

1 **Title:**

2 **Everyday use of urban cemeteries: A Norwegian case study**

3

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15 *Highlights:*

- 16 • Everyday and recreational activities were registered in two urban cemeteries.
- 17 • The pattern of usage differed and may be linked to differences in landscape design.
- 18 • Issues with design for multiple use of urban cemeteries are discussed.

19 **Abstract**

20 The cemetery lay-out is set to meet the need for burying, but Scandinavian cemeteries are often  
21 well-maintained green spaces that could be potentially attractive areas for recreation. Shortage  
22 of urban green space and changing views on death and funerals could also lead to alterations in  
23 use of public urban green spaces, such as cemeteries. The objective of this study is to explore  
24 and describe everyday use of two urban green cemeteries in Oslo and discuss issues concerning  
25 designing for multiple and everyday use of urban cemeteries. Systematic moment observations  
26 of users' activities were made in the cemeteries. Eighteen types of activities were registered  
27 including visiting graves, crossing, biking, walking the dog, and exploration of cultural  
28 heritage. The study showed a varied use of both cemeteries and that everyday activities were  
29 common. Still, the cemeteries' main function is to serve the mourners with a place to

30 commemorate. In the planning and management of urban cemeteries one will have to take the  
31 needs of all its user-groups into consideration in order to keep and develop the particular quality  
32 that the cemetery as an urban public green space offers to its visitors and the local community.  
33 This paper discusses different issues related to various design solutions.

34

## 35 **1. Introduction**

### 36 *1.1 Background*

37 While cemeteries are places generally used for funerals and mourning, in Scandinavia they also  
38 represent urban green spaces with park-like qualities. Cemeteries are public spaces, and the  
39 historical literature shows that they have played a central role in local communities and have  
40 been used for a variety of activities throughout history (Brendalmo, 2014). Today however,  
41 they are not necessarily associated with green spaces open for use by the local community  
42 (Woodthorpe, 2011). In densified parts of cities, the cemetery may be the closest green space  
43 accessible for everyday use. In the last 20 years there has been significant urbanization in  
44 Scandinavia (Bengtsson, 2002; SSB, 2014). As cities become denser, the presence of green  
45 spaces decreases, and in the period 1994 to 2006 Oslo lost 420 hectares of green spaces  
46 (Halvorsen Thoren, 2010). Reasons such as shortage of urban green spaces, changing views on  
47 death and funerals (Hviid Jacobsen, 2013) and cultural influences from a growing multicultural  
48 population could potentially lead to changes in use of public urban green spaces, such as  
49 cemeteries.

50 There is a growing body of research on use of cemeteries as green spaces (e.g. Harvey, 2006;  
51 Sandell, 2010), but there are few empirical studies that provide figures on actual everyday use  
52 of urban cemeteries. However, in a pilot study based on limited observations in an urban  
53 cemetery in Oslo, the researchers (*Research group, 2016*) found that many people were passing  
54 through or using the cemetery for recreational purposes. In his paper we present an observation  
55 study undertaken at two 19<sup>th</sup> century urban cemeteries and explores who the cemetery-users are  
56 and what type of activities they perform beyond visiting graves. The objective of this study is  
57 to explore and describe everyday use of two selected urban cemeteries in Oslo and discuss  
58 issues concerning the design of urban cemeteries for multiple and everyday use. The study form  
59 part of the research project XXX, exploring the role of the urban cemetery today.

### 60 *1.2 Cemetery design and multiple use*

61 The main purpose of the lay-out of the cemetery has been to meet the need for burying the dead,  
62 but Scandinavian cemeteries are often well-maintained green spaces that could potentially be  
63 attractive recreational areas. The idea of the cemetery as a recreational space was already  
64 present during the British and Scandinavian cemetery design in the 19<sup>th</sup> century (Johnson, 2008;  
65 Sommer, 2003). The design of the urban cemeteries was intended to, in addition to bury the  
66 dead and solve sanitary issues, improve urban life quality through contributing to beauty and  
67 wildlife. Furthermore, in the landscape design history of cemeteries there are several designs  
68 aimed at creating spaces similar to those of urban recreation (Sommer, 2003). In Scandinavia,  
69 there are examples of cemeteries that were intended to offer urban dwellers an escape from the  
70 city, by creating a distinctly different natural environment for contemplation and peace  
71 (Berglund, 1994). Such spaces may fulfil city dwellers' daily needs for mental recovery  
72 (*Research group, in review*). Moreover, many cemeteries have site designs with walkable  
73 friendly paths, seating and trees, which can serve as visual shelters from traffic. This may invite  
74 to recreational use beyond visiting graves, such as dog walking, socializing, resting on benches,  
75 strolling or even physical exercise.

