

**THE ROLE OF ENVIRONMENTAL ASPECTS IN  
FINNISH TRANSPORT AGENCY'S PUBLIC  
PROCUREMENTS**

**Jyväskylä University School  
of Business and Economics**

**Master's thesis**

**2019**

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JYVÄSKYLÄN YLIOPISTO

## ABSTRACT

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Title of thesis The role of environmental aspects in Finnish Transport Agency's public procurements	
Discipline Corporate Environmental Management	Type of work Master's thesis
Time (month/year) 02/2019	Number of pages 78 + 11
<p>Green Public Procurement (GPP) is a process where public entities procure products, works and services that have lower environmental impact than their traditional counterparts. Environmental sustainability characteristics are presented in an invitation to tender that describes client's needs and demands concerning certain acquisition. The true value of GPP stems from public authorities' role as a major consumer. Due to the great purchasing power that public entities hold, public procurements can have a strategic role in the society and enhance sustainable development.</p> <p>Finnish Transport Agency (FTA) is a procuring authority that maintains and develops public roads, rail- and waterways in Finland. FTA procures most of the products and services required to fulfil their public responsibilities. The total volume of their procurements amounts to 1/5 of the infrastructure procurements in Finland. Due to the great monetary value of procurements, FTA has the possibility to enhance environmental sustainability in Finland. This qualitative study creates a general view on what is the current status environmental issues in FTA's procurements. The findings are based on data collected from FTA's procurement documents (instructions and model templates) and from expert interviews during 2018.</p> <p>FTA's authorities fulfil procurements in a way that the process is compliant with the procurement legislation and FTA's internal instructions. Based on the content analysis of procurement documents, environmental criteria are presented either as voluntary recommendations or as mandatory obligations for FTA's service providers. These mandatory obligations are mainly based on the current environmental legislation. The basic structure of FTA's procurement process is "planning, tendering and execution". All these stages can include environmental sustainability aspects either directly or indirectly through other aspects. Collaboration, good experience and procurer's expertise steer FTA's procurers into considering environmental sustainability in their procurements. Ambiguity of the concept (environment), lack of resources and perceived cost of environmentally friendlier options hinder considering environmental aspects in procurements. In practice this means that environmental sustainability actions are not demanded from service providers or suppliers.</p>	
Keywords public procurement, green public procurement, sustainable development, environmental sustainability, infrastructure, transport	
Location     Jyväskylä University Library	

## TIIVISTELMÄ

Tekijä Saara Ojanen	
Työn nimi Ympäristönäkökulmien rooli Liikenneviraston julkisissa hankinnoissa	
Oppiaine Yritysten ympäristöjohtaminen	Työn laji Pro Gradu -tutkielma
Aika 02/2019	Sivumäärä 78 + 11
<p>Vihreät julkiset Hankinnat (GPP, green public procurement) on prosessi, jossa julkiset yhteisöt hankkivat tuotteita, töitä ja palveluja, jotka ovat ympäristölle vähemmän haitallisia kuin muut tuotteet, työt ja palvelut. Ympäristövaatimukset esitetään tarjouspyynnössä, jossa kuvataan asiakkaan tarpeita vastaavan hankinnan ominaisuudet. Julkisten toimijoiden suurella ostovoimalla voidaan vaikuttaa siihen, minkälaisia tuotteita, töitä ja palveluita markkinoilla on kullakin hetkellä. Julkisten hankintojen suuren rahallisen arvon vuoksi julkisilla hankinnoilla voi olla strateginen rooli yhteiskunnassa kestävästä kehityksestä edistävänä työkaluna.</p> <p>Liikennevirasto on hankintaviranomainen, joka ylläpitää ja kehittää julkisia teitä, rautateitä ja vesistöjen kulkuväyliä Suomessa. Liikennevirasto hankkii suurimman osan julkisten tehtäviensä suorittamiseen tarvittavista tuotteista ja palveluista ulkopuolisilta palveluntarjoajilta. Hankintojen kokonaismäärä on arviolta noin 1/5 kaikista Suomen infrastruktuurihankinnoista. Hankintojen suuren rahallisen arvon vuoksi Liikenneviraston hankinnoilla voidaan vaikuttaa ympäristön tilaan Suomessa. Tämä kvalitatiivinen tutkimus kuvaa ympäristönäkökulmien roolia Liikenneviraston julkisissa hankinnoissa. Tulokset perustuvat Liikenneviraston hankintadokumenteista (ohjeet ja mallipohjat) ja asiantuntijahaastattelusta kesällä 2018 kerättyihin tietoihin.</p> <p>Liikenneviraston viranomaiset noudattavat hankinnoissaan julkisia hankintoja koskevaa lainsäädäntöä ja organisaation sisäisiä ohjeita. Hankintadokumenttien sisällön analyysin perusteella hankintojen ympäristövaatimukset esitetään joko vapaaehtoisina suosituksina tai pakollisina velvoitteina. Näistä pakolliset velvoitteet perustuvat pääasiassa nykyiseen ympäristölainsäädäntöön. Liikenneviraston hankintaprosessin perusrakenne on "suunnittele, kilpailuta ja toteuta". Kaikki nämä vaiheet voivat sisältää ympäristönäkökulmia joko suoraan tai välillisesti muiden hankintaa koskevien vaatimusten kautta kautta. Yhteistyö, positiiviset aikaisemmat kokemukset ja hankkijan asiantuntemus ohjaavat Liikenneviraston viranomaisia ottamaan huomioon ympäristönäkökulmat hankinnoissaan. Käsitteen (ympäristö) abstrakti luonne, resurssien puute ja ympäristöystävällisempien vaihtoehtojen oletetut kustannukset haittaavat ympäristönäkökohtien huomioon ottamista hankinnoissa. Käytännössä tämä tarkoittaa sitä, että palveluntarjoajilta tai toimittajilta ei vaadita ympäristönäkökulmien huomioimista heiltä hankittavissa tuotteissa, töissä tai palveluissa.</p>	
Asiasanat julkiset hankinnat, vihreät hankinnat, kestävä kehitys, ympäristönsuojelu, infrastruktuuri, liikenne	
Säilytyspaikka Jyväskylän yliopiston kirjasto	

**LIST OF ABBREVIATIONS**

CDP	Competitive Dialogue Procedure
CSR	Corporate social responsibility
EMS	Environmental management system
ESPD	European Single Procurement Document
FTA	Finnish Transport Agency
GHG	Greenhouse gas
GSS	Green Supplier Selection
GPP	Green Public Procurement
LCA	Life-cycle analysis
LCC	Life-cycle costing
PCP	Pre-Commercial Procurement

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# 1 INTRODUCTION

Public acquisition of goods and services by public entities are called public procurements. Public procurements play a vital role in European Union and in member state economy. It has been estimated that approximately 20% of European gross domestic product (GDP) is generated through public procurements (PwC, 2016a, 8). Green public procurements (GPP) is a process where procured goods, services and works have smaller environmental impact than their traditional counterparts (European Commission, 2016a).

Finland was described as one of the “Green -7” in a GPP study conducted in 2005. The “Green – 7” comprises of Austria, Denmark, Finland, Germany, Netherlands, Sweden and United Kingdom. These countries were described as forerunners in using GPP related elements and features such as national guidelines and programmes, information resources and innovative procurement tools to guide public procurers to and in GPP - world. Finland has been active in GPP from 2009 when a government's resolution (VNP 8.4.2009) was made to consider environmental perspectives in municipalities, local governments and central governments' purchases by 2015.

In addition, a government resolution (VNP 13.6.2013) on promotion of so called cleantech solutions in public procurement was made during 2013 (PwC, 2016b, 71). This resolution instructs public entities in promoting and creating energy-efficient and environmentally friendlier procurements, especially in construction, energy sector, transport and waste management. There are four basic principles in this government resolution that government procurement units are expected to follow.

- 1) Energy and environmental perspectives are considered in all procurements.
- 2) Government procurement units investigate new alternatives and steer attention towards cleantech solutions, especially on construction, energy sector, transport and waste management.
- 3) Procurement units use database of the advisory service on sustainable procurements.
- 4) Life cycle costing (LCC) and other calculators are used, if possible, in order to demonstrate how cost reductions and energy and material efficiency are achieved.

Finnish Transport Agency (FTA) is a procuring authority that maintains and develops public roads, rail- and waterways in Finland. The organisation enables the development of transport services on the state-owned transport routes, promotes traffic safety and sustainable development and regional in transport systems. FTA procures most of the products and services required to fulfil their public responsibilities. The total volume of their procurements is 1.6 billion euros annually, respectively. This amounts to 1/5 of the infrastructure procurements in Finland. (Liikennevirasto, 2015.) Due to the great monetary value of procurements, FTA has the possibility to steer markets and exemplify public procurer's responsible role concerning societal issues such as mitigating climate change and enhancing energy efficiency. In fact, public interventions have always been a mean to solving negative environmental impacts. Private sector's participation is directed



towards the consumer and intermediate client base whereas public entities look to improve and affect wider aspects of society. (Testa, Annunziata, Iraldo & Frey, 2016.).

Transportation connects people, goods and services. Technological improvements have made traveling and delivering goods faster, safer and greener (=less hazardous to environment) than before. (IRF, 2013.) However, means of safeguarding the environment such as mitigating negative environmental impacts, ensuring resource and energy efficiency and protecting natural habitats, have nowadays become crucial part of infrastructure's life cycle. Making these actions part of proactive, everyday work instead of simply reacting to problems as they occur. In addition, everyone is expected to do their part one way or another. One possible tool for public organisations such as FTA is GPP.

Procurement laws and regulations are based on two principles: organisations are entitled to seek best value for money, but they must treat different tenderers in a fair and equal manner. The aim of these principles is to ensure cost-efficiency of public funds and fair operational field for participants in the markets. These aspects can be achieved by protecting non-discrimination, equal treatment, transparency and proportionality in acquisitions. (Roos, 2012.) The main goals for public procurements are described in the Act on Public Procurement and Concession Contracts (1397/2016). This law includes the goal, and in fact obligation, of consider sustainability issues in public procurements. The decision how this law is brought to life is, however, individual procurer's responsibility, who makes these decisions based on the guidelines determined in their organisation.

Organisations and their guidelines, policies and programmes are a way to minimize environmental impacts systematically. For example, construction projects are always part of bigger societal structures and society is always the sum of its buildings and infrastructure. Thus, on a strategic level public construction projects are also part of regional strategic management. (Kuittinen & La Roux, 2017, 19.) On an organisational level, environmentally sustainable procurements can be part of both organisation's strategy and environmental programmes. Organisation's strategy and environmental goals can be integrated directly into procurements and procurement processes of the organisation by demanding certain features from service providers and their goods. (European Commission, 2016a, PwC, 2016a, 31). Procuring authorities play a vital role in turning strategies into practice.

Environmental strategies are those that organisations use to enhance their corporate environmental performance while enhancing their financial performance. The basic concept of environmental strategies lies in eco-efficiency, meaning that the organisation uses fewer resources to produce the goods that they need or offer to public. The switch to green economy demands suppliers in reinforcing the environmental performance of products while client's promote and stimulate the need for better products and technologies. In addition, there is a need for guidance when it comes for the consumer making informed purchasing decisions. Green economy can be described as a change that requires boundaries breaking acts and collaboration between actors. (Figge & Hahn, 2012; Testa et al., 2016.)

The essence of public procurements does not differ from private sector's acquisitions. Both practices aim to match not only supply and demand but also suppliers

and clients. Another aspect that both private and public sectors face is the demand for responsibility and environmental sustainability. The pressure stems from regulations, stakeholder needs and expected business value. However, in contrast to private actors, public authorities are accountable to tax payers since they essentially use public funds to procure goods. Public procurements should not only represent organisation's values but also what is considered important in the society.

## **1.1 About this study**

Finland's ministry of transport and communications' administrative sector's strategy for 2016-2020 sets societal goals and schemes to execute strategic targets. One of these targets is to maintain the wellbeing of society, create sustainable growth and national competitive advantage through innovative communications and transport services. This target culminates into transport and communication service markets and into the total renewing of energy use and media-sector. The renewing of energy use not only highlights minimising the use of fossil fuels in transport but also development and use of cleantech. Since FTA is part of ministry of transport and communications administrative sector, FTA participates in this strategy work. In practice, this means building and maintaining energy efficient and environmentally sustainable transport routes in Finland. (Ministry of transport and communications' administrative sector strategy, 2016.)

Ministry of transport and communications has also set two operational targets for FTA for the era of 2016 - 2019. First one, set to be achieved during 2018, dictates that with research and development (R&D) the organisation will map out how FTA's procurements can enhance energy efficiency in road-, rail- and waterway infrastructure and in those services related to them. The second one, set to be achieved during 2019, defines that FTA must include energy efficiency requirements in their product procurements. By 2019, at least 10% of public procurements in transport and communication sector must be considered innovative. Their share will be measured by using an innovative index that has a target score of 73. (Ministry of transport and communications' administrative sector strategy, 2016.)

As part of the strategic work described above, a preliminary study was conducted during 2018 in FTA. This study focused on the environmental role of FTA's procurement instructions. This thesis further expands the topic by including expert interviews and a deeper analysis of procurement instructions' content. By creating a general view on what is the current status of environmental issues in FTA's procurements, information and insight for future studies and development work will be provided. The baseline for the results' value is the presumption that procurement instructions guide FTA's hands-on work. Therefore, the content of instruction should also be presented in expert's views concerning the subject.

Since FTA is one of the largest procurers in Finland, they can take the lead in GPP field. This, however, is not possible without proper knowledge of current purchasing

practices and policies. This thesis aims to provide insight to this matter and thus is valuable to not only FTA but other public organisations as well. This thesis will also provide information on what factors enhance and hinder the use and uptake of GPP in public organisations. These factors can be considered highly important in human resource management, strategic management and in corporate environmental management. These factors can be used to motivate employees and ease their work in the field of GPP.

Public procurements are used to provide societies those services that they need in order to function properly. This together with the notion that public authorities are expected to consider the natural environment, people and economic in their practices makes GPP important topic to study. When it comes to environmental sustainability, both private and public organisations are under scrutiny. Public authorities are expected to show example through their actions. This expectation includes issues such as how organisations comply with legislation, regulations and contribute to tackling environmental problems such as climate change. One might even argue that showing an example is not a question of being able but a question of duty. By studying GPP in certain organisational context, different practices and policies are brought to daylight. Current academic articles about GPP mainly focus on the issue from public organisations' standpoint and how their actions comply with national legislation. In addition, researchers have studied the subject through the lens of one environmental issue such as greenhouse gas emissions from public transportation. This thesis maps out the role of environmental sustainability, characteristic for GPP, in FTA's procurements. Thus, narrowing the number of organisations while extending the spectrum of environmental issues.

This study follows qualitative research methods due to the aim of describing procurement practices as a phenomenon in certain context. Data consists of two very different sources; procurement related documents and interviews. The data was coded and analysed using thematic analyse.

The research questions for this study are

1. What is the current role of environmental sustainability in FTA's procurements?
2. How environmental aspects are integrated in the procurement process in FTA?
3. What factors enhance and what factors hinder including environmental sustainability in FTA's procurements from managerial viewpoint?

This thesis consists of five parts: 1) theoretical background (GPP as a concept, GPP in practise and especially in infrastructure project), 2) description of Finnish Transport Agency's administration, environmental management and procurement practises, 3) data and research method, 4) results, 5) discussion and conclusions.

## 1.2 Public Procurements in Finland

The legal framework or background for public procurements are not dealt in detail in this thesis. However, few basic principles are worth to mention in order to gain understanding of the issues affecting GPP.

The boundaries for procurements are set in the treaty on the functioning of the European Union and in the EU procurement directives. In addition, government procurement agreement (GPA) of the World Trade Organisation and bilateral trade agreements bind EU from the international perspective. (European Commission, 2016a, 5.) GPA aims to preserve the environment from negative impacts. This agreement is mandatory for all EU members through complying with directives (Bag, 2017).

Directive 2014/24/EU on public procurement and Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors were given in 2014. In Finland, the Act on Public Procurement and Concession Contracts (1397/2016) and Act on Public contracts and concessions of entities operating in the water, energy, transport and postal services sectors (1398/2016) were devised to reach goals set in directives.

Finland is one of the largest procurers in Nordic EU countries, spending approximately 18% of state's GDP in public procurements. In Finland, the public procurement system is harmonised and decentralized. In addition, there is the total absence of regulation of procurements that are below national and EU thresholds set in the EU. In practice, this means that contracting authorities make the decision on whether or not to apply procurement procedures set in the regulations if the expected value is below national threshold. (PwC, 2016b, 1.) There are, however, different organisational threshold that can demand procedures for procurements that are below national or EU thresholds.

Procurement directives (1397/2016 and 1398/2016) dictate that contracting entities such as states and municipal authorities need to arrange competitive tendering. Contracting entities include authorities of central and local government and joint municipal authorities, the Evangelical-Lutheran and Orthodox churches of Finland and their parishes and other authorities such as state commercial institutions and institutions of public law character. In addition, actors that have gained more than half of the value in support from those entities mentioned above are considered as contracting entities.

Those procurements (products, services and works) that have the expected value (excluding tax) more than national or EU threshold (table 1), must be put out to tender. As FTA is considered a central government authority their EU thresholds vary between 144 000 euros (Supply and service contracts and design contests) to 5 548 000 euros (Public works contracts). National thresholds for FTA vary between 60 000 euros (Supply and service contracts and design contests) and 500 000 euros (Concessions/ services). The difference between EU and national thresholds concerns the notice practices about the procurement. Notices concerning those procurements having the expected value above EU threshold should be published EU wide. (Hilma, 2018.)

Table 1. National and EU thresholds for public procurements in Finland. (Hilma, 2018)

Goods	Threshold for central government authority	Threshold for other contracting authority	Threshold for entities operating in the water, energy, transport and postal services sectors
Supply and service contracts and design contests	144 000 (EU)	221 000 (EU)	443 000 (EU)
Public works contracts	5 548 000 (EU)	5 548 000 (EU)	5 548 000 (EU)
Supply and service contracts and design contests	60 000 (National)	60 000 (National)	60 000 (National)
Concessions/ services	500 000 (National)	500 000 (National)	500 000 (National)
Health care and social services contracts	400 000 (National)	400 000 (National)	400 000 (National)
Other special service contracts	300 000 (National)	300 000 (National)	300 000 (National)

Procurement procedures can be divided into open, restricted and negotiated procedures. These concepts differ in which parties can participate in the tendering process. In open procedure, all interested parties (the service providers) can return tenders, which are later evaluated by the procurer (public entity, the client). The restricted procedure is fulfilled in two stages. In the first stage, supplying parties are pre-qualified, meaning that they are either allowed to participate in tendering process or discarded. The pre-qualification is done based on characteristics set beforehand. These characteristics are qualifications that must be met before service providers can enter the tendering process. The second stage follows the open procedure in a way that those parties qualified in the first stage can return tenders. Tenders are evaluated and the winning party is awarded with a contract. The negotiated procedure can be used if there is only one supplier and suitable bids are not received in previous notice phase. Negotiated procedure can also be used in emergency situations and when the need to replace goods is done on partial basis. (HMEP, 2013, 36-38.)

## 2 GREEN PROCUREMENTS

### 2.1 Concept

*"Green Public Procurement (GPP) is a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured." European Commission, 2016a*

Song, Yu and Zhang (2016) have distinguished two dimensions of GPPs; product- and process based. The product based green procurements consists of obtaining and processing of green materials. These green materials are evaluated through the strategic resources owned by the organisation. In addition, product base procurements consider the use of non- or less hazardous and renewable materials in product development. Environmental sustainability and energy efficiency can be improved by setting environmental standards or preferences to goods being procured through demands focusing on their materials. Process based green procurements are related to the integrating, building and reconfiguration internal and external competence i.e. recycling or re-engineering, and thus managing the green supply processes.

Even though GPP is implemented to achieve environmental sustainability in changing business environment, GPP cannot be separated completely from sustainable procurements. The reasoning lies in the shared belief that all the aspects of sustainability are linked. For example, GPP enhances sustainable production and consumption by demanding goods that are environmentally friendlier and often also friendlier for the surrounding society and livelihood of the markets. Both production and consumption operations are to be considered when evaluating the overall sustainability of goods. In addition, because sustainable consumption calls out for sustainable procurement commitments, so does green procurements. This is due to the fact that purchasing operations have a link to not only on society but also to the environment through their ethical impacts, resource use and waste generation capabilities. (Bag, 2017.)

GPP can also be described as a bridge between those who produce innovations (private sector) and those who purchase them (public sector). Due to public sectors power in size and monetary wise, their role in shaping competition and establishing the markets is needed (Rainville, 2016). However, GPP does not revolve only around innovations since entities may first look for those products and services that are already in the markets. This shifts the focus to improving already existing products.

### 2.2 GPP in practice

The basic goal for using GPP is to enhance the environmental performance of organisation. Public procurement process is built on three steps; evaluating the need for

acquisition and planning the procurement, tendering process and supplier selection and execution of contract. All of these stages can include those aspects that ultimately make them green. Environmental criteria for procurements send a message to suppliers and service providers that authorities purchase goods and services with reduced environmental impacts. (European Commission, 2016a; Uttam & Roos, 2014.) Next chapters will elaborate practical aspects of GPP process.

### **2.2.1 Before acquisition**

There are two basic steps to be taken before acquisition. One is to consider whether or not acquisition is needed at all. This can be considered as a core characteristic for sustainable development; purchasing and ultimately using natural resources only when it is necessary. The second step is more directly linked to the nature of GPP and concerns those environmental impacts that are linked to their procurements and organisation can minimise them.

The base for GPP and GPP criteria lies in identifying those environmental impacts that are essential from the organisation's point of view. These environmental impacts can either be generic or project based. Thus, each of the projects including GPP need to be assessed individually. (Uttam & Roos, 2014.) Since each of the project is unique, criteria for procurements should be based on their unique characteristics. Garbarino, Rodriguez Quintero, Donatello, Gama and Wolf (2016) took this rule of thumb one step further by stating that the GPP process and GPP criteria should be determined based on the actual need and resources of the contracting authority, thus bringing assessment closer to practice. Garbarino et al. (2016) also recommend that environmental issues are not only evaluated individually in each project but in each step of the project and procurement process as well. The most suitable phase for this task being the preparation and preliminary phases. However, with every decision comes the basic need to gather and process information in order to make educated decisions. What makes seeking information more complex is the fact that environmental impacts lie further ahead in the future and cannot be measured beforehand, just evaluated. This brings uncertainties to the process (Igarashi, de Boer and Michelsen, 2015).

European commission (2016a, 30) has grouped environmental impacts based on the nature of organisation's contracts. Supply contracts for example may include impacts that are caused by those raw materials that procurer needs to produce products. Supply contracts can also deal with aspects that concern enhancing product's durability and the production processes. Use phase on the other hand can be evaluated through energy consumption, water consumption and use of chemicals. Service and work contracts usually include technical qualifications for employees and service providers who are responsible for carrying out the contracts. Service and work contracts may also include demands for materials, management procedures and resources. Therefore, environmental impacts are not strictly linked to the contracts' characteristics.

When the environmental impacts are identified, the organisation can either prevent or minimise them through their own operations and resources. By setting environmental criteria for products, services and works and then demanding from suppliers that these criteria are met, enhancements in environmental performance may occur thus achieving the goal of GPP. Environmental criteria can be described as well-defined concept once procurement authority has provided information in the tendering process how to fulfil the criteria and how it must be verified (Fuentes – Bargues, González - Cruz & Conzáles - Gaya, 2017; Rainville, 2016.)

