



Pekka Leviäkangas, Antti Talvitie, Harri Haapasalo, Maila Herrala,
Pekka Pakkala, Marko Nokkala, Jussi Rönty & Kaisa Finnilä

Ownership and governance of Finnish infrastructure networks

2. Ownership and governance of infrastructure networks

2.1 Brief history

Communities' infrastructure networks such as electricity, heating, water, sewage, telecommunications and transport networks have traditionally been owned and operated by the public sector. These public goods have often been provided through taxes, even though pay schemes that exclude non-payers would have been technically feasible. Free services have been provided because of a belief that denying public services to non-payers would be denial of rights (Jacobson & Tarr 1995). Current economic theories, however, argue that many public utilities and services can be delivered more efficiently when private sector is involved or when the entity delivering the service is corporatized or privatized. The private sector is said to bring stronger managerial capacity, access to new technology, specialized skills and more flexible and rapid response to changes in the world markets (Rondinelli 2003). Also opposite opinions have been presented that, in certain circumstances, public ownership or public-private partnerships would be more efficient.

The rise of the public ownership took place at the beginning of the 20th century. Economics supported government ownership if any market inequities or imperfections such as monopoly power or externalities were present (Shleifer 1998). It was believed that government could protect the companies from the power of the market and secure the post-war service provision of socially important commodities (Taylor 2006, Perotti 2004). These ideas lasted for several decades until the ideas of economic transformation at the end of the 1970s. Protection, rent-seeking and customs barriers gave way to (regulated) profit maximization and efficiency acquired through private sector involvement.

2. Ownership and governance of infrastructure networks

The wave of privatization started in the early 1980s with the UK government taking the lead under Prime Minister Margaret Thatcher. Privatization spread rapidly worldwide. In many countries previously nationalized infrastructure networks were sold to private ownership. However, privatization experienced difficulties during and after the process, such as increased prices, self-serving management, deterioration of quality of the product or service or both, and other nuisances. It was realized that, in absence of good regulatory framework, privatization does not always lead to lower costs, better quality or more efficient production because, from the public viewpoint, of the private sector objectives did not coincide with those of the public. Privatization processes are still going on in some developing countries, but in the industrialized world it has declined a little. In the latter countries, private sector involvement is being used in different ways when emerging economic theories and financing instruments suggest that methods such as corporatization of public entities, public private partnerships (PPP), or other market-oriented mechanisms might offer higher and sustainable benefits in the provision of public services.

Public private partnerships started to gain ground in the 1990s when the negative consequences of the privatization processes became clearer and when it was understood that purely public provision is not efficient either. The partial inclusion of the private sector in projects and in the provision of public services gives the advantages of the strengths of both the public and the private sectors. Private sector is thought to effect more competitive and economically efficient operations while the public sector emphasizes more social responsibility and accountability. Figure 1 shows the ownership and governance reforms.

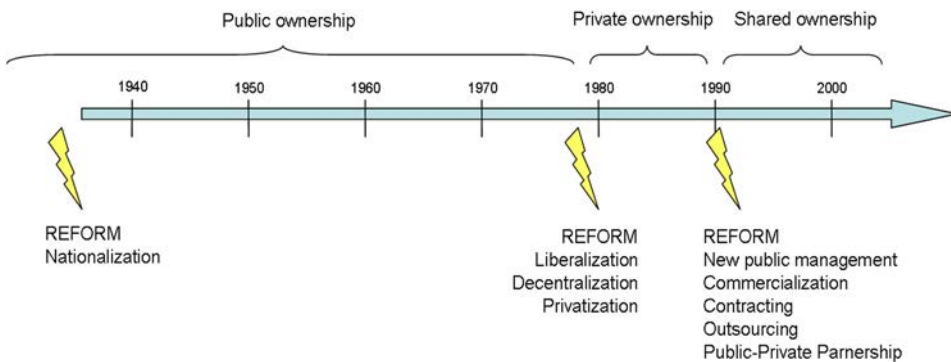


Figure 1. Reforms and development of ownership.

Politics has always influenced public service provision. This is also true in today's Finland. Infrastructure development, kinds of public goods demanded, and the roles played by private firms have over the years been shaped by politically important actors and the workings of government, political, and legal institutions. The same holds true also abroad; in the US, for example, regulatory, franchising and contracting arrangements have been influenced by the opinions of how "public" the various goods and services are. When the service has been seen as predominantly "private", the private service provider makes decisions about price, output and quality of the service. When the service instead has been seen as public, these decisions have had to be made, or at least regulated, by government agencies, regardless of the role played by the private sector (Jacobson & Tarr 1995).

