



Living Together in the City: Dog Welfare and Biodiversity in Urban Environments

Att leva tillsammans i staden: Hundars välfärd och biologisk mångfald i urbana miljöer

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Abstract

Dogs have been very close to humans for generations and are today seen as family members. Their welfare is, therefore, considered important. Despite this and the existence of laws meant to ensure their welfare, cities are not always dog friendly. They can instead be very stressful for dogs and negatively affect their well-being. In addition, cities not only affect dogs but also negatively impact biodiversity, as urbanisation has generally made cities warmer than the countryside and reduced many green areas within cities, which negatively affect many species. Therefore, this study investigated, through an online survey, what dog owners believe promotes dogs' welfare and how cities can become more dog friendly. The responses were then linked to existing literature on biodiversity to determine whether dog-friendly cities could also increase biodiversity.

The survey yielded 736 responses, of which 242 were complete. Most responses came from Uppsala County, and most dog owners had 1 dog. The results also showed that 90.91% of dog owners believe that green areas, such as parks, dog parks, meadows, and forests, are the most important factor for improving dogs' welfare in cities. Additionally, 57% of dog owners valued blue areas, such as ponds, harbours, lakes, and beaches. Both green and blue areas reduce the number of areas with cars and other factors that can be stressful for dogs, while also providing greater opportunities for dogs to perform important behaviours such as running, smelling, playing, and socialising with other dogs. Green and blue areas also cool down cities, which can be important for dogs on hot days. These areas also play an important role in supporting biodiversity, but the extent to which they contribute depends on their design and connectivity. Variation is important; for example, varied vegetation that mimics nature, together with green and blue areas which are close to each other to form a connectivity, allowing species to move between them.

In the study, it was also found that 66.94% of dog owners value wider and/or separate bike and pedestrian paths to promote dogs' well-being, as these can lead to safer dog encounters. In addition, 75.62% respectively 69.01% of dog owners, consider waste bins and streetlights to be important factors in creating a dog friendly city. Waste bins help keep the environment clean, reduce the risk of dogs stepping into hazards such as broken glass, and support biodiversity. Streetlights create a sense of safety for dog owners and dogs, but can disturb moths and bats. The study also showed that dog owners consider it important to allow dogs inside cafés, restaurants, and shopping centres, as they believe it promotes dogs' welfare. Whether this actually improves dogs' well-being can be discussed, as well as whether it is ethically correct.

A deeper discussion is also needed on whether the factors considered dog-friendly positively affect biodiversity. Many of these factors appear to support biodiversity and could help us achieve environmental goals, but it is important to remember that biodiversity is complex. The relationship between dog friendly cities and biodiversity, therefore, needs to be further examined.

Keywords: Dogs, Dog-friendly, Urban environment, City, Biodiversity, Sustainability

Sammanfattning

Hundar har genom generationer stått människan mycket nära och betraktas idag som en viktig familjemedlem. Därför anses även deras välfärd vara viktigt. Trots detta samt existerande lagstiftning som syftar till att skydda deras välfärd är stadsmiljöer inte alltid anpassade efter hundars behov. De kan istället vara väldigt stressiga för hundar och påverka deras välbefinnande negativt. Urbaniseringen påverkar inte enbart hundar, utan även den biologiska mångfalden. Städer är generellt varmare än landsbygden vilket påverkar flera arter negativt. Samtidigt har urbaniseringen lett till en minskning av grönområden vilket även det har en negativ påverkan för såväl hundar som biologisk mångfald. Denna studie undersökte därför genom en online-enkät vad hundägare anser främjar hundars välfärd och hur städer kan bli mer hundvänliga. Dessa svar kopplades sedan samman med befintlig litteratur om biologisk mångfald för att se om hundvänliga städer även skulle kunna öka den biologiska mångfalden.

Enkäten resulterade i 736 svar, varav 242 var fullständiga. Majoriteten av svaren kom från Uppsala län och de flesta hundägare uppgav att de hade en hund. Resultatet visade att 90,91% av hundägarna anser att gröna områden, så som såsom parker, hundparker, ängar och skogar, är den viktigaste faktorn för att öka hundarnas välfärd i stadsmiljö. Därutöver ansåg 57% av hundägarna att blå områden såsom dammar, hamnar, sjöar och stränder är betydelsefulla. Gröna och blå områden minskar antalet områden med bilar och andra potentiella faktorer som kan vara stressfullt för hundar samt ger större möjlighet för hundar att utföra viktiga beteenden så som att springa, lukta, leka och socialisera med andra hundar. Dessa områden kylvärd även ner städer vilket kan vara viktigt under varma dagar. Gröna och blå områden är även viktiga för den biologiska mångfalden. Däremot är utformningen av dessa områden avgörande. Det är viktigt med variation och att områdena speglar en så naturlig miljö som möjligt, samt att de gröna och blå områdena placeras nära varandra så att de kopplas samman och möjliggör att arter kan röra sig mellan dem.

Resultatet från studien visade också att 66,94% av hundägarna värdesätter bredare och/eller separerade cykel- och gångvägar för att främja hundars välbefinnande eftersom det kan bidra till säkrare hundmöten. Cirka 75,62% respektive 69,01% av hundägarna ansåg även att tillgång soptunnor och gatubelysning är viktiga faktorer för att skapa en hundvänlig stad. Soptunnor bidrar till att hålla miljön ren, vilket minskar risken för att hundar skadar sig på exempelvis vassa föremål, samtidigt som de har en positiv effekt på den biologiska mångfalden. Gatubelysning skapar i sin tur en ökad känsla av trygghet för hundägare och hundar under dygnets mörkare timmar. Dock kan ljuset från gatubelysningen ha en negativ påverkan på malar och fladdermöss. Studien visade även att hundägare anser att det är viktigt att tillåta hundar inne på kaféer, restauranger och i köpcentrum, då de anser att det främjar hundars välfärd. Huruvida detta faktiskt förbättrar hundars välbefinnande kan dock diskuteras, liksom de etiska aspekterna av detta.

Det finns även ett behov av en fördjupad diskussion kring huruvida den biologiska mångfalden påverkas av de faktorer som anses vara hundvänliga. Flera av faktorerna verkar kunna stödja den biologiska mångfalden samt har potential att uppfylla vissa miljömål. Dock måste det tas i åtanke att biologisk mångfald är komplext och påverkas av många olika faktorer. Därför behöver sambandet mellan hundvänliga städer och biologisk mångfald undersökas vidare.

Keywords: Hundar, Hundvänlig, Urban miljö, Stad, Biodiversitet, Hållbarhet

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1. Introduction

The dog, *Canis familiaris*, is believed to have been domesticated around 14,000–33,000 years ago (Wells 2017; Thalmann et al. 2013; Ovodov et al. 2011) and genetic investigations and information have shown that the dog evolved from the grey wolf (*Canis lupus*) (Thalman et al. 2013). As a result of the evolution of dogs, over 400 distinct breeds have been developed, and no other animal has developed a relationship with humans as close as that of dogs (Jensen 2021). Over generations, dogs have assisted humans in domesticating other animals, herding livestock, hunting, and followed human from the agricultural society to the urbanisation (Jensen 2021). Today, dogs can assist us with a variety of tasks. Research has shown that therapy dogs can enhance the reading abilities of school students by increasing their motivation and performance (Barber & Proops, 2019). Dogs can also help reduce stress in college students (Barker et al. 2016), increase oxytocin levels and reduce cortisol and heart rate in humans (Handlin et al. 2011). They also assist the police or help people with conditions such as epilepsy (Jensen 2021).

It is, therefore, difficult to imagine what the world would be like without dogs. In Sweden, a total of 1.078.000 dogs were registered in 2025 (Jordbruksverket 2025). While dogs provide numerous benefits to humans, it is equally important to consider their welfare in human-dog relationships. They have followed us into urbanisation, where many factors can affect their welfare. These include densification, reduced green (parks, forest, meadows, nature reserve etc.) and blue (lakes, beaches, rivers, ponds, harbour, wetlands, water parks etc.) spaces, various sounds, and an environment that impacts their ability to exhibit their species-specific behaviour (Blackwell et al. 2013; Chin et al. 2025; Haaland & Bosch 2015; Hargrave 2022; Koohsari et al. 2022; Westgarth et al. 2017; Westgarth et al. 2022).

However, to understand when a dog has good welfare, we must understand the dog's behavioural needs and physiological requirements, which raises the question of which features in urban environments can support dog welfare. Furthermore, as densification reduces green areas, it also negatively impacts biodiversity (Haaland & Bosch, 2015; Ren et al. 2023). This raises another question: Can a dog-friendly city increase biodiversity in urban areas?

1.1 Welfare and behaviour of dogs

Defining the welfare of a dog or any animal can be a complex challenge. It can be explained through different frameworks, such as the five freedoms by the Farm animal welfare council (1993), which states the animals should have: Freedom from hunger, thirst and malnutrition; Freedom from thermal and physical discomfort; Freedom from pain, injury and disease; Freedom from fear and distress; Freedom to express normal behaviour. Yet it can be more complicated than that, as Palmer and Sandø (2018) argue that the assessments of animal welfare rely on human assumptions about what is correct (ethically) about animals. They raise the question whether the goal of animal welfare is to avoid pain or suffering, or if it is to create pleasure and other positive emotions.

Animal welfare can also be defined as the quality of the animal's life and that the animals themselves should provide a norm of what is important to their welfare (Bracke et al. 1999; Keeling et al. 2018). This somewhat aligns with what Webster (2016) discusses. He states that the fifth freedom, "*to express normal behaviour*", should be redefined as "*freedom of choice*". That means the animals have the freedom to express their natural behaviour with regard to choice of diet, environment, social contact, comfort, and security. Mellor et al. (2020) argue that the five domains model does not categorise welfare as inherently good or bad, but is intended to identify factors that may affect the welfare negatively or positively. They discuss how human presence can negatively or positively affect animals through these models. For example, Mellor et al. (2020) discuss that restricted food and water, poor air quality, loud/unpleasant sounds, humans who mistreat animals, such as violence, handling roughly, punishment, etc., are all factors that affect the animal's welfare negatively. While factors that affect the animal's welfare positively are attitudes from humans who make the dogs feel confident and cared for, humans who give food on time and take care of the dogs to prevent diseases, participate in engaging and enjoyable activities such as games, exercises, and create a strong bond with the dog are all positive (Mellor et al 2020).

Regarding the behaviour of dogs, they exhibit quite similar behaviour to wolves. However, because domestication has led to changes in physiological traits and behaviour (Galibert et al. 2011), such as some breeds having long, hanging ears, which makes communication more challenging, olfaction has become more important (Udell et al. 2010; Wells 2017). The dog uses its olfaction to receive information from urine, glands, and faeces to determine another individual's status and territory (Wells 2017). It can help a blind dog navigate its environment and recognizing individuals, but it is also important for hunting and tracking

(Jensen, 2021). A dog's smelling ability is, therefore, one of the most important senses.

Other important behaviours include playing, being social, and learning (Jensen, 2021). Dogs are social animals and have developed a complex social relationship with humans which can be compared to a bond a human has with a child (Wells 2017). When dogs and human interact with each other oxytocin raises in both (Handlin et al. 2011). Play can also strengthen their social relationship with humans but is also crucial to develop their motor skills (Sommerville et al. 2017). Play also help dogs to learn more about themselves, such as their strength, but also to practice and learn, for example, hunting behaviour (Jensen 2021).

Another essential function of the dog is that the dog releases heat from its body through panting (Sjaastad et al. 2016). However, in warm/hot and humid places, dogs can experience difficulties regulating their body temperature, which can lead to heat-related illnesses (Drobatz and Macintire 1996; Etue et al. 2025). A dog's normal body temperature is between 37,5 – 39,0 °C, and when the dog's body temperature reaches levels above the normal upper range, they can develop heat-related illnesses (Sjaastad et al. 2016). Hall et al. (2022) found that dogs can develop heat-related illness even when the median temperature is 16.9 °C, but the triggers in that study were primarily due to dogs sitting in a car rather than physical exercise. Another study by Beard et al. (2024), conducted in the United Kingdom, found that in 2022, the highest mean air temperature (approximately 18°C) occurred in July, when the most heat-related illnesses in dogs were reported. In their study, July also had the highest maximum temperature (above 30°C) during the whole year. However, it is not only the temperature that is a risk factor for developing heat-related illness. Dogs with a brachycephalic skull shape, overweight and physical activity during warm periods are all risk factors (Beard et al. 2024; Hall et al. 2020; Hall et al. 2022).

