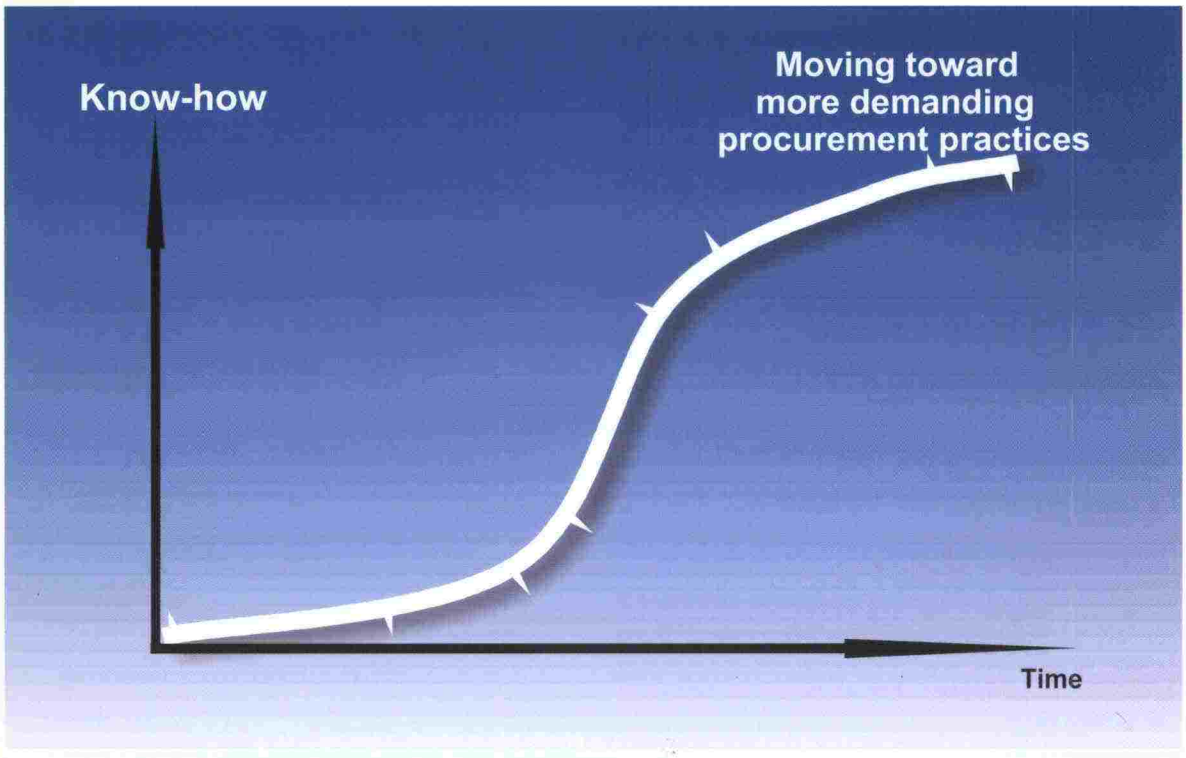
FINNISH ROAD
ADMINISTRATION

Procurement Strategy of the Finnish Road Administration (Finnra)



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Finnish Road Administration

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Telefax +358 (0) 204 22 2652
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Painotuote

Finnish Road Administration

CENTRAL ADMINISTRATION
Pasila office center
P.O.Box 33
FIN-00521 Helsinki
Tel. exchange +358 (0) 204 22 11

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SUMMARY

According to the Finnish Road Administration's (Finnra's) vision, Finnra has the potential to utilize the best procurement practices in a developed and functional marketplace in Finland. The goal of Finnra is to develop and begin using project delivery methods and practices that make it possible to utilize the innovations and new product developments by design/engineers and contractors. This hopefully, can thereby improve operational productivity, efficiency, and even a profitable environment for design/engineers and contractors.

These new project delivery methods for capital investment projects will complement the existing project delivery method portfolio, and attempts to integrate the design/engineering and construction professions. The new procurement methods include more inclusive agreements that will procure services for a longer period and have a broader and more inclusive content. Quality standards will be subjected to end product specifications (functional or performance requirements), and will also include more "outcome based criteria". The agreements will make contractors or service providers be responsible for quality control. This in effect, will compel service providers to be responsible for production, monitoring, reporting, and overall quality requirements.

The procurement of maintenance services will shift to more extensive, longer-term contracts, which provides opportunity to benefit from contractors' innovations and cost effective solutions for the client. The desired level of service is achieved by specifying conditions for end products (outcome based criteria) in the contracts.

Two trends are foreseen in the development of procurement of maintenance. The main trend of development is a shift toward longer-term area maintenance contracts, which incorporate a broader range of services than the existing maintenance contracts. These contracts emphasize the "procurement of services" and for this reason the contract agreements will be termed as service agreements. The second trend of development is the improvement of separate maintenance contracts.

Finnra procures design/engineering services primarily by means of competitive bidding, and minor commissions via negotiated contracts. Procurement of capital investments will continue to primarily use a pre-qualification system. For Design-Build contracts (integrated design/engineering and construction), the contractor selection criteria will be based on overall cost effectiveness, meaning the contract is decided on a combination of quality and price. Traditional contracts (Design-Bid-Build) will continue to be based mainly upon price. In procurement of maintenance, Finnra will continue to primarily use a open-competitive tendering process and in some cases a negotiated tendering process, which are in accordance to EU rules and regulations. Overall best value or best overall cost effective approach will continue to be the primary basis for deciding on area maintenance contracts.

The proportion of quality criteria will remain an important element and could possibly increase.

The development of Finnra's procurement methods brings new challenges, development issues, and increased know-how to all organizations involved, including Finnra, the service providers, contractors, design/engineers, and consultants. The tasks and know-how that have traditionally been part of Finnra's old organization (in-house capabilities) will gradually be transformed to the service providers, contractors, and suppliers (supply chain). The development of new operational methods for both the service providers and Finnra itself, are a prerequisite for a functional and successful procurement strategy.

FOREWORD

In 2002, the goal of the procurement process was to create a procurement strategy for Finnra. The basic principles for compiling the strategy were presented at Finnra's management's strategy seminar on February 6, 2002. A project plan for compiling the strategy was approved by Finnra's management group on April 15, 2002.

At the beginning, a key aspect of the strategy was to include the infrastructure sector organizations into the strategy work. Three seminars were arranged with the infrastructure sector, where they had an opportunity to express their views on the policies of the strategy. The first seminar held on May 14, 2002, dealt with the guidelines of the strategy. The second seminar on October 22, 2002 dealt, with a guideline implementation plan. And the third seminar on December 18, 2002, reviewed a draft document of Finnra's procurement strategy. Prepared statements from the infrastructure sector participants were also presented at the seminar.

The guidelines of the strategy were reviewed at Finnra's management's strategy seminar on June 10, 2002, and the implementation plan at a strategy seminar on November 12, 2002. A draft of the procurement strategy was reviewed by Finnra's management group on December 16, 2002.

The compiled procurement strategy includes and follows the general international development trends. According to international developments, procurement is shifting toward procurement of more integrated services, requiring broader know-how by the service providers, and results in entities previously procured by several agreements will be included under one inclusive agreement. The quality standards for agreements are shifting to utilize functional or performance requirements. The compiled strategy also includes a scheduled plan specifying when developed methods will be tested and implemented.

The procurement strategy was prepared by three work groups. The working group responsible for the procurement strategy for capital investments included Matti Lahti, Häme district; Hannu Utti, central administration; Aarno Oinonen, central administration (until July 31, 2002); Jussi Ala-Fossi, central administration; Seppo Mäkinen, Uusimaa district; Mauri Kimpimäki, Vaasa district and secretary Martti Perälä, Plaana Oy.

The working group responsible for the procurement strategy for upkeep, improvements, and maintenance included Jukka Karjalainen, Savo-Karjala district; Tuomo Kanniainen, Oulu district; Harri Jalonen, central administration; Anne Leppänen, central administration; Katri Eskola, central administration and secretary Martti Perälä, Plaana Oy.

The market study working group included Ari Huomo, central administration; Viljo Hytönen, Lappi district; Reijo Kukkonen, Kaakkois-Suomi district; Jussi Ala-Fossi, central administration; Seppo Toivonen, central administration (beginning May 22, 2002) and secretary Martti Perälä, Plaana Oy.