76 Some 19<sup>th</sup> century cemetery designs also had educational purposes, and included elements that  
77 could shape behaviour. One example is found in Loudon's writings (in Johnson, 2008) on the  
78 cemetery reform in the United Kingdom (UK). His idea was that orderly and symmetrical layout  
79 could create and foster moral sentiments and conduct, and consequently discipline its users.  
80 Design elements that invite to certain behaviour may be seen as a result of deliberate choices in  
81 the design of cemeteries, and demonstrate the idea of environmental affordances (Gibson,  
82 1977). How design has the possibility to directly influence use, is particularly interesting when  
83 it comes to cemeteries, because they are places where behaviour also must be restricted to  
84 protect its distinct character and function. Regarding potential recreational use of cemeteries, it  
85 is important to keep in mind that the functional premises of a cemetery differ to those of a public  
86 park. Some recreational activities are conflicting with the main purpose of the cemetery. The  
87 nature of the place and respect for both the dead and those visiting graves, limit the variety of  
88 activities that are perceived as acceptable. It is reasonable to believe that certain types of  
89 recreational use of the cemetery may encourage conflicts with those visiting or tending to  
90 graves. An empirical study of the use of today's urban cemetery revealed the cemetery as a  
91 multidimensional landscape (Woodthorpe, 2011), which at the same time serves as a site of  
92 emotion for the bereaved, of commerce for the management and a place for the local community  
93 for recreation and cultural heritage.

94 As a strategy to regulate use to avoid potential conflicts and meet the needs of all cemetery  
95 users, both design elements and rules of conduct in the cemetery can be helpful tools. In  
96 Norway, the rules of use are posted at the entrances of the cemeteries, and the activities that  
97 Cemetery Officials prohibit are biking, jogging, skiing, horse-riding, driving without a special  
98 permit, sunbathing and playing. Dogs can enter, but must be kept on a lead. Furthermore, the  
99 users are encouraged to show consideration to the grave-visitors and only engage in quiet  
100 activities.

### 101 *1.3 Research on cemetery behaviour*

102 Although the empirical research literature on behaviour of cemetery visitors is limited, some  
103 studies exist. In their research, Francis, Kellaher and Neophytou (2000) interviewed grave-  
104 visitors to reveal the meanings and functions of their visits. Woodthorpe (2011) interviewed  
105 both visitors, staff and local residents to explore the cemetery's various functions. The study's  
106 findings support the importance of the urban cemetery for the local community. Deering (2010)  
107 studied recreational use of cemeteries through interviews and analysis of material on the  
108 internet, further exploring anti-social behaviour in cemeteries, as well as night-time usage and  
109 perceived safety (Deering, 2014). While the literature on use and function of urban parks,  
110 including mapping of behaviour and user-needs is extensive (e.g. Adinolfi, Suarez-Caceres, &  
111 Carinanos, 2014; Golicnik & Thompson, 2010; Nordh & Ostby, 2013; Peschardt, Schipperijn,  
112 & Stigsdotter, 2012), there is little empirical research on mapping of multiple use of urban  
113 cemeteries. Mapping of recreational values of urban green space is increasingly common in the  
114 Nordic countries (Lindholst et al, 2015). This is because knowledge of who the users are is  
115 highly important for the management and planning of all green space in densified urban areas,  
116 including the urban cemetery.

117

## 118 **2. Methods**

### 119 *2.1 Cases*

120 Two urban cemeteries in Oslo were selected as cases for the study. Both cemeteries are situated  
121 in residential areas characterized by apartment blocks, they are well connected to public  
122 transport, and hold burial grounds for various religions. Gamlebyen gravlund (Figure 1. A) is  
123 located in a central residential area of the city within short walking distance to the central train  
124 station. It was chosen due to its representativity as an urban cemetery, and due to already

125 observed use for recreational purposes. Østre gravlund (Figure 1. B) is situated further northeast  
126 in the city, and was chosen as a comparative case due to its potential for everyday use.

127 -----Figure 1 to be inserted here---

### 128 2.1.1 Gamlebyen gravlund

129 The lay-out of the cemetery was established in 1874. It covers approximately 13 acres of land  
130 and has around 4500 graves in use (Oslo Municipality Cemetery Officials, 2015). The cemetery  
131 is designed with a grid system, and has several paths (Figure 2 and 3). It is enclosed by a fence  
132 and has three gates. In the central part of the cemetery, there is a small chapel currently rented  
133 out to a Coptic congregation. The central area is the highest part of the cemetery, with slopes  
134 towards east and west. The topography gives the cemetery a rather open character with long  
135 views. In the eastern part of the cemetery there is a Muslim burial ground established in 1972,  
136 and in the western part there is a historical monument. There are fewer graves in the west,  
137 facilitating a more park-like atmosphere in this side of the park. The vegetation at the cemetery  
138 is trimmed with lawns and hedges. Most graves are decorated with flowers. Alleys with birches  
139 and chestnut trees mark two of the paths through the cemetery. There is no lighting of the  
140 cemetery, except for a few light poles around the chapel. Along the mesh fence towards east  
141 and south there are apartment buildings with views to the cemetery. There are other public green  
142 spaces in the neighbouring area of the cemetery, but the closest ones are less accessible due to  
143 steep terrain.

