



universität
wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

Green Space and the Global Garden City: How have the utopian ideals of Garden City planning diverged for the cities of Welwyn Garden City (UK) and Den'enchōfu (Japan)?

verfasst von / submitted by

Thomas Eastaugh

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Master of Arts (MA)

Wien, 2020 / Vienna, 2020

Studienkennzahl lt. Studienblatt /
degree programme code as it appears on
the student record sheet:

A 066 664

Studienrichtung lt. Studienblatt /
degree programme as it appears on
the student record sheet:

Masterstudium DDP Urban Studies

Betreut von / Supervisor:

Ass.-Prof. i. R. Mag. Dr. Walter Matznetter,
MSc

Abstract

With rising levels of dire living standards in the late 19th century, the Garden City ideal was hailed as a possible panacea to combat the ills of urbanisation. This paper addresses changes seen under the Garden City planning model, as understood between the two cases of Welwyn Garden City (UK) and Den'enchōfu (Japan). Understanding the changes undergone in public green spaces in both sites from a chronological viewpoint allows for divergences away from the original utopian plan to be understood. Using a combination of literature analysis and GIS mapping of historic documents, a comprehensive timeline of changes to green space in both sites is shown, showcasing the evolution process in both urban hubs. This study allows for questions of transnational policy transfer to be strongly linked to the spatial formation of urban centres. The results generated suggest that both sites have experienced similar patterns of change in terms of green space distribution, divided between 5 distinct periods of transformation. These results question the current narrative regarding the transnational spread of the Garden City ideal, and reframe the narrative of change as one of 'mutation', and not divergence away from the original utopian ideals. This is especially true in regards to Den'enchōfu, which, under the criteria of green space provision, appears to reflect the expected standards of a Garden City. This stands in contradiction to current understandings of the site. The implications of said findings show that rather than undergoing extensive divergence away from the original Garden City ideal, cities have experienced localised interpretation of the original plan, especially in their spatial structure.

Angesichts des steigenden Lebensstandards im späten 19. Jahrhundert wurde das Ideal der Gartenstadt als ein mögliches Allheilmittel gegen die Übel der Verstädterung gepriesen. Dieses Papier befasst sich mit den Veränderungen, die im Rahmen des Planungsmodells der Gartenstadt zu beobachten, wie sie zwischen den beiden Fällen Welwyn Garden City (Großbritannien) und Den'enchōfu (Japan) verstanden wurden. Die Forschung der Veränderungen der öffentlichen Grünflächen an beiden Standorten aus chronologischer Sicht ermöglicht es, die Abweichungen vom ursprünglichen utopischen Plan zu verstehen. Unter Verwendung einer Kombination aus Literaturanalyse und GIS-Kartierung historischer Dokumente wird eine umfassende Zeitleiste der Veränderungen der Grünflächen an beiden Standorten gezeigt, die den Entwicklungsprozess in beiden städtischen Zentren veranschaulicht. Diese Studie ermöglicht es, Fragen des transnationalen Politiktransfers stark mit der räumlichen Bildung von urbanen Zentren zu verknüpfen. Die gewonnenen Ergebnisse legen nahe, dass beide Standorte ähnliche Veränderungsmuster in Bezug auf die Grünflächenverteilung erfahren haben, die sich auf 5 verschiedene Transformationsperioden verteilen. Diese Ergebnisse stellen die gegenwärtige Erzählung über die transnationale Ausbreitung des Gartenstadtideals in Frage und umreißen die Erzählung des Wandels als eine Mutation und nicht als eine Abweichung von den ursprünglichen utopischen Idealen. Dies gilt insbesondere in Den'enchōfu, das nach den Kriterien der Grünflächenbereitstellung die erwarteten Standards einer Gartenstadt zu reflektieren scheint. Dies steht im Widerspruch zum gegenwärtigen Verständnis des Ortes. Die Implikationen der genannten Befunde zeigen, dass die Städte, anstatt weit vom ursprünglichen Gartenstadtideal abzuweichen, eine lokalisierte Interpretation des ursprünglichen Plans erfahren haben, insbesondere in ihrer räumlichen Struktur.

Keywords: *Den'enchōfu, Welwyn Garden City, garden cities, Ebenezer Howard, chronological analysis, GIS, cross-cultural comparison, green spaces, policy mutation, policy transfer*

Table of Contents

Abstract	1
Table of Contents	2
1. Introduction	4
1.1. Topic of thesis	4
1.2. Note on language	4
2. Project Outline	5
2.1. Problem statement	5
2.2. Research question	6
2.3. Hypothesis	7
3. Methodological Outline	8
3.1. Historical document analysis	8
3.2. Field observations	13
3.3. GIS mapping	13
4. Comparative Data and Chronology	17
5. Literature Review	21
5.1. Readings addressing the research question	21
5.2. Readings addressing the Garden City concept	22
5.3. Readings addressing Welwyn Garden City	26
5.4. Readings addressing Den'enchōfu	32
5.5. Readings addressing green space	37
5.6. Readings addressing methodological approaches	38
5.7. Literature Review Summary	39
6. Field Observations	41
6.1. Initial observations of Welwyn Garden City	41
6.2. Initial observations of Den'enchōfu	43
6.3. Comparative observations	46
7. GIS Analysis of Green Space	48
7.1. 1899 Hertfordshire XVIII.SE	50
7.2. 1925 Hertfordshire XVIII.SE	51
7.3. 1948 Hertfordshire XVIII.SE	53
7.4. 1992 Welwyn Garden City & Hertford Ordnance Survey	55
7.5. 2019 Welwyn Garden City & Hertford Ordnance Survey	57

7.6. Summary of Welwyn Garden City green space analysis	59
7.7. 1919 Tokyo Seinanbu	60
7.8. 1930 Den'enchōfu	62
7.9. 1958 Den'enchōfu	63
7.10. 1985 Jiyūgaoka	65
7.11. 2019 Ōta-ku	66
7.12. Summary of Den'enchōfu green space analysis	68
8. Discussion	70
8.1. Results and discussion	70
8.2. Limitations	72
8.3. Reflection on research question	73
9. Conclusions and Recommendations for Further Study	76
9.1. Conclusions	76
9.2. Recommendations for further study	77
References	78
Appendix	84
Field observation transcripts	84
Welwyn Garden City	84
Den'enchōfu	86
Proof of purchase and fair use for the maps included	88

1. Introduction

1.1. Topic of thesis

As shown in the title, this research paper intends to approach the Garden City concept as an exported planning model. The familiarity that not only people in the UK, but also urbanists as a whole, have with this planning ideal as applied in Europe shows that it is (or at least was) an accepted approach to challenging urban issues. However, less of us are aware of the model when applied to non-European cities. This raises an interesting question - whether or not the same outcomes are visible when a European model is directly imported into a non-European context. For the purposes of exploring this research theme, the divergences/convergences of the planning model will be compared in two historic cases of the Garden City concept being applied - firstly in the UK, with Welwyn Garden City, and secondly in Japan, with Den'enchōfu. These divergences will be understood through the examination of public green space in both sites, understood through a chronological viewpoint.

1.2. Note on language

Japanese terminology will be provided in translation where possible, accompanied with the original characters and a phonetic transcription. For references to articles in which the title is only provided in Japanese, a phonetic transcription will only be used. Japanese names will follow the local convention of placing the surnames first, following the style most often seen in English-language work.

2. Project Outline

2.1. Problem statement

In the early 20th century, the concept of the Garden City was hailed as a model to solve the ills of the rapidly growing city. The Garden City should therefore have been a planning method that worked across borders and boundaries, seeing convergence globally for anywhere with rapid urbanisation. Even Ebenezer Howard, the ideologue who devised the concept, had aspirations towards the spread of this concept outside of the UK (Howard, 1902).

However, we see different outcomes of how the Garden City has been implemented between global sites, both from the perspective of the residents and the planning authorities. The established literature has already addressed some of the ways in which both of the cities have moved away from the original idea, often in surprising ways (Oshima, 1996; De Pieri, 2018). We can then acknowledge therefore that a gap exists between the original model of the Garden City, and the ways in which it has been implemented internationally.