The procurement strategy study was managed by a steering group including Markku Teppo, central administration; Mauri Pukkila, Häme district; Pekka Jokela, central administration; Jukka Karjalainen, Savo-Karjala district; Matti Lahti, Häme district; Ari Huomo, central administration and secretary Martti Perälä, Plaana Oy.

Helsinki, February 2003 Finnish Road Administration

Content

1 INTRODUCTION

New procurement methods and relevant documentation were initially developed by Finnish National Road Administration already in the 1990s, prior to the reorganization of the Finnish National Road Administration and The Finnish Road Enterprise. These practices were already tested during tendering periods subjected to open competitive bidding and in negotiated contracts with Finnish National Road Administration's production organization, known as the Finnish Road Enterprise. The development of Finnra's own internal procurement practices still continue as Finnra's procurement strategy for 2003–2007 is implemented and compiled. The procurement strategy also includes an implementation plan.

One of Finnra's primary task is to create and set an example as a key driving force for the entire Finnish infrastructure sector.

During the preliminary study and feasibility study under Tekes's (National Technology Agency of Finland) five-year "INFRA Construction and Services 2001- 2005" national technology program started in 2001, it was noticed that the infrastructure sector has developed poorly compared to other industrial sectors. Several problems with the entire sector were that the construction process had its own rules of the game and did not support industrialization of construction, incorporate life cycle costs, reduce environmental impacts, lowering of costs, and promote product development. For this reason, development of procurement methods that support development of know-how was selected as one of the key focal areas of the infrastructure technology program.

In addition, the laws concerning the renewal of the Finnish National Road Administration touched upon some of the same problems and issues. The substantiation of the laws defined guidelines for the development of Finnra's procurement tasks in the near future and especially during the transition period. One of Finnra's primary task is to create and set an example as a key driving force for the entire Finnish infrastructure sector.

2 INTERNATIONAL PROCUREMENT PRACTICES

Many countries around the world are striving to answer the challenges in constructing and maintaining the transport infrastructure, which is important for the development of society. The dominating trend is the public sector's relinquishment of its own production activity and privatization of production activity.

England has been a forerunner in this development, and the Anglo-Saxon countries have followed suit. The privatization process has also included development of infrastructure procurement methods. This development has advanced furthest in England, New Zealand and portions of Australia. These models have also been tried elsewhere in the world, and their experiences will be available in a few years period.

A common characteristic of the development of procurement methods has been a shift to procurement of longer-term, larger service network areas, broader content of services, and responsibility for quality aspects.

At the same time this has meant a change in the role of the client organization by procuring services previously procured via separate contracts. Refer to Figure 1. for a pictorial illustration.

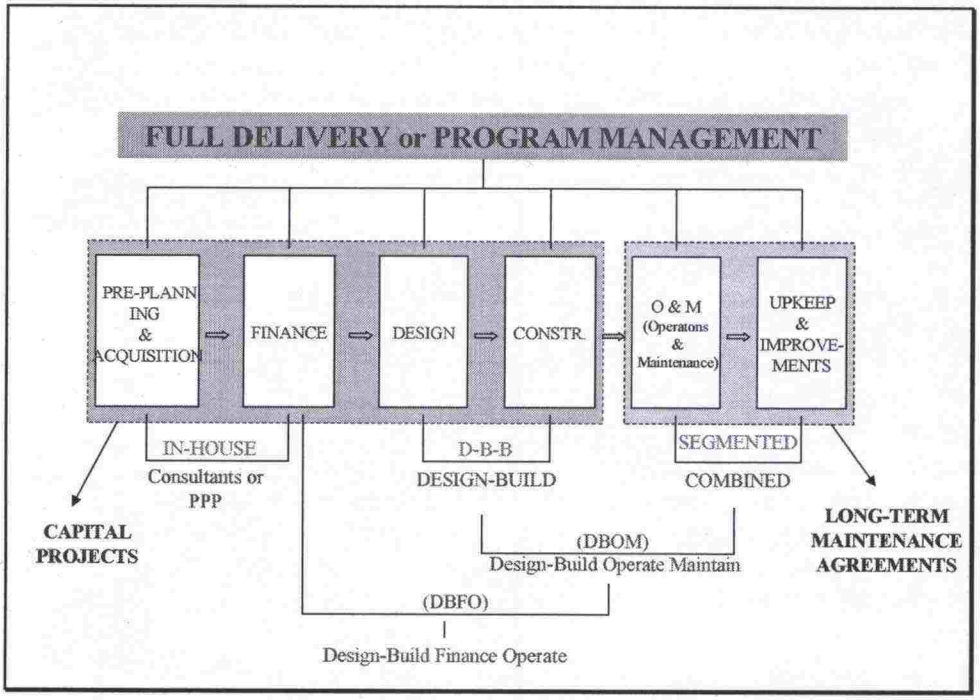

Figure 1. Depiction of Procurement Methods.

A wide-ranging know-how is required by the service providers and is characterized by the following:

- The term of the service is longer.
- Service providers ability to affect technical solutions have increased.
- Service providers ability to utilize their own innovations have increased.
- The client's requirements have become broader in scope and requires a wide-range of knowledge and expertise.
- Service providers expertise are expanding to manage end product requirements, various organizational skills, and other general know-how in the road sector business.
- The client's and service providers partnering requirements are increasing and maturing.
- Competitive bidding activity has become more demanding, longer-lasting and also more costly.
- The profitability of service providers has improved.
- Service providers risks have increased.
- The client's cost savings have increased by shifting toward more innovative procurement practices.

According to international experiences, newly developed procurement methods have benefited both clients and service providers.

On the basis of international experiences gained so far, cooperation and partnering have enabled the realization of the "win-win principle", meaning that both the clients and service providers have benefited.

There are various estimates of the amount of cost savings realized by the client. Client organizations have stated cost savings ranging from 10–20% as compared with earlier practices. Contractors have stated larger savings of 20–30%.

3 CURRENT ROAD PROCUREMENT PRACTICES

Finnra's previous procurement strategy for commissioning policies and competitive bidding practices for roads was completed on November 10, 2000. The main focus of that strategy study was the gradual opening of competition during the transition period from 2001–2004, which was part of the road reform from the past administration of the Finnish National Road Administration. The policy of that strategy was a key element for development of competition.

In addition, other aspects to the strategic study include procurement based upon best value or overall cost effective approach, the service providers responsibility for quality, a more cooperative approach and development of the road infrastructure market. The strategic goal of Finnish National Road Administration is to procure larger projects and more comprehensive products and services."

The forms of implementation of the procurement strategy has already been realized and applied to in beginning in 2001 and 2002. Consultants for design/engineering services, development of maintenance area contracts, and investment project contracts were subject to competitive bidding.

Design/Engineering services

Design/Engineering services were opened to public competition according to the agreed upon phased-in schedule during the transition period. Procurement of other expert services (e.g., procurement of road and traffic information, follow-up studies and special studies) is now being partly placed into open competition and partly changing from negotiated procurement to open competitive bidding.

The most common form of procurement in projects that started in 2002 was via Design-Bid Build (DBB) traditional method, which accounts for approximately 75% of all projects by quantity.

Design/Engineering procurement follows the principle of best value or best overall cost effective approach by selecting the consultant based up a combination of price and quality. The competitive bidding for design/engineering services has been robust in the recent years, and they are now becoming quite established. Design/Engineering service providers have not yet been subject to approval by a quality system procedure.

Investments

Various forms of contracting methods are currently used in procurement of capital investments. The most common form of procurement in projects that started in 2002 was via Design-Bid Build (DBB) traditional method, which ac

counts for approximately 75% of all projects by quantity and approximately 35% based upon the total expenditure. Contract development has advanced toward more integrated methods such as the use of Design-Build (DB) project delivery method, which accounts for approximately 25% of all projects by quantity and approximately 65% based upon the total expenditure. Construction Management at-fee and at-risk (CM at-fee and at-risk) project delivery method are seldom used.

Beginning in the year 2002 about 60% of the capital investment construction projects were based upon open competition, and about 40% were negotiated agreements with the Finnish Road Enterprise. Based upon calculations by cost, the corresponding percentages were about 90% for competitively tendered contracts and about 10% for negotiated contracts.

Contractor selection criteria for Design-Bid Build (DBB) contracts is based solely on price. Design-Build (DB) contracts use a best value or best overall cost effective approach and selection is based upon a combination of price and quality. The contractors are required to meet Finnra's approved quality systems for bridge and pavement work. Projects are not divided into parts, instead the goal is to have complete project coordination. Project management practices and the professional skills in this industry, however, require that in actual practice the various suppliers and sub-contractors are bundled together in a project and is increasingly a common type of practice. Also, projects will extend beyond Finnra's regional boundaries and will probably be more common.

