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A Hedonic Pricing Model in Helsinki, Finland:

Exploring the Impacts of Green Infrastructure on Apartment Listing Prices

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Abstract (400-500 words)

Green Infrastructure (GI) is a critical element of urban sustainability that provides environmental, economic, and social benefits. Adoption, however, has been slow. It is critical to demonstrate the paybacks in localized contexts to encourage uptake (European Commission, 2021; Matthews et al., 2015).

Hedonic pricing models (HPM) are a method of regression that isolate physical and spatial characteristics of property to estimate the impact on valuation (Monson, 2009). This method is used to evaluate how proximity to GI such as parks, coastlines, and forests impact real estate markets. Although HPMs have been deployed for on-site features such as balconies and floor levels, very few have assessed on-site GI.

This dissertation investigates the impact of on-site GI on apartment listing prices in Helsinki, Finland through an HPM. Taking into account local real estate practices and urban form, a structural characteristics index was created. A multi-linear regression was then conducted on a dataset collected from 200 property listings to measure the relationship between the structural characteristics and property listing prices.

Although the model was overfit (requiring a larger sample), several significant findings were discovered. For each unit increase, the apartment listings gained or lost the following in value: square metre of living area (+€8,079), bathroom (+€101,040), floor level (+€7,928), each km away from the coastline (-€15,080), each km away from the central business district (-€14,277), landscape gardening (+€79,250). No finding produced statistically significant evidence against the hypothesis (that GI has a positive association with apartment listing valuation).

These findings offer practical applications for the real estate industry. Strategies can be crafted to maximize apartment valuation by recognizing proximity to certain features and on-site landscape gardening. The findings support the notion that spatial and on-site GI increase property valuation.

Keywords

Hedonic Pricing Model, Green Infrastructure, Environmental Economics

Originality statement. I hereby declare that this Master's dissertation is my own original work, does not contain other people's work without this being stated, cited and referenced, has not been submitted elsewhere in fulfilment of the requirements of this or any other award.	**Signature**

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Abbreviations

A-D* Stat	Anderson-Darling Goodness of Fit Test
CBA	Cost-Benefit Analysis
CBD	Central Business District
GI	Green Infrastructure
HPM	Hedonic Pricing Model
KM	Kilometre
LCA	Life Cycle Assessment
LID	Low Impact Development
M	Metre
MAE	Mean Absolute Error
MAPE	Mean Absolute Percentage Error
NBS	Nature Based Solutions
RMSE	Root-mean-square deviation
TEV	Total Economic Value
TCM	Travel Cost Method
VIF	Variance Inflation Factor
WTP	Willingness to Pay

1 Introduction

Natural elements in the landscape provide human societies with a range of benefits. These include economic, social, and environmental benefits in the form of ecosystem services. Ecosystem services encompass "*the benefits that human societies derive, directly or indirectly, from ecosystem functions"* (Costanza et al., 1998). The benefits of ecosystem services are often organized into four categories: provisioning services (natural resources, e.g., food and timber), regulating services (air/water quality improvements, pollination, etc.), cultural services (recreation, aesthetics, religious, etc.), and supporting services (photosynthesis, nutrient cycling, etc.) (European Union, 2019; FAO, 2022; Notte et al., 2017; Reid et al., 2005).

Regulating, supporting, and cultural ecosystem services tend to be more abstract and intangible than provisioning ecosystem services. This has caused them to act as externalities in the economy, in that their value is not captured in the market (Goulder & Kennedy, 2013). Without accounting for the value of ecosystem services, they become depleted, displaced, and removed. To address this, efforts for integrating the environment into economics through what is referred to as "*environmental economics*", formulated in the early 1960's (Pearce, 1990).

As environmental economics advanced, the concept of natural capital developed. Natural capital refers to "*the living and nonliving components of ecosystems—other than people and what they manufacture—that contribute to the generation of goods and services of value for people"* (Guerry et al., 2015). Ecosystem services are a product of natural capital.

A type of natural capital is green infrastructure (GI). GI is a disputed term (Benton-Short et al., 2017) but is generally understood to be "*vegetation, soils, and bioengineered systems that provide ecological services such as microclimate regulation, air quality improvements, habitat, and stormwater management*" (Bolund & Hunhammar, 1999). GI is most often conceptualized in urban contexts.

1.1 Green Infrastructure in Helsinki

Helsinki is located on a peninsula of river valleys and granite cliffs that protrudes into the Finnish Gulf. The city has over 100 miles of coastline, which include the 315 nearby islands. The historical vegetation cover consisted of coniferous woods.

The area has undergone biophysical changes as the city developed. For example, the 25 streams that run through the city have been altered through drainage, straightening, and removal of riparian vegetation (Vierikko & Niemelä, 2016). Although the city has still managed to maintain a 46% green cover, much of the original native coniferous woods have been removed for development (Jaakkola, 2012). Population in the metro area of Helsinki has increased from 365,600 in 1950 to 1,327,762 in 2022 (World Population Review, 2022). The local environmental pressures have spurred sustainable development and ecological restoration actions.

For example, much of the GI found presently in the city's public realm was driven by the adoption of the "*Action Plan for Sustainability*" in 2002 which set the path for long-term ecological, economic, social, and cultural sustainability. The innovation of this framework was recognized in 2003 when the city was awarded the "*Certificate of Distinction of the European Sustainable City Award*". This was later reinforced by the Climate Strategy 2030 which aims to reduce greenhouse gas emissions to one-third of 2004 levels by 2030 (Jaakkola, 2012).

On private property, GI in Helsinki takes the form of vegetation, green roofs, bioswales, bioretention ponds, permeable pavement, urban agriculture, landscaping, urban wetlands, rain gardens, and living walls. GI like trees and gardens are more common historically, whereas other forms of GI are only beginning to emerge in new developments.

In 2013, Helsinki introduced the "*Helsinki Green Factor Tool*" as a pilot program. The tool calculates a ranking that is assigned to properties by assessing the ratio of the scored green area to the lot area. The tool continues to be tested in various aspects of the planning process to promote GI adoption (ilmastotyokalut, 2018).

1.2 Rationale

In the private sector, property development is almost entirely profit-driven. The sole purpose, like other private sector companies, is to generate a direct financial profit (Isaac, 1996). Justifying design features, including GI, in economic terms is essential for adoption. Demonstrating paybacks of GI in localized contexts builds confidence in the applications and clarifies expectations. Although much of Helsinki's development is administered by public enterprises, filling in research gaps related to the economic value of GI is expected to encourage uptake.

1.3 Aims and objectives

This dissertation explores the impact of GI on apartment listing prices in Helsinki, Finland through an HPM. The objectives of the research include:

Objective 1: Conduct a literature scan of methods used for quantifying the economic impact of GI on property valuation. Select an appropriate methodology based on the literature review.

Objective 2: Develop a data collection criterion. Collect property data listing prices and structural characteristics.

Objective 3: Conduct analysis of data. The type of analysis deployed is based on the literature review.

Objective 4: Draw conclusions from the analysis to determine the impact of GI on property listings in Helsinki.

1.4 Disposition

Chapter 1 introduces the philosophy of environmental economics and the importance of GI, provides the rationale for the project, and outlines the aim and objectives of the research.

Chapter 2 is a literature review of the various methods that are available to assess the economic value of GI. The HPM is introduced and a justification for selecting the method is given. HPMs conducted in Helsinki are reviewed and gaps in literature are identified.

Chapter 3 is an overview of the methodological approach taken. This section specifies the methodological philosophy as well as how data collection and regression were carried out.

Chapter 4 presents the results produced from the HPM. A description is provided for the various elements of the regression model output to assist with the interpretation. Key findings are highlighted.

Chapter 5 concludes the research with a discussion that explores the significance of the results. This is followed by limitations, recommendations for future work, and concluding remarks.

2 Literature Review

A range of methods has emerged for accounting for the economic value of various types of natural capital and the ecosystem services that they provide. The main objective of these methods is to determine the total economic value (TEV) of the natural capital asset which "*represents all the ways that goods and services influence individual utility*" (Tinch, 2019). This quantification of intangible externalities in the economy is also referred to as shadow pricing (Starrett, 2000). Constructs such "*The System of Environmental-Economic Accounting*" (SEEA) framework have been developed in an attempt to set standards for integrating environmental data into economic formulas (United Nations, 2021).

The ecosystem services that natural capital assets provide may benefit direct private interest, indirect public interest, or both. For example, many of the regulating and cultural ecosystem services such as improved air, water, and soil quality benefit the public. Urban trees increasing property valuation however are an example of natural capital benefiting private interest.

Most environmental economics research focuses on the public interest benefits. However, natural capital assets such as GI are increasingly recognized for their contributions to private interest. The benefits include increased property valuation, extended infrastructure lifespan, cost savings, energy and water savings, property marketability, and permitting benefits.

A set of methodologies within this niche of environmental economics have been developed to estimate the economic impacts of GI applications in urban environments. These estimations serve a critical role in justifying GI through quantified metrics. Building confidence in this manner is important because, despite the well-known public benefits of GI, widespread adoption has been slow (Matthews et al., 2015).

2.1 Methods For Identifying the Economic Value of Green Infrastructure

2.1.1 Cost-Benefit Analysis

A cost-benefit analysis (CBA) is the "*is the estimation and weighing of the positive and negative effects of government action*" with a "*look before you leap"* mentality (Livermore et al., 2013).

This definition also extends to the actions of property developers/managers and other actors. It is one of the most basic types of analysis, as it is essentially a subtraction of the costs from the benefits. The result is a determination of the economic efficiency of the proposal.

CBA may include other methodologies within the analysis. For example, "*shadow pricing, contingent valuation, hedonic pricing, market pricing, travel cost method, and other measurement tools*" can express the cost and benefits in monetary values (de Groot et al., 2002). Alternatively, or in tandem with, the CBA may assess strictly the direct costs and budgets to determine the "*Net Present Value (NPV), the Internal Rate of Return (IRR) and the Pay Back Period (PBP)"* (Perini & Rosasco, 2013b).

CBA is used extensively to estimate the TEV of GI in various contexts. CBA has been specifically valuable to private actors who seek granular data on investment returns.

For example, A CBA of green roofs in Seoul, Korea found that "*the gap between the cost and benefit values of green and traditional roofs is not that significant*" and that "*If the cost of construction decreases because the market for green roof infrastructures expands, there could be opportunities for the other scenarios to become economically feasible*" (Shin & Kim, 2019). In another example, a CBA of urban agriculture in sustainable park design found that "*urban agriculture approach compared to conventional urban park design approach can be profitable by reducing the life cycle costs of the construction and maintenance, and also through increasing the life cycle incomes*" (Hosseinpour et al., 2022).

CBA has been criticized for over-simplifying the estimation of GI's value. This is due to the narrow scope that most CBA methodologies deploy to conduct the analysis. It is suspected the CBA underestimates the TEV of GI by omitting key environmental and social benefits from the analysis. According to (Vandermeulen et al., 2011) "*recently, policymakers have called for economic valuations of far more complex societal issues, characterised by several levels in geographic scope, timing, stakeholders, value".*

2.1.2 Willingness to Pay/ Contingent Valuation

Setting an appropriate price for goods and services has been a challenge for businesses, marketers, and economists since economies have existed. To forecast market value and customer response to pricing, experiments are often undertaken with different product designs. The reaction to the various configurations can be used as a predictor of market behaviour (Breidert, 2006).

Willingness to Pay (WTP) models has been applied to estimate the market value of nature-based solutions (NBS) including GI. NBS are "*actions which are inspired by, supported by, or copied from nature*"(European Commission, 2020). To estimate the WTP, a contingent valuation (CV) experiment is often conducted. CV experiments are a survey method that asks a selection of market actors how much they would pay for certain features of products or services. The results act as a proxy for the wider market (Markandya & Ortiz, 2011).

For example, a WTP study using the CV method was conducted in Manchester, UK estimate the value of GI investments in the core of the city. The survey focused on four main areas: attitudes to green space; landscaping preferences, WTP; and attitudes towards the services that green spaces provide. 512 respondents were interviewed for the survey. The WTP study found that "*larger or more visible GI investments, which refer to the level of perceived greenery in each investment option including the size of each element and the wider composition within the image, elicit higher payment values than investments perceived as presenting lower levels of visible greenery*" (Mell et al., 2013).

Additionally, in Taiwan, a WTP study was conducted using the CV method to probe the influence of the greening design of the building environment on the urban real estate market. A survey of 300 respondents from industrial circles, government, academia, and others was conducted to estimate the WTP. Through analysis of the survey response, the authors concluded that "*greening benefits exhibit a positive significant impact on urban real estate markets, a result consistent with the results of related domestic and foreign studies*" (Chang & Chou, 2010).

The extensive use of WTP to predict the market value of GI is an indication that the method is an effective tool. The results generally favour the adoption of NBS and help reinforce the case for GI application in public and private development projects. Furthermore, WTP helps quantify the externalities of NBS not captured in traditional urban economics.

The method has limitations. In Hong Kong, a WTP study was conducted using the CV method to probe the motives for conserving urban green spaces. 495 diverse respondents were surveyed to gauge their WTP for urban green spaces. The study found that residents were confused by the line of questioning as they mostly associate parks as a public resource (Lo & Jim, 2010). When WTP is applied to features not often perceived as private amenities such as greenspaces or waterbodies, the concept can be abstract, limiting the publics' ability to participate in the surveys.

The qualitative nature of the WTP gives the results an indication of the market value but is less definitive than other quantitative methods. What respondents say they will pay for and what they will pay for in practice may diverge. The WTP is therefore best used as a gauging tool and not as a specific pricing tool.

2.1.3 Case Studies

Case studies are "*in-depth, multi-faceted explorations of complex issues in their real-life settings"* (Crowe et al., 2011). Case studies offer an approach to assessing the valuation of NBS projects already completed. The studies act as retroactive CBA. The findings can help the project generalize the feasibility of forthcoming NBS applications and identify refinement practices to create future efficiencies.

In Taiwan, a case study was undertaken on urban GI development using a case study approach. The authors concluded that *"the development of green infrastructure increases the value of land use and energy saving and increase urban disaster prevention"* (Hsu & Chao, 2021). The University of New Hampshire also undertook a case study analysis of Low Impact Development (LID) practices in several suburban developments across the United States. The authors concluded that "*lots in the conservation subdivisions cost an average of $7,000 less to produce,* *resulted in a 50 percent decrease in selling time, and had a value of 12 to 16 percent more as compared to lots in conventional subdivisions"* (University of New Hampshire, 2015).

A challenge with case studies is securing the data from projects that are required to conduct analysis. Economic data from projects tend to be more sensitive than other types of datasets. Owners of development projects may be hesitate to engage with researchers. Additionally, case studies offer a snapshot in time, but the results do not necessarily reflect future outcomes. Changes in project implementation and prices of services and materials may cause similar projects to have different economic outcomes. The case studies do however act as an important indicator of economic viability in the marketplace.

2.1.4 Lifecycle Assessment

A lifecycle assessment (LCA) is an analysis of a product or service from its raw materials stage to the waste stage. The LCA is often used to assess the environmental burden of a product or service, but it can also be used to calculate the economic value by assessing the costs and benefits received through the lifecycle (Klöpffer, 1997). This method has been used to estimate both the TEV and identify environmental trade-offs of NBS, LID, and GI (Spatari et al., 2011).

A LCA of green buildings found that "*the initial cost of a green building is 7.5% more than the ordinary building. However, life cycle cost of the green building is 25.6% lower than the ordinary building for 20 years period, and 24.9% lower for 40 years period*" (Kansal & Kadambari, 2010). The World Green Building Council defines a green building as "*a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment*" (Maciej Serda, 2013). Research by (Flynn & Traver, 2013) proposed the use of LCA to evaluate the environmental, economic, and social performance of GI stormwater control measures. In the case study presentation, they found that "*the construction phase is the main contributing life cycle phase for all adverse environmental impacts, as well as total life cycle cost and labor impacts".*

LCA has a similar challenge as case studies because securing data can be complex and time-consuming. There are a significant number of raw materials used in NBS which makes the analysis intricate. To receive data and permissions of all these materials is the onus that presents barriers to conducting LCA.

2.1.5 Travel Cost Method

The Travel Cost Method (TCM) is a method that estimates the economic value of recreational and cultural services. This method assesses how much individuals pay to travel to recreational services. A TCM of the monetary value of recreational services in the Ömerli Catchment in Istanbul, Turkey found a "*significantly positive and undeniable consumer surplus for the use of the catchment*" (Cetin et al., 2021).

