administered the main drainage of the Auckland isthmus.

In 1963 the Auckland Metropolitan Drainage Board was absorbed into Auckland Regional Authority, and then subsequently into the Auckland Regional Council. In 1992 Watercare Services Limited was formed from the water and drainage operations of the Auckland Regional Council. Shareholding was in the hands of the Auckland Regional Services Trust. On the dissolution of the Trust in 1998, its ownership passed to the six serviced territorial local authorities. With governance reforms in 2010, shareholding then passed to the Auckland Council.

Desirable characteristics of these special purpose entities were:

- single aim;
- secure funding;
- solid record of long term planning; and
- economies of scale allowing for specialisation by professional staff.

These features are common with those considered to be consistent with best practice by recognised authorities in the industry[6].

5. Legal Context

There are numerous acts and regulations relating to water management. These include, amongst others:

- the Biosecurity Act
- the Building Act
- the Conservation Act
- the Crimes Act
- the Environment Act
- the Environment Canterbury (Temporary Commissioners and Improved Water Management) Act
- the Hazardous Substances and New Organisms Act
- the Health Act
- the Land Act
- the Local Government Act (including the three Acts to establish the Auckland Council)
- the Public Works Act
- the Reserves Act
- the Resource Management Act
- the Soil Conservation and River Control Act
- the Treaty of Waitangi/Te Tiriti o Waitangi Claims Settlement Acts
- the Civil Defence Emergency Management Act
- the Fire Service Act.

Despite serious culling in recent years, many other out-dated acts and regulations which impinge on water policy and management remain on the statute book.

The water industry is a classic utility, but unlike all other utility industries which have single purpose legislation (the Gas, Electricity and Telecommunication Acts), there is no equivalent Water Act.

Surprisingly, while the Local Government Act empowers local authorities to construct water works and drainage schemes, there is no legal obligation on local authorities to provide water and sewerage services, although there is an implied obligation for them to do so. If these services are provided by local authorities then statutory obligations under the Local Government Act and other legislation do apply.

The Building Act imposes obligations on local authorities to ensure that buildings are sanitary (i.e. have adequate water and sanitation) and therefore habitable, but does not require the local authority to provide these services.

The situation with sewerage is slightly different. While on-site (septic tank or more sophisticated) individual systems are perfectly adequate if soil and site conditions are suitable, if inappropriate systems are installed, or appropriate systems allowed to malfunction, there can be detrimental public health impacts beyond the individual site.

This complex legislative framework also complicates alternative service provision options, as some powers are specific to local authorities and would not be available to any new created special services entity. In particular, these include the powers of entry onto property, backflow regulation, the ability to set rates or introduce bylaws, implementation of public works provisions, and disaster financing.

The exact nuances of the framework are poorly understood by practitioners, legal advisors and government agencies.

This is evidenced by the delayed implementation of mandatory drinking water standards at the 11th hour in July 2009, when it was suggested that doing so would unnecessarily penalise smaller district councils.

The Ministry of Health disagreed, arguing that provided public health risk management plans (PHRMPs) were put in place, and that utilities were taking all practicable steps towards implementation, this was evidence of compliance with the statute.

For some supplies this simply amounts to the implementation of permanent boil notices[7]. Some smaller communities remain on permanent boil notice because of the capital cost of upgrading reticulated supplies.

6. Relationship with Customers

While the provision of water services remains in the control of local authorities the relationship between supplier and consumer is based on the latter's ownership of property within the former's jurisdiction. In effect, it is an administrative relationship rather than one based on explicit and agreed terms and conditions defined in a written contract between the two parties. However, in some jurisdictions, particularly where metering and volumetric charging is employed, standard terms and conditions are stated.

By contrast, other utility suppliers in the electricity, gas and telecommunications industries do enter into contracts with their customers. These set explicit and agreed service levels between suppliers and customers.

Therefore the relationship becomes contractually based and this can drive behavioural change. Ratepayers become customers with revised and heightened expectations regarding the performance of their suppliers and vice versa.

7. Water Services – Public or Private Good?

There is confusion round whether water services are a public or private good, which clouds debate on where the ownership of these assets should sit, and can inhibit those responsible for governance from making rational decisions.

The distinctive features of public goods are:

- non-payers cannot easily be excluded from receiving the benefit that others pay for (that is, public goods are susceptible to free riding); and
- one person's consumption does not reduce the consumption opportunities of others.