2.2 Definitions

Ownership has four attributes (Olsson 1999, Alchian & Demsetz 1973, Alchian 1993): (i) the right to decide how the property is used; (ii) the right to benefit and earn income from the asset's use or lease; (iii) the right/obligation to bear the consequences if the net value of the property changes; and (iv) the right to sell, give up or exchange the property and exclude others from using it.

Transferability of property rights enables the separation and specialization of ownership and control, that is, the separation of the ownership from management.³ Although this can bring benefits, it also introduces the principal-agent problem: will the agent (the management) pursue the principal's (the owner's) objectives under asymmetric information and diverging interests. In order to align the interest of the principal and the agent, the latter's compensation contracts must on one hand have fair risk-sharing properties, and on the other hand the Board of Directors need to have the powers to represent the interests of the principals and exercise appropriate control over the operations. The principal-agent problem is dealt with by means of corporate governance.

³ There are, in fact, normally four actors involved in infrastructure services: the owner (normally the state or municipality); the administration (which makes or procures the plans to effect the owner's policies); the manager (which supervises or controls that the plans and services are carried out as specified); and the supplier/operator (which designs, builds, maintains and operates the infrastructure services). These are explained more thoroughly later in the text.

2. Ownership and governance of infrastructure networks

The definition of corporate governance is taken from Organization for Economic Cooperation and Development (OECD): “*Corporate governance is the system by which companies are directed and controlled, in the interest of shareholders and other stakeholders, to sustain and enhance value.*” OECD has proposed a ‘menu’ of good governance for external and internal control mechanisms that motivate corporate executives to make decisions that enhance the firm’s value to its stakeholders.

Good governance essentially means:

- focusing on the organization’s purpose and on outcomes for citizens and service users
- performing effectively in clearly defined functions and roles
- promoting values for the whole organization and demonstrating the values of good governance through appropriate behavior
- taking informed, transparent decisions and managing risk
- developing the capacity and capability of the governing body (Board) to be effective
- engaging stakeholders and making accountability real.

Appendix D details the OECD ‘menu’ for good governance in state-owned enterprises (SOE) and companies (SOC). These are well-observed in most SOEs and SOCs in Finland. However, in municipally owned enterprises (MOE) and companies (MOC) the experience is mixed, in fact their characteristics fall far short of several of the ‘menu’s requirements.

Governance is especially important when the ownership and control are separated, as they should be in SOEs and MOEs. When the ownership is divided between many parties, as is sometimes the case in Finland, or when the owners do not “run” the company, as is also the case in many Finnish SOCs, SOEs, MOEs and MOCs, but have a management team in charge of daily operations of the company, corporate governance is of central importance. Governance is important even when the owners’ employees operate the infrastructure networks as is the case for most infrastructure networks in Finland, which are operated by a department in the municipal administration or a state entity. The role of the Board of Directors to ratify and monitor important decisions and to avoid collusion between owners and management of the control agents is a difficult issue in state or municipality-owned entities.

The OECD ‘menu’ addresses these issues (see Appendix D). Briefly, good corporate governance requires the creation and establishment of institutions and mechanisms, which can reduce the transaction costs arising from the separation of ownership and control. Governance is about information sharing and trust between owners and administrators and managers so that the owners can not only have confidence but can also monitor and verify that the management makes reasonable decisions from the owner’s viewpoint.

The choice of ownership form, control (Board) and operation (administration and management), the Board mediating between the other two, defines the governance framework and, ultimately, the performance and efficiency of the enterprise and its operation (Figure 2). This governance framework is also determined in relation to decentralization, outsourcing, commercialization, corporatization or privatization and public-private partnerships as discussed later. Note that the governance framework encompasses also ownership, although in the sequel, for clarity, ownership is often viewed as an independent choice.

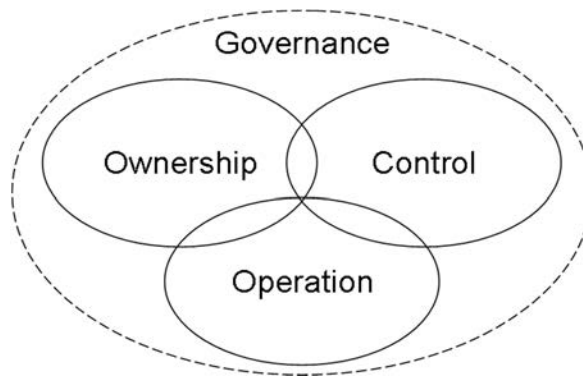


Figure 2. Ownership, control, operation and governance.