While there are fair criticisms to be lodged against the conception and praxis of the Garden City, as will be expanded upon within this research, Howard's vision is widely referred to as a 'utopian' one (Hall, 2014). The influences from other utopian writers during his lifetime (both Edward Bellamy's 1888 *Looking Backward* and Peter Kropotkin's work were acknowledged as having an impact upon Howard) means that this idea is now recognised as an attempt at creating a utopian city.

This suggests divergence is visible even between two places following the same utopian vision - especially when there are clear differences in social/historical backgrounds. This is important for current day visions for cities, especially when considering an 'exportable' or 'marketable' approach to policies and planning.

There is a wide variety of established literature on the historical formation and foundation of the Garden City. There are also a lot of retrospective articles looking at the current state of Garden Cities and New Towns in Britain. However, the English-language literature regarding Den'enchōfu is limited; English-language fieldwork studies of urban issues in Japan are rather rare, and a general trend towards historical discussions of urbanity appears to be the norm for Western academics when discussing Japan. Japanese-language literature likewise approaches Den'enchōfu as a curious remnant of Western urban planning ideals enacted in Japan, with the focus turned more towards the ways in which it has been re-absorbed into the wider patterns of urbanisation in Tokyo rather than towards the ways it upholds the Garden City principles.

Therefore, a gap between languages and national foci exists. This gap in the literature can be bridged through first-hand comparative methodologies, bringing together both Japanese and English-language approaches.

2.2. Research question

The purpose of this research will be to explore the changes seen in both of these urban hubs, especially when framed under the original plans of the Garden City movement. This shall be investigated by looking at land-use changes to public green spaces. Under Howard's original 1898 plan, the Garden City was envisioned as offering "Generous green space, including: surrounding belt of countryside to prevent unplanned sprawl; well connected and biodiversity-rich public parks; high quality gardens; tree-lined streets; and open spaces" (The International Garden Cities Institute, 2018). However, underlying mechanisms in both the UK and Japan may have complicated this utopian outlook; the re-positioning of Garden Cities as commuter hubs in the UK, and high levels of urban sprawl in Tokyo may have left Howard's original ideals subject to immense changes. Establishing a timeframe for this discourse, the ideals of the late 19th century were first implemented in Letchworth under Howard's watch in the early 20th century. The success of this experiment encouraged similar development in Japan with Den'enchōfu (hereafter referred to as DECF) and a second UK development with Welwyn Garden City (hereafter referred to as WGC) in the early 20th century. This trial and transfer of ideas contains an important element of this research question - one that will be explored through historical and chronological analysis.

Focusing this case even further - there is a wealth of historical planning documents (Lewis, 1913; Miller, 2010) and manifestos written by those involved in the movement of the Garden City (hereafter referred to as the GC). This means that the original ideals are well documented. Comparing these documents as thoughts frozen in time provides a solid base for extrapolating changes to their original intentions. The two urban centres both started with the same intentions, with a model exported from the UK to Japan, meaning that any subsequent changes should be stark. The exporting of this idea, especially considering the key role that prominent industrialists had in both cases, is another key element of the research question.

Thinking of this research question in terms of general variables, one can identify the following - Space, Time, and Subject. Space, in this context, refers to the geographical boundaries of DECF and WGC. This is a variable that has remained unchanged since the conception of this proposal. Time refers to the period between the original conception of these cities to the present day. This is a variable covering a large amount of time, yet must remain for a comprehensive approach. It will analyse the conception of the utopian vision, the transfer of the ideal from one country to another, the use of both cities, and the changes made to both sites since their inception. The final variable is that of the Subject. This will be the analysis of changes to the planned environments of these cities, using the changes made to green public spaces as a way of examining the divergent paths these cities may have taken.

By looking at these probable divergences felt since the start of development, the phenomenology of societal and historical differences at play between urban areas in the UK and Japan can be explored. Using these two case studies as examples can help underline comments about urban policy in Japan and the UK in general, as wider underlying mechanisms affecting the urban sphere will be visible. To avoid a purely descriptive approach, explanatory variables will be raised - namely the wider urban trends visible in both countries as identified in the literature review.

Therefore, in summary, the research question seeks to address the existence and nature of changes seen between two socially and historically distinct cities following the same planning model, viewed under the

lens of calculable changes to green space distribution over time. Chronologically identifying and addressing changes should, under the scope of this question, bring to light contradictions between the two case studies and the original plans of the GC ideal.

2.3. Hypothesis

The underlying hypothesis for this research is that a level of divergence will be visible, as it appears that a planning model rarely will be a one-size fits all approach. Especially considering the distinct socio-cultural and historical differences in urban development between Japan and the UK, in addition to the geographical differences between both sites, it seems reasonable to assume that some distinct gaps in the application of the GC model will be visible. Whether or not both cities have seen the same degradation to their public green spaces should be distinctly contrasting at the end of this research.

However, what implications and contributions to wider knowledge will this research provide? By exploring non-European examples (especially those following European urban planning), relevant questions regarding the ‘exporting’ of knowledge to cities that perhaps need a more tailor-made approach will be raised. This sort of insight is especially pertinent today as questions of sustainability plague policy-makers; questions of not just the applicability of green space but the relevance of the GC in the modern era.

This is not to suggest that there is a lack of understanding about these issues. There is plenty of English language literature written about GCs (e.g. publications from the International Garden Cities Institute, Peter Hall’s wide analyses of Howard) although usually framing it as a ‘historical development’ and not a living experience for residents nowadays. One could argue that it is problematic to treat such urban designs as frozen in time, and not evolving alongside other developments. Other studies have explored the degradation or preservation of green space - although rarely in conjunction with the GC. However, English-language studies of specific urban developments in Japan are limited, especially when placed in global contexts. For DECF in particular, genuine fieldwork carried out in this location is limited to Japanese-language academics. Secondly, WGC has been subject to a degree of academic attention, yet is often neglected in historical analysis in favour of other groundbreaking GCs (e.g. Letchworth), or other New Town developments (e.g. Milton Keynes).

Bridging the gap that exists between Western perceptions of Japanese urbanism, and the treatment of modern GCs as nothing more than historical remnants, means that there is a large amount of unexplored comparative research available. While the ideals of the GC have been reinterpreted in a modern landscape through questions of sustainability, modern GCs often feel shelved as curious experiments in urban planning. Hopefully, this research will also help identify the GC model as one that has relevance today.

3. Methodological Outline

Reflecting on the lessons gleaned from the literature review, the framework by which research will be carried out must, by nature, be cross-disciplinary. Only pursuing one strand, while likely to generate useful data, will unfortunately not present a comprehensive comparative analysis of the cases being studied.

For this reason, the methodology will act in the following manner:

- 1. Historical document analysis
- 2. Field observations
- 3. GIS mapping of green space

3.1. Historical document analysis

To outline these methods, one must start with the historical document analysis. By virtue of the forward-thinking nature of the GC concept, there are over 100 years of literature available on the evolution of the planning approach. However, considering the scope of this thesis, such an extensive amount of literature would be overwhelming, meaning that attention must be paid to specific elements. By comparing Howard's original text with city governance documents, a comprehensive picture of what extent both sites keep within the limitations of the original planning idea can be shown. Whether or not cities were laid out following the natural movement of people along a main trunk road, to whether or not they were designed to be self-sufficient, to whether they also encouraged Howard's reformist social ideals can all be identified and unpacked.

A variety of original materials have been obtained. In detail, these are composed of historic maps of both WGC and DECF, as well as access to online data banks with aerial photography of both sites. The methods used to obtain said documents differed greatly, and will now be touched on in some detail.

For historical maps, a number of different sources were used depending on the site in question. For WGC, pre-1950 Ordnance Survey maps are digitised and available to view on the National Library of Scotland website. These date back to 1899, in which a pre-developed plot of land is visible. Moving forward in time, the gradual growth and urbanisation of the plot is depicted. Unfortunately, said documents come with their own limitations, which are outlined later in this working paper. Additionally, OS records in the public domain only date back to pre-1950 documents, meaning a gap appears in the analysed timeline. This gap could be filled with more modern planning proposal documents available at the local borough archives in WGC, however this collection has been frustrated due to the ongoing COVID-19 pandemic. These are visible in the gaps in Table 1. This data gap ends in 1992, for which a physical paper copy of an original OS map has been obtained. Bringing forward the date to the current year, the updated 2019 OS data is freely viewable on their website with the creation of an account, which thankfully also includes a vector-mapped layer displaying current green spaces in the city. This means, considering all the material gathered, that a concrete picture of development in WGC over its lifetime can be assembled.