These are known as the non-excludability and non-rivalry characteristics of public goods. The more a good or service is non-excludable or non-depletable the greater the prospect for it being classified as being in the public domain.

Both water supplies and wastewater services can satisfy the economic test for private goods – there is rivalry in consumption and non-payers can be excluded. If one individual consumes a quantity of water, another person cannot use the same water and the capacity of wastewater systems is finite.

Water also sits at the bottom of Maslow's hierarchy of needs along with food and shelter. These goods have been provided by the private sector with two exceptions; the failed communist experiment between 1917 and 1989, and the provision of water in built environments.

There is no debate on whether food and shelter supply should sit in the public or private domain; even so state housing and food banks are evidence of the need for some degree of public intervention.

Equally, there are some public good aspects regarding the provision of water and sanitation services.

Potable water supply is an essential requirement for public health. Public supplies were originally built in response to epidemics of cholera, typhoid and other water borne diseases.

It is also for this reason that the Health and Local Government Acts include provisions which can require a local authority to install sewerage, and individual property owners to connect to sewerage systems where these exist.

Firefighting relies on reticulated water supplies, which have public good elements. The Resource Management Act requires councils, in approving new subdivisions, to make adequate provision for firefighting water.

Stormwater services generally satisfy the economic test for public goods. There is no rivalry in consumption and non-payers generally can't be excluded from receiving the benefits that accrue from its management. These services are not included in this discussion.

There are successful and unsuccessful examples of both private and public water services internationally, but the majority remain in public ownership.

8. Six Challenges

(a) Out-of-Date Policy

Often overlooked in debate on water matters is the fact that public policy on urban water infrastructure today is still based on 19th century policy. At that time outbreaks of water borne

diseases were common in often unsanitary urban environments. Local authorities had responsibility for public health within their jurisdictions and were therefore empowered to provide water and drainage services.

In the intervening period there has been no first principles review of these arrangements to determine if they are still appropriate.

(b) Too Many Institutions Providing Input

At a central level:

Nine central government agencies have responsibilities for aspects of water policy, while none are in overall charge.

- the Ministry for the Environment administers the Resource Management Act;
- the Department of Building and Housing administers the Building Act;
- the Department of Internal Affairs administers the Local Government Act;
- MAF has responsibilities for rural water infrastructure;
- the Ministry of Science and Innovation is responsible for water research policy and funding;
- The Environmental Protection Authority is responsible for administering the HSNO Act;
- the Ministry of Health is responsible for drinking water legislation;
- Treasury is responsible for the National Infrastructure Unit; and
- the Ministry for Economic Development has responsibilities for economic development.

Rouse[8] (2007, p192) recommends overall responsibility for policy on reticulated water services is placed within one government agency.

At a regional level:

Eleven regional councils have responsibility for administering the Resource Management Act.

At a local level:

Six unitary authorities have responsibility for administering both the Resource Management Act as well as the Local Government Act, and a further 61 territorial authorities administer the Local Government Act. Local authorities are multiple purpose entities facing competing demand for resource for the provision of services.

Water supply, sewage treatment and disposal, stormwater management and flood protection are almost exclusively controlled by 78 regionally and locally based agencies. These sit under nine central agencies – none of which hold primacy. This is a fragmented regime for a country of only 4.4 million people.

With recent governance reforms, 1.3 million Aucklanders are now being serviced by one water business. This leaves 66 other businesses servicing on average approximately 47,000 consumers each. Economies of scope and scale cannot be achieved under these arrangements.

(c) Numbers of Supplies - Fragmentation

In addition to the organisational fragmentation described above there are over 2,250 separate water supplies in New Zealand. There are around 350 wastewater treatment facilities. On a per capita basis, New Zealand has a very high number of water facilities, in part reflecting the geographic make-up of the country. While the latter does present challenges in the provision of infrastructure generally, the degree of fragmentation shows there is scope for rationalisation in some areas.

(d) Performance of Suppliers

The performance of suppliers is extremely variable. Some perform very effectively, with larger suppliers featuring well in international benchmarking exercises, but some smaller suppliers are struggling to provide adequate services.

For example, reticulated supplies serving smaller towns and communities with populations of under 5000 are less likely to meet the drinking water standard because the cost of upgrading these systems is more problematic for their owners.