2.3 Situation in Finland

Most of the infrastructure networks in Finland are publicly owned and the privatization movement has not advanced at the same pace as in several other countries. Technical infrastructure networks are typically owned, administered and managed by the public sector as they are considered public goods and critical infrastructure by the state and the municipalities. However, the public sector is beginning to adopt the business entrepreneurial practices in the form of Municipality-Owned Enterprises (MOEs) and Companies (MOCs).

2. Ownership and governance of infrastructure networks

The private ownership models that were observed during the course of the research were for the private road and waterworks co-operatives and (two) private ports. The range of variations is from the public departments which deliver all services by public employees to the purely private. Most of this report deals with infrastructure under public ownership.

There are important differences between public companies and public enterprises. Importantly, the public enterprises cannot go bankrupt, they do not have to pay VAT and other taxes, and often – even after the EU SOE decision – they are in some places competing with entities organized as companies. When contrasted with the OECD guidelines for the SOE, the MOEs fall short on many dimensions, as reviewed in Appendix D. It also is necessary to make a distinction between Client MOE/SOEs and Supplier MOE/SOEs. The former procure services or products, either by negotiation or competitively, and the latter supply the services or products the clients have procured either through competition or direct negotiations.

Many waterworks, ports, energy and the airports are already public enterprises (MOE/SOE) or companies (MOC/SOC). This may be due to their customers paying directly for the services or products they use, these revenues cover (most of) the expenditures. In the municipalities, the road and street users are not paying directly for their use, but funds are provided from the general budget, which presents a management challenge for the municipality's technical directors. At the state level, the road and waterways users pay special taxes and fees for road or seaway use; these revenues accrue to the state as general tax revenue. The taxes and fees collected from the road users more than cover the expenditures on the roads (Leviäkangas & Talvitie 2004); but fall slightly short for seaways. Of course, for both roads and seaways, there are regional variations in the cost recovery. The railway users pay for rail service operator, VR, for service, although the publicly owned infrastructure cost is mostly covered through state budget. For roads and railways the taxpayers do pay for the infrastructure, but until 2009 in road sector the special fuel tax was levied on the road users only, however the tax was not ear-marked for road infrastructure costs; in the railway the majority of infrastructure costs is covered by direct state budget transfers, with only a fraction recovered from user charges through VR. These two sectors provide an incomplete picture of the sector financing when assessed only through revenues collected.

From 2009 onwards, the road traffic has been subjected to carbon-based taxation. This resulted in a decrease in the cost recovery of the sector as far as public state roads are concerned, but still covered all the costs (Leviäkangas & Hautala 2011).

The state has been more active than the municipalities in restructuring the infrastructure networks. The main motivation or logic is that the state has been more intent to restructure in order to reduce the national budget expenditures for infrastructure administration and management. Some restructuring is also taking place in the municipalities as several small to mid-sized municipalities have adopted the (true) client-supplier model, explained in the next chapter. Even in a few of the larger cities there are MOEs both in the client and supplier side. Restructuring does not necessarily lead to converge towards privatization or private service provision. What is more important is to strive for efficiency gains through restructuring measures. Several challenges exist, preventing the municipalities becoming good stewards of infrastructure networks. The challenges include how to keep or return the assets in good condition, how to obtain good knowledge of asset conditions and accurate cost information about asset maintenance, and how to procure the supplier services competitively from the market.

Governance correlates with ownership and includes a hierarchal structure, which has a systematic approval process where issues, budgets, management and administration, and others pressing issues are decided. Various types of boards and committees are the mainline structure, while the technical network agencies and departments run the day-to-day operations and management of the infrastructure networks. The governance structures between the state and municipalities are quite similar, but change when different models are used. Figure 3 shows the different of governance arrangements for both the state and municipal levels.