For DECF, the process of obtaining historical maps was somewhat more difficult, as land surveying in Japan is controlled nationally by the Geospatial Information Authority of Japan (*Kokudo Chiri-in*). Their archives are not available digitally, and require a *Permission of Access Request Form* to be delivered to the appropriate office. During the 3-week fieldwork trip to Tokyo made in January 2020, an appointment at said office was made, and through careful selection of documents using the in-house referencing system alongside a member of their staff, 16 photocopies were purchased. These range from 1919 to 2013, covering all decades, with variations of projection and scales obtained where necessary. The staff at this bureau were able to offer guidance regarding national surveying techniques for each period, and helped provide explanations for the somewhat archaic language used in the material. These historical maps are supplemented with the most recent publicly available map of the site in question, covering the year 2019.

These documents were additionally supported by landsat imagery. For DECF, this is accessible via the GSI website (Geospatial Information Authority of Japan, 2020). The inclusion of said photography, easily accessible online, needed to be matched by the case study of WGC to be truly useful in any comparative studies. For that, the necessary log-in details to access the JISC Geospatial Data collection (JISC, 2020) were obtained. This online GIS tool provides not only modern-day geographical use maps of the UK, but also a small collection of modern aerial photography. Through these methods, modern day satellite images of both cases were obtained in high definition. This allows for the sites as they stand today to be fully understood, aiding in the Field Observation section of the methodology.

For the purposes of highlighting not only the comparative method taken, but also the current gaps existing in the gathered resources, a comprehensive table outlining all the maps obtained so far is included below. Following these tables, some explanatory notes are included to help understand the terminology used.

NUMBER	NAME	YEAR OF ISSUE	PROJECTION	SOURCE
1	Hertfordshire XXVIII.SE	1899	OS 6 Inch	https://maps.nls.uk/view/101579427
2	Hertfordshire XXVIII.SE	1925	OS 6 Inch	https://maps.nls.uk/view/101579424
3	Hertfordshire XXVIII.SE	1948	OS 6 Inch	https://maps.nls.uk/view/101579421
4	Hertfordshire XXVIII.SEx	1950	OS 6 Inch	https://maps.nls.uk/view/101579418
Gap in the obtained documents for: 1950-1992				
5	Welwyn Garden City & Hertford	1992	OS 2.5 Inch	Physical copy
6	Welwyn Garden City & Hertford	2019	OS 2.5 Inch	https://osmaps.ordnancesurvey.co.uk/51.80379868,-0.20652643,15/pin
7	Welwyn Garden City & Hertford Green Space	2019	OS 2.5 Inch	https://osmaps.ordnancesurvey.co.uk/51.79868,-0.20958,16

Table 1: Collected maps for Welwyn Garden City, sorted by projection and year of publication

Table 1 shows the number of maps obtained, the official titles for each document, the year of publication, the given survey projections, and the sources used to acquire each object. Other than maps 5, 6 and 7 (which were sourced physically and through the Ordnance Survey official website respectively), the rest of the maps were all sourced using the National Library of Scotland's database. The projections described are useful in processing each map in GIS, as they radically alter the size and layout of each document. As should be noted from the table, the maps spanning 1899 to 1950 are produced in the OS 6 Inch format, in which boundaries are displayed somewhat further apart than in the 2.5 Inch projections for maps 5 and 6.

As is highlighted in the table, a sizable gap in the data exists between 1950-1992. As stated above, although efforts were made to contact those responsible for keeping records in the borough, this was ultimately impossible due to pandemic lockdown in the UK.

NUMBER	NAME	YEAR OF ISSUE/ JAPANESE ERA	PROJECTION
1	Den'enchōfu	1930 (昭5)	KYU-1-MAN
2	Den'enchōfu	1931 (昭6)	KYU-1-MAN
3	Den'enchōfu	1939 (昭14)	KYU-1-MAN
4	Den'enchōfu	1940 (昭15)	KYU-1-MAN
5	Den'enchōfu	1958 (昭33)	KYU-1-MAN
6	Jiyūgaoka	1985 (昭60)	1-MAN
7	Jiyūgaoka	2000 (平12)	1-MAN
8	Tokyo Seinanbu	1919 (大8)	2.5-MAN
9	Tokyo Seinanbu	1931 (昭6)	2.5-MAN
10	Tokyo Seinanbu	1932 (昭7)	2.5-MAN
11	Tokyo Seinanbu	1947 (昭22)	2.5-MAN
12	Tokyo Seinanbu	1970 (昭45)	2.5-MAN
13	Tokyo Seinanbu	1978 (昭53)	2.5-MAN
14	Tokyo Seinanbu	1987 (昭62)	2.5-MAN
15	Tokyo Seinanbu	2000 (平12)	2.5-MAN
16	Tokyo Seinanbu	2013 (平25)	2.5-MAN
17	Ōta-ku	2019 (令1)	1.5-MAN (MAPPLE)

Table 2: Collected maps for Den'enchōfu, sorted by projection and year of publication

Table 2 outlines the historical maps collected for the Japanese case study. Unlike in Table 1, in which a column dictating sources was provided, all Japanese maps were obtained from the local Tokyo bureau of the GSI. The maps are sorted by projection, which is transliterated from Japanese, sub-categorised by year of publication. The term '*man*' seen here refers to a scaling of 1/10,000, with *2.5-man*, for example, referring to 1/25,000. The term '*kyu*' refers to a former method of surveying no longer practiced. Dates are given in both Western and Japanese styles.

Below are two examples of the maps obtained. Both have been magnified and cropped accordingly to show the high-fidelity of the data being used.

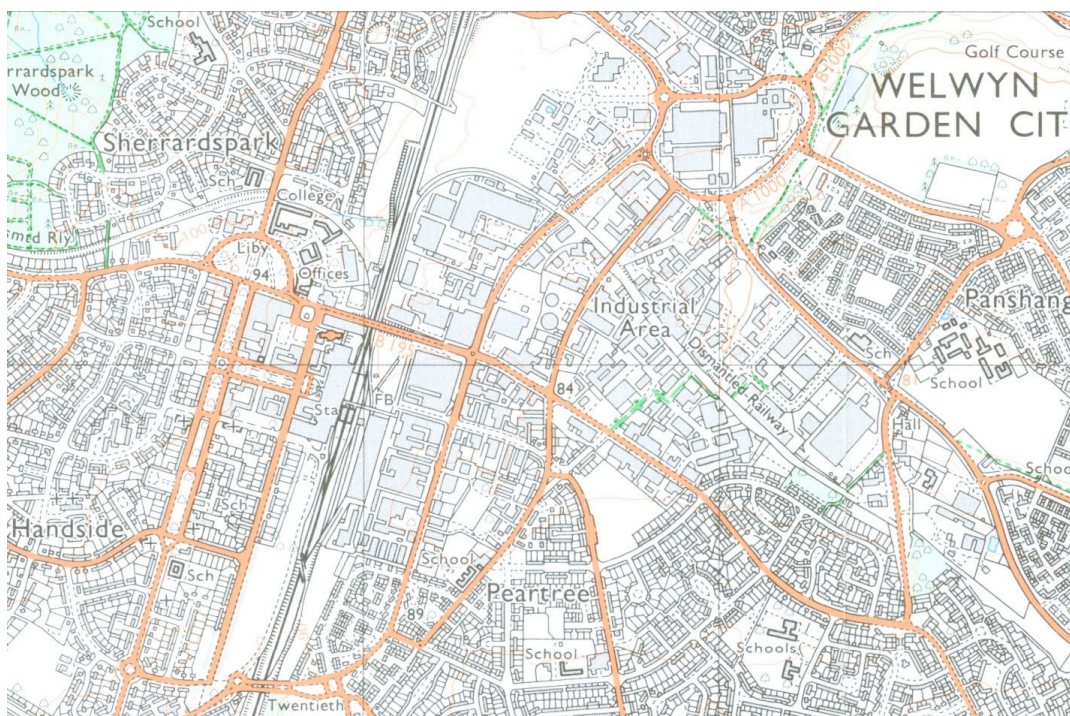


Image 1: A magnified and cropped element of Welwyn Garden City Map No.5 (Welwyn Garden City & Hertford, Ordnance Survey 2.5-Inch)



Image 2: A magnified and cropped element of Den'enchōfu Map No. 17 (Ōta-ku, 1.5-Man Mapple)

The subject of copyright must be addressed when using maps. For WGC, maps 1 to 5 are reproduced with the permission of the National Library of Scotland, under the terms of the Creative Commons license. Reproductions of maps 6 and 7 are permitted under the Educational License of the Ordnance Survey. For

DECF, maps 1 to 16 are reproduced following permission granted upon purchase at the offices of the Geospatial Authority of Japan. Proof of purchase is included in the Appendix of this paper (pp.90-91). Map 17 is reproduced following the Educational Licensing Agreement of Mapple, and has not been scanned in its entirety.