The high fixed cost components of water supplies means there is an inverse relationship between the investment required per person and the size of the system. The smaller the serviced population, the larger the cost per person of upgrading water supplies to meet the standard.

(i) Water Suppliers

The Health (Drinking Water) Amendment Act 2007 sets standards for the quality of drinking water supplied via reticulated systems. Implementation of this statute was put back from 1 July 2009 to 1 July 2012 because of debate around the cost and benefit of compliance.

Compliance with the standard remains voluntary*. There is a statutory requirement for the Ministry of Health to report annually on the performance of reticulated water supplies.

The 2011 Ministry of Health *Annual Review of Drinking-Water Quality in New Zealand 20098/10*[9] advised that:

- 707 local authority drinking water supplies serviced 96% of the population who were on reticulated supplies;
- 96% of the reticulated population were supplied with water that met the chemical standard;
- 94% of the population on reticulated supplies were provided with water that met the bacteriological standard; and
- 75% of the population on reticulated supplies were being provided with water that complied with the protozoal standard.

Data on treatment plants showed:

- 55% were compliant with the bacteriological standard; and
- 10% were compliant with the protozoal standard.

An earlier report showed that of the 667 water treatment plants that were reported as being non-compliant with the standards in 2007, over 90% were from population centres of under 5000, servicing mainly rural New Zealand. Some of these smaller communities have high deprivation indices (measures of the lack of resources, opportunities and income in defined areas) and static or declining populations.

The burden of the capital cost of upgrading their plants to meet the standard is concomitantly higher per ratepayer than it is for their urban counterparts and, as has been previously mentioned, some towns remain on permanent boil water notices.

***Footnote**

While not mandatory under the Health Act, some legal commentators have suggested that the Fair Trading or Consumer Guarantees Acts may impose a 'fitness for purpose' test on a potable water supply and that in any such challenge the New Zealand Drinking Water Standard would probably be the legal test.

(ii) Wastewater Services

The performance of reticulated waste water systems is less well known. It is difficult to obtain information on the performance of wastewater services because it is not aggregated and published. The majority are complying with the conditions on their consents granted under the Resource Management Act.

Anecdotal information suggests substandard performance and non-compliance with conditions on consents on the part of many smaller plants. Technical reports and papers produced by Regional Councils indicate some breaches of environmental standards as a result of discharges from wastewater treatment plants.

Two examples are cited:

1. The poor state of the Manawatu River is well known. A 2007 Horizons Regional Council report *Nitrogen and Phosphorus Loads to Rivers in the Manawatu-Wanganui Region : An Analysis of Low Flow State : Technical Report to Support Policy Development*[10] (p39) states:

   "Phosphorus loads in the Lower Manawatu and Oroua Rivers are alarmingly high. The DRP load at Opiki Bridge site is at least three times the proposed standard and more than ten times the standard in the Oroua at Awahuri Bridge. These estimated average loads are a direct result of the Palmerston North STP, Affco and Feilding STP discharges, each one of which individually breaches the proposed DRP standards as well as the current MCWQRP standards."

2. In a 2008 Otago Regional Council paper[11] paper Selvarajah states (p1): *"There is a widely held view among the technocrats and policy makers that in New Zealand the point source discharges are no longer an issue and that they have been managed properly. The reality is the contrary. Many local authority sewage discharges are still of third world discharge quality and many consented discharges to water will still require lengthy mixing zones.*

   It has been more than 16 years since the RMA had been enacted. Despite the high progress made to date, there are still many municipal and several industrial effluent discharges that are of poor quality. The effluent treatment of these discharges is substandard and often does not match the scale and environmental risks of the discharges. In many cases regional councils are reluctant to impose stringent consent requirements due to financial constraints."

A significant number of smaller communities lack adequate wastewater services.

A Ministry of Health commissioned review in 2006[12] identified 139 communities from which potential applications for sanitary works subsidy scheme assistance could be made from communities with high deprivation indices, including 106 from District Councils.

The report made it clear that current sanitary arrangements in these communities were unsatisfactory, posing human and environmental risks. It advised that even with sanitary works subsidy scheme subsidies some communities would struggle to upgrade, let alone maintain, sewerage systems.

As with drinking water, the burden of the capital cost of upgrading plants to meet the standard is concomitantly higher per ratepayer in smaller towns than it is for their metropolitan counterparts.