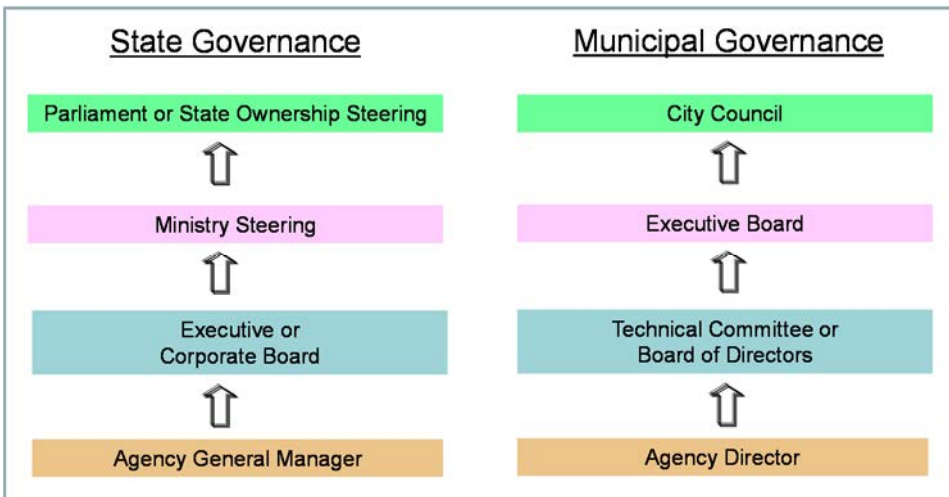


Figure 3. Typical governance structure.

2. Ownership and governance of infrastructure networks

C-Business project has examined several types of governance models for infrastructure networks, both at the state and the municipal level. The actors involved in all infrastructure sectors include:

- *Owner* defines the legal and organization framework, policies, goals, and funding. In Finland there are three kinds of owners: the state, the municipalities, and private companies and cooperatives.
- *Administrator* ensures that the policies, goals, and political aims of the owner are fulfilled. For example, in Finland, the administrator for the national roads is the Finnish Transport Agency, aided by the ELY Regional offices; in the municipalities the administrator is usually the city's technical department.
- *Manager* specifies the activities in detail, procures, supervises, and monitors the works. In the road sector, the manager is ELY regional office for the state (ELY = Centre for Economic Development, Transport and the Environment); in the municipalities the technical department, or a municipal enterprise or company; the manager can also be a private sector "operator" of the services; in a few cases the manager tasks are outsourced to a consultant, or a design-build contractor.

Typically, in most cases, the administrator and the manager combine the tasks of the *Client Services*.

- *Supplier* is the entity that supplies the services for studies, design, construction, maintenance, and operation of services; these can be the same of different entities or companies.
- In Finland, the supplier can be the technical department's labor ("own workers"), or a private sector company, or a combination of these two. In cases where the supplier and the manager roles are combined and outsourced, the *Client* is the administrator.

The modern trend is that the manager and the supplier are from the private sector. The administrator can be a civil service or private sector entity. In some cases the administrator and manager duties or the manager and supplier duties are combined. The practice in which the Client procures the services and the private sector supplies them is called the (true) *Client-Supplier Model*.

In the following chapter the classification of typical ownership and governance models is described.

2.4 Classification

There are at present 336 (in 2011) municipalities in Finland and each of them has its own tailor-made approach to governance of infrastructure networks. These variations in the approach are classified to six basic models (Figure 4) to fit the circumstances and administrative and political context in the municipalities. In spite of the lack of standardization and common practices the six governance models cover the existing practices surprisingly well. The recent mergers and cooperative efforts require some homogenization of practices. The merging of practices has been deliberate and slow and even impractical in some cases. Thus, in sum, the observation during their research was that, despite of the diversity of arrangements, issues and characteristics in each sector can be classified into a few models.

On the basis of case studies, the ownership and governance models can be categorized into six models:

- **Traditional model:** Work is carried out for the most part by the own labor force, often with some degree of outsourcing.
- **Municipality- or State-Owned Enterprise model:** MOE or SOE can be either the client or supplier part of an organization; legislation is used to establish business or entrepreneurial entities and practices with the objective of self-sustaining cost recovery. MOE/SOE does not pay taxes. There are three variants:
 - Client MOE or SOE
 - Supplier MOE or SOE
 - Integrated MOE (Co-ownership or merger of several municipalities)
- **(True) Client-supplier model:** All the services are procured in the market, such as design, construction, maintenance and other services. Procurement is done in competitive market without negotiated contracts.
- **Municipality- or State-Owned Company model:** MOC or SOC can be either the client or supplier part of organization. These entities, legally established, are self-supporting and pay full corporate and value added taxes.
 - Client MOC and SOC
 - Supplier MOC and SOC
 - Integrated MOC (Co-ownership or merger of several municipalities).