### **2.2.2 GPP criteria**

Since 2008, the European Commission has been developing general GPP criteria for so called priority sectors such as road design, construction and maintenance, waste water infrastructure, transport and electricity. The use of this criteria is voluntary (European Commission, 2016a, 31-35). The available criteria can be used as selection criteria, technical specifications, award criteria and contract performance clauses. There are two levels for each of these criteria: the core criteria focus on the key areas of the environmental impacts of goods being procured. More ambitious criteria is called comprehensive criteria and this considers the higher levels or aspects of environmental performance. In addition, the comprehensive criteria can go further in supporting environmental protection and innovations. (Garbarino et al., 2016.)

Selection criteria deals with assessing the experience and competence of contractors and technical specifications include compliance requirements that are compulsory for all tenders. Award criteria on the other hand are optional for tenders, but by accomplishing these criteria, contractors may earn additional points and strengthen their role in competition. Contract performance clauses specify the carrying out of contracts. Technical specifications (criteria) can be defined in procurements by referring to European, international or national standards or in terms of subject-matters (product, service or work) performance or functionality. EU and national green public procurement criteria can also be used to depict the technical specifications. (European Commission, 2016, 31-35.)

There are safeguards set in public procurement practices. Meaning that criteria for goods cannot be created in a way that they set restrictions for competition. The technical specifications need to be related to the characteristics of subject matter or to the production of the good, service or work being purchased. It is also possible to demand specific materials or that certain percentage of product's content is recycled or reused. Specifications cannot be related to the capacities or qualities of the potential supplier. By setting clear and understandable specifications, the specifications can be verified, and the procurement process becomes transparent. (European Commission, 2016a, 29-35.) European Commission (2016a, 33) states that performance-based or functional requirements are accepted through the desired result. Such results can be linked for example to quality, quantity, reliability and measurability of these characteristics. Inputs or work methods cannot be included. When setting performance-based or functional



requirements, it is important to evaluate before-hand how different tenderers can be assessed and compared. Clear, detailed and correct criteria set an evaluation base for the tenders. If these demands are not met by the service providers, there is something missing either in tendering documents or in procurer's knowledge about the markets. (European Commission, 2016a, 31-35; Fuentes – Bargues et al., 2017)

The question of verification can be problematic when setting the criteria. Requirements that are justifiable and based on scientific evidence make the task of verification easier. Verification can also be done, for example, by demanding externally audited certifications and management systems from suppliers. Varnäs, Balfors and Faith-Ell (2009) state that procurer can overcome the problematic nature of GPP criteria by using only one criterion such as those presented in European Commission's publications. Additionally, they can approach the purchase through life-cycle analysis (LCA), the use of eco-labels or by choosing those suppliers who use environmental management schemes in their practices. However, to include environmental management systems (EMS) can be challenging since there is difference between reports and actions.

Eco-labels are voluntary methods of certifying environmental performance and a labelling form supported by standard or regulated procedures and criteria (Fuentes-Bargues et al., 2017). European Commission allows the use of eco-labels as long as they are accessible to all parties based on non-discriminatory criteria. Just like the selection criteria of procurements, also the label must be linked to the products, services or works being procured. Only those requirements that are linked to subject matter can be demanded from the supplier. Meaning that even though a label has requirements that are mandatory in order to obtain that label but are not related to certain procurement, procurer cannot set them as minimum criteria. This is especially important since service provider can use other means to demonstrate their products are compatible with those holding an eco-label. Therefore, a procurer cannot stipulate all the possible characteristics from certain labels if they are not directly linked to the target of procurement. No standardized labels, equivalents, such as verified test reports, certificates from conformity assessment body or manufacturer's technical documents must be accepted beside official label certificates if they prove that the characteristics are what procurer demands. The type of evidence submitted by the tenderers need to be depicted in the tendering documents. Since requirements and their compliance may be challenging to assess, European Commission suggests that procurement authorities should refer to relevant legislation such as waste electric equipment (WEEE) directive. (European Commission, 2016a, 33-40.)

### **2.2.3 Enhancing and hindering factors**

There are external and internal factors affecting the local and regional GPP. The most common enhancing factors for green procurements are regulations and laws that guide the procurers into considering environmental issues in procurements, stakeholder pressure, organisation's commitments to social responsibility (CSR), expected business benefits due to consumers desire to purchase and use products that are sustainable,

procurer capabilities (increases in know-how, fiscal and human resources used in research, development and marketing dialogue), strategic management and using GPP as strategic tool and collaboration with suppliers, especially in innovation projects. In addition, the need to break down knowledge-based barriers can enhance the use of GPP in organisation when procurers that already are ready to use GPP want to demonstrate their commitment other organisations. (Bag, 2017; Khidir, Zailani, & Jayaraman, 2010; Large & Thomsen, 2011; Varnäs et al., 2009; Walker & Brammer, 2012.) Factors enhancing the GPP improve the general progress and support the supplier's development work. Quite often different external and internal factors are linked together, and it can be difficult to separate the factors completely.

Hall, Löfgren and Peters (2015) have emphasised that the national regulatory ambitions and practices are the most relevant from external factors and individual procurement authorities' preferences being in the key role as internal factors from organisation's viewpoint. Bag (2017) and Walker and Brammer (2012) on the other hand has stated that as external factors influencing the success of green procurements, science for example eco-design and technology such as information technology can be seen as some of the key factors in driving the use of GPP forward.

Public opinion and stakeholder pressure may influence organisation's actions and priorities, but in a study conducted by Hall et al. (2015) expert interviews revealed that public opinion did not play a role in utilising GPP. Public entities seemed to follow the example of others, in their cases comparable organisations such as subnational authorities. This demonstrates that public entities utilising GPP not only steer the development of private markets but also the public organisation's strategic work. The only problem according to Hall et al. (2015) seems to be that no one wants to be the first, but everyone wants to be better than the other. One reasoning for the fear of being first could be the fact that implementation of GPP and GPP criteria demands resources and organisations expect something in return. However, one should understand that some of the environmental benefits need longer time-span than just one year to emerge and therefore GPP is a long-term commitment among many uncertainties.

Resources needed for GPP can be divided to procuring authorities's abilities, to reporting- and impact assessment resources and to the readiness of industry (Kuittinen & La Roux, 2017, 26). According to Alhola and Kaljonen (2017), the resource question can be seen as a consequence for not understanding strategic role of procurements. This is especially problematic on the top management level and can lead to the lack of support. It is not uncommon that if the GPP - process is not seen important or meaningful, there will not be sufficient resources such as time and finance to enable the process. The result is that procurers, operational managers and strategic managers do not have the resources needed to improve their skills needed to make GPP cost-effective and worthwhile. These actors are also those who would benefit from information and training the most. Resources are ensured once those in charge of allocating them are committed to GPP and GPP is implemented to strategy. Grandia, Steijn and Kuipers (2015) have come to the same conclusion in their study. According to them if strategy, organisation and GPP

policies are seen as an entity, the GPP implementation becomes part of the whole organisation making it equal to other strategic tools.

Igarashi, de Boer and Fet (2013) and Kuittinen and La Roux (2017) both state that organisation cannot achieve its environmental goals if they are not linked to procurements in a way that is in line with organisation's strategies and policies. Large and Thomsen (2011) suggest that strategic level procurements enhances GPP and also the collaboration.

Bringing procurements and strategy closer together however demands clarity in concepts, meaning that environmental aspects are made concrete enough to be applied in the procurements. Strategic mandate, or authorisation, for public organisations is the result of national strategies and policies. Organisational goals and targets play a part in fulfilling this strategic mandate. Different actors guide the work of procuring authorities and in some cases these actors and their tasks may overlap. With overlapping, comes the risk of fragmentation of instructions and policies. Thus, affecting the quality and comprehensiveness of the whole process and its targets. Strategic mandate, just like environmental aspects, must be clear throughout the organisation. (Kuittinen & La Roux, 2017, 17-18.) In practice, this can be done by top-level management defining how GPP is considered in everyday work and what are the goals that the organisation aims to achieve with them. In addition, organisation should define the tools for GPP and how the development is being measured. Integrating procurement strategies into action also calls out for strategic management and procurement expertise. Organisations need to understand how each of their units can affect the different goals set in the strategy. However, setting goals does not yet guarantee the fulfilment of GPP in projects, whereas tendering and contracting process does. (Alhola & Kaljonen, 2017.) However, Grandia et al. (2015) have argued that the procurer's sense of fairness of procurement policies and procedures affect the GPP related behaviour. According to them, organisations aiming to implement GPP need to ensure that procurers find these actions just, before they can fully commit to them.

Igarashi et al. (2015) have summed key problems as that there is a tension between those devising policies and those fulfilling them. The cornerstone of this problem lies in how to include environmental criteria in tendering documents and what weight could be given to different requirements demanded from the goods. This together with the lack of information and not always having enough resources will result in a situation where environmental requirements are not demanded in a way that they could be, and procurement authorities cannot fully compare environmental and economic characteristic of different offers.

Procuring authorities need time to get familiar with the environmental impacts and environmental criteria and expertise to carry out an effective procurement. The expertise is often linked to certain phase of project, which have sector, or industrial based variations (Kuittinen & La Roux, 2017, 26). According to Uttam and Roos (2014), information on how the GPP criteria could be achieved and dictated in the tendering documents is vital for procuring authorities. Without a doubt, tools are useless without instructions on how to use them. The role of information in facilitating the use of GPP is emphasised also in Testa et al's. (2016) study. In this study information and training on

an individual level was found to be the most enhancing factors for using GPP. Information can also have a form of learning from others. This process includes sharing the positive outcomes from green procurements and achieving shared awareness on what can be achieved with GPP. Training ensures that the professionals in charge of procurements have proper skills, knowledge and tools to use GPP in their work. A special emphasis was placed on those guidelines that give the information on how to exceed the minimum environmental requirements set in the law. The individuals in organisational structure influence GPP practices more than the administration. In addition, Grandia et al.'s (2015) study had similar findings. In their study the result show that managerial supervision or rules, regulations or procedures that do not have legitimate purposes do not affect the individual commitment to use GPP. This means that organisational structures and functions that are planned to manage the GPP practices do not influence the success of GPP processes as much as one might expect.

European Commission conducted a survey in 2015 concerning the key challenges in implementation of GPP. The most common challenges were lack of political support, perceived cost of environmentally friendlier goods, lack of expertise and training among procurers, lack of co-operation and practical tools, ineffective management systems and lack of verification methods for environmental criteria. (European Commission, 2015.) Many of these are consistent with the same challenges found in other studies conducted previously and after European Commission's study such as Ojala, Varis and Peltola, 2017 and few older studies by Khidir et al., 2010 and Bratt, Hallstedt, Robèrt, Broman and Oldmar, 2013.

The lack of political support extends beyond senior officials who are responsible for giving administrative support for procuring authorities. Very often the lack of environmental awareness on senior management level leads to purchasing staff following this example or that the purchasing staff simply does not receive information needed to conduct environmentally friendly purchase. (European Commission, 2015.) Bratt et al. (2013) have found out that the lack of competence can be a barrier in implementing GPP. Similar results have concluded also Kuittinen and La Roux (2017). In their study, the core competence of procurers in construction projects often covers the planning- and implementation phases, need assessments, tendering and management. Specific environmental expertise may demand training or the use of consultants. These are all resource needs that must be considered when procurement is used as part of organisation's environmental work. According to Kuittinen and La Roux (2017), improving the competence via training is often necessary in order to achieve the goals set for projects. Training can deal with environmental competence; the procurement process itself or parts of it such as the tendering process. In addition, by analysing the previous procurements, authorities can gain information in achieving the goals that are set for public procurements.

Based on a study by Ojala et al., (2017) one of the most likely obstacles for using environmental sustainability as a requirement in procurement is the current market status and not having enough information about it. Kuittinen and La Roux (2017) also state that knowing the markets is especially important since branches such as energy and environmental technology develop in fast pace and without realistic views of the markets

it is not possible to plan and implement GPP efficiently. Environmental requirements make the process more complex and reduces the number of tenders. This in turn can increase the costs of procurements due to lack of competition (Cheng, Apollonia, D'Amato & Zhu, 2018). Also, Ojala et al.'s (2017) study showed that by setting sustainability criteria for the procurements, the clients were not happy with the amount of offers that they received. This seemed to be problematic especially to those buying from small and local markets. The lack of suppliers can work as a barrier for utilising GPP. The study also showed that clients were concerned with the supplier's ability and willingness to make changes according to the demanded criteria. The fear was that small and medium enterprises do not have the resources to make changes, thus being left out of the tendering process and minimising the variety of goods in the markets. Hall et al. (2015) came to the same conclusion few years prior to Ojala et al. (2017). The problem of not having enough green alternatives matching the demands is an example of a gap between political ideals and reality. The availability of green goods is certainly one of the relevant barriers to GPP. However, Varnäs et al. (2009) state there is a possibility of a snowball effect if public sector starts to procure green products that are not yet mainstream. This will increase the suppliers' interests in manufacturing these products. Another form of snowball effect can be witnessed when clients exert pressure to their service providers to enhance environmental sustainability. Khidir et al. (2010) refer to this phenomena as "green multiplier effect".

Quite contrary to Varnäs et al. (2009), Ojala et al. (2017) suggest that the base for changes in markets comes from information and training, not demanding certain type of goods from the suppliers. According to them, in order to make environmental requirements more widely available for public procurers it is important to increase information about legislation and procurement instructions, to use procurement examples in purchasing instructions, to increase dialogue between clients and suppliers and to collect tips and experiences from other procurers. Uttam & Roos (2014) have suggested that especially in those cases where the procurement activities are complex, promoting communication between different actors, would be the first step in a successful procurement. Incorporating engagement strategies and moving away from the policies and compliance activities with dialogue also GPP would strengthen. Involving the contractors before starting the official tendering process can help the client in forming a framework for the objectives that need to be met during the project. By conducting "soft market testing", meaning communicating with current supplier and other industry contacts, valuable information can be gained for both parties involved in the procurement process (HMEP, 2013, 36-38).

There are many barriers for purchasing green, but there are also many solutions to these barriers. These solutions can be divided into internal and external solutions much like the factors that affect the whole process. Inside the organisations middle managers commitment, development of green procurement policies and goals, corporate culture and training of the personnel are key factors. Important tool from the wide pool of external factors is the communication with the suppliers (Varnäs et al., 2009). In line with Varnäs et al. (2009), also Alhola & Kaljonen (2017) emphasise the regular collaboration and

interaction not only between clients and suppliers, but also between different procuring authors. These tasks will help with the lack of communication. In addition, with enhanced collaboration different actors can identify the expertise and learn from others. Enhancing and hindering factors are described in table 2. Factors are further divided into external and internal factors from organisation's point of view.

Table 2. Summary of enhancing and hindering factors found in the literature

<b>Enhancing factors</b>
<b>Internal factors</b>
Collaboration with service providers, authorities and suppliers (Alhola & Kaljonen, 2017; Bag, 2017; Uttam & Roos, 2014; Varnäs et al., 2009; Walker & Brammer, 2012)
Learning from others such as colleagues and other similar organisations (Grandia et al., 2015; Testa et al., 2016)
Perceived benefits (reputation, societal acceptance) (Bag, 2017; Khidir et al., 2010)
Perceived business benefits (Khidir et al., 2010)
Procurer's individual commitment to environmental issues (Hall et al., 2015)
Resources (Kuittinen & La Roux, 2017;
Strategic management in organisation (Grandia et al., 2015; Igarashi et al, 2013; Kuittinen & La Roux, 2017; Large & Thomson, 2011)
Training and education of procurers (Testa et al., 2015; Ojala et al., 2017; Värnas et al., 2009)
Corporate Social Responsibility (Khidir et al., 2010; Large & Thomson, 2011)
<b>External factors</b>
Legislation and regulations (Hall et al., 2015; Khidir et al., 2010)
Stakeholder pressure (Khidir et al., 2010; Varnäs et al., 2009)
Technological enhancements (Bag, 2017; Walker & Brammer, 2012)
<b>Hindering factors</b>
<b>Internal factors</b>
Fear of being first (Hall et al., 2015)
Fragmentation of instructions, policies and strategies (Igarashi et al, 2015)
Lack of expertise (Bratt et al., 2013; European Commission, 2015; Kuittinen & La Roux, 2017; Uttam & Roos, 2014)
Lack of managerial support (Grandia et al., 2015)
Lack of resources such as money and time (Igarashi et al, 2015; Kuittinen & La Roux, 2017)
Lack of verification methods (European Commission, 2015)
Perceived costs, that can be either direct or indirect (European Commission, 2015; Khidir et al., 2010)
Unclear role of procurements in strategies (Igarashi et al, 2013; Kuittinen & La Roux, 2017)
<b>External factors</b>
Fragmentation of instructions, policies and strategies (European Commission, 2015)
Lack of collaboration with service providers and / or suppliers (Alhola & Kaljonen, 2017; Uttam & Roos, 2014; Varnäs et al. 2009)
Lack of political support (European Commission, 2015)
Lack of service providers due to small markets (Cheng et al., 2018; Ojala et al., 2017)
Readiness of the markets (Hall et al., 2015; Ojala et al., 2017)
Tension between different actors, mainly policymakers and those fulfilling the policies (Hall et al., 2015; Igarashi et al., 2015)

## 2.2.4 Supplier selection and decision-making process

Supplier selection is highly critical step in attaining not only physical resources but also information for the organisation. In addition, supplier selection can be seen as a strategic decision since supplier's or service provider's decisions have an impact on their client's reputation and resources, especially if these decisions are not fully accepted by the society

(Gurel, Acar, Onden & Gumus, 2015). Green supplier selection (GSS) is a tool that can be used to include environmental criteria in public procurement process and especially in choosing suppliers or service providers. GSS is only one part of procurement process. Apart from supplier selection, there are also the contract management, after care (evaluation of the outcome) and future development work. (Igarashi et al. 2015.)

GSS can be understood as a hurdle of factors that together form the GSS process. According to Igarashi et al. (2015) GPP often means the same as GSS when used in public sector. Reasoning for this statement lies in that supplier selection that must be done in a way that it can be described as fair to everyone. As stated before, these are two basic principles from the procurement legislation in EU. In addition, since GPP is a tool for government policy, there is no room for favouritism in supplier selection. Selecting and excluding tenderers may be done based on the contractor's ability to perform the contract. Authorities responsible for assessing this may consider experience and competence of a contractor in variety of ways such as ask proof of references.

Tenderers and their technical and professional competence may be required for example by asking whether the economic operator can implement environmental issues management measures during the award of the contract. Quality management and environmental issues management systems may be required by asking if the operator is able to present independent institutions certifying that an economic operator fulfils certain environmental management requirements standards. (European Commission, 2016a, 42-43, Valtion hankintakäsikirja, 2017, 163.)

Authorities are also entitled to exclude tenderers that have breached environmental legislation. There are also cases, where exclusion is mandatory. Such case is criminal activity. (European Commission, 2016a, 42-43.) The potential supplier indicates compliance with the suitability requirements by filling a European Single Procurement Document (ESPD-form) as a proof and by insuring that they are not subject to any mandatory or discretionary exclusion criterion and that the candidate or tenderer fulfils the criteria set by the client. The ESPD form includes information to be filled in by the bidder with information about the service provider, about their representatives and subcontractors and mandatory and discretionary exclusion criteria information. The candidate or tenderer will attach the ESPD form to the offer or participation application. (Valtion hankintakäsikirja, 2017, 136.)

The most common criteria set for suppliers are cost for the procurement and quality of the final product or service. Additionally, by including different aspect such as environmental requirements, supplier selection can become green. Thus, emphasising the relation to GPP even further. Gurel et al. (2015) concluded that there are eight main factors in GSS that affect the way procurer makes procurement decisions. These are cost, delivery, quality, service, strategic alliance, pollution control, green product and environmental management. Out of these pollution control (waste management, energy consumption and harmful materials), green products (packaging, recycling and reusing) and green management (environmental management systems) can be considered directly green criteria while other factors can be linked to environmental sustainability but not per

se purely green. All of these eight factors include determinants that describe their role in GSS and can be recognised in GPP process.

Grandia et al. (2015) use the definition of “Decision making process” when explaining the task that individual procurers face when, for example, choose suppliers and service providers. This definition described the change from “a tool to a process” that emphasises the procurers’ ongoing role in procurements. Individuals, whether it is the procurement authority or top-level manager, role can be considered problematic in GPP.

Even though, European public procurers are working under the same legislations and are expected to follow these regulations, there are significant variations in implementation of GPP. The variation rises from those factors playing role in the individuals decision-making process such as individual values, knowledge, motives, attitudes and beliefs needed to steer GPP from a tool into a process. Individual's characteristics come apparent especially when evaluating tenders with other than analysis tools such as Life Cycle Assessment (LCA). In these cases, the evaluation is done based on predetermined characteristics such as delivery time and price or values containing some subjective bias. (Grandia et al. 2015; Fuentes – Bagues, 2017.)

Hall et al. (2015) have stated that the organisational commitment that arises from national and local governments is most important step in greening procurements. Commitment, whether it is individual or organisational, is important because the priority in public procurements often is to minimise costs. This is done by choosing the service provider that offers their goods at the lowest price based on the perceived costs while fulfilling personal vision, values and attitudes. Grandia et al. (2015) argue that procurers’ commitment to change their purchasing behaviour into GPP demands acknowledging the content, process, context, leadership and individual differences in this subject. One might even describe this as achieving full understanding of the organisation, oneself and those around you. Bratt et al. (2013) have also described the challenge of individual commitment in implementation of GPP. Without a doubt, employees that are committed, are more likely to make changes, even if changes demand resource.

Hall et al. (2015) describe environmentally motivated authorities as “inside activists” referring to individuals who are engaged in environmental work outside the organisations and possibly already before embarking on in public occupations. These authorities are in charge of actual content and context of procurements thus influencing the intake of GPP in the process. In addition, these individuals may or may not have role in spreading the policies to others in organisations since they can steer the focus towards GPP. Similar insights on the individual's positive role has witness also Grandia et al. (2015). They conclude that individual’s willingness to change their behaviour can have a positive impact on organisation's efficiency and outcomes. According to Grandia et al. (2015), proficient and proactive GPP procurers will most likely promote GPP to others while improving the GPP process. In the end, it is individual's beliefs that steer the behaviour towards permanent and thorough change, not pressure from managers, regulations or penalties.

Igarashi et al. (2015) have distinguished four approaches in using environmental criteria in GPP. These approaches are ignoring, incorporating, insisting and integrating.



According to the Igarashi et al. (2015) procurement authorities first make the decision to either ignore or include the environmental criteria. This can also be done unintentionally. With ignoring approach, the procurer intentionally ignores the environmental requirements as clear criteria due to low pressure for using environmental criteria or finding only the conventional requirements necessary such as delivery time when choosing a supplier. If the procurer decides to include green criteria, they can either use incorporating, insisting and integrating strategies alone or mix them together.

Sometimes the environmental criteria can be implicit in the form of incorporating demands to other preferences, for example environmental management can be included under different quality assurance systems. In addition, cost can be used as implicit environmental criteria especially if the costs are evaluated through life cycle costs. As stated before, cost is one of the most common criteria used in procurements but Igarashi et al. (2015) argue that quite often cost is also one of the most important factors that guide the decisions concerning procurements. There are two reasons for this. First, by choosing the most suitable service provider procurer is more likely to reduce costs since service providers are aware of the needs and second, right supplier is more likely to increase procurer's competence among procurers and stakeholders. They are looked up to. Building an entity where environmental factors are part of other requirements is called incorporating in Igarashi et al.'s (2015) study. Incorporating is a way to make only minor changes in standard procedures and in offered goods. However, if the goal is to enhance the sustainable development incorporating strategies are problematic. Suppliers will not become aware of the environmental standpoints in procurement documents when the preferences are presented as part of other qualifiers, simply because green criteria are faded into other demands. In addition, incorporated requirements are harder to supervise than those that are articulated independently. Incorporating also makes it possible to avoid independent trade-off between environment and other aspects, meaning that the procurer does not have to exclude requirements in order to include and give value to something else. (Igarashi et al. 2015; Gurel et al. 2015.). This situation can be described as one where environmental sustainability is included to the procurement, but there is no or only little importance to it. One might even say that this is a form of PR. Procurer can always state, if asked, that organisation uses green criteria but the responsibility of fulfilment is left to service providers.