2.1.6 Hedonic Pricing Model

Property is sold on the market as a bundle of goods. The goods include the land, the building, the location, and the components that make up these features. HPMs uses multi-linear regression analysis to isolate physical and spatial characteristics to assess the influence on the property's valuation (Monson, 2009).

There are three main types of HPMs deployed: spatial, non-spatial, and mixed type. The type of HPM utilized depends on the feature being assessed (CFI Education Inc., 2015). Spatial HPMs are used to assess the economic influence of features in spatial proximity to the property such as parks, forests, and recreational amenities. Non-spatial HPMs focuses on the economic influence of features found within the site boundaries such as building design, landscaping, and parking. Mixed-type HPMs integrate HPM types (spatial and non-spatial) to assess a series of features and their correlation to property valuation.

HPMs have been useful for identifying the economic influence of NBS as set by the market in various contexts. The use of HPMs for this purpose has grown in popularity and complexity in recent years. With the increased use of HPMs, methodologies have improved. Below is a sample of HPMs applied to NBS that was reviewed for this research.

2.1.6.1 Spatial Hedonic Pricing Model Examples

The Effect of Community Gardens on Neighboring Property (Voicu & Been, 2008):

Through the application of an HPM, the authors estimated the impact of community gardens on neighbourhood property values in New York City, United States. The estimate derived from HPM was a gross tax benefit of USD $503 million over a 20-year period. These results were amplified in poorer neighbourhoods, raising property value by 9.4%.

City Trees and Property Values (Wolf, 2007):

This article summarizes several HPMs that assessed the impact of street and yard trees on property values. The summary indicates a 2% property increase with the presence of mature yard trees (greater than 9-inch DBH), 3-5% property increase with the presence of trees in front yard landscaping, 6-9% property increase with the presence of good tree cover in a neighborhood, and 10-15% property increase with the presence of mature trees in high-income neighborhoods. The article reinforces the concept that results were amplified in poorer neighbourhoods.

Role of Green Infrastructure in Determining House Value in Labuan Using Hedonic Pricing Model (Nazir et al., 2015):

The authors used a mixed qualitative/quantitative approach to assess how house prices are impacted by GI in Labuan, Malaysia. The quantitative element of the research involved a series of interviews with the local authority, developer, community, respondents, and other stakeholders. The results of the HPM indicated a 79% increase in housing prices when all GI were present. The authors concluded that GI contributes to housing market prices in Labuan, Malaysia.

Valuing green infrastructure in Portland, Oregon (Netusil et al., 2014):

The authors used an HPM to test if green streets (streets with tree canopy cover) impact the sale price of single-family residential properties in Portland, Oregon. 29,712 single-family residential property transactions were utilized for the HPM along with neighbourhood canopy cover data. The results of the HPM suggest that green street adds USD $11,583 (4.39%) to median sale prices.

2.1.6.2 Non-Spatial Hedonic Pricing Models Examples

New York City Property Values: What Is the Impact of Green Roofs on Rental Pricing? (Ichihara & Cohen, 2010a):

Authors tested the impact of green roofs on rental prices in New York City, United States using an HPM. The model was run using census data and descriptive statistics of average rental prices. The HPM revealed a 16.2% increase in rental prices in those apartments with green roofs present.

Influence of Trees and Landscaping on Rental Rates at Office Buildings (Laverne, 2003):

The study is an investigation of trees and landscaping on rental prices of office buildings in Cleveland, Ohio, USA. Data was used from 85 office buildings that included 270 individual and unique leases along with descriptions of the landscaping at each site. Through the HPM, authors concluded that office buildings that featured landscaping with a good aesthetic value added approximately 7% to the average rental rate of the building.

2.1.6.3 Mixed-Type Hedonic Pricing Model Examples

Effects of floor level and landscape proximity on housing price: A hedonic analysis in Hangzhou, China (Xiao et al., 2019a):

The authors investigate the impact of floor level and landscape proximity on housing prices in Hangzhou, China using an HPM. A data set comprising of 18,551 housing transaction samples were used for the HPM. The results of the HPM indicated that "*as floor level increases, housing price first rises at a decreasing rate, and then starts to drop when floor level is larger than 4*".

HPM is a popular method for estimating the TEV of NBS due to its feasibility and effectiveness. Property sales data is often public information that has little friction in securing. The analysis takes place in the context of actual economic data with an HPM methodology that has been tested, scrutinized, and verified to portray realistic results. Based on these advantages, HPM is the selected methodology for this research.

2.2 Gaps in Research

There is a gap in the research that examines what impact on-site GI has on property valuation (if any) in Helsinki. HPMs can inform this research gap. To date, few HPMs have been applied in Helsinki. The most prominent is by (Votsis, 2017) titled: "*Planning for green infrastructure: The spatial effects of parks, forests, and fields on Helsinki's apartment prices*". This research utilized an HPM, finding "*green types yield different marginal effects and these depend on location within the city and the nature of spatial spillovers generated*". A non-spatial HPM would complement this research by filling the knowledge gap of what economic dynamics are occurring within property boundaries.

Exploring the relationship that GI has with property valuation is expected to advance the understanding of how the Helsinki real estate market values natural capital. By doing so, GI can be more readily justified in the design process. It is expected that the adoption of GI would increase should applications benefit the property valuation of local real estate. Although this research focuses on the immediate economic benefit to the property owner, the economic reward of GI adoption is radiant, as the public reaps the benefit of more healthy, livable, and climate-resilient cities.

3 Methodology

3.1 Study Area

The study area is Helsinki, Finland. The city consists of eight major districts and 34 subdistricts (City of Helsinki, 2011). Property data has been selected from available listings across the city to represent a random sample.

3.2 Methodological approach

HPM was selected as the methodological approach for this study. HPM was selected because it utilizes actual economic data to reveal the TEV of GI. This method is commonly used for determining how GI and other externalizations in the economy influence the real estate market. The extensive use of the model increases confidence in the method. Additionally, the method can be carried out within realistic timeframes and is feasible with available resources.

The research advances the use of non-spatial HPMs by assessing features within the bounds of property delineations. As highlighted in the literature review, some research has utilized non-spatial HPMs, but the majority has been applied to assess the influence of spatial features such as nearby parks, forests, or recreational complexes on property listings. By augmenting the hedonic equation using non-spatial dummy variables to account for these features, the model can be functional. In turn, the methodology can act as a blueprint for future research in this area.

The philosophy that the research adopted is a pragmatic approach through ontological terms. The study created new knowledge by drawing conclusions about how GI applications impact property listing prices in Helsinki based on the results of the HPMs using quantitative data. Deductive reasoning was applied as the research is driven by the central hypothesis that GI has a positive association with apartment listing valuation and can be quantified through an HPM.

The nature of the study involved a mixed method of qualitative and quantitative methodology. The research was conducted through cross-sectional data at a single point of time, between January 2022 and August 2022.

3.3 Hedonic Equation

This research organizes the available information and calculation through the hedonic equation listed below. The dependant variable (listing price), symbolized as Lp, is explained by adding the independent variables (constant α and structural coefficients). β symbolizes the structural value coefficients. i is the value of the coefficients.

To provide a more detailed explanation, the equation involves the addition of the listing price minus its structural values (the constant α) to the coefficients of the structural values (locational structural value coefficients (Lv), apartment structural value coefficients (Av), and GI structural value coefficients (Gv)). The structural value coefficients are multiplied by the dummy variables utilized to detect the presence or absence of certain features. Non-dummy structural values with other units are not multiplied. With multi-linear regression utilized, there is an error term, which is added to the model (ε).

$$Lp_i = \alpha + \beta_1 Lv_i + \beta_2 Av_i + \beta_3 Gv_i + \varepsilon$$

This simple hedonic equation was utilized to clearly illustrate the specific increase (€) per unit that the structural value coefficients have on the constant alpha value. For this research, the GI structural value coefficients are of the most interest. A semi-log form of the equation could also be used to calculate the percentage increase that each structural value coefficient has on the constant alpha value.

3.4 Structural Characteristics

Appendix 1. presents the structural characteristics that were used in the HPM. These structural characteristics are common inherent attributes that determine property listing prices (Ho Wai Son & Han Hsuen, 2022). By controlling these variables, the influence of GI features on property listing prices was examined. Common structural characteristics were identified during the literature scan of other HPMs and selected based on the context of this research. The structural characteristics are broken into three groupings: locational, structural, and GI.

3.5 Data Collection

Sales data is not public information in Finland, and therefore a data-sharing license would be required from the municipality. The time and capital resources required to secure a data-sharing license were deemed outside the scope of this project. As an alternative, listing prices were used for the HPM. Property data was collected using popular realtor websites including Etuovi, Oikotie, and Properstar. In Europe, listing prices can act as a proxy for sales transactions. Although the value is derived from the perceived value set by the seller, real estate agent, and property appraiser the listing price leads the negotiation (Fregonara & Irene, 2021).

Distances between the property and spatial variables were collected either from data in the property listings or measured using the Google Earth measurement tool. Spatial measurements are in Euclidean distance (directly between the two locations rather than through the street network). Although (Netusil et al., 2014 and Sander et al., 2010) recommends street network distance, Euclidean distance was provided as the measure of distance to amenities in the property listing.

The presence or absence of GI variables was assessed by reviewing photos from the listings, and imagery on Google Earth, Maps, and Street View. 200 apartment listings were assessed. The maximum number of listings to be assessed was selected based on feasibility for the projected timelines. Only apartments/condominiums were selected for assessment.

Spatial variables often used in HPMs, such as crime rates and ethnic makeup have been omitted from this model. Although neighborhoods in Helsinki have distinctive characteristics and ethnic makeups, the differences are not as sharp as in other cities. For example, Helsinki was ranked as the 2nd most safe city in the world in Mercer's 2019 Quality of Living Survey (Mercer, 2019). It is assumed that crime rates and ethnic makeup do not significantly influence the real estate market in Helsinki.

Much of the successful social cohesion in Helsinki can be credited to housing policy. There is careful consideration for the amount of owner-occupied and rental apartment units in each neighbourhood. Right-of-occupancy housing, subsidized rental apartments, short-term rental opportunities, and hitas homes (owner-occupied housing intended for residents) contribute to economically diverse neighbourhoods (City of Helsinki, 2022a).

A copy of the property data can be found in Appendix 2.

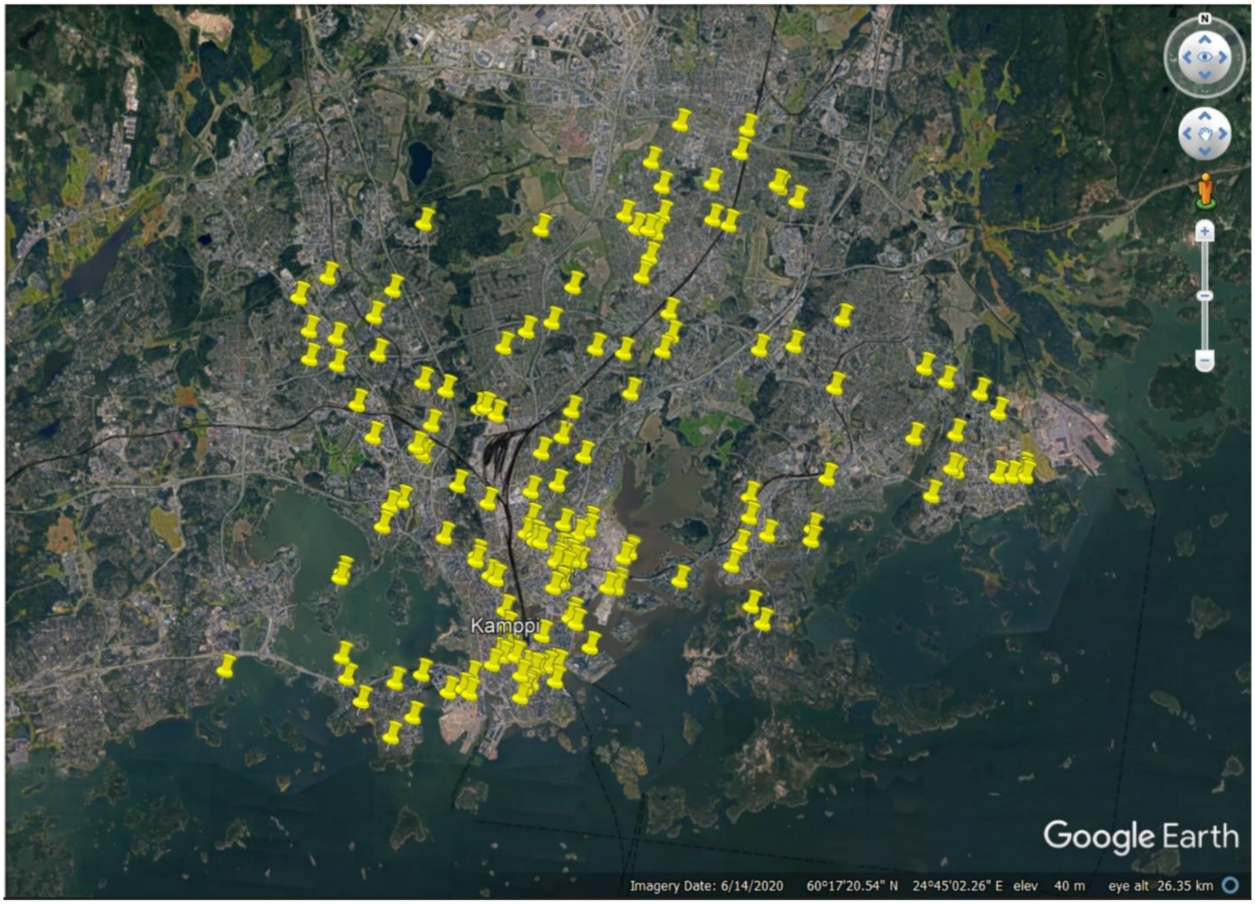

*Figure 1. Map of property listings assessed (*Google Earth*, 2022)*

*Figure 2. Green roof at Lauttasaarentie 52 (*Google Earth*, 2022)*

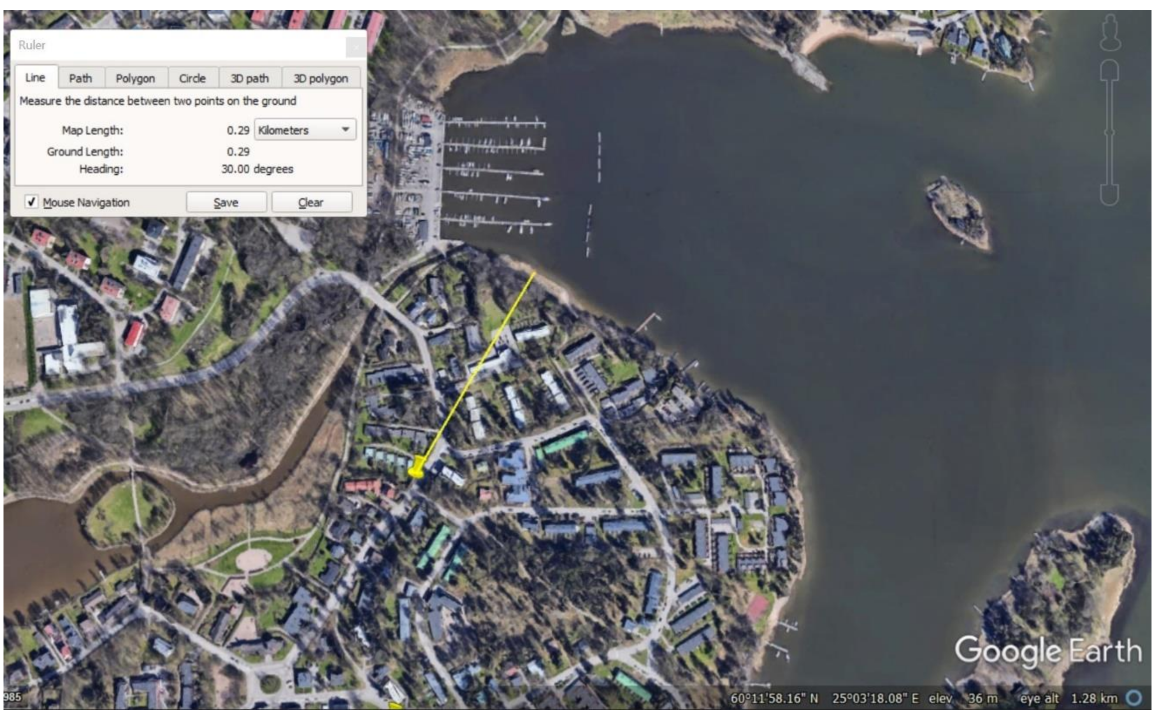

*Figure 3. Measuring Ruonasalmentie 12 distance from coastline (*Google Earth*, 2022)*