(iii) Water Efficiency

Many New Zealanders take water services for granted and, as a consequence, use water inefficiently. Limited survey work by Heinrich[13] (p66) indicates water use inside houses averaging 150 litres per person per day. The average daily domestic water use across local authorities that apply volumetric charging for water supply is typically in the region of 200 litres per person per day.

The Auckland Water Group[14] (p16) reported that across the seven former (metered) Auckland jurisdictions, domestic consumption was 176 litres per capita per day.

Only five of 66 local authorities meter and volumetrically charge across the whole of their jurisdictions. Another eight meter and volumetrically charge across parts of their jurisdictions.

The rest include water charges in their rates. Figures for domestic water use in these jurisdictions vary enormously. Typically it is of the order of twice that of metered customers[15].

The introduction of metering and volumetric charging enables effective and cost efficient monitoring of domestic water use. It will not be appropriate for all communities, but it is a tool that could be more widely used to manage water use and provide charging transparency.

It is recognised that there are social equity issues relating to tariffs which can frequently cloud debate on the merits of universal metering, but water utilities are not social welfare agencies. Metering provides information on household water use and can therefore be used to determine tariff rates and where necessary the level of subsidies. Universal metering and tariff systems are not the same things. The former is necessary to allow the sophistication that the latter can provide in addressing social equity issues.

Debate on the merits of metering and volumetric charging is frequently clouded by claims that it will lead to privatisation of water services. There is no appetite for such privatisation in New Zealand. Water New Zealand policy is that this infrastructure should be retained in public ownership.

Metering also enables improved monitoring for leak detection which can lead to significantly improved water efficiency. Some suppliers lack metering in their distribution networks, meaning that water losses from leakage cannot be assessed or always readily repaired. As a result losses can be in excess of accepted norms, and water efficiency is further impaired.

(iv) Variable Performance in Asset Management

Evidence points to variable performance in water asset management. Some local authorities are performing extremely well. There are others whose practice barely meets minimum audit standards.

In a review[15] of local authority planning for forecast demand for water, the Auditor General stated (p8); *"(Of the eight reviewed) Five of the local authorities had incomplete asset management information. Two had better information, but it was still not complete. The eighth had a lot of information, but did not make the best use of it."*

A Department of Internal Affairs commissioned report[16] on local government water network infrastructure states (p6):

"The current condition of assets is primarily reported within Asset Management Plans. While reference is made to condition within Valuation Reports the level to which this is reported varies between councils. The manner in which asset conditions are reported varies but is generally given:

- *by remaining life; or*
- *by condition grade (using numerical or descriptive grades).*

The detailed methodology used to determine asset conditions is not always provided within many of the documents. Some councils confirm they have not undertaken a systematic survey of assets to derive their condition."

The report concludes that difficulties with the robustness of data affected the ability to make comparisons between councils. While there were summaries of how asset conditions were assessed there was no actual data on asset condition provided in Asset Management Plans.

(e) Funding Constraints

The Department of Internal Affairs report advised that Councils' long term community plans[16] identified $8.9 billion of capital expenditure intended for these water services for the 2009-18 period, an increase of 40% on 2006 figures. Replacement value for this infrastructure was estimated at $24.1 billion in 2009[16]. Actual annual expenditure is currently lower as councils defer capital expenditure in attempts to keep rates down; the effect of this deferred expenditure on the state of infrastructure is open to debate.

The *Smarter Government* Cabinet paper[17] highlighted the financial constraints facing some local authorities. Common features of these councils include small static or declining populations, large road networks and dispersed aging water networks, with relatively high levels of debts and rates per capita.

With the current state of water infrastructure and constant deferral of planned capital expenditure, the size of the deferred investment has become too large to manage under current funding arrangements.

The challenge facing councils in funding water services is acknowledged by Lawrence Yule, the current President of Local Government New Zealand[18].

(f) Transparency

Local councils currently combine monopoly ownership, governance, management, pricing, customer representation and (some) regulation for water services. As a result accountability is weak and levels of service are inconsistent. The relationship between supplier and customer is an administrative one, rather than being contractually based.

Ownership

Councils are multiple service entities and provide all the capital for improvements. There is competing demand for capital. There are also disadvantages in not seeking a financial return on investment in their assets.

Whilst many investments are required for statutory compliance purposes, by not recognising the opportunity cost of capital, councils are not exposed to the same financial discipline on investment. They therefore cannot use financial return as a mechanism for resolving conflicting demands for capital investment, and determining optimal solutions.