Igarashi et al. (2015) use the term insisting when explaining a situation where procurement authority makes environmental requirements mandatory elements in the procurement process. In this strategy, there are no trade-offs between environmental requirements and other characteristics. Environmental criteria is seen as equally important qualifier among other factors. Including environmental criteria to this extent demands a change in decision-making process because including these factors ultimately mean need to verify and monitor them. At the same time this depict organisation's and individual's values. Green becomes important.

If a procurer intentionally leaves something out in order to include other requirements, it is called integrating. In practice, this happens when a procurer chooses environmental criteria instead of other requirements. However, including environmental

criteria alone in the procurement does not necessarily have an impact in the process but the weighting of these requirements does. Low weights (5-10 %) have low integrated value whereas higher (15-20%) weight sends a clear message to suppliers, thus having impact on procurements (Igarashi et al. 2015). Especially since 20 % weight in award points can be hard to compensate with other characteristics.

According to Ethans (2014, 2-15) authorities in charge of decisions have not considered environmental impacts and environmental criteria thoroughly for various reasons i.e. immediate priorities (managing aging infrastructure) and limited ability to not only consider but also implement adaptations means. The author argues that key factors in integrating green criteria for example into planning work are local circumstances that spur action, having access and knowledge how to use information and local expertise and including environmental impacts in already existing planning processes. Huan (2013) on the other hand argues that socioeconomic considerations are often affecting the planning boundaries and assessing environmental effects. This can lead to a situation where ecological systems and planning are considered only in an unbalanced way which in turn depicts organisation's values poorly in procurement process.

When price is not the only determinant in choosing offered goods, weighting of environmental aspects becomes extremely important. Ultimately the question lies in what is the extent to which these two characteristics (price and environment) are compared (Cheng et al. 2018). Figge and Hahn (2012) have stated that integrating environmental strategies needs to be done both financial and environmental perspectives in mind. By analysing organisation's environmental performance as a complement, instead of inferior, to financial performance and assessing it in monetary terms four different strategy types can be identified: 1) economic value creation and environmental value creation, 2) economic value creation but destruction of environmental value, 3) creating environmental value but destructing economic value and 4) destruction both economic and environmental value. In these strategies the financial or environmental resources have relative weights thus those resources that are used efficiently in the markets, have higher weights in terms of value creation.

A great example of integrating strategies in the form of economic and value creation comes from Netherlands. The department of public works of the ministry of infrastructure and environment in Netherlands developed a methodology that enhances innovative and high-quality procurements while choosing the most economically advantageous bid. The procurer chooses a tenderer based on the price and quality related issues such as sustainability, project management, and design and risk management. What makes this methodology noteworthy is that the procurer ensured that quality issues are monetised by assigning certain values to certain aspects in invitation to tender. The values are then deducted from the price presented in the final tender and that tenderer with the lowest price wins. This methodology gives tenderers a chance to evaluate the value of quality in their bid. If a tenderer chooses to improve quality, more monetised value is deducted from the original price. (OECD, 2014.) There are three major advantages to this example. First, methodology sends a clear message to tenderers that improving quality will increase their possibilities to win. Second, in order for the quality to have enough

impact to make a difference in the price it must be emphasised. Thus, once again, sending a clear message to service providers. Third, procurers may be choosing the most economic advantageous bid but at the same time they are procuring high quality. Additionally, the monitoring problem is solved by issuing sanctions if the offered quality is not met during the implementation phase.

Both public and private sectors are facing more and more demands to reduce environmental impacts and improve environmental sustainability. Figge and Hahn (2012) state that the so-called green business is thought to be a textbook example of a win-win situation where organisation with a suitable strategy gain competitive advantages and financial assets through their sustainability work. The base of this kind of win-win situation lies in the reduced use of resources and energy and higher revenues through environmentally sound new products and services, or GPP.

### **2.2.5 EU's GPP in infrastructure (road) projects**

Generally public procurement process is built out of four steps: defining the requirements of the contract, selecting suppliers, evaluating tenders and awarding contract and implementing the contract (Roos, 2012, Valtion hankintakäsikirja, 2017, 52). In some cases, the process is described through three steps: planning the procurement, tendering process and implementing the contract. This process is used also in FTA. The basic principle and content are the same in both processes. European Commission has published guidance on how to use GPP in road projects. The GPP characteristics are set on the project phase and through project's requirements. All of these phases can be seen as independent procurements that follow the procurement process described above.

The road project, according to European Commission, has five phases that are as follows.

- 1) Preparation
- 2) Design
- 3) Construction
- 4) Use
- 5) End of life.

Each of these unique phases can be further divided into 1 - 5 sections (Garbarino et al., 2016). The European Commission's criteria instructions follow common phases of procurement process, namely awarding design team and contractors and defining requirements for planning, constructing, use phase, maintenance and refurbishment. Instructions also include concrete examples how to integrate GPP to the procedure. Naturally, the goal, timetable and procurement authorities' expertise affect how these instructions are used in real-life projects. Like stated before in this thesis, each project should be evaluated individually based on their environmental impacts before applying GPP. European Commission has stated that including GPP criteria at the early stages of project helps in achieving the set goals and best value, budgetary wise.

The road decommissioning can be described as unusual since the roads are designed and constructed to last 80 – 100 years. The end of life stage includes demolition of the pavement, ancillary elements and other terminate functions. GPP criteria for this stage usually includes pre-demolition audit and waste management plan. (Garbarino et al., 2016.) Because the GPP criteria for this stage is scarce, these criteria will not be dealt any further in this thesis.

The suggested criteria for other parts of road infrastructure's life-cycle includes the so-called core and comprehensive criteria. Core criteria can be described as the basic level, focusing on the key environmental impacts of road design, construction and maintenance. Authorities are free to step up their game and use comprehensive and more ambitious criteria. Both, core and comprehensive criteria can be used to guide the pre-selection of design team and/or contractor and the basic procedure is to demand proportionated competencies of key actors. There are also aspects, such as considering sub-contractors works, that could be added to this approach widening the analysis even more. (European Commission, 2016b.)

The starting point for design, construction and maintenance of roads in GPP is to fulfil the works in a resource efficient manner and to consider environmental impacts such as noise, fuel consumption of machinery and drainage on the construction site. (European Commission, 2016b.) Road construction, maintenance and the use of the road affect environment in many ways. Changes in physical and chemical soil conditions, water flow, air and water quality, natural habitats for species and wildlife migration patterns are only some of the changes caused by the roads. However, in some cases, road can enable the livelihood of native species with roadside habitats. With increasing awareness of environmental issues, changes in regulations and new, improved solutions, road development may lead to compatibility of environmental protection and overall project approval by the societies. This however demands effective planning and coordination of works in order to consider alternative designs, mitigation strategies and increasing of knowledge among different actors in the process. (Huan, 2013, 2-4.)

Procuring environmentally friendlier design, construction, maintenance, refurbishment and demolishing of roads is a complicated process. Construction and maintaining of roads can include variety separate contracts (public procurements) that can have a significant role on the environmental impacts during the whole road life cycle. Therefore, it is vital to identify those phases and parts of procurement process where GPP criteria can be used. According to European Commission (2016b), the most significant environmental impacts stem from road's life-cycle due to fuel consumption and used building materials. Fuel consumption is related to construction, maintenance and upkeep through machinery choices. In addition, there are also other issues, such as road surface structures, rolling resistance and vehicle interaction, to consider while evaluating fuel consumption.

*Preparation phase: evaluating the need*

There are some general factors that should be considered before, during and after procurement procedures. Identifying and establishing the need for procurement and ensuring that the procurement process is built in accordance with laws, regulations and organisation's guidelines can be considered as the most important aspect. When organisation has established and evaluated the need for goods, they should establish not only a procurer team but also identify the stakeholders and their engagement in the process. By communicating about the project management, the team is able to demonstrate the progress and by demonstrating management, they are able to control risks associated with the procurement and the project itself. (HMEP, 2013, 36.) As can be seen from this example, procurements are not related only to products' or services' technical characteristics but also to achieving wider public acceptance to the project.

Before setting the GPP criteria, procurement authorities must understand the technologies, products and available solutions in the markets. This information can be collected by conducting a preliminary market analysis or open dialogue with market actors. Pre-Commercial Procurement (PCP) and the Competitive Dialogue Procedure (CDP) provide procuring authorities a chance to discuss procurement requirements with some of the tendering candidates. The aim of this dialogue is to develop alternative solutions for the need and to set the basis of which actors are invited to tender. (Uttam & Roos, 2014.) To achieve the targets that are set to certain procurements, it is necessary to take care of the education of procurement authorities, conduct CDP and analyse the procurements' possible outcome. CDP is especially important because the current environment- and energy technology develops at a high speed. Without realistic view of the current markets, different options and their meaning for procurements do not have solid base. (Kuittinen & La Roux, 2017, 26.)

Conducting market research and exploring different options, ensure that the use of public funds is efficient and responsible. When organisation has a clear mindset on what is the desired outcome of public procurement, the contract requirements are easier to determine. The purpose and objectives of the procurements are determined by the nature and content of procurement and the client and end-user needs. This process also helps to identify what kind of requirements and goals are dealt in the contractual terms and whether incentives and fines are needed to achieve them. (Valtion hankintakäsikirja, 2017, 131.)

EU's preparation phase's in GPP includes tasks such as assessment of the need, strategic briefing, and project briefing and concept design sections. The assessment of the need for a new or reconstructing existing road is done on a strategic level based on the overall objectives of the society. Typically, this is done on a political level. The key question, sustainability wise, in road infrastructure lies in whether a new road is needed or could the already existing one be reconstructed. If the evaluation leads to constructing a new road, further questions deal, for example, with how it is integrated with other transport routes, now and in the future. Contracting authorities' environmental priorities can be included in the project definitions as long as they are included in their corporate

level or local policies and plans. (Kuittinen & La Roux, 2017, 26.) Thus, being part of a strategic mandate described earlier in this thesis.

Realistic project objectives are the combination of exchanged ideas, opinions and experiences while keeping the needed resources in mind. It is the sum of identifying optimal alignments, solving technical problems and aim to improve service level. Part of strategic briefing is the feasibility stage where the best solution for implementation is chosen. Each project should be examined based on environmental, social and economic impacts by conducting for example LCC studies or preliminary LCA studies. Environmental preferences can be incorporated in the design stage by setting technical brief for teams in charge of design. The concept design phase includes different assessment tasks aimed to ensure that risks are reduced, and costs are estimated accurately. In this stage, environmental constraints during construction are set. In addition, this stage provides contractor enough information in order to make a proposal. (Garbarino et al., 2016.)

### *Design phase*

In some cases, procuring authority is not procuring an object but expertise. In road construction projects experts such as engineers and consultants may provide knowledge and experience in key areas such as environmentally improved infrastructure, advice on innovations and conducting LCCs. This person's experience should be verified via references such as asking them to provide descriptions of similar projects or key actor's CVs. Procurement directives state that expertise can be used as an awarding criteria or as selection criteria. Detailed designs are the base for procuring construction work. GPP can be included in the process by setting structural parameters, rolling resistance, noise and drainage demands. In addition, procurer may give material specifications and preferences for execution of the contracts. During design stage, design brief and performance requirements are specified. In conventional arrangements, design and constructor are procured separately, however it is also possible that the design and construction are procured together. GPP criteria should be fully addressed in performance requirements. Usually, there is less direct control associated with the final design, when the design and construction are procured together. (Garbarino et al., 2016.)

The core criteria in choosing actors working among road design could include references of projects where environmental performance has been improved or is considered high quality. One possible way to assess this performance would be to demand the use of environmental performance tools such as carbon footprint or multi-criteria certification. Procurement authorities may also demand that construction materials are recycled, re-used or include characteristics that can be considered less harmful to environment compared to traditional ones. Demanding durability is one way of increasing environmental performance of materials. Other means to include GPP in core criteria is to demand certain mitigation actions such traffic congestion plans or designs for noise barriers during construction. More ambitious demands, comprehensive criteria, would include competencies on evaluating issues such as effects on rolling resistance, durability

of materials and the use of LCC, LCA and studies compliance with ISO-standards. Other demands are identical to those presented in core criteria. (European Commission, 2016b.)

In addition to these selection requirements, procuring authority can set more detailed design and technical specifications. European Commission (2016b) presents the use of low temperature asphalt as one of the possible specifications. The core criteria sets a specific maximum temperature (140°C) for laying bituminous mixtures. In the comprehensive criteria, the temperature limit is 120°C. However, in Finland pavements are considered being part of the maintenance work even though the first pavement is constructed already in construction phase (Hyvärinen, 2018). Therefore, European Commission's GPP cannot be used without modifying in Finnish road design procurements.

The design phase demands versatile expertise, and environmental expertise is one field among others. Skills such as engineering, planning, landscape and environmental-science specialties improve quality and respond to individual local circumstances. This is extremely important since very seldom there is a standard design solution that can be applied in every situation and in every location. Some of the key aspects in developing environmentally sensitive design is to give emphasis and resources to implementation of environmental plans that are site-specific. Project staff responsible for fulfilling these plans should be aware of their content and fully understand the reasons behind them. At best, designing process with environmental assessment and mitigation plans can provide a learning experience to all those participating in the project. When environmental concerns are weighed thoroughly already in the design stage, adverse impacts can potentially be turned into environmental benefits through reducing emissions and enhancing natural habitats. (IRF, 2013.)

#### *Construction phase: overseeing design and considering the use phase*

One of the most critical phases in infrastructure project is the time of construction. This is due to the complex nature and high resource demand during this stage. Complexity stems mainly from execution of the contract and designs. Resources needed to oversee the plans to develop environmental and quality management during construction play a vital role. Even though GPP criteria should have been identified already in the design phases, it is still possible to integrate GPP preferences in the construction stage. The execution depends highly on the fact whether or not design and construction are procured in separate contracts. If design and construction contracts are integrated, the design team has means to respond to contractors' requirements and vice versa. This in turn will help control risk and uncertainties. (Garbarino et al., 2016.)

European Commission's (2016b) GPP criteria for choosing main contractors deals with competencies of the main construction contractor and how the work is being executed. Both core and comprehensive criteria are based on the constructor's relevant competencies and work experience from the point of view of improved environmental performance. Experience deals with issues such as durability of construction materials, management of congestion, waste- and water pollution management during construction.

In addition, use of environmentally friendlier construction materials such as recycled raw materials are essential. International Road Federation (2013) has emphasised also the use of recycled materials even though they do not deal GPP in their publication. According to them, the strategic assessment of local recovered material suitable for certain construction project is critical if the clients want to lower the use of virgin excavated materials.

The comprehensive criteria includes mainly same aspects as does the core criteria in this stage. There are however, more detailed demands for using analysing tools in evaluating constructor's environmental performance. One of the key aspects in comprehensive criteria is to evaluate fuel consumption and issues affecting that. Unlike in core criteria verification, where information and references from past five years is sufficient to verify the contractor's experience, the comprehensive criteria demand that verifications shall be supported with other tasks as well. These tasks include third party auditing, LCA or LCC analysis or collection of performance parameters. (European Commission, 2016b).

The main contractor is responsible of fulfilling the design team's plans that the client has approved. If there is a contradiction between plans and practical work, the contractor should inform the procurer and agree with them about the deviation. It is important to include contract clauses that determine guidelines for these cases and also possible penalties if deviation is intentional. Contract clauses should also include those cases where the monitoring results are non-compliant with regulations or other expected results. (European Commission, 2016b.). Even though it is unlikely that quality and technical preferences should change during the construction, it can be beneficial to estimate what are the circumstances where changes could be accepted. After all, changes can also concern innovations and other means of improvements that could possibly save resources and create additional value to the project and ultimately to the client.

In GPP, part of the criteria are quality control tasks performed once the road is constructed. Usually this is conducted by testing the compliance with the design after construction, inspecting i.e. water pollution components and wildlife passages. These requirements should be described in detail already in the invitation to tender. (Garbarino et al., 2016.) One could argue that these are often such elements that operational actors may have more insight than those in charge of design. For example, there could be cases where improvements on paper are manageable but in reality, it would lead to greater workload and thus greater expenses.

In practice, during road construction most relevant environmental elements that are important to consider, if possible, are overall energy consumption, greenhouse gas emissions, water consumption, ecosystems, occupational health, traffic management and waste management. One way of enhancing green technologies in procurements is to gradually give value to them in the tendering process, making them part of the project from day one. In practice, this can be done by applying best practises, guidelines and rating systems that will motivate the development of environmentally sustainable goods. This would lower the risks associated with the lack of experience with such products that are not yet used in wide-scale production. (IRF, 2013.)



### *Maintenance: enabling the efficient use of roads*

Maintenance includes those processes that ensure safe use of roads, such as maintenance and upkeep during winters. The use phase of roads can be described as the stage when those decisions made in previous stages come to realisation. For example, when the procurer sets requirements for design team to integrate a low noise pavement in the project and the contractor builds the demanded infrastructure, the use stage shows whether the noise is in fact lower.

Procurer can set technical specifications for maintenance of roads. These technical specifications can include aspects such as handling of demolition waste or material recovery percentage of elements during maintenance projects. The core criteria, in this case, set that 70% of non-hazardous waste need to be recovered, whereas the comprehensive criteria's limit is minimum of 90%. (European Commission, 2016b.)

The use phase demands monitoring since maintenance decisions are based on monitoring results. Road maintenance is highly dependent of the location and its specific features such as vegetations, fauna, aging structures and habitants. Maintenance work for completed roads is done based on these conditions and available finance. (IRF, 2013.) The maintenance work itself can be carried out either by the contracting authority or a separate organisation specialised in this kind of tasks. There are many widely applied contracts models for road maintenance such as managing agent contract where the contract is usually limited to certain period. The contract can be extended if the quality is satisfactory. (Garbarino et al., 2016.)

## **2.3 Outcome of GPP**

Environmentally sustainable procurements have great potential as policy instrument and as a tool in helping nations and organisations achieve their economic, environmental and energy efficiency goals. (Bag, 2017) Already in 2002 in Johannesburg Plan of Implementation World Summit on sustainable development recognised the public procurements as a way to stimulate environmental protection while enhancing economic and social sustainability. Environmental benefits from sustainable public procurements being reduced environmental impact of goods, services and works and efficiency in recourse use. (Roos, 2012.) The true value of GPP stems from public authorities' role as a major consumer. Due to the great purchasing power that public entities hold, public procurements can have a strategic role in the society and enhance sustainable development.

The organisational capabilities such as economic and human resources, management and monitoring contracts can be defined as preconditions for GPP, meaning that these aspects need to be ensured before GPP is utilised. Nowadays it seems that larger and more resourceful organisations are more likely to exercise GPP practices than those of smaller size and fewer fiscal and human resources. Organisation's large size can work as advantage from client's side as well. Hall et al.'s (2015) study found that those

organisation's that are among largest public organisations can offer such projects to suppliers that losing the contracts have a massive impact of service provider's functions. (Hall et al., 2015.) Based on this finding, European Commission's (2017) definition seems accurate. They state that GPP is a market-based instrument and a policy tool that provides incentive in changing the decisions and product portfolios of procurers and suppliers. This description can also be used to shed light on GPP's two major outcomes: GPP is a potential tool to be used in developing societies towards sustainable production and consumption. In addition to this higher-level aim, GPP can be part organisation's own environmental work since it can be used in achieving their own environmental targets. GPP can also be used as a communication tool in raising general awareness about environmental impacts to wider public while setting an example for other organisations. (European Commission, 2017.) Since GPP in practice means setting criteria for goods and services, GPP's effectiveness and impacts on societies are dependable on individual procurer's decisions. (Bratt et al., 2013; Song et al., 2016.)

Previously there has been three goals for public procurements: equity, integrity and economic efficiency. These have been set by the legal constraints, requirements and regulations. (Ahsan & Rahman, 2017; Keulemans & Vande Walle, 2018.) In line with these aspects, public procurements have started to favour the reduction of costs. However, when all bidders, regardless of their nationality, have fair access to markets and the public sector is aiming for transparency, the low price-criteria has become the most enhancing factor in public procurements. (Keulemans & Vande Walle, 2018.) Environmental criteria for procurements can be seen as trivial and as a cause to rising costs that the taxpayers ultimately pay. On the other hand, people expect the public sector to set an example that the private sector would follow. Public entities are constantly balancing between these expectations. The negative side of favouring cost reductions is the opportunity to abuse procurement process by offering low price to clients. However, current legislation gives client the right to demand explanation to abnormally low prices. Clients have also the right and the obligation to discard any offers that have low price due to misconduct of environmental or social regulations.

Alhola and Kaljonen (2017) state that the use lowest price as a criteria in choosing a supplier, can be the outcome of insufficient information on how to define the need, quality and environmental sustainability of goods being procured. Ultimately, the problem lies in procurers not considering the environmental benefits as widely as one should or could. This might be because of the perceived cost of green products. According European Commission (2015) the reason for perceiving the green products to cost more is based on notion that the initial purchasing costs are higher but the operating, maintenance and/or disposal costs are lower for environmentally sustainable products during the whole lifecycle is assessed (European Commission, 2015). By using for example LCC or LCA as criteria, the true costs for the whole lifetime become more apparent. For example, environmentally designed buildings may have higher initial costs but when costs are evaluated based on the whole life cycle, the cost range is similar to conventional buildings. This is due to i.e. energy efficiency of the building which is realised only after longer period of operating time. (Varnäs et al., 2009.)

Procurement's impact goals set the ultimate purpose for acquisition. Such as cost-effective implementation, quality (applying for exceptional quality required for an item), innovation (seeking a new solution) or sustainability (procuring an environmentally friendly solution or aiming to support employment) are some of the of impact goals worth mentioning. (Valtion hankintakäsikirja, 2017, 132.)

Different impact goals can also serve greater strategic mandate. In fact, it can be argued that public sector does not only procure goods and service, but they also pursue higher-level policy objectives. This practice is called secondary policies or linkage, which ultimately can mean choosing actors on other than price related grounds. In secondary policies or linkages, the impact is based on the public sectors large size and the monetary power it holds. Thus, their decisions to use certain criteria in tenders can change the market structures and the nature of goods and services. (Kuittinen & La Roux, 2017, Keulemans & Vande Walle, 2018.)

It has been stated that since the public sector is concerned with societal well-being, it has a different view on improving sustainability than private sector does. Procurement processes and how priorities are set in purchasing decisions, not only tell about the organisation's values but also about its role in society. Public sector can help innovations break into the markets but GPP will only become effective once green innovations have spread throughout the society and enhanced as widely as possible. (Cheng et al., 2018; Walker & Brammer, 2012.)

Kuittinen and La Roux (2017) argue that requirements set in public procurements can also enhance the development of environmental management systems. As it is main contractor's obligation to verify their environmental awareness, supply chains may be under investigation and thus sub-contractors will want to enhance their environmental quality control through main contractor's demands. In a study conducted by Varnäs et al. (2009) the results show that obligations from organisation's environmental management system may guide procurers to use GPP but not in all cases. Studies (Testa, et al. 2016) show that certified environmental management systems in public organisations does not increase the success of green procurements unless the environmental management system is "mature" meaning that the environmental management systems has been implemented awhile back and it has established its role in the whole organisation.