1.2 Welfare of dogs in urban environments

Urban environments can be stressful for dogs for several reasons. One of them is that they might react negatively towards various stimuli, mostly sounds, such as construction noises, rubbish trucks, lawnmowers, cars backfiring, passing traffic or pedestrians, overhead aircraft, emergency alarms, and fireworks (Blackwell et al. 2013; Chin et al. 2025; Hargrave 2022). Apart from this, green spaces in cities in Sweden are declining (Husqvarna Group 2024), and densification and/or reduced green space can also negatively affect dogs by discouraging people from

walking their dogs (Koohsari et al. 2022). This, in turn, can negatively affect the dog's health, as several dog owners have reported that walking improves their dog's physical and mental health (Westgarth et al. 2017; Westgarth et al. 2022). Nevertheless, appropriate walking spaces are not the only necessary thing; dog owners also need access to waste bins and streetlights for safety, and awareness of potential hazards such as broken glass (Eldridge & Jović 2024).

Dog owners can also experience difficulties understanding rules or regulations about public transport, or they may find that the rules change depending on who works at the public transport (Eldridge & Jović 2024). Apart from this, dog owners feel there is a lack of cafés and other stores that accept dogs. This highlights the need for more dog-friendly amenities in urban areas. Unfortunately, dogs are not always taken into account when designing cities or building areas (Gaunet et al. 2014). While plants are often seen as aesthetic and positive health factors, the presence of animals has long been seen as a nuisance. The above factor that dogs are not taken into consideration when designing cities and long has been seen as a nuisance can potentially harm the dog's welfare.

Another factor affecting dogs' health is the heat. Especially considering the urban heat island effect, which is characterised by higher temperatures in urban areas than in rural or suburban environments (Heaviside et al. 2017). A hot environment can lead to heat-related illness (Drobatz and Macintire 1996; Etue et al. 2025), as can leaving a dog in a hot vehicle. It has been showed by Hall et al. (2022) that exposure to a hot car can increase a dog's risk of developing a health-related illness by up to threefold, and as mentioned in section 1.1 dogs with a brachycephalic skull shape, overweight and physical activity during warm period, are all also risk factors for developing heat-related illness, (Beard et a. 2024; Hall et al. 2020; Hall et al. 2022). Warm periods also make the surface hot, especially concrete/asphalt, which absorb and store heat and can reach 50°C or higher (Hudak 2022). Taking too long walks on this hot ground can burn the dog's paws (Agrida 2025).

Therefore, during warm periods, green and blue spaces in cities are important because they can provide a cooler environment for dogs. Blue areas, in general, cool urban environments (Zhang et al. 2025) and green areas with trees provide shade, which can both cool the ground and lower air temperature (Armson et al. 2012; Zhang et al. 2014). Areas with water that allow dogs to swim can also cool them down, as Parnes et al. (2023) found that letting dogs go into water can cool them down very quickly.

The extent to which blue and green areas can cool urban environments depends on various ecological factors, such as vegetation coverage and plant height (Li et al., 2024). However, green areas not only cool the environment but also offer opportunities to include designated dog parks, which can promote the dog's physical and mental health and socialisation (Chen et al. 2022; Lee et al. 2009).

1.3 Biodiversity in urban areas

Biodiversity is threatened and declining rapidly, which results in ecosystems becoming weak and potentially collapsing (Naturskyddsforeningen, 2025). An investigation by Naturskyddsforeningen (2025) suggests that certain policy decisions taken by the governing parties in 2025 may undermine existing environmental legislation and targets. Besides this, Ren et al. (2023) predict that the world will experience rapid urban expansion from 2016 to 2050. They also indicate in their article that this expansion will result in the loss of 147.6 km² of natural habitats, leading to a decline in biodiversity and potentially causing species extinctions.

Densification also leads to the loss of public and private urban green spaces, resulting in decreased quality and, ultimately, lower living quality, biodiversity loss, and a lack of ecosystem service provision (Haaland & Bosch, 2015). As mentioned above, it also leads to the urban heat island effect (Heaviside et al., 2017), which has been shown to impact biodiversity in cities (Velasco et al., 2024). For example, bird species in cities are declining due to heat, as they migrate to suburban areas that are more suitable (Cai et al. 2023).

However, urban areas can support biodiversity. Trees in a city landscape can support different insects (Turrini & Knop 2015) and different design of green areas, for example both monotonous and more natural areas can support various different pollinators (Daniels et al. 2020). Green roofs also have positive effects in urban environments, including increased biodiversity. For example, species richness of arthropods and birds has been shown to be higher on green roofs than on traditional roofs (Wang et al. 2022). It can also increase the number of insects, but it depends on various factors. For example, green roofs located near public gardens can have 50% more species of insects than isolated green roofs (Hussain et al. 2023).

1.4 What does the legislation say?

1.4.1 Laws and regulations concerning dog welfare

Different laws regulate the welfare of dogs. For example, Chapter 2, Section 1 of Djurskyddslagen (SFS 2018:1192) states that *'all animals should be treated well and protected against unnecessary pain and sickness'*. Furthermore, Section 2 also states that *'animals should be kept in a suitable environment to promote their welfare. The environment must allow them to perform behaviours they are strongly motivated for, promote their welfare, and lastly, prevent abnormal behaviours'*. Also, chapter 1, section 1 in Lag (SFS 2007:1150) om tillsyn över hundar och katter mentions that *'dogs must be cared for in such a way that, considering their nature and other circumstances, is needed to prevent them from causing damage or significant inconvenience'*. Moreover, chapter 2, section 1 of Statens jordbruksverks föreskrifter och allmänna råd om hållande av hundar och katter (SJVFS 2020:8) states that *'dogs cannot be tied up or held in a way which prevent them from being able to move'*. There are exceptions mentioned for the latter, for example, when travelling in a vehicle, which can be for vacation, dog competition, dog training, education with the dog or puppies, or during potty training.

Section 5 of SJVFS 2020:8 also mentions how the dogs' basic needs should be met. Here, it states that *'the owner must possess the necessary competence and that dogs must be handled and cared for in a manner that meets their needs for social interaction, mental stimulation, exercise, sufficient rest, and temperature regulation. The meeting with humans must be daily, and if possible, with dogs as well'*. Section 5 of SJVFS 2020:8 also mentions that the exercise and mental stimuli must be adapted to the individual dog's circumstances. The general advice in Chapter 2, Section 5 (SJVFS 2020:8), regarding mental stimulation states that the dog should be able to use its nose in various ways, such as hunting, playing, and to be able to follow what is happening in the environment, including herding or retrieving objects.

In Chapter 4, Section 6 (SJVFS 2020:8), it is stated that all dogs should be walked outside every day. Complementary to this, Section 7 (SJVFS 2020:8) mentions that dogs kept inside should be walked outside every day, considering their exercise needs, age, and health condition. Section 10 in SJVFS 2020:8 also states that dogs can be held in pairs or groups, provided that they are compatible.

1.4.2 Laws and regulation governing biodiversity in Sweden

When it comes to biodiversity, various laws regulate it. One law is Miljöbalken (SFS 1998:808), also known as the Swedish Environmental Code in English, which states in Chapter 1, Section 1, that *'it is intended to promote sustainable development and ensure a healthy and sound environment for both present and future generations.'* Continuously, it states that *'such development will be based on the fact that nature is worthy of protection'*. The code shall be applied in such a way to ensure that:

1. Human health and the environment are protected against damage (caused by pollution or other factors);
2. Natural and cultural environments will be protected and preserved;
3. Biological and diversity is preserved;
4. The use of land, water, and the physical environment is generally aimed at securing long-term good management in ecological, social, cultural, and economic terms;
5. Reuse, recycling, and other material management practices help maintain natural cycles.

This code, SFS 1998:808, also states in Chapter 2, Section 1, that *'everyone who has/intends to have business or take action must have knowledge of how to protect human health and the environment from damage'*. The business or action that claims a land or water area, according to Section 6 (SFS 1998:808), must also choose the location where it has the least impact on human health and the environment. Moreover, chapter 3, section 6 (SFS 1998:808), states:

"Land and water areas, as well as the physical environment in general, that are important for reasons of public interest on account of their natural or cultural value or for outdoor recreation shall, to the extent possible, be protected against measures that damage the natural or cultural environment. Special consideration shall be given to the need for green spaces in and near urban areas. Areas of national interest for nature conservation, conservation of the cultural environment or outdoor recreation shall be protected against measures referred to in the first paragraph."

Except for this, there is also a new regulation from the EU, Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869. At the beginning of the regulation, it is mentioned that the decline in biodiversity is partly caused by urbanization, pollution, and unsustainable forestry activities. It also mentions that

urban green spaces include urban forests, parks, gardens, tree-lined streets, and urban meadows. Regulation (EU) 2024/1991 states that action must be taken to ensure urban green spaces continue to provide the necessary ecosystem services and to maintain habitats for biodiversity, particularly for plants, birds, and insects, including pollinators.

In annexe VII of (EU) 2024/1991, there are examples of how countries can restore nature. One example is to make use of 'close-to-nature' and introduce native tree species, another example is to increase the urban green spaces, such as parks, trees, woodland patches, green roofs, tree-lined streets, wildflower grassland, ponds, urban meadows and of course take into consideration species diversity, native species, local conditions and climate change. The list has 33 examples, but each county can choose for itself how to implement this regulation. However, the goal is to restore nature in each member country, which includes forests, ponds, urban green spaces, and marine water, among others. To quote the goal, it says:

"Member States shall put in place the restoration measures that are necessary to re-establish the habitat types in groups 1 to 6 listed in Annexe II in areas where those habitat types do not occur, with the aim of reaching the favourable reference area for those habitat types. Such measures shall be in place on areas representing at least 30 % of the additional surface needed to reach the favourable reference area for each group of habitat types, as quantified in the national restoration plan referred to in Article 15, by 2030, on areas representing at least 60 % of that surface by 2040, and on 100 % of that surface by 2050"

2. Aim and questions

2.1 Aim

Urbanisation is reducing green and blue spaces, which can affect the welfare of dogs and biodiversity in cities. Urbanisation also leads to increased noise, increased movement, and crowded places. The level of crowding in a place can vary. However, some areas may not offer a dog park/dog exercise area, which can potentially impact the dog's welfare. Urbanisation affects dogs, alongside broader impacts such as declines in pollinator populations and the displacement of certain bird species from cities. Urbanisation also creates hot spots, making cities warmer than the countryside, which affects dogs, plants, insects and other animals.

Therefore, the aim of this study was to investigate the requirements for good dog welfare in urban environments and to explore how cities can be planned/designed to be dog friendly. The aim is also to examine if a dog friendly designed city also increases the biodiversity in urban areas.

2.2 Questions

- Which factors are perceived to make urban areas dog-friendly?
- How can city design/planning improve dogs' welfare?
- Can the development of dog-friendly urban environments also enhance the biodiversity in cities?

3. Method

The study was conducted via an online survey created through the Netigate program, which was available from September 29 to October 21, 2025. It was accessible to dog owners in Sweden, and all the answers were anonymous.

3.1 The survey's design and distribution

The survey began with an introductory text that explained the purpose of the study. Additionally, in the introduction, a link was provided for those who wanted to learn more about how the Swedish University of Agriculture (SLU) handles personal information.

The survey was available in both Swedish and English and was divided into two parts (see Appendix 1 for the Swedish version or Appendix 2 for the English version). The first part consisted of background questions and included six questions related to e.g. age and information about their dog(s). The second part focused more on the dog owners' perception of the city for dogs and included 24 questions related to the town they lived in, and what they considered making a city dog friendly. Most of the questions in the second part were based on 1-5 rating scales of how critical different features were, such as dog parks, pedestrians, streetlights, and blue and green areas. A few questions included free-text answers.

The survey was distributed through social media, including various Facebook groups ("Vi i Enköping", "Alla personer i Enköping", "Vi som älskar hundar", "Hundar i Uppsala", "Hundfolk i Dalarna") and via the writer's own Facebook page. The survey was also sent to a large number of student email addresses which were provided by the supervisor, Maria Andersson. In addition, posters, as shown in Figure 1, were displayed around campus at SLU in Uppsala.