Project design/engineering services involves several specialty experts. Usually a separate agreement is made for each design/engineering aspects, and each design/engineer may be a different person or entity. However, construction design/engineering and the physical construction aspects are being more integrated to some degree into the future.

Maintenance

Experimentation leading to the current practices for **"area maintenance contracting"** was started in 1998, with five three-year contracts. The same experimentation was continued in 1999 with five area contracts.

Opening competition for area maintenance contracts began in 2001.

Area maintenance contracts were open to public competition beginning in 2001. At that time, 23 area contracts were subjected to competitive bidding, and 26 area contracts were tendered in 2002. The area maintenance contracts during 2001 and 2002 were for a duration of three years. Competitive bidding for area maintenance contracts will continue so that in 2003, there will be 28 contracts and the remaining 22 area contracts will be bid in 2004. Also in 2004, the expiring area contracts tendered in 2001 will come up for re-bidding. The remaining contracts not included in the open bidding competition will be negotiated with the Finnish Road Enterprise.

In the autumn of 2002, an experiment with four area maintenance contracts began, which included repairs of frost-heave damaged gravel road base structures, as an attempt to balance the contractor's resources over the whole year.

Area maintenance contracts are awarded on a lump sum contract basis. In addition to price, the company's quality attributes and methodology are also considered in the selection process. Price accounts for 75% of the overall criteria and other attributes account for 25%. Results form the competitive bidding has significantly lowered the maintenance costs of public roads.

Nowadays, the area maintenance contracts include 75% based upon lump sum payment, where the quality of the work is mainly assessed using end product results (outcome based criteria). About 25% of the criteria is based upon a unit price for work performed.

Area maintenance contracts do not included all aspects maintenance attributes. Some of the most significant attributes that are not included in area contracts are road markings, road lighting, pump maintenance and traffic signals.

Most upkeep and improvements measures are not included in area maintenance contracts. The most significant repair measure is resurfacing, which is tendered via separate contracts.

Resurfacing contracts have been expanded in the direction of road structure improvement by including lower-class roads. Nowadays, the resurfacing contracts for low volume traffic roads usually includes structural improvement in the form of specific site repairs, such as the repair of a frost heave damage, drainage improvements, and stabilization methods.

Until now, functional or performance requirements have mainly been tested in negotiated contracts. Work that includes light structural improvement has also been tested with these two to three-year negotiated contracts, in which the contractor has been able to select their own innovative measures during the contract period.

The goal of the procurement strategy is to develop and implement project delivery methods and practices that make it possible to utilize the innovations and new product developments by design/engineers and contractors.

4 OBJECTIVES OF THE PROCUREMENT STRATEGY

The Finnish Road Administration's (Finnra's) procurement strategy originates from Finnra's vision. Finnra's vision is to utilize the best procurement practices in a developed and functional marketplace in Finland.

The strategic development goals is to construct the vision and develop a procurement strategy that includes an overall strategic representation and timeframe for accomplishing these goals. The timeframe for the goals was to develop a new procurement strategy in the beginning of 2003, and a strategy that would be in effect until 2007.

The procurement strategy assures that the road users and other key stakeholders are providing high-quality and correctly focused services. The goal of the procurement strategy is to develop and implement project delivery methods and practices that make it possible to utilize the innovations and new product developments by design/engineers and contractors. This hopefully, can thereby improve operational productivity, efficiency, and even a profitable environment for design/engineers and contractors. Another aspect is to improve the process so that it will lower the costs of procuring associated products and services in a competitive market. Another important as

pect is to develop procurement practices to improve Finnra's own administration efficiency.

The new procurement methods should enable and encourage the entire civil design/engineering sector and individual service providers to develop their activity and innovate practices. These innovations benefit both the innovator and the client. To encourage innovation, the procurement methods will attempt to optimize the potential for innovation. The development of new Information Technology (IT) and other new technological advances offers possibility and rationalization for a renewed R&D effort and promote innovation.

The "**Key Performance Indicators**" (KPIs) or quality standards for road management products and transport services are to a great extent based on the effective goals that are agreed upon in the annual yield agreements between the Ministry of Transport and Communications (MTC) and Finnra. Finnra's task is to convert the effectiveness of the (KPIs) into functional or performance requirements in the contract documents, which defines the contracting criteria. The main contractor has the ability to convert the functional or performance requirements into technical requirements in the agreements between the main contractor and subcontractors. The various organizations involved in the procurement chain must understand how the systematic requirements are developed that affect both higher and lower level requirements.

In this chain, Finnra is responsible for developing the functional or performance requirements used in its agreements, and responsibility for developing technical requirements will be transferred down toward the supply chain management. Figure 2 depicts the infrastructure value chain and the relationship for the development of differing performance requirements.

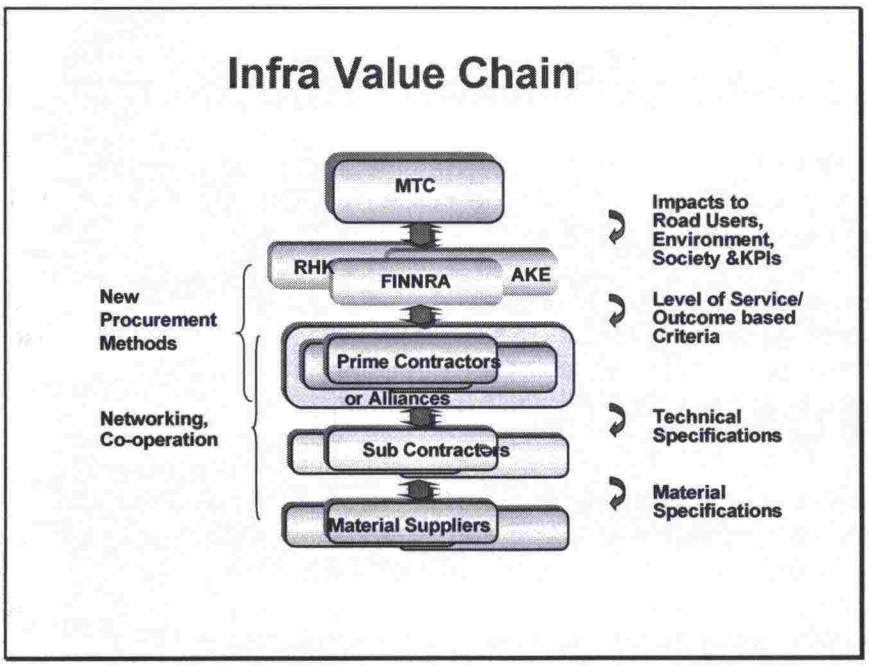

Figure 2. Infrastructure Value Chain.

5 PROCUREMENT METHODS FOR CAPITAL INVESTMENTS

In the new procurement methods for capital investments will be made with an *overall-encompassing* agreement .

New project delivery methods for capital investment projects will complement the existing project delivery method portfolio (separate contracts for Design /Engineering and Construction), and attempts to integrate the design/engineering and construction professions. The new procurement methods include more inclusive agreements that will procure services for a longer period, have a broader and more inclusive content. Quality standards will be subjected to end product specifications (functional or performance requirements), and will also include more "outcome based criteria". Competitive bidding practices and the existing procurement methods will also be developed. Figure 3. depicts the new methods.

The idea of an *overall encompassing* agreement is that the same service provider manages various phases of implementing process. The scope of an overall encompassing agreement may vary, and it can be expanded at different phases. An overall agreement may contain:

1. Design/engineering services (overall consultant agreement)
   - preliminary design/engineering services
   - complete design/engineering services
2. Design-Build (DB) agreement
   - design/engineering for construction (contractor)
   - complete design/engineering services
3. Design-Build-Operate-Finance (DBFO – Complete Design/engineering, Construction, Upkeep and Improvements and maintenance, for a specified duration – typically 15–25 years (Finnra refers to this as a Life Cycle Method and includes Design-Build-Operate-Maintain - DBFO)
4. Full Delivery or Program Management (from preliminary planning through a predetermined usable defined duration.