2. Ownership and governance of infrastructure networks

- **PPP model:** The client (municipality or state) and a private contractor enter into a legally organized partnership, hence the name Public Private Partnership (PPP). In Finland, Mikkeli is the only example of a PPP model. Mikkeli retains a certain percentage share and the contract winner has the remaining share of the partnership. This means that the rewards and risks are shared.
- **Private Cooperative or Association:** This is an entity formed by a group of autonomous persons to meet certain service needs of its members. A cooperative is owned by its members, who usually are the customers of the service. Both the road and water sectors have a private cooperative model. The road cooperative model can receive government grants for capital expenditures. Many municipalities provide financial support for maintenance of private road associations as a service to the residents in the community.

Using this classification the ownership and governance models are illustrated in Figure 4.

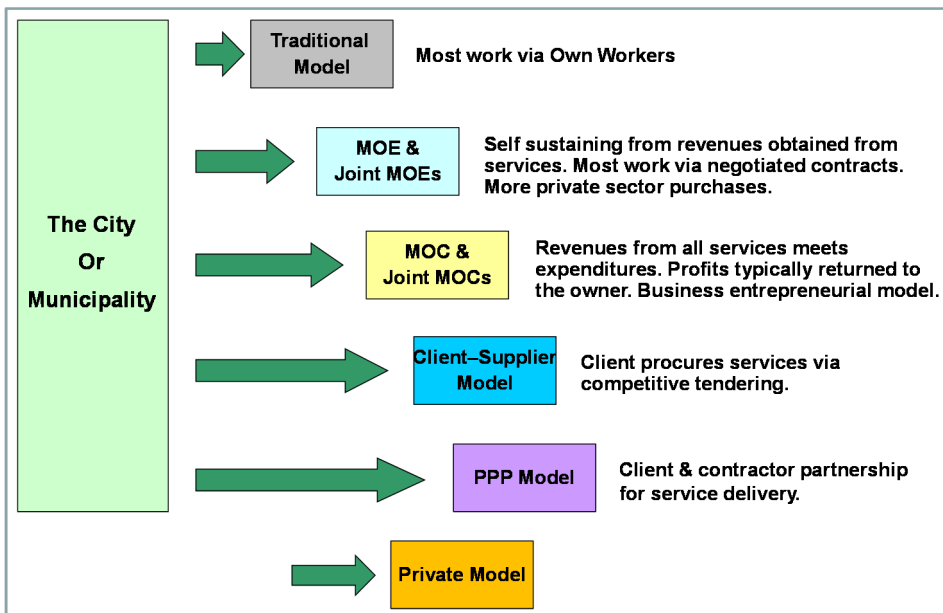


Figure 4. Typical ownership and governance models.

The ownership model can also be looked at from governance vantage point as shown in Figure 5. It shows the various governance forms, public and private. The state ownership structure would be equivalent to the municipal figure. The (true) client-supplier model and the PPP model are not shown as they do not match this particular style of private or public ownership shown in Figure 5.

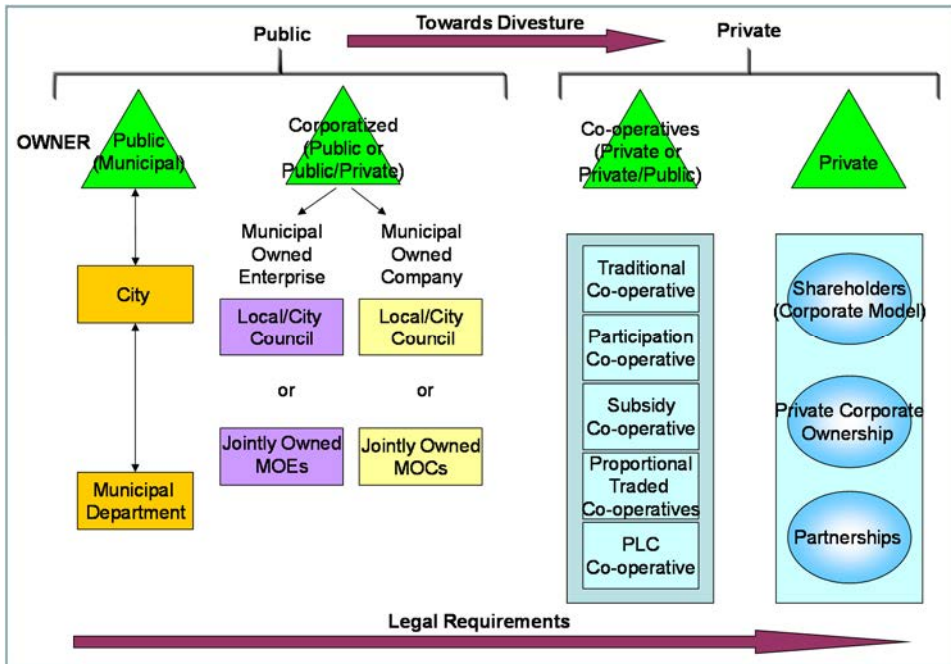


Figure 5. Ownership from governance point of view.