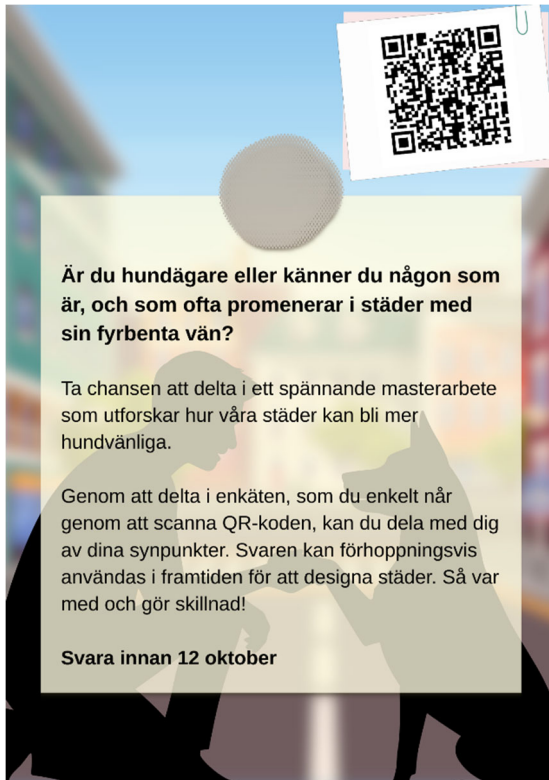


Figure 1. Poster which was displayed at the campus at SLU, Uppsala.

3.2 Data analysis

Only completed survey answers were used in the analysis. The free-text answers were being reviewed to get a picture of what is important to dog owners when it comes to creating a dog-friendly environment.

Graphs summarising the collected data was generated in Netigate, but modified in Excel for the report.

4. Results

The survey generated 736 answers, but only 242 (32,8 %) fulfilled the survey. Most of the answers were from Uppsala County (62%), followed by Stockholm County (12%), Skåne County (5%), Dalarna County (5%) and Västra Götaland County (4%). All other counties were represented by 2% of the respondents or lower.

Most dog owners had one dog (77%), followed by two dogs (17%) and three dogs (5%). Furthermore, most dog owners were between 20 and 39 years old, followed by 40 and 60 years old, as seen in Figure 2. They mostly walked their dog in suburban environments, as seen in Figure 3.

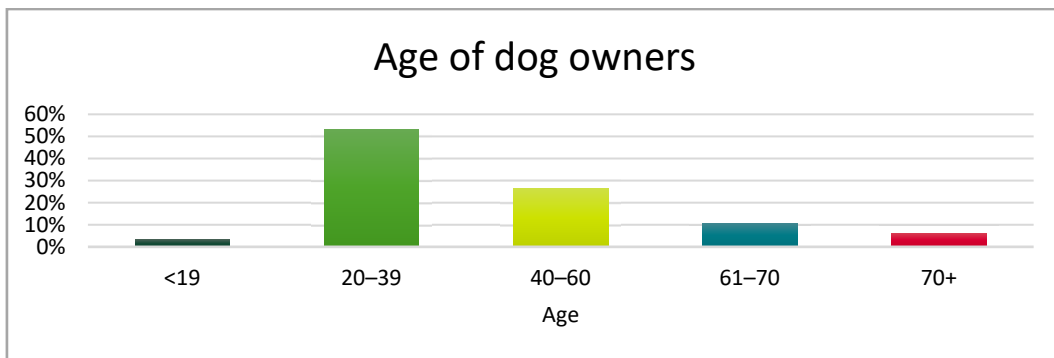


Figure 2. The distribution of respondents across age categories (%).

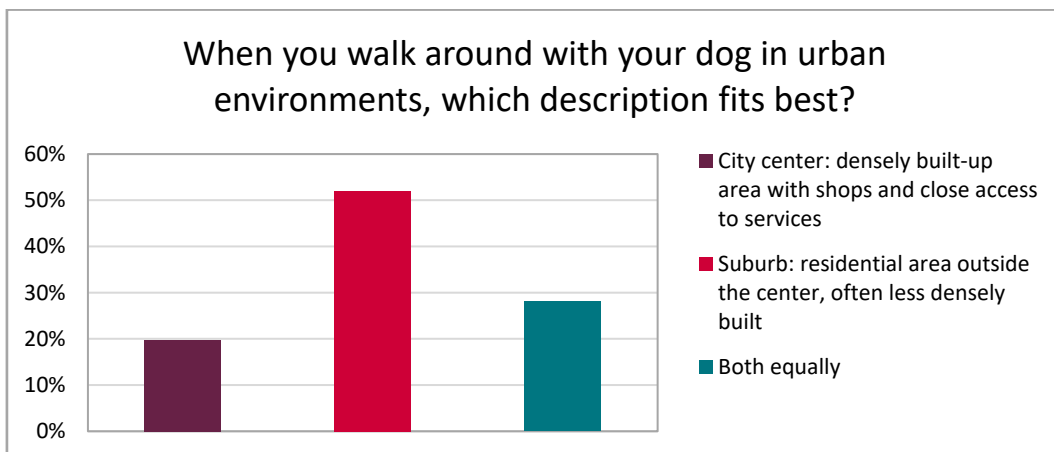


Figure 3. Primary walking environments for dogs (urban, suburban, or both).

4.1 What factors do people believe make urban areas dog-friendly?

This section will cover dog owners' thoughts from the free-text question "*How would you define a dog-friendly city that promotes dogs' welfare (well-being)?*" The result showed that dog owners believed green spaces, nature, and designed dog parks promote dogs' welfare. Many respondents wrote that they believed parks, green spaces, or designed dog parks where dogs are allowed to run free and/or socialise, promote dogs' welfare.

All 242 replies were reviewed, and quotes 1-20 below represents what dog owners think is important in a dog-friendly city. The first 1-4 quotes show that dog owners value green spaces, parks and designated dog parks.

Quote 1. Many green spaces, larger ones! Lots of vegetation.

Quote 2. Several smaller and larger green areas within walking distance in the city and city centre, reasonably well-maintained with regard to gravel, glass, and other litter. Dog parks are nice, but general park areas are more important. It's good if they are maintained like parks, e.g., as in Enköping.

Quote 3. Dog parks where you can let your dog run free, as well as lots of greenery

Quote 4. That there are places with nature without all the potentially stressful elements that may exist in a city/residential area. Also, that there is at least one proper dog park where dogs can socialize with other dogs on their own terms.

Dog owners also valued trash bins, clean streets, and water stations to make urban areas more dog friendly, as seen in quotes 5 and 6. Quote 2 mentions clean areas free of glass and other litter.

Quote 5. Plenty of vegetation, bushes, parks with areas to run and throw a ball. Good ground surfaces that do not harm the dogs' paws. Dog poop trash bins. Places to give water (especially during the summer).

Quote. 6 Plenty of trash cans, making it easy to dispose of poop after picking it up. Drinking water in several places, so you can give water during the walk. Dog parks where dogs can run off-leash. Dogs allowed on outdoor restaurant areas.

The results also showed that dog owners think wider pedestrian paths are important to make urban areas more dog friendly. This was described as facilitating safer encounters with other people and dogs and reducing feelings of crowding. Many also mentioned they preferred separated pedestrians and cycling paths, as well as walking paths away from cars or the noisy/stressful city. Dog

owners also mentioned the sounds and stress of the city. A dog friendly environment was therefore often characterised as one with reduced exposure to loud or stressful sounds. Examples of these can be seen in quotes 7–12.

Quote 7. I would say that urban planning needs to take sidewalks into account, as well as green areas and a calm traffic pace. Preferably, let patches of forest and parks remain, and also ideally provide dog parks within reasonable distances.

Quote 8. Wide walking and cycling paths so that there is plenty of space when meeting others, green areas with at least grass but preferably forests and trees

Quote 9. Lots of green areas. Large dog parks where the dogs can stretch out and run free. Not too much loud noise; fireworks, bangs, etc.

Quote 10. Many walking paths and open grassy areas. Not so many roads or construction sites that make loud noises.

Quote 11. Reduced stress factors: Few cars, wide sidewalks, larger dog parks, and dog-friendly restaurants, etc.

Quote 12. Green areas, separate lanes for walking/cycling/driving

When it comes to restaurants, cafés and shopping malls, dog owners reported that they want more stores to allow dogs. Several respondents raised concerns regarding public transport, noting a lack of clear information about whether dogs are permitted and, if so, where in the public transport they are allowed. Example of this can be seen in quotes 13 – 15.

Quote 13. Lots of green spaces, places where dogs are allowed (stores, cafés, etc.), public transportation where dogs can come along.

Quote 14. Many trash cans, landscaped walking paths and sidewalks, parks, dog parks, shops, shopping malls, restaurants & cafés that allow dogs, public transport that allows dogs.

Quote 15. Lots of green areas and walking paths, good access to trash bins, restaurants, cafés, and shopping centers where you can bring your dog. well-adapted public transport but clearly marked where dogs are allowed and where they are not.

Furthermore, dog owners also mentioned a few factors that were not covered by the rating questions (as seen in the section below), such as free dog poop bags around the city and “*outdoor gyms*” for dogs. Quotes 16 – 20 show what some dog owners wrote.

Quote 16. Good walking trail, trash bins for poop, preferably free dog poop bags, well-maintained dog park managed by the municipality.

Quote 17. That there is a dog park, many lovely green areas, and free dog poop bags in several places. The dog is allowed to accompany you to several restaurants.

Quote 18. The possibility to bring your dog into malls and stores. If it's not allowed to bring them inside, I would at least like suitable places to wait outside with your dog. There is a need for trash bins at regular intervals for poop bags. These are often missing when walking in my city's residential areas. It would be nice to have the option to get free poop bags at some places frequented by dog owners. It would be great to have some kind of permanent obstacle course – similar to an outdoor gym. It is also important to have a clear separation of pedestrian and bicycle lanes on walking paths so that you don't get scared when being overtaken by a bike or electric scooter at high speed.

Quote 19. Public transport, swimming areas, restaurants and shops where dogs are allowed, parks and dog parks, public dog gyms

Quote 20. There should be many dog yards, both large and small. I also want there to be dog playgrounds that are fenced in. Even in parks where there are outdoor gyms for people, there should be natural obstacles along the way where you can train your dog. Brain exercise.

4.2 How can city design/planning improve dogs' welfare?

In the free-text answers, dog owners frequently mention green spaces as a factor that promotes dogs' welfare. As shown in Figure 4, almost 91% of dog owners thought green areas were very important for improving dogs' welfare.

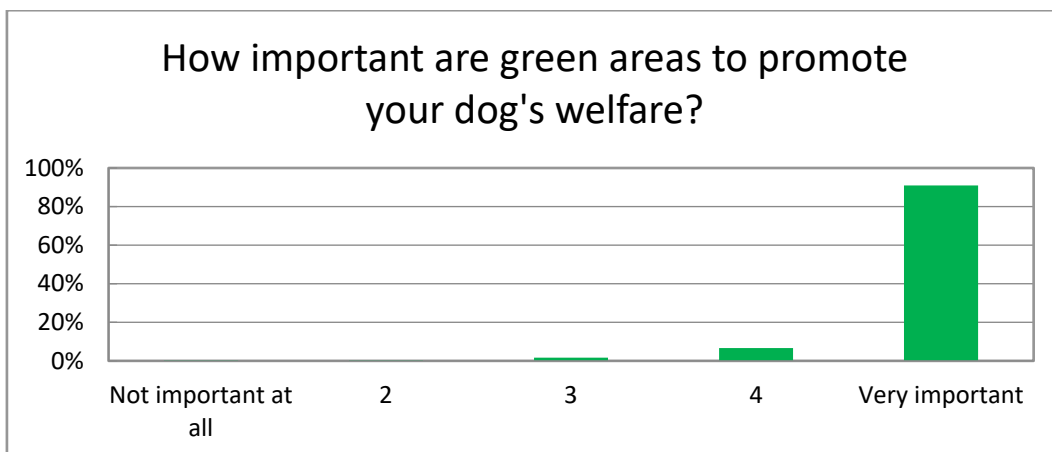


Figure 4. Perceived importance of green areas to improve the dogs' welfare. Approximately 91% (n=220) of the dog owners believe green areas, such as parks, meadows, wooded areas, nature reserves etc. are very important to promote the dog's welfare.

Blue areas were considered important, as seen in Figure 5, but less important than green spaces. However, when dog owners were asked only about dog swimming places (i.e., one type of blue area, e.g., beaches), these were considered more important than blue areas in general, as seen in Figure 6. Approximately 50% of dog owners considered dog swimming areas as very important.