144 -----Figure 2 and 3 to be inserted here---

### 145 2.1.2 Østre gravlund

146 The current cemetery was established in 1895. A Jewish burial ground that was established in  
147 1912, is located in the eastern part and separated from the rest of the cemetery by tall spruce  
148 trees. The cemetery covers approximately 30 acres of land in total and there are around 12 000  
149 graves in use (Oslo municipality Cemetery Officials, 2015). The cemetery is designed along a  
150 grid pattern of paths and hedges (Figure 4 and 5). A mid axis, planted with *Ulmus* in columnar  
151 shapes, leads through the cemetery in a northeast towards southwest direction. Most grids have  
152 a different character, such as varying sizes or different arrangement of grave stones. The  
153 topography at the cemetery is flat. A stone wall surrounds it on two sides, while mesh fences  
154 cover the other sides, giving the site an enclosed atmosphere. The cemetery is rich in greenery  
155 with several trees of different species. A memorial space is located in the middle of the

156 cemetery. As in Gamlebyen gravlund, the graves are decorated with flowers, except for in the  
157 Jewish burial ground. There is no lighting in the cemetery. Towards the northeast the cemetery  
158 borders to a residential area, but there are no gates on this side of the cemetery. Commercial  
159 areas and offices are located on the other sides, and the cemetery borders to one of Oslo's main  
160 high-ways, route E6. There are no other green public spaces in the neighbourhood, except  
161 common green spaces that belong to the residential buildings.

162 -----Figure 4 and 5 to be inserted here---

## 163 2.2 Behavioural mapping

164 The method of behavioural mapping was based on momentary time sampling techniques (e.g.  
165 Adinolfi et al., 2014; Golicnik & Thompson, 2010). Systematic scans on predefined areas in  
166 the cemeteries were made, and demographics such as age-group and gender, in addition to  
167 activities performed by the observed users were registered in a behavioural mapping scheme  
168 (Gehl & Svarre, 2013; Whyte, 2001). A pilot study undertaken the previous year developed the  
169 selection of observation areas and activity categories, ensuring inter-rater reliability. The  
170 observations were made from two central spots in both cemeteries with good visual access.  
171 Eighteen types of activities were registered (see Table 2) including grave visiting, crossing the  
172 cemetery either by walking or by bike, dog walking or recreational activities such as exploring  
173 or resting. The chosen path and the walking pace of visitors were used to determine whether  
174 they belonged to the category of crossing or recreational purposes. To illustrate, those using a  
175 shorter route and faster speed were categorized as crossers, while those showing interest in  
176 other activities such as exploring and reading grave inscriptions, resting on benches and so on,  
177 were categorized accordingly. Groups of people attending funerals or urn internments were not  
178 registered since such activities were beyond the objective of the study. To avoid intrusiveness,  
179 registrations of the users' movement pattern were not performed and behavioural maps are not  
180 provided.

181 One of the study's authors carried out the behavioural mapping at the cemeteries from April to  
182 July 2014, two hours twice every work week and once every second weekend. Initially the  
183 registrations were made in the afternoon to cover potential everyday and recreational activity.  
184 In the second period of registration, the activity in the morning/lunch hours were registered to  
185 examine if the cemeteries were used for lunch-breaks etc. These hours were selected to capture  
186 and register the variety of activities undertaken daily, and to enable representative and  
187 comparable samples. To achieve the objective to describe everyday activity, the public summer

188 holiday which commences in mid-July was left out of the registration period. Rainy days were  
189 mostly avoided as they do not allow for much recreation. However, observations were made on  
190 cold days, down to 5 °C. Temperatures were retrieved from www.yr.no, Norwegian  
191 Meteorological Institute. The observations of users' demographics and activities were analysed  
192 as frequencies, and are presented as percentages of total numbers in each category. Due to the  
193 momentary time sample technique, one user was occasionally registered as engaging in more  
194 than one activity. The user was registered as both socializing and dog walking, hence the total  
195 percentages of activity exceed 100%.

196

### 197 **3. Results**

#### 198 *3.1 Number of users*

199 During the observation period, a total of 3851 people were registered in Gamlebyen gravlund,  
200 while 1250 people were registered in Østre gravlund. Table 1 shows the period of registration,  
201 hours and temperatures, and mean registered users per hour in the various periods. In  
202 Gamlebyen gravlund, the number of users doubled during afternoon compared to morning,  
203 while the numbers of users on workdays and weekends were fairly the same. In Østre gravlund,  
204 the numbers of users were more equally distributed in the course of the day, and the time with  
205 most users was morning/lunch hours in weekends.