Organisation's CSR work and environmental management depict organisation's values. Even though including CSR in procurement practices can increase costs due to the amount of labour, especially if CSR is not integrated throughout the whole organisation, the quality enhancements, open dialogue between actors and social credibility are often thought to be worth the costs. These results are called soft effects. (Varnäs et al., 2009; Kuittinen & Le Roux, 2017.) In addition, better communication, integration and collaboration with suppliers may be considered as part of these soft effects. Engaging with different actors through commitment, communication and training can improve the overall sustainability. This is the case especially concerning the procurements environmental, labor health and safety issues in procurements in small and local businesses. (Walker & Brammer, 2012.)

### **3 FINNISH TRANSPORT AGENCY**

Finnish Transport Agency (FTA) is a procuring authority that maintains state-owned public roads, railways and majority of waterways in Finland. The organisation is also in charge of developing the transport services and systems on these state-owned transport routes, promoting regional efficiency, traffic safety and sustainable development. Additionally, FTA coordinates the road management and is in charge of the transport sector management of the Transport and Infrastructure in ELY (Economic Development, Transport and the Environment) Centres. (Liikennevirasto, 2015 & 2018a). FTA procures most of the products and services required to fulfil their public responsibilities. The total volume of procurements is 1.6 billion euros annually, respectively. This amounts to 1/5 of the infrastructure procurements in Finland. (Liikennevirasto, 2015.)

The core processes of the FTA's operations consist of leadership, planning, traffic and mobility services, traffic management, development of the traffic network and enabling processes and services. (Liikennevirasto, 2017a.) FTA's internal clientele consists of FTA's management and staff whereas the external clientele consists of citizens and industries, to whom FTA's work becomes clear through its services. Some of the most important stakeholders of FTA are the Ministry of Transport and Communications and its subordinate agencies, ELY Centres, regional councils, cities, municipalities and service providers. (Liikennevirasto, 2017a; Tuominen & Hartonen, 2013.)

From the beginning of 2019, the organisation of the administrative branch of the ministry of transport and communications will change. In total, there will be three new organisations. The Finnish Transport Safety Agency (Trafi), Communications Regulatory Authority and certain functions of FTA will form a new organisation called Traficom (Transport and Communications Agency) whereas the remaining functions of FTA will be known as the Transport Infrastructure Agency. The Transport Infrastructure Agency focuses on planning, development, maintenance, coordination of road, rail and maritime transport infrastructure and land use. Those FTA's functions that merge into Traficom deal with monitoring, promoting and communication of transport, markets and services. The third organisation, Traffic Management Finland Oy, is responsible for traffic control and management. Some of these tasks will transfer from FTA. (Liikennevirasto, 2018b.)

#### **3.1 Administration of FTA until 2018**

Ministry of transport and communication and its administrative sectors' strategy guides FTA's operations. FTA and the Ministry's joint steering committee are responsible for operational, financial and strategic questions, legislative drafting and managing the administrative branch. The director general is responsible for the management of FTA with the help from FTA's own steering committee and other experts. The steering committee consists of directors of each division, the Director of Strategy and the Director

of Communications and Corporate Social Responsibility. (Finnish Transport Agency, 2016.)

FTA has five functional areas (Legal Services and Procurement Department, finance and performance management, regional steering, communications and stakeholder relations and safety and security) and four divisions (Operations Management, Planning and Projects, Infrastructure Management and Traffic Control and Management). Each division is composed of departments and units. The organisational structure is described in figure 1. (Finnish Transport Agency, 2018.)

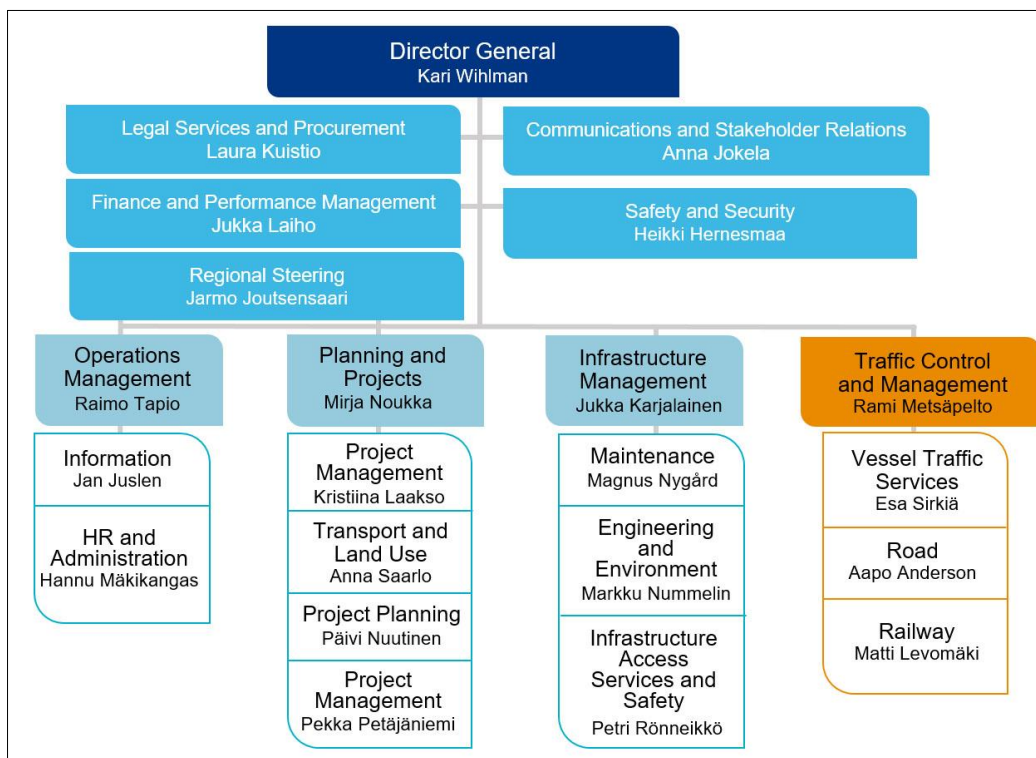


Figure 1. Organisational structure of FTA. (Finnish Transport Agency, 2018)

FTA's strategy is based on the organisation's mission statement "to enable smooth, efficient and safe travel and transport" and to the 2025 vision "Smart routes and intelligent traffic - for you". Strategy consists of action plan, vision, shared strategic goals and measures to clarify them (Tuominen & Hartonen, 2013). FTA's strategic goals are renewed ecosystem for mobility and transport, reliable digital services and greater operational efficiency, services based on a well-functioning and safe infrastructure and skilled professionals and an innovative organisational culture. (Finnish Transport Agency, 2018.)

An essential part of strategic guidance is to follow the trends and the operating environment. The goals set in the strategy are largely dependent on organisational culture and organisational values. The task of strategic guidance is to ensure that FTA's operations are based on proactive actions and monitoring changes in society and in the surrounding environment. This process determines the basis for the guidelines, activities

and the design of the operations. (Finnish Transport Agency, 2018; Tuominen & Hartonen, 2013.)

FTA's values are “boldly professional”, “Achieving results together” and “For the common good”. These values are the starting point for operations and decision-making. Bold professionalism means approaching new ideas openly, learning from trial-and-error, being transparent and trusting in expertise. Knowing customer needs and acting responsibly while guiding operations with the vision of future transport in mind turns the third value, for the common good, into reality. (Finnish Transport Agency, 2018.)

### **3.2 Environmental management**

The question of environment and routes is complex and versatile. The standpoint for environmental work can either be how does roads, water and railways affect the environment or how do environmental problems affect road, water and railways. Whatever the standpoint may be, these aspects are linked. Constructing, maintaining and using built routes cause environmental impacts such as emissions i.e. volatile organic compounds, nitrogen oxides, carbon monoxide, and particulate matter. Environmental impacts in turn affect the capability to adapt and mitigate other adverse environmental impacts such as climate change than can cause problems for infrastructure. These are all aspects that FTA needs to consider in their environmental work.

FTA's environmental management aims at developing traffic system that supports efficient, environmentally friendly and well-balanced regional and urban structure. FTA's environmental policies set the tone for practical work. Policies stem from legislation, the ministry of transport and communication's environmental principles and from FTA's strategy. (Liikennevirasto, 2014.)

During the last years, FTA's focus in environmental work has been in mitigating the climate change (Liikennevirasto, 2014). Climate change is highly important aspect to consider in the infrastructure sector. The infrastructure, such as roads, drainage systems, tunnels and bridges, are highly vulnerable to adverse environmental impacts caused by the climate change through changes in precipitation, sea level and extreme weather conditions. For example, flooding, heavy rains and snow showers, extreme temperatures and freeze thaw conditions may create potholes, softening asphalt and increased sunken tracks and grooves. Flooding of low-lying infrastructure is especially problematic due to erosion of road and river bases and thus exposing foundations. In these conditions, infrastructure may not operate as well as planned. Since roads and bridges are designed to last 50 to 100 years, climate change impacts may cause rising of operating and maintenance costs and/ or decrease life spans. However, the vulnerability of infrastructure is dependent on the location of the structure. In addition, there are also many uncertainties that only the time will tell. (Ethans, 2014, 15 – 17.)

Mitigating negative environmental impacts in society is closely linked to planning, constructing and maintaining the road-, rail- and waterways. FTA aims to evaluate the environmental impacts before any changes in the environment occur. The starting point

for all of the planning projects is to integrate land use and traffic systems. Keeping the traffic network in good condition and enhancing the already existing traffic services is aimed to consider future demands. (Liikennevirasto, 2014.)

Environmental strategy is meant to define the key environmental targets, principles and procedures for FTA. The key environmental challenges defined in strategy deal with mitigating the climate change, improving living environment and minimising the adverse health effects that are caused by the traffic and protecting the Baltic Sea.

FTA's environmental targets are devised based on core environmental challenges. Climate change is to be tackled with establishing GHG (greenhouse gas) emission and energy levels in different transport routes to 2014 level and by 2020 the levels are reduced 10% from 2015 level. In addition, transport routes are developed and planned in a way that reduction in energy use is possible. There are also procurement related targets: planning, construction and maintenance procurement must be fulfilled in a way that climate change is considered. Groundwater and soil contamination are dealt with updating the information about high-risk groundwater bodies and defining risk management schemes for these sites. Most urgent risk management schemes are fulfilled by 2020 and those contaminated soil sites that are considered urgent will be cleaned by 2020. In addition, by using salt substitutes and participating in groundwater and soil cleaning projects, groundwater risks can be reduced, and the quality of groundwater improved. Pesticides are not used for track and road maintenance in groundwater areas. Noise and vibration control can be achieved with procurement related actions such as considering in planning, construction and maintenance the adverse effects of vibration. Exposure to noise from road traffic can be reduced by using silent coatings, speed limitations and noise barriers, but due to the resource shortage, protection against noise and vibration cannot be sufficiently achieved unless speed limitations and silent coatings, as well as possibly rail attenuators are widely used. It is highly likely that with traffic demand reduction and introducing environmentally friendly modes of transport, not only emissions are cut down but also traffic noise will be dealt with. By preventing sea traffic accidents especially those concerning dangerous substances the well-being of the Baltic Sea is protected. Other aspects deal with biodiversity and material efficiency: as knowledge of the number and importance of valuable substitute habitats improves, so does the conservation of biodiversity. When the use of recycled material increases, the consumption of virgin aggregates is likely to reduce. However, research, development and improvement of procedures and guidance for the use of recycled materials is needed. (Liikennevirasto, 2014.) FTA's targets set in the strategy are described in table 3

Table 3. Finnish Transport Agency's environmental targets. (Liikennevirasto, 2014)

Environmental challenge	target for FTA
climate change mitigation and adaptation	<ul style="list-style-type: none"> <li>-Establishing the current level of GHG emissions and energy use from road-, rail- and waterway use.</li> <li>-Reducing 10% GHG emissions by 2020 from the 2015 level.</li> <li>-Planning and developing the road, rail and waterways in a way that there is a reduction in energy use.</li> <li>-Procurement practices in planning, construction and maintenance considerate the climate change.</li> </ul>
minimising groundwater and soil contamination risks	<ul style="list-style-type: none"> <li>-Updating the information about high-risk groundwater bodies and defining risk management schemes for these sites. Most urgent risk management schemes are fulfilled by 2020.</li> <li>-Contaminated soil that is considered urgent will be cleaned by 2020.</li> <li>-Using salt substitutes and participating in cleaning projects-</li> </ul>
noise and vibration control	<ul style="list-style-type: none"> <li>-Procurement practices in planning, construction and maintenance takes into consideration the adverse effects of vibration.</li> </ul>
protection of the Baltic Sea	<ul style="list-style-type: none"> <li>-Preventing sea traffic accidents especially those concerning dangerous substances.</li> </ul>

FTA's environmental programme brings environmental policy into life by including principles and guidelines on how to address the challenges introduced in environmental policies. Some of these principles and guidelines include procurement related actions. General principles and guidelines in answering to these environmental challenges are reducing greenhouse gas emissions and energy use in domestic traffic (climate change), developing traffic and route management (groundwater pollution, waste generation and saving natural resources) and reducing pollution from road, rail- and waterway use (air quality). FTA's environmental targets that include procurement related means and actions are climate change mitigation and adaptation, minimising groundwater pollution risks, air quality control and reduction of waste and saving natural resources. (Liikennevirasto, 2017b.)

Table 4 describes the targets for FTA and the procurement related means and actions for accomplishing the targets. These means are built on the notion that by improving procurement practices and instructions, greenhouse gas emissions and waste can be reduced, and energy and material efficiency improved in FTA's procurements. Out of the four environmental targets, climate change mitigation and adaptation and air quality control include actions that have a direct link with procurements. Climate change mitigation and adaptation is improved through route management procurements, maintenance contracts and pavements. In addition, some development actions such as LCA tools and renewing of procurement process were dated for 2017. Air quality improvements are to be achieved with demands concerning vehicles used in regional maintenance. Starting from 2017 vehicles must fulfil the EURO IV emission standard limits.



Table 4. Procurement related means and actions for accomplishing the environmental targets. (Liikennevirasto, 2017b.)

Environmental challenge	Procurement related means	Procurement related actions
climate change mitigation and adaptation	<p>Reducing the GHG emissions from traffic route management by improving procurement practices and instructions, mapping out the emissions from traffic services and maintenance contracts and by enhancing public transport, walking and cycling.</p> <p>Improving energy efficiency and lowering energy use in traffic route management by mapping out the current state and by improving procurement practices and instructions</p>	<p>improving the energy efficiency in road-, trail- and waterway management procurements during 2017-2020.</p> <p>operators in regional maintenance projects (starting from 1st of October 2016) must pass a course on environmentally efficient driving.</p> <p>R&amp;D: Green Procurements. Establishing the possibilities to consider climate change in renewing of procurement processes during 2016 - 2017</p> <p>R&amp;D: setting energy use and GHG emission related criteria for pavements being procured</p> <p>R&amp;D: developing CO2/LCA-tools for the procurements starting from 2017</p>
minimising groundwater pollution risks	Improving the traffic route management by improving operations, procurement practices and instructions	
air quality control	reducing pollution and emissions from traffic routes by controlling the emissions and by improving the procurement policies and instruction	Vehicles used in regional maintenance (class Is roads) must fulfil the EURO IV emission standard limits starting from 1 <sup>st</sup> of October 2017.
reduction of waste and saving natural resources	Improving the traffic route management by improving operations, procurement practices and instructions, promoting sustainable material choices, developing environmental permit procedures and material use statistics.	

### 3.3 Public procurements in FTA

In order for the FTA to carry out its basic task, it will acquire products, services, and expertise from different supplier market. The supplier markets vary greatly, as some of

the markets comprise of a large number of suppliers and some have only actors with a monopoly position. The role of FTA, as a subscriber and client, differs according to the market. In certain markets, FTA has a significant role and its activities can affect the entire sector and sector's operating conditions. On the other hand, there are markets where FTA has little significance, either on a national or global level. For this reason, procurement guidelines and development efforts are devised and implemented based on procurement categories. Procurement practices and controlling the supplier markets plays a vital role in fulfilling FTA's strategic goals and overall strategy: FTA works to provide high quality transport system and transport routes in Finland. By recognizing the different clients and their needs and by procuring the services and products that are needed to fulfil these needs, FTA has a chance to achieve this goal. (Liikennevirasto, 2013.)

Reducing negative environmental impacts can be achieved through improving the already existing transport routes and through considering environmental aspects when designing, constructing and maintaining the routes. FTA states that they demand high environmental quality and impact control throughout the whole life cycle of goods that they purchase. FTA expects their service providers to commit to environmental guidelines and being responsible for the environmental impacts their actions cause. (Liikennevirasto, 2014.)

FTA has categorized their procurements into three groups (A, B and internal procurements). Group A consists of those product and service categories where FTA plays a major and/or vital role according to supplier markets. There are procurements where FTA affects the operational conditions of the whole industry. In this category, the suppliers consist mainly out of actors operating in the infrastructure. Most of the procurements in this category have a direct link to their end users. Group B consists of those product and service categories where FTA plays a minor or mediocre role on a national or on a global level. Supplier markets in this category are more versatile and multidisciplinary than those in group A. Internal procurements consist of those purchases that linked to FTA's own operations such as ICT-services.

Group A and group B comprise of procurement categories (eight categories in group A and seven categories in group B). Each of these categories consist of 1 - 7 sub-categories or products groups (appendix 1). Internal procurement-group includes two categories and in total 7 product categories. This thesis focuses on group A and group B, therefore internal procurements are not dealt any further in this study.

Each procurement category has a category manager and several product managers. The category managers are responsible for setting the guidelines and development goals for their categories whereas the product managers deal with product and category instructions and devising model templates for the practical work. The project managers participate in the actual procurement processes. FTA uses internal extranet-site "Procurement instructions" (in Finnish Hankinnan ohjeistus) to guide and instruct their authorities in charge of procurements. The service includes instructions, guidelines and model templates. The service is part of FTA's operating system and the content of the service is constantly updated.

### **3.3.1 Procurement principles and development goals – the role of environment**

Procurement policies - guidelines and development goals determines the principles, development targets and development measures for public procurements in FTA. The aim of the procurement policies is to strengthen the end-user and supplier market management, the infra-industry productivity, and to make the FTA a pioneer in the infra-industry and a trendsetter in public procurements. (Liikennevirasto, 2013.)

Procurement principles and development goals for FTA's procurements are presented in a publication (Liikenneviraston toimintalinjoja 3/2013, Hankinnan toimintalinjat - linjaukset ja kehittämiskohteet) from 2013. This publication includes category-based information for 12 procurement categories. FTA's publication includes strategic focus points for all procurement practices. In addition, there are also category-based principles and development targets presented in the document (Liikennevirasto 2013). Document provides an overall picture of what was the role of environmental sustainability five years ago. FTA's authorities are aware of the need to update this document but due to organisational change it is not beneficial to do the work before the new organisational structure is secured and stable.

The strategic focus point for procurements deal with acknowledging and controlling the supply chains in a way that infrastructure's end-user, different forms of co-operation, sustainability, efficiency and expertise are considered in the procurement process. Based on these focus points, FTA devised improvement targets for procurement practices. Improvement targets are:

- 1) Devising, guiding and carrying out the right service level and quality for procurements throughout the supply chains.
- 2) Promoting and utilisation of markets.
- 3) Increasing proactive management and uniformity in procurements and utilisation of best available practices in supply chains.
- 4) Increasing security in supply chains.
- 5) Strengthening and diversifying the expertise and resources in procurement practices.

There are also other targets for improvement such as promoting the global supplier markets, ensuring the co-operation between suppliers and customers in a changing environment, promoting innovative new technology and promoting sustainable development. Apart from strategic point, there are also basic principles that are part of FTA's procurement practices. First one is based on the legislation and states that all of those procurements having monetary value above the national, EU or FTA's internal threshold will be fulfilled according to the procurement legislation. The second principal dictates that procurement practices and procurement management need to have a proactive standpoint. This means that end-users, supplier markets, project costs and risks are already taken into consideration during the planning of procurements. All of the procurements are expected to follow the principle of uniformity, meaning that different

documents and contracts will follow the same template, if possible. The fourth principal deals with applying the procurement policies; policies should be applied to procurements in a versatile and agile way. The last principal guides considering environmental sustainability and environmental management in projects. These GPP related issues should be considered if possible. (Liikennevirasto 2013.)

The category-based principles and development goals include environmental perspectives to some extent. The most common principles deal with material efficiency (Procuring solutions and services instead of products and procedures) and innovations (Improving innovations through procurement process and innovative contracts). Material efficiency was included in following categories: planning, investment projects, management and use, maintenance and ferries. Material efficiency, in this context, may also refer to the fact that client does not demand certain materials in their procurements. Instead they demand certain characteristics such as durability (Hyvärinen, 2019). Whereas innovation was part of investments, management and use, maintenance, ferries, sea transport services, commissioning and procurement services, technical systems and instruments and R&D. "Commissioning and procurement services" aims to include similar goals such as environmental consideration, for all the contracts through their whole supply chains. In the category "Materials" the target was to further develop the consideration of sustainable development and using CO2 emissions as a procurement criteria. Other categories did not include environmental perspectives in their development goals. Those procurement category-based principles and development goals that included environmental aspects are described in table 5.

Table 5. Finnish Transport Agency's procurement categories and their environmental principles. (Liikennevirasto, 2013)

Principles and development goals for including environmental perspective	Procurement category
Procuring solutions and services instead of products and procedures.	-Planning -Management and use -Maintenance - Ferries
Improving innovations through procurement process and innovative contracts.	-Investment projects -Management and use -Maintenance -Ferries - Technical systems and instruments -Commissioning and procurement services - R&D
Considering sustainable development and studying the possibility to use CO2 emissions as part of procurement criteria.	-Ferries
Considering sustainable development in those procurements that are energy intensive and using CO2 emissions as a procurement criteria.	-Materials

## 4 DATA AND RESEARCH METHOD

This chapter will elaborate how this qualitative study was conducted. According to Leavy (2017, 9) there are five major research approaches: quantitative, qualitative, mixed methods research, arts-based research and community based participatory research. These approaches may overlap. Since this thesis uses the qualitative research approach, other approaches are not looked any further. Qualitative research was chosen for this thesis because it usually is appropriate for those studies that aim to explore, describe and explain phenomena.

Leavy (2017, 9) further defines the aim for qualitative research as generating meaning through inductive approach. By exploring, robustly investigating and learning about social phenomenon, studies will shape the knowledge about the subject. The outcome of a qualitative study is an unpacking of meanings that people credit to activities and situations. Flick (2002, 17) uses the notion of symbolic interactionism to describe this action.

Flick (2002, 16) describes that qualitative research has three positions that conceptualise how studied subject relates to the context in which it is studied. The three positions mentioned above are symbolic interaction (mentioned before), ethnomethodology and structuralist positions. According to Flick (2002, 17) people's actions are determined by the meaning that these actions have for them. The basis of this meaning is the social interaction that people have with others. Moreover, these meanings are altered based on the interpretation of people interacting with social structures and issues at hand. The framework of ethnomethodology is closely linked to symbolic interaction since it deals with the reality that people produce in interacting with others. This interaction is structurally organised and context depending making it so that conversational interaction is never disorderly, accidental or irrelevant. However, the true value of qualitative research comes from deriving a picture that describes people's subjective experiences and meaning-making processes and acquiring detailed information from a small sample.