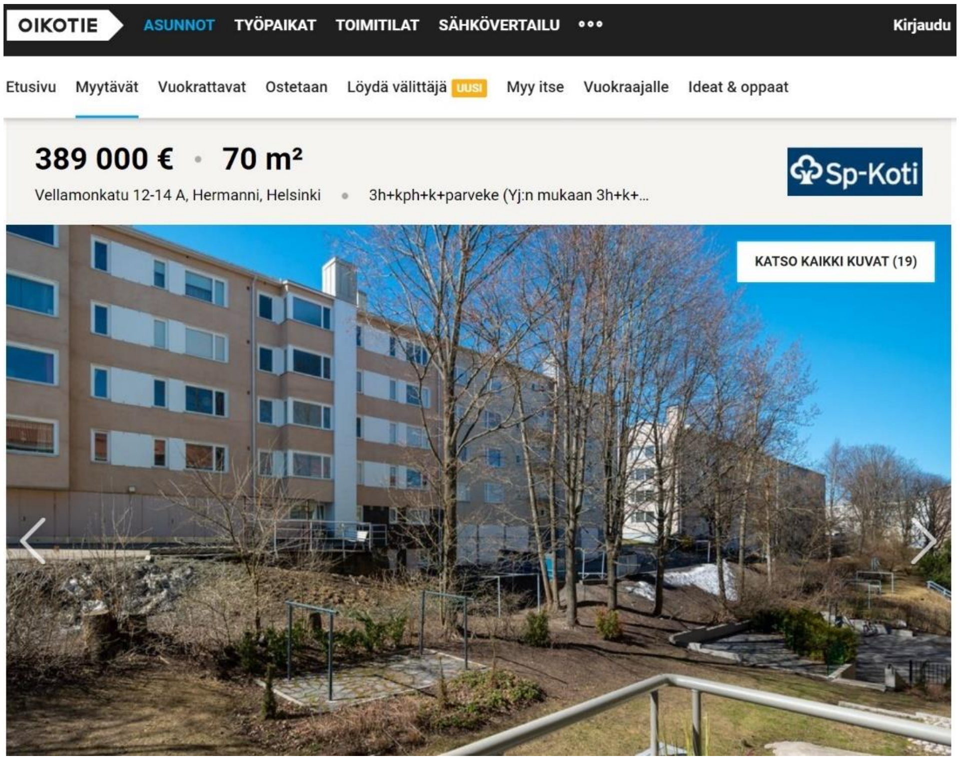

Figure 4. Assessing GI features of Vellamonkatu 12-14 on realtor website (Oikotie, 2022)

*Figure 5. View of on-site GI at Kaarikuja 4 (*Google Earth*, 2022)*

3.6 Hedonic Regression Analysis

An HPM comprising of 33 variables and 200 observations was conducted. Listing price (€) acted as the dependent variable whereas the structural characteristics acted as the independent variable. Since the model has more than one independent variable, it is considered a multi-linear regression (Bevans, 2020). The HPM was carried out in Microsoft Excel using the extension "*RegressIt*", a statistical forecasting tool released in 2014 by Fuqua School of Business at Duke University. One of the value propositions of the Regressit extension is that it enables regression of more than 16 variables to take place within Microsoft Excel (RegressIt, 2022).

4 Results

The complete results of the HPM are shown in Figure 6. A total of 200 observations were fitted for the HPM. Two values are listed as missing. The regression was run with a 95% confidence level.

The R square indicated that 87% of the structural characteristic's variations are explained by the price listings. Therefore, the data is a good fit for the model. The R squared value assumes that all independent variables considered have an impact that the HPM can explain. The closer the R squared value percentage is to 100, the better suited the data is to the model (Statology, 2019).

The adjusted R squared indicated that 85% of the variation of the structural characteristic's values are explained by the price listings. This reinforces that the model is a good fit. The adjusted R squared value only considers independent variables when there is an effect on the performance of the model. Therefore, the more dissimilar the values present in the HPM, the lower the accuracy of the estimations become because only the averages are considered (Corporate Finance Institute, 2022a).

The critical t of the HPM output was 1.974. If the t-statistic values are larger than the critical t, then the null hypothesis can be rejected. In HPMs, the critical t null hypothesis makes the statement that "*all coefficients in the model are equal to zero*". In the HPM output, four of the values (number of bathrooms, landscape gardening, living area, and floor level) were larger than the critical t, in turn rejecting the null hypothesis. This implies that these values are statistically significant (Statology, 2021g).

The standard error represents the average distance that the observed listing prices (€) fall from the regression line (Statology, 2021a). On average, the observed values fall €126,027 from the regression line. There is a 95% confidence level that the observed sample mean is plus or minus 1.96 standard errors from the population mean.

Positive coefficients indicate that for every increase in the unit of an independent variable, the dependent variable increases. Likewise, negative coefficients indicate that for every increase in the unit of an independent variable, the dependent variable decreases (Stockburger, 2022).

Therefore, the signs of the coefficients in this research indicate the increase or decrease of the listing price in euros when the presence of structural variables is detected. Out of the total 34 variables, 14 had positive coefficients and 20 had negative coefficients.

Seven of the coefficients (bathrooms, distance to CBD, distance to the coastline, landscape gardening, living area, postal code, and floor level) were statistically significant. This is established through P-values that are less than 0.05. This causes the null hypothesis to be rejected for these coefficients. The null hypothesis of the P-values was that the coefficient is equal to zero, implying they have no effect. Therefore, the P-values are detecting that these coefficients have a statically significant impact on the listing prices (dependant variable) (Statology, 2021b).

VIF measures how many "i*nflated variances*" are caused by multicollinearity. Multicollinearity is a term to describe scenarios where the independent variables are correlated. Only two variance inflation factor (VIF) values (distance to CBD and number of rooms excluding kitchen) indicate the potential for multicollinearity (values over four) (Corporate Finance Institute, 2022b). Multicollinearity can disrupt models significantly because the independence of independent variables is critical for assessing their impacts on the dependent variable (The Pennsylvania State University, 2018).

Confidence intervals of each coefficient provide a range of where the actual coefficient value falls. This range is provided because the coefficients displayed in the HPM are simply estimates. If the range occurs above 0, then it can be determined that the independent variable is having an impact on the dependent variable with a confidence of 95% (Sullivan, 2022). Four of the coefficients in the HPM output (number of bathrooms, living area, landscape gardening, and floor level) had ranges that occur above 0.

The standard errors of the coefficients were also displayed in the output. This is the standard deviation of each coefficient. The standard error value indicates the model's precision for that coefficient. The lower the standard error, the more accurate the model is for that coefficient (Minitab, 2022). The standard errors in the model are large across the output in comparison with the coefficients. This implies the model does not reflect an overall precision in the results.

The coefficients with the lowest standard errors are distance to the CBD, distance to the coastline, and floor level.

The model had a mean error of 1.791. The mean error (also known as the mean square error) is "*the average of the square of the errors*". A zero would indicate a perfect fit model. Therefore, the lower the mean error, the better fitted the model is to the dataset (Rowe, 2018). The low mean error in this model signifies that the model was a good fit.

The HPM output had a root mean square error (RMSE) of 114,816. Similar to R square and adjusted R square, RMSE is a sign of how well the model fits the dataset. The RMSE is a measurement of the mean distance between the predicted coefficient values and the actual coefficient values. This calculation is derived by computing the square root of the residuals. The residuals are the difference between the observations and predictions. Data is considered a better fit for the model when the RMSE is low (Statology, 2021d). The RMSE of the HPM output is considered moderate in relation to the range of the dataset.

The mean absolute error (MAE) had a value of 85,401. The MAE is similar to the RMSE in that it is the difference between the observations and predictions, but it is the mean absolute value of the difference rather than simply the difference. RMSE is a better indication of error in the model because it has a "*greater sensitivity to observed that are further from the mean*". However, both RMSE and MAE are still indications of how well the data fits the model (Statology, 2021e). As with the RMSE, the MAE value in the HPM output is considered moderate in relation to the range of the dataset.

Mean absolute percentage error (MAPE) is a percentage value that signifies model accuracy and forecasting. The mean is calculated through the formula "*Σ (|actual – forecast| / |actual|) * 100*" with Σ as a representation for sum, n as a representation for sample size, actual being the actual data value, and forecast being the forecasted data value (Statology, 2021c). The lower the MAPE value, the greater accuracy, and forecasting ability the model is expected to have. In general, MAPEs over 50% are suggestions that forecasting would not be highly accurate with the current model. The HPM output for this model was 54.56%, indicating the model is not well suited for forecasting.

To test if the data came from any specific distribution, the HPM output ran an Anderson-Darling Test (A-D* Stat). The A-D* Stat is a "*goodness of fit*" test because it tests to see if the random data sample follows a theoretical normal distribution. The A-D* Stat rejects the null hypothesis that the dataset has a normal distribution when the P-value of the test was less than 0.05 (McNeese, 2011; National Institute of Standards and Technology, 2022; Springer, 2008).

The P-value of the A-D* Stat in the HPM output was 0.007. Therefore, the null hypotheses can be rejected. This indicates that the dataset did not have a normal distribution. Ultimately, the rejected null hypothesis implies that the A-D* Stat can not be used to infer meaning other than that the data were not distributed normally. It is assumed that the lack of a normal distribution in this dataset was due to dummy variables which implies the presence or absence of certain structural characteristics but skews the data distribution with large concentrations of zeros and ones.

In summary, the results were largely unexpected because many of the coefficients did not demonstrate high enough statistical confidence to meaningfully defer implications. The coefficients that held statistical significance are distance to the CBD, distance to the coastline, distance to the nearest park, postal code, number of bathrooms living area, floor level, and landscape gardening. Four of these were spatial variables, two were structural variables, and one was a GI variable.

With only one of the 16 GI variables producing a statistically significant result, it is difficult to test the planned hypothesis that GI impacts listing prices in Helsinki. Therefore, rather than testing the planned hypothesis, the discussion section will explore the data and results of the HPM output. The aim is to analyze why the results were unexpected, make inferences from the statistically significant coefficients, identify data predictors, and determine how future HPMs can be improved.

Figure 6. Output of Regression

Model: Model 1
Dependent Variable: Listing_Price__Euros

	R-Squared	Adj.R-Sqr.	Std.Err.Reg.	Std.Dep.Var.	# Fitted	# Missing	Critical t	Confidence
	0.878	0.853	126,027	329,212	200	2	1.974	95.0%

Variable	Coefficient	Std.Err.	t-Statistic	P-value	Lower95%	Upper95%	VIF	Std. Coeff.
Constant	113,436	67,448	1.682	0.094	-19,730	246,601	0.000	0.000
Age	-124.548	387.288	-0.322	0.748	-889.193	640.096	2.408	-0.014
Attached_garage	24,767	24,648	1.005	0.316	-23,897	73,430	1.434	0.033
Balcony	-20,139	25,000	-0.806	0.422	-69,499	29,221	1.533	-0.027
Balcony_greenery	16,037	38,245	0.419	0.676	-59,472	91,546	1.356	0.013
Bathrooms	101,040	32,956	3.066	0.003	35,974	166,106	2.502	0.132
Bedrooms	-20,170	20,555	-0.981	0.328	-60,753	20,413	3.223	-0.048
Bioswale	6,621	83,977	0.079	0.937	-159,179	172,421	1.312	0.002451
Detached_garage	-33,461	60,919	-0.549	0.584	-153,737	86,814	1.139	-0.016
Distance_to_the_central	-14,277	5,136	-2.780	0.006	-24,417	-4,137	5.041	-0.169
Distance_to_the_coastli	-15,080	7,298	-2.066	0.040	-29,489	-671.475	2.329	-0.086
Distance_to_the_neares	73,733	47,383	1.556	0.122	-19,818	167,284	1.526	0.052
Distance_to_the_neares	116,292	62,182	1.870	0.063	-6,479	239,062	1.443	0.061
Distance_to_the_neares	-12,042	14,240	-0.846	0.399	-40,156	16,072	1.372	-0.027
Distance_to_the_neares	29,767	22,083	1.348	0.180	-13,833	73,367	1.537	0.045
Distance_to_the_neares	25,030	115,359	0.217	0.828	-202,730	252,791	1.305	0.006727
Distant_to_the_nearest_	-22,132	33,099	-0.669	0.505	-87,483	43,218	1.649	-0.023
Green_roof	-2,803	43,574	-0.064	0.949	-88,834	83,228	1.348	-0.002027
Landscaping_garden	79,250	23,670	3.348	0.001	32,516	125,984	1.357	0.106
Lawn	-36,382	23,146	-1.572	0.118	-82,080	9,317	1.632	-0.054
Living_Area__m2	8,079	573.294	14.092	0.000	6,947	9,211	3.983	0.763
Living_wall	-105,823	77,079	-1.373	0.172	-258,004	46,358	1.466	-0.045
Meadow	155,167	137,635	1.127	0.261	-116,573	426,907	1.187	0.033
Parking__non_garage	-3,474	22,900	-0.152	0.880	-48,687	41,738	1.471	-0.004994
Postal_Code	-268.996	59.180	-4.545	0.000	-385.839	-152.153	2.956	-0.212
Rain_garden__Bioreten	22,786	105,679	0.216	0.830	-185,863	231,435	1.392	0.006904
Rooms__excluding_kitcl	-21,801	18,760	-1.162	0.247	-58,840	15,238	4.905	-0.070
The_floor_on_which_the	7,928	3,981	1.991	0.048	68.075	15,787	1.259	0.061
Vegetable_Garden	-38,397	51,959	-0.739	0.461	-140,982	64,188	1.148	-0.021
Vegetation__5_or_less_	-16,493	30,038	-0.549	0.584	-75,798	42,811	2.290	-0.023
Vegetation__6_or_more	-38,601	30,812	-1.253	0.212	-99,434	22,232	2.988	-0.059
Vegetation__shrub	-15,056	30,888	-0.487	0.627	-76,040	45,927	1.958	-0.019
View_of_Natural_Eleme	-1,822	24,583	-0.074	0.941	-50,359	46,714	1.613	-0.002555
Waterbody	-135,878	101,882	-1.334	0.184	-337,029	65,273	1.294	-0.041

	Mean Error	RMSE	MAE	Minimum	Maximum	MAPE	A-D* stat
Fitted (n=200)	1.791E-10	114,816	85,401	-370,620	426,138	54.6%	1.11 (P=0.007)

5 Discussion

The model produced mainly unexpected results. Many of the coefficients were counterintuitive values, not statistically significant, or do not meet confidence thresholds in the variety of statistical tests run in the HPM. This implies that the results and model should be reviewed critically.

5.1 Investigating Causes of Unexpected Signs and Coefficients Without Statistical Significance

Out of the 34 coefficients in the model, only 14 had positive values. Many of the negative coefficients deviate from expectations and comparisons in the literature. There are several potential causes for unexpected results in multi-linear regression including the "*range of independent variables is too small, excluding important variables from the model, multicollinearity and computation error*" (Mullet, 2018).

In some models, observations that are grouped too closely together can distort results. The standard errors may become large enough that it causes the slopes to inverse. Likely, the small sample size (200) in comparison to the number of predictive independent variables (34) that were tested caused certain coefficients to produce large standard errors which in turn caused the negative coefficients (Mullet, 2018). A larger sample size would have caused the dispersion to shrink and the distribution mean to become closer to the population mean, causing the standard error to be reduced (Zhu, 2020).

In general, statistical research recommends at least 10-15 samples per predictor independent variable (Hair, 2014). In this research, that would equate to a sample size of at least 340. This is explained as one of the main concepts in inferential statistics which describes how fewer inferences come from smaller sample sizes. When there are too many predictors for the sample size, this is called an "*overfitted regression model*" (Minitab, 2015). A larger sample size would have improved the ability of the model to detect impacts on the dependent variable.

In some instances, coefficients that are partial and those that are total may be misinterpreted by the researcher (Mullet, 2018). A partial coefficient is produced through multi-linear regression models that display coefficients that are the "*average change in the response* *variable associated with a one unit increase in a given predictor variable, assuming all other predictor variables are held constant*" (Statology, 2021f). A total coefficient does not take other variables into account, it is simple "*the proportion of the variance in the response variable that can be explained by the predictor variable"* (Statology, 2018).

The coefficients of this model have been correctly assessed through the lens of partial coefficients. The lack of statistical significance among most coefficients along with results that conflict with comparative literature offers confidence that misinterpretation of the data was not the case.