206 -----Table 1 to be inserted here---

#### 207 *3.2 Demographics*

208 The gender distribution among the users in the cemeteries was close to equal (Gamlebyen  
209 gravlund; 48.5% male, and Østre gravlund; 49.3% male). Less than five percent of the users  
210 were children in both cemeteries (children in trolleys were not counted as individual users)  
211 (Figure 6). Younger people constituted for a large group the users in Gamlebyen gravlund, with  
212 41.5% registered as teenagers or in their twenties. Only 16.1% of the users in Østre gravlund  
213 were in this age-group. Adults (30-70 years of age) made up around half of the people in  
214 Gamlebyen, while 65.8% in Østre gravlund. The proportion of seniors (above 70 years of age)  
215 were also larger in Østre gravlund, being 15.5% compared to 1.8% of those using Gamlebyen  
216 gravlund.

217 -----Figure 6 to be inserted here---

218 *3.3 Diversity of activities*

219 All eighteen activities were registered in both cemeteries, but the relative proportions of the  
220 various activities differed (Table 2). The largest user group in Gamlebyen gravlund was people  
221 passing through, commuting to another destination. This group was succeeded by dog walkers,  
222 and those crossing by bike or with trolleys. The percentage of the users that visited graves was  
223 around five percent, on both workdays and weekends. In Østre gravlund 54.5% of the workday-  
224 users were there to visit graves and a majority, 69.7%, of the weekend-users were grave-visitors.  
225 The second largest group was those walking through, succeeded by people walking their dog,  
226 biking through and lastly people resting on benches. During the observation period, very few  
227 people visited the Muslim or the Jewish burial grounds in both cemeteries. However, these areas  
228 also contain fewer graves and make up smaller areas.

229 -----Table 2 to be inserted here---

230 In both cemeteries, users were observed reading inscriptions on graves. Additionally, groups of  
231 people came to visit the memorial of Falsen, one of the founders of the Norwegian Constitution.  
232 These were categorized as exploring, or visitors of cultural heritage. The activity category  
233 “Other” included all other activities that were not predefined in the behavioural mapping  
234 scheme. Cultural activities, such as preparation for an art performance in Gamlebyen gravlund,  
235 as well as a one-day film shooting session were observed. Furthermore, in Gamlebyen gravlund  
236 homeless people were observed spending the night behind bushes and trees in the western part  
237 of the cemetery. During the period of observation, the church across the street was made into a  
238 shelter for homeless people. The shelter was closed during daytime and several of the people  
239 staying there came to the cemetery to wash and drink water from the tap in the southern part.  
240 Local children were observed playing hide and seek in the cemetery, and a few people were  
241 registered laying on the grass. In both cemeteries people were taking pictures of flowers and  
242 trees in spring blooming, as well as the graves. In Gamlebyen gravlund, some cars were  
243 observed, while a great proportion of the users in Østre gravlund arrived by car. Many people  
244 also drove all the way up to the grave they were to visit.

245

246 Figure 7 summarizes the findings by illustrating the five main categories of activities that were  
247 registered in the cemeteries independent of workday and weekend.

248 -----Figure 7 to be inserted here---



249

## 250 **4. Discussion**

### 251 *4.1 Use of the cemeteries*

252 The study's findings showed that users utilized the cemeteries in many ways, and that everyday  
253 activities were performed in both of the urban cemeteries. All the predefined eighteen activities  
254 were registered in both cases. In Gamlebyen gravlund, as much as 95% of the registered activity  
255 was performed by people who came for other purposes beyond visiting graves. The majority  
256 was people passing through the cemetery. In Østre gravlund, most users came to visit a grave,  
257 but many also used the cemetery for everyday activities. The registrations of people that were  
258 using the cemeteries can be categorized into different user-groups; grave-visitors, people  
259 crossing the cemetery on their way to another place, dog-walkers, and those spending time at  
260 the cemetery for recreational, social or cultural purposes. In terms of demographics there were  
261 close to equally as many males and females using the cemeteries, while few children and  
262 teenagers were registered in both cemeteries.

263 The frequency and patterns of use differed between the two cemeteries. In Gamlebyen gravlund,  
264 the user number was twice as high during the afternoon compared to the morning/lunch-hour.  
265 It seemed to be a natural thoroughfare and a recreational area for its local community in their  
266 leisure time. Østre gravlund, on the other hand, had less everyday-users, despite being  
267 surrounded by office buildings with a great flow of employees passing through the area daily,  
268 as it is located right by an underground station. It is also the only public green space in the  
269 immediate area, something which has the potential to attract many people for breaks during  
270 office hours, or commuting to and from work. This finding raises the question to what extent  
271 the physical design of the cemeteries in the larger urban context explains the observed  
272 difference in use.