2.5 Variations in ownership and governance structures

2.5.1 Management variations

The debate continues over public or private ownership. Both extremes, a public or a private monopoly are not considered effective. However, a private monopoly, unless well-regulated, is perceived by many to be worse as public values and quality can be displaced by monopoly pricing, and service provision at the lowest possible cost. A cooperative approach between the public and private might be a worthy approach to achieve a proper balance. More recently, with diminishing public resources and downsizing trends, it has become difficult for a government entity to deliver all the services the infrastructure networks provide, and private

2. Ownership and governance of infrastructure networks

participation may be a welcomed strategy. But, even under diminishing budgets there is a need to consider and seek other alternatives than the simple strategy of elimination of all or most public jobs.

Most of the municipal infrastructure networks are *administered and managed* through public agencies, departments or technical centres, which are termed the client organization (excludes co-operatives). The *supplier* organization does the physical works, services and operations, which can be performed by own labor force or outsourced from the private market. In the cases where there are MOCs and SOCs, the services may be performed by vertically integrated sister companies. There are small municipalities, Askola, Inkoo, Varkaus and some others that have totally divested their own direct labor force for the infrastructure networks. Also the Finnish Transport Agency (FTA) is a client organization and has and owns no direct labor force to supply services (a client-supplier model). The VR Group owns a railway supplier company VR-Rata. Finavia also owns sister companies, but their services are procured competitively and also offered to other clients.

The administrative services are performed by the municipality staff. There are many variations and idiosyncrasies. In the traditional model the following decisions are made: (i) which organization does the planning and approvals; (ii) will the design services be carried out by own labor force, or will it be outsourced; (iii) what percentage of the civil or other works will be done by own labor; (iv) who performs the outsourcing for the services; (v) and how the personnel are arranged within the organization itself. The established monopolies have flexibility to choose between direct labor force and procurement from the market. An interesting variation is in the Kiiminki road sector where the outsourcing of services is actually performed by the supplier organization and not the client.

It is typical in the MOEs/MOCs structure that the client negotiates contracts with the supplier MOEs/MOCs, instead of procuring the services using competition, as in the (true) client-supplier model. This is an artificial exercise since the supplier's direct labor force is retained as first priority. This practice was observed in all road/street supplier MOEs/MOCs; their contracts were always negotiated, for both capital and maintenance projects. This is a weakness of the model. In the (true) client-supplier model all services are not negotiated, but procured through open public tendering. The core functions with the client organization can vary, but procurement is permanent – and important.

Some of the publicly owned enterprises and corporatized companies have corporatized subsidiaries (sister companies) that supply services for management,

operations, and civil works. These are sometimes referred to as vertically integrated companies. This corporate style structure was observed for the state rail network operator, some water networks, airports, energy production and transmission, and ports. For the most part, these types of public ownership models are employing corporate entrepreneurial practices.

In MOCs/SOCs there are also other variations. How much profit is returned to the owners; whether there are corporate subsidiaries; whether international competition or ventures into other business opportunities are allowed; and whether there is single or shared ownership (municipal mergers).

Asset management and ICT systems, and asset management tools are needed to determine the activities and their timing. This practice varied greatly; most municipalities did not have asset management systems at all. This was correlated with the municipality's size and with the ownership model. Larger municipalities do have some type of asset management systems, while the smaller ones rely on local knowledge of experienced staff.

Even though the ownership may have been restructured, there is very little private management of the infrastructure networks. This is an interesting finding since private management operators are quite popular, especially for waterworks in England and the USA. In Finland, private sector participation in the management services was only used in some recent cases. Askola roads use a private firm to manage, operate and provide the services it needs. FTA uses private firms to manage some isolated projects. These one-off cases show that there are options available for private participation from management to service delivery, including the PPP model.

2.5.2 Service variations

The tasks performed by the client and supplier units vary between governance models. The services vary with the level of expertise available in the municipality. If the ("in-house") direct labor force has competence, the services are provided with own labor force up to its capacity. In the case where market does not exist within the municipality, services can be procured from surrounding municipalities' direct labor force through a cooperation approach or, when direct labor capacity is exhausted, directly from private market. A good example, in some municipalities, is the resurfacing of streets and roads where there is a framework agreement with surrounding municipalities to use the in-house staff or labor first up to its capacity (this is irrespective of the governance model).