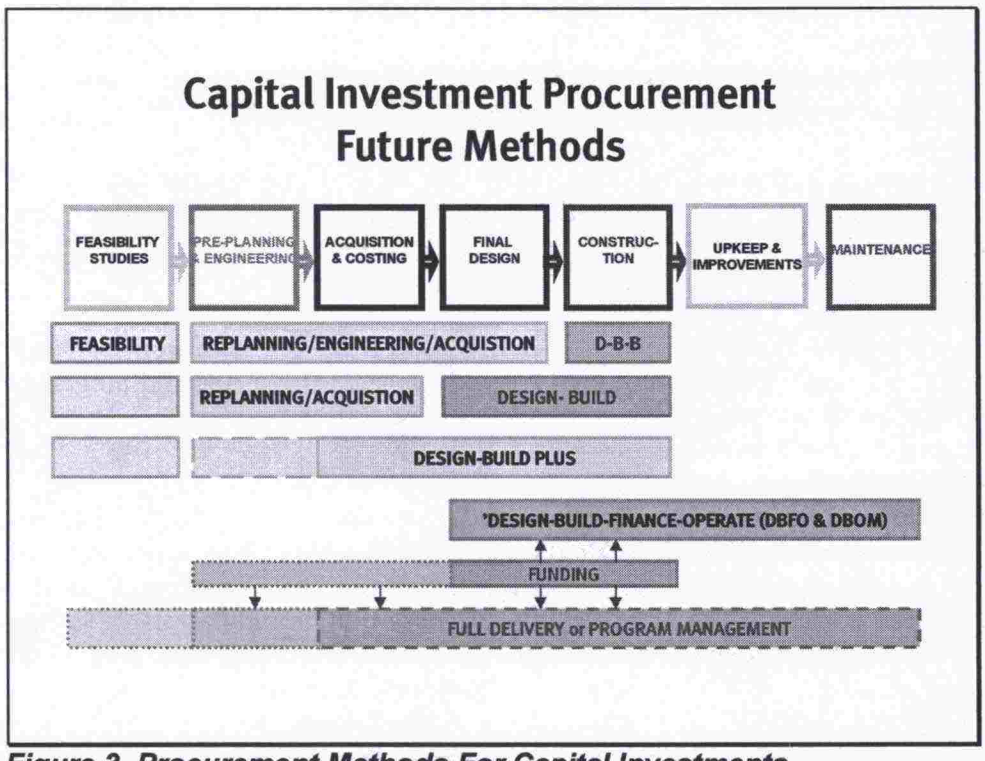

Figure 3. Procurement Methods For Capital Investments.

Preliminary planning is not usually included in overall agreements, but instead the client procures it separately. There is progression toward procuring these statutory requirements in an overall *encompassing* agreement for these consecutive phases of preliminary design/engineering, Right of Way (ROW) and cost estimations, and final design/engineering. This ensures the transfer of design/engineering information from one phase to the next. The agreements also include all necessary preparatory tasks, such as procurement of maps and terrain models. Small engineering projects are packaged into larger entities.

The use of procurement of services will increase at Finnra in the future.

The Design-Build (DB) agreements that incorporate design/engineering and construction is also suitable for small and mid-size projects. Design-Build-Operate-Finance (DBFO) agreements which include design/engineering, construction, and 15–25 years of maintenance, upkeep, and improvements are best suited for procurement of large investments. Implementation of these agreements require well-rounded know-how as well as networking and partnering. Procurement of major investments is discussed separately in Chapter 6. Applications for full delivery or program management agreements are still too distant in the future.

Finnra previously used Construction Management at-fee and at-risk (CM at-fee and at-risk) methods to supplement the under-capacity or lack of know-how in its own organization. If Construction Management is utilized, the contract is with one service provider that manages and procures services for the client (Construction Management at-risk) Construction Management at-fee agreements will not be a standard of practice.

Procurement for capital investments projects requires that the competitive bidding process needs to be developed. Past experience with small Design-Build projects realized the need to simplify and reduce the cost during the tendering process, and new methods and tools should be developed as well as a new strategy for small projects. The transparency of operation, trust and ethical rules are the most important issues in developing competitive bidding. The use of incentives, bonuses and rewards for economical, high-quality solutions also serves as an important aspect to the contract.

These new procurement methods require close and true cooperation within Finnra itself, and also with the service providers for design/engineering, contraction, and other consultants. These are intended to produce a functional and economical method for procuring products and services.

Finnra's new procurement practices will require changing from product's technical quality standards to functional or performance requirements.

Procurement of investments will be developed so that the procurement models can be used for both large and small projects. The new procurement methods will be complement the existing models. In addition, the existing procurement methods will be improved.

These new procurement methods will be developed in phases by pilot or experimental projects. Experimental or pilot projects will provide experience for the suitability and acceptance of each model. Based on the experience, the procurement methods can be modified and tested in the marketplace, before they can be either rejected or accepted as part of the procurement strategy. Refer to Figure 4. which highlights this development process until 2007.

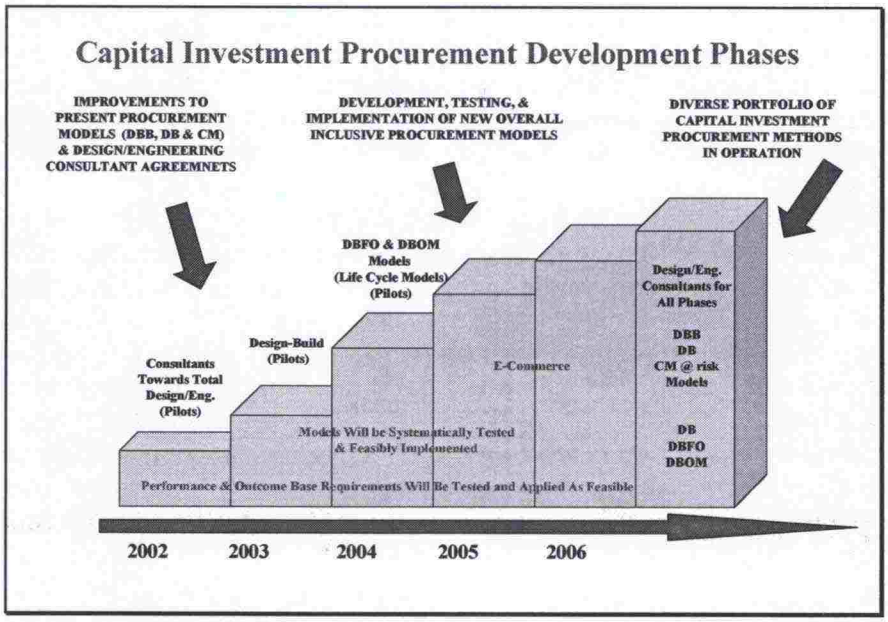

Figure 4. Capital Investment Procurement Development Phases.

The goal is to let the first overall inclusive design/engineering agreements in the regions during 2003, and according to a planned schedule, to have all the new forms of procurement in use by 2007.

Current procurement models will also be improved using experimental or pilot projects. Functional and performance requirements will be tested and implemented at various phases in the process. The applicability of service life in Design-Build contracts will be tested, starting in 2003.

6 LIFE CYCLE MODEL AS A PROCUREMENT METHOD FOR MAJOR INVESTMENTS

In general, the life cycle concept covers the period from obtaining raw materials used in the manufacturing process to its final disposal, which is sometimes referred to as the ***"cradle to grave concept"***. In the broadest sense, Life Cycle Costs (LCC) consists of the costs to the client and the usable product's life cycle and any environmental impact associated in the process.

The term of the Life Cycle Assessments (LCA) in this procurement strategy is shorter. Only the costs and impact of the product during its service life or duration are examined. The main emphasis of the assessment is on how these factors can be converted into measurable criteria that are used in determining during the tender evaluation phase. Initially, the intent is to consider the costs associated to Finnra and service life of the product, but also to evaluate the extend of costs associated to traffic flow and the impact on the environment.

The main idea of the life cycle model (DBFO & DBOM) is the procurement of services versus a product. This will assist to make it possible to minimize the costs of investment and maintenance over a long service life, thus enhancing customer-oriented satisfaction and providing mechanisms that promote and maximize the potential for innovations. The life cycle model supplements the procurement alternatives of major capital investments.

The life cycle model is best suited for major capital investments and their maintenance and upkeep.

The agreement period for the life cycle model is typically 15–30 years. At its broadest scope the life cycle model's responsibility includes design/engineering, construction, maintenance and upkeep, ensuring the flow of daily traffic, and providing other traffic services. Financing of the life cycle model may be based on direct payment by public funding sources or via private financing mechanisms. The client will pay an annual service fee based upon the payment mechanism once the service is in use. Using the private financing, assures that risk control and more effective construction process is realized or exceeded. Based on experiences with the Jarvenpaa-Lahti road project, the difference is in the margin of credit of between the private and public sector.