The potential for multicollinearity was assessed through VIF values and a separate review of the predictor variables. Two coefficients (distance to CBD, number of rooms excluding kitchen) had VIF values indicating multicollinearity (values over four). Distance to the CBD should be distinctive from the other spatial variables (distance to the coastline, major road, park, railway station, transit stop, recreation center, and school) because they are not concentrated in the CBD.

The structural characteristic coefficient number of rooms excluding kitchen, however, may be correlated with living area and number of bedrooms. The correlation occurs because more rooms inherently imply an increased living area. A test model was run omitting number of rooms excluding kitchen and number of bedrooms to ensure any multicollinearity from these independent predictor variables were not significantly impacting the results. The test model did not detect any significant change in results.

The possibility of what is known as the "*dummy variable trap*" was considered. The dummy variable trap occurs when one independent variable inadvertently implies the presence or absence of another independent variable. The 1 dummy value of an independent variable often implies 0 of another. For example, if independent variables are listed as right-handed and left-handed, a dummy value of 0 in the right-handed independent variable implies 1 in the left-handed independent variable. The correlation between the variables causes multicollinearity (Karabiber, 2022).

No evidence of the dummy variable trap was found in the model. A dummy variable in any of the structural characteristics did not imply a result in any of the others. The spatial variables can be omitted because they do not utilize dummy variables. The structural variables were independent of another, other than the three categories for garages (attached garage, detached garage, and non-garage parking). The garage parking categories are protected from the dummy variable trap because no parking is not included as a variable. This was excluded because a 0 value in all three categories implies no parking. The GI variables also do not imply the presence or absence of each other because each property can feature any combination of these features. Similarly, no GI was excluded, as a 0 value in all categories implies no GI is present.

Computational errors are another potential source of reverse coefficient signs. There are several potential causes of computational errors in multi-linear regression models. For example, there may have been one or several data entry errors which produced faulty values. Likewise, malfunctions in computer algorithms or software may also result in computation errors.

(Mullet, 2018) suggests several tests for computational error. One such method involves shuffling the independent variables and re-running the regression to observe if the output produces different coefficients. This method was conducted but the output produced the same coefficients as the original model. Another method involves assessing if the R square value is < .99. The R square value passes this assessment as the output value was 0.878.

There are other methods that assess the residuals of the coefficients and dummy variables, however, the RMSE and MAE both incorporate an assessment of residuals in their goodness of fit tests. As noted in the results section, both tests found the values moderate in relation to the range of the dataset. Out of precaution, the data was also manually inspected to ensure the dummy variables were not entered in an inverted manner. It was concluded that computational error is not the source of error in the coefficient signs.

The most probable factor for the inverted coefficient signs stems from the limited sample size. If the sample added 140 property listing assessments as a minimum or had some of the independent variables removed, the model would likely produce more expected results. Time constraints were the limiting factor for more extensive data collection in this research.

The lack of statistically significant results based on P-values also hindered confidence in the model. Only seven of the coefficients (bathrooms, distance to CBD, distance to the coastline, landscape gardening, living area, postal code, and floor level) were statistically significant. The reason for the P-values not meeting the statistically significant threshold (< 0.05) is also potentially tied to the small sample size.

(Hair, 2014) states "*by increasing sample size, smaller and smaller effects will be found to be statistically significant, until at very large samples sizes almost any effect is significant*". What this implies is that the impact of independent variables, such as the GI structural characteristics, may have an impact on the dependent variable (apartment listing price) but with an effect not detected in the limited sample size. In this regard, (Britto Figueiredo Filho et al., 2013) stress the importance of investigating the magnitude of impact rather than simply significance. However, for this magnitude to be assessed, a large enough sample size is required to detect the impact of the independent variables.

Out of caution, meaning was not derived from any of the coefficients unless there was statistical significance. The coefficients that were not statistically significant are still explored against comparative literature. The aim is to investigate the unexpected results and contextualize the variables within Helsinki's context.

5.2 Analysis of Coefficients

5.2.1 Constant

The constant (also known as the y-intercept, or intercept) is the value of the regression where the y and x-axis intercept when plotted. In a multi-linear regression that features independent variables with dummy values, the constant is an estimate of the population mean for the independent variable's dummy values (Frost, 2018). In the context of HPMs, including this research, the constant can be interpreted as the average bare land value of apartments assessed. This is because the constant is meant to represent a baseline when all other structural values are held at a constant zero.

The constant coefficient was not statistically significant and produced a value of €113,436. It is difficult to compare this value against property value statistics because there is little (if any) bare land in Helsinki. To give this value some perspective, the average price of a one-bedroom apartment in Helsinki was €8,329 per square metre in 2022 (Tilastokeskus, 2022) and the average single-family home ranged from €3,000 - €7,300 per square metre in the summer of 2019 (Info Finland, 2022). Based on these values, the coefficient appears to support a reasonable estimation.

Although the coefficient did not meet the .05 P-value threshold for significance, the P-value was very close at .09. It's vital to note that the lack of statistical significance of the constant does not impact the interpretation of other coefficients in the model.

5.2.2 Spatial Structural Variables

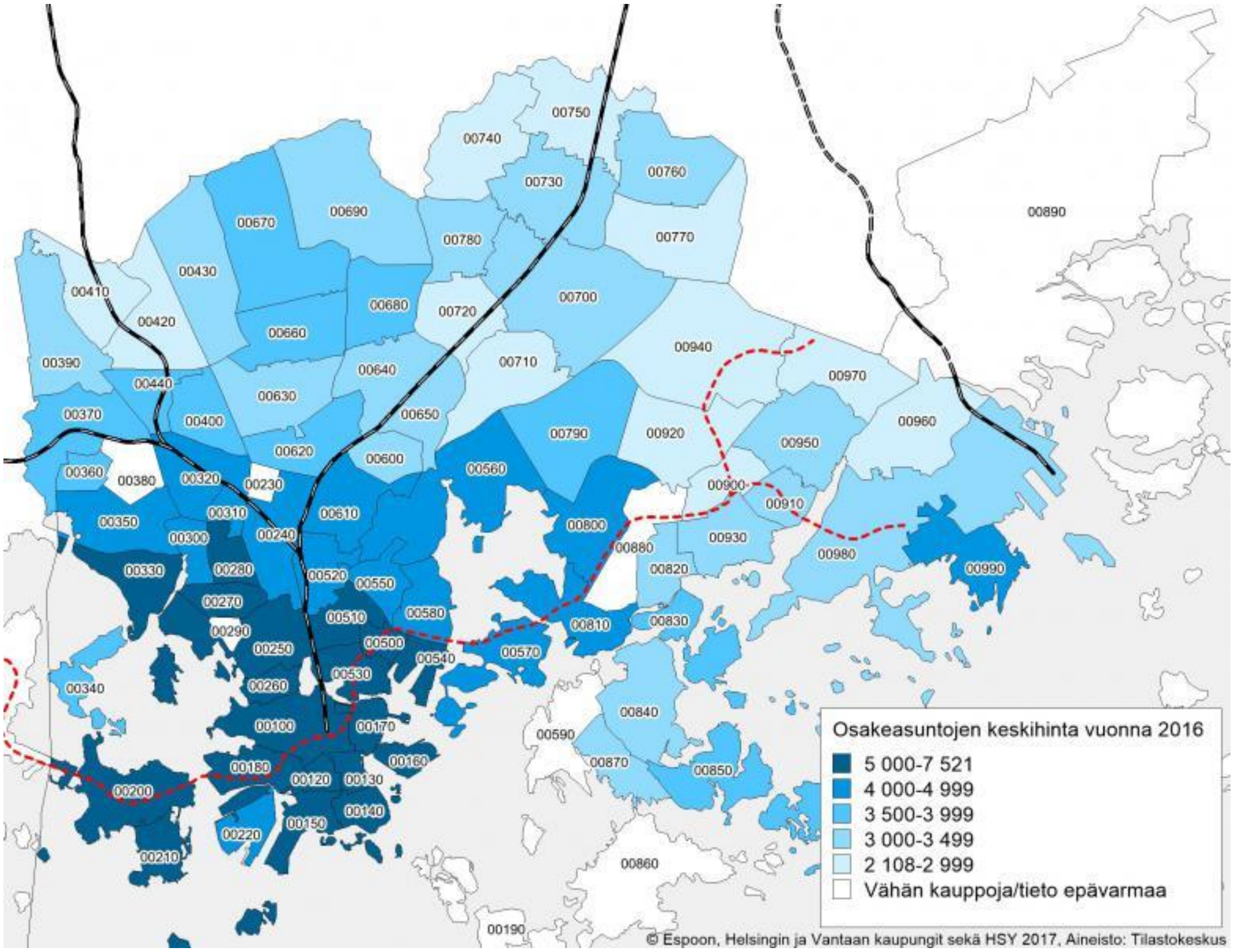

Figure 7. Map of Helsinki Postal Codes and Average Price Per Square Metre of Condominiums 2016 (Uuttahelsinkia, 2016)

The purpose of including postal codes in the model was to provide a control for spatial differences that may occur in various neighbourhoods. The coefficient of the postal code was statistically significant with a negative value. This result aligns with available real estate data. In Helsinki, postal codes range from 100 to 990. Abstractly, the higher the postal code value, the greater the distance from the CBD. The regression output indicated that for every one unit increase in postal code the property listing lost €268.99 in value.

Related to this finding, is the statistically significant coefficient for distance from the CBD. Helsinki has three central business districts that all fall within geographic proximity to each other: Kluuvi, Kaartinkaupunki, and Kamppi (Kiehelä & Falkenbach, 2014). For this research, Kamppi was used as the indicator for Helsinki's CBD.

For every one km increase in distance from the CBD, the apartment listing lost €14,277 in value. Although a unit change in postal code change should amount to a greater distance than a km unit change, thereby producing a greater coefficient, the postal codes are only generally farther away from the business district. This is not always the case, however. For example, postal code 870 is closer to the CBD than postal code 760. The underlying assertion derived from both these coefficients is that listings closer to the CBD had a higher value.

Distance to the nearest railway station produced a negative coefficient that was not statistically significant. A negative coefficient supports trends in comparative research (for every km increase away from railway station the listing price value decreases). (Sun et al., 2016) deployed an HPM in Tianjin, China that indicated proximity to railway/subway stations caused a significant increase in home values (up to 2.1% to 6.1% higher when within 2 km of the stations).

For the assessment of distance to the nearest major road, the model produced a positive coefficient that was not statistically significant. The positive coefficient contradicted established research trends. (Belmeziti et al., 2018; Seo et al., 2019) indicates that property values benefit from accessible transportation nodes such as highways and major arterial roads. Its possible noise and pollution caused by proximity to major transportation nodes could negatively impact the purchaser's WTP for apartments near major roads. In this light, trends in comparative research should not be viewed as absolute.

Proximity to coastlines is a well-established value proposition for property values. (Conroy & Milosch, 2011) found that "*a one-mile increase in distance from the coast would reduce the sale price by approximately USD $8,680 (€8,526.32)*" through an HPM in San Diego, United States. Likewise, an HPM of houses in Port Elizabeth, South Africa by (Hibbers, 2018) indicated "*proximity to the ocean is valued at between R133.35 (€7.81) and R329.59 (€19.30) per meter closer to the ocean*".

This research supports the comparative literature, as distance to the coastline produced a statistically significant negative coefficient. The regression output indicated that for every one km increase in distance from the coastline the property listing lost €15,080 in value. This equates to a €15.08 per metre loss in property listing value. This is within the range of the comparative literature (€5.29 per metre in (Conroy & Milosch, 2011) and €7.81 - €19.30 in (Hibbers, 2018)). The findings are expected as there is universal demand to live near coastlines for a variety of economic and recreational purposes.

Proximity to parks is another well-established value proposition to real estate. An HPM specific to Helsinki by (Votsis, 2017) found a positive correlation between parks and property valuation among all three types of parks assessed, although the impact has a diminishing effect as the distance from the CBD increases. Surprisingly, the model in this research produced a positive coefficient that was not statistically significant.

Provision is a potential cause for a positive coefficient. With over 722.5 hectares, representing nearly 40% of Helsinki's land area, the city is well provisioned in parkland (City of Helsinki, 2019). The greatest distance from parkland of the data collected was 1.04 km at Capellanranta 3 which is in the prestigious Sörnäinen neighborhood on the waterfront. Large-scale ongoing development construction in this area indicates parkland is likely to be established soon.

Additionally, many residents live within proximity to the sprawling coastline or Nuuksio National Park. The proximity to these recreational sites may cause the WTP for proximity to parks to be lower in Helsinki than in other cities. Although the coefficient did not meet the .05 P-value threshold for significance, the P-value was very close at .06.

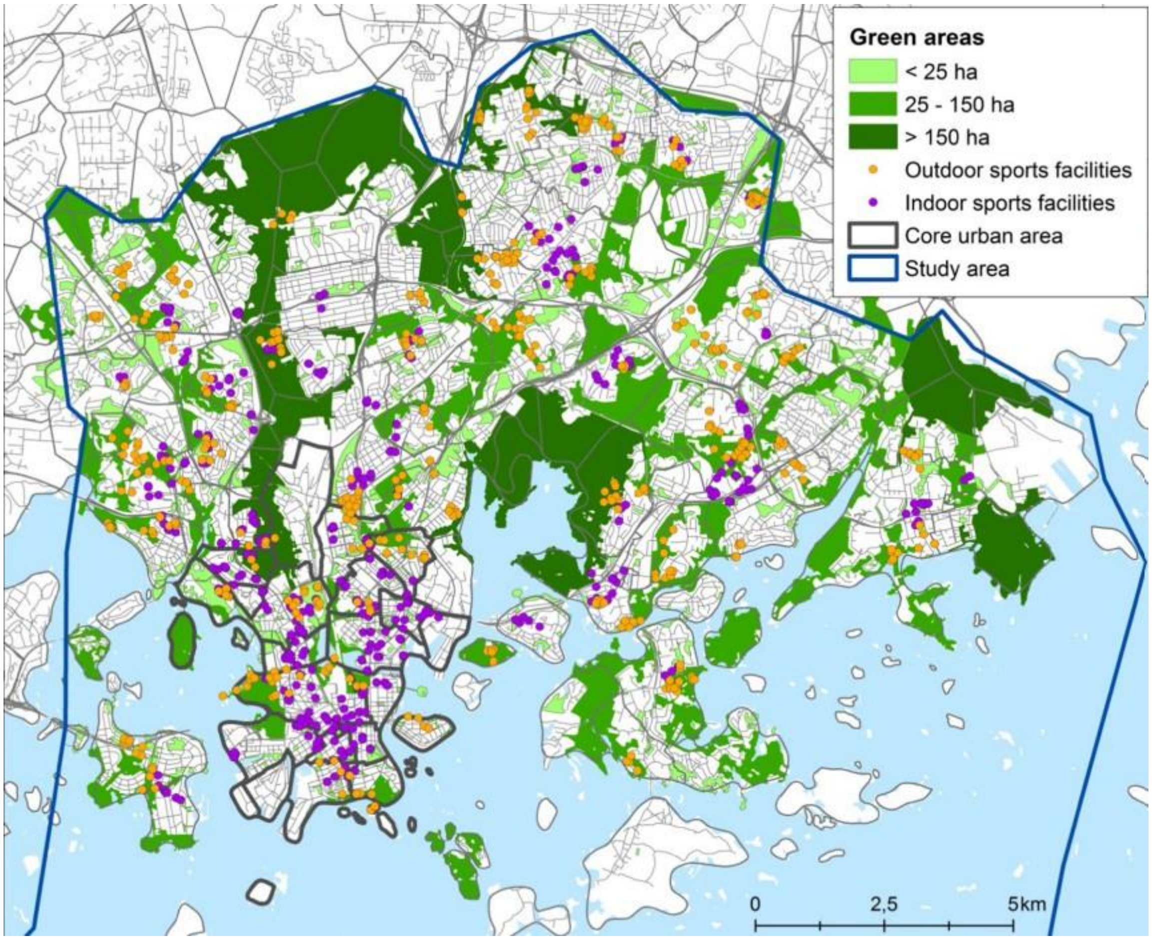

Figure 8. Map of Parks and Recreation Centres in Helsinki (Pyky et al., 2018)

Distance to the nearest recreation centre was suspected to face similar dynamics as the distance to the nearest park coefficient. For example, the city manages 70 recreational centres throughout the city (70 sports halls and gyms, including 3 ice rinks, 4 swimming halls, and 1 horseback riding stable) (City of Helsinki, 2022c). As with parks, the WTP for proximity to recreation centres may be lower in Helsinki because the city is well-provisioned in recreation centres. This may be contributing to the positive coefficient that was not statistically significant.