Triangulation is a principle in qualitative research. Flick (2002, 226) uses the term triangulation to describe different methods, groups, settings and theories associated with the validation and enrichment of collected results. According to Yin (2016, 87) the basic notion of triangulation is that there are at least three means of verifying and validating piece of data. Data triangulation refers to the sources of data, investigator triangulation to the use of different observers or interviewers, methodological triangulation to means of measuring and theory triangulation to perspectives and hypotheses (Flick, 2002, 226). As can be seen from the above, there are different forms of triangulation. Out of these, this study used data triangulation and the procurement documents and interviews contributed to this. Data triangulation was chosen because the versatile nature of the subject. In addition, using only one source of data felt inadequate due to the vast number of procurement categories. The results were analysed by using thematic approach.

This study both case study as a method and thematic analysis as a form of data analysis. According to Flyvbjerg (2011, 301-316) the base for case study lies in choosing a unit of study, setting its boundaries and its "casing". Unit's boundaries determine what is the case and what is the context of a case. Case studies are intensive studies that comprise more detail and variance. They also typically evolve in time in a way that independent and irrelevant occurrences form an entity that is whole. In addition, case studies are also context dependent. According to Flyvbjerg (2011, 301-316) concrete case knowledge is as valuable as general, theoretical knowledge. Case study produces concrete and context dependent information, since predictive and universal theories are inexistent in studying human actions. This case study aims to summarise all the diverse information on the subject of green procurements in FTA.

Case studies are more interested in describing the data and results than it is in testing theory and hypothesis. Interviewees and other data sources are chosen based on the information that they are expected to provide, not randomly. Another characteristic for case study is that research is conducted in a flexible manner and plans are changed if needed. Quite often, research plans and research questions are revised as study progresses. (Aaltio-Marjosola, 1999; Flyvbjerg, 2011.)

Data collection methods, such as interviewing, observing, collecting and examining, are chosen based on the phenomena being studied. All of these data collecting methods produce different kind of data. For example, interviews produce verbal type of data when a person explains actions, recollections and expressed beliefs or viewpoints. Collecting on the other hand produces contents of printed materials, records or artefacts that are comprised of written words. (Yin, 2016, 138-140.) Data for this thesis was collected from expert interviews (n=15) and from Procurement instructions – extranet's content. In total 220 procurement documents and extranet pages were analysed for this thesis. Collected data is further described in the following chapters. The justification for choosing interviewing and collecting methods can be found in Flick's (2002, 29) argumentations that texts are essential data for findings, interpretations and in the end, communicating the findings.

This study had an inductive approach. The approach for a study can be inductive or deductive. In inductive approach generalisations are made from observations and in deductive the emphasis is testing observations based on theory or generalisations. Qualitative content analysis can be conducted with thematic analysis where the first part after familiarising with the text is coding those units that answer researcher's questions. Thematic analysis aims to identify patterns from the data. Thematic analysis suits especially well to those studies that focus on people's views and perceptions. (Eskola & Suoranta, 2001.)

The codes for collected data can be derived from the content of literature or from the interview's expressions and can be marked in the text for example by using different colours in order to help the grouping of information. (Alastalo & Åkerman, 2010; Eskola & Suoranta, 2000; Flick, 2002.) In this thesis, both sources of data were first coded using research questions as a base. Different aspects (codes) were marked with a different color in the texts. After this task, same codes were grouped together based on different themes

which were reviewed. Those preliminary themes that did not bring any additional information about the studied subject, were discarded. Themes were further analysed in order to find latent levels which Maguire and Delahunt (2017) describe as a mean to examine underlying concepts and assumptions and ideologies. Next, thematic analysis of documents and interviews are presented in more detail.

#### **4.1 Documents**

Collecting and examining data is based on the collecting of objects such as documents related to the topic of the study. Objects can be collected from archives, electronic sources or from websites. The collected objects produce verbal, numeric, graphic and pictorial data about the physical and social environment and about abstract topics such as organisation's policies and procedures. (Yin, 2016, 154 – 155.)

In this thesis, first part of content analysis focuses on documents collected from Procurement instructions - extranet. The document content analysis was performed during the summer of 2018 as part of a preliminary study that was conducted as part of FTA's internal development work. Analysis consists of six steps that followed thematic approach.

1) Documents from Planning, Investment Implementation, Upkeep and Use, Maintenance and Technical Systems and Equipment categories were collected. These categories were selected for review as they were expected to have the greatest potential to influence the environmental aspects. All of the procurement categories can be seen in appendix 1. Documents consisted of model templates and texts collected from the extranet-site. Some of the model templates included instructions for procurers while other documents were merely examples on what was considered in previous projects. List of documents can be seen in appendix 2.

2) Documents were analysed using the key words to search environmental criteria or requirements. The used key words were "environment", "nature", "waste", "soil", "water", "energy", "climate", "protection" and "material" in their various forms. Keywords were chosen based on the FTA's environmental programme and policy. The aim was to collect information how FTA's authorities are instructed to consider environmental aspects in procurements and how these aspects are integrated in the actual procurement process.

3) Those documents including keywords were further grouped based on their type into two groups: instructions and model templates.

4) These documents were then manually coded according to their content. The coding followed research questions. The role of environmental sustainability was evaluated through coding different environmental themes and the integration of environmental

issues through evaluating the characteristic of environmental criteria. Each coding unit (minimum a sentence stating environmental issues) were marked with a different colour.

5) Results from coding were analysed using thematic approach in order to form a comprehensive role of environmental sustainability issues in these documents. The themes found based on the analysis is described in the appendix 3. This appendix includes also information about the nature of environmental aspect in procurement process since they are further divided into minimum requirements and recommendations for service providers or, in rare cases, for procurers as stated in instructions.

6) Evaluating the results and their contribution to this study.

Procurement instructions – extranet contains generic information that supports the tendering process and category-based templates to be used when conducting procurements. Instructions and model templates are further developed and completed based on needs. It became apparent while analysing the collected data that it would not create any additional value to summarise the findings from analysed documents. This was due to the fact that there is scarcity in universal and/or general environmental aspects that would penetrate through whole procurement process in every procurement category. In addition, the aspects found in this analyse consist mainly of one or two sentences integrated and incorporated into other contract clauses. However, these findings cannot be discarded completely since they provide valuable insight of the basic principles of procuring goods and services in FTA: each procurement is independent, and its documents are devised according to individual needs of the project. These findings are consistent with the results gathered from the interviews. Therefore, findings from document analysis and from interviews are brought together and presented in a way to construct a description of the current situation. All of extracts from the documents and quotes from the interviews are translated by the author of this thesis unless otherwise stated.

## **4.2 Interviews**

Information can be gathered from many different sources. One of the sources are the experts we may or may not know personally. Even though these experts are leaders, authorities or politicians, there are factors such as education and status characteristics that affect the perspectives and biases of their answers. (Leavy, 2017, 4.) These are important issues to keep in mind when deciding which people to interview. Expert interviews are used in those cases where interviewees are chosen based on the information that they are expected to have about the studied phenomena. Expert interviews are highly beneficial if there is lack of documented information about the studied subject or that the documented information describes processes that are ongoing. (Alastalo & Åkerman, 2010; Flick, 2002.)



There are four basic principles for expert interviews: expert has knowledge about certain phenomena and thus they cannot be replaced by other interviewees. The information collected from interviews is based on facts and descriptions of processes and it is possible that interviewees give wrong answers. (Alastalo & Åkerman, 2010, 376.)

Interviews can roughly be divided into structured and qualitative interviews. Qualitative interview is not as strictly scripted as it is in structured interview (i.e. questionnaire or a poll). (Yin, 2016, 143.) Expert interviews can be considered as a form of semi-structured interviews where interviewee is guided through the interview with methodological aids, meaning different types of questions. Interviewee has the freedom of answering these questions spontaneously based on their own expertise (Flick, 2002, 80-89). In qualitative interviews, the researchers have a certain agenda of study questions and the questions are posed to interviewees according to context and settings of the interview. The conversational mode of this kind of interview leaves room for more interaction between researcher and interviewee. Even though the conversational mode may not seem that much different from routine spoken communications, there are some major differences. These differences include imbalance in the amount of speak (researcher must speak less than the interviewee by asking follow-up questions), non-directiveness of researcher (interviewee must be given the space to express their meaning and colour the boundaries that the researcher has set) and staying neutral (researcher may use manners, tone of voice or other signals that affect the interviewees words). (Yin, 2016, 143 – 145.)

Interviews in this study serve two purposes. First, they provide insight on what is the role of procurement instructions in FTA or in other words, instructions about considering environmental aspects in procurements. Second, since the procurement instruction extranet-site is very generic and focuses mainly on how to proceed with the tendering process, expert views give knowledge on the matter of procurements in practice and about their views on a practical level.

The interviews were conducted during July and August 2018. Manager Laura Kuistio from legal services and procurement unit first contacted the category and product managers via email. Kuistio's cover letter can be found in appendix 4. Later I contacted the interviewees and suggested interview dates for suitable candidates.

Interviewees were chosen based on two criteria, first the interviewee must work with procurements that are part of procurement groups A or B. Second, the interviewees must be available for interviews during June-August 2018. In addition, main emphasis was put to those interviewees that work in road-, railroad- or waterway management (maintenance, upkeep or construction) and in planning of different transport routes. Some of these interviewees were also asked to suggest further interviewees thus using the snowball technique. In total 19 people were contacted by the interviewer, one declined to be interviewed and 3 did not respond to the message. The final interviewees (15 people) worked as category managers, product managers or as project managers. Some of the interviewees worked both as a product and project manager. The interviewees are described in a table found in appendix 5.

The table contains the identifier (P1...P15) given to the person, as well as the description of the person's division and title. The column "Other" includes such work tasks that are not category-, product- or project manager's responsibility, but are related to procurements, for example, through a procurement approval process. The "Other" column has also been used for people who no longer work among any category or product responsibilities. Changes in job descriptions came apparent only during the interviews. The interviewees' experience among procurements varied between 5 and 20 years. Out of the 15 participants 13 worked in design, investment implementation and in route maintenance categories. Most of the interviewees were selected from procurement group A, since the aim of this thesis was to examine the environmental aspects of the most influential procurement categories.

The interview questions (appendix 6) were formulated in a way that they would map out interviewee's experiences and views on procurement process without directly revealing the research questions of this thesis. Justification for this was the aim to construct a truthful and diverse description of the situation where participants would themselves choose which issues are relevant and which are not.

There were five different set of questions to give some structure for the interviews. The first one consists of questions concerning the role of the interviewee in FTA and procurement process in general. The second set of questions dealt with procurement guidelines, policies and development targets in FTA's procurements. The third set of questions concerned the actual criteria in procurements and the interviewees take on this matter. The fourth section mapped out the interviewees view on FTA's role in society and its ability to influence different themes through procurements. The last section dealt with the future trends that were most likely to occur in procurements from interviewees' point of view. If the interviewees did not bring up environmental issues in their answers, further questions concerning this standpoint were asked.

All of the interviews were recorded and transcribed. After this phase, each transcript was read through and abstract was written. These abstracts were used in a preliminary study conducted simultaneously with this thesis. Longer statements from the interviews were used to build a comprehensive picture of the current status of the procurements. Thus, forming the second part of content analysis performed in this thesis. These individual statements were also used when interviews were coded. Coding was done manually based on research questions. Each coding unit (minimum a sentence) were marked with a different colour. In order to analyse factors affecting uptake of environmental criteria in procurements interviews were also coded considering these findings. Because environmental aspects stemming from the legislation are thought to be the minimum level of environmental sustainability in FTA's procurements, enhancing and hindering factors presented here deal with exceeding that minimum level. These factors shed light to the third research question on what factors enhance and what factors hinder including environmental sustainability in FTA's procurements.

After coding and grouping the codes four themes were discovered from the interviews. These themes were basic principles in FTA's public procurements, procurement characteristics, FTA's possibilities to influence and factors affecting the use environmental sustainability characteristics in procurements. Themes were further coded and divided into sub-themes presented at the table 6. Out of these themes, only basic principles in FTA's public procurements did not have environmental aspect, meaning that based on the interviews environmental sustainability is not one the core elements to consider when procuring goods and services. However, other sub themes in this category may include factors that can affect the way environmental sustainability is dealt in FTA's public procurements and in the procurement process. Themes are presented more detail in following chapters.

Table 6. Main and sub-themes from the interviews

Main theme	Subthemes
Basic principles in FTA's public procurements	<ul style="list-style-type: none"> <li>- Following internal instructions throughout the whole process</li> <li>- Complying laws and regulations throughout the whole process</li> <li>- Planning and preparing of procurement process before actual acquisition</li> <li>- Using model templates in tendering</li> <li>- Monitoring contract clauses</li> </ul>
Procurement characteristics	<ul style="list-style-type: none"> <li>- Clear and unambiguous criteria for procured goods</li> <li>- Procuring high- quality</li> <li>- Procuring environmentally acceptable design(s)</li> <li>- Procuring goods in an economical way</li> <li>- Mandatory requirements and voluntary recommendations described in the tendering documents</li> <li>- Equal treatment of tenderers</li> <li>- Environmental criteria integrated into other requirements</li> <li>- Balance between different characteristics such as environmental considerations and other demands</li> <li>- Environmental demands that are based on the legislation</li> <li>- Environmental demands that are based on the procurers expectations and knowledge</li> </ul>
FTA's possibilities to influence	<ul style="list-style-type: none"> <li>- Minimum requirements in procurements are sufficient</li> <li>- Procurements are not ideal tool</li> <li>- FTA is an example for others</li> </ul>
Factors affecting the use of environmental sustainability characteristics in procurements	<ul style="list-style-type: none"> <li>- Enhancing factors</li> <li>- Hindering factors</li> </ul>

## 5 RESULTS: THE ROLE OF ENVIRONMENTAL SUSTAINABILITY IN FTA'S PROCUREMENTS

Interviewees stated that the basic principle for everyone participating in procurements is to follow internal instructions, procurement legislation and to use model templates. The source for instructions and templates is the procurement instructions – extranet. Deviation from the instructions was thought to be risky and could lead to a result where service provider or tenderer complains about the procurement decision or the procurement process. This, in turn, has a negative impact on FTA's public image.

Each of the procurement category-based instruction in the Procurement instruction – extranet site follows the basic A, B, C- structure of procurement process (picture 2). A being the planning and preparing of procurement, B being the actual tendering process and C execution of contract. Each of these sections consists of general information about the procurement phase and model documents that are used in each step. Templates vary according to procurement category.

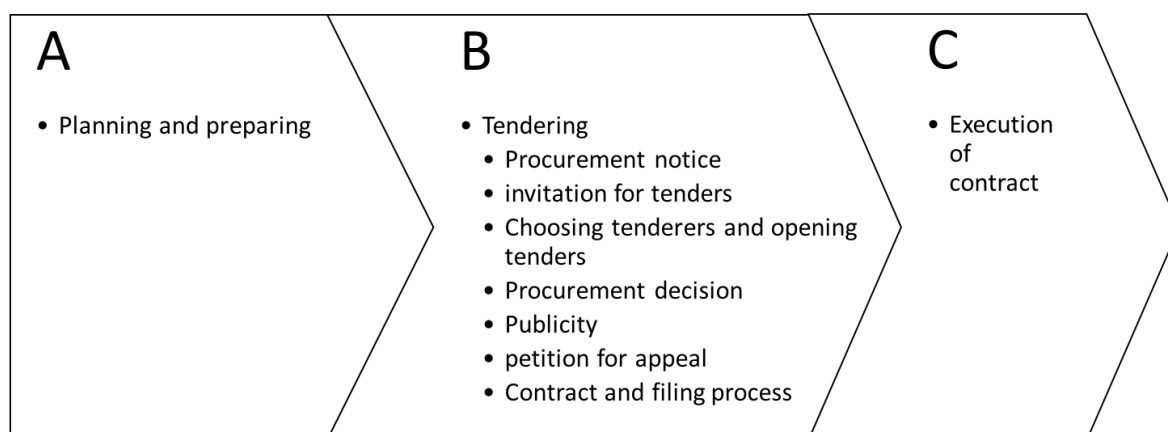


Figure 2. Basic structure of procurement process in FTA's procurement Extranet (FTA's Procurement instructions – extranet, 2018).

Environmental themes and criteria in FTA's procurement documents (appendix 3) collected from the procurement instructions – extranet includes minimum requirements and recommendations in the form of contract clauses. These clauses fit under themes of climate change mitigation, state of the environment and material efficiency. Contract clauses were included in “operational and quality plan in road maintenance”- and “environmental requirements in maintenance of railroads and their safety equipment”- documents which can be found in section B, tendering process, of procurement instructions. Environmental aspect were also included in “environmental requirements in maintenance of railroads and their safety equipment”-, “safety document of route projects”-, “project programme in road maintenance”-, “project programme in construction projects”- documents and in “project programme in waterway construction projects”- and in “product description in design”-documents. These documents were

placed to section C (execution of contract). Content of documents is further described in chapters 5.2 and 5.3. One of the basic principles brought up by the interviewees also was the task of monitoring that the contract clauses are fulfilled. In addition, interviewees aim to analyse the finalised procurement process in order to improve actions in the future. These basic principles are closely linked to procurement process structure presented above. Each of the sections (A, B and C) are connected in a way that the work done in previous stages affects the next ones.

## 5.1 Planning and preparing the procurement

Section A, planning and preparing the procurement is the first phase of procurement process presented in the extranet- site. Documents and data collected from this section did not include any of the key words used to conduct the content analysis. However, since the extranet-site is being updated constantly, this result only describes the current situation during summer 2018.

Interviewees emphasised the role of planning and preparing of procurement and the procurement process before tendering. Much like in the content of extranet, environmental sustainability was not considered part of planning and preparing phase or at least it was not brought up during the interviews. According to the interviewees planning and preparing is done in order to ensure that process is complying laws, internal instructions and regulations. Thorough planning and preparing was considered especially important since making changes in tendering and/or contract phase is time consuming, expensive and can even lead to suspension of the procurement.

*We think that analysing the procurement is really important. So that we truly get familiar with what we are procuring. (Interviewee P12.)*

Part of planning and preparing the procurement is evaluating the potential demands for the goods being procured. Describing procurement's characteristics in tendering process (section B) demands that analysing and preparing phase is conducted adequately. Requirements for goods and services must be unambiguous and clear to everyone. One interviewee (P5) explained this dilemma as such *“if we want an engineer that can design a road for us, there is no point to describe the requirements in a way that someone who designs railroads will win the bid”*. Another important aspect brought up by an interviewee (P10) was that part of the preparing phase is to conduct market research in order to achieve a clear mindset on what is needed, who are the potential service providers and suppliers or are there any.

According to the interviewees, in those cases where environmental aspect is not considered the reason lies in lack of resources such as time, human resources and expertise. One participant (P12) explained that environmental considerations could be included in construction phase if environmental issues were integrated already in the design phase or by allocating more time to planning and preparing the construction phase.

Both of these solutions are not easily fulfilled. Reasons are described more detail in chapter 5.4.

## 5.2 Tendering process

Section B, tendering process, included environmental aspect in those parts that instructed on devising procurement notice, invitations for tenders, about choosing tenderers and opening the received tenders. This section provides information of the legislation that guides public procurements.

Procurement instructions – extranet states that invitation to tenders must contain all the information that a potential supplier needs to form a tender. Invitation to tender must also include the criteria that is used to evaluate the tenders and what is the ground for choosing the winning tender. According to procurement legislation (act on Public Procurement and Concession Contracts 1397/2016 and act on public contracts and concessions of entities operating in the water, energy, transport and postal services sectors 1398/2016) client can request tenderer to provide proof of their technical and/or professional abilities. This can be demonstrated for example by preparing a document that indicates how environmental management and issues related to this are dealt with during the contract period.

The operational and quality plan template for maintenance of roads includes requirements for both tendering and the contract implementation phase. The operational and quality plan in the tendering phase is used to evaluate the supplier's abilities and skills. The selected service provider must follow the initial plan presented in the tendering phase. Although its nature is preliminary and can be updated, its nature is binding. Operational and quality plan may lead to the rejection of tenderer if the plan is not devised according to the client's expectations. Plan's content can include for example how to minimise negative environmental impacts.

### **Maintenance of roads for the period of 2019 - 2023, Operational and quality plan, extract:**

*The operational and quality plan should include.*

- *how waste management and environmental issues are considered,*
- *how the use of environmentally polluting materials is minimised,*
- -
- *plans for the use of discharge masses (authority permits etc),*
- *mapping of environmental risks*

FTA uses price-quality ratio (the most economically advantageous tender or MEAT) that enables the use of qualitative criteria such as environmental or innovative characteristics of product or service to be used instead of only the price. However, the shared perception between interviewees was that finance guides the procurements in infrastructure projects more than other aspects. FTA instructs that if a tenderer offers product or service in an abnormally low price, contracting authority has the right to request explanation for the

price. This clause is based on the procurement legislation. Contracting authority could for example demand proof that the supplier obeys the environmental laws and regulations. If the explanation is not satisfactory, the contracting authority can reject the offer. In addition, the contracting authority must reject the offer if the abnormally low price is the outcome of misconduct in areas such as environmental-, social-, or labour laws or regulations. However, these misconducts need to be verified.

Interviewees were clear that prioritising between different demands, whether they were monetary or qualitative, was not wise. According to the participants there are aspects that cannot be compared or that there is no disproportion between issues such as communication, safety and environment but all of the aspects are equally important.

*Comparing issues such as environmental friendliness and safety or lifetime together is not necessarily wise. (Interviewee P14.)*

Comparing different requirements for procurement and choosing only some is a complex task because procuring authorities need to have the understanding of the procured goods before demanding the requirements and choosing how to evaluate bids including these requirements.

According to the interviewees' requirements can be mandatory or recommendations for service providers. In FTA's case both of these requirement types are presented mainly in the form of contract clauses. By participating in tendering, service provider is expected to commit fulfilling these requirements. According to the interviews, FTA not only demand certain features from the goods they procure but also give recommendations to their service providers. These demands and recommendations vary according procurement. There are also differences between FTA's procurement categories on what is the extent to which environmental considerations can be included category in question.

Invitation to tender - template for design services' environmental aspects are part of technical and professional capabilities of a service provider. For example, execution projects' preliminary building plan can be evaluated based on different safety and environmental criteria. This can be done as setting award criteria and by giving extra points for those who offer solutions that are thought to being better than average. Interviewees were not that keen on using award criteria due to the nature of the process. Ultimately thee equal and fair treatment of tenderers is the guiding star for public procurements and according to interviewees award criteria can compromise this. In addition, interviewees stated that award criteria and challenges related to it extent to beyond tendering phase. Decisions about fair and equal requirements are made during planning and preparing the procurement and breaching these demands can be seen during the contractual term.

*Additional points are really challenging. First of all, how do you weigh different demands? And what if someone promises to fulfil something and they do not follow through? Should there be sanctions? In my opinion it is minimum and mandatory criteria for everyone. (Interviewee 12.)*

Design assignment's task definition template demonstrates a different approach for including environmental aspects in tendering documents. The template includes a description of the task by setting the design task, its background, goals and the design process practices. The goal of planning can be set, for example, through the environmental impacts such as reducing noise pollution and reducing the risk of contamination of groundwater resources as was done in road construction design template.

Even though environmental sustainability may not necessarily be on a par with requirements such as safety, environment is part of procurement criteria indirectly. For example, high quality is an aspect that interviewees linked to environmental sustainability: long lifetime and durability are expected to lower the maintenance fees and resources needed to renew the structures. This vision can be identified also life-cycle approach.

Quality-related criteria can be defined in tendering documents, for example, by setting technical quality requirements for procurements. On the other hand, quality requirements can also be set for used materials. According to the interviewees' particularly challenging is setting quality standards in design i.e. when procuring an expert service. The difficulties in understanding the concept of high quality are familiar for the service providers as well. In certain situations, service providers have difficulties understanding strict requirements and reasoning behind them, especially if there is a contradiction between FTA's and municipalities' quality demands.