273

274 The cemeteries differ in lay-out and design. Østre gravlund is enclosed by stone walls and tall  
275 fences in addition to several dense hedges. It has only one main entrance, and the smaller  
276 entrances are poorly marked. This may give visitors the impression that they are 'welcome in'  
277 but less 'welcome to walk through'. This may reduce the number of users passing through the  
278 cemetery. In addition, it can affect the users' perception of safety having only one main exit.  
279 The entrances in Gamlebyen gravlund are also poorly marked, but because it is a natural  
280 thoroughfare for the locals it still attracts people. There are two main entrances, lower hedges,

281 and in general it has a more open character with solely mesh fences. It may be reasonable to  
282 assume that such design differences affect frequency of use, especially when it comes to  
283 walking through the cemeteries, something that will be dealt with further in the next section.  
284 However, other possible and more contextual reasons for differences in use of the cemeteries  
285 should be borne in mind when discussing links between design and usage. This would be the  
286 impact of the cemeteries' location in the city, the type of residential buildings and demographics  
287 of the population in the neighbourhood, the local culture and people's attitudes towards use of  
288 cemeteries.

289

290 In this study, the behavioural mapping revealed that a great diversity of activities were  
291 performed in both cemeteries, but that one of them was relatively more used for everyday  
292 activities. The following discussion will focus on issues concerned with design for multiple use  
293 of cemeteries such zoning and signage, opening of fences and management of vegetation.

294

#### 295 *4.2 Design issues for multiple use*

296 The study showed that the urban cemeteries were used both as a place for remembering and  
297 mourning and for everyday activities such as crossing on the way to the city centre, walking the  
298 dog, short recreational stays, or for experiencing cultural heritage. The observed multiple use  
299 of the cemeteries underlines the importance of planning in order to prevent conflicts among its  
300 user-groups. Violations of the posted user rules in the cemeteries were common, such as biking  
301 and off-leash dogs. The findings are in line with studies from the UK and France describing the  
302 cemetery as a multidimensional landscape with potential of conflicting needs of its users  
303 (Woodthorpe, 2011; Deering, 2010).

304 On the one hand, as a public space that should be open for all, the cemetery should meet the  
305 needs of all its various user-groups. On the other hand, since it is functionally different from a  
306 public park, it is important to carefully consider what types of activities a cemetery invites to,  
307 in order to maintain its role as a place for mourning and peace in the city. One design solution  
308 for preventing conflict between grave-visitors and other user-groups, is to utilize more explicit  
309 signs with user rules. Making it more clear to the users which activities are *not* allowed in the  
310 cemetery can help to avoid unwanted disturbances of the mourners. However, to use prohibition  
311 as a mean to regulate behaviour may create a less welcoming atmosphere (Scollon & Scollon,  
312 2003), which may not necessarily be desirable for the grave-visitors. On the other hand, using

313 signs to show what *is* allowed and welcomed can be a solution to overcome this problem (Skaar  
314 & Vistad, 2013).

315  
316 Zoning is often used in public space design to prevent user conflicts. Zoning is a technique that  
317 can be performed by using only design elements, such as hedges, to make physical demarcation  
318 of zones. It can also include using a combination of design elements and signage, for example  
319 information boards with maps. Moreover, zoning can also be utilized to design and facilitate  
320 paths for crossing a cemetery to avoid disturbance of the grave-visitors from people rushing  
321 through. This would be relevant for the observations of this study as people crossing the  
322 cemetery constituted for a significant user-group. Hedges could be used both as guiding  
323 elements for the crossers and for visual protection for grave-visitors. Mapping where people  
324 preferably cross can be used to define main crossing routes that can be further designed as  
325 thoroughfares (Ng, 2015).

326  
327 As seen in the study, one purpose of visiting the cemetery seemed to be recreation seeking, as  
328 well as experience of cultural heritage. The historical urban cemetery is an important bearer of  
329 culture in the European context (Sommer, 2003; Worpole, 2003). This brings up the discussion  
330 of designation of zones for recreational use and the role of the cemetery within the urban green  
331 structure (e.g. Deering, 2010). In our cases such zoning could be done by for example gather  
332 benches in areas with less graves. However, if peace and contemplation is the aim of the  
333 recreationist's visit, being alone can be one of the main premises, and placement of benches in  
334 a network rather than groups could be more suitable. Another strategy to create quiet  
335 recreational areas in the cemetery is to place open areas in the midst of the cemetery, instead of  
336 in the edges, which may make the user more aware and respectful towards the place. In  
337 Copenhagen the management strategy of the cemetery Assistens can be seen as an example of  
338 zoning. In this example, the cemetery welcomes various recreational and cultural activities  
339 alongside with mourning, by using activity zoning and signage (Kulturcentret Assistens, 2015).

340  
341 Zoning may not always be the right solution when planning for multiple use of cemeteries, as  
342 it may also cause unforeseen consequences. For example, designating and facilitating for dog  
343 walking in one area may attract more dog walkers than intended and hence it contributes to  
344 changing the character of the cemetery. Additionally, attracting more and new groups of users  
345 to the cemetery will have implications for the management and increase the maintenance costs.  
346 Another aspect is that zoning implies segregation of functions, which may prevent a natural

347 flow of people in the cemetery. In this study, the places furthest away from the main crossing  
348 routes were also where homeless people found shelter.

