The Business of Sewerage

Viet Nam – Asian Development Bank

Sanitation Dialogue

Thanh Hoa, April 2009

Contribution: Matthew Guisemann, City West Water, Australia, MGiesemann@citywestwater.com.au

What is a sewerage service?

A sewerage service comprises two components:

- The collection of sewage from properties
- The safe disposal of treated sewage to the environment

Both these components must be managed if a sewerage service is to be effective. Treated sewerage includes both an effluent and a sludge.

A sewerage business manages both these components plus all the processes in between (collection, transfer, pumping, treatment)

Who benefits from a sewerage service?

There are two beneficiaries from a sewerage service:

- The individual – the collection of wastewater from a property is a service to that property and from which it accrues a local benefit of improved amenity (health and standard of living) – this is a direct benefit

- The community – the safe disposal of wastewater to the environment is a service to the community and from which it accrues a regional benefit of improved amenity (health, standard of living and environmental enjoyment) – this is an indirect benefit

Who should pay for a sewerage service?

On the basis of those who benefit should pay there is an argument that:

- The property owner should pay because of the direct benefit received
- The community should pay because of the indirect benefit received

In developed countries the property owner pays 100% of the costs. However payment by the community, or some combination of the two, is equally valid.

How should payments be made?

Individual

- Load the water rate – 80% of the water entering a property ends up as sewage – the whole of life cost of water (from its extraction from the environment to its return to the environment) should be paid by the user of the water
- Add to the water bill – attractive as it increases the collection of revenue and saves on a separate customer data base and billing system
- Bill separately – suitable if sufficient enforcement of payment in place (e.g. accruing interest, debt on title, court action with costs)

How should payments be made?

Community

- Allocation as part of government budget
- Certainty over time (say five years) is required
- Sewerage business loses some autonomy

What is wanted?

Governments want:

- A sewerage service today;
- A sewerage service tomorrow; and
- To pay the lowest net present cost

To provide a sewerage service today assets are required that can be operated to deliver that service. Sewerage businesses, like all utilities, are asset intensive. Asset management is therefore a key competency.

To provide a sewerage service tomorrow the same assets are required in the same condition. Assets must be maintained. Again asset management is required.

What revenue is needed?

A sewerage service can be operated today if it has sufficient funds to operate and maintain its activities

However this is not enough to operate the sewerage service tomorrow – extra funds are required to maintain assets and replace assets reaching the ends of their lives

Hence a sewerage business must recover sufficient funds to meet its operating costs plus its future asset replacement costs. The latter is recovered through ‘depreciation’.

Revenue required = operations and maintenance expenses + depreciation

What is the lowest net present cost?

The net present cost of an asset is the initial capital cost of the asset plus its discounted operations and maintenance costs over time, say 25 years

Discounting is a method used to account for the opportunity cost of money (not the subject of this presentation!)

Example

A pump station costs $50,000 to construct and $1,000 a year to maintain. The design life of the pump station is 25 years.

The net present cost of the pump station is **$57,843**.

However the sewerage business chooses to only spend $500 a year on maintenance. This reduces the life of the pump station to 20 years.

The net present cost of the pump station is **$59,105**.

If through poor maintenance the life is reduced to 15 years the net present cost is **$72,191**!

It is always cheaper to maintain an asset than to cut maintenance and shorten the asset's service life.

So Far

- A sewerage service includes both the collection and safe disposal of sewage
- Disposal means the disposal of treated effluent and sludge
- There are two beneficiaries from a sewerage service – the individual and the community
- There are several ways of recovering costs – there is no one ‘right’ way
- Sewerage services must collect sufficient revenue to pay for today and tomorrow
- Reducing maintenance costs is a false economy

How does it work in a developed country?

In a developed country a sewerage business is permitted to recover the following costs from its customers:

- The cost of operating the business
- Depreciation
- Profit

These are referred to as:

- Operating costs
- Return of capital
- Return on capital

respectively

Is it a free for all?

The Government limits how much revenue a sewerage business can collect by:

- Negotiating acceptable operating costs with a sewerage business by agreeing a level of service
- Requiring a sewerage business to use reasonable depreciation rates
- Limiting the sewerage business's profit to about 6% if the depreciated value of its assets

This is referred to as 'economic regulation'

Level of service

The thing that drives the operating costs is the level of service provided by the sewerage business

The level of service is measured using key performance indicators for which targets are set (KPIs)

The targets for key performance indicators are often set by others. For example the degree to which sewage must be treated before it can be discharged to a receiving water

It is essential for any business to measure how well it is performing. It is the only way good management decisions can be made. KPIs do this. Data management is another competency a sewerage business must have.

The ‘right’ level of service

The ‘right’ level of service to choose is the level of service that can be afforded. It is pointless choosing a higher level of service. It will not be achieved and will result in poor company morale.

A level of service can be improved over time through a gradual increase in tariffs or from efficiency gains

For example a septic tank service will achieve at least 50% the level of service of a connected system for only about 15% of the cost.

Trade off

The negotiation that takes place between a Government and a sewerage business amounts to a tradeoff between the level of service to be provided and the operating costs that can be recovered

The key document that is used in this process is the sewerage business's Business Plan (has many other names – 'Water Plan', 'Corporate Plan')

The Government periodically checks the sewerage business to ensure it is spending its money in the manner agreed and that it is achieving its key performance indicator targets (level of service)

How to prepare a business plan?

A business plan is an amalgam of several other documents. These key documents are:

- A compliance register
- A risk register
- An asset management plan
- An information services plan
- A customer charter
- An environmental charter

So far (again!)

Economic regulation is used in developed countries to set sewerage prices

The method used permits a sewerage business to collect sufficient revenue to pay for today and tomorrow

Key performance indicators are used to measure how well a sewerage business is performing and whether it is meeting the Government's requirements

The level of service provided is trade off with the amount of revenue permitted to be collected

A business plan is the key document in collating all this information and analysis

What do sewerage systems cost?

System	Effluent BOD	Cost Recovery	Ratio
	mg/l	USD (millions) / Yr	
Septic Tank/Sludge Treatment	150	23	1
Septic Tank/Sludge Treatment Effluent Separation	150	53	2.3
Connected Sewerage Only	300	40	1.7
Connected Sewerage plus Oxidation Pond	40	53	2.3
Connected Sewerage plus Aerated Lagoon	30	87.5	3.8
Connected Sewerage plus Activated Sludge	20	135	5.9

Data is for an Asian city of one million people

Cost recovery is the annual cost of the sewerage system including depreciation

Different treatment systems are shown providing progressively better treatment

Are sewerage systems affordable?

Sewerage services are also affordable

A typical household sewerage bill in Australia ranges from USD 285 to USD 550 per annum. This represents full cost recovery (Viet Nam requires Cost Recovery Only)

This represents only approximately 3% to 5.8% of the pension and 0.7% to 2.5% of the average annual income.

Percentage may be higher for Asian cities but not on a pro-rata basis.

Can sewerage systems be profitable?

Sewerage business's are profitable in all developed countries

There is no reason why sewerage business should not be profitable in developing countries

The secret is the **level of service** :

- Setting too high a level of service will doom the enterprise to failure.
- Setting too low a level of service will cause questions to be asked.

Don't be too ambitious. Start with what is there and build on it over time. This is the strategy that has been adopted by all developed countries.

Summary

A sewerage service includes both collection and disposal of sewage – both are critical

Sewerage services must collect sufficient revenue to pay for today and tomorrow

Revenue can be collected from both the individual and/or the community

Cutting maintenance is a false economy

Competencies in asset management and data management are required

Performance must be measured and targets set

Sewerage services can be affordable and profitable