Comparative literature often identifies recreation centres as fitness facilities or swimming pools. For example, an HPM applied in West Virginia (Charleston and Huntington), United States by (Burton, 2003) concluded that "*a fitness facility or trail increases median home value in a census tract by between USD $10,600 (€10,398.80) and USD $11,060 (€10,848.16) depending upon model specification*". (Hoffman, 2012)'s HPM in southern Arizona, United

States, found "*the inclusion of family-recreation programming was found to contribute 6.82% of home value within master-planned communities*".

Distance to the nearest transit stop also produced a positive coefficient that was not statistically significant. This similarly contradicts findings in the comparative literature. In general, HPM's in the literature indicate that bus stops have a positive association with property values (Wang et al., 2015).

The positive association is not definite, however. The authors of an HPM that produced a counter-intuitive negative association in certain neighbourhoods of Hartford and Stamford Areas, Connecticut, United States, between bus stops and property values concluded that railway stations have an association with higher income neighbourhoods and bus stops with lower income neighbourhoods, which impacts property values (Zhang et al., 2021). The same effect may be present in this research.

Like bus stops, public schools are also sometimes associated with low-income neighbourhoods which can negatively impact housing prices (Rosiers et al., 2010). The importance of school quality is stressed as a determinant for property value impact. However, comparative HPMs such as (Sah et al., 2016) support the negative coefficient (not statistically significant) produced by the model. Private schools are rare in Helsinki, but the brand of school may cause a similar effect.

5.2.3 Structural Variables

Living area and number of bathrooms both produced statistically significant positive coefficients. This is an expected result, as buyers generally pay more for larger spaces. This is not always the case, because in some urban contexts smaller apartments are priced higher per square foot (Solovev & Pröllochs, 2005). The regression output indicated that for every square metre of living area, the property listing gained €8,079 in value and for every additional bathroom the property listing gained €101,040 in value.

The standard bathroom in the United States is approximately 40 sq. ft (Tyagi, 2021). Bathrooms are approximately the same size or larger in Finland because they often include saunas. Based on this assumption, the coefficient indicated an increase of €2,526 for every sq. foot of bathroom added to the listing.

Unexpectedly, the variables for number of rooms excluding kitchen and number of bedrooms produced a negative coefficient that was not statistically significant. As mentioned previously, it was suspected that there is multicollinearity between living area, number of bedrooms, and number of rooms excluding the kitchen. The multicollinearity could be the source of the unexpected result.

Attached garage, detached garage, and non-garage parking variables all produced coefficients that were not statistically significant. Attached garage produced a positive coefficient while detached garage, and non-garage parking produced negative coefficients. It was expected that the presence of an attached garage, detached garage, or non-garage parking would all produce positive associations as indicated in comparative HPMs (Cebula, 2009).

The negative coefficients could result from the abundance of parking available, as almost all properties in the city have parking or there is access to free street parking for those living in the inner city (City of Helsinki, 2022b). However, with one in three Helsinki residents owning a car (Yle, 2019) and considering the long winters that encourage the use of a garage, it is fitting that attached garages would produce a positive coefficient.

Another unexpected result came from the balcony coefficient. The model indicated the negative coefficient was not statistically significant. This finding conflicts with comparative HPM literature that support balconies as a structural characteristic that increases property valuation (Zakaria & Fatine, 2021).

Balconies have inherently been recognized as contributions to sustainable development due to "*enhance energy efficiency by acting as a sun-shading device, provide a planting space, and mitigate air pollution and traffic noise*". Their impacts are especially significant in cities with high-density environments. HPMs have indicated a strong association between balconies and property prices (Wing Chau et al., 2004).

It's worth noting that an HPM conducted in Helsinki and Espoo (Minkkinen, 2019), also found a negative association with property prices for balconies. The author notes the potential reason for the negative correlation could be "*that balcony itself increases costs for the homeowner if there comes balcony renovation. However, the cost of this renovation is relatively small comparing the negative connection to the debt-free price so this do not explain entirely the high negative connection*". The dynamics between balconies and property values in Helsinki should be investigated with further research to identify the counterintuitive results.

A statistically significant finding was produced for floor level. The coefficient was positive. This indicates that for every floor level increase the apartment listing increased by €7,928 in value.

The low-density urban form of Helsinki likely contributes to the premiums of high floor levels. With the low supply of high-rise buildings, buyers with this preference have few options which in turn increases demand. Adding to this are the plentiful views that are not blocked by other high-rise buildings and a low chance that the view will be blocked soon.

HPMs that test apartment floor levels in the literature produce nuanced findings based on the urban context. Findings often indicate a positive association with floor level height up to a certain threshold then turning negative. For example, (Xiao et al., 2019b) found house prices in Hangzhou, China to "*first rises at a decreasing rate and then declines with the increase in floor level".* The threshold in their study was the 3rd floor for multi-story buildings and the 8th floor for high–rise buildings. However, an HPM in Hong Kong by (Wong et al., 2011) found a decreasing premium with floor height.

Age of the apartment was shown to have a negative coefficient that was not statistically significant. The effect of age has mixed results across comparative literature. An HPM by (Dambon et al., 2022) in Zurich, Switzerland found a depreciative age effect association in some neighbourhoods and a premium for older single-family homes in others. In two other HPMs (Dambon et al., 2022; Zheng Mo, 2014), a clearer depreciative age effect association was demonstrated.

5.2.4 Green Infrastructure Structural Variables

Unpredictably, green roofs produced a negative coefficient that was not statistically significant. This result conflicts with comparative HPM research. An HPM deployed by (Ichihara & Cohen, 2010b) in New York City, United States indicated a 16% price increase on buildings with green roofs. Another HPM conducted by (Tomalty, 2010) in Montreal, Canada revealed a positive association with green roofs, generating an 11% property value premium.

HPMs aim to detect how various configurations of the property influence valuation. Green roofs are installed to provide an array of benefits including increased roof life expectancy, reduction of noise, enhanced thermal insulation, heat shielding, reduced glare, and more attractive spaces (Hui, 2006). The benefits are generally reaped over a length of time, thereby increasing the value of the property, and lowering the operating costs.

Green roofs also provide benefits that are not captured strictly within property valuation terms. For example, green roofs provide benefits to the greater public which is an important element of their adoption. This includes mitigation of the urban heat island effect, air pollution improvements, stormwater management, sound insulation, and habitat creation (Berardi et al., 2014). The contribution of economic value is heightened when all these factors are considered. A CBA undertaken by (Teotónio et al., 2018) in Lisbon, Portugal revealed that "*a total of 10.375 roofs in Lisbon with extensive and intensive roofs would lead to a total social NPV (Net Present Value) of €320 million over a 40-year period*".

An example in Helsinki is illustrated by a CBA conducted by (Nurmi et al., 2016) which concluded that "*as the reviewed literature would suggest, the private benefits are usually not high enough to cover the current level of additional private costs*". The suspected main reason for this is that the climate in Helsinki is not warm enough to reap the rewards of energy savings. Therefore, the presence of a green roof in Helsinki may be contributing to a negative property valuation association. Additionally, the relative rarity of green roofs in Helsinki could have contributed to the coefficient that was not statistically significant as only 11 of the 200 listings assessed featured a green roof.

The result of view of GI also conflicts with comparative HPM research, as a negative coefficient that was not statistically significant was produced. This independent variable was created to specifically identify how a view of GI within the property boundaries impacts the price of the apartment listing. Other HPMs tend to include adjacent lands in the assessment. The trends indicate a positive association in value.

Through the CBA conducted in Helsinki by (Nurmi et al., 2016) green roofs generated scenic benefits which were determined to be "*a significant factor in green roof CBA; the increase in the property values in the buildings within 30 m of a green roof was assessed to be between 0% and 1.2%*". Positive associations on property value from scenic views are further reaffirmed in HPMs carried out by (Samarasinghe & Sharp, 2009; H. A. Sander & Polasky, 2009). The reason for the negative coefficient that was not statistically significant was unclear, though suspected to be related to the overfit model.

Rain garden/bioretention area produced a positive coefficient that was not statistically significant. This result supports comparative research. A WTP model in Sydney and Melbourne, Australia by (Iftekhar et al., 2021) found that the WTP of residents was $133 (€130) per year per household for rain gardens. Only one rain garden/bioretention area was found out of the 200 property listings assessed. Lack of data was suspected to contribute to the coefficient generating a result that was not statistically significant.

Comparably, living walls produced a negative coefficient that was not statistically significant. There are no known HPMs that have tested the impact of living walls on property values, however a WTP study in Seville, Spain by (Pérez-Urrestarazu et al., 2017) concluded that there is support for living walls and greening, but people are not always WTP for it. A CBA of various vertical greenery system configurations found that some are economically sustainable (Perini & Rosasco, 2013a).

Following the trend of the GI results, the vegetation independent variables (Vegetation (6 or more trees), Vegetation (5 or less trees), Vegetation (shrub)*)* all produced negative coefficients that were not statistically significant. Comparative HPM literature conflicts with the findings by supporting vegetation's positive association with property value (Netusil et al., 2010; Pandit et al., 2013; H. Sander et al., 2010). This dynamic is so prevalent that it has caused some to accuse trees of causing gentrification through "green gentrification". However, observations by (Sharifi et al., 2021) have concluded that gentrification generally causes urban greening not the other way around.

The comparative HPMs have assessed tree canopy cover or proximity to forests. The purpose of the vegetation independent variables for this research was to investigate the dynamics that vegetation within the property lines has on apartment listing prices. The greatest possibilities for the unexpected results are undetected neighbourhood, structural, cultural dynamics, or the overfit model.

The only GI structural variable that produced a statistically significant result is landscape gardening. This finding is supported by HPMs such as (Chen, 2010)'s which was conducted in Shenzhen, China. The HPM found that landscape gardens increase house prices by 17.2%. A less impressive value increase was found by (Potrawa, 2020) through an HPM in Rotterdam, Netherlands that indicated a value increase of only €9.53.

Real estate firms and property appraisal companies also reaffirm that landscape gardens generate a premium for property values. (Benham & Reeves, 2022) have observed increases of 12% in London, UK, while (Naciri, 2016) noted a potential 28% increase in Grenville, South Carolina, United States in an interview with landscape economist John Harris. The model in this research found that landscape gardens increased the listing price by €79,250. This is an expected result as landscape gardening significantly increases the aesthetics and perceived livability of the property.

Related to landscape gardens are vegetable gardens, yet the model produced a negative coefficient that is not statistically significant. HPMs have not assessed vegetable gardens within the property limits specifically, however, an HPM by (Gibbons et al., 2014) in England, assessed proximity to domestic gardens (could be vegetable or landscape gardens) that found that a 2% increase in the sales price was generated. Another HPM in New York City, United States by (Been & Voicu, 2011) found proximity to community gardens increased neighboring property values by 9.4%.

Only seven vegetable gardens were detected on the assessed apartment listings. Many apartment buildings do not provide vegetable gardens. Residents often rent vegetable garden plots from the municipality on other lands.

Lawn independent variable conflicts with comparative research as a negative coefficient that was not statistically significant was produced. An HPM by (Coley, 2005) indicates an increase in property values with the presence of lawns on private property or within the surrounding neighbours. Although there have been some movements to convert lawns to meadows to increase biodiversity and reduce energy use (University of Jyväskylä, 2022), lawns remain popular in Helsinki.

Meadows independent variable, on the other hand, produced a positive coefficient that was not statistically significant. Meadows are generally included in categories such as parks, open spaces, or rural grazing areas under conventional HPM in the literature. These models support meadows as a positive association with house prices (Cavailhès et al., 2009; Luttik, 2000). (Liljenstolpe C, 2011) however, found positive associations only when meadows were mixed with other types of land cover. With only a single meadow found among the 200 assessed listings, the likely cause for the coefficient that was not statistically significant stems from a lack of data.

When looking at the bioswale independent variable, the model produced a positive coefficient that is not statistically significant. This finding is supported by comparative WTP research which associates property price increases with bioswales in LID projects (Londoño Cadavid & Ando, 2013). Like other coefficients that were not statistically significant, lack of data is problematic, as only three bioswales were identified on the 200 assessed listings.

Waterbody was added as an independent variable to assess if small ponds and water features impacted apartment listing prices. The variable produced a positive coefficient that is not statistically significant. HPMs that have previously assessed waterbodies have only assessed waterbodies in proximity to the property rather than on it. These comparative models suggest small increases in the property value (Potrawa, 2020). Only two properties featured waterbodies out of the 200 assessed.

Balcony greenery is not often recognized as GI. The purpose of including it in the model was to assess if small forms of greenery could be detected in the apartment listings. The balcony greenery independent variable produced a positive coefficient that was not statistically significant. No other HPMs have assessed balcony greenery.

This research hypothesized that GI would have a positive impact on property listing valuation in Helsinki. Although many of the GI structural variables did not produce statistically significant results, its worth noting what was not produced. No statistically significant result conflicted with the hypothesis or with the literature that supports positive associations of property valuation with GI.

5.2.5 The Helsinki Context

It is important to place the model and findings in the context of Helsinki's underlying economic system and urban fabric. Finland has adopted the Nordic model of capitalism which combines capitalism and socialism. The capitalist element of Finland is clear as private ownership and trading are legal and promoted. Finland has ranked higher than the United States in some free-market indexes, including "*greater protection of private property, less impact on competition from government controls and more openness to trade and capital flows*"(Partanen, 2019). However, Finland also has socialist indications with nearly a third of the country's wealth being owned by the government, 1 in 4 Finns being employed by the government, and 90% of workers being unionized (Bruenig, 2019).

One of the most influential factors impacting this research regarding Finland's unique economic circumstances is that Helsinki does not operate in a free land market economy. 80% of Helsinki's land is owned by the municipality and state, giving the government a monopoly over land use planning (City of Helsinki, 2012). This has a significant influence on the city's urban economics. Design, permitting, construction, and leases are administered by government agencies.

The municipality holds 60,000 housing units. Of these, 48,500 are subsidized rental housing. Each year the city produces approximately 6,000 new dwellings. 25% are subsidized rentals and 30% are not subsidized but have price controls (Housing 2030, 2022).

The government's control influences the market. Real estate values are not determined solely by the buyer's WTP but rather by a calculation that government agencies determine as fair market value. Many of the listings assessed are leases that feature subsidies or price control. The small percentage of private properties in Helsinki still compete with subsidized and price-controlled properties.

(Hyötyläinen & Haila, 2018) argue that when the City of Helsinki sells public land to private developers, there are harmful implications. In what they term "*entrepreneurial public real estate policy*", the municipality sells public land to generate revenue by creating efficiencies through privatization. Their analysis criticized the lack of social planning that generated record sale prices and created enclaves of high-net individuals.

Similarly, (Willner, 2021) concluded that the state-enterprise sector such as property management and manufacturing is beneficial in Finland. The author notes that privatization can result in economic efficiency (especially in the service sector), however, customers and staff are negatively affected. From the author's perspective, the consequences of privatization are not worth the transition away from public sector management. This reflects the widely held support for public administration in Finland.

Therefore, any HPMs applied in Helsinki are context specific. The findings are indications of a mix of private demand and government estimations. The value of independent variables deduced are relevant locally but may not apply in other contexts.

Another consideration is the physical makeup of Helsinki. The quantity of some of the GI features assessed greatly outweighs those of others. For example, landscape gardening was much more common than green roofs or rain gardens/bioretention areas. The reason for the commonality of certain GI features and not others is based on geography, culture, and economics.

5.3 Limitations

The study has potential limitations. Listing prices were used as the primary independent variable. Although listing prices is a proxy, it does not represent sales data. This may have influenced the results of the model.

Most coefficients produced by the model are not statistically significant. Based on the analysis of possible errors, it appears that the model suffered from overfitting. Although the statistically significant results can be interpreted with high confidence, caution should be taken when assigning meaning to any of the coefficients without statistical significance.

Additionally, the researcher does not have Finnish language fluency. Many of the planning documents were available in English or are translatable, but some materials were inaccessible due to language barriers. Its possible information relevant to this study was overlooked for this reason.

5.4 Conclusions

The study deployed an HPM to assess the impact of GI on apartment listing prices in Helsinki, Finland.

The estimations indicate that:

- For every unit increase in postal code, apartment listings lost €268.99 in value.
- For every one km increase in distance from CBD, apartment listings lost €14,277 in value.
- For every one km increase in distance from the coastline, the apartment listing lost €15,080 in value. This equates to a €15.08 loss of value per metre away from the coastline.
- For every square metre of living area, apartment listings gained €8,079 in value.
- For every additional bathroom, the apartment listing gained €101,040 in value (€2,526 for every sq. ft of bathroom).
- For every floor level increase of the apartment, the apartment listing increased by €7,928 in value.