*Criteria for procurement are largely related to quality. Especially when talking about design services, it has a wide range of perspectives on what it is and how it is measured. (Interviewee P1.)*

Construction project's requirements include clauses that recommend using biodegradable oil but also demand that suppliers ensure waste management and noise control as local environmental authorities instruct and/or is stated in environmental legislation. It can be stated that obeying the environmental laws is the minimum requirement for all the service providers. Quite contrary to concrete demands and recommendations of construction projects, design requirements have a wider and more abstract approach.

According to the interviews, environmental sustainability is present in every step of the design phase since design's outcome must be acceptable from environmental, social and economic perspective. There are however mandatory nature surveys that must be conducted during the design phase. Information, such as threatened species and their habitats, collected from these surveys are then included in the final design. This kind of requirements make expectations more concrete. There are also some studies such as investigating contaminated soils that can be conducted only by certified actors. Thus, making certification a minimum requirement that cannot be dismissed.

Maintenance contracts for roads include emission regulations for machinery used by the service provider. In addition, service providers are expected to report their fuel consumption and construct an environmental plan describing how environmental aspects



are considered in their work during the contract period. There are also environmental requirements present in maintenance of railroads and their safety equipment- documents.

**Track and Safety Equipment 2014 - 2019 Maintenance Area 7 (Karelian track), Invitation to tender, annex 1.14, Environmental requirements, extract:**

*The supplier is responsible for considering the energy efficiency and the measures needed to adapt to climate change. During maintenance work, the supplier must aim to optimize energy consumption and guide employees to adopt energy-saving solutions and practices. The supplier must present in their environmental plan the means to curb greenhouse gas emissions caused by the maintenance work and improve their energy efficiency.*

According to some of the interviewees, the problem with recommendations lies in their voluntary nature. When the requirements are voluntary and, according to one interviewee, obscure, there is always the high possibility of suppliers not fulfilling them during contract period or fulfilling them in a way that only the bare minimum is done.

*Expressions such as should and to seek are not good. Clauses must be concrete and requirements unambiguous so that a pupil in elementary school understands them. (Interviewee P6.)*

### **5.3 Execution of contracts**

Section C of the procurement instructions consists of guidelines and templates for executing contracts with those service providers whose offer has won the bid. This section included environmental aspect in the form of contractual penalties. According to the instructions, contracting authority is entitled to impose a fine if a service provider neglects environmental regulations. This clause is also included in the procurement templates and brought up by the interviewees. Most of the requirements that are based on the legislations concern service provider's actions and expertise during the construction and maintenance phase. These requirements are based not only to the environmental protection legislation but also FTA's environmental guidelines. In addition, there are so-called standard actions or *“the knowledge about good practices, that is, what should be included”* as one interviewee (P11) put it. These requirements are those that authorities issuing the environmental permit expect to be considered such as communication with the primary stakeholders.

Environmental requirements are part of project programme that is an attachment of project contract. Consequently, the mandatory nature of programme is based on the contract's binding nature.

**Repair construction for road, railway and bridges, Project contract, Annex project programme, extract:** *The contractor must comply environmental legislation and the regulations issued by the authorities under environmental legislation, as well as the authorisations and other declarations issued under environmental legislation related with the contract. - - Waste from construction and demolition activities are sorted separately for steel, wood, concrete, asphalt and mixed waste. - - The contractor must comply with the environmental guidelines of the Finnish Transport Agency*

According to the interviews, both FTA and the service providers share the interest to monitor environmental impacts during the construction. The reasoning for this lies in publicity, stakeholder's acceptance and showing to being worthy of that trust. However, monitoring is an activity that some of the interviewees felt was problematic due to lack of resources on their end. If requirements are not met, the client has the right to halt work until violations are corrected. In some cases, there are clauses that enable issuing sanctions to service providers violating the environmental requirements.

***Track, Road and Bridge Building Contract, Bridge Repair and Waterway projects, Project contract, extract:***

*Fine*

*All deviations always result in a fixed amount of the fine imposed by the subscriber, as shown as follows. The fines are fixed (VAT 0%).*

- Non-compliance with the quality plan and environmental negligence. This includes, but is not limited to, the following:*
- Breaches in the preparation of technical work.*
- Lack of proof of fulfilment of the quality requirements set out in the plans (including quality labelling of materials).*
- Lack of proof in the work of the main contractor in monitoring the quality assurance of subcontractors' work.*
- Negligence in real-time quality assurance.*

*First time: 1000 EUR, second time: 2000 EUR, following times: 3000 EUR*

With road maintenance practices, there may be a variety of damage to road users, property owners and other third parties. The contractor shall be liable for damages incurred by third parties in the event of damage is due to negligence of contractual obligations or if the liability is otherwise due to the contractor on the basis of the law.

## 5.4 Enhancing and hindering factors

Those enhancing and hindering factors that affect the integration of environmental sustainability to FTA's procurements are presented in table 7. These factors describe those issues that either steer authorities towards or away from including environmental sustainability in their procurements. Collected factors are further divided into external and internal factors. Based on the interviewees, most of the enhancing and hindering factors are internal by characteristic.

Table 7. Summary of enhancing and hindering factors from the interviews.

<b>Enhancing factors</b>	
<b>Internal factors</b>	
Clear instructions	
Collaboration with other units	
Past experiences	
Perceived benefits (reputation, societal acceptance)	
Procurer's expertise	
Strategic work on administrative level	
<b>External factors</b>	
Legislation and regulations	
Political atmosphere	
Stakeholder pressure	
<b>Hindering factors</b>	
<b>Internal factors</b>	
Ambiguity of the concept	
Attitude	
Goal of efficiency	
Hurry	
Inefficient procurement procedure due to bureaucracy	
Lack of collaboration between units	
Lack of expertise	
Lack of resources (money, time)	
Lack of verification methods	
Limited means to influence the procurement practices	
Perceived costs	
Uncertainties brought by the long timespan between design and implementation	
Unclear role of procurements in strategies	
<b>External factor</b>	
Inefficient forms of collaboration between authorities	
Service providers' expertise (external)	

The most relevant factors for increasing the use of environmental requirements included factors such as collaboration among different actors, feedback from stakeholders, clear instructions and legislation. In addition, procuring authorities expertise, positive experience from the past, perceived benefits and strategic and political support were thought to be key enablers to including environmental aspects in procurements.

Stakeholders' awareness of the environmental impacts of route projects may increase the demand for environmental protection. Interviewees stated that inhabitants experienced or feared environmental disadvantages such as noise and vibration and vocalised these to authorities which in turn have the responsibility to listen and try to mitigate negative impacts. Another stakeholder group brought up by the interviewees was the local authorities. According to the interviewees, local authorities such as environmental authorities, emphasised the consideration of environmental protection i.e. species and their habitats and FTA authorities are compelled to fulfil the expectations based on the current environmental legislation. Third group of stakeholders that the interviewees described were the service providers. Interviewees argued that service provider do not necessarily state or demand environmental aspects but they are important in turning environmental aspect into reality. However, this group can be challenging since their capabilities and resources to fulfil environmental requirements vary greatly. In addition, there are differences in their readiness to innovate and enhance their environmental performance. Larger service providers have the resources to experiment and to respond to demands. Some of interviewee's felt that it is FTA's duty to make sure that all of the service providers, including the small and medium sized, have the necessary information about the latest infrastructure improvements and guidelines. In addition, some of the interviewees argued that it is FTA's responsibility to make sure that also small and medium sized service providers can participate in tendering process. In practice this means that procurement requirements are not too demanding or innovative.

Efficiency can be considered either enhancing or restricting factor among procurers. Authorities that have abundance of resources are able to consider environmental aspects whereas scarcity of resources steer the attention to mandatory issues such as safety and costs. In some cases, those willing to spend more assets to environmental issues are classified as those pursuing "over-quality" due to exceeding the minimum level of environmental protection set in the legislation. In those cases where minimum level was exceeded, other advantages than just environmental sustainability was expected and efficiency was considered as a enhancing factor.

*Cost-effectiveness guides us. Environmental issues come naturally in our field [maintenance] as while saving money we save the environment. (Interviewee P8.)*

Participants considered strategic management to enhance environmental sustainability in procurements in general, especially on Ministry of transport and communications level, but did not recognise this enhancing factor in FTA's organisational culture. In fact, one interviewee (P4) felt that including either a small- or large-scale environmental target in FTA's strategy would help disregard the pursue of efficiency.

Authorities' knowledge includes not only information about the environmental science of infrastructure project and knowledge how to mitigate negative environmental impacts but also information learnt by doing. In fact, interviewees explained that some of the environmental criteria set in projects have a history of learning from first trying and coming to realisation that certain activities are good practice. These results are

emphasised even more if experiments and trials save resources and / or the feedback from stakeholders is positive.

*Today, noise and vibration are factors that bring us feedback. We know from experience that they must be clearly presented in the plan [design].*  
(Interviewee P5.)

A restriction closely linked to information and expertise is the vast amount of instructions that FTA has published. Interviewees argued that it is hard to keep up with all of the instruction, especially since they are updated, and new instructions are added all the time. On the other hand, interviewees felt that due to lack of certain information such as information about environmental impacts, procurers are forced to trust their gut feeling when making decisions. With this gutfeeling comes additional uncertainties such as the perceived cost.

Collaboration between service providers, procurers and FTA's environmental experts from engineering and environment unit was highly appreciated. According to the interviews open dialogue and learning from each other, will affect the quality of projects when everyone is on the same page as what clients' needs are and how service provider can fulfil these needs. In some cases, FTA's environmental experts have guided procurers to considering environmental issues in their projects.

Main restrictions for including environmental sustainability criteria in FTA's public procurements are lack of resources, verification methods and knowledge among procuring authorities but also ambiguity of the concept (environment) and what is considered relevant in the project. In practice this means that due to these factors, environmental sustainability actions are not demanded from service providers or suppliers. The question of relevance has a link to resource efficiency since it is frowned upon when resources are used to those features that do not add value to the project. In addition, lack of collaboration, long time span between plans and implementation and need for efficiency were some of the main issues brought up by the interviewees as factors hindering the use of GPP related requirements.

*The environment is part of our life-cycle projects. and we want it there. but concreteness is hard to achieve. (Interviewee P7.)*

Restricting factor of inefficient procurement procedure has many forms. Interviewees described setting qualitative requirements highly demanding and challenging. One interviewee (P6) even described it as “*a writing competition for tenderers*”. Participants also argued that they are forced to give high points to those that write what procurers want to hear and even though this is understandable, there is an underlying problem of not evaluating the success of references. There are even some cases where a procurer knows that certain service providers' project management was not satisfactory, but procurers' hands are tied because the demanded reference projects are presented as asked. Another challenge related to references come apparent when a procurer demands new

technological solutions that are not yet mainstream. In these cases, there is only few, or none, references projects that would prove the service provider's expertise.

According to the participants authorities core expertise in infrastructure projects does not include environmental science to the extend it might be needed. Collecting information before embarking on a procurement, for example conducting market research, and training the authorities are much needed activities. In addition, by analysing finished procurements, authorities will collect important information not only about the final product but also about the procurement process itself. Naturally, these activities demand resources (mainly time) that FTA authorities do not necessarily have. What makes these tasks even more challenging is the ambiguity of the concept of environment, not only to those procuring goods but also for those providing services.

*The problem is that are we talking about environmental planning or environmental impact assessment. Is it about horticulturists or about noise and nature conservation? These many dimensions of the concept are difficult to understand. (Interviewee P4.)*

*Environment is such a wide concept. Quite often its seen only as landscape issues, meaning what kind of plants are we going to plant. Then there is the ecological side – We [procurers] don't have the expertise, nor does our service providers. And I'm not even sure if we are even talking about the same concept. (Interviewee P7.)*

According to the interviews there are differing opinions concerning the time needed to conduct infrastructure procurements. It seems that this process related problem is present especially those allocating funds for FTA, meaning the Finnish government. In addition, there is also confusion between different units inside FTA about this issue.

*The starting point for everything lies in budgeting and once that is done, we are informed that the project should have started already last week. and in FTA people do not really understand that if the expected value is over the EU threshold it will take another 6-9 months before the contracts are signed. (Interviewee P5.)*

FTA authorities argued that procuring authorities should evaluate their activities in a more long-term nature and see procurements from wider perspective. Design, implementation of design, operational management and maintenance of infrastructures need to be considered as part of bigger entity where each of the part play a vital role. This attitude change can be achieved through collaboration. Collaboration is not only important to ensure quality of the procurement, but also for the enhancement of environmental awareness in society and among the service providers. Thus, making it one of the core enhancing factor among interviewees.

According to the interviewees, there is still room for improvement in collaboration and its forms, especially between FTA's units but also with the co-operation of various authorities outside FTA. Co-operation between authorities was criticised for pursuing too

much independence, thus making collaboration and enhancing environmental innovations challenging.

*Authorities should help each other, but sometimes it feels like actors hold on to their own views in order to prove that they are independent and self-sufficient. (Interviewee P11.)*

*Collaboration with cities and municipalities should be better. With better collaboration way we could guide their procurements to certain direction. (Interviewee P10.)*

The lack of resources is not only a challenge on its own but linked to collaboration as well. Interviewees were quite clear on which of the authorities in FTA were most relevant for their work and thus most desired partners in close collaboration. Designers hoped for more co-operation with the implementation of the investments, while the representatives of the investment implementation category wished to cooperate with the experts responsible of maintenance. Due to the lack of human resources interviewee's felt that the possibilities to increase collaboration were scarce.

One other obstacle for increasing co-operation was the rather long period of realisation of plans and the general uncertainty about the implementation of the project as a whole. In such situations, it may be difficult to motivate other units to participate in planning meetings even though they had the time for it. In addition, one interviewee explained that there is only little room to change infrastructure designs during implementation phase because the plan binds the implementation team. Additionally, long time span often leads to a situation where some of the information gathered in previous stages need to be evaluated and updated. This in turn needs resources. The problem of a long timetable becomes apparent also during the construction phase. In some cases, there is a gap between design and implementation phase and during that time gap, changes in project's personnel may occur. Dealing with these changes can cause delays in the project. The current trend according to one interviewee is that service providers are asked to offer combined design and construction services. This will not only help with the problem of long timetable but also ensure that resources needed for the procurement process are used efficiently and necessary information is always available.

Some of the interviewees felt that there is no need to prioritise some criteria instead of others. This however does not explain why environmental requirements are not considered to greater extent than it is now. The answer could be explained by the interviewees sense of their role to influence how environmental issues are implemented in projects and how routinely environmental considerations were taken into account. The answers vary according to procurement categories. Some of the procuring authorities that work among design implementations felt that their means to influence was restricted, because namely of funding decisions that steer to hurry with the construction work, others that previous project stages have already made the decisions and in current culture of efficiency, there is no time or possibilities to change the decisions. However, those interviewees working with design had quite opposite view on this matter. They felt that

the current legislation guides considering environmental issues in design in the form of assessments and studies. Changes are made to design, if during construction a need to change designs becomes apparent. These situations are, according to the interviews, quite unusual.

## **5.5 FTA's procurements and influencing societal themes**

The interviewees were not unanimous about FTA's role in influencing societal themes through procurements. Some of the participants felt that FTA's possibilities to influence social themes, such as climate change mitigation, are good and minimum requirements set in the procurements are most effecting tool. On the other hand, there were participants that argued that effectiveness is generated mainly through other activities than procurements, for example, when deciding which route projects are being implemented.

*It starts with the demands. Minimum requirements that we set during procurements. These come from technical requirements and what is instructed in procurement instruction – extranet. And if you evaluate whether or not procurements should be considered as a tool, then yes, for example when we demand environmental certificate, its hard to go beyond that. (Interviewee P2.)*

Procurements were considered as a concrete way to communicate to the stakeholders, as procurements are part of all the projects. The current situation however does not favor using procurements in wider terms in enhancing environmental sustainability. Interviews revealed two reasons for this: lack of expertise and procurements vague role in strategy. Focusing on these challenges is highly important since participants emphasised FTA's role in showing an example to the whole infrastructure sector.

*Finnish Transport Agency can set an example for others, because we are the largest actor in finnish infrastructure sector. The way we do things and what kind of demands we present play a role. (Interviewee P1.)*

The vague role of procurements in strategy is not the only restriction in enhancing environmental sustainability in FTA's procurement processes but it is closely linked to other factors. Currently, according to the interviews, there are very few concrete means to use procurements in environmental work. This is due to the gap between strategy and everyday work. Based on the interviews, FTA could influence climate change by procuring environmentally sustainable coatings in their projects. This, however, was brought up as the only practical way to enhance environmental sustainability with procurements and only by few interviewees. Authorities' and service providers' core expertise is needed in infrastructure projects and apparently, they lack the vision and know-how of environmental issues. Eventhough the results may not be inclusive, these factors affect the way authorities consider environmental sustainability in procurements.



## 6 CONCLUSIONS AND DISCUSSION: ARE FTA'S PUBLIC PROCUREMENTS GREEN?

European commission (2016) has defined green public procurements as those goods, services and works that have reduced environmental impact throughout their whole life-cycle compared to their traditional counterparts. The goal for using GPP is to enhance organisation's environmental work while improving the state of the environment in general. FTA's environmental work is carried out by including environmental targets in authorities work and given them the mandate to include these targets in their procurements. Legislation guides the FTA authorities to consider environmental standpoint in procurement through obligations mandatory for all the actors in society. It can be concluded that environmental sustainability is part of procurements, but environmental sustainability aspects extending beyond minimum level are considered only if these actions add value to the projects and are resource efficient. FTA's authorities aim to fulfil procurements in a way that the process is compliant with the procurement legislation and FTA's instructions.

In general, it can be stated that the main reasons for including environmental aspects in FTA's procurements stem from 1) legislation, regulations and guidelines 2) nature of work and 3) procurers' expertise. These reasons mainly guide considering the minimum level of environmental sustainability. Authorities can use procurement instructions – extranet site as a starting point for their procurements. However, the site has some limitations such as outdated templates and the fact that the site was incomplete when this study was conducted

Based on the content analysis of FTA's procurement instructions and model templates, there is scarcity in universal and/or general environmental aspects that would penetrate through whole procurement process in every procurement category. In addition, the aspects found in this analyse consist mainly of one or two sentences integrated and incorporate among other contract clauses and are highly category dependable.

The basic structure of FTA's procurement process is “planning, tendering and execution”. All these stages can include environmental sustainability aspects either directly or indirectly through other aspects. Interviewees especially emphasised the planning phase: thorough planning and preparing was considered important since making changes in tendering and/or contract phase is time consuming, expensive and can even lead to suspension of the procurement. Part of planning and preparing the procurement is evaluating what are the procurement criteria for goods beign acquired. Describing procurement's characteristics in tendering process demands that analysing and preparing phase is conducted adequately. Requirements for goods and services must be unambiguous and clear to everyone. Including this kind of environmental requirements demands expertise from the procurers.

Environmental criteria in tenders can be by nature either selection or award criteria in the form of either core (basic level) or comprehensive (more ambitious) criteria.

Based on the interviews, FTA has integrated environmental criteria in their procurements by demanding certain references from their service providers such as project engineers. Thus, it can be concluded that the criteria is selective by nature. Award criteria, on the other hand, is something that the procurers found difficult and not eager to use. Most of the requirements are based on the legislation and its demands, but there is no legislation that dictates that public entities must demand certain amount of references from their service providers. In fact, procurement legislation states that selecting and excluding tenderers may be done based on the contractor's ability to perform the contract. Authorities responsible for assessing this may consider experience and competence of a contractor in variety of ways such as ask proof of references.

Procurement instructions – extranet site includes environmental aspect in those parts that instruct on devising procurement notice, invitations for tenders, about choosing tenderers and opening the received tenders. All of these are part of tendering process stage. This section provides information of the legislation that guides public procurements and category-based templates. Some of these templates have environmental sustainability related content such as requirements for service providers. In FTA's procurements these requirement types are presented mainly in the form of contract clauses. By participating in tendering, service provider is expected to commit fulfilling these requirements. FTA not only demand certain features from the goods they procure but also give recommendations to their service providers. These demands and recommendations vary according procurement. There are also differences between FTA's procurement categories on the extent to which environmental considerations can be included in that category.

Execution of contract section of the procurement instruction - extranet included environmental aspect, for example in the form of contractual penalties. Contracting authority is entitled to impose a fine if supplier neglects environmental regulations. This clause is also included in the procurement templates and brought up by the interviewees. According to the interviews both FTA and the service provider share the interest to monitor environmental impacts during the construction. The reason for this is for example stakeholder's acceptance and showing to being worthy of that trust. However, monitoring is an activity that some of the interviewees felt was problematic due to lack of resources on their end.

Song et al. (2016) have distinguished two dimensions of GPP: product- and process based. Because analysing the procurements was not part of this thesis, the identification of FTA's procurement dimensions is based on the interviews. Neither of these dimensions are fully present in the collected data but there are aspects from both product and process based GPP in FTA. Process based GPP can be related to internal and external competence such as recycling supplies and materials during construction. This is the case in those projects where service provider is given the possibility to use recycled pavements or other materials already found at the construction site. Product based GPP on the other hand can be described as those where environmental preferences such as energy efficiency is part of the procurement. This is the case for example in maintenance projects starting from 2019. The base for successful GPP lies in generic or project based environmental impacts. It can be argued that in FTA's case the generic environmental

impacts are those verbalised in the environmental legislation. In addition to these demands, there are some projects where environmental requirements are included due to the additional value that they create for the project. These requirements are derived from the project based environmental impacts.

## **6.1 Evaluating enhancing and hindering factors**

Majority of enhancing factors present in the literature and in FTA are internal. Based on the analysis “perceived benefits” is the only internal factor that both literature and FTA recognised. External factors (legislation and regulations and stakeholder pressure) are present both in literature and in data collected from the interviews. Hindering internal factors present in literature and in FTA are lack of verification methods, resources and expertise and unclear role of procurements in strategies and their perceived cost. There were no shared hindering external factors present. Analysis also revealed that the majority of FTA experts’ hindering factors were internal, whereas factors in literature were more evenly divided into internal and external. This finding is important when considered which of these factors FTA can more easily steer to certain direction. Internal factors such as lack of expertise and ambiguity of the concept (environment) can be enhanced through training whereas external factor of inefficient forms of collaboration between authorities demand more work throughout the procurement network.

The comparison of enhancing and hindering factors from the literature and from the interviews are presented in the table 8. Initial tables can be found in chapter 5.4 (table 7 summary of enhancing and hindering factors from the interviews) and in chapter 2.2.3 (table 2 Summary of enhancing and hindering factors according to their characteristics.). Differences in findings can be explained with the content of each factor. For example, literature differentiates expected benefits from GPP. These benefits can be savings, positive reputation or gaining wider acceptance for the organisation and its operations. FTA interviewees on the other hand brought up only those benefits that did not include economic dimensions. Lack of resources (money, time), readiness of the markets and perceived costs of GPP were hindering factors present both in the literature and in the interviews.

Analysing the content of different factors will increase the similarities between findings from literature and interviews more than just dividing factors directly into enhancing and hindering factors. One can expect that those factors that hinder the GPP implementation are also those that will enhance the process once the right level is achieved. For example, both literature and interviews reveal that the lack of expertise is one of the major hindering factors but only literature included education and training, i.e increasing the expertise, as an enhancing factor. It can be argued that the vast amount of differences between literature and interviews is due to the narrow standpoint. Another example is related to individual values and attitudes. FTA experts stated that personal attitude can hinder the GPP related actions, whereas literature findings declare that

individual commitment is one of the enhancing factors. One should analyse the basic notion of attitude and commitment in order to fully understand the depth of these factors.