Failure to fully fund water services directly from customers may also limit councils' ability to provide social infrastructure.

Customer Representation

Councils are also the customers' representatives. Because of the inefficiency of providing more than one water and sewerage network, these services are most cost effectively purchased on a community wide basis, which necessitates some form of representation to cover the customers' interests.

Currently this is provided by the councils/councillors, who also determine the level of service the customer receives, and also what they will pay for that service. This means that the councils, as the customers' representatives, provide only weak feedback on consumer aspirations and satisfaction. Separating customer representation from service provision is good practice, and is the approach adopted by other utilities.

Pricing
There is no external price control regime for the delivery of these services and, because of the monopolistic nature of the businesses, no market forces to establish price. It therefore falls with councils to determine the tariffs or rates.

Council decisions on pricing are dominated by the political imperative to keep rates down rather than reasoned analysis of the balance between investment needs and customer interests.

The historic practice of bundling water and sewerage charges with rates means that customers often have little idea of the cost of water services, or their value. Often they don't have any readily available information on whether rates income apportioned to water services is being subsidised or is subsidising other council activities.

The respective rights and responsibilities of the service provider and customer in today's commercial climate would be better managed as explicit (and agreed) terms and conditions for the supply of water and receipt of sewage based on customer contracts. This is standard practice with other utilities in the electricity, telecommunications and gas industries.

These conflicting roles for councils result in confusion between the roles and responsibilities of ratepayers and customers, provide weak feedback on performance, blur accountability and confuse business matters with regulatory issues.

They deny customers choice and do not allow the water and sewerage service providers to think commercially and concentrate on customers' needs.

Other utilities that tend towards monopoly (gas, telecommunications and electricity) are subject to external regulation and price control. Water services providers would be encouraged to improve performance if subjected to similar regimes.

9. Common Features of Well Performing Models

Other countries have faced the same problems and successfully dealt with them. There are four common themes in the solutions that have been applied.

Rationalisation of governance, control and management
Common features in jurisdictions that have successfully reformed their water utilities are, that they have been de-politicised by removal from local government control, and bulked up into larger businesses to achieve economies of scope and scale. While there are associated costs, experience elsewhere suggests this is outweighed by capacity gains and significant improvements in service delivery.

The Scottish experience[19] is cited as an example of rationalisation. Scotland faced similar challenges as those currently before New Zealand. These included a significant infrastructure deficit. Over 200 water businesses were amalgamated into 16 in 1986, then to 3 in 1997 and finally one in 2002. Scottish Water, a publicly owned company, operates and maintains the water and wastewater assets on behalf of the Scottish Parliament for the whole of the country.

Scotland shares many features with New Zealand, including rugged terrain, low population density in rural areas, long coastline, and a high degree of urbanisation in a few population centres. Since amalgamation the infrastructure deficit has been overcome.

The water industry regulator for Scotland reports that average household bills in 2010-11 are the fourth lowest in the UK. Scottish Water has reduced its running costs by almost 40% from their historic base, and now operates as efficiently as the private water and sewerage businesses in England and Wales. The drinking water regulator currently reports compliance figures in excess of 99% of drinking water quality standards.

In England and Wales 50 million consumers are serviced by 21 privately-owned companies, formed as a result of reforms undertaken in 1989.

In Victoria, Australia, a programme of reform has resulted in 19 water utilities that service a population of 5.4 million.

In 2008 the Queensland government announced it would amalgamate services in South East Queensland and place it in a connected grid, owned and operated by state owned businesses. These reforms are now being phased in.

Move to Commercial Structures
Irrespective of ownership, a common feature of well performing water utilities is their commercial approach with professional governance and management. Income is not derived via taxes or rates but directly from billing customers who only pay for the services they use. These businesses operate in the customer services industry.

High Quality Regulation
Good regulation is crucial for many sectors including utility industries - water, energy and telecommunications, which tend towards monopolies.

A well-regulated environment provides stability and transparency for decision making.

The English privatised water industry is independently regulated. Ofwat, the water services economic regulator, is "intrusive" to a level far beyond what we are used to here in New Zealand; it agrees price levels, monitors performance, and establishes efficiency targets. Every water provider has to submit its business plans to Ofwat, which then sets clear performance parameters over a five-year period. This regulatory system is based on Government guidance/national strategy, and there is high level engagement, with delivery and accountability sitting with the regulators and the companies.