349

350 Flow of people passing through the cemetery may also be important for safety issues. Presence  
351 of people creates a natural surveillance and may lower the possibility of crime in public space.  
352 Perceived safety is also important, and presence of people may make people feel safer and  
353 hence also use the cemetery more, reinforcing the loop of factual and perceived safety  
354 (Maruthaveeran & van den Bosch, 2014). It is likely that perceived safety is equally as  
355 important for the grave-visitor as the everyday-user. It may increase the well-being of the users,  
356 as it provides them with better overview and hence more perceived control. Therefore, to make  
357 users feel safe, the height of hedges and plantation and the material and height of fences for  
358 creating privacy, must be balanced against the need for being seen by others (Jansson, Fors,  
359 Lindgren, & Wistrom, 2013). Consequently, the need for privacy and shelter from passers-by  
360 may sometimes be less important than safety issues, and would in each case need careful  
361 mapping. Another issue concerning management of vegetation is about its potential function as  
362 psychological buffer against traffic noise (Dzhambov & Dimitrova, 2014). Again, visual access  
363 as a safety measure will have to be negotiated with its recreative value for the users. To increase  
364 safety and perception of safety, positioning of paths, service points for water and waste,  
365 benches, entrances and gates must also be considered. Moreover, lighting at the cemetery may  
366 foster increased use and perception of safety (Fotios, Unwin, & Farrall, 2015). Today, the  
367 cemeteries are dark during evenings, which make them potential unsafe places. On the other  
368 hand, darkness can also be seen as a quality in an urban context, protecting some places from  
369 the otherwise strong light pollution in the city.

370

### 371 *4.3 Further research*

372 This study is based on brief observations of types of activities undertaken in the cemetery.  
373 Observation reveal actual use, and not what people would report doing or not doing, and is  
374 therefore a valid and useful way of mapping behaviour in public space. However, moment  
375 observations fail to reveal the user's intentions of using the cemetery, neither possible changes  
376 in activity. In this study, users were categorized as crossers if they selected the shortest route.  
377 However, these users may have chosen to cross the cemetery to get a recreational experience  
378 on their way, something that observation cannot pick up and thus needs to be explored further  
379 by asking the users. The various religious practices related to cemetery visits also need to be  
380 accounted for when studying use of cemeteries. For gaining more knowledge on how design

381 and people interact, it is recommended to perform more detailed activity mapping through  
382 applying methods of how people move and use public space (Cooper, Marcus & Francis, 1998).  
383 However, caution must be taken in cemeteries to respect the users' need for privacy. Studying  
384 behaviour at the cemetery would also require more in-depth knowledge about how and why  
385 people use the cemeteries, and why some people do not. In this regard, potential conflicts  
386 between everyday use of cemeteries and occasional use for visiting graves can be further  
387 revealed. In an urban context, it is interesting to study how accessibility of green space in  
388 densified areas impact the use of urban cemeteries. The question of whether there is a  
389 correspondence between multiple use of cemeteries and a wider acceptance for everyday use,  
390 can unravel the role of the urban cemetery as a public green space.

391

## 392 **5. Conclusions**

393 This study has shown how the urban cemeteries were used for a diverse range of everyday and  
394 recreational activities beyond visiting graves, and hence had a role as a multifunctional green  
395 space in the city of Oslo. They were in many ways park-like environments that seemed to invite  
396 to recreational activities. Still the cemetery's main function is to serve bereaved people with a  
397 quiet place to mourn and commemorate. In the planning and management of urban cemeteries  
398 it is important to consider all its user-groups in order to maintain and develop the particular  
399 quality the cemetery as a public green space in the city offers to its visitors and the local  
400 community. Through a strategic landscape design and different measures such as zoning,  
401 signage and suitable lighting it is possible to open up for more varied use, and avoiding potential  
402 user conflicts.