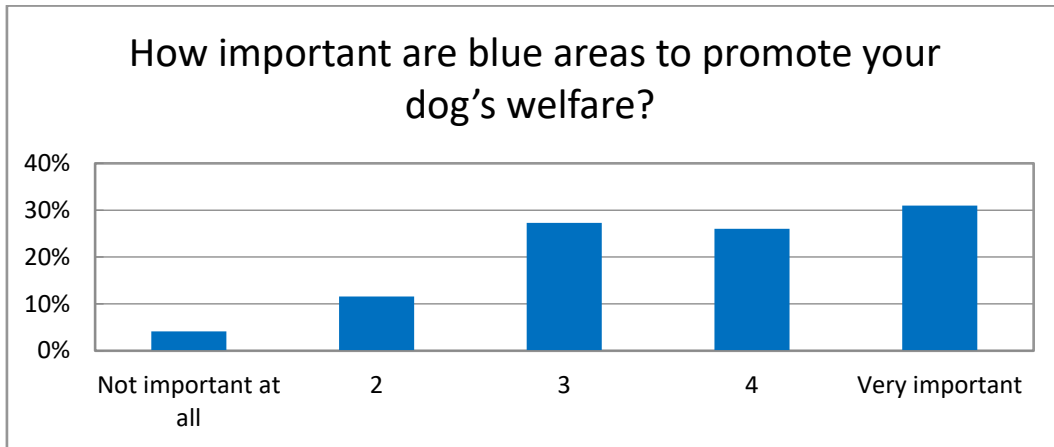


Figure 5. Perceived importance of blue areas, such as, wetlands, harbour, lakes, river, beaches etc. to promote the dogs' welfare. Approximately 57% (n=137) of the dog owners chose the option 4 or very important.

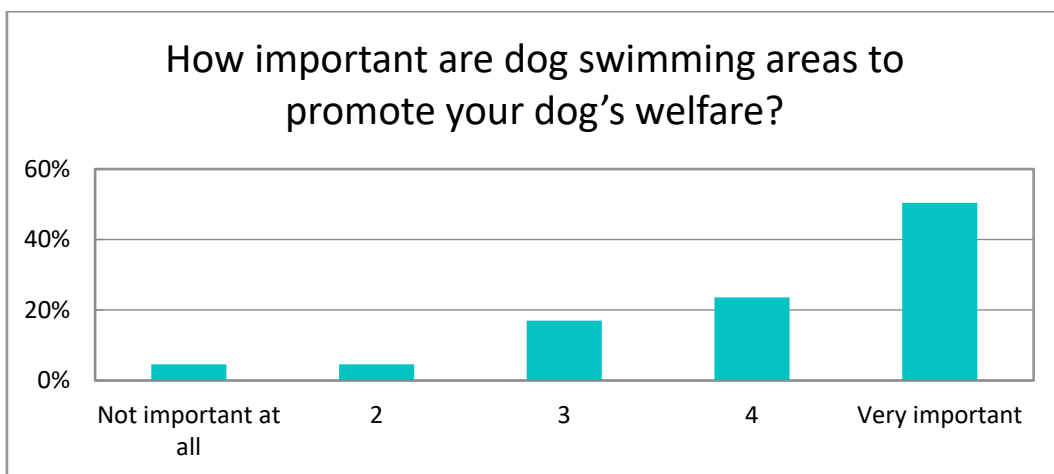


Figure 6. Perceived importance of swimming areas to promote dogs' welfare. Approximately 50% (n=121) of the dog owners believe it is very important with swimming areas to promote the dog's welfare.

The results also showed that dog parks are important, which both can be seen in the free text answers from previous section and Figure 7. In the figure it is seen that approximately 60% of the respondents value dog parks for promoting dogs' welfare.

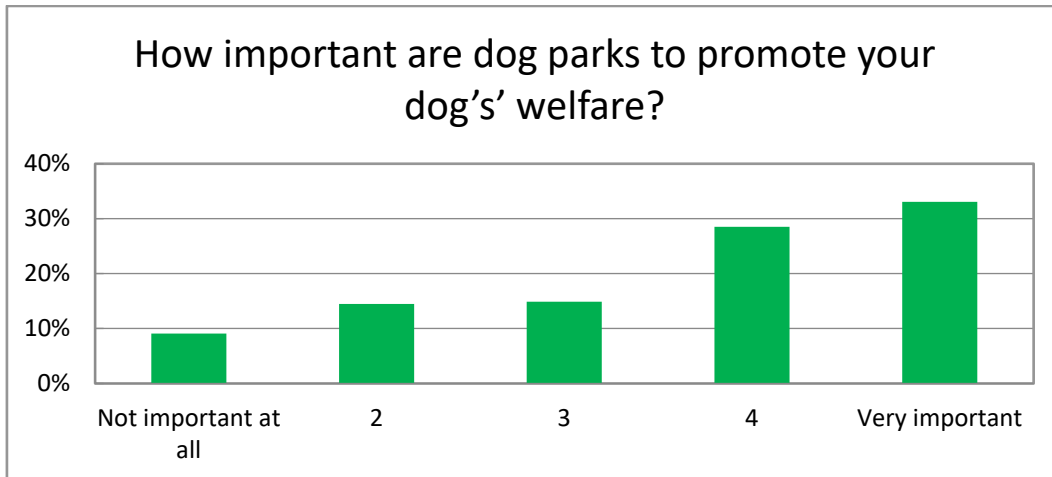


Figure 7. Perceived importance of dog parks to promote the dogs' welfare. Approximately 62% (n=149) of the dog owners chose the option 4 and very important.

Despite dog parks being valued highly, dog owners ranked good cycling and walking paths, streetlights along the cycling and walking paths, and, lastly, trash bins as more important than dog parks. Approximately 67% chose the option "very important" for the question about how important good cycling and walking paths are for promoting the dogs' welfare (Figure 8), and 69% chose "very important" for the question about streetlighting (Figure 9). However, even more dog owners chose the option "very important" for waste bins, almost 76%, as shown in Figure 10.

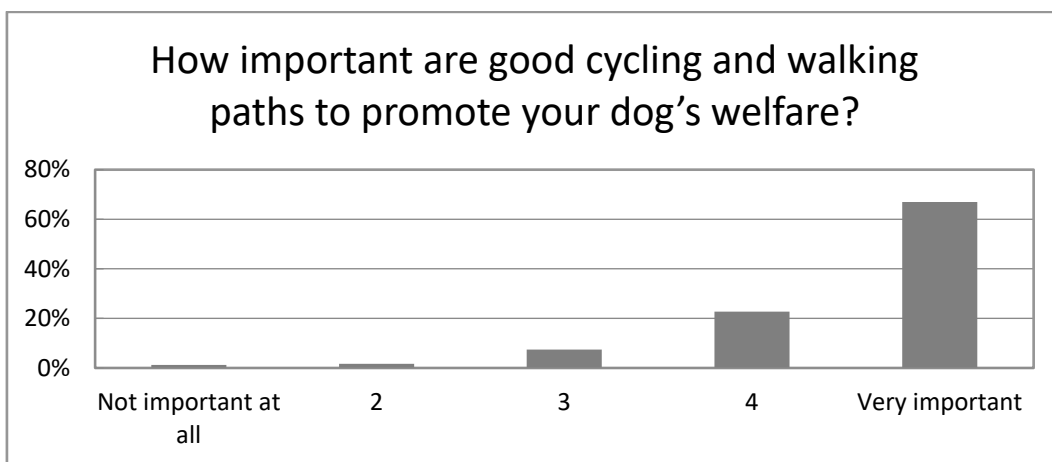


Figure 8. Perceived importance of good cycling and walking paths to promote the dogs' welfare. Approximately 67% (n=162) of the dog owners believe it is very important to promote the dogs' welfare.

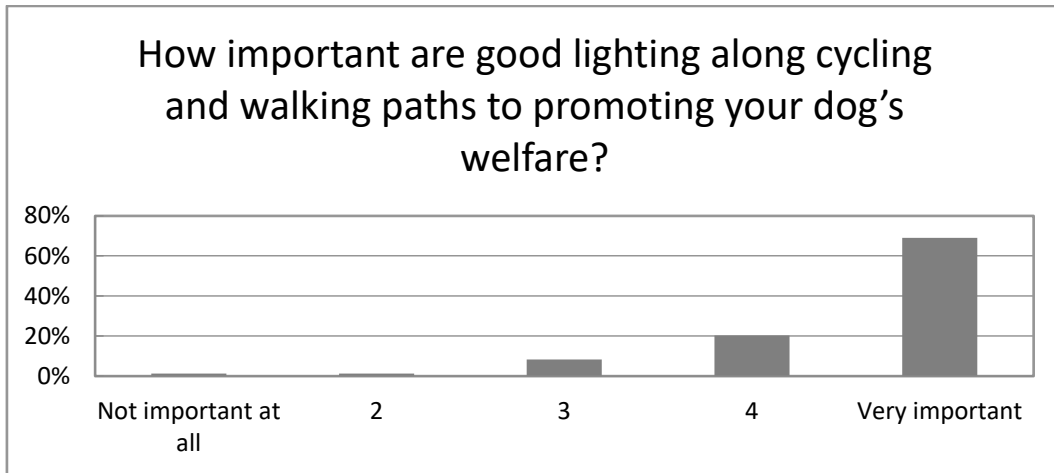


Figure 9. Perceived importance of good lighting along cycling and walking paths to promote the dogs' welfare. Approximately 69% (n=148) of the dogs owners believe it is very important for the dogs' welfare.

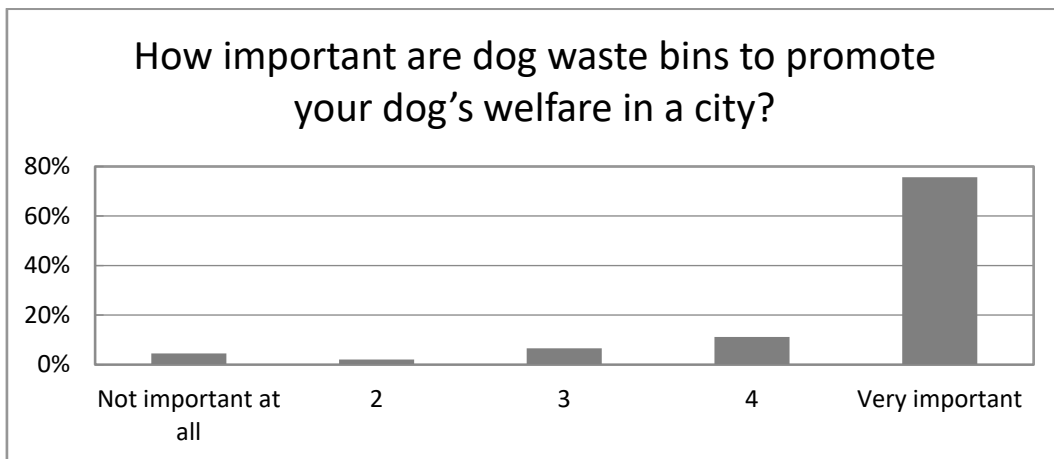


Figure 10. Perceived importance of waste bins to promote the dogs' welfare. Approximately 76% (n=183) of the dog owners believe it is very important to promote the dogs' welfare.

Apart from this, dog owners also think it is important to have dog friendly cafés/restaurants, which can be seen in the free-text answers from the previous section and in Figure 11. In the figure below, approximately 78% of dog owners believe allowing dogs inside cafés/restaurants will promote their welfare.



Figure 11. Perceived importance of the ability to bring dogs to cafés/restaurants to promote the dogs' welfare. Approximately 79% (n=190) of the dog owners chose option 4 and very important.

Dog owners also valued access to veterinary care (Figure 12) and pet stores (Figure 13). Almost 88% chose "very important" for access to veterinary care, and almost 52% chose "very important" for pet stores.

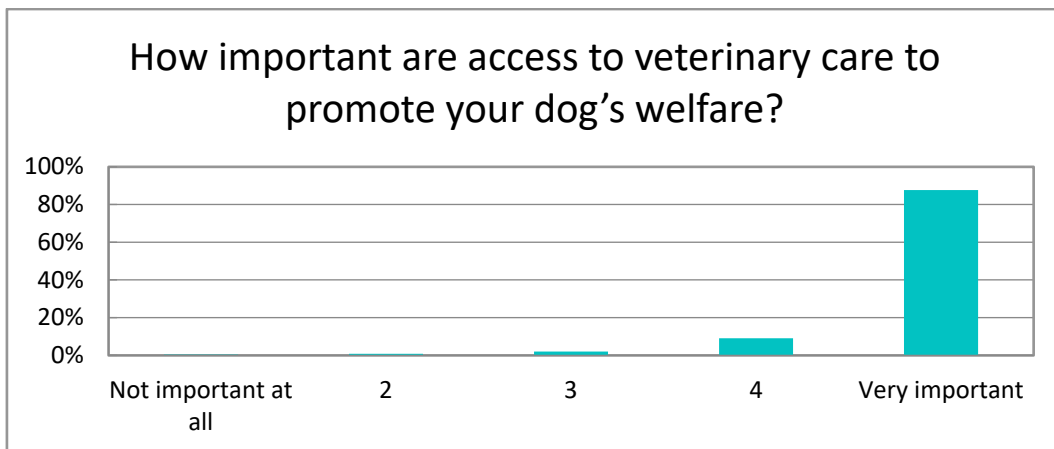


Figure 12. Perceived importance of access to veterinary care to promote the dogs' welfare. Approximately 88% (n=212) of the dog owners believe it is very important.