The life cycle model is best applicable to traffic projects that involve a significant one-time investment, high operating and/or maintenance costs and harmonization of the interests of many parties or competing between alternative levels of service. Possible targets of use include motorway construction, competing against alternative ferry connection services (such as bridges) and redevelopment of busy traffic routes.

The Finnish life cycle model is based upon application of international procurement models that are based upon partnerships between the public and private sectors. Based on international experiences, the life cycle model brings benefits to the customer, the client and the service provider. In procurement methods based on life cycle model, service providers compete for the best quality/price ratio for a given service. From the beginning of the contract agreement, the client will receive a legally binding price for the cost of construction, maintenance and upkeep, and an assurance that the road assets will keep their residual value. Customer-oriented services are enhanced when the payment mechanism is linked to the expectations of the road user and societal demands.

7 PROCUREMENT PRACTICES FOR MAINTENANCE

The procurement of maintenance services will shift to more extensive, longer-term contracts, which make it possible to benefit from contractors' innovations and are less costly to the client. The desired outcome based criteria for the various levels of service are achieved by specifying condition standards for end products requirements. Figure 5. displays the development process for contracts in the future.

Two trends of development are visible in the development of procurement of maintenance:

1) The main trend of development is a shift toward longer-term area maintenance contracts, which include a broader range of services than the previous maintenance contracts. These contracts have a major empha

Area maintenance contracts will emphasize the service nature of the activity.

size for the service nature of each activity, thus the contract agreements will be renamed/replaced by service agreements.

2) The second trend of development is the development and improvements of separate maintenance contracts.

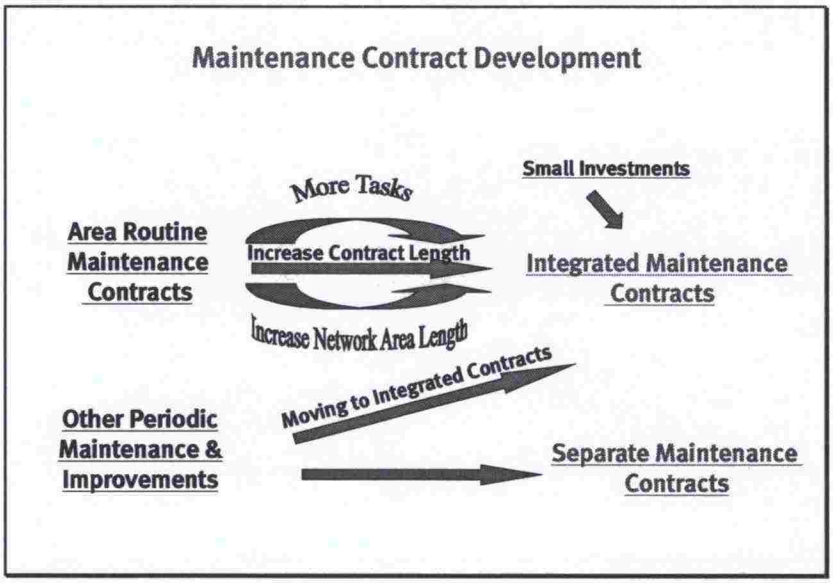

Figure 5. Maintenance Contract Development.

After the transition period, the duration of long-term area maintenance contracts will be seven years. A seven-year contract period makes it possible to amortize capital equipment investments and permits even competition in the regions.

The geographical size of the contract areas will grow from the current 500–1,500 km range to 1,000–2,000 km. In the largest urban areas with busy traffic volumes, the contract area of 500–1,000 km may be sufficient. On the other hand, for the sake of competition in remote areas, it may be necessary to keep the contract areas to about 500 km in order to increase and sustain a competitive environment.

The content of the current contract will expand and some of the maintenance work currently procured as separate contracts will be included in the area maintenance contracts. For example, maintenance of road markings and lighting may be included in area contracts. On the other hand, if this work can be justifiably beneficial via separate contracts then that can be tendered separately. Maintenance of structures and equipment can be included in area contracts at least as quantitatively measured jobs with a certain volume per year. Over the long term, functional or performance requirements should be applied to these contracts.

Repair of frost-heave damage and other minor repair investments can also be included in area contracts. Also, this will be a natural link to include minor improvements to road safety in these area contracts.

The content of a long-term area maintenance contract is shown in Figure 6.

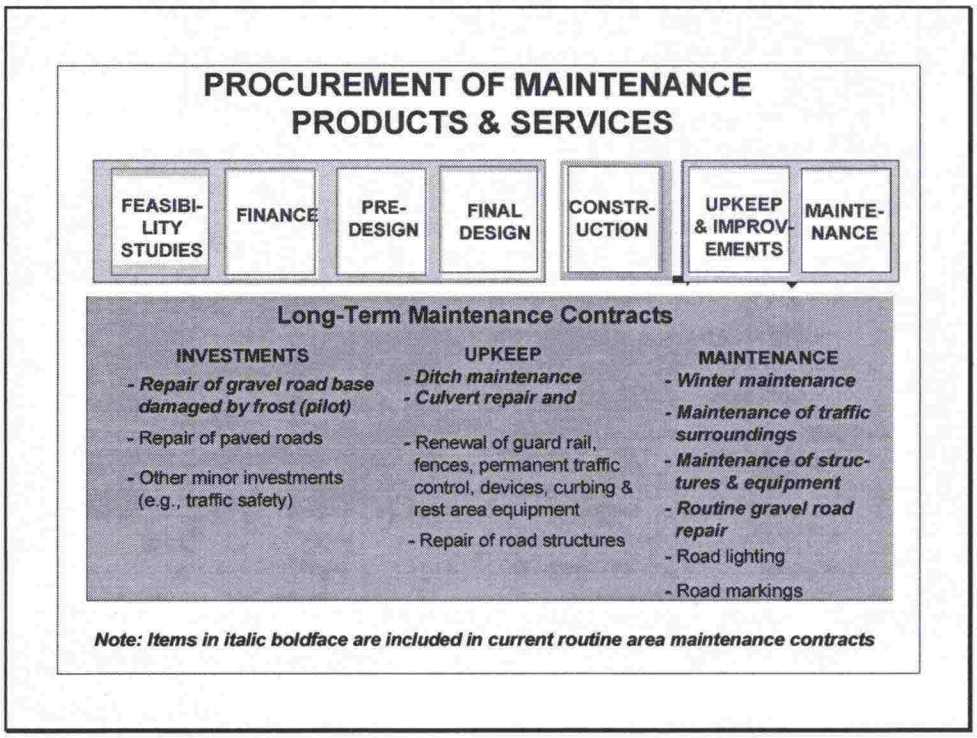

Figure 6. Content of Long-Term Maintenance Contracts.

Separate maintenance contracts are also developing into include more services. As a rule these contracts are full service and lump sum type contracts, which also include some design/engineering aspects. As an example, a resurfacing contract may include design/engineering as well as including minor structural improvement and road markings. Some of these contracts can be converted to pavement warranty contracts with a contract term from 5 to 15 years. For example, a maintenance contract for a specific section of main road may conflict with the area maintenance agreement, and needs to be addressed. In some cases it would be beneficial to take advantage of large volume purchases, as Finnra accomplished in 2002 by procuring the entire energy demand for lighting of roads in Finland.

The first 5 and 7 year **long-term area maintenance contracts** will be tendered in 2003 and also incorporate optional years in these first few trials. More frost-heave damage repairs currently being tested will be added to these area contracts beginning in 2003. Also, inclusion of road markings in some area maintenance contracts will be tested. Figure 7. shows the stages and progression of long term contracts.