Table 8. Comparison of enhancing and hindering factors that affect the uptake of GPP collected from the literature and from the interviews.

<b>Enhancing factors</b>		
<b>Factor</b>	<b>Literature</b>	<b>FTA</b>
<b>Internal</b>		
Clear instructions		x
Collaboration with other units		x
Perceived business benefits	x	
Learning from others (colleagues and other similar organisations)	x	
Past experiences		x
Perceived benefits (reputation, societal acceptance)	<b>x</b>	<b>x</b>
Procurer's expertise		x
Collaboration with service providers, authorities and suppliers	x	
Procurer's individual commitment to environmental issues	x	
Resources	x	
Strategic management in organisation	x	
Strategic work on administrative level		x
Training and education of procurers	x	
Corporate Social Responsibility	x	
<b>External</b>		
Legislation and regulations	<b>x</b>	<b>x</b>
Political atmosphere		x
Stakeholder pressure	<b>x</b>	<b>x</b>
Technological enhancements	x	
<b>Hindering factors</b>		
<b>Factor</b>	<b>Literature</b>	<b>FTA</b>
<b>Internal</b>		
Ambiguity of the concept		x
Attitude		x
Fear of being first	x	

table 8 continues on next page

table 8 continues

<b>Hindering factors</b>		
<b>Factor</b>	<b>Literature</b>	<b>FTA</b>
<b>Internal</b>		
Fragmentation of instructions, policies and strategies	x	
Goal of efficiency		x
Hurry		x
Inefficient procurement procedure due to byrocreasu		x
Lack of collaboration between units		x
Lack of expertise	<b>x</b>	<b>x</b>
Lack of managerial support	x	
Lack of resources (money, time)	x	x
Lack of verification methods	x	x
Limited means to influence the procurement practices		x
Uncertainties brought by the long timespan between design and implementation		x
Unclear role of procurements in strategies	x	x
Perceived costs	x	x
<b>External</b>		
Fragmentation of instructions, policies and strategies	x	
Inefficient forms of collaboration between authorities		x
Readiness of the markets	x	
Service providers' expertise		x
Lack of service providers due to small markets	x	
Tension between different actors	x	
Lack of political support	x	
Lack of collaboration with service providers and / or suppliers	x	

Using GPP and especially implementing this process demands resources. Resources needed for GPP can be divided to procuring authorities' abilities, to reporting- and impact assessment resources and to the readiness of industry (Kuittinen & La Roux, 2017). Interviewees revealed that out of these groups the most common restricting factor among them are the those related to procurers' abilities such as knowledge, time and finance. The readiness of the industry was considered as a restriction when evaluated the expertise of small and medium sized service providers but some participants felt that their largest service providers are more proactive in environmental sustainability issues than FTA is. This seems to be the case especially in the pavement industry. The interviewees describe the content of environmental sustainability in this context as a mean to improve environmental performance of service provider's operations. When this enhancing factor is combined to collaboration, it can benefit FTA as well. In these cases FTA gains valuable information, positive publicity and chance to be part of innovation projects.

Based on the literature, individual procurement authorities' preferences are the key in enhancing the use of GPP inside organisations. This is especially important since another insight from the literature states that public entities are likely to follow the example of others, in their cases comparable organisations. This can mean that inside FTA only few of these individuals are needed to spread the positive outcomes of GPP because it can be difficult to find a comparable organisation for FTA. In reality, individual's role may be watered down with the lack of resources such as time needed to get acquainted with the subject. Procuring authorities need time to get familiar with the environmental impacts and environmental criteria and expertise to carry out an effective procurement. Their expertise is often linked to certain phase of project, which have sector, or industrial based variations. Information and training on an individual level can be one of the most enhancing factor for GPP. Information can also have a form of learning from others. This process includes sharing the positive outcomes from green procurements and increasing awareness on what can be achieved with GPP. Training ensures that the professionals in charge of procurements have proper skills, knowledge and tools to use GPP in their work. Interviewees placed a special emphasis on those guidelines and instruction that give them information how to exceed the minimum environmental requirements set in the law. This can be seen as a form of increasing individual expertise as well.

## **6.2 Decision making strategies in FTA's procurements**

The general outcome concerning decision making in FTA can be grouped into two very different groups: other participants feel that they have only few ways to enhance environmental sustainability in their procurements and others feel that they can make changes but since environmental sustainability already is at the best stake there is no need to make changes.

FTA's procurement process, or procurements in themselves, are anything but simple and straightforward when it comes to environmental issues. The most important

result that stem from the interviews is that there are many layers, many phases, many actors, and their interests. Combining these and including environmental aspects, creates a tapestry of many principles, goals, factors and obstacles. In the centre of this are the authorities making decisions on whether to include or not environmental aspects in procurements. Legislation sets a minimum level for this task and often it is considered sufficient. Next, I will evaluate which of the Igarashi et al.'s (2015) decision-making strategies are present among FTA authorities. Igarashi et al. (2015) found in their study that ignoring, incorporating and insisting were the most dominant decision-making strategies when deciding whether to consider environmental aspects in procurements. Based on the findings of this thesis, there are incorporating, insisting and integrating strategies present among FTA procurers.

Environmental aspects in FTA are included mainly because of legislative reasons and because this is the standard practice: they bring additional value for the project or savings. Thus, justifying the argumentation that incorporating strategies are used in FTA. On the other hand, project manager may prepare proactively for stakeholder demands, which can be seen as a ground rule for using incorporating strategies as it is based on the need to make changes because of external pressure.

*Society, residents, and municipalities have woken up the environmental impacts caused by our transport routes. - - Nature conservation organizations and associations give feedback on a project basis. In some cases, we ask for feedback. The scale of the project must be taken into account here. If you make a road in the middle of the forest, it does not interest anyone. But if the road is located on the lake shore, there may be someone who is interested in the matter. (Interviewee P5.)*

Igarashi et al. (2015) describe that often changes, such as additional procurement criteria, linked to incorporating strategies are first tried and later incorporated as extension to existing criteria rather than resulting as a new entity. Using requirements such as “quality” can be part of incorporating strategies. There are indications about this strategy also in FTA since many interviewees brought up that they have technical and other demands that are not per se called environmental criteria. Demanding high quality and long lifetime from the goods fits into this description.

Insisting strategies define environmental criteria as mandatory for service providers and there are no trade-offs between different criteria. All of the demands are equally important and thus awarding criteria is not needed. According to one participant (P6), there is no trade-off or prioritising between different aspects that they consider in projects, but all of the aspects are equal.

Similarly to Igarashi et al. (2015) also FTA procurers shun using award criteria, mainly focusing on minimum requirements for all tenderers. However, against Igarashi et al.'s (2015) findings, FTA uses also recommendations for their service providers. The reasons for using recommendations varied according to interviewee. Some stated that recommendations are part of their procurements and cannot be changed as if it is part of their organisational culture, some argued that if recommendations are changed to obligations, there is no room for service providers own development and improvement



work. One might argue, that these recommendations do not play any role in greening FTA's procurements since fulfilling them will not increase tenderers scoring in procurement process and the common perception is that service providers “go the extra mile” only if it benefits them and creates additional value to their business.

Igarashi et al. (2015) have defined reasons for ignoring environmental aspects. The main reason according to them is that procurers find conventional criteria enough. FTA's decision-making strategies from this aspect is not as straightforward. Interviewees made clear that they find the current state of legislative demands enough and that there is no need to add any more requirements to this. However, environmental criteria based on the legislation cannot be called conventional in this sense, because conventional in this FTA includes those aspects that do not include environmental aspects such as price.

Ignoring environmental aspects can be evaluated also based on the limitations presented by Figge and Hahn (2012). They have stated that there are fundamental limitations for organisation's pursuing environmental sustainability through business decisions. These limitations ring true also in public procurements. First, often where there are different alternatives the one with the highest financial gains is chosen even though the overall positive impact would be greater in those strategies where the financial gains are lower but the environmental gains bigger. Even though both environmental and economic gains are achieved (so called win-win situation), the financial gains become the goal that is primally followed. In FTA this can be seen among those procurers that state that there is no contradiction between environment and other aspects but still pursue other than environmental aspects.

Second limitation, according to Figge and Hahn (2012) dictates that in those situations where an authority has the possibility to choose between two options, they will choose the one that improves financial performance but lowers the environmental performance discarding the option that would not improve financial performance but would improve environmental performance. This can be seen in FTA through interviewees sense of perceived cost. In these cases, participants justify not including environmental requirements with monetary reasons or not knowing what the true benefits are from new environmental requirements.

Figge and Hahn's (2012) third limitation is a combination of two previous examples, stating that those strategies that have the greatest financial gains will outweigh those strategies where organisation improves environmental performance and lowers financial performance or where the financial performance remains the same. Meaning that there is a possibility for the environmental performance improving.

Interviews revealed that in those cases where environmental aspects were ignored, the decision was made knowingly. One justification for this kind of action were project related reasons. Interviewees argued that there are projects where including environmental aspects would only increase costs and not value.

*Procurement criteria are always considered project-specific. Of course, there is always the minimum level set by the legislation, but the project organization always evaluates each case independently. Environmental issues may not have been taken into account because they are not considered that important, i.e in practice, the project doesn't include any particular environmental factors that should be taken into account in procurements. (Interviewee P1.)*

Another justification for ignoring strategies is that environmental aspects are left out because interviewees are not able or are not entitled to decide whether to include or not environmental criteria. This is a question of power and responsibilities but also a question of project stages as stated in the previous example. The differences in the extent on including environmental aspects in procurement can be explained with how the participant's saw their possibilities to address environmental issues in their work. According to the interviewees, their own influence was restricted by i.e. funding decisions from the government. In addition, the participants felt that the environmental criteria were a result of cost efficiency and the political atmosphere, thus other aspects outweighing environment in procurements. In this situation, environmental aspects are included in everyday work, i.e. in the design, construction, upkeep and maintenance of routes through procuring high quality.

These explanations for ignoring strategies are aspects which the interviewees used to justify their own actions. Some of the interviewees argued that other procurers ignore environmental aspects because they simply don't find them meaningful or that they are somehow anti-environment. Even though this aspect can be linked to “finding the current legislation sufficient”, there is also the aspect of personal values and attitudes. What makes this result interesting is that none of the interviewees themselves articulated this kind of values or negative attitudes towards environmental issues. One could ask, does this describe a situation where everyone wants change, but no one wants to be the change?

### **6.3 Future recommendations**

Next, I will present future recommendations for enhancing the role of environmental sustainability in FTA's public procurements. The participant felt that FTA could promote environmental awareness in society through their service providers and through their activities. This is an important aspect to consider since for example Hall et al. (2015) have stated that those organisation's that are among largest public organisations can offer such projects to suppliers that losing the contracts have a massive impact of service provider's functions. Therefore, it is safe to say that FTA has a true chance to make a difference.

Recommendations presented in this section are based on the findings from expert interviews.

During expert interviews, it became apparent that participants expect the current environmental legislation to tighten during next five years, and thus greater consideration of environmental issues should be included in FTA's activities, such as procurements. Interviewees evaluated that the main emphasis will be on themes such as noise and vibration, recovery of recycled materials and GHG emission mitigation. Considering these issues in procurements demands knowledge, collaboration with the service providers and technical improvements. Considering that technical improvements are something that procurers can enhance through innovation or pilot projects, it would be recommended to invest in training and educating procurers in considering environmental issues. Alternatively, environmental experts can guide procurers in this task but with current resources and workload, FTA's engineering and environmental unit is not able to fulfil this demand. Interviewees hoped that there would be more human resources to help grasp the problem of environmental sustainability among procurers but also among environmental experts. The current situation was described as one where help is sought from environmental experts once the problems are already at hand. Interviewees wished that they could have more proactive take on environmental issues.

Since FTA has many procurement categories, it would be beneficial at first to limit the greening process to only some of them. Choosing the most prominent categories could, for example, be done by evaluating their environmental impacts, volume (units) or value (expected monetary value). In my opinion, the most prominent platform to start increasing the role of environmental sustainability could be group A procurements since FTA has a major role in these markets.

Interviewees noted that the procurement instruction - extranet is useful but needs changes in order for it to be more user-friendly from GPP point of view. Participants expressed a need for “environmental considerations in procurements”- databank in the site. This databank could include those good practices that procurers already follow, hints and information about different environmental requirements in procurements and how “green procurements” are defined in FTA and how they link to procurement strategy. Ultimately this suggestion would strengthen the enhancing factor of “learning from others” already present among FTA's procurers. In an ideal situation, this site would also include tools for LCA- and CO<sub>2</sub>- calculation that the procurer could use to evaluate projects' environmental impacts and a way to turn abstract concept into more concrete one.

Another important aspect is to track the progress, since FTA's procurements have high monetary value one cannot expect changes to happen overnight. The development work must be long-term and based on identified areas for improvement in order to use resources efficiently and to make long-lasting changes. Making procurements green, or greener, will demonstrate FTA's political commitment to climate change mitigation and other environmental strategic goals such as enhancing circular economy. I think that it is important to notice, that the targets for green procurements can either be verbalised through the procurement process and its phases (“By 2020 50% of all tenders above EU

threshold include award criteria for greener option”) or by defining what can be achieved with procurements (“ LCA study is conducted on 20% of construction projects by 2020”). The vision and intentions of FTA are reflected in the procurement process, while external stakeholders, service providers in this case, realise this vision during the projects. Participants believed that voluntary incentives and guidelines for eco-friendly activities will not be realized if the contractor does not have the tools, resources and know-how to do this. In these cases, it might be beneficial to set minimum requirements in tendering documents instead of contract clauses that are voluntary.

In addition, participants felt there were major changes ahead in the whole transport system, for example through the expansion of *Mobility as a Service* thinking, and FTA should also take these factors into account. However, the changes always involve uncertainties and the participants felt that their activities would benefit from guidance on what is the desired level, for example in relation to noise abatement. Current instructions focus on fulfilling the procurement process, not the content of documents.

#### **6.4 Reviewing the research and contribution**

First research question in this thesis concerned the role of environmental sustainability in FTA's procurements. Answer can be found through the themes found in interview data and by analysing the nature of procurement documents collected from procurement instructions – extranet. Documents also serve as concrete example on how the integration of environmental sustainability in FTA's procurements are done thus shedding light to research question two.

Integration of environmental aspect in the procurement process can be evaluated, for example, by studying the tenders or purchases. In this thesis environmental aspects were mapped out by studying instructions and model templates used in the procurements. As it turned out, these provided a one-sided and incomplete picture since model templates are updated and changed according to each project and its demands. Therefore, it is more beneficial to evaluate the integration through the content from the interviews.

There are some limitations to this study. These limitations mainly concern interviewees' expertise and initial assumptions concerning procurement guidelines. Category and product managers were the original interviewees but soon it became apparent, that those who have the practical expertise on procurements are project managers. However, due to the time restrictions and the fact that most of the interviews were already scheduled, only four project managers were interviewed. These participants shed light to enhancing and hindering factors experts face in their work when it comes to procurements. In addition, interviewees described the situation in certain procurement category in a way that those in charge of theoretical guidelines, development goals and instructions cannot describe. Justification for this argument lies in project managers' expertise that stems from following guidelines and instruction in everyday work. Therefore, it would have been highly beneficial to increase the number of project managers participating in this thesis. It would have also been interesting to see the

differences in category managers, products managers and project managers views. In addition, some participants did not know whether they were assigned a category or product manager and what kind of tasks were related to this task. With project managers this problem did not emerge. There were also some problematic features in procurement instruction – extranet site and in its content, such as some of the outdated information in procurement templates.

Another major limitation is related to the procurement principles and development goals for FTA's publication. As stated before (chapter 3.3.1) this document was published already in 2013. The initial assumption was that this is the guiding star for procurements and by using this document as a basis for interviews, I would be able to construct a general view of the development work and guidelines of procurements. Very soon, during the first interviews, it became clear that participants had very little to say about this document. In fact, some of the interviewees were not aware of this document or its content thus raising questions what actually is the role of this publication.

Laws, regulations and government decisions are the base for FTA's operations. In addition to these external guidelines, FTA has prepared internal instructions that are binding and must be followed. These instructions are not part of Procurement instruction – extranet and therefore not analysed in this thesis. However, it would be beneficial to analyse these documents in order to fully understand the demands presented for service providers. In fact, many of the interviewees did point out that those instructions are what guides their work not the procurement instructions – extranet. There were some participants who quite openly explained that they have used the site only few times in the past to collect model templates. After this task they have not returned to the site because they felt that there is no need to collect new templates. There were no indication that participants used the current site to educate themselves with procurement issues.

## REFERENCES

- Aaltio-Marjosola, I. (1999) Casetutkimus metodisena lähestymistapana. Available at: <https://metodix.fi/2014/05/19/aaltio-marjosola-casetutkimus/>. Retrieved: 7.12.2018
- Act on public procurement and concession contracts 1397/2016
- Act on public contracts and concessions of entities operating in the water, energy, transport and postal services sectors (1398/2016)
- Ahsan, K. & Rahman, S. (2017) Green public procurement implementation challenges in Australian public healthcare sector. *Journal of Cleaner Production* 152 (2017) 181 - 197.
- Alastalo, M. & Åkerman, M. (2001) Asiantuntijahaastattelun analyysi : faktojen jäljellä in Ruusu vuori, J., Nikander, P. & Hyvärinen M. (edit.) (2010) Haastattelun analyysi, Tampere, Vastapaino, 2010
- Alhola, K. & Kaljonen, M. (2017) Kestävät julkiset hankinnat -nykytila ja kehittämisehdotuksia. Suomen ympäristökeskuksen raportteja 32/2017. Suomen ympäristökeskus
- Bag, S. (2017) Identification of Green Procurement Drivers and Their Interrelationship Using Total Interpretive Structural Modelling. *Vision - The Journal of Business Perspective*, 21(2) 129–142.
- Bratt, C., Hallstedt, S., Robèrt, K.H., Broman, G. & Oldmar, J. (2013) Assessment of criteria development for public procurement from a strategic sustainability perspective. *Journal of Cleaner Production* 52 (2013) 309 – 316
- Cheng, W., Apollonia, A., D’Amato, A. & Zhu, Q. (2018) Green Public Procurement, missing concepts and future trends - A critical review, *Journal of Cleaner Production* 176 (2018) 770 - 784
- Ethans, D., (2014) *Climate Change and Infrastructure: Decision Making Issues and Adaptation Measures*, Climate Change and Its Causes, Effects and Prediction ,Nova Science Publishers, Inc. New York
- Eskola, J. & Suoranta, J. (2000) *Johdatus laadulliseen tutkimukseen*. Tampere: Vastapaino
- European Commission (2015) *GPP Networking Needs - Final Report*.
- European Commission (2016a) *Buying green! A handbook on green public procurement*. 3rd Edition

- European Commission (2016b) Green Public Procurement Criteria for Road Design, Construction and Maintenance, commission staff working document
- European Commission (2017) About GPP - Life-cycle costing,  
Available at: <http://ec.europa.eu/environment/gpp/lcc.htm>. Retrieved: 2.8.2018
- Figge, F. & Hahn, T. (2012) Is green and profitable sustainable? Assessing the trade-off between economic and environmental aspects. *Int. J. Production Economics* 140 (2012) 92–102.
- Finnish Transport Agency (2016) General presentation. PowerPoint-document.
- Finnish Transport Agency (2018) Vision, strategy and values. Available at:  
<https://www.liikennevirasto.fi/web/en/operating-philosophy/vision-strategy-and-values#.XAo9Y8sUmrQ>. Retrieved: 7.12.2018
- Flick, U. (2014) Introduction to qualitative research, 5<sup>th</sup> edition, London, Sage, 2014
- Flyvbjerg, B. (2011) Case study in Densin, N. & Lincoln, Y. (eds.) *The sage handbook of qualitative research*, 4th edition, Thousand oaks, California, 2011
- Fuentes – Bargues, J., Gonzáles - Cruz, C. & Conzáles - Gaya, C. (2017) Environmental Criteria in the Spanish Public Works Procurement Process, *Int. J. of Environmental Research and Public- Health* 14, 2014.
- Garbarino E., Rodriguez Quintero R., Donatello S., Gama Caldas M. & Wolf O. (2016) Revision of Green Public Procurement Criteria for Road Design, Construction and Maintenance. Technical report and criteria proposal.
- Grandia J., Steijn B. & Kuipers B (2015) It is not easy being green: increasing sustainable public procurement behaviour, *Innovation: The European Journal of Social Science Research*, 28:3, 243-260.
- Gurel, O., Acar, A. & Ondern, I. (2015) Determinants of the green supplier selection, 3rd International Conference on Leadership, Technology and Innovation Management, conference paper, *Procedia - Social and Behavioral Sciences* 181, 131 – 139.
- Hall, P., Löfgren, K. & Peters, G. (2015) Greening the Street-Level Procurer: Challenges in the Strongly Decentralized Swedish System, *The Journal of Consumer Policy*, 39, 467–483
- Hilma (2018) Hankintojen ilmoitusmenettely. Available at:  
<https://www.hankintailmoitukset.fi/fi/docs/ilmoitusmenettely/>. Retrieved: 11.12.2018

- HMEP (2013) Procurement route choices for highway maintenance services. Use of toolkit and guidance document. Available at: <http://hmepprct.co.uk>. Retrieved: 29.8.2018
- Huan, Y., (2013). *Assessing and Managing the Ecological Impacts of Paved Roads*. National Research Council, Washington, D.C.: National Academies Press.
- Hyvärinen, M. (2018) Personal communication, 8.10.2018
- Hyvärinen, M. (2019) Personal communication, 25.1.2019
- Igarashi, M., de Boer, L. & Fet Annik. (2013) What is required for greener supplier selection? A literature review and conceptual model development, *Journal of Purchasing & Supply Management* 19, 247–263
- Igarashi, M., de Boer, L. & Michelsen O. (2015) Investigating the anatomy of supplier selection in green public procurement, *Journal of Cleaner Production* 108, 442 - 450
- IRF (2013) *Moving towards green road infrastructure, case studies and lessons learned*, International Road Federation
- Tuominen & Hartonen, (2013) *Liikenneviraston prosessit*. Internal document.
- Keulemans, S. & Vande Walle, S. (2018). Cost-Effectiveness, domestic favouritism and sustainability in public procurement, a comparative study of public preferences. *International Journal of Public Sector Management* Vol. 30 No. 4, 328-341
- Khidir ElTayeb, T., Zailani, S., & Jayaraman, K. (2010). The examination on the drivers for green purchasing adoption among EMS 14001 certified companies in Malaysia. *Journal of Manufacturing Technology Management*, 21(2), 206–225
- Kuittinen, M. & La Roux, S. (2017). *Vihreä julkinen rakentaminen, hankintaopas*. Ympäristöopas 2017, Ympäristöministeriö
- Large, R.O., & Thomsen, C.G. (2011). Drivers of green supply management performance: Evidence from Germany. *Journal of Purchasing and Supply Management*, 17(3), 176–184.
- Leavy, P. (2017). *Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. New York, New York ; London, The Guilford Press, 2017.
- Liikennevirasto (2013) *Liikenneviraston toimintalinjoja 3/2013, Hankinnan toimintalinjat - linjaukset ja kehittämiskohteet*