- Landscape gardening increased apartment listing prices by €79,250.
- No coefficient produced statistically significant evidence against the hypothesis (that GI has a positive association with apartment listing valuation).

These findings offer practical applications for the real estate industry. Strategies can be crafted to maximize apartment valuation by recognizing proximity to certain features and on-site landscape gardening. The findings support the notion that spatial and on-site GI increase property valuation. Planning officials can consider the findings a gauge of market demand in the city.

5.5 Recommendations for Future Work

It is recommended that this HPM is improved upon and extended by including 1) sales data and 2) a larger sample size. Enriching the dataset in this manner would reveal more significant findings about the market value of GI features in Helsinki. Further HPMs could be undertaken to assess the market value of other on-site sustainability configurations related to green building features and water management.

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Appendix 1: Structural Characteristics

Symbol	Variables	Description	Unit
Lv	**Spatial structural variables**	**Variables known to influence property listing price depending on their proximity to the apartment**	
CBDDIS	Distance to the central business district (CBD) Kamppi	The point in Helsinki's centre with the highest density of commercial establishments (Kamppi) (Rice, 2009)	Kilometres (km)
RWYDIS	Distance to the nearest railway station	Railway station is defined as a rapid transit rail network for pedestrian travel (Vocabulary.com, 2022a)	Kilometres (km)
MRDDIS	Distance to the nearest major road	Major road is defined as a non-local road (collector road, arterial road or highway) (Matti Gronroos, 2021)	Kilometres (km)
CSTDIS	Distance to the coastline	Coastline is defined as an ocean coastline	Kilometres (km)
PRKDIS	Distance to the nearest park	Park is defined as a municipally owned park	Kilometres (km)
RECDIS	Distance to the nearest recreation centre	Recreation centre is defined as a municipally owned recreation centre or private business offering recreational services. Includes fitness centres and swimming pools.	Kilometres (km)
BUSDIS	Distance to the nearest transit stop	Transit stop is defined as a location where pedestrians board municipal transit	Kilometres (km)
SCHDIS	Distant to the nearest school	School is defined as a municipally owned elementary school	Kilometres (km)

Structure	Structural variables	Variables that make up the structure of the apartment known to influence property listing prices	
APT	Apartment	"*a set of rooms for living in, especially on one floor of a building*" (Cambridge Dictionary, 2022)	Dummy, dichotomic variable (1: Apartment, 0: otherwise)
LA	Living area	"*The interior habitable area of a dwelling unit, including basements and attics, but does not include a garage or any accessory structure*" (Law Insider, 2022)	Squared Metres (m^2)
AG	Attached garage	Garage that is connected to the residence	Dummy, dichotomic variable (1: Attached garage, 0: otherwise)
DG	Detached garage	Garage that is separate from the residence	Dummy, dichotomic variable (1: Detached garage, 0: otherwise)
BLY	Balcony	"*A platform that projects from the wall of a building for the purpose of leisure*" (Merriam-Webster, 2022a) includes porches, defined as "*a raised, covered, sometimes partly closed area, often made of wood, on the front or side of a building*"(Dictonary.com, 2022)	Dummy, dichotomic variable (1: Balcony, 0: otherwise)

ROOM	Rooms, excluding kitchen	"*A division of a building enclosed by walls, floor, and ceiling*" (Merriam-Webster, 2022e)	Numeric
BED	Bedrooms	*"A room that is designated for sleeping*" (Merriam-Webster, 2022c)	Numeric
BATH	Bathrooms	"*A room containing a bath or shower and typically also a washbasin and a toilet*" (Merriam-Webster, 2022b)	Numeric
FLR	Floor level	Floor level of the apartment	Numeric
AGE	Age	Years since construction	Numeric
PRK	Parking (non-garage)	Designated location for vehicle parking (other than garages)	Dummy, dichotomic variable (1: parking, 0: otherwise)
Green Infrastructure	**Green Infrastructure Variables**	**Features that meet the definition of "*Green Infrastructure*" as defined in chapter 1 within the property boundaries**	
GR	Green roof	"*A green roof is a vegetated roofing system which is functionally integrated onto a roof area*" (World Green Infrastructure Network, 2022a)	Dummy, dichotomic variable (1: Greenroof, 0: otherwise)
VGR	View of Green Infrastructure	Green infrastructure located within the property boundaries that can be seen from the windows or balcony of the apartment.	Dummy, dichotomic variable (1: View of Green Infrastructure, 0: otherwise)

RG	Rain garden/ Bioretention Area	*"A depressed area in the landscape that collects rainwater from a roof, driveway or street and allows it to soak into the ground*" (EPA, 2022)	Dummy, dichotomic variable (1: Rain Garden/ Bioretention Area, 0: otherwise)
LW	Living wall	*"A living wall is a vertical vegetated wall system with irrigation"*(World Green Infrastructure Network, 2022b)	Dummy, dichotomic variable (1: Living wall, 0: otherwise)
VT1	Vegetation (6 or more trees)	The presence of six or more trees (woody plant greater than 3 m in height)	Dummy, dichotomic variable (1: Vegetation (trees), 0: otherwise)
VT2	Vegetation (5 or less trees)	The presence of five or less trees (woody plant greater than 3 m in height)	Dummy, dichotomic variable (1: Vegetation (trees), 0: otherwise)
VS	Vegetation (shrub)	The presence of one or more shrubs (woody plant less than 3 m in height)	Dummy, dichotomic variable (1: Vegetation (shrub), 0: otherwise)
LGR	Landscape Garden	*"(Horticulture) a garden that has been artistically designed"* (The Free Dictionary, 2022)	Dummy, dichotomic variable (1: Garden, 0: otherwise)
VGR	Vegetable Garden	*"a small garden where vegetables are grown"*(Vocabulary.com, 2022b)	Dummy, dichotomic variable (1: Garden, 0: otherwise)
L	Lawn	*"ground (as around a house or in a garden or park) that is covered*	Dummy, dichotomic variable (1:

		with grass and is kept mowed" (Merriam-Webster, 2022d).	Lawn, 0: otherwise)
MD	Meadow	"*an area of land with grass and other wild plants in it* "(Cambridge Dictionary, 2022)	Dummy, dichotomic variable (1: Meadow, 0: otherwise)
BS	Bioswale	"*a ditch with vegetation and a porous bottom*" (Urban green and blue grids, 2022)"	Dummy, dichotomic variable (1: Bioswale, 0: otherwise)
WB	Waterbody	"*Any body of surface water, such as a lake, river, or pond*" (Oxford Reference, 2007)	Dummy, dichotomic variable (1: Waterbody, 0: otherwise)
WC	Watercourse	*"A natural or artificial channel through which water flows*" (Merriam-Webster, 2022f)	Dummy, dichotomic variable (1: Watercourse, 0: otherwise)
BG	Balcony greenery	Vegetation, gardens, or living walls on balconies	Dummy, dichotomic variable (1: Balcony greenery, 0: otherwise)
Dependant Variable			
LP	Listing price		Euros (€)

Appendix 2: Property Listings Data

House Address	Postal Code	Distance to the central business district	Distance to the nearest railway station (km)	Distance to the nearest major road (km)	Distance to the coastline (km)	Distance to the nearest park (km)	Distance to the nearest recreation center	Distance to the nearest transit stop (km)	Distant to the nearest school (km)	Living Area (m2)	Attached garage	Detached garage	Balcony	Rooms, excluding kitchen	Bedrooms	Bathrooms	The floor on which the apartment is	Age	Parking (non garage)	Green roof	View of Natural Element	Rain garden/ Bioretention Area	Living wall	Vegetation (6 or more trees)	Vegetation (5 or less trees)	Vegetation (shrub)	Landscaping garden	Vegetable Garden	Lawn	Meadow	Bioswale	Waterbody	Balcony greenery	Listing Price (Euros)
Kaarikuja 4	940.00	11.35	0.45	0.09	3.27	0.14	0.45	0.15	0.56	59.50	0.00	0.00	1.00	2.00	1.00	1.00	3.00	55.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	168000.00
Työnjohtajankatu 5 A 58	880.00	6.64	0.35	0.08	0.72	0.08	2.75	0.10	0.69	34.00	0.00	0.00	1.00	1.00	0.00	1.00	8.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	271000.00
Lauttasaarentie 28	200.00	5.87	0.00	0.04	0.36	0.27	1.06	0.03	0.54	90.00	1.00	0.00	1.00	4.00	3.00	2.00	2.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	788000.00
Auroran katu 13	100.00	0.54	0.22	0.00	0.88	0.05	0.30	0.10	0.40	82.20	0.00	0.00	1.00	0.00	2.00	1.00	5.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	748000.00
Iso Roobertinkatu 41	120.00	0.70	0.84	0.00	0.39	0.08	0.87	0.11	0.16	46.00	1.00	0.00	0.00	2.00	1.00	1.00	5.00	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	438000.00
Isokaari 40	200.00	4.01	0.35	0.20	0.17	0.24	1.48	0.10	0.65	39.50	0.00	0.00	1.00	2.00	1.00	1.00	1.00	66.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	325000.00
Heinolankatu 6	520.00	2.82	0.73	0.11	0.90	0.14	1.14	0.12	0.27	38.00	0.00	0.00	1.00	2.00	1.00	1.00	3.00	80.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	264000.00
Vuorimiehenkatu 13	140.00	1.44	1.29	0.00	0.41	0.08	0.20	0.19	0.51	226.50	0.00	0.00	0.00	5.00	2.00	3.00	1.00	94.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	2095000.00
Syystie 10	780.00	10.13	1.06	0.00	4.34	0.23	1.04	0.04	0.51	28.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	200900.00
Lampuotilantie 34-36	630.00	7.29	1.81	0.07	3.28	0.09	1.58	0.12	0.49	71.50	1.00	0.00	1.00	3.00	2.00	1.00	4.00	63.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	312000.00
Tulvaniitynpolku 5 B	650.00	7.60	1.02	0.11	1.84	0.12	0.65	0.21	1.02	48.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	25.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	219000.00
Isonniitynkatu	520.00	4.11	1.14	0.38	1.47	0.09	0.86	0.11	1.24	84.50	0.00	0.00	0.00	4.00	3.00	2.00	2.00	35.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	409000.00
Kasarmikatu 26	130.00	1.03	0.90	0.00	0.43	0.14	0.37	0.13	0.36	59.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	94.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	530000.00
Ruonasalmentie 12	830.00	7.91	1.82	0.00	0.26	0.15	2.23	0.02	0.78	119.50	0.00	0.00	0.00	5.00	3.00	2.00	0.00	56.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	665000.00
Perustie 24	330.00	4.43	2.56	0.06	0.62	0.40	2.16	0.10	0.40	55.00	1.00	0.00	1.00	2.00	1.00	1.00	5.00	69.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	320000.00
Orioninkatu 2	550.00	3.42	0.71	0.09	1.01	0.02	1.23	0.09	0.13	44.00	0.00	0.00	1.00	2.00	1.00	1.00	1.00	65.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	279900.00
Aino Acktén tie 10	400.00	6.68	0.71	0.00	3.44	0.17	2.79	0.08	0.17	84.00	0.00	0.00	1.00	2.00	2.00	1.00	1.00	67.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	419000.00
Cygnaeuksenkatu 12	100.00	0.92	0.86	0.00	0.22	0.04	0.87	0.16	0.17	66.50	0.00	0.00	1.00	2.00	1.00	1.00	6.00	98.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	695000.00
Viipurinkatu 16	510.00	1.77	1.10	0.00	0.81	0.05	0.56	0.08	1.22	28.30	0.00	0.00	0.00	1.00	1.00	1.00	2.00	95.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	192000.00
Aleksis Kiven Katu 24	500.00	2.70	1.54	0.00	1.23	0.15	0.41	0.23	0.70	30.80	0.00	0.00	0.00	1.00	1.00	1.00	4.00	95.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	219000.00
Valpurintie 3	270.00	3.03	1.86	0.00	0.54	0.08	0.27	0.18	0.17	57.50	0.00	0.00	1.00	3.00	1.00	1.00	2.00	81.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	420000.00
Vesannontie 7	510.00	3.25	1.27	0.00	1.41	0.10	0.68	0.00	0.53	37.70	1.00	0.00	1.00	1.00	1.00	1.00	3.00	68.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	248000.00
Rehbinderintie	150.00	1.24	1.59	0.09	0.26	0.09	0.75	0.11	0.47	60.50	0.00	0.00	0.00	1.00	1.00	1.00	2.00	109.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	674000.00
Messeniuksenkatu 3	250.00	2.43	1.50	0.00	0.59	0.08	0.17	0.14	0.24	25.00	0.00	0.00	0.00	1.00	1.00	1.00	7.00	86.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	239000.00

Mikonkatu 11	100.00	0.87	0.25	0.00	0.53	0.33	0.82	0.00	0.36	146.00	1.00	0.00	1.00	4.00	3.00	2.00	4.00	11.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1665000.00
Steniuksentie	320.00	5.17	0.95	0.00	0.91	0.18	0.30	0.05	0.18	28.00	1.00	0.00	1.00	1.00	1.00	1.00	3.00	62.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	209000.00
Väinölänkatu 17	610.00	5.32	0.70	0.00	1.60	0.08	0.00	0.16	0.44	31.00	0.00	0.00	1.00	1.00	1.00	1.00	3.00	81.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	198000.00
Harjukatu 4a	500.00	2.77	0.17	0.00	0.66	0.06	0.52	0.17	0.31	24.10	0.00	0.00	1.00	1.00	1.00	1.00	4.00	82.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	149000.00
Santavuorentie	400.00	6.41	0.79	0.00	3.64	0.24	1.19	0.00	0.74	73.50	1.00	0.00	1.00	3.00	2.00	1.00	3.00	70.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	345000.00
Kotkankatu 8 A	510.00	2.81	0.85	0.00	0.95	0.22	0.49	0.12	0.34	39.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	55.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	285000.00
Vilhonvuorenkuja 6	500.00	2.75	0.14	0.00	0.39	0.00	0.76	0.05	0.60	18.20	0.00	0.00	0.00	1.00	1.00	1.00	7.00	84.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	159000.00
Pohjoisranta 16	170.00	1.75	0.69	0.00	0.04	0.08	0.75	0.16	0.37	111.00	0.00	0.00	0.00	4.00	3.00	2.00	4.00	96.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1278000.00
Köydenpunojankatu 8	180.00	0.57	0.52	0.00	0.22	0.10	0.28	0.14	0.30	76.00	1.00	0.00	1.00	3.00	2.00	1.00	3.00	41.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	595000.00
Pursimiehenkatu 14	140.00	1.00	1.12	0.00	0.41	0.05	0.57	0.23	0.19	36.00	0.00	0.00	0.00	1.00	1.00	1.00	5.00	84.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	297000.00
Niitynperäntie 5-	440.00	7.70	0.60	0.00	3.33	0.20	1.04	0.05	0.99	49.00	0.00	0.00	1.00	2.00	1.00	1.00	1.00	41.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	210000.00
Kruununhaankatu 1	170.00	1.77	0.69	0.00	0.17	0.11	0.49	0.10	0.24	74.50	0.00	0.00	0.00	4.00	3.00	1.00	4.00	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	698000.00
Vellamonkatu 12-14	550.00	3.67	0.88	0.00	1.00	0.13	1.09	0.20	0.27	70.00	1.00	0.00	1.00	3.00	2.00	1.00	2.00	66.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	399000.00
Käärtipolku 1	390.00	8.94	1.75	0.20	3.43	0.00	0.38	0.05	0.19	43.00	1.00	0.00	1.00	2.00	1.00	1.00	5.00	58.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	200000.00
Kustaankatu 4a	500.00	2.65	0.29	0.04	0.71	0.12	0.42	0.10	0.22	47.00	0.00	0.00	0.00	2.00	1.00	1.00	6.00	86.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	319000.00
Hämeentie 16	530.00	2.06	0.37	0.00	0.42	0.12	0.26	0.03	0.26	27.00	1.00	0.00	1.00	1.00	1.00	1.00	4.00	36.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	210000.00
Vanha Turun maantie 5-7	320.00	5.06	0.96	0.00	2.07	0.12	0.59	0.02	0.81	45.00	0.00	0.00	0.00	2.00	1.00	1.00	4.00	61.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	309244.16
Annankatu 4	120.00	0.79	0.83	0.00	0.77	0.12	0.12	0.20	0.15	56.50	0.00	0.00	0.00	2.00	1.00	1.00	3.00	36.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	518000.00
Porvoonkatu 14	510.00	2.68	0.96	0.00	0.92	0.05	0.44	0.00	0.12	22.00	0.00	0.00	0.00	1.00	1.00	1.00	3.00	91.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	193000.00
Mäkelänkatu 13	550.00	3.21	1.02	0.00	1.27	0.18	0.94	0.00	0.16	27.00	0.00	0.00	1.00	1.00	1.00	1.00	4.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	195000.00
Kolsarintie 3 C	390.00	8.50	1.36	0.16	3.48	0.02	0.11	0.11	0.51	62.00	1.00	0.00	1.00	1.00	3.00	1.00	2.00	58.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	239000.00
Jarrumiehenkatu 2	520.00	3.88	0.52	0.22	2.10	0.00	0.54	0.16	0.79	45.50	0.00	0.00	0.00	2.00	1.00	1.00	10.00	46.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	278000.00
Perustie 20	330.00	4.36	2.53	0.00	0.67	0.07	0.88	0.17	0.15	104.00	1.00	0.00	0.00	3.00	2.00	1.00	4.00	84.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	650000.00
Kauppalantie 29	320.00	11.39	0.56	0.00	2.77	0.22	0.48	0.03	0.30	60.00	0.00	0.00	1.00	3.00	2.00	1.00	3.00	60.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	380000.00
Imarretie 6 D	730.00	11.58	0.27	0.43	5.10	0.21	0.14	0.14	0.36	51.50	0.00	0.00	1.00	2.00	1.00	1.00	3.00	33.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	209000.00
Vanha tapanilantie 2	780.00	10.60	1.38	0.00	5.26	0.14	1.06	0.04	0.37	33.00	0.00	0.00	0.00	1.00	1.00	1.00	2.00	7.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	170000.00
Isonnevantie 10	320.00	2.07	0.75	0.00	0.14	0.09	0.62	0.17	0.63	64.00	1.00	0.00	1.00	2.00	1.00	1.00	1.00	64.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	269000.00
Taivaskalliontie	400.00	5.91	0.64	0.09	1.59	0.19	1.63	0.19	0.20	39.00	0.00	1.00	1.00	2.00	1.00	1.00	1.00	83.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	239000.00