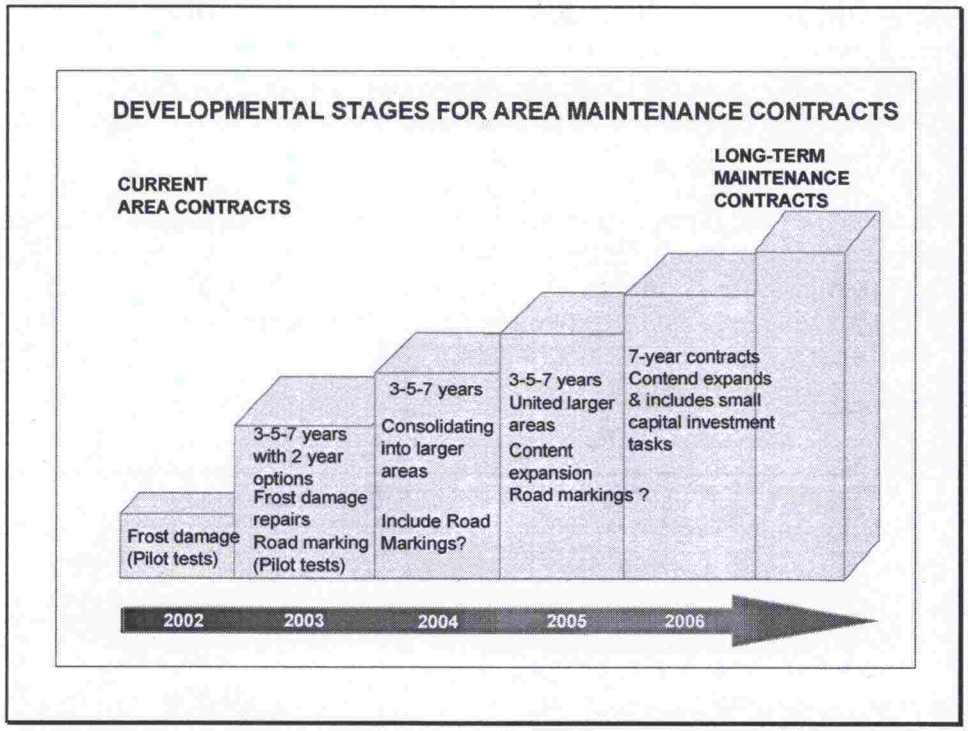

Figure 7. Future Development Stages of Maintenance Contracts.

Area maintenance contracts during the years from 2003–2005 will have a corresponding duration of 3, 5 and 7 year contracts. This approach is necessary so the shift to 7-year contracts can happen in such a way that it permits even competition in all the areas each year. This will also make it possible to transform the quality criteria via method based requirements and increase the functional or outcome-based criteria requirements.

If the market responds favorably towards these new practices, then contracts beginning in 2006 will have a duration of 7 years.

If the market responds favorably towards these new practices, then contracts beginning in 2006 will have a duration of 7 years. In developing these contracts there will be a system created that allows flexible changes to the content. This will allow possible alterations to the agreements and changes to the quality standards during the contract term. Toward the end of the transition period, procurement for capital investments and maintenance services will be combined into more encompassing and larger packages.

During the development of **separate maintenance contracts and also for upkeep & improvements type contracts**, the intent is to shift from the lowest bid price contract towards models in which the tender award is made to the most economical service life costs. This will be done within the framework of available funding. Several alternative practices exist, which are currently being developed and tested. When functional or performance requirements and their measurements are fully developed, it will be possible to experiment with long-term performance-type contracts. The selection criteria and functional or performance requirements for long-term performance-type contracts will be tested in two-year experimental contracts during the period from 2003-2004.

Upkeep and improvement type contracts for resurfacing of paved roads are examples of separate contracts. With the introduction of functional or per

formance requirements, the content of contracts can expand the scope of design/engineering, but taking into consideration the limitations of improvements. With certain projects the length of the contracts may be increased, for example, to three years. Contracts may also include work packages from several regions.

Functional or performance requirements are also being developed for other types of contracts including bridges. The contract duration is also being expanded into multi-year contracts and/or combining several regional contracts together, if necessary. Figure 8. depicts the improvements and development stages of separate maintenance contracts.

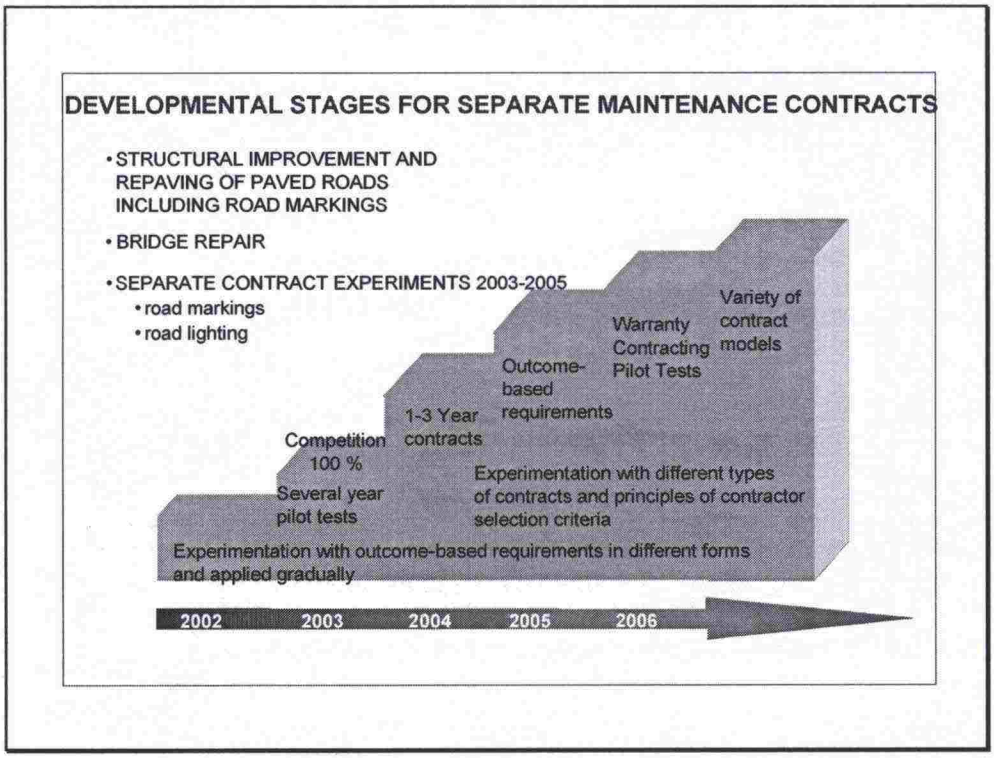

Figure 8. Development of Separate Maintenance Contracts.

Integrating road markings from three different regions are being tested in one large contract which is based upon functional or performance requirements. In 2004, road markings may be transferred into the area maintenance contracts, if experiences indicate that this is a viable solution. Road lighting will be subjected to a controlled bidding process in 2003-2005, and subsequently considered to be transferred to the area maintenance contracts, if good results are obtained.

8 MARKETING AND SUPPLY CHAIN MANAGEMENT

Finnra is striving for efficient operation and controlled distribution of risks throughout the entire procurement chain. Over the long term, Finnra intends to take advantage of seasonal fluctuations in the market and employ resources evenly for the procurement of services. With the help of the procurement strategy and implementation plan, Finnra intends to influence the structure and operation of the market. In order to achieve sufficient flexibility, Finnra also needs to develop its internal operation.

Market information
To procure and analyze market information, Finnra uses the expertise and services available from the private sector. Information obtained includes general operating environment information, corporate structures, economic trends, future outlook, market volume, willingness to tender, costs and bottlenecks. Monitoring is focused by area and by product. Finnra also actively monitors the sector's bidding price level.

Service provider information
To utilize the best possible services and supplies and to optimize risk distribution, Finnra systematically monitors the sector's suppliers and service providers.

Finnra requires contractors to have RALA's approval or an equivalent method to demonstrate their competence and capacity to perform their social obligations.

Finnra requires contractors to belong to companies deemed competent by Construction Quality Association (Rakentamisen Laatu RALA ry) or demonstrate the ability to indicate their competence and capacity to declare their social obligations. This requirement applies to the entire delivery chain. This process is a tool to influence the transparency of the entire production chain's capacity to produce quality. The information can be utilized in the pre-qualification and final selection phases. Also project supervision or quality control measures can insure that social obligations are efficiently managed in Finnra's contracts.

Finnra currently has a internal auditing process for contractor rating and approval procedure and an approval process that applies to bridge contractors, special bridgework contractors, and resurfacing contractors. Approval or a corresponding display of competence is required before being able to bid on Finnra's jobs. Finnra is developing a contractor approval system in cooperation with the Construction Quality Association (RALA). The significance of a quality system relates to the relevant activity that is being emphasized. ISO and similar certifications in Finnra's requirements will be specified later.

Case-by-case contractor audits that do not meet the specific approval procedure may become more common. They will be used to measure the success of new and large contracts, and to ensure the operation of newly established companies, consortiums, and etc.