- Liikennevirasto (2014) Liikenneviraston toimintalinjoja 1/2014, Liikenneviraston ympäristötoimintalinjoja.  
Available at: [https://julkaisut.liikennevirasto.fi/pdf8/lto\\_2014-01\\_liikenneviraston\\_ymparistotoimintalinja\\_web.pdf](https://julkaisut.liikennevirasto.fi/pdf8/lto_2014-01_liikenneviraston_ymparistotoimintalinja_web.pdf). Retrieved: 1.8. 2018
- Liikennevirasto (2015) Yhteiskuntavastuuraportti. Available at:  
<https://www.liikennevirasto.fi/web/yhteiskuntavastuuraportti-2016/report/etusivu>. Retrieved: 4.6.2018
- Liikennevirasto (2017a) Traffic Agency Process Map. Internal document.
- Liikennevirasto (2017b) Liikenneviraston ympäristöohjelma 2017–2020, Liikenneviraston toimintalinjoja 2/2017.
- Liikennevirasto (2018a) Tapamme toimia, available at:  
<https://www.liikennevirasto.fi/tapamme-toimia#.W6djHGgzZdg>, Retrieved: 1.6.2018
- Liikennevirasto (2018b) Liikennevirasto on ensi vuoden alusta Väylä, available at:  
<https://www.liikennevirasto.fi/-/liikennevirasto-on-ensi-vuoden-alusta-vayla#.XCc5vVwzZdg>. Retrieved: 29.12.2018
- Maguire, M. & Delahunt, B. (2017) Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. *Aishe-J* volume 8, Number 3.
- Ministry of transport and communications' administrative sector strategy, 2016
- OECD (2014) Smart procurement - Going green: best practices for green procurement – Netherlands. Available at:  
<https://www.oecd.org/governance/procurement/toolbox/search/austria-best-practices-green-public-procurement-gpp-awareness-raising.pdf>, retrieved: 7.12.2018
- Ojala, E., Varis, T. & Peltola, V. (2017) Selvitys energia- ja ympäristövaikutusten huomioon ottamisesta julkisissa hankinnoissa - ajoneuvot ja kuljetuspalvelut, Motiva Oy 5/2017
- PwC (2016a) Stock-taking of administrative capacity, systems and practices across the EU to ensure the compliance and quality of public procurement involving European Structural and Investment (ESI) Funds. Directorate-General for Regional and Urban Policy. Final Report. Available at:  
[http://ec.europa.eu/regional\\_policy/en/policy/how/improving-investment/public-procurement/study/#26](http://ec.europa.eu/regional_policy/en/policy/how/improving-investment/public-procurement/study/#26), Retrieved 31.7.2018

- PwC (2016b) Public procurement – Study on administrative capacity in the EU Country Profiles - Finland. Directorate-General for Regional and Urban Policy. Available at: [http://ec.europa.eu/regional\\_policy/en/policy/how/improving-investment/public-procurement/study/#26](http://ec.europa.eu/regional_policy/en/policy/how/improving-investment/public-procurement/study/#26), Retrieved: 31.7.2018
- Rainville A. (2016) Standards in green public procurement – A framework to enhance innovation. *Journal of Cleaner Production* 167, 1029–1037
- Roos, R. (2012) Sustainable Public Procurement: Briefing Note, Discussion paper prepared by Rita Roos on behalf of the United Nations Procurement Capacity Development Centre and the United Nations Environment Programme
- Song, H., Yu, K. & Zhang, S. (2016) Green procurement, stakeholder satisfaction and operational performance. *The International Journal of Logistics Management*, Vol. 28 Issue: 4, pp.1054-107
- Testa, F., Annunziata, E., Iraldo, F. & Frey, M. (2016) Environmental responsibility in building design: an Italian regional study, *Journal of Cleaner Production* 112, 1893–1900
- Uttam, K. & Roos, C. (2014) Competitive dialogue procedure for sustainable public procurement, *Journal of Cleaner Production* 86, 403–416
- Valtion hankintakäsikirja (2017), Valtiovarainministeriön julkaisu 29/2017, Valtiovarainministeriö
- Varnäs, A., Balfors, B. & Faith-Ell, C. (2009) Environmental consideration in procurement of construction contracts: current practice, problems and opportunities in green procurement in the Swedish construction industry. *Journal of Cleaner Production* 17, 1214–1222
- VNP 13.6.2013 Government decision-in-principle on the promotion of sustainable environmental and energy solutions (cleantech solutions) in public procurement, Available at: <https://valtioneuvosto.fi/paatokset/periaatepaatokset/voimassa-olevat>, retrieved 12.6.2018
- Walker, H. & Brammer, S. (2012) The relationship between sustainable procurement and e-procurement in the public sector. *Int. J. Production Economics* 140, 256–268.
- Yin, R. (2016). *Qualitative research from start to finish (Second edition.)*. New York: Guilford Press.

## APPENDICES

**Appendix 1. Finnish Transport Agency's procurement groups, their categories and products.**

Group	Category	Product
A	Planning	<ul style="list-style-type: none"> <li>• Preliminary planning</li> <li>• General planning</li> <li>• Road layout planning (layout of roads, railways and waterways)</li> <li>• construction planning of construction and maintenance work</li> </ul>
A	Implementation of investments	<ul style="list-style-type: none"> <li>• Alliance contracts</li> <li>• Public Private Partnership contracts</li> <li>• Contracts that include planning</li> <li>• Implementation contracts</li> </ul>
A	Upkeep and use	<ul style="list-style-type: none"> <li>• Road management: regional contracts, road lighting, pumping stations</li> <li>• Management of railways and waterways</li> <li>• Use of port ways and draw bridges</li> <li>• Electricity</li> </ul>
A	Maintenance	<ul style="list-style-type: none"> <li>• Road maintenance: pavements &amp; markings</li> <li>• Maintenance of railways, waterways, port ways and bridges</li> </ul>
A	Ferries	<ul style="list-style-type: none"> <li>• Road and liaison traffic ferries</li> </ul>
A	Sea transport services	<ul style="list-style-type: none"> <li>• Ice breaker services</li> <li>• Fuel</li> </ul>
A	Railroad traffic managements	<ul style="list-style-type: none"> <li>• Traffic management services</li> <li>• Dispatcher training</li> <li>• Passenger information service</li> </ul>
A	Public transport services	<ul style="list-style-type: none"> <li>• Bus and air traffic</li> </ul>
A	Commissioning and procurement services	<ul style="list-style-type: none"> <li>• Procurement services</li> <li>• Railroad management</li> </ul>
A	Technical systems and instruments	<ul style="list-style-type: none"> <li>• Road: telematics</li> <li>• Railway: remote control systems, maintenance support, safety devices, electrification and high-intensity current systems</li> <li>• Waterway: safety devices and control systems</li> </ul>
A	Materials	<ul style="list-style-type: none"> <li>• Railroad materials</li> </ul>
B	R&D	<ul style="list-style-type: none"> <li>• Procurement or research and development work</li> </ul>
B	Information and measurement services	<ul style="list-style-type: none"> <li>• Data (railroad, road and waterway)</li> <li>• Hydrographical surveying</li> <li>• Traffic and condition information</li> </ul>
B	Information systems	<ul style="list-style-type: none"> <li>• Development and upkeep</li> </ul>
B	Consulting services	<ul style="list-style-type: none"> <li>• Professional services</li> </ul>
<p>Group A consists of those product and service categories where FTA plays a major and/or vital role according to supplier markets. There are procurements where FTA affects the operational conditions of the whole industry. In this category, the suppliers consist mainly out of actors operating in the infrastructure. Most of the procurements in this category have a direct link to their end users.</p>		
<p>Group B consists of those product and service categories where FTA plays a minor or mediocre role on a national or on a global level. Supplier markets in this category are more versatile and multidisciplinary than those in group A.</p>		

## Appendix 2. List of documents. Names of the documents are in Finnish

Alueurakan yleiset sopimusehdot 2003  
 Alustava laatusuunnitelma  
 Avainhenkilöluettelo  
 B.1 Henkilöluettelo  
 B.2 Referenssiluettelot  
 B.4 Kustannushallinta ja toteuttamiskelpoisuus  
 B.5 Hankekohtainen laatusuunnitelma  
 B.6 Maaperä- ja laboratoriotutkimusten työ- ja laatusuunnitelma  
 B.7 Maastomallimitausten työ- ja laatusuunnitelma  
 C.5 Tuntiveloitushinnat ja tuntimäärät  
 Hankintailmoituksen laatimisohe (EU-hankinnat)  
 Hankintailmoituksen laatimisohe (kansallinen ilmoitus)  
 Hankintailmoituksen laatimisohe, erityisalot, investointi  
 Hankintailmoituksen laatimisohe, EU-hankinnat  
 Hankintailmoitusohje (31.8.2017)  
 Hankintapäätös sopimusmuutoksista (uusi 7.9.2017)  
 Hankintapäätös, hankintamenettelyn keskeyttäminen  
 Hankintapäätös, osallistumishakemuksen hylkääminen  
 Hankintapäätös, sopimuksen optioehtojen lunastaminen  
 Hankintapäätös, tarjouksen hylkääminen alhaisen hinnan takia  
 Hankintapäätös, tarjouksen tai tarjoajan hylkääminen  
 Hankintapäätös, tavalliset ja puitejärjestelyn hankinnat  
 Henkilöreferenssit  
 Henkilöreferenssit, ei työpanosta  
 Henkilöreferenssit, työpanos  
 Henkilöstöresurssit lomake  
 Henkilöstöresurssit -ohjeistus  
 Hintalomake  
 Hintalomake, optio  
 Hintaskaalattu menettely  
 Hyväksymiskirje: Päätös urakan lopullisesta hyväksymisestä vastaanottotarkastuksen jälkeen  
 Ilmoitus hankintaoikaisun vireille tulosta  
 Ilmoitus hankintaoikaisusta ja lausuntopyyntö  
 Ilmoitus hankintaoikaisuvaatimuksen vireilletulosta  
 Ilmoitus markkinaoikeuden toimivallasta ja oikaisuohje, erityisalojen hankintalaki  
 Kanavaliikennemääräykset  
 Kanavien kiinteistönhuolto-ohje  
 Koneteknisten huoltojen tarkastuslista  
 Koneteknisten laitteiden tarkastus- ja huolto-ohjeet  
 Konsultin valintaperusteet, menettelyjen ohjeistus  
 Kunnossapitosopimus  
 Kustannuserittelyt  
 Kustannuserittelyt, kokonaishinta  
 Kustannuserittelyt, tavoitehintaa  
 Kustannusten hallinta  
 Kutsu jättää tarjous

Laadullinen vertailu ja ohje  
Lausuntopyyntö hankintaoikaisuvaatimuksesta  
Liite 1 Sopimusluonnos Ratasuunnittelu  
Liite 1 Sopimusluonnos Tiesuunnittelu  
Liite 1.1\_Tilaajan muut sopimukset  
Liite 1.10\_Kokoukset ja yhteiset toimitukset  
Liite 1.11\_Raportointi ja dokumentointi  
Liite 1.12\_Vauriokorjaukset  
Liite 1.13\_Kunnossapidon materiaalit  
Liite 1.14\_Ympäristö-vaatimukset  
Liite 1.2\_Sopimushinta ja hintamuutokset  
Liite 1.4\_Rajapinnat  
Liite 1.5\_Kunnossapitotöiden tehtäväluettelo  
Liite 1.6\_Kunnossapidon laatutavoitteet  
Liite 1.7\_Kannustinjärjestelmä  
Liite 1.8\_Turvallisuussäännöt ja menettelyohjeet  
Liite 1.9\_Turvallisuusasiakirja  
Liite 2 Tehtävämäärittely Ratasuunnittelu  
Liite 2 Tehtävämäärittely Tiesuunnittelu  
Liite 3 Tarjousten valintamenettely  
Liite 3 Tarjousten valintamenettely Tiesuunnittelu  
Liite 4 Tarjouksen laadun arviointiperusteet Ratasuunnittelu  
Liite 4 Tarjouksen laadun arviointiperusteet Tiesuunnittelu  
Liite 5 Pätevyysvaatimukset Ratasuunnittelu  
Liite 5 Pätevyysvaatimukset Tiesuunnittelu  
Liite 6 Turvallisuusohje suunnittelun maasto- ja mittauksiin Ratasuunnittelu  
Liite 6 Turvallisuusohje suunnittelun maasto- ja mittauksiin Tiesuunnittelu  
Lisä- ja muutostyötilaus  
Lisä- ja muutostöiden yksikköhintaluettelo  
Lisä- tai muutostyötarjous (päivitetty 5.5.2017)  
Lähete, rakennus- / takuujen vakuuden palautus  
Maanteiden talvihoito, Laatuvaatimukset  
Maastopalveluohje  
Mallit rikosrekisteriotteista, henkilö ja yritys  
Malliviesti, pyyntö toimittaa rikosrekisteriotteet  
Mediaani kokonaistaloudellinen menettely  
Muutos- ja lisäyöhintaluettelo  
Muutos- ja lisäyöhintaluettelo keitele  
Määrämittaushoje  
Normaali kokonaistaloudellinen menettely  
Ohje, rikosrekisteriotteiden tarkastamiseen EU-hankinnoissa  
Oikaisuohje  
Oikaisuohje, hankintalaki ja erityisalojen hankintalaki  
Oikaisupäätös, kielteinen  
Oikaisupäätös, myönteinen  
Osallistumishakemusten avaus- ja käsittelypöytäkirja  
Palvelusopimus  
Palvelusopimus keitele  
Palvelusopimus meriväyläyksikkö

Pisteytystaulukko  
Poijuohjelma, ohjeellinen  
Projektisuunnitelma  
Päätös urakan lopullisesta hyväksymisestä takuutarkastuksen jälkeen  
Reimarin tietoturvatason tarkistuslista  
Reklamaatio  
Riskienhallintasuunnitelma  
Riskienhallintasuunnitelma (ahvenanmaan alue, matriisi)  
Riskienhallintasuunnitelma keitele  
Sanktiot ja bonukset  
Selvityspyyntö alhaisen tarjoushinnan perusteista  
Sillan purkutyö- ja turvallisuussuunnitelma  
Sillan tarkastuslomake  
Skaalattu kokonaistaloudellinen menettely  
Sopimuksen siirto  
Sopimuskatselmuspöytäkirja  
Sopimuskatselmuspöytäkirja, suunnittelu- ja asiantuntijapalvelut  
Sopimuskohtaiset urakkaehdot (SKU) Keiteleen kanava  
Sopimusluonnos  
Sopimusmuutokset sopimukseen  
Sopimusmuutokset sopimukseen  
Soveltuvuusvaatimukset-liite  
Soveltuvuusvaatimuslomake  
Sukellustarkastusohje  
Sulutus- ja häiriötilastot  
Suunniteltavat rakenteet  
Sähkötekniset laitteiden tarkastus- ja huolto-ohjeet  
Sähkötekniisten huoltojen tarkastuslista  
Takuutarkastuspöytäkirja, KU, ST  
Taloudellinen loppuselvitys, pöytäkirja, KU, ST  
Tarjoajien soveltuvuutta koskevat selvitykset  
Tarjouksen hintaosa  
Tarjouksen laatuosan sisältöluettelo  
Tarjous- ja muutostyöhintalomake 5v  
Tarjouslomake  
Tarjouslomake A (sisältöosa), avoin  
Tarjouslomake A (sisältöosa), avoin menettely  
Tarjouslomake A (sisältöosa), rajoitettu  
Tarjouslomake B (hintaosa)  
Tarjouslomake keitele  
Tarjouslomake kokonaishinta  
Tarjouslomake yksikköhinnat  
Tarjouspyynnön lisäkirje  
Tarjouspyyntö  
Tarjouspyyntökirje  
Tarjouspyyntökirje  
Tarjouspyyntökirje  
Tarjouspyyntökirje keitele  
Tarjouspyyntökirje, avoin menettely

Tarjouspyyntökirje, avoin menettely  
 Tarjouspyyntökirje, avoin menettely.  
 Tarjouspyyntökirje, rajoitettu menettely  
 Tarjouspyyntökirje, rajoitettu menettely  
 Tarjouspyyntökirje, rajoitettu menettely.  
 tarjouspyyntökirje, ratasuunnittelu  
 tarjouspyyntökirje, tiesuunnittelu  
 Tarjousten avaus- ja käsittelypöytäkirja  
 Tehtävämäärittely, tie  
 Toiminta -ja laatusuunnitelma  
 Toiminta -ja laatusuunnitelma  
 Toimintaselostus  
 Tuotevaatimusmalli  
 Turvallisuuden aloituskokous, hoidon ja ylläpidon alueurakka (2.3.2017)  
 Turvallisuuden aloituskokous, pöytäkirja  
 Turvallisuusasiakirja  
 Turvallisuusasiakirja  
 Turvallisuusasiakirja ahvenanmaan alue  
 Turvallisuusasiakirja keitele  
 Turvallisuusasiakirja, tie, rata ja vesi  
 Turvallisuusasiakirjojen laadintaohjeet (linkki sivustolle)  
 Turvallisuuskoordinaattorin tehtävä, nimitys  
 Turvallisuuskoordinaattorin tehtävä, nimitys (uusi 2.3.2017)  
 Turvallisuussäännöt ja menettelyohjeet  
 Turvallisuussäännöt ja menettelyohjeet  
 Turvallisuussäännöt ja menettelyohjeet kanavat  
 Turvallisuussäännöt ja menettelyohjeet  
 Turvallisuussäännöt ja menettelyohjeet, rata  
 Turvallisuussäännöt ja menettelyohjeet, tie  
 Turvallisuussäännöt ja menettelyohjeet, vesi  
 Työkohtainen tarkennus  
 Työkohtainen tarkennus  
 Työmaakokouspöytäkirja  
 Työmaakokouspöytäkirja, KU, ST  
 Työselostus  
 Urakkaohjelma  
 Urakkaohjelma (tie-, rata- ja silta sekä sillankorjausurakat)  
 Urakkaohjelma (vesiväyläurakat)  
 Urakkaohjelma väylänpito  
 Urakkaohjelma  
 Urakkasopimus  
 Urakkasopimus  
 Urakkasopimus radan-, tien ja sillanrakennus-, sillankorjaus- sekä vesiväyläurakoihin  
 Vaatimus vakuuden jatkamisesta  
 Vakuutus yhteiskunnallisten velvoitteiden täyttämisestä  
 Valitusosoitus markkinaoikeuteen, erityisalojen hankintalaki (ID 301, Kameleon-päivityksessä)  
 Valitusosoitus markkinaoikeuteen, hankintalaki (ID 304, Kameleon-päivityksessä)  
 Vastaanottotarkastuspöytäkirja

Vastaanottotarkastuspöytäkirja  
Vastaanottotarkastuspöytäkirja, KU, ST  
VNa 205/2009  
Välitarkastuspöytäkirja  
Väylä- ja turvalaiteluettelot  
Väylänhoitourakan yleiset sopimusehdot 2004  
Yksikköhintaisten töiden määrä- ja yksikköhintaluettelo  
Ympäristönhoitokartta  
Ympäristönhoitotöiden työselostus  
Yritysjärjestelyiden aiheuttamat toimenpiteet hankintasopimukseen ohje (uusi 5.3.2018)



### Appendix 3. Environmental themes and criteria in those documents including key words

Environmental theme and sub- themes	Environmental criterion in procurement process (characteristics of the criterion and the type of the procurement)
<b>Climate change mitigation</b>	<b>minimum requirement</b>
energy efficiency	contract clause: environmental requirements in maintenance of railroads and their safety equipment
emission control	contract clause: environmental requirements in maintenance of railroads and their safety equipment
fuel consumption	contract clause: environmental requirements in maintenance of railroads and their safety equipment
<b>State of the environment</b>	<b>minimum requirement</b>
noise control	contract clause: safety document of route projects
material choices	contract clause: safety document of route projects
environmental protection	contract clause: environmental requirements in maintenance of railroads and their safety equipment contract clause: project programme in road maintenance contract clause: operational and quality plan in road maintenance contract clause: safety document of route projects
waste management	contract clause: project programme in construction projects
complying rules, instruction and regulations	contract clause: project programme in construction projects and in waterway construction projects
<b>Climate change mitigation</b>	<b>recommendation</b>
energy efficiency	contract clause: environmental requirements in maintenance of railroads and their safety equipment  contract clause: project programme in waterway construction projects
<b>Material efficiency</b>	<b>recommendation</b>
recycling materials	contract clause: project programme in construction projects
<b>State of the environment</b>	<b>recommendation</b>
groundwater protection	instruction: product description in design
chemicalising	contract clause: environmental requirements in maintenance of railroads and their safety equipment
noise control	contract clause: environmental requirements in maintenance of railroads and their safety equipment,  instruction: product description in design

#### **Appendix 4. Cover letter for category and product managers**

*Original in Finnish see below*

Dear recipients & for your information supervisory staff!

This year's performance target for innovative and sustainable procurements is to promote energy efficiency through procurement practices.

Saara Ojanen studies the current situation - how energy efficiency, and other environmental requirements, are considered in our instructions.

When Saara contacts you, I ask that you give your time, your knowledge and your expertise!

Regards

Laura

Laura Kuistio  
Manager, Legal services and procurement

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Hyvät vastaanottajat & tiedoksi esimiehet!

Tämän vuoden tulostavoitteeseemme innovatiivisten ja vastuullisten hankintojen osalta sisältyy energiatehokkuuden edistäminen hankintatoimen keinoin.

Saara Ojanen selvittää nykytilannetta – miten energiatehokkuusvaatimukset, mutta myös ympäristövaatimukset laajemmin, on meillä nyt huomioitu erityisesti ohjeistuksessa.

Saaran ottaessa yhteyttä, pyydän, että annatte aikaanne, tietojanne ja osaamistanne!

Ystävällisin terveisin

Laura

Laura Kuistio  
Johtaja, Oikeus ja hankinta

### Appendix 5. Interviewees

Interviewee	Field	category or product manager	project manager	other
P1	planning and projects			
P2	infrastructure management			
P3	infrastructure management			
P4	planning and projects			
P5	planning and projects			
P6	planning and projects			
P7	planning and projects			
P8	planning and projects			
P9	planning and projects			
P10	planning and projects			
P11	infrastructure management			
P12	infrastructure management			
P13	infrastructure management			
P14	infrastructure management			
P15	infrastructure management			

Confidential

## **Appendix 6. Interview questions**

### **Question theme: background information**

1. Work assignments and procurements: Are your current work tasks related to procurements? If yes, how?
2. How long have you been working in among these tasks?
3. What procurement category does your work currently relate to? What is the expected value of goods that you procure? How much do you spend on average on a yearly basis on this procurement category? An estimate is sufficient.

### **Question theme: Procurement policies, guidelines and development targets**

1. Purchasing policies, i.e principles of implementation: What do you think are the most important basic principles that everyone should follow in the procurement process in FTA?
2. Development targets related to the implementation of procurement: What do you think are the most important development targets for procurement process here in FTA?

### **Question theme: Criteria for procurements**

1. General criteria: What are the most common criteria that are demanded from a product, service or a contract?
2. Environmental criteria: If you consider the procurements that you have been involved in, has environmental aspects been part of that procurement process?

If environmental aspects have been considered in your procurements, how are they integrated in the process? For example, as minimum requirements or were they used in comparison to earn extra points in tendering?

If the environmental aspect have not been part of procurement, why?  
What issues should change in FTA to integrate environmental aspects into procurements or strengthen their role in procurement process?

3. What do you think are the most important factors that guide procurement process in FTA?
4. What do you think are the most important factors that guide setting general criteria for the product / service / contract in FTA?

5. Guidance for setting environmental criteria: If environmental aspects have been considered in your procurements, what do you think was the main reason for including environmental criteria in that procurement?

**Question theme: Impacts**

1. How would you evaluate FTA's ability to influence, for example, through procurement in the society?

**Question theme: Future**

1. What do you think are the most important and most likely trends to occur in near future (5 years) in FTA's procurements?  
You can consider the issue at a general level and look at the category you are primarily involved in through your own work.
2. How do you see the role of environmental issues in the future from FTA's procurement point of view?