3.2. Field observations

Alongside historic maps, modern satellite imagery was also used. Basing assumptions of the city on these images, the carrying out of field observations of both sites revealed first-hand the extent to which they appear in the modern era. For this, time was allocated to visit both WGC and DECF, and gather primary research in the form of photography and mapping. This first-hand surveying was done in order to bridge the gap between qualitative and quantitative data generation.

For WGC, the initial observations took place on the 15th, 17th and 18th of December, 2019. Arriving at the site via car, and then transitioning to walking down the length of the main boulevard, written notes were supplemented with photography and field recordings. Using the field observation as an experiential study, initial impressions of the layout of the city and the presence of green space were noted. Furthermore, a LOMVUM digital laser measure was also brought to the site, for possible on-site measuring of local green spaces. While this provided some hands-on experiential understanding of the layouts and measurements of the green spaces visited, it also raised two issues. Firstly, the wider open fields, often with obstructing foliage and buildings, meant that clear measurements were difficult to take. Secondly, any measurements taken by hand ultimately are far less accurate than those provided either by Welwyn Hatfield Council, or by those available publicly over the Ordnance Survey measurements online. For these reasons, the usefulness of said approach was limited. However, the notes made during said observation (both written and voice-recorded) provided insight into the reality on the ground, away from the levels of abstraction found in surveyed maps; said notes were processed into a final observation report for use in the final thesis.

This procedure was similarly continued with the case of DECF, in which fieldwork was carried out on the 9th and 10th of January, 2020. Following the same pattern of observation and reporting as performed in WGC, fieldwork was carried out combining photography, written notes, digital laser measurements, and audio recordings.

Key examples of the photography taken at both sites have been included in this document. Furthermore, the written notes and audio recordings taken have been transcribed and included in the Appendix (pp.86-89).

3.3. GIS mapping

To supplement this qualitative analysis, it is necessary to carry out a detailed mapping of the current state of public green space in both cities. Using GIS software to generate data from the historical plans of the cities will highlight the original intentions of the planners. While GIS instruction as part of 4Cities has been limited to the Madrid semester, there is a wealth of instructional tutorials and videos available online (Gandhi, 2020), as well as previous academic papers outlining GIS methodologies by other researchers (e.g. Lahoti et al., 2019), which form a methodological basis for this work. This section of the working paper

will expand upon the methodologies being used as part of this process in detail. All GIS mapping described below is using the open-source QGIS 3.10 software; while other web-based or paid items are available, there is enough supporting information to allow for proper usage of GIS mapping with open-source options.

Firstly, digitised versions of the historic documents were created. Whether through high-resolution scanning of physical documents, or through the careful selection and downloading of publicly-available online maps, a set of digitised documents spanning the timeframe analysed will be prepared.

Upon digitisation, the documents were imported into QGIS as raster layers. Each digitised map was imported separately using the in-built georeferencer plug-in. As the base map being used in this methodology is imported from OpenStreetMaps (due to not only its global coverage, but also the fact it is updated regularly), issues arose with different projection scales. To compensate for this, the in-built georeferencer function of QGIS allows for recognisable features of any imported raster image to be pinned to current features visible on OSM. As an example, while images of early DECF are lacking the urban density of the current site, some roads, parklands and buildings are recognisably unchanged. Selecting said sites and referencing them back to the current day projection of DECF allows for the raster image to be warped and stretched in such a way that it fits neatly above the current day map. Naturally, the original projection of any imported digitised map must also be inputted; luckily these projections are listed alongside all material gathered during the research thus far (QGIS also provides a wide selection of projections used only in Japan). The final output from a georeferenced raster layer is that the scanned map will appear warped, as it has been distorted to fit one projection from another (see Image 3 on following page).



Image 3: Example of georeferenced map overlayed onto a base OpenStreetMaps projection. This raster layer has been given a transparency of 60%, for readability.

Upon a succesful layering of the historic map as a raster image upon the base OSM map, the image was exported and saved as proof of working. Moving to the next step, two vector layers were created overlaying the raster image. The first vector layer used line vectors to delineate the boundaries of the given area. These were based on current administrative boundaries in order to provide a constant range of analysis. These were boundaries provided through the OpenStreetMaps information tileset, which is a much more flexible measure when used with GIS, as opposed to, for example, electoral boundary information. Said boundaries are shown using a heavy red line (Image 4 on following page), which is plotted by hand. The total areas of both boundaries are described in detail in the GIS Analysis portion of this paper.

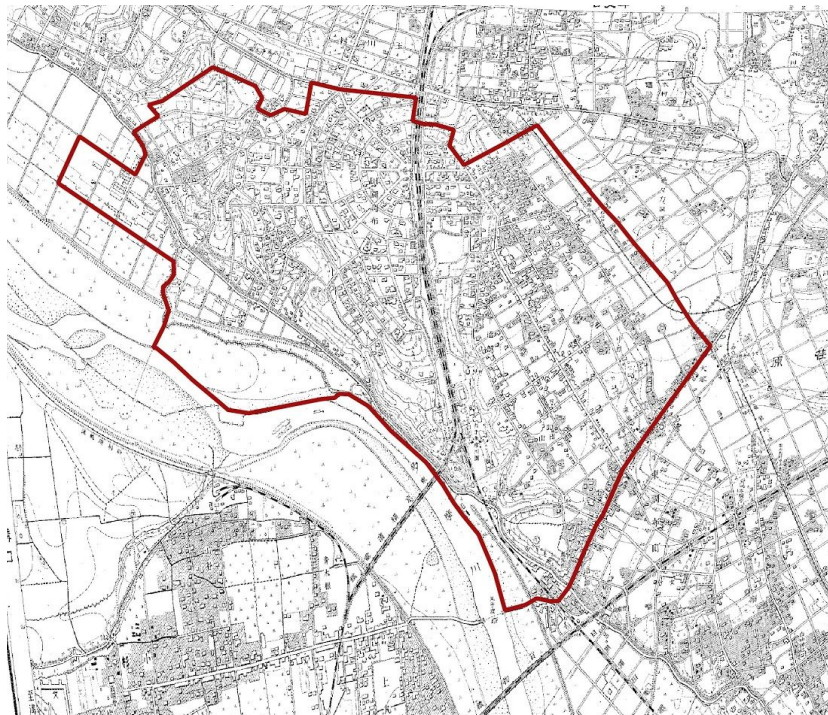


Image 4: Boundaries delineated using a line vector layer.

Onto this delineated map, a new shapefile layer using polygon vectors was created to highlight green space. This creates a digitised view of the dispersion of green space in the sites studied.

While modern-day maps of both sites clearly state the different categories of land use in the legend, historic maps are far less likely to be so thorough in their explanations. Some collected historic maps of WGC, for example, clearly show both farmland and forested land, yet are unclear about the land use of pre-developed spaces. This raises the question of how much scrutiny surveyors paid to land-use at said time; the only way to certifiably perform correct vector mapping was to follow the legends of all maps collected, despite any gaps in their own measurement. For modern maps covering time periods in which aerial photography is also available, land use was double-checked against existing photography of the site. Following this method, the typologies of green space were expanded upon for each map presented. Upon finishing said vector mapping, the finished map was saved and once again exported as an image for proof of working (Image 5 on following page). This green space mapping is a hand-drawn process, by which vectors are traced over the documents in

use. As a result, this is not only a time consuming method, but also relies heavily on the accuracy of the source material.