9 FORMS OF CONTRACTING AND AGREEMENTS AND PRINCIPLES OF PAYMENT USED IN PROCURING SERVICES

Project Delivery Models

The main types of project delivery methods based upon the service providers responsibility are categorized below:

- Design/engineering task (including one or more design phases)
- Construction contracts (DBB) which includes traditional construction
- Design-Build (DB) which includes responsibility for design/engineering and construction
- Design-Build plus warranty (DB + Warranty) which includes responsibility for design/engineering and construction with a defined warranty period
- Design-Build-Operate Maintain (DBOM) and Design-Build Finance Operate (DBFO) which includes complete design/engineering, construction, upkeep and improvements, and maintenance with either public or private financing
- Maintenance contracts with a wide range of maintenance or upkeep and improvement type services and repairs
- Area maintenance contracts consisting of maintenance, upkeep and improvements for a wide variety of activities for a certain network area

In conjunction with the above-mentioned forms of project delivery models, Finnra can use:

- Construction Management at-risk (CM at-risk) services to ensure the implementation on behalf of the client.
- Consultation-type contracts and supervision services to supplement the client's capacity or expertise.

Contract Types For Payment

The primary contract types of payment are Lump-Sum (total price) and target price (TP). Unit prices for invoiced work are used to supplement the former contracts for additional work or uncertain requirements, but are used primary for special reasons. Hourly invoicing or time-based contracts are also used for procurement of design/engineering services.

Lump-Sum (total price) contracts will be the main contract type and more increasingly used in long-term area maintenance contracts. As a rule, separate contracts will be Lump-Sum contracts for an overall service.

Product and service requirements

The desired outcome for Design-Build projects can be via technical specifications (product requirements) and increasingly more functional or performance requirements, which permit alternative solutions. Functional or performance requirements can be based on either technical calculations or via performance monitoring.

If technical calculations are used, the calculated value of a product's service life is used as a basis for deciding the contract. When the contract is complete the product is assessed for compatibility with the tender.

If functional or performance requirements are based upon monitoring, then the calculated value of a product's service life is used as a basis for deciding the contract. The final value of the product's service life is calculated after the monitoring period on the basis of observations. This affects the final price of the product.

In maintenance and long-term warranty contracts the desired level is specified as a continuous condition and service requirement. Especially in repair contracts, where the final condition of the road at the end of the contract must be included in the principles of payment.

10 PRINCIPLES AND PROCEDURES FOR SELECTING SERVICE PROVIDERS

In **procurement of design/engineering** the principle of best value or best overall cost effective approach by selecting the consultant based up a combination of price and quality. The selection procedure will require further development. A competitive bidding process is used for the selection of design/engineering services, except for small projects which use the negotiated method. In Design-Build contracts the contractors typically hire a design/engineering consultant. This method requires close, long-term cooperation between design/engineering companies and contractors.

The new forms of procurement for capital investments require close, non-discriminating cooperation between the design/engineer, main contractor and subcontractors .

As Finnra's procurement activity evolves more toward management of the procurement chain, the need for expert consultants will increase. Expert services are procured using a pre-qualification system, and negotiation process for small projects. Expert services where price competition is not possible or justifiable, selection of a consultant or service supplier is based on quality and professional skill.

In **procurement of capital investments,** Finnra will continue to primarily use a pre-qualification system. In Design-Build contracts the basis for deciding a contract is best value or best overall cost effective approach by selecting the Design-Builder based up a combination of price and quality. The relative weight of quality and price varies, but the quality portion will increase in the future. The basis for deciding traditional contracts (DBB) will remain with price.

The new forms of procurement for capital investments require close, non-discriminating cooperation between the design/engineer, main contractor and subcontractors. This requires the development of new practices for cooperation and new ethical rules for cooperation. Finnra attempts to motivate the need for cooperation through requirements listed during the tendering phase for the list of partners chosen, and the mode of cooperation to confirm the quality plan related to the proposed products or services. These factors are taken into consideration when assessing tenders on the basis of developed criteria.

In **procurement of maintenance services,** Finnra will continue to primarily use a pre-qualification system, and in some cases an open competitive tendering process. For large and demanding area maintenance contracts that exceed the EU threshold value, a two-step, pre-qualification system is used for selecting the participants. All companies capable of performing the work are able to participate in the bidding competition. As the market opens to competition and new entrepreneurs enter the sector, the client does not wish to set the threshold too high for new potential bidders. Because of the nature of an area maintenance contract, its demands, and expensiveness of submitting a tender, it is sensible to exclude those companies that do not have technical, economic or proven prerequisites to complete the work.

For procurement of capital investments and maintenance services, Finnra will continue to primarily use a pre-qualification process.

In the later stages (in 2006-2008) as the sector develops, it will be necessary to consider classifying companies according to their expertise and competence, whereupon only companies classified as having sufficient experience would be allowed to submit a tender for the most demanding area contracts.

The basis for deciding area contracts will continue to be best value or best overall cost effective approach. The significance of quality will remain and possibly even grow. Quality assessment will be developed in a more uniform and objective direction. One tender assessment team will evaluate a company's background information and reference credentials during the registering phase, so companies submitting tenders to different regions will receive a consistent and general evaluation for all contracts. Project-specific factors will be evaluated together during the assessment of tenders.

In special contracts Finnra will strive to shift from the least expensive contract price to the most economical service life cost or providing better life cycle costs. There are several alternatives for specifying best value or best overall cost effective approach (such as comparative calculations or quality points), which will be tested and developed in 2003-2005.

11 DEVELOPING TENDERING ACTIVITY

The tendering process will gradually utilize more forms of electronic tendering and e-commerce. Also, there will be an overall project schedule with detailed tendering plans. The Request For Proposals (RFP) and tendering documents will also be available in electronic form and via internet. Prospective bidders will be provided a password to access the network, familiarize themselves with a project, and to download appropriate documents.

The tendering process will gradually utilize more forms of electronic tendering and e-commerce.

Tools are being developed that will make submitting of bids directly on the network easier and more cost-efficient. Evaluating the response to the tender requires extensive know-how and is cumbersome, slow and expensive using current procedures and tools. This has led to payment of stipends to the qualified bidders. It will be possible to reduce the cost of submitting tenders using the applications and information models presently under development. Also, the new information systems and tools are being developed for efficient and effective comparison of tenders.

In the beginning phases, most or all tendering information are available to participants in electronic form via CDs. As the sector develops, tendering ac

tivity will shift to internet-based tendering activity (e-commerce) in 2004–2006.

The requests for Proposal (RFPs) for tenders in 2003 area maintenance contracts and Design-Build contracts will primarily be available to bidders in electronic form, but the tender responses will still be submitted on paper.

12 QUALITY ASSURANCE AND ENSURING CUSTOMER SERVICE

Quality

The service provider is responsible for providing, supervision, quality control, and any reporting requirements.

Contracts for Design/Engineering and consultant services, capital investments, area maintenance services, and separate service provider contracts are procured with the emphasis that the service provider is responsible for quality and quality control. Each service provider is responsible for providing, supervision, quality control, and any reporting requirements. In order for Finnra to be effective towards its customers, service providers must be familiar with the customer demands, needs to ensure that the final products meet their expectations, and desire to perform customer services. It is also in Finnra's best interest to perform quality assurance so that the contract results in the desired outcomes and goals. In the future, the service provider will be required to monitor and report information related to the condition of the road network.

In procurement of **design/engineering and consultant services**, the consultant must first compile a quality plan according to which quality is reliably assured and documented. Although approved quality systems are recommended they are not prerequisites for delivering design/engineering and expert services.

Likewise for **construction and maintenance**, prior to any activity, the contractor compiles a quality plan for quality control and quality documentation. The client receives information about deviations from the contractor's deviation report. The client employs spot checks to monitor the quality and the accuracy of received quality information.

In area maintenance contracting the client also receives information about the road network and the contractors' operation. This information is supplemented by on-site spot checks based upon the data gathered and road user feedback. Due to the service nature of an area contract, it is important to motivate the contractors to provide more customer oriented services to the road users and develop a quality system to meet their needs. With this in mind, the benefit of paying a bonus can be based upon customer satisfaction surveys. Customer satisfaction will not be used as a basis for dis-incentives or sanctions, but strictly based upon quality requirements set by the client. The strategic goal is to educate the service providers to understand that these area maintenance contracts are mainly service based-contract and to meet the road users desires and needs.

Customer service

Finnra's values, vision and customer relations strategy assigns major goals for Finnra's customer-oriented operation. The customer's expectations and needs must be taken into consideration even more during the planning phase, procurement process and the implementation stage. While providing services that fulfill customer expectations, it is also necessary to ensure that the general objectives of society are realized. These objectives are related to road safety, environmental protection and by considering equal treatment of regional areas.