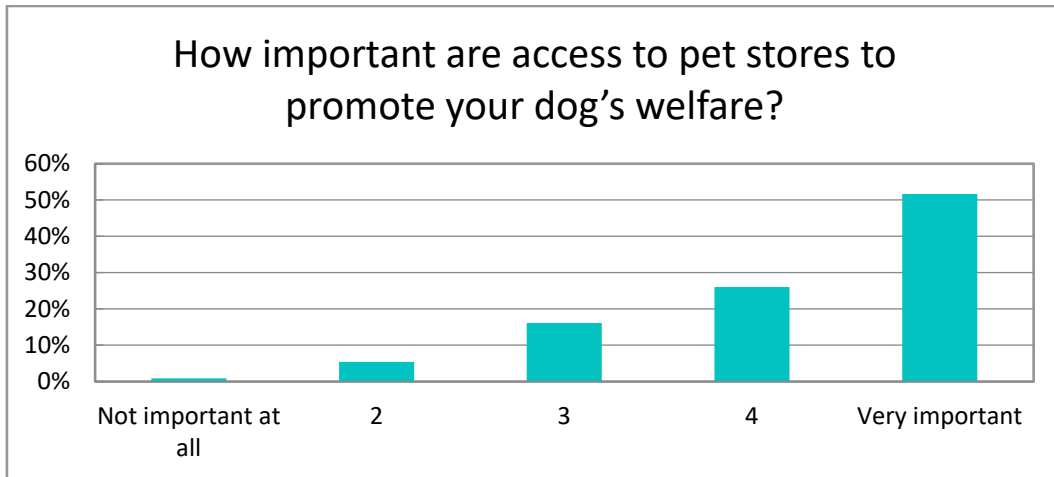


Figure 13. Perceived importance of access to pet stores to promote the dogs' welfare. Approximately 52% (n=125) of the dog owners believe it is very important.

5. Discussion

The purpose of this report was to investigate the requirements for good dog welfare in urban environments and to explore how cities can be planned/designed to become dog friendly. The aim was also to examine if a dog-friendly designed city also increases the biodiversity in urban areas.

5.1 What factors do dog owners believe make urban areas dog-friendly?

The present study provides evidence that dog owners perceive access to green areas and dog parks as significant factors in promoting dogs' welfare in urban environments. The respondents further emphasised the importance of having green areas near their homes, as can be seen, for example, in quote 2. Previous studies have shown that dog owners report that walking their dogs improves their dogs' physical and mental health (Westgarth et al. 2017; Westgarth et al. 2022). Nevertheless, urban environment can often be stressful for dogs as they can react negatively to different sounds, such as construction, car backfiring, passing traffic, and fireworks (Blackwell et al. 2013; Chin et al. 2025; Hargrave 2022). The combination of these stressors with densification, which reduces access to green spaces, may reduce dog owners' motivation to walk their dogs (Koohsari et al., 2022). This may explain why respondents in the present study value green spaces as a key component in making urban environments more dog friendly, as these spaces can offer less stressful sounds and better walking paths, which motivate them to take walks with their dogs.

Another reason dog owners may value green spaces and dog parks highly is because these areas offer places where dogs can play and socialise. Play is a fundamental behaviour for dogs as it helps them develop their motor skills and learn more about themselves, including their strengths, and is important when practising, for example, hunting behaviour (Jensen 2021; Sommerville et al. 2017). Play can also strengthen social relationships with humans (Sommerville et al., 2017). It has been seen that when dogs and humans interact, oxytocin levels rise in both, which could have a positive effect on canine welfare (Handlin et al. 2011).

Dog owners may also perceive dog parks and green areas as environments that follow the Swedish animal welfare legislation. For example, according to section 5 of SJVFS 2020:8, dogs need to be cared for in a manner that meets their needs for social interaction, mental stimulation, and exercise. Dog parks and green areas can be a great way to follow this law, as they offer opportunities for dogs to play, either with their owners or with other dogs. It will thereby support both social interaction and physical activity. In addition, these areas enable activities such as treat or other scent searching, which allow the dog to use its olfactory abilities. Olfaction is one of the most important senses for dogs and is used, for example, in hunting and tracking behaviours (Jensen, 2021). Allowing the dog to engage in olfactory exercises enables them to express these important behaviours while providing mental stimulation.

The results of the present study also indicate that dog owners perceive the availability of waste bins and street lighting as important for enhancing their dogs' welfare, even when these factors do not directly affect the dogs. Although one possible explanation for why dog owners believe this is important is that waste bins reduce litter, such as broken glass or gravel, which, in turn, lowers the risk of paw injuries. This concern was reflected in the free-text responses (see quotes 2 and 5), in which dog owners emphasised the importance of clean surfaces to reduce hazards. Another explanation is that waste bins reduce the amount of dog faeces in public environments. There is a risk that dog faeces may contain nematode species and/or protozoan parasites, which can be harmful to both dogs and humans (Tamponi et al. 2020). Waste bins may therefore indirectly promote canine welfare by creating a safer, cleaner walking environment.

Streetlights primarily benefit dog owners but may, like waste bins, indirectly affect dogs' welfare. Streetlights can make dog owners feel safer as darkness is commonly associated with negative emotions (Park & Garcia 2020). A lack of street lighting may discourage dog owners from walking their dogs during dark periods, thereby reducing the dog's physical activity and environmental stimulation. Dogs can also detect odour-based physiological changes associated with human emotional states (D'Aniello et al. 2018; Siniscalchi et al. 2016). As discussed by Siniscalchi et al. (2016), dogs use either the left or right nostril to detect odours, which activates the right or left hemisphere, and that in turn influences how dogs react and behave. The right nostril is used to detect a potential threat (which can trigger escape behaviour), and the left to determine whether the threat is real. Therefore, if dog owners feel fear or anxiety when taking walks during dark periods, these emotions can be detected by dogs and

indirectly influence their behaviours and potentially impact their welfare. This highlights the need for adequate streetlighting in urban environments.

The results of the present study also provide evidence that dog owners believe pet-friendly stores and public transport promote their dogs' welfare, as seen in Figure 11. The free-text answers also revealed clear evidence that dog owners value the opportunity to take their dogs into stores/cafés. However, the extent to which these environments promote canine welfare remains unclear. Instead, it may be a value for dog owners. A recent study by Shao et al. (2024) found that dining out with their pet is socially, emotionally, and entertainingly valuable for owners. In this context, dog owners' perception may also be influenced by assumptions about what is ethically correct about their dog's welfare rather than the dog's actual experience (Palmer & Sandø 2018). Dog owners may believe that their dog's welfare will improve if they are allowed to accompany them into shopping malls, cafés, or restaurants.

Another possible explanation is that dog owners may hesitate to leave their dogs alone due to concerns about separation anxiety. The underlying causes of separation anxiety are still not fully understood, but it has been discussed that the dog's sex, breed, family structure, and even the owner's lifestyle can be risk factors for the development of separation anxiety (Ogata 2016). In such cases, bringing the dog along is perceived as a way to help prevent anxiety. Many dog owners may also want to include their dogs in different activities simply because dogs are viewed as family members.

However, in some situations, taking the dog along may be necessary rather than a preference. Dog owners may be travelling or predict that they will be away from home for too long. According to chapter 4 section 7 of Statens jordbruksverks föreskrifter och allmänna råd om hållande av hundar och Katter (SJVFS 2020:8) dogs should be taken out for a walk at least every six hours during daytime. Taking the dog to places such as cafés or restaurants could be a way to fulfil this law.

Bringing the dog to a café, restaurant, or shopping mall could also be a way to socialise the dog and provide environmental training. Previous research has shown that puppies exposed to problem-solving games, novel objects and potentially startling stimuli from an early age can show improved stress resilience, reduced startle response and faster recovery from stressful situations (Stolzlechner et al. 2022) An other study have also found that low level of socialisation during puppy hood or dogs participating less frequently in activities and training have

higher risk of being afraid (Puurunen et al. 2020). Interestingly, the same study found that urban environments lead to more fearful responses towards other dogs and strangers. Puurunen et al. (2020) suggest that this may be because, in urban environments, there are many different sounds and crowded areas, which can be stressful for dogs. Therefore, a combination of more green areas and dog-friendly restaurants/cafés/shopping malls could reduce stress, as more green areas could lead to less stressful sounds. At the same time, different stores could be a way for dogs to participate in various activities and socialise, which can improve their stress resilience and reduce fearfulness. Puppies need environmental training, such as exposure to various sounds, scents, and visual stimuli, to increase their self-confidence (Agrida 2025). It is also important to visit different kinds of environments, both calmer and livelier. Also, continuous training throughout a dog's life may be necessary to prevent future problem behaviours, such as stress or fear (Stolzlechner et al. 2022). This indicates that not only puppies but also adult dogs need training.

Anyhow, regardless of the reason dog owners may want to take the dogs inside different stores, it raises ethical questions. Is it right to bring the dog inside even if other people might be allergic? Or bringing the dog inside a restaurant where the dog might contaminate the food? How do we decide which is right and which is not?

One possible solution is that restaurants could designate specific areas for dogs and their owners. Previous research has shown that dog owners are generally positive about dog friendly restaurants, particularly regarding pet-friendly policies and seating arrangements (Zhang et al. 2026). However, in the same study seating arrangements and policies were also a particular source of uncertainty for dog owners, as it is not always clear where they can sit, whether seats are available, or whether it might be very crowded. Apart from this, Zhang et al. (2026) found that dog owners tend to be more positive toward a restaurant when pet-inclusive services are provided, such as staff providing water, bowls, and treats, as well as dog comfort, such as shaded areas, access to water, or comfortable outdoor seating. These findings argue that it is possible to arrange restaurants and cafés in ways that work for both dog owners and individuals with, for example, allergies or fear of dogs. It also minimises the risk of food contamination. However, taking the dog into other stores or shopping malls can be trickier, as owners must navigate these spaces while managing their dog. Dog access in these kinds of places needs further investigation before implementing something.

Regarding public transport, which dog owners believe promotes dogs' welfare, as seen in Figure 11, respondents expressed uncertainty about where dogs are allowed on public transport. Some respondents also mentioned they were not sure if dogs were allowed at all. This issue is not limited to Sweden, as the same problem is discussed in the study by Eldridge & Jović (2024). Restrictions on dogs in public transport may be due to allergies or fear of dogs. However, for some dog owners, public transport may be the only way to get from one place to another. In situations such as veterinary visits, access to public transport is essential, as it may be a crucial visit for the dogs' welfare. According to chapter 4, section 1 of SJVFS 2020:8, dog owners are responsible for their dogs' well-being. At the same time, not all individuals have access to a car or to alternative support, such as a friend or family member who can help them in different situations. This highlights the importance of transport systems.

Public transport is important not only for going to the veterinary clinic, but also for accessing, for example, green areas where the dog can express its natural behaviours, such as walking, running, tracking, or engaging in other forms of mental stimulation. From an ethical standpoint, it is understandable that public transport seeks to minimise risks posed by allergies or fear among passengers. Even though dog owners knew dogs were permitted, they still reported uncertainty about where dogs were allowed. More explicit directions indicating where dogs are allowed are therefore important. These directions could also reduce the problem of allergies and fear, as these people can then choose a place on the public transport where dogs are not allowed.

5.2 How can city design/planning improve dogs' welfare?

This section builds on the previous section. As already discussed, according to dog owners, green areas are among the most important factors that can improve dogs' welfare. Respondents also reported a desire for cities to be designed so that green areas are located near their homes. Although the survey did not specify what dog owners consider to be "*nearby*". However, a study by Schipperijn et al. (2010) showed that green spaces located within 300 meters of the home are visited more frequently than those farther away. Similarly, Bosch et al. (2015) concluded that urban planning should be structured so that people have a maximum distance of 300 meters to a green space of at least one hectare. On the other hand, Schipperijn et al. (2010) noted that the nearest green area is not always the one visited most, and they suggest having various urban green areas within a reasonable distance (<600 m) so that people can choose which to visit.

Cities should, therefore, provide a variety of green spaces of different sizes, including both large and small dog parks, to promote dogs' welfare. These environments offer more open spaces that, as discussed in the previous section, enable dogs to engage in behaviours they are strongly motivated to perform, such as olfactory exploration, play, social interaction, and learning (Jensen 2021). It can also provide safe environments for dogs to socialise with other dogs. Previous studies have shown that socialising with other dogs in dog parks can promote dogs' physical and mental health (Chen et al. 2022; Lee et al. 2009). Allowing dogs to express behaviours they are strongly motivated to perform aligns with Chapter 2, section 1, of Djurskyddslagen (SFS 2018:1192).