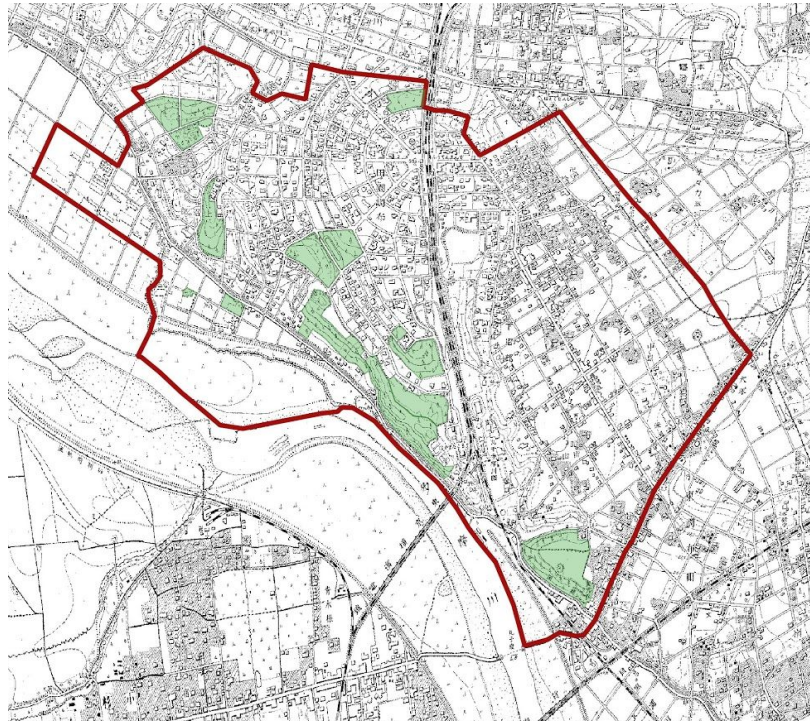


Image 5: Green space highlighted through a polygon vector layer.

These complicated steps bring the research to an interesting point, in which the identified green space is digitised in such a way as to be exportable as textual data. This means that, by using simple in-built functions in QGIS, highlighted vectors had their total area calculated instantly. This production of quantifiable data along the timeline for both cities generated interesting results, allowing for quick recognition of any changes. While gaps still exist in said methods (as the collected datasets are still less than comprehensive), the generated data was extremely useful for in-depth comparisons. Additionally, any generated data can be double-checked alongside official land-use or development plans for both sites; any visible discrepancies can be corrected or addressed as necessary.

The eventual goal of said GIS mapping was the creation of an easily-understandable dataset, allowing for visual representation in a comparison table. This part of the methodology, therefore, brings the chronological approach from the original historic plans forward to the modern day.

4. Comparative Data and Chronology

The following two tables have been constructed via reference with the literature review. For the purposes of understanding the context in which the relevant reading was undertaken, the following two tables lay out key information about the two sites under study.

Table 3 includes details about both case studies as they exist today, with key facts that readers may be unaware of. Understanding these crucial details, and appreciating the urban landscapes in which both cases exist, should help contextualise and frame the findings of the following literature review. It is presented on the following page

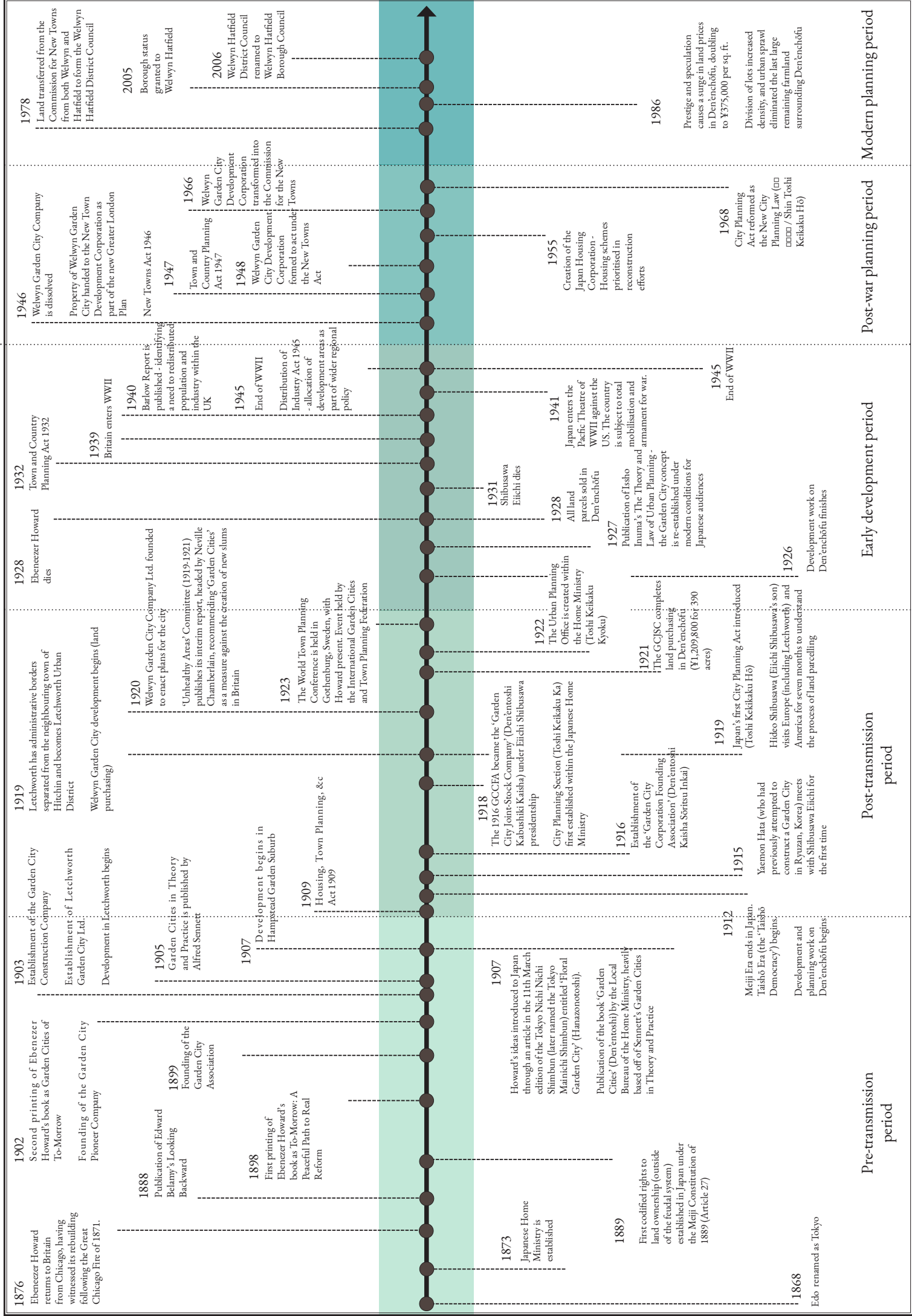
	Welwyn Garden City	Den'enchōfu
Date of founding	1920 ¹	1921 ⁹
Current population size	46,619 (2011) ¹	21,700 (2020) ¹⁰
Current area (.ha)	1400 (including surrounding rural developments) ¹	284 (only counting residential districts) ¹⁰
Current population density (km2)	* 3,681 people/km2 * (2017) ²	8,807 people / km2 (2015) ¹¹
Current local administration	Welwyn Hatfield Borough Council	Ōta-ku Ward Office (大田区 / Ōta-ku)
Local administrative boundary size (.ha)	12,954 ha ³	5,046 ha ¹²
Distance to capital city	44 minutes by car to London Kings Cross station ⁴ 28 minutes by express train to London Kings Cross ⁵	19 minutes by car to Tokyo main station ⁴ 24 minutes by metro/rail to Tokyo main station ¹³
Accessible train lines	Great Northern Rail ⁶ Thameslink ⁷	Tōkyū Tōyoko Line (東急東横線 / Tōkyū Tōyoko Sen) ¹⁴ Tōkyū Meguro Line (東急目黒線 / Tōkyū Meguro Sen) ¹⁵
Average house price	* GBP £389,102 (2018) ⁸ (= USD \$471,142)	JPY ¥113,260,000 (2020) ¹⁶ (= USD \$1,056,954)
<p>* Unfortunately as both sites now fall within wider urban administrative areas (Welwyn Hatfield Borough Council and Ōta-ku Ward respectively), information marked with an asterisk refers to data gathered regarding the wider area.</p> <p>¹ The International Garden Cities Institute 2018 ² Office for National Statistics, 2019 ³ Welwyn Hatfield Borough Council, 2019 ⁴ Calculated using : https://www.distance.to/ ⁵ Calculated using: https://ticket.greatnorthernrail.com ⁶ Great Northern (2020) ⁷ Thameslink (2020) ⁸ Welwyn Hatfield Times (2018) ⁹ Oshima, K. (1996) ¹⁰ Ōta-ku (2020) ¹¹ Tōkyō no Tōkei (2015) ¹² Ōta-ku (2016) ¹³ Calculated using: http://transfer.navitime.biz/tokyu-eng/pc/transfer/RailwayMap ¹⁴ Tōkyū Railways (2020) <i>Tōyoko Line</i> ¹⁵ Tōkyū Railways (2020) <i>Meguro Line</i> ¹⁶ At Home (2020)</p>		