Service providers and suppliers must know Finnra's values and be prepared to implement them accordingly.

Finnra is also creating a professional image as a respectable customer oriented organization and treats them fairly and equitably. This is only possible when a vision of providing the customer service concept, is applied from the entire design/engineering and procurement chain, all the way to the last service provider. That's why sufficient attention must be given to this matter also in procurement agreement documents, so that service providers and suppliers can embrace a customer-oriented way of thinking.

Finnra will require service providers and suppliers to:
- know Finnra's values and be prepared to operate accordingly
- know Finnra's effectiveness goals and desire to implement them
- know Finnra's pledge to service and put into practice

The customer's viewpoint is usually taken into consideration in actual end products. The biggest problems arise in the construction phase, when the customer meets the staff of the contractor or subcontractor and forms an image of Finnra on the basis of their behavior and actions.

Special attention must be observed to:
- traffic safety and efficient traffic flow
- environmental aspects
- clear and specific traffic control and diversion patterns
- legal and proper display of traffic signs, information signs and other forms of communication aimed toward the road user
- equitable treatment of all road user groups at road construction sites
- responding to customer feedback and proper etiquette with customers

13 RISK MANAGEMENT

One goal of the procurement strategy is to be able to make use of short-term economic and seasonal fluctuation in the market. This requires that Finnra as a client, must be able to use its funds flexibly over a sufficiently long period.

In long-term contracts it is especially important to verify the financial capacity and the reliability of the service providers. Thus, the significance of obtaining information about the service provider and defining contract guarantees is emphasized even more. However, the long guarantee periods of contracts must not place unreasonable economic burdens upon the contractors. In principle, guarantees are not even necessary in contracts that include upkeep and improvements, because the guarantees are already implied and linked to the payment methods.

The objective is to place the risk on the party that is best able to manage it.

From the standpoint of the quality assurance of contracts, specification of functional or performance requirements will become very important. Requirements that are poorly specified or difficult to objectively measure, appear in tenders that produce high prices from contractors or even make it impossible to achieve the desired level of service. Correcting defective measures at a later time will be difficult and expensive. Contractors usually have a positive attitude toward the use of functional or performance requirements. Giving up strict technical requirements is seen as an opportunity to develop and utilize innovations and invest in product development.

After contract agreement, it is difficult to predict upon the future, and these long-term agreements must include an option to revise or change the quality standards in order to benefit from improvements and possibilities innovations in technology. The objective is to place the risk on the party best able to manage it. In practice, this is a question of optimizing the distribution of risk, and not necessarily risk minimization. According to this principle, especially in long-term contracts, the client is responsible for risks beyond the control of the contractor. Such risks include the effects of winter on area maintenance contracts.

The trend toward lump sum contracts and long-term agreements will require more initial information from the client (such as research and road network information in investment projects and condition and road network information in area maintenance contracts).

The small number of tenders and a lack of competition may be a risk when procuring large overall inclusive services. This can be avoided by means of active interaction and exchange of information with all providers during the preparation of a project. In this type of agreement special attention must be given to risk management. In the Life Cycle Model (DBFO) the financiers participation improves the risk management of the project.

One additional cooperative research study from the procurement strategy is to analyze and report the results from the risks of each procurement methods and the risk optimization and distribution. This study will provide content to the procurement strategy's risk distribution principle in which the risks of different procurement methods are assumed by the party with the best possibilities to control them. The results of the study may possibly affect the application and uses of the different procurement methods.

14 DEVELOPING THE KNOW-HOW AND INFORMATION MANAGEMENT OF FINNRA AND SERVICE PROVIDERS

Development of Finnra's procurement methods brings new challenges and requires development and know-how from all organizations, including Finnra, design/engineers, service providers, contractors and various consultants. The tasks and know-how that have traditionally been Finnra's responsibility will increasingly be required by the service providers and their suppliers. Finnra's role as agreed upon with the Ministry of Transport and Communications (MTC) in the entire procurement chain for road management services and products, is to influence quality standards for products and services during all phases in the process. During the management of the procurement chain,

Finnra also ensures that the desired affects are achieved during the term of the agreement. The role of the main contractor is to control and manage the production chain, and the role of the service providers is to manage and control the design/engineering and/or production processes.

Finnra and the main contractor's roles are to integrate the operation of those participating in the chain and manage the entire supply chain. In developing its own capacity and know-how related to the new procurement methods, Finnra will need to develop and concentrate on the following:

- Managing the entire procurement process
- Managing the procurement methods, contract agreements and related partnering issues
- Life cycle management of products
- Information management and utilizing new technology during the procurement process
- Developing procurement methods and practices with strong cooperation from industrial participants

Finnra will not necessarily use its own staff for accomplishing these tasks and duties. As these operating methods and know-how develop, Finnra will increasingly utilize the professional skill and know-how of the sector's consultants and purchase these services from them. These tasks could include compilation of quality standards for products and services, preparation of requests for tenders and tender documents, assessment of tenders, quality control and inspection, cost analysis, price and market information, software and system development, or any combinations of these.

From a broader perspective, the know-how and expertise cannot be managed by one specific organization, but needs to use the services and professional skills of other experts. In that case, the main implementers may be consortiums or an alliance of service providers.

The public availability and common use of the data will increase beyond organizational boundaries.

Information management is viewed by Finnra as a key factor. Finnra has abundant resources of information that can be utilized in the procurement process, and can take advantage of producing much new information. This requires the development of necessary tools and clear-cut rules for using, updating and relinquishing the information to other parties. The reliability requirements of the information will also increase when economic commitments and decisions are based upon the information.

The public availability and common use of the data will increase beyond organizational boundaries. Databases maintained by different organizations will act as basic storage of information. The stored information can also be utilized by independent service providers, who can refine and utilize the information for many customers. This will require a nationwide agreement on common practices.

The technical development of products, services, materials and production methods should increasingly be shifted to other service providers in the sector. Nevertheless, Finnra wishes to ensure the functionality of the service and production chain and continue to advance new developments in the sector. For this reason Finnra will participate and partially finance new development and activities in cooperation with those involved in the process.

15 CRITICAL SUCCESS FACTORS AFFECTING IMPLEMENTATION OF THE STRATEGY

A prerequisite for a functional procurement strategy, in addition to Finnra's own development, is, in particular, that the market decides to follow and accept this strategy. The critical questions are:

- Can a functional market be created? Is there a substantial and healthy market available?
- Will new cooperative operating methods be created between different parties in the market, whereby know-how can be combined and used effectively?
- Will it be possible to increase innovation and receive benefits from it? Can new methods be created to make it worthwhile for actors to invest in innovation and product development?

A prerequisite for a functional procurement strategy, in addition to Finnra's own development, is, in particular, that the market decides to follow and accept this strategy.

Another critical criteria for success in guiding the market is Finnra's own capacity to react and ability to change, in the face of new operating methods and in a changing environment. For this reason abundant reliable information is needed about contractors, economic trends and the market in general. Most of this information is worth obtaining from external information providers. In practice this will require new types of cooperative relationships where information suppliers and independent service companies are refiners and distributors. All parties should benefit.

The function of the market needs to be continuously observed and monitored by the client and utilize all available methods (e.g., timing, types of contracts and project size). A professional client can ensure that the market remains healthy, stable and functional.

One objective of the procurement strategy is to guide the relationship between the design/engineer and the contracting profession into the direction of authentic, healthy and close teaming effort. The desired objective is to increase innovation, but may not be realized unless the know-how and professional skill of both parties can be fully utilized. The strategy and its implementation plan will make possible and require a close teaming cooperation model between the design/engineer and the contractor so that an unhealthy, subordinating relationship between the design/engineer and the contractor is not created.

It is important to preserve the structure of the present supply chain (design/engineers, large contractors, subcontractors, product and machine entrepreneurs). This way the parties will not feel they are being left in an insecure, subservient position, and the desire is that the sector will be preserved and all involved parties will be able to renew themselves and develop.

It is important to eliminate the risk of default. To make the entire implementation process flexible, especially the combination of various design/engineering phases, it is necessary to ensure that actors participating in the process do not default during the later stages.

The procurement strategy has a significant impact not only with the procurement activity, but also with Finnra's other operations. Changing towards long-

term agreements requires that project's funding must committed when contracts are in the planning phase. The duration of area maintenance contracts, also requires a funding commitment for longer periods when the contracts are signed.

Form the standpoint of a successful procurement strategy it is important that service providers and suppliers practice principles according to Finnra's values and service pledges.

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