A good regulatory system should focus on the delivery of a value-for-money service to customers. A simple fixation on pricing will not deliver this. The focus needs to shift to investment and delivery infrastructure, accountability, efficiency through benchmarking, minimum standards of delivery, and transparency for customers.

Other examples of economic regulation of monopolies include:

- the Water Industry Commission of Scotland;
- the Essential Services Commission in Victoria, Australia;
- the Independent Pricing and Regulatory Tribunal in New South Wales - the regulator for the electricity, gas, water and transport industries.

Direct billing for the services rather than via rates or taxes

Direct billing for services has four benefits.

- It changes the relationship between the seller and the purchaser from the provision of an administrative service to one of servicing individual customers. It is an important distinction.
- It is more transparent and equitable. Individual customers pay for what they use and no more.
- It secures the income stream for the business by removal from rates or tax based systems subject to local political control.
- It modifies the way customers think and behave. Expectations around levels of service from the provider increase, improving the latter's performance.

10. Proposed Model for New Zealand

As mentioned earlier improved water services cannot be separated from better water management generally. These proposals take into account initiatives already underway under the Government's *Fresh Start for Freshwater* work programme.

We suggest the following changes for consideration:

(a) Land and Water Commission

As suggested by the Land and Water Forum[1] (recommendation 37), a Land and Water Commission should be established to provide oversight of water policy and management generally.

(b) Water Policy Agency

Given its critical importance to the economic base of the country, one lead government agency should be responsible for policy development for reticulated water services. This agency would be answerable to the Land and Water Commission. It would also be responsible for regulation of drinking water standards.

The Treasury is the New Zealand government's lead advisor on economic, regulatory and financial issues, and already incorporates the National Infrastructure Unit. The provision of water services is integral to economic development, as is the provision of government services at a local level generally.

It would therefore be appropriate that all local government oversight be removed from the Department of Internal Affairs and transferred to a stand-alone unit within Treasury.

(c) Independent Economic Regulator

An agency responsible for economic regulation is generally considered to be a desirable feature of good governance of water monopolies. Such agencies monitor prices and service levels as well as performance targets, based on Government direction and strategy. They also monitor and benchmark performance, with the primary aim of ensuring that customers get value from their water services providers.

Well performing independent economic regulators of water utilities do produce benefits beyond price setting. They accumulate a body of knowledge from both the utilities they regulate and others in like jurisdictions overseas, which they can use to challenge utilities to continually improve their performance.

They also provide transparency and therefore credibility. Customers in jurisdictions where such regulators exist are provided with a level of assurance that utilities are not exploiting their monopoly market position.

Creating a new agency in New Zealand would not be necessary. This function could be added to that of one the existing locally based utility regulators.

At a minimum, advice from successful overseas economic regulators should be sought if an existing locally based monopolies regulator is to take up this function. The regulator must be free from political interference.

(d) Water Services Businesses

While there is a body of research into optimal size and scope of water utilities, much of it is conflicting. A recent literature survey by Berg and Marques[20] was quite critical of 190 quantitative studies which used cost or production functions to examine, among other things, the scale, scope and density economics of utilities in different countries.

There is however reasonable consistency in research work commissioned by the Office of Water Services for England and Wales [21] comparing efficiency of water services in those two countries with Korea, United States, France, Italy and Japan. This supported economies of scope and scale being achieved for utilities servicing larger populations with dis-economies appearing where serviced properties exceeded certain levels.

The type of utility (water supply only, vertically integrated, water and sewage) affected where the cut off occurred. For Japan the optimum population base was 766,000. With an average serviced population of 2.4 million in England and Wales, diseconomies of scale were demonstrated. This work is supported by research by Worthington and Higgs[23].

However, as noted previously, Scottish Water, servicing 5.7 million customers, is performing much more efficiently than its three immediate predecessors.

We suggest formation of a limited number of publicly owned companies incorporating:

- significant water catchments or multiple water catchments; and
- significant metropolitan centres.

This suggests around two to four businesses in the South Island and four to eight in the North Island. Public ownership of these businesses could be vested via shareholding councils, or in the Crown. Directors should be appointed on merit.

Aggregating the existing 67 agencies water services into between six and twelve businesses modelled along the lines suggested above would overcome the impediments to performance described in this paper.