Table 3: Comparison chart of both sites (this author, 2020)

The following table was constructed using the findings of the literature review. However, for ease of understanding, it has been placed ahead of the literature review, in order to provide reference for the dates

and documents being discussed. This table shows the evolution of both sites, with references to the people, policies and organisations that were involved as key actors in both sites. Rather than showing said actors in a stakeholder map usual of such urban analysis, the historiographic nature of the approach taken in this paper lends itself far more to a timeline, in which the two concurrent evolutions can be directly compared alongside each other.

On the following pages, a large timeline has been constructed, as informed by the literature review. This diagram not only presents all the pertinent points in time during the evolution of both sites, but also is split into key periods. These periods are explained in detail later in this paper. This timeline should be referenced in understanding not only the growth of both sites, but also the key actors and stakeholders at play, as well as the methods by which the GC ideal underwent transfer.



Pre-transmission period

Post-transmission period

Early development period

Post-war planning period

Modern planning period

5. Literature Review

Since the original state of the art, a primary strand of research undertaken has been a thorough literature review. Dividing the available literature into thematic strands has allowed for a wide collection of targeted readings to take place, although, naturally, much of the established literature reaches across multiple disciplines and fields. The pertinence of secondary research, especially regarding a research question that focuses so deeply on historical narratives and changes, affords this author a large body of work on which to draw experience from. As previously mentioned, there has been in-depth academic analysis and critique of the GC ideal from previous researchers, and although light has been shone on both cases in the UK and in Japan, there has been little English-language research examining the transmission or connection between both geographically disparate examples. By studying the existing literature, and drawing bridges between established work, the boundaries surrounding this paper can be made clear; not only will existing questions be answered, but gaps in the established knowledge will also be identified. This literature review, therefore, will move thematically through the appropriate readings. Beginning with texts that have informed the research question of this paper, the GC will next be examined. Moving on to readings concerning the two case studies, WGC and DECF, a wider look at both British and Japanese urbanism will be examined. Finally, readings relating to the methodology, including green space usage, the use of GIS as a research tool and the themes of transnational policy sharing will be addressed. Each theme, after the readings pertaining to which have been discussed, will then be clarified in turn by comparisons and analyses drawing from the texts. In this manner, this literature review will systematically identify the key themes, moving forward in progression.

5.1. Readings addressing the research question

Beginning with Fischer and Poortinga's *Addressing methodological challenges in culture-comparative research* (2018), an issue became apparent. Namely, that a general comparative approach between two cities, that, while following the same development plans originally, are ultimately vastly different examples of urban life, may in fact be too ambitious for a MSc research paper. Their paper outlined the inherent fallacies and biases that are all too common in cross-cultural research; the instinct to explain away underlying differences between disparate groups of people as simply 'cultural' can create false-positives and neglect to formulate scientifically robust approaches. The 'assumption of interchangeability' that comes with cross-cultural approaches means that observed differences could come from a myriad of unobserved variables, with culture being one of the few that is not subject to manipulation by a researcher. In short, this can often result in un-testable reasoning and circular logic. For the study of WGC and DECF, this means that factors common between both cases must be prioritised as analytical points ahead of any inherent cultural differences. Therefore, as outlined in the Research Question section of this paper, it was crucial to move towards one clear object of study - green space. This follows Fischer and Poortinga's own recommendations for increasing the robustness of any cross-comparative approach, in which the necessity for 'operationalising theoretical predictions' (through specific cases and clear study protocols) was underlined.

A key paper in understanding the transmission of ideas (or 'policies') is Peck & Theodore's 2010 article entitled *Mobilizing policy: Models, methods and mutations*. Their theories, in which the movement of

policies need to be considered as inherent ranges of mobility and mutation, rather than the transactional nature of simple 'transfer' between actors, underlined the multi-faceted and complex way in which ideas evolve. They criticise the academic orthodoxy of understanding ideas as being exported from an area of 'superior performance' to one of less, disparaging the way in which previous work has strictly been limited to 'ex post facto evaluations of successful transfers'. In other words, ideas rarely arrive as guidelines to be replicated in their entirety, but rather as models that are already experiencing transformation due to the process of transmission; the nature by which an idea is made possible to be transferred installs an inherent feedback loop by which transferral in turn influences the idea. Their writing shifts the discourse from 'reproduction' to 'replication' - ideas and policies have their gaps filled in and are mutated by the context to which they are delivered, outside of those available to the original creators. For the GC concept, this suggests that DECF will naturally show implicit elements of Japanese urbanism in place of typical British approaches, as a means of ensuring a smooth transition to a new urbanist approach. They expand on this by stating:

'Policy models that affirm and extend dominant paradigms, and which consolidate powerful interests, are more likely to travel with the following wind of hegemonic compatibility or imprimatur status.'

This refers to the prevalence of large organisations or powerful individual actors in spreading ideas and policy; the GC concept, as will be shown later in this paper, was propelled and exported by key industrialists, echoing this statement. This, in turn, references an article by McCann & Ward (2010), in which the 'persistent tension' between fixity and motion in policy regimes is explained. The need for actors to act as the engine behind a given idea, and the need of recipient actors to receive and integrate said idea, is a relationship on which this paper is based. How can one understand the evolution of the GC ideal towards the current day without truly understanding the way in which it was 'fixed' by recipient actors?

Therefore, in summary, the research question of this paper aims to intertwine these two concepts. Fisher & Poortinga's 'operationalisation of theoretical predictions' (by which the robustness of cross-comparative approaches can be refined under clearly defined research criteria) is combined with Peck & Theodore's 'mutational model' (by which the study of mobility in policy sharing is approached in a multi-layered manner). These two research approaches lead this paper to not only focus on the identifiable variable of green space in GCs, but also to reflect upon the activity of actors and organisations in the spread of the GC ideal. The comparative approach undertaken by this thesis keeps both research approaches at the head of any findings made.

5.2. Readings addressing the Garden City concept

The first aspect to consider, moving from a wider perspective to a more nuanced analysis of the case studies, was the GC movement as a source of ideological planning perspectives. One reading of note was Peter Hall's synopsis of GCs, found in his 2014 book *Cities of Tomorrow: An intellectual history of urban planning and design since 1880*. Indeed, the whole of Chapter 4 of this book - titled *The City in the Garden* - outlined the beginnings of the GC movement, with particular attention paid to the individuals and organisations that mobilised such a radical approach to urban planning. This descriptive approach, relaying the historical narratives that opened the gates to creative problem solving, informed the construction of the timeline found previously in this thesis. Hall pays particular attention to the fact that, while the GC was formulated

in Britain by Howard, he himself was influenced by prior thinkers and writers. The transactional nature by which the GC was exported from Britain to Japan, as studied under this research question, was itself a product of prior idea transfer - a fact that cannot be forgotten moving ahead with the research. From Ward Richardson's 1876 pamphleteering in Chicago to the pre-Fabian humanist discussions of the Zetetical Society, Hall makes it clear that Howard's prominence as a radical thinker was, in effect, a result of his position as a conduit through which late-19th century Anglo-Saxon dissent amalgamated. Interestingly, Hall disagrees with the current perception of Howard; considering him more concerned with the ideology of reform than with the physical dimensions of urban planning - '[He was] much less interested in physical forms than in social processes'. This dimension, in which radical Kropotkinesque communitarian ideals are re-packaged in a way more palatable for 19th century British statesmen, reveals one of the more compelling aspects of the GC as opposed to other forms of early urban planning - that it was, fundamentally, a socially radical approach. Indeed, Sutcliffe, in *Towards the Planned City* (1981), describes how the concept was 'assembled' by combining elements of 'christian socialism, land reform, the arts and crafts and anarchist movements'.