Minna Canthin katu 16	250.00	2.24	1.64	0.00	0.52	0.05	0.23	0.10	0.21	42.00	0.00	0.00	1.00	2.00	1.00	1.00	7.00	84.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	338000.00
Sepänk atu 3-5	150.00	1.04	0.10	0.00	0.57	0.00	0.49	0.09	0.21	54.00	1.00	0.00	1.00	2.00	1.00	1.00	3.00	62.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	495000.00
Mäkelä nkatu 93 B 16	610.00	4.76	1.44	0.00	2.04	0.05	1.61	0.06	1.00	43.50	0.00	0.00	1.00	2.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	300000.00
Strömb ergintie	380.00	1.99	0.40	0.13	2.00	0.00	0.59	0.20	0.60	60.00	1.00	0.00	1.00	2.00	1.00	1.00	7.00	21.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	367000.00
Lapinri nne 2 C	180.00	0.28	0.49	0.00	0.58	0.04	0.40	0.00	0.99	38.00	1.00	0.00	1.00	1.00	1.00	1.00	3.00	41.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	284000.00
Luotsik atu 14	160.00	2.00	1.42	0.21	0.16	0.11	0.25	0.15	0.20	37.50	0.00	0.00	0.00	2.00	1.00	1.00	1.00	111.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	284000.00
Porslah dentie	960.00	13.29	1.35	0.00	1.38	0.12	0.54	0.04	0.59	53.50	0.00	0.00	1.00	2.00	1.00	1.00	2.00	20.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	203000.00
Meri-Rastilan tie 11	980.00	11.06	0.56	0.56	0.58	0.11	1.25	0.12	0.33	80.00	0.00	0.00	1.00	3.00	2.00	1.00	3.00	29.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	18362.65
Aurinko tuulenk atu 5 A	990.00	13.39	0.85	0.17	0.56	0.05	0.77	0.14	0.68	99.50	1.00	0.00	1.00	4.00	3.00	1.00	1.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	449000.00
Maistra atinkatu	240.00	3.55	0.65	0.30	1.78	0.16	0.60	0.19	0.29	49.50	0.00	0.00	1.00	2.00	1.00	1.00	3.00	38.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	295000.00
Malaga nkatu 4	220.00	1.47	0.58	0.04	0.51	0.11	0.25	0.07	0.60	66.50	0.00	0.00	1.00	3.00	2.00	1.00	0.00	4.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	545000.00
Toinen linja 3	530.00	1.77	0.15	0.00	0.22	0.19	0.19	0.07	0.25	36.50	0.00	0.00	1.00	1.00	1.00	1.00	4.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	368000.00
Lokkala ntie 3	330.00	4.39	2.11	0.00	0.97	0.05	1.03	0.03	1.47	85.00	0.00	0.00	0.00	4.00	3.00	2.00	3.00	66.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	595000.00
Sepänk atu 13	150.00	1.04	1.17	0.12	0.42	0.00	0.63	0.16	0.26	114.00	0.00	0.00	1.00	5.00	3.00	2.00	8.00	58.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1250000.00
Kaarlen katu 13	530.00	2.35	0.54	0.03	0.79	0.07	0.20	0.04	0.25	26.20	0.00	0.00	0.00	1.00	1.00	1.00	4.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	197000.00
Palovart ijantie 1-7 B	750.00	10.86	0.20	0.19	7.05	0.20	0.77	0.08	0.30	80.00	0.00	0.00	1.00	3.00	2.00	1.00	3.00	46.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	139000.00
Helsingi nkuja 4 C 108	500.00	2.58	1.71	0.00	0.69	0.14	0.36	0.05	0.21	93.00	0.00	0.00	1.00	4.00	3.00	1.00	7.00	93.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	968000.00
Manner heiminti e 57-59	250.00	2.69	1.41	0.00	0.83	0.17	0.29	0.18	0.31	90.00	0.00	0.00	1.00	4.00	4.00	2.00	2.00	83.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	648000.00
Punavu orenkat u 19	150.00	0.85	1.02	0.00	0.25	0.00	0.45	0.15	0.22	118.50	0.00	0.00	0.00	3.00	2.00	2.00	1.00	94.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	999000.00
Sinebry choffink atu 11	120.00	0.65	0.82	0.09	0.31	0.00	0.42	0.08	0.22	81.00	1.00	0.00	1.00	4.00	3.00	2.00	2.00	40.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	750000.00
Kalasat amanka tu 26	580.00	3.67	0.31	0.07	0.29	0.40	0.55	0.26	0.93	87.50	1.00	0.00	1.00	3.00	3.00	2.00	5.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	566648.00
Fredriki nkatu 81	100.00	1.23	0.53	0.00	0.67	0.01	0.38	0.13	0.39	63.20	0.00	0.00	1.00	3.00	2.00	1.00	3.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	517000.00
Vuosaar entie 1 B ja C	980.00	12.30	0.34	0.23	1.00	1.25	0.29	0.07	0.12	74.50	0.00	0.00	1.00	3.00	2.00	1.00	1.00	22.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	25677.60
Unionin katu 45	170.00	1.39	0.43	0.00	0.08	0.03	0.44	0.03	0.23	60.00	0.00	0.00	0.00	2.00	2.00	1.00	9.00	98.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	534000.00
Rauhan katu 2	170.00	1.62	0.58	0.00	0.08	0.34	0.81	0.29	0.42	42.00	0.00	0.00	0.00	1.00	1.00	1.00	2.00	94.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	372000.00
Vattunie menkat u 18	210.00	3.10	0.74	0.80	0.25	0.22	0.19	0.04	0.64	32.00	0.00	0.00	0.00	1.00	1.00	1.00	6.00	48.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	246000.00

Piikintie 16	680.00	8.90	2.32	0.21	4.30	0.51	0.90	0.22	0.58	73.00	0.00	0.00	1.00	3.00	2.00	1.00	2.00	51.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	265000.00
Kuusitie 15	270.00	3.55	2.13	0.12	0.88	0.00	0.42	0.16	0.50	45.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	77.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	275000.00
Nousiai stentie 4	280.00	3.76	1.22	0.25	1.33	0.11	0.68	0.30	0.67	52.00	0.00	0.00	1.00	3.00	2.00	1.00	2.00	74.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	375000.00
Huovitie 6	400.00	6.15	0.70	0.10	3.45	0.05	1.88	0.09	0.88	66.00	0.00	0.00	1.00	3.00	2.00	1.00	2.00	68.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	257000.00
Sallatun turintie 1	970.00	13.01	0.45	0.00	3.26	0.27	1.79	0.07	0.49	55.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	68.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	199000.00
Neljäs Linja 17-19	530.00	2.08	0.62	0.21	0.49	0.06	0.20	0.25	0.25	25.50	0.00	0.00	1.00	1.00	1.00	1.00	3.00	60.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	225000.00
Hämeen tie 67	550.00	1.39	0.72	0.00	1.09	0.04	1.72	0.20	0.12	25.00	0.00	0.00	0.00	1.00	1.00	1.00	3.00	94.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	198000.00
Kyntäjä ntie 20	390.00	8.62	1.46	0.32	2.89	0.16	0.70	0.33	0.57	73.00	0.00	0.00	1.00	3.00	2.00	1.00	1.00	50.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	290000.00
Mäntyti e 7	270.00	3.16	1.99	0.06	0.64	0.09	0.18	0.27	0.27	85.00	0.00	0.00	0.00	3.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	548000.00
Mustan niement ie 11	760.00	13.70	0.59	0.22	7.35	0.17	1.09	0.22	0.66	73.00	0.00	1.00	1.00	3.00	1.00	1.00	1.00	34.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	318000.00
Neulapa dontie 7	920.00	9.70	0.71	0.37	2.65	0.31	0.64	0.39	0.22	67.00	0.00	0.00	1.00	3.00	2.00	1.00	3.00	52.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	169000.00
Teollisu uskatu	520.00	3.20	0.48	0.41	1.29	0.10	0.15	0.22	0.33	42.00	1.00	0.00	1.00	2.00	1.00	1.00	6.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	395000.00
Kumpul anportti	520.00	4.12	1.10	0.34	1.48	0.04	0.72	0.30	1.20	74.50	0.00	0.00	1.00	4.00	3.00	1.00	1.00	34.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	345000.00
Rengin kuja 1	410.00	9.30	0.11	0.25	4.38	0.06	0.90	0.10	0.37	71.50	0.00	0.00	1.00	3.00	2.00	1.00	3.00	36.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	194000.00
Muinais rannanti e 3	940.00	9.96	1.07	0.15	3.64	0.03	1.18	0.06	0.44	83.00	0.00	0.00	1.00	3.00	2.00	1.00	1.00	7.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	285000.00
Mecheli ninkatu 34 B37	260.00	1.50	1.39	0.00	0.22	0.11	0.50	0.22	0.36	86.00	0.00	0.00	1.00	3.00	2.00	1.00	6.00	21.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	868000.00
Tankom äenkatu 10	950.00	12.61	1.65	0.23	2.45	0.17	0.88	0.25	0.75	44.00	0.00	0.00	1.00	2.00	1.00	1.00	3.00	3.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	169500.00
Lauttas aarentie 52	200.00	3.60	0.65	0.00	0.20	0.07	1.27	0.19	0.24	41.50	0.00	0.00	1.00	2.00	1.00	1.00	5.00	5.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	459000.00
Urheilu kalastaj ankuja	990.00	13.30	1.03	0.59	0.00	0.35	1.12	0.03	0.65	84.50	0.00	1.00	1.00	4.00	2.00	2.00	3.00	15.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	518000.00
Myrsky kuja 1 C	990.00	13.46	1.00	0.44	0.00	0.19	0.92	0.09	0.64	52.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	13.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	298000.00
Capella n puistoti	580.00	3.60	0.27	0.25	0.10	0.48	0.29	0.33	1.09	26.00	0.00	0.00	1.00	1.00	1.00	1.00	10.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	325000.00
Taidem aalarink atu 1	430.00	10.50	1.78	0.53	6.70	0.12	1.13	0.03	1.44	48.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	3.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	34142.00
Taidem aalarink atu 16	430.00	10.44	2.10	0.77	6.89	0.20	1.27	0.17	1.39	49.00	1.00	0.00	1.00	2.00	1.00	1.00	3.00	3.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	238000.00
Tattarik atu 7	770.00	12.38	5.68	0.40	0.19	0.31	1.29	0.09	1.02	79.50	0.00	0.00	1.00	4.00	3.00	2.00	1.00	3.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	348000.00
Pläsinp ellonkuj	740.00	10.79	2.11	0.08	6.00	0.00	1.80	0.16	1.06	44.00	0.00	0.00	1.00	2.00	1.00	1.00	4.00	5.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	212000.00
Pitäjän mäentie 33b 7	370.00	7.63	0.39	0.00	2.19	0.10	0.29	0.14	1.42	70.00	0.00	0.00	1.00	4.00	3.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	445270.00
Aleksis Kiven katu 19	510.00	2.80	0.84	0.15	1.07	0.17	0.51	0.08	0.18	84.50	1.00	0.00	1.00	3.00	2.00	2.00	1.00	5.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	659000.00

Aarteen etsijänti e 8 i	970.00	12.40	0.52	0.28	2.48	0.07	1.58	0.03	0.37	74.00	0.00	0.00	1.00	3.00	2.00	1.00	1.00	34.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	184000.00
Roihuv uorentie	820.00	8.28	0.74	0.00	0.83	0.33	0.47	0.14	0.45	47.50	0.00	0.00	1.00	2.00	1.00	1.00	4.00	3.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	288000.00
Koroiste nkuja 1	280.00	3.71	1.44	0.07	1.36	0.07	0.72	0.09	0.92	27.00	1.00	0.00	0.00	1.00	1.00	1.00	4.00	27.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	209000.00
Laivurin katu 37	150.00	1.11	1.28	0.00	0.55	0.03	0.50	0.14	0.15	121.00	1.00	0.00	0.00	4.00	2.00	1.00	4.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1380000.00
Paciuks enkaari	270.00	3.81	2.27	0.09	0.65	0.19	0.59	0.11	0.71	49.50	0.00	0.00	1.00	2.00	1.00	1.00	2.00	25.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17626.66
Capella nranta 10 B 30	580.00	3.83	0.45	0.34	0.04	0.65	0.41	0.46	1.06	77.00	0.00	0.00	1.00	4.00	3.00	2.00	3.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	615000.00
Henrik Lättiläis en katu 23 C	710.00	6.71	1.18	0.08	0.94	0.55	1.63	0.22	0.95	65.50	0.00	0.00	1.00	2.00	2.00	2.00	1.00	8.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	298000.00
Gustav Pauligi n katu	990.00	12.95	0.63	0.30	0.45	0.81	0.53	0.30	0.35	55.50	0.00	0.00	1.00	2.00	1.00	1.00	3.00	18.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	298500.00
Sompas aarenlai turi 16 A	540.00	2.86	0.76	0.29	0.03	0.35	0.72	0.28	1.20	90.50	1.00	0.00	1.00	4.00	3.00	2.00	4.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	809000.00
Neljäs linja 4	530.00	1.98	0.32	0.07	0.40	0.12	0.21	0.08	0.20	27.00	0.00	0.00	0.00	1.00	1.00	1.00	5.00	59.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	229000.00
Kaljaasi Auroran kuja 1	540.00	3.10	0.70	0.61	0.04	0.15	0.65	0.08	1.35	59.50	1.00	0.00	1.00	2.00	1.00	1.00	7.00	2.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	575000.00
Iiluodon tie 3	990.00	12.64	0.33	0.25	0.48	0.22	0.60	0.06	0.40	58.00	0.00	0.00	1.00	2.00	1.00	1.00	3.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	255000.00
Capella nranta 6	580.00	3.72	0.40	0.30	0.06	0.61	1.96	0.29	1.06	92.50	1.00	0.00	1.00	4.00	3.00	2.00	6.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	920000.00
Metsälä ntie 8A	620.00	5.83	1.46	0.00	3.59	0.00	1.51	0.19	0.79	50.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	262500.00
Regina nkuja 3	810.00	5.82	1.02	0.72	0.06	0.08	0.57	0.16	0.57	44.00	1.00	0.00	1.00	2.00	1.00	1.00	1.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	448000.00
Liisank atu 6	170.00	1.65	0.59	0.00	0.20	0.11	0.62	0.10	0.18	121.00	0.00	0.00	1.00	4.00	3.00	2.00	2.00	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1195000.00
Capella nranta 3	580.00	3.70	0.38	0.23	0.05	1.04	0.39	0.42	0.99	83.50	1.00	0.00	1.00	3.00	2.00	2.00	1.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	739000.00
Kivijatat ie 13	940.00	10.17	1.44	0.37	3.51	0.06	1.15	0.21	0.18	73.50	0.00	0.00	1.00	3.00	2.00	2.00	2.00	23.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	269000.00
Aallonh alkoja 5	540.00	3.12	0.63	0.56	0.05	0.18	0.60	0.03	1.33	31.00	1.00	0.00	1.00	1.00	1.00	1.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	335000.00
Johan Sederh olmin	810.00	6.85	0.83	0.04	0.19	0.05	0.71	0.04	0.54	64.00	0.00	0.00	1.00	3.00	1.00	2.00	4.00	34.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	345000.00
Kutomot ie 10 b A	380.00	6.10	0.99	0.27	1.78	0.14	0.21	0.34	0.55	118.00	0.00	0.00	1.00	4.00	3.00	2.00	3.00	8.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	695000.00
Teollisu uskatu 34 B	520.00	3.19	0.53	0.03	1.78	0.13	0.15	0.21	0.33	31.00	0.00	0.00	1.00	1.00	1.00	1.00	5.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	279900.00
Metsälä ntie 8 B	620.00	5.87	1.33	0.00	3.79	0.00	1.50	0.31	1.08	66.50	1.00	0.00	1.00	3.00	2.00	1.00	3.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	322525.00
Veneent ekijänk uja 6	210.00	2.92	0.98	0.19	0.05	0.00	0.19	0.20	0.85	93.50	0.00	0.00	1.00	3.00	2.00	1.00	2.00	21.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	698000.00
Kivipari ntie 2	920.00	10.18	0.13	0.19	2.45	0.29	0.10	0.05	0.48	55.00	0.00	0.00	1.00	2.00	1.00	1.00	4.00	12.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	34386.72
Länsisa tamank atu 18 B	180.00	1.50	0.54	0.62	0.17	0.13	0.37	0.07	0.62	77.00	1.00	0.00	1.00	3.00	1.00	1.00	8.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	811500.00
Aallonh alkoja 9	540.00	3.04	0.77	0.00	0.03	0.15	0.73	0.13	1.39	78.50	1.00	0.00	1.00	4.00	3.00	2.00	3.00	2.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	711000.00