Benefits

- Governance based on merit.
- Economies of scope and scale thus lowering barriers to achievement of standards.
- Businesses able to be run on commercial lines.
- Security of funding - providing capital to upgrade water infrastructure, and supplying it where it is presently absent or substandard.
- Improved skill sets - employment in single purpose entities subject to commercial disciplines provides greater career opportunities for, and is more likely to attract and retain quality staff.
- Greater transparency encouraging businesses to lift performance.
- Improvement in procurement practices with aggregation on demand side.
- Customer focus providing improved services at lower cost.

(e) Funding

Under current arrangements capital funding for water services is insecure. Capital funding for the water companies would be achieved as it has been for Watercare Services Limited, i.e. via transfer of assets and liabilities from existing owners and gearing as necessary. Customers would be charged directly for services, as they are for other utility services such as gas, electricity and telecommunications.

This model requires that network pricing be applied to some degree. Network pricing is employed to provide other utility services in New Zealand and is accepted public policy. It is currently being used by the Christchurch City Council to improve water infrastructure in the formerly separated Banks Peninsula district.

Watercare Services Limited is taking the same approach to upgrading that portion of infrastructure that was substandard, which it inherited in the Auckland area.

Benefits

- Security of funding.
- These arrangements rolled out across the rest of New Zealand would provide both the capital base and revenue stream to bring water network infrastructure up to accepted standards in smaller communities. It would also fund new infrastructure in those communities that cannot afford it at present.
- Obviate need for transfer payments from the Crown such as the existing drinking water subsidy scheme.

(f) Transparency

Single purpose entities, independently governed and funded by debt, equity and revenue for services would provide the transparency that is missing from current arrangements.

Benefits:

- The existing conflicts of interest facing councils, in providing at the same time, monopoly ownership, customer representation and pricing functions, would be removed. Pricing would be monitored by the independent economic regulator.
- Customer representation would be removed from the vagaries of the local body electoral process and provided instead through directors, charged with running their businesses in accord with agreed statements of corporate intent.
- The existing blurred administrative relationship between Councils and ratepayers would be replaced by explicit commercial terms and conditions for the supply of water and receipt of sewage based on customer contracts. The expectations of both parties regarding each other would be raised, and as a result the performance of both should improve.
- Customers would know the cost of services and their value, paying directly for the water they use.
- There would be no suggestion of cross subsidisation between water and other services. Instead publication of annual financial reports would give assurance that funds received by the water companies were used solely for maintaining water services at agreed levels of service.

11. Summary

New Zealand's governance system for water services could be improved to align with progress made in other countries.

The industry is fragmented.

Best practice management of water services infrastructure is well known to New Zealand's water managers; it is practiced in some areas, but is not currently applied across the board in New Zealand.

Deferred investment in water infrastructure exists, resulting in substandard performance on the part of some suppliers.

Debate on water services is clouded by concerns about privatisation.

A first principles review of water services is supported. If conducted well, we consider that an improved system of the governance of water services can be implemented for New Zealand.

12. Assumptions for First Principles Review

A first principles review of water services would be based on the following assumptions.

- Improving the management of water services cannot be compartmentalised from reform of New Zealand's water management system overall.
- These services deliver in the main private rather than public goods.
- Well performing water businesses are usually subject to commercial disciplines.
- Full cost recovery is essential for the sustainability of water services. Without it infrastructure deteriorates.
- There is no political appetite for privatisation of reticulated water infrastructure or management.
- Network pricing is an accepted feature of utility pricing and an element of well tested solution to infrastructure deficits.
- Current policy settings are still partially based on 19th century concepts of public health. These are no longer completely appropriate.
- Water services are classic utilities and natural monopolies, and models for governance would logically be based on those successfully applied to similar entities.
- Separation of service delivery from customer representation and pricing will provide greater transparency and accountability.
- Any model applied must be incorporated into integrated water catchment or multi - catchment management planning.
- Single purpose entities are more likely to provide the appropriate level of service at an appropriate price.
- Water services are organised on large enough scale to attract high quality management, and should be free from political interference.
- There are common features of well performing reticulated water businesses across the globe that can be considered for application in New Zealand.
- There should be an integrated approach to policy for water services within one central government agency, rather than across multiple agencies as is occurring at present.
- Policy, regulation and delivery should be separated to give focus to the required expertise and provide transparency.

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