However, the welfare benefits of the dog park depend on its design. Chen et al. (2022) summarised key aspects of designing dog parks, including size, location, adjacent park facilities, amenities, and aesthetics. For example, the importance of separate areas for large and small dogs to avoid dog aggregation. Chen et al. (2022) also recommend that dog parks include dog-specific exercise equipment, such as an outdoor "gym", which few people in this survey reported wanting. Chen et al. (2022) also suggest installing garbage cans, a water system, shade, shelter, more grass, double-gated entrances for safety, lighting, a proper fence, and a variety of design options to create high-quality dog parks.

As discussed by Chen et al. (2022), it is important to consider the location of dog parks, and one suggested approach is to place them within or near other green spaces. If these two important features are close together, it allows dog owners to choose where to go easily. It may also help solve the problem that dog owners feel pedestrians in urban environments are narrowed. In green areas, it is often easier to create wider or separate walking and cycling paths, which can improve the walking experience and motivate dog owners to walk more with their dogs. Walking more with the dogs can improve their physical and mental health (Westgarth et al. 2017; Westgarth et al. 2022). Wider paths may also ensure safer dog meetings, as dogs commonly exhibit aggressive behaviour when meeting other dogs (Blackwell et al. 2008; Casey et al. 2013). There are several reasons a dog may show aggressive behaviour when meeting other dogs. In this situation, the most likely reason is that the owner tightens the leash when meeting another dog, which signals to their own dog that a threat is approaching and triggers aggressive behaviour. (Řezáč et al., 2011). Narrowed paths can increase the likelihood of this situation, as the dog owner may instinctively tighten the leash to prevent the dog from reaching the other dog. Therefore, wider paths may allow dog-dog encounters to occur farther apart, reducing the need to tighten the leash and thereby lowering the risk of aggressive reactions.

Apart from this, more green areas can allow dog owners to step off paved paths and walk on grass when extra space is needed, helping avoid aggressive behaviour when meeting another dog. Wider paths or green areas can also make others feel safer, as some are afraid of dogs. Wider paths create a greater distance from the dog or allow the afraid person to walk on the grass instead.

Another reason to have wider and/or separate cycling paths is to avoid collisions with cyclists or e-scooters, as well as to prevent dogs and their owners from being startled when someone passes very close. Cyclists and e-scooters can be a potential stimulus for dogs, which can be stressful, especially if they approach unexpectedly and at high speed. By separating pedestrian paths from cycling and e-scooter paths, passing situations can become more predictable, reducing stress responses in dogs. Apart from this, good pedestrian areas also require adequate streetlighting and available waste bins, which were seen to be important to dog owners in this study. Streetlights create a greater sense of safety for dog owners, as darkness is associated with negative feelings (Park & Garcia, 2020) and could indirectly make dog owners feel scared when walking outside, as explained in the previous section. Streetlighting is also important in dog parks, as mentioned by Chen et al. (2022), and may be particularly important during the dark periods in Sweden.

As mentioned previously, dog owners reported that a dog friendly city includes more waste bins. Some also mentioned in the free-text responses that they would like free dog waste bags provided. Increased availability of waste bins and free dog waste bags could help keep urban environments cleaner by reducing dog faeces. A study by Wells (2006) found that 53% of dog owners in Ireland clean up dog faeces, while Lowe et al. (2014) found that almost all dog owners agree dog faeces should be cleaned up in public parks, playing fields, and streets. Despite this, 46% of dog owners in the Lowe et al. (2014) study reported that dog waste, including bagged waste, left on the ground, is an issue during dog walks.

Picking up dog faeces is important, as it can contain nematode species or protozoa that can be harmful to both dogs and humans. For example, Tamponi et al. (2020) found a protozoan of zoonotic concern. Furthermore, Lowe et al. (2014) reported that dog owners had a higher risk of cleaning up faeces but then discarding the waste bag if no waste bin was nearby.

As the presence of dog faeces in walking areas is a problem. A potential solution is to increase the number of waste bins and provide free dog waste bags in the city. Particularly in areas with high dog activity. Waste bins can also lead to a reduced potential hazard, which dog owners in this study mentioned they are concerned about, such as broken glass on the ground. However, the availability of free waste bags needs further investigation, whether they should be offered citywide or at target locations where dogs and dog owners commonly walk.

The study further shows that blue areas, such as wetlands, harbours, lakes, rivers, and beaches, were considered important by dog owners, although they were not perceived as important as green areas. Despite this, city planners should include blue areas, as both blue and green areas can provide a cooler environment for dogs, which is essential on warm days (Li et al., 2024; Zhang et al., 2014). Especially as dogs can develop heat-related illness (Drobatz & Macintire 1996; Etue et al. 2025).

According to Chapter 2, Section 1 of SFS 2018:1192, dog owners should treat their dogs well and protect them against unnecessary pain and sickness, which implies that dog owners should avoid physical stimulation when it is too warm outside. However, Section 5 of SJVFS 2020:8, mentions that the dogs' basic needs should be met. It states that the owner must possess necessary competence and that dogs must be handled and cared for in a manner that meets their needs for social interaction, mental stimulation, exercise, sufficient rest, and temperature regulation. This section argues that dogs need exercise and mental stimulation regardless of the weather, yet on hot days, it might not always be possible to find cooler areas to walk or exercise the dog. This highlights a potential conflict.

This is why green and blue areas are important in city design, as they can cool the environment. The capacity of blue and green areas to cool urban environments depends on various ecological factors, such as vegetation coverage and plant height (Li et al., 2024; Zhang et al., 2014). Urban planning should consider various vegetation coverings, such as different sizes of bushes, and strategic tree planting to provide shade. This makes it possible to create shaded areas, reducing the risk of heat-related illness and allowing dog owners to take at least small walks with their dogs during warmer days.

In addition, dog owners also highlighted the importance of dog swimming areas, which are most associated with beaches, for promoting dogs' welfare. Swimming areas can help dogs cool down on warmer days. A study by Guinness et al. (2020)

found that dog owners take their dogs to beaches mainly because they offer an open space where the dog can move freely, are free from cars, provide an environment where dogs can explore different scents, and allow dogs to engage in activities such as swimming, playing and socialising with other dogs. Beaches, therefore, provide both physical, mental, and social opportunities for dogs, which can promote their welfare. However, creating new beaches in or near urban areas may not always be possible. Instead, it may be possible to create other water-based areas where dogs are allowed, or design dog friendly zones at existing beaches.

Other environments that dog owners believe should allow dogs are cafés, restaurants, pet stores, and access to veterinary care. Whether cities should design/include stores that allow dogs (apart from veterinary care) can be discussed, as in the previous section. Allowing dogs inside, for example, shopping malls, which several dog owners mentioned in the free-text answers, may reflect what dog owners value and assume is ethically correct regarding their dog's welfare (Palmer & Sandø 2018). For instance, dog owners may not want to leave their dog alone due to concerns about separation anxiety, or because dogs are seen as family members, and dog owners therefore wish to include them in these activities. Another possible explanation is that these areas provide effective training across different environments, as discussed in the previous section. However, allowing dogs inside shopping malls can raise ethical discussions. Dog-friendly stores may benefit dog owners, but they may negatively affect others. Dog hair can cause problems for those who are allergic, as it can get stuck on cloths in, for example, clothing in stores, and people who are afraid of dogs may avoid stores that allow dogs. This can cause they feel excluded from these areas.

Allowing dogs in cafés or restaurants can be easier than in shopping malls or stores. Cafés and restaurants can have designated areas for dogs and their owners. As mentioned in the previous section, Zhang et al. (2026) found that dog owners are generally positive about dog-friendly restaurants regarding pet-friendly policies and seating arrangements. Additionally, bringing the dog to a café or restaurant may provide the dog with mental stimulation and opportunities for training appropriate behaviour in different environments and situations. Zhang et al. (2026) also concluded in their study that dog owners value it when restaurants provide water for dogs and offer comfortable seating, such as shaded areas. In this way, it can provide shade for dogs on a warm day. These arguments therefore suggest that dog friendly cafés and restaurants can promote dogs' welfare and reduce the problems of allergies and fear, as people can then choose a place where dogs are not allowed.

This study also indicated that public transport is important for dog owners, although some respondents expressed uncertainty regarding where dogs are allowed. As discussed previously, public transport may be the only option for some people, highlighting the importance of allowing dogs on public transport with clearer rules specifying where they are allowed. Clearer guidelines can reduce the feeling of uncertainty when taking public transport and, at the same time, minimise conflicts related to allergies or fears among dogs caused by other passengers. Furthermore, dog owners in this study also indicated that access to veterinary clinics and pet stores is important when designing cities. Urban planning should therefore include several veterinary clinics and pet stores throughout the city, which are easily accessible via public transport.

5.3 Can creating dog-friendly urban environments also increase biodiversity in cities?

As discussed in the two previous sections, the most important factors in designing a dog-friendly urban environment include green and blue areas, wider pedestrian areas, streetlights, waste bins, dog-friendly cafés and restaurants, and public transport that allows dogs. An important question is whether these factors could also increase biodiversity? The following section will discuss this.

Biodiversity is threatened and declining rapidly, which results in ecosystems becoming weak and potentially collapsing (Naturskyddsforeningen 2025). Features which promotes dogs' welfare such as urban green spaces are also important for supporting biodiversity (Lepczynk et al. 2017). However, the capacity to support biodiversity depends on the design and the size. Different species require different amounts of space; for example, city birds require between 10 and 35 hectares of green areas, while forest birds often need much larger areas (Lepczynk et al. 2017). Nevertheless, if the quality of the green area is high, it can still support biodiversity. It has also been seen that vegetation structure is important for biodiversity. For example, trees can support bugs, leafhoppers and spiders (Turrini & Knop 2025), while areas with both trees and shrubs tend to support even higher insect diversity (Sharmin et al. 2024).

Because different species require different environments, it is important to provide a variety of environments. Previous research has shown that community gardens support higher numbers of flower visitors and exhibit different patterns and abundances of pollinators compared to other types of urban parks (Daniels et al. 2020). The authors argue that this is probably because community gardens are

closer to natural conditions as they are less intensively managed and more varied, whereas different urban parks are more designed. Despite this, large, monotonous public green areas can support insects, such as honeybees and bumblebees, which can fly long distances, while small public beds more often support solitary bees and hoverflies (Daniels et al. 2020). Overall, the authors suggest having as near-natural environments as possible, as that supports the widest range of species. To mimic nature in urban areas it is important with multi-layered vegetation, for example, tall trees filter sunlight, shrubs can provide mid-shade, and ground plants help retain soil moisture (Prihatmantri et al. 2018).

Designed areas with plants commonly used as ornaments can still support biodiversity, as these plants can attract pollinators (Toscano et al. 2025). However, these plantings should not be located near dog parks. Chen et al. (2022) discussed that dog parks may lead to soil erosion and damage vegetation and wildlife. Instead, the authors argue that dog parks should be designed with suitable grass that can tolerate intensive use and potential contamination from dog faeces.

Apart from green areas, blue areas are also important. Because dog-friendly cities include more access to blue areas, they may contribute to increased biodiversity. However, the contribution to increased biodiversity depends on the connectivity to other blue and green areas. Ponds that are connected to other surrounding blue and green areas can increase biodiversity in urban areas by facilitating the movement of, for example, insects and other animals, and thereby functioning as ecological corridors (Hyseni et al. 2021). A similar conclusion was made by Hassall (2014), who discusses that ponds support amphibians and insects. In addition, Hasall (2014) also mentions that urban ponds can control stormwater flow and filter water from heavy metals.

Perrelet et al. (2024) also found results similar to those of the other two authors. Nevertheless, these authors also discuss how blue-green infrastructure not only increases biodiversity but also benefits other ecosystems and supports ecosystem services, such as cooling the city, increasing water capture, and supporting pollination and pest control. Apart from this, Perrelet et al. (2024) also discuss the importance of combining blue and green areas and creating a network of these areas to enable species movement across the urban landscape.

Apart from these findings, Perrelet et al. (2024) also highlight the importance of green roofs in these contexts, a topic that the other two articles did not address.

Green roofs have been shown to increase arthropod and bird species richness (Wang et al., 2022). Especially if these green roofs are located near public gardens, as they then can support up to 50% more insect species (Hussain et al., 2023). Green roofs can also help lower urban temperatures (Razzaghmanesh et al. 2016; Susca et al. 2022). Although dog owners in this survey were not asked about green roofs or whether they can promote dogs' welfare, they could still be a relatively important component of dog friendly cities as they reduce city temperatures (Razzaghmanesh et al. 2016; Susca et al. 2022). Reducing temperature can help dogs cope with heat stress on warm days, thereby indirectly supporting dogs' welfare and, at the same time, biodiversity.