2. Ownership and governance of infrastructure networks

Helsinki represents a traditional model where both the client and the supplier are organized as municipal units (separated from each other). The City Engineer's office (Rakennusvirasto) acts as the client and city's own supplier organization, Stara, builds and maintains streets, parks and other infrastructure, renovates city-owned buildings and provides logistical services. In Oulu, the client organization of the municipality (organized as a unit) procures most of the construction and maintenance of streets, water, and recreational areas from TEKLI, the supplier MOE of the city.

In the case of Lahti Aqua Oy, the parent company Lahti Aqua is responsible for water and sewage services and their development, administration and customer service. Subsidiary Aqua Services Oy provides operational and maintenance services and subsidiary Aqua Networks Oy owns the pipelines and facilities, and commission and finance investments. Lahti Aqua procures for example construction services also from private companies.

2.5.3 Mergers, cooperation & others

One common trend that was observed with municipalities is the formation of joint municipal authorities that are taking advantage of economies of scale and scope by having one joint entity to provide the services for all participating municipalities. There have also been several recent mergers of municipalities into one larger municipality with the same result. In addition, short of a merger of municipalities, is the merger of individual infrastructure networks, such as waterworks around Helsinki, Lahti, Turku and Hämeenlinna with the big city as the anchor. In Helsinki region the waterworks, organized as a Federation of Municipalities (FoM), resembles a MOE with some MOC features. Waterworks in Lahti, Turku and Hämeenlinna are organized as MOCs.

The Helsinki Region Environmental Services Authority (HSY), organized as a FoM, provides waste management and water and sewage services in Espoo, Helsinki, Kauniainen and Vantaa. Although HSY provides also other services, water and sewage services have a profit and loss statement and balance sheet separate from other HSY services. HSY does all four core services (water acquisition and treatment, water delivery, sewage collection and sewage treatment) and maintenance with direct labor. Some smaller construction work can also be done with the direct labor, but most construction is outsourced. An interesting aspect in HSY governance is that the general (shareholder) meeting of the federation elects the members of the Board of Directors in relation to political power

for the duration of the municipal election cycle. This would not be possible in a MOC and this might be one reason why the municipalities in the Helsinki metropolitan area chose to establish a federation instead of a MOC.

One example of cooperation is the concession agreement between Lahti Aqua Oy and the municipality of Hollola. The 15 year concession agreement covers all water and sewage services in Hollola so that the municipality of Hollola owns the facilities and networks and Lahti Aqua Services Oy provides services with Hollola's equipment. This is the first model in Finland, where the waterworks takes a financial risk to provide certain service level to neighbouring municipality with a fixed price.

Some other merged entities apply the traditional model; in Seinäjoki the merged entity is predominantly using the traditional model with direct labor force and outsourcing only services to selected remote areas. The technical network in Kerava is a unique model in which six different departments are merged into one client MOE. Six departments are consolidated into one in order to obtain economies of scale and scope. This represents another kind attempt to improve efficiency and effectiveness.

2.5.4 Evolution of governance models

Concurrently with the interviews and the development of governance classification reference was made to previous research on the evolution of ownership and governance typologies (Talvitie 1996, Robinson 1999, Dunlop 1999). Although there were variations from municipality to municipality, it appeared that it was possible to classify the governance models into five distinct classes based on the separation of client and supplier functions.

Most public authorities began as an in-house organization (traditional organization, Phase 1 in Figure 6). In many, especially larger, municipalities this has evolved through the identification (Phase 2) and separation of the client and supplier functions and roles (Phase 3) into corporatization of the producer (Phases 4a–c). In the initial phases of the client and supplier separation negotiated contracts are common between the client and supplier entities (Phases 2–4b). A culmination point is the pure client-supplier organization (Phase 4c) where all procurement is done competitively and all the suppliers are either privately or publicly owned companies operating under the same commercial laws. From Phase 5 forward the supply organization is fully privatized and is just another company amongst many that provide products and services for the customers.

2. Ownership and governance of infrastructure networks

The subsequent phases (Phases 6–7) indicate corporatization or privatization of the client, which in Finland has happened only in a handful of cities⁴.