403

## 404 **6. References**

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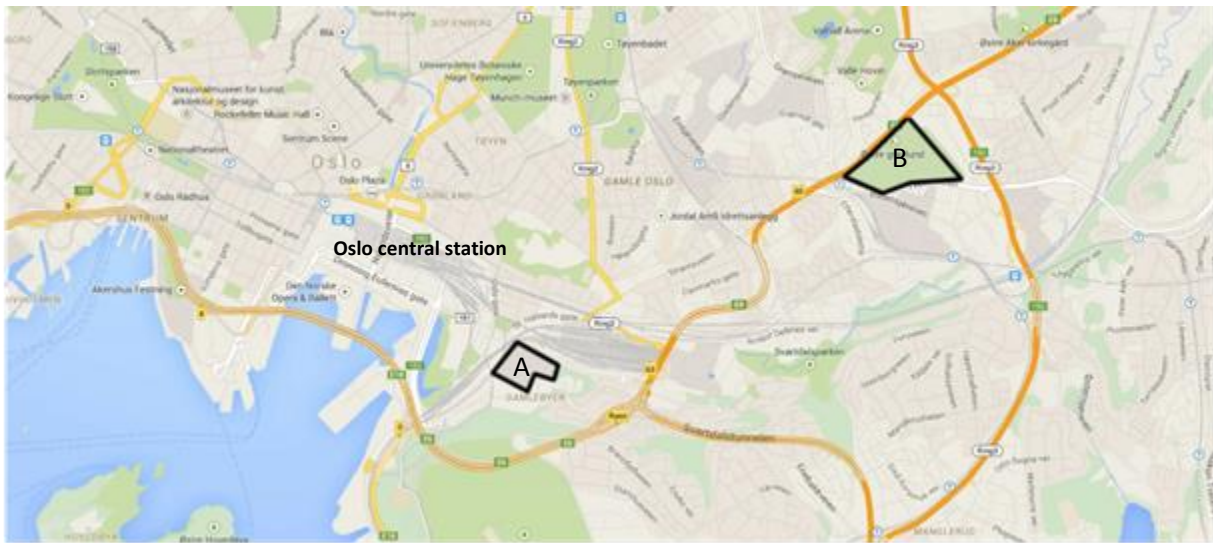
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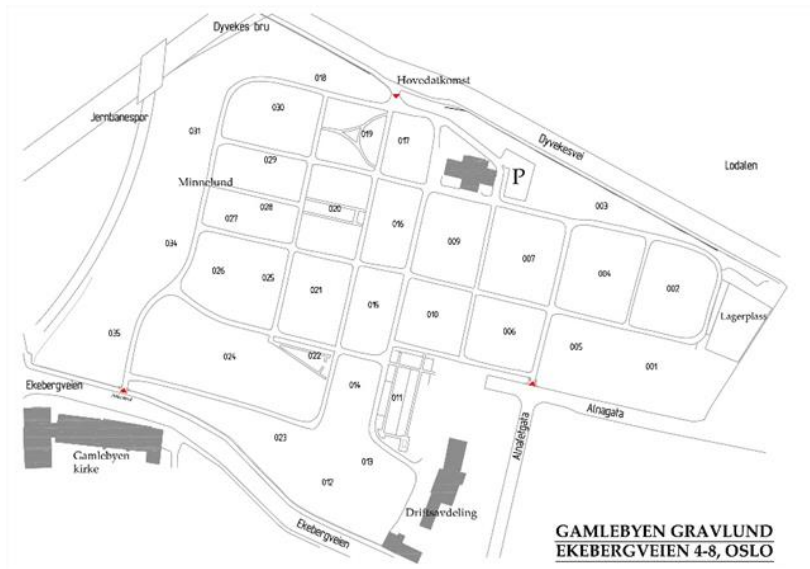