Hall then goes on to re-examine the fundamentals of the GC ideal - looking at population sizes, urban dispersal, and residential footprints. He refers back to Howard's original plans, and then moves towards the ways in which they were (mis-)understood both in Britain and abroad. Looking first to the exporting of the idea to Europe, with the Cité-jardins in France and the Waldsiedlung in Germany, he then briefly touches upon the transmission of the ideas further afield. Unfortunately, perhaps due to English-language biases, much is made of the efforts in repackaging the GC for American and Australian planners; due attention to the exporting of the ideal outside of Anglo-Saxon discourse is neglected. The case of Japan is given only a brief mention, leading this author to look elsewhere, as will be discussed later on.

Hall's clear and concise writing is his major strength, especially regarding the historical narratives producing this reformist planning approach. Indeed, the unpacking and analysing of Howard's original text, *Garden Cities of To-Morrow* (1902), presented from a modern perspective, allows the reader to have concrete examples showing how Howard's ideas were properly realised. Hall outlines, as touched on the Problem Statement of this paper, how Howard's ideas can truly be considered 'utopian'. Taking influences from both the current trend for early science fiction literature during the period in which he worked (Edward Bellamy's *Looking Backward*, 1888), and from other writers at his time (Peter Kropotkin, *Fields Factories and Workshops*, 1898), Howard's vision was one of harmony and of eradicating social ills. This was - to use Thomas More's 1516 neologism - by definition a utopian aspiration.

In this way, it was crucial to re-examine Howard's original plans as outlined in *Garden Cities of To-morrow* (1902), originally published in 1898 as *To-Morrow: A Peaceful Path to Real Reform*. It goes without saying that a re-reading of Howard's utopian vision helped emphasise the importance of green space to the proper functioning of a GC, something that influenced the methodology of this paper. His ideals of a city of 32,000 people having 5/6ths of the area of their city being green space is instantly knowledgeable as having been disregarded in the actual praxis of founding the two cases being studied here - although he himself acknowledged that these parameters were "merely suggestive, and will probably be much departed from". Using Hall's interpretations as a reference in reading Howard's work, especially in regards to the ways in which remnants of his original proposals are visible in the modern axial sprawl emanating from London across Hertfordshire (incorporating New Towns in addition to GC), the long-lasting and forward-thinking proposals of *Garden Cities of To-morrow* are solidly justified. The green belts and 'Inter-Municipal Railway'

(i.e modern electrified inter-city light rail) as visible in Howard's original diagrams are both immediately visible in the cases studied today, and are shown in Image 6..

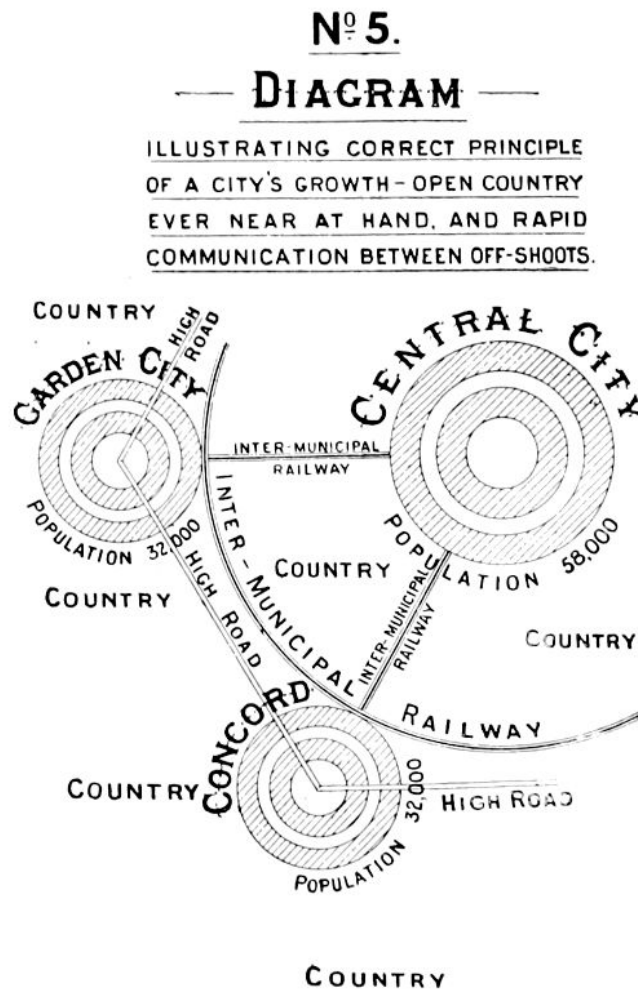


Image 6: 'N° 5 Diagram: Illustrating correct principle of a city's growth - open country ever near at hand, and rapid communication between off-shoots' from Garden Cities of To-Morrow (Howard, 1902)

For a more modern understanding of how these parameters are set and measured, the information available from the International Garden Cities Institute has been crucial in the evolution of this literature review. Their publications address the ways in which Howard's ideals are being reinterpreted and delivered in modern day urban developments; they serve as a source of information for cities around the globe to connect and share interdisciplinary information in following his original vision. They outline a number of cases of current GCs across the globe, and publish perspective papers and think pieces on the relevance of the planning ideal regularly. However, their list of global GCs is limited to 30 of 'the most important and relevant Garden Cities'; they seemingly limit their scope to only the creme-de-la-creme of cases, focusing on those with either worldwide recognition or those that they, being an organisation based in the first GC of Letchworth, deem to be adhering to Howard's initial plans. Despite this limitation to their global perspective, their publications do make reference to both WGC and DECF, which, for the purposes of this thesis, have been useful in establishing a preliminary foundation from which to expand outwards. One specific perspective paper - *Garden Cities - Visionary, Popular and Viable?* (Parham, Downs & Murray, 2018), recontextualises the initial proposals outlined by Howard under a modern 21st century framework.

By both examining the elements of GC planning that have proved themselves long-lasting and applicable even by today's standards, and addressing gaps in the initial proposal that would need reworking to fit current British planning paradigms, the paper essentially re-evaluates the potential of the GC ideal. Interestingly, with (albeit significant) changes made to the master-plan and organisational framework of this planning approach, the IGCI reaffirms the applicability of Howard's ideas. Criticism of the current status quo in urban approaches, with heavy-handed reliance on 'technological fixes', is paired with a fair assessment of the ways in which the GC could be made to be an economically (as well as socially) viable model for today. Attention is paid to the way in green space, acting along urban transects, could further influence this approach, stating that there is a need for - "Generous green space linked to the wider natural environment, including a mix of public and private networks of well-managed, high-quality gardens, tree-lined streets and open spaces".

This reaffirming of the inherent positives in this urban plan, and not simply considering it a historical artefact rooted in a 19th century reformist era mindset, shows that attention is still being paid not only to the creation of new GCs, but also to the importance of maintaining those we are currently blessed with.

Interestingly, the Town and Country Planning Association, in their 2017 book *The Art of Building a Garden City*, follow the same intent as the IGCI in promoting new GCs. This book, which frames the development of the GC within wider planning narratives of British urbanism, was co-produced with the Royal Institute of British Architects. It focuses less on the transmission of the GC ideal across the global scale, and instead focuses on the national policies that helped define the movement in the UK. The well-explained manner in which this evolution was framed places the development of WGC within the wider discourse of British planning - innovative self-build plots and Community Land Trusts (CLTs) define the historical growth of the city as particularly remarkable from an architectural perspective. The book looks to the future, recommending the development of new GCs as a way towards sustainable living.