Green and blue areas can also contribute to achieving some of the Sustainable Development Goals, such as Goal 15, Life on Land (The global goals 2025). Specifically, Goal 15.5 states that biodiversity and natural habitats shall be protected, and Goal 15.9 states that ecosystems and biodiversity shall be integrated into governmental planning. A dog-friendly city also means more streetlights and waste bins. Streetlights enhance safety for dog owners and their dogs but may negatively impact biodiversity. Streetlights can disturb moths from pollinating plants, as they act as traps, leading them to fly from plants to the light (Evans 2023). Streetlights also affect bats; even LED lights can negatively affect the activity of some bat species, although the responses vary among species (Stone et al. 2012).

In contrast, waste bins can have a positive impact on biodiversity by reducing dog faecal waste and other litter, keeping the environment cleaner. It has been seen that cigarette butts and plastics are the most common types of litter found in urban environments (Gholami et al. 2020). Cigarette butts can impact the environment in different ways. They can be carried into rivers, where they fragment and release microplastics and toxic substances that negatively affect aquatic life, but they also affect terrestrial species (Shen et al. 2021). These toxins can lead to mortality, changes in behaviour and reproduction, and reduced growth (Green et al. 2022; Shen et al. 2021). Apart from this, plastic pollution in the environment can also harm species, as it can break down into microplastics or nanoplastics that interfere with biological processes such as pollination (Kumar et al. 2021). These plastic particles can be similar in size to pollen grains, thereby hindering pollinators from actually pollinating plants (Kumar et al. 2021). Therefore, more waste bins can reduce the litter in the environment and reduce the risk that nature and biodiversity will be negatively affected.

Urban planning and design must also take into consideration all relevant legislation. For example, the Swedish Environmental Code (Miljöbalken SFS 1998:808) states that nature is worthy of protection and that this environmental code shall be applied so that the natural and cultural environment is protected against damage and biological diversity is preserved. In addition, the Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 has been applied to ensure increased biodiversity. In annex VII, there are a few examples of how countries can restore nature, such as introducing native tree species, increasing green spaces, parks, trees, woodland patches, installing green roofs, tree-lined streets, wildflower grassland, ponds, urban meadows, and taking into consideration species diversity. A dog friendly city often means more of these features. Therefore, designing cities to promote dog welfare may support biodiversity and help achieve the new EU goals.

5.4 Social, ethical and sustainable aspects

This study investigated how cities can become more dog friendly and whether dog friendly cities can also support and increase biodiversity in urban environments. Nevertheless, the extent to which cities should adapt to dogs raises ethical questions. To what extent can urban spaces be designed promote dogs' welfare without negatively affecting non-dog owners? For example, some people may see more green and blue areas and dog parks as primarily for dog owners and their dogs, which can create a sense of exclusion for non-dog owners. When designing, for example, green areas which all residents can use, it must be done in a way so everyone feels included. When discussing these ethical questions, it is important to remember that creating more green areas can support biodiversity, particularly in the context of climate change and accelerating species loss. By considering this, it is possible improve the sustainability in the urban environment.

These aspects must be discussed further, along with a deeper investigation of public attitudes, including the perspectives of non-dog owners, cat owners, and other relevant groups, before implementing anything. For instance, allowing dogs inside shopping malls may cause people who are allergic or afraid of dogs to avoid these areas. Implementing rules that allow dogs only in one specific area is more challenging in shopping malls because of the movement of a lot of people. Whereas restaurants and cafés can offer more controlled environments, which make it easier to have designated seating areas to separate dog friendly and non-dog areas.

Nevertheless, dog owners may want to bring their dogs into shopping malls, stores, or other places for several reasons. It may be because they are unable to leave their dogs alone due to separation anxiety or simply because they are seen as family members, and dog owners want to include them in everyday activities. Another reason is the need for training opportunities to teach dogs how to behave in different environments. Regardless of the reason, allowing dogs into shopping malls or other stores is an ethical question that warrants further discussion. Balancing animal welfare, human preferences, and environmental sustainability is a challenge.

5.5 The method's and literature's pros and cons

This study used an online survey to collect data, which is an effective way to reach many people across a wide geographical area, in this case, Sweden. Since all respondents are presented with the same questions, survey data is easier to compare than interview data, where the questions can vary slightly, which in turn can lead people to interpret them differently. There may also be follow-up questions in an interview. Nevertheless, even in online surveys, people may still interpret the question differently. For example, terms such as '*green*' and '*blue areas*' can be interpreted differently depending on individual experiences. Despite this limitation, a study that requires many responses from people across the country is easier and more time-effective with an online survey than an interview.

However, a major limitation of this study was the uneven geographical distribution of respondents. Most responses came from people in Uppsala County. Mainly because Facebook classified the survey as a scam after it was published in several groups, which prevented further distribution. The sample, therefore, cannot be considered representative of Sweden as a whole. This is problematic because urban design varies across cities, especially in terms of access to parks, dog parks, forests, beaches, and nature reserves. Such variation may influence people's perception of what is important in a dog friendly city. Humans tend to value items, opportunities or resources more highly when they are limited (Cherry 2017), which may explain why green spaces in this study were highly valuable. If the survey had reached a more geographically diverse sample, the result might have differed, as those living in cities with more access to green spaces might have valued it less.

Because of the uneven representation, it was not possible to analyse regional differences in Sweden, such as access to green spaces, dog parks, and wider

pedestrian areas. A more even representation could have made it possible to do a comparative analysis across different regions to identify strengths and weaknesses in urban design and provide deeper insights into how cities can be designed to become more dog-friendly. Another limitation is the high dropout rate. Many people started the survey, but only about one-third completed it. Interviews often yield more complete datasets because more people are more likely to answer all questions when fully engaged in the interview. However, reaching out to hundreds of people when using the interview method can be very challenging. For these kinds of studies, an online survey is the most suitable. To improve completion rates in future studies, surveys should be designed to be concise and easy to complete, and reminders should be sent to encourage respondents to finish the questionnaire.

A strength of the online survey is its ability to collect large amounts of data, which can be analysed efficiently. Survey platforms, such as Netigate, which was used in this survey, also immediately create a visualisation of response patterns, for example, graphs, making it easier to identify commonly held views. For example, in this study, it was evident that respondents believed that green spaces promote dogs' welfare.

Another benefit of online surveys is that they can collect information about public opinion. When designing or planning cities, the residents' preferences and values should be valued. For example, if many residents express a wish for more green spaces, this information could serve as a guide to know what to prioritise in the city. However, a limitation of the survey was that some questions could have been formulated more precisely, particularly those concerning the availability of waste bins and green areas. The definition of *availability* is unclear, and respondents may interpret it differently. It would have been better to include follow-up options, for example, the maximum acceptable distance to a waste bin or a green area. This can guide decision-makers in planning and designing cities according to respondents' desires.

Another limitation of the survey is that it did not cover biodiversity. Nevertheless, measuring biodiversity in surveys is challenging as numerous ecological factors influence biodiversity. A more accurate way to measure biodiversity is to conduct a field study to identify which factors can positively impact biodiversity, depending on the existing urban environment. In this study, it was reduced to a simple connection between dog friendly cities and biodiversity. The link was proven through a review of existing scientific literature. However, because the articles originate from different countries, ecosystems, and methodological

approaches, it limits direct comparability. Nevertheless, it is still possible to identify general factors that support biodiversity, which made this simpler connection between dog-friendly cities and biodiversity possible. However, this raises the awareness of the need for future research that more directly measures the relationship between dog friendly cities and increased biodiversity.

5.6 The usefulness of the study and future research

This study provides insight into how cities can be designed to include dogs more in society and how these adaptations may also increase biodiversity and urban sustainability. This study is highly relevant in the context of the global climate crisis and the recent EU regulation that requires EU members to restore nature.

The study also raises essential questions about the roles of dogs in society and the extent to which their welfare and needs should be considered in urban planning. Dogs have coexisted with humans for many generations and are often seen as family members, making it difficult not to see them as part of the family. However, this raises ethical questions such as where the boundary should be drawn between human and non-human interests. Should dogs be as equal as humans? What decides whether they should be equal or not? This study argues that dogs' health and welfare deserve greater consideration in urban planning, but the question is how much we should consider their welfare. Boundaries may be needed to balance the wishes of different people. Questions such as whether dogs should be allowed in all public spaces, including shopping malls, require further ethical and social debate. These issues show potential future research topics.

Furthermore, when comparing the results with the existing literature, it became obvious that research on dogs' welfare in urban environments is limited. Most of the articles found focused on how dogs or green areas positively impact human health. Because of this limitation, dog welfare in urban environments is a promising area for future research. Additionally, dog-friendly cities have the potential to promote human health too, not only dogs' welfare. Many scientific articles demonstrate how nature can positively impact human health. The impact of nature on human health was not discussed in this study, but it is a well-established field and a potential area for future research. For example, how features that benefit dogs in urban areas also benefit human health. Finally, this study also highlights the need for a deeper investigation into whether there is a link between dog-friendly cities and increased biodiversity.

6. Conclusion

Green areas are considered among the most important factors for promoting dogs' welfare in urban areas. Dog parks and blue areas were not as highly ranked as green areas. Still, approximately 60% of the dog owners believe these two factors are essential when designing a city, along with walking paths. These factors can make it easier for the dog to express its natural behaviour, thereby increasing its welfare. Additionally, dog owners rated very highly for waste bins and streetlights, which favours dog owners more than dogs, but could indirectly benefit dogs. Another thing that dog owners ranked as important is letting dogs inside cafés, restaurants, and shopping malls. Allowing dogs inside these areas may be something dog owners value more than dogs themselves, or something they believe is ethically right. It can also be problematic from different ethical views. Still, it could enhance the dogs' welfare, and must therefore be discussed further.

Factors that promote dogs' welfare in urban environments can also enhance biodiversity, such as green and blue spaces. However, it depends on how these areas are designed and whether the blue spaces are connected to other blue and green spaces, forming a path for animals to move between places. Implementing more green and blue areas could also help achieve the goal of the new EU Regulation. However, not all the factors are good for biodiversity. For example, streetlights can disturb moths and bats. Anyway, an overall dog friendly city has the potential to increase biodiversity, but further research on the connection between a dog friendly city and biodiversity is needed before reaching a conclusion.

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Popular science summary

Can Cities Be Designed for Dogs and Nature?

For many people, dogs are an important part of daily life and are seen as family members. They require physical exercise, mental stimulation and socialisation, which makes access to suitable places necessary for their welfare. Despite this, growing cities are not always suitable places for dogs. It can be crowded with many different sounds, which can make dogs react negatively, such as construction, fireworks, backfiring cars, and even passing traffic. Apart from this, in many cities, green and blue spaces are being reduced, which can also negatively affect dogs' well-being.

This study, therefore, examined, through an online survey, how dog owners in Sweden experience the city environment and how cities can be designed to promote dogs' well-being. The features that support dog welfare were also investigated to see if they might benefit urban biodiversity.

The responses from the dog owners revealed that green spaces in urban environments are among the most important factors in promoting dogs' welfare. Parks, meadows, nature reserves, dog parks and beaches are all important for dogs' physical exercise, mental stimulation, socialisation, and for improving the bond between dogs and humans. Additional streetlights and waste bins were also important factors, according to dog owners. Waste bins keep the environment clean and reduce the risk of dogs catching diseases or stepping into hazards, such as broken glass. At the same time, streetlights can help make dog walking safer during dark hours.

Many dog owners also thought that taking their dogs with them to cafés, restaurants, and shopping malls is important for promoting dogs' welfare. Whether it improves the dog's well-being is not certain. Instead, it can be what dog owners believe is right. However, this raises ethical questions. People who are allergic or afraid of dogs might find this problematic. At the same time, it can be important or necessary to take dogs with you to different stores. This must, therefore, be discussed further.

Many of the factors which support dog welfare can also support biodiversity. Green and blue areas with diverse vegetation provide habitats for various insect, amphibian, and bird species, and contribute to temperature regulation. How much these areas can support biodiversity depends on the design. Areas that mimic natural environments support more species than monotonous designs. Blue and

green areas should also be connected by being close to each other, to form bridges that allow different species to move between different areas. Apart from this, waste bins keep the environment clean by preventing toxic items such as cigarette butts and plastic from entering the environment.