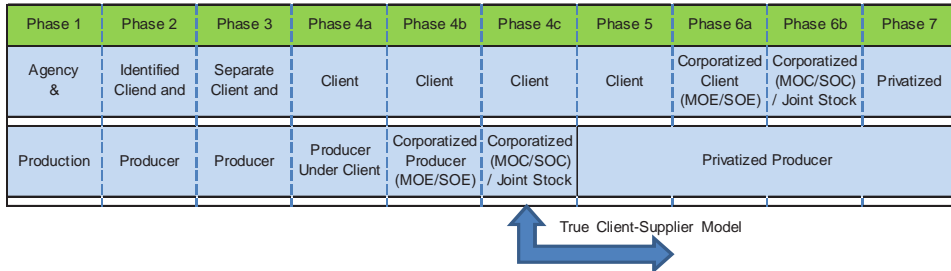


Figure 6. Stages in reform.

In ports sector the World Bank has provided a selection of managements models broadly applied globally. The World Bank port reform toolkit (World Bank 2007) outlined four port administration models and assessed the strengths and weaknesses of each model. The ownership-governance model adopted in countries is influenced by the way the ports are organized, structured, and managed. The models outlined in the tool kit are the *Service Port*, the *Tool Port*, the *Landlord Port*, and the *Private Service Port*. These models differ by how the services are provided by public sector, private sector or mixed ownership providers; their orientation (local, regional or global); who owns the superstructure and capital equipment; and who provides dock labor and management.

Service port model is one predominately public model in which the Port Authority, a government entity, owns the land and all port assets (fixed and mobile) and performs regulatory and port functions. All cargo-handling operations are performed by direct labor of the Port Authority. This model is used in many developing countries. The Chairman of the Port Authority is (usually) a civil servant responsible for port administration, and reports directly to the Minister. In some cases, cargo-handling services are performed by a different public entity; this division of operations between public entities can present unique management challenges. Under this model, the same organization has the responsibility for performing regulatory functions, developing infrastructure and superstructure,

⁴ Although privatization is here described as Phase 7 it is certainly not the end result of all reform activities. The project group does not recommend privatization of infrastructure that is necessary to the society.

and executing operational activities. Generally there is an absence of private sector involvement in port activities. The strength of this model lies in the fact that facilities development and operation are the responsibility of only one entity, allowing for a streamlined and cohesive approach to growth. On the other hand, the dearth of competition can lead to inefficiencies in port administration, to a lack of innovation, and services that are not user or market oriented. Dependence on government for funding may lead to wasteful use of resources or under-investment.

Tool port model is characterized by divided operational responsibilities. The Port Authority owns, develops, and maintains the port infrastructure and superstructure; including cargo handling equipment such as quay cranes, forklift trucks etc. The operation of Port Authority equipment is usually performed by Port Authority labor, but other operations are performed by private cargo-handling firms, on board vessels as well as on the quay and apron. The private operators are usually small companies. While the model results in an avoidance of duplication of facilities because investment in infrastructure and equipment is provided by the public sector, the fragmentation in responsibility for cargo-handling can lead to conflicts between small operators and between the stevedoring companies and port administrators. Another weakness of the model is that there is a risk of under-investment. Strong stevedoring companies are not developed to benefit the local economy.

In the **Landlord port model**, the Port Authority maintains ownership in the port while the infrastructure is leased to private operating companies. The responsibilities of the Port Authority as a landlord include economic development, long-term land development, and maintenance of basic port infrastructure like access roads, berths, and wharves. The private operating companies that lease from the Port Authority provide and maintain their own superstructure and purchase and install their own equipment. Dock labor is also employed by the private leasing companies. The strength of this model is that the same entity both executes operations and owns the cargo-handling equipment; therefore, the executed plans are likely to result in better outcomes and be more likely greater responsiveness to changing market conditions. However, there is a risk of over-capacity as more than one private operator may pressure for expansion. Also, there may be duplication of marketing effort as both the terminal operators and the port authority visit potential customers; therefore greater co-ordination of marketing and planning is required with this model.

2. Ownership and governance of infrastructure networks

In the **Private (service) port model**, the public sector no longer has interest in port activities. Port land is owned by the private sector. All regulatory functions and operational activities are performed by private companies. This is the model used in many ports in the United Kingdom. This model often results in flexible investments in port operations. A particular strength of the model is that port development and tariff policies are market oriented. On the other hand, this type of model may result in monopolistic behavior as well as a loss of public involvement in developing long-term economic policy and strategies. Figure 7 shows the traditional port management models.

Type	Infrastructure	Superstructure	Port Labor	Other functions
Public service port	Public	Public	Public	Majority public
Tool port	Public	Public	Private	Public/private
Landlord port	Public	Private	Private	Public/private
Private service port	Private	Private	Private	Majority public

Figure 7. Port management models according to World Bank Tool Kit (World Bank 2007).