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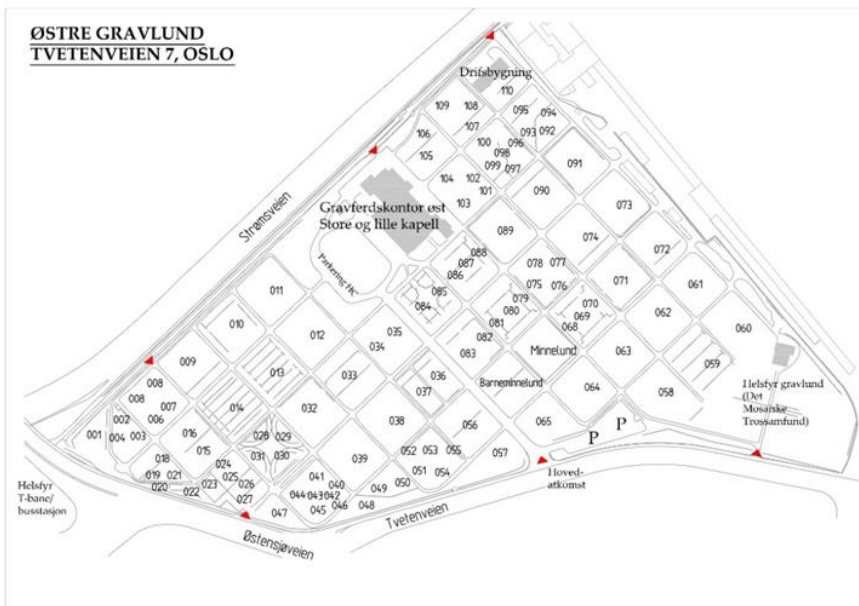
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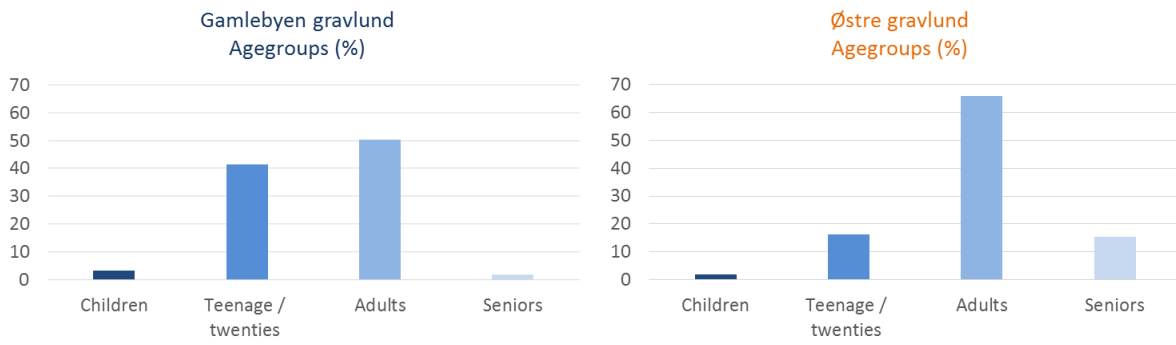
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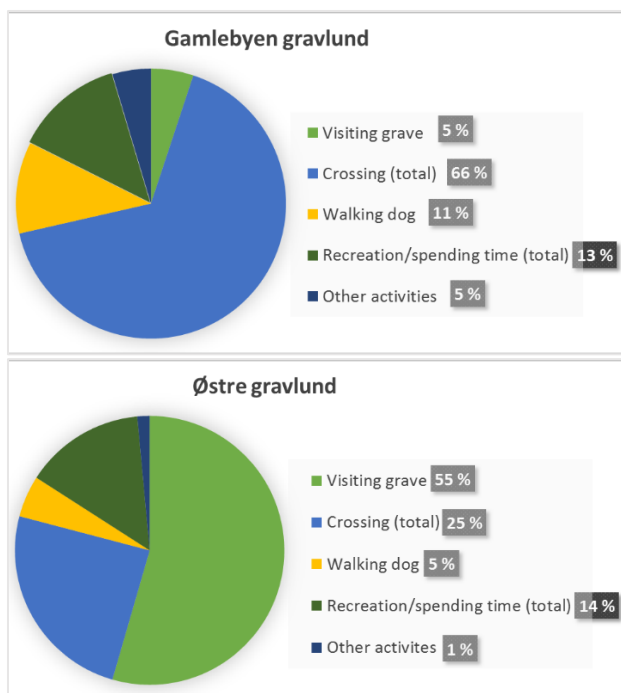
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**Table 1. Period of registration, number of days and hours, temperature, and users registered per hour.**

Period of the year	April-May		Late May-Mid July	
Time of day	Afternoon/evening		Morning/lunch hours	
	14.30-16.30/17.00-19.00		08.30-10.30/11.00-13.00	
Temperature ( <i>M</i> /range)	14.4 °C/5-25 °C		16.1 °C/10-25 °C	
Cemetery	Old town	Eastern	Old town	Eastern
Days total	18	18	16	16
Hours total	36	36	31	32
Number of users per hour ( <i>M</i> )	74.7	19.5	37.5	17.2
Workdays	77.3	18.4	38.4	14.8
Weekend/holydays	69.5	21.6	31.8	27.3

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530 **Table 2. Registered activities performed at the cemeteries in percentage during workdays and weekend/holydays**  
 531 **independent of time of day.**

Activity	Gamlebyen gravlund		Østre gravlund	
	Workdays (N=2826)	Weekend/holydays (N=1025)	Workdays (N=827)	Weekend/holydays (N=423)
	%	%	%	%
Visiting grave	5.3	5.3	54.5	69.7
Crossing - walking	53.3	53.7	21.2	13.6

Crossing - biking	14.2	6.2	7.8	3.2
Crossing - trolley	4.5	5.2	2.0	1.0
Crossing - skateboard	0.3	0.3	0.1	0.0
Walking dog	10.5	15.4	4.9	6.4
Jogging	0.7	1.0	1.5	0.6
Strolling	1.1	2.9	1.7	2.3
Socializing	2.8	5.2	1.0	1.0
Strolling with trolley/toddlers	1.2	0.7	1.1	1.0
Playing	0.3	0.5	0.5	0.8
Exploring/cultural heritage	2.0	3.4	3.3	2.2
Resting on bench	4.2	3.7	6.2	6.4
Picnic/eating	0.2	0.1	0.3	1.5
Alcohol/drugs	0.4	0.6	0.2	0.0
Visiting Muslim/Jewish area	0.7	0.3	0.7	0.0
Visiting Coptic chapel	1.4	1.0	-	-
Other	2.9	5.1	0.4	0.6

532 Due to the momentary observation method one user was occasionally registered being engaged in more than one activity, i. e.  
533 both socializing and walking dog, and the total percentage exceeds 100%.

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