Notably, not all dog-friendly features benefit biodiversity; for example, streetlights trap moths and disrupt their pollination, and they disturb the activity of bats. Dog parks can be a risk factor for environmental disturbance, as the ground may be damaged by many dogs walking in the same area. In that case, suitable vegetation is needed to prevent damage. Despite this, the overall findings suggest that dog-friendly cities can support both dogs' welfare and biodiversity when carefully planned. It could also result in more sustainable cities.

Acknowledgement

I would like to thank my supervisor, Maria Andersson, for her support throughout this study and for providing valuable feedback. I also want to thank Therese Rhen for giving good feedback and discussion during the presentation. I would also want to show my appreciation to all the dog owners across Sweden who participated in the survey and made this study possible. Lastly, I would like to thank my friend, Marie Ebbestad, for helping me reach dog owners at the SLU campus in Uppsala by printing the poster I created and adding it around campus.

Appendix 1

Följande enkät riktar sig till dig som har hund och bor/vistas i städer/urbana miljöer. Enkäten tar uppskattningsvis 5 minuter att besvara och innehåller två delar, där första delen innehåller några bakgrundsfrågor och andra delen innehåller frågor om hur hundvänlig din stad är. Inga känsliga personuppgifter kommer att samlas in och all redovisning av svar görs på gruppnivå vilket innebär att svar inte går att koppla till en enskild person. Dina svar är anonyma.

Enkäten du besvarar är en del av ett masterarbete som bedrivs vid SLU och av student Amanda Brodd Olknuts. För mer information kring hela projektet kan man kontakta handledare Maria Andersson på epost: maria.andersson@slu.se

Vi samlar in följande uppgifter om dig: geografisk data (vilket län du bor i), ålder, antal hundar du har, vad för ras din/dina hundar är, samt frågor om dina åsikter kring hur städer är utformade. Ändamålet med behandlingen av dina personuppgifter är att student, Amanda Brodd Olknuts, ska kunna genomföra sitt masterarbete enligt korrekt vetenskaplig metod och bidra till en ökad förståelse kring hur städer kan utformas så att de kan bli mer hundvänliga. Svaren på enkäten kommer sedan kopplas till om hundvänligare städer även kan bidra till ökad biodiversitet i städer och om vi på så sätt kan uppnå en del av de globala målen (nummer 3, 11, 13 & 15).

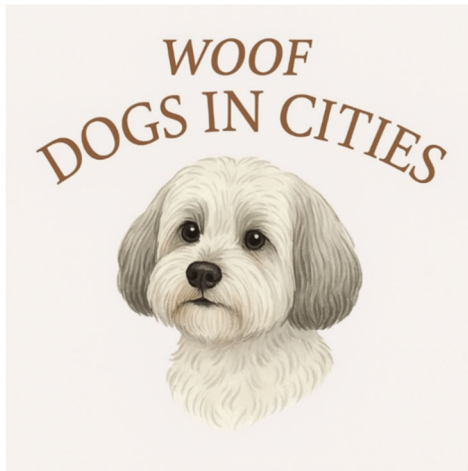
När du medverkar i den här enkäten innebär det att SLU behandlar dina personuppgifter. Att ge SLU ditt samtycke är helt frivilligt, men utan behandlingen av dina personuppgifter kan du inte delta i forskningen. Denna text syftar till att ge dig information som behövs för att du ska kunna ta ställning till om du vill ge ditt samtycke till att SLU hanterar dina personuppgifter eller inte. Ytterligare information och detaljer finns att läsa på SLUs hemsida: <https://www.slu.se/om-slu/kontakta-slu/personuppgifter/>

Du har alltid rätt att ta tillbaka ditt samtycke utan att behöva ge några skäl för detta. SLU är ansvarig för behandlingen av dina personuppgifter, och du når SLUs dataskyddsombud på dataskydd@slu.se eller via 018-67 20 90.

Vi samlar in följande uppgifter om dig: geografisk data (vilket län du bor i), ålder, antal hundar du har, vad för ras din/dina hundar är, samt frågor om din åsikt kring hur städer är utformade.

Jag samtycker till att mina svar används i forskning samt att SLU behandlar personuppgifter om mig på det sätt som förklaras i denna text.

Tack för att du vill delta i studien. I den första delen kommer du få svara på några bakgrundsfrågor.



Hur gammal är du?

- <19
- 20–39
- 40–60
- 61–70
- 70+

I vilket län bor du?

- Blekinge län
- Dalarnas län
- Gotlands län
- Gävleborgs län
- Hallands län
- Jämtlands län
- Jönköpings län
- Kalmar län
- Kronobergs län
- Norrbottens län
- Skåne län
- Stockholms län
- Södermanlands län
- Uppsala län
- Värmlands län

- Västerbottens län
- Västernorrlands län
- Västmanlands län
- Västra Götalands län
- Örebro län
- Östergötlands län

Hur många hundar har du?

- 1
- 2
- 3
- 4
- 5
- 6 eller fler hundar

Vad har du för ras/raser? (Fritext fråga)

Vilken storlek har din(a) hund(ar)?

- Liten (<10 kg)
- Medel (10–25 kg)
- Stor (>25 kg)

När du rör dig med din hund i urbana miljöer, vilken typ motsvarar bäst?

- Stads kärna: centrum med tät bebyggelse, butiker och nära till service
- Förort: bostadsområden utanför centrum, ofta mer glesbebyggt
- Lika mycket i båda

Du har nu kommit till del 2 i undersökningen. I följande del kommer det mer frågor om din åsikt kring hur hundvänlig din stad är och vad som är viktigt att ha i en stad för att den ska vara hundvänlig. Dina svar är betydelsefulla.

Hur skulle du definiera en hundvänlig stad som ökar hundars välfärd (välmående) (Fritext fråga)

Hur hundvänlig tycker du att din stad/ort är idag?

- Mycket hundvänlig
- Ganska hundvänlig
- Varken eller
- Inte speciellt hundvänlig
- Inte hundvänlig alls

Vad tycker du är det bästa med att ha hund i din stad? (du kan t.ex. tänka på möjligheter till motion, hundrastgårdar, sociala möten eller närhet till natur)
(Fritext fråga)

Hur upplever du att hundägare och hundar bemöts i din stad?

- Mycket positivt
- Ganska positivt
- Neutralt
- Ganska negativt
- Mycket negativt

Vad är det som gör att hundägare och hundar bemöts positivt eller negativt i din stad/ort? (Fritext fråga)

Finns det regler eller restriktioner du tycker är problematiska (t.ex. koppeltvång, förbud att ha hund på vissa platser)? (Fritext fråga)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Grönområden (T.ex. parker, naturreservat, skogsdungar, ängar)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Blåområden (Områden med vatten, t.ex. stränder, hamnar, sjöar, vattenparker, våtmarker, åar/bäckar/kanaler)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hundrastgårdar

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hundrastgårdar som även har agilitybanor

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hundrastgårdar som erbjuder utrustning att kunna prova på nose-work

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Inomhus-hundrastgårdar

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Bra cykel- och gångvägar

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Bra belysning vid cykel- och gångvägar

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Kunna ta med sig hunden till café/restaurang (Det vill säga kunna sitta inom- och utomhus)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hundbad vid stränder/badplatser

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hotell som tillåter hundar

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Vattenstationer för hundar runt om i städer

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hundlatriner (papperskorg för hundbajs)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Hunddagis

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Träningsmöjlighet (t.ex. hyra lokal med utrustning för agility, nosework)

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Tillgång till veterinär

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Tillgång till veterinär/djurskötare som enbart är fokuserade på rehabilitering. Det vill säga kunna boka tid för att få hjälp med rehab-träning eller använda speciell utrustning, t.ex. balansbollar och vattenlöpband.

På en skala 1–5, hur viktiga tycker du att dessa resurser skulle vara/är för att främja din hunds/hundars välfärd i en stad?

- Tillgång till djuraffär

Det var sista frågan. Tack så mycket för att du deltog i studien!



Appendix 2

The following survey is intended for dog owners who live in or frequently spend time in cities or urban environments. The survey takes approximately 5 minutes to complete and consists of two parts. The first part contains a few background questions, and the second part includes questions about how dog-friendly your city is. No sensitive personal data will be collected, and all results will be presented at a group level, meaning that no individual responses can be traced back to a specific person. Your answers are anonymous.

This survey is part of a master's thesis conducted at the Swedish University of Agricultural Sciences (SLU) by student Amanda Brodd Olknuts. For more information about the project, you are welcome to contact the supervisor Maria Andersson at: maria.andersson@slu.se

We collect the following information about you: geographical data (which county you live in), age, number of dogs you own, your dog's/dogs' breed(s), as well as your opinions on how cities are designed. The purpose of processing your personal data is to enable the student, Amanda Brodd Olknuts, to carry out her master's thesis according to proper scientific methods and to contribute to a better understanding of how cities can be designed to become more dog-friendly. The survey responses will also be used to explore whether more dog-friendly cities can contribute to increased urban biodiversity and help achieve some of the UN Sustainable Development Goals (specifically Goals 3, 11, 13, and 15).

By participating in this survey, the Swedish University of Agricultural Sciences (SLU) will process your personal data. Providing your consent to SLU is completely voluntary; however, without the processing of your data, you cannot take part in the research. This text is intended to give you the information needed to decide whether you wish to give your consent for SLU to process your personal data. Further details can be found on SLU's website, follow this link: [Processing of personal data at SLU | slu.se](#)

You have the right to withdraw your consent at any time without providing a reason. SLU is responsible for the processing of your personal data. You can contact SLU's Data Protection Officer at dataskydd@slu.se or by phone at 018-67 20 90.

By continuing, I consent to my responses being used for research purposes and to SLU processing my personal data as described above.

Thank you for taking part in the study. In the first section, you will be asked to answer a few background questions



Picture by ChatGPT

How old are you?

- <19
- 20–39
- 40–60
- 61–70
- 70+

In which county do you live?

- Blekinge County
- Dalarna County
- Gotland County
- Gävleborg County
- Halland County
- Jämtland County
- Jönköping County
- Kalmar County
- Kronoberg County

- Norrbotten County
- Skåne County
- Stockholm County
- Södermanland County
- Uppsala County
- Värmland County
- Västerbotten County
- Västernorrland County
- Västmanland County
- Västra Götaland County
- Örebro County
- Östergötland County

How many dogs do you have?

- 1
- 2
- 3
- 4
- 5
- 6 or more dogs

What breed(s) do you have? (Free text answer)

What size is your dog/are your dogs? If you have several dogs of different sizes, you can choose several options.

- Small (<10 kg)
- Medium (10–25 kg)
- Large (>25 kg)

When you walk around with your dog in urban environments, which description fits best?

- City center: densely built-up area with shops and close access to services
- Suburb: residential area outside the center, often less densely built
- Both equally

You have now reached part 2 of the survey. In this part, there will be more questions about your opinion regarding how dog-friendly your city is and what resources are important for a city to be considered dog-friendly. Your answers are valuable.

How would you define a dog-friendly city that promotes dogs' welfare (well-being)? (Free text answer)

How dog-friendly do you think your city/town is today?

- Very dog-friendly
- Quite dog-friendly
- Neither nor
- Not particularly dog-friendly
- Not dog-friendly at all

What do you think is the best thing about having a dog in your city?

(You can, for example, consider opportunities for exercise, dog parks, social interactions, or access to nature.) (Free text answer)

What is your impression of how dog owners and dogs are treated in your city?

- Very positive
- Quite positive
- Neutral
- Quite negative
- Very negative

What factors do you believe influence whether dog owners and dogs are treated positively or negatively in your city/town? (Free text answer)

Are there any rules or restrictions that you find problematic? (For example, leash laws or areas where dogs are not allowed). (Free text answer)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Green areas (e.g. parks, nature reserves, wooded areas, meadows)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Blue areas (areas with water, e.g. beaches, harbors, lakes, water parks, wetlands, streams/rivers/canals)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog parks

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog parks that also have agility equipments

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog parks that offer equipment for nose work

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Indoor dog parks

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Good cycling and walking paths

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Good lighting along cycling and walking paths

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- The ability to bring your dog to cafés/restaurants (both indoor and outdoor seating)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog swimming areas at beaches/swimming spots

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Hotels that allow dogs

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Water stations for dogs around the city

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog waste bins

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Dog daycare centres

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Training opportunities (e.g. renting facilities with agility or nose work equipment)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Access to veterinary care

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Access to veterinarians or animal health staff specializing in rehabilitation (e.g. scheduling sessions for rehab training or using special equipment like balance balls and underwater treadmills)

On a scale from 1 to 5, how important do you think the following resources are for promoting your dog's/dogs' welfare in a city?

- Access to pet stores

That was the last question.

Thank you very much for participating in the study!



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