Toinen linja 3	530.00	1.81	0.18	0.00	0.34	0.19	0.19	0.06	0.25	36.50	1.00	0.00	1.00	1.00	1.00	1.00	4.00	3.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	369000.00
Jaalaranta 5	180.00	1.16	0.18	0.33	0.03	0.02	0.23	0.15	0.20	62.00	1.00	0.00	1.00	2.00	1.00	1.00	6.00	27.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	549000.00
Läksyrinne 13	760.00	13.15	0.99	0.23	6.63	0.29	0.38	0.25	0.24	115.00	1.00	0.00	0.00	4.00	1.00	2.00	1.00	43.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	339000.00
Rakentajantie 2	370.00	8.12	0.74	0.26	2.83	0.09	0.69	0.28	0.33	32.50	0.00	0.00	1.00	1.00	1.00	1.00	1.00	48.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	128000.00
Fleminginkatu	510.00	2.64	0.46	0.25	0.89	0.17	0.36	0.02	0.88	100.00	0.00	0.00	1.00	3.00	1.00	1.00	5.00	111.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	742000.00
Kuhankeittäjäntie 26	780.00	10.75	1.17	0.00	4.94	0.33	0.92	0.13	0.37	44.50	0.00	0.00	1.00	2.00	1.00	1.00	2.00	35.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	179000.00
Saunalahdentie	330.00	4.26	3.26	0.36	0.22	0.00	0.36	0.16	0.24	46.60	1.00	0.00	1.00	2.00	1.00	1.00	3.00	67.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	387000.00
Tenholantie 12	280.00	4.31	0.90	0.50	1.95	0.26	0.50	0.00	0.74	37.50	0.00	0.00	1.00	2.00	1.00	1.00	7.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	305000.00
Karhusuontie 7	720.00	9.45	0.76	0.00	4.00	0.10	0.13	0.17	0.34	101.50	0.00	1.00	1.00	4.00	3.00	2.00	1.00	50.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	339000.00
Särkiniementie 3b A15	210.00	3.66	1.29	1.43	0.19	0.00	0.45	0.24	1.06	81.50	1.00	0.00	1.00	3.00	2.00	2.00	5.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	798250.00
Vuolukiventie	710.00	8.46	0.87	0.59	2.49	0.00	1.18	0.07	0.36	66.00	0.00	0.00	1.00	2.00	1.00	1.00	3.00	58.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	198000.00
Aurinkotuulenkatu 12	990.00	13.34	0.87	0.31	0.08	0.06	0.90	0.00	0.62	94.50	1.00	0.00	1.00	4.00	3.00	2.00	6.00	14.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	445000.00
Aallonhalkoja 9	540.00	3.02	0.76	0.69	0.03	0.16	0.70	0.14	1.38	59.50	0.00	0.00	0.00	2.00	1.00	1.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	539000.00
Klaveeripolku 3	420.00	8.73	0.34	0.11	4.50	0.00	0.96	0.10	0.57	71.50	0.00	0.00	1.00	3.00	1.00	1.00	3.00	23.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	270000.00
Rapakivenkuja	710.00	0.56	0.46	0.06	3.23	0.07	1.31	0.10	0.71	52.50	0.00	1.00	1.00	2.00	2.00	1.00	2.00	58.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	148000.00
Ruusulankatu	250.00	1.84	1.79	0.05	0.64	0.19	0.99	0.15	0.34	81.00	0.00	0.00	1.00	2.00	1.00	1.00	6.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	767000.00
Karmiinikuja 4 A 20	430.00	10.55	2.18	0.83	6.92	0.21	1.34	0.15	1.42	41.00	0.00	0.00	1.00	2.00	1.00	1.00	4.00	4.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	217000.00
Mannerheimintie 64	260.00	1.70	1.48	0.00	0.76	0.11	0.07	0.08	0.21	84.00	0.00	0.00	1.00	3.00	3.00	2.00	3.00	75.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	695000.00
Naapuripellonti	410.00	10.01	0.57	0.07	4.90	0.18	1.35	0.21	0.35	35.00	0.00	0.00	1.00	1.00	1.00	1.00	2.00	38.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	139000.00
Eteläranta 2	130.00	1.25	0.82	0.00	0.16	0.03	0.28	0.12	0.59	261.20	0.00	0.00	1.00	5.00	4.00	3.00	5.00	136.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2580000.00
Lauttasaarentie	200.00	2.25	0.70	0.00	0.04	0.35	0.77	0.11	0.95	96.50	0.00	0.00	0.00	4.00	3.00	2.00	3.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	868000.00
Saukonpaadenranta 22	180.00	1.82	0.79	0.99	0.00	0.60	0.66	0.31	0.96	76.50	1.00	0.00	1.00	3.00	2.00	1.00	3.00	6.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1109250.00
Leppisaarentie 1	830.00	7.89	1.88	0.43	0.30	0.23	1.83	0.12	0.77	37.00	1.00	0.00	1.00	2.00	1.00	1.00	3.00	61.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	199000.00
Neitsytsaarentie	960.00	13.06	1.84	1.14	0.97	0.21	0.24	0.15	0.64	51.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	57.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	176000.00
Englantilaisaukio 10	580.00	3.58	0.21	0.21	0.14	0.40	0.19	0.06	1.11	52.00	0.00	0.00	1.00	2.00	2.00	1.00	26.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	489000.00
Helsinginkatu 21	510.00	2.52	0.48	0.00	0.79	0.06	0.71	0.05	0.53	21.00	0.00	0.00	0.00	1.00	1.00	1.00	3.00	109.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	185000.00
Intiankatu 34	560.00	5.01	1.48	0.22	1.09	0.04	0.96	0.02	0.72	25.00	0.00	0.00	0.00	1.00	1.00	1.00	2.00	83.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	187000.00
Unioninkatu 6	130.00	1.16	0.77	0.04	0.19	0.06	0.22	0.14	0.55	80.00	0.00	0.00	1.00	3.00	2.00	1.00	4.00	86.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	695000.00
Uudenmaankatu 28	120.00	0.61	0.68	0.00	0.63	0.19	0.25	0.11	0.13	64.00	0.00	0.00	1.00	3.00	1.00	1.00	3.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	554000.00

Uudenmaankatu 28	120.00	0.61	0.68	0.00	0.63	0.19	0.25	0.11	0.13	64.00	0.00	0.00	1.00	3.00	1.00	1.00	3.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	554000.00
Petter Wetterin tie 9	810.00	6.15	0.54	0.36	0.27	0.06	0.30	0.24	0.30	44.00	0.00	0.00	1.00	2.00	1.00	1.00	4.00	22.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	269000.00
Ruoholahdenkatu 10 B	180.00	0.25	0.48	0.00	0.61	0.02	0.42	0.08	0.20	54.00	0.00	0.00	1.00	1.00	1.00	1.00	4.00	82.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	370000.00
Pyynikintie 1	710.00	8.12	1.10	0.24	2.08	0.16	1.03	0.10	0.61	95.00	0.00	0.00	1.00	4.00	3.00	1.00	5.00	47.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	235000.00
Ratakatu 9	120.00	0.90	0.92	0.00	0.63	0.09	0.91	0.10	0.16	30.00	0.00	0.00	1.00	1.00	1.00	1.00	3.00	71.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	328800.00
Neljäs linja 16	530.00	0.85	0.88	0.00	0.84	0.11	0.28	0.11	0.36	54.00	1.00	0.00	1.00	2.00	1.00	1.00	3.00	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	345000.00
Pengerkatu 20	500.00	2.61	0.15	0.08	0.49	0.05	0.60	0.11	0.45	18.00	0.00	0.00	1.00	1.00	1.00	1.00	2.00	86.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	128000.00
Torkkelinkatu 15	500.00	2.45	0.39	0.10	0.52	0.00	0.44	0.21	0.37	37.50	0.00	0.00	1.00	1.00	1.00	1.00	1.00	93.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	297000.00
Retkeilijänkuja	980.00	11.70	0.33	0.21	0.64	0.32	0.52	0.24	0.53	67.00	0.00	0.00	1.00	3.00	2.00	1.00	3.00	23.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	258000.00
Leimasinkatu 9 C75	620.00	5.68	1.26	0.22	3.31	0.16	1.41	0.13	0.92	33.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	205400.00
Kaarlenkatu 15	530.00	2.45	0.54	0.03	0.81	0.04	0.19	0.04	0.22	54.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	93.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	359000.00
Koulutanhua 4	840.00	5.80	2.15	0.27	0.58	0.04	0.57	0.18	0.99	77.50	0.00	0.00	0.00	3.00	1.00	1.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	377000.00
Iso Roobertinkatu 3-	120.00	0.78	0.78	0.00	0.58	0.13	0.21	0.13	0.24	96.00	0.00	0.00	0.00	2.00	1.00	2.00	4.00	147.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	857000.00
Puunkaatajantie 29	760.00	14.07	2.11	0.06	6.75	0.06	0.66	0.20	1.21	97.00	0.00	0.00	1.00	4.00	3.00	2.00	3.00	42.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	225000.00
Huopalahdentie 19	330.00	4.69	1.82	0.00	0.51	0.27	0.85	0.05	0.27	74.50	1.00	0.00	1.00	3.00	2.00	2.00	4.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	568000.00
Merikortitie 5	960.00	4.62	1.82	0.00	1.12	0.09	0.65	0.04	0.35	50.80	0.00	0.00	1.00	2.00	1.00	1.00	6.00	58.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	149000.00
Mannerheimintie 138	270.00	3.28	1.69	0.00	0.79	0.08	0.49	0.12	0.10	78.00	0.00	0.00	0.00	4.00	2.00	1.00	6.00	82.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	525000.00
Mätästie 5	770.00	13.67	2.81	0.13	6.88	0.27	1.07	0.08	0.36	50.50	1.00	0.00	1.00	2.00	1.00	1.00	2.00	48.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	125000.00
Rukkilanrinne 6	410.00	10.11	0.30	0.13	5.29	0.03	1.39	0.20	0.40	25.00	0.00	0.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	159000.00
Agricolankatu 2	530.00	2.36	0.45	0.15	0.44	0.08	0.53	0.18	0.32	20.00	0.00	0.00	0.00	2.00	1.00	1.00	5.00	84.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	215000.00
Kaanaankatu 1b C 124	560.00	5.65	2.01	0.50	0.19	0.09	0.63	0.09	0.87	34.00	0.00	0.00	0.00	1.00	1.00	1.00	5.00	34.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	297600.00
Hämeentie 14	530.00	2.04	1.34	0.99	0.46	0.13	0.25	0.03	0.21	41.00	0.00	0.00	0.00	2.00	1.00	1.00	4.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	269000.00
Urkupillintie 7 K 89	420.00	8.97	0.53	0.23	4.53	0.06	1.21	0.03	0.61	36.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	45.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	145000.00
Porvoonkatu 21	510.00	2.79	1.06	0.24	0.97	0.13	0.50	0.12	0.16	65.50	0.00	0.00	1.00	3.00	2.00	1.00	4.00	63.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	449000.00
Kiertotähdentie	740.00	12.69	2.60	0.50	7.12	0.06	1.73	0.02	0.39	63.50	0.00	0.00	1.00	2.00	2.00	1.00	2.00	48.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	185000.00
Huopalahdentie 19 D 55	330.00	4.69	1.86	0.00	0.39	0.04	0.90	0.05	0.24	70.50	0.00	0.00	1.00	3.00	2.00	2.00	8.00	3.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	575000.00
Siltasaarenkatu 24	530.00	1.88	0.31	0.00	0.24	0.11	0.24	0.10	0.15	49.50	0.00	0.00	1.00	2.00	2.00	1.00	3.00	61.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	369000.00

Sompas aarenlai turi 16 B	540.00	2.83	0.71	0.05	0.03	0.37	0.70	0.28	1.16	86.50	1.00	0.00	1.00	4.00	1.00	2.00	6.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	729000.00
Kulosaa ren Puistoti e 46	570.00	4.97	0.11	0.11	0.15	0.44	1.13	0.16	0.45	0.70	0.00	0.00	1.00	3.00	2.00	1.00	2.00	62.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	375000.00
Tilkanto ri 10	300.00	4.32	0.24	0.36	0.02	0.09	0.50	0.35	0.15	44.50	0.00	0.00	1.00	2.00	1.00	1.00	1.00	30.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	235000.00
Perustie 21	330.00	4.49	2.56	0.14	0.67	0.44	0.94	0.05	0.17	64.00	0.00	0.00	0.00	2.00	1.00	1.00	6.00	85.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	478000.00
Pehtoori ntie 4	410.00	4.86	2.64	0.27	0.68	0.20	0.71	0.05	0.79	77.00	0.00	0.00	1.00	3.00	2.00	1.00	1.00	77.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	239000.00
Runebe rginkatu 54	260.00	1.52	1.40	0.00	0.37	0.21	0.29	0.15	0.26	86.00	0.00	0.00	0.00	3.00	2.00	1.00	2.00	95.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	693000.00
Kruunu vuorenk atu 2	160.00	1.77	1.20	0.28	0.20	0.05	0.44	0.04	0.43	72.50	1.00	0.00	0.00	3.00	2.00	2.00	2.00	82.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	948000.00
Töölönt ullinkat u 4 b D	250.00	2.69	1.47	0.08	8.00	0.33	0.22	0.20	0.21	81.50	0.00	0.00	0.00	4.00	3.00	2.00	3.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	768300.00
Kasperi nkuja 14	870.00	6.06	2.75	0.42	0.63	0.23	0.87	0.05	0.38	28.00	0.00	0.00	1.00	1.00	1.00	1.00	2.00	46.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	159000.00
Harustie 1 C	980.00	11.66	2.80	0.07	0.76	0.10	0.65	0.16	0.37	40.50	0.00	0.00	1.00	2.00	1.00	1.00	3.00	32.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	149000.00
Kolmas linja 4	530.00	1.92	0.22	0.35	0.30	0.25	0.21	0.08	0.20	68.50	1.00	0.00	1.00	3.00	2.00	1.00	6.00	10.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	615000.00
Myllypa dontie 1	920.00	9.20	1.06	0.05	2.51	0.42	1.16	0.13	0.52	67.00	0.00	0.00	1.00	2.00	1.00	1.00	2.00	56.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	228000.00
Maisem amaala uksenk atu 4 D	430.00	10.55	1.66	0.35	6.82	0.75	1.20	0.16	1.06	42.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	248500.00