Finally, regarding GCs as a general theme under discussion in this section of the literature review, this author found that using Yamamura's work on *Regional planning in Great Britain* (1982) helped ascertain the applicability of the GC model to a Japanese context; his timeline discussing the transition of the GC from Britain to Japan was of the utmost importance in the production of a clear timeline of idea transfer. Yamamura's article, examining the timelines by which the GC ideals developed in both the UK and Japan, with particular attention paid to the various institutions and stakeholders involved (many of whom seem to have undergone multiple name changes during the short periods in which they were active), shows the multiple levels of ordinance and administration involved during the implementation of this radical planning approach. He, similar to Hall, presses the issue that the GC concept cannot be fully realised through the creation of individual developments existing among cities in a country that continues to pursue the status quo of urban infrastructure; the GC was always meant to be understood from the perspective of regional-scale planning, with multiple cities interconnecting and networking to form a dispersed 'social city'. However, as Osborn and Whittick mention in their 1963 work *The New Towns - The Answer to Megalopolis*, this interconnectedness between multiple GCs was not something that Howard himself ever dedicated too much effort towards during his lifetime, instead focusing on the creation of exemplary individually-planned cities. While WGC has both more recent New Towns and the first ever GC - Letchworth - nearby, both our cases can somewhat be understood as missing this element of the 'social city' as first posed by Howard. Lacking interdependence and connectivity with other radial GCs around a larger metropolis, they lack a dimension that would have, at least under Howard and Yamamura's perspectives, increased quality of life and maintained the other defining characteristics of GC planning through a

reduction in reliance on the larger city on which they would orbit. It is this lack of numbers of networked GCs that Yamamura points to as a reason for why, at least in the Japanese case, he describes DECF and the various other New Town housing developments in Japan as having become 'bed towns'.

Finally, for this section, it is key to open up this literature review to voices more critical of the implementation of the GC ideal. Hügél's 2017 work - *From the Garden City to the Smart City* - uses the perceived failures of Howard's work to underline possible cracks in the theoretical armour of the Smart City concept. Studying the GC under a modern lens in this manner affords it a critical voice in present-day city planning; Hügél succinctly defines the failures of the GC. One of those he addresses is that Howard, while having the skills to present his theories in a popularly consumable way, lacked the ability to synthesise said theories into a comprehensive approach. His pragmatism, focusing on the quick establishment and showcasing of an example GC (with Letchworth), unfortunately meant his theories lacked the proper degree of synthesis and stayed somewhat 'loosely defined'.

This is striking for a number of reasons - Hügél's main criticism of Howard's work seems to be that his overarching theories were somehow undermined and repackaged as urban planning when, in his view, they would be more suited to a concretely organised social theory. Framed as such, it is clear that Hügél understands the GC as less of a practice of urban planning, and more of a mechanism of total reformism against the status quo in Britain at the time. However, as tempting as this viewpoint is for a critical reader, it fails to examine individual cases and the ways in which this theory was practiced. Hügél pays a lack of attention to the physical dimension of GCs, and the way in which theory was fixed spatially.

In summary, the readings examined surrounding the GC present a multi-layered picture. The original text by Howard, while clearly written, is made all the more approachable under Hall's study. The narrative that strikes this author, considering the long time frame being studied, is that the conception of the GC ideal was one of radicalism and innovative thinking. However, moving forward, seeing the GC as understood by the IGCI and Yamamura, shows the repackaging of such radicalism into a conventionally approachable set of ideals; guidelines that could inform current planners without having to address the hard-hitting social reformism of Howard. Finally, this narrative is brought to the present under Hügél, who not only addresses this repackaging, but also draws parallels between overarching urban planning approaches that combine spatial and social change to achieve grander visions - i.e. the ultra fashionable trend of 'Smart Cities' in today's world. Seeing this historical narrative through the readings allows this research to frame any changes that may have occurred; will the more radical ideas of the early GC be reflected in more radical spatial management? Likewise, will the repackaging of said ideas into more moderate, socially acceptable guidelines reveal itself in less drastic changes being made later in the timeline? These questions will be addressed only through detailed study of both cases.

5.3. Readings addressing Welwyn Garden City

Therefore, the next two themes to be identified are readings regarding the cases being examined. Both WGC and DECF have been subject to useful analysis. For WGC, it is important to establish a general overview of the site, especially considering the comparative approach that acts as the crux of the research. Before delving into more academic work, a general overview of the town was outlined using easily-accessible websites - the previously mentioned International Garden City Institute have a short briefing page on WGC (*Welwyn Garden City*, 2018), that outlines the history and key figures relating to the settlement. This information

was useful in the creation of the short comparison chart presented previously. While the scope of this thesis aims to avoid a simple descriptive analysis, another theoretical trap that may hamper results is the attributing of changes or divergences between both sites to deeper cultural or socio-historical differences, when, following Occam's Razor, they may just as easily be attributed to geographical or spatial contrasts. For that reason, it is important to understand the basic attributes of WGC; these are outlined in the table previously mentioned.

Key elements of the site that are of particular interest to passers-by are not only limited to those typical of a GC, such as the central axial boulevard rare in other British towns, but also to the standard of architecture found throughout. Designed by Louis De Soissons, a celebrated French architect active in turn of the century Britain, the houses in the central residential zone of the town are typical of the Neo-Georgian style, with distinctive porticos and sash windows. While other, more modern and experimental styles of building are also found (used to project the economical and forward-thinking ideals of the movement to any potential visitors or investors) (New Town Herts, 2017), the majority of the residential properties remain unchanged and well-kept. One of the established structures for ensuring this aesthetic consideration is the Welwyn Estate Management Scheme, which is touched on below. Additionally, the original De Soissons studio remains in operation on the site, offering renovations and alterations to the properties in keeping with the style of the area (Louis De Soissons, 2020).

General information relating to the site was also reinforced by the work undertaken by Alan Cash, a local resident who has collated key historical texts relating to the site on his personal website (Cash, 2015). His passionate approach to collating and organising disparate texts relating to the site helped bridge the theoretical progression between texts aimed at the layman and those aimed at academics. In particular, his Welwyn Garden City Citizens handbooks (1946-1948), show the reignited post-war interest in the site as a place of social change; many were looking to the top-down reformist planning of the area as a panacæa to the shortage of housing following the war.

Finally, it should be mentioned that as of April 2020 (during the writing of this paper), WGC is celebrating its centenary. While a number of publications and events were planned (WGC100, 2020), the ongoing situation with the coronavirus pandemic in Europe has cancelled much of the output scheduled for this occasion. However, this centenary has brought renewed interest in the site, with articles from the BBC (BBC, 2020) and a new bronze sculpture of Ebenezer Howard commissioned for the central civic space of the town (WGC100, 2020).

Moving on from a general reading, the historical narrative of the GC first examined in Howard's text needed to be shown in use. Reiss' 1920 text - *Welwyn Garden City* exemplifies the ideals of GCs being deployed in the real world, with the model of praxis being the case study of WGC. Written mid-development of the town, for *The Town Planning Review*, Reiss provides a synopsis and overview of the project for the general reader, writing in an approachable and easily-understood style. Attention is specifically paid to elements of development work that may have been more familiar to laymen of that time, with particular focus on financial concerns for land purchasing (talking in terms of 'low prices' and 'excellent sites') as well as geographical factors that readers would recognise (e.g. distance from London, local rivers and topological landmarks, nearby transport links).

Reiss' work provides an interesting perspective into the understanding of GCs at the time of their development and promotion, and, by virtue of the time period in which it was written, affords the readers

an in-depth look at the levels of work being carried out on the site. He lays out key facts regarding land area and projected population for the site, but more interestingly reveals a key mechanism of Howard's original plans. Considering the need for private investment in developing said sites, Howard was keen to outline the ways in which profitability could be assured even through reformist planning, with emphasis on the purchase of cheap agricultural land that could then be developed and provide a return. This theory is categorically practiced in the case of WGC, in which Reiss explains how land was purchased at £40 per acre (approximately, counting for inflation, £1,800 in today's prices). This, compared with the cost of agricultural land today - averaging at £6,979 per hectare in 2019 (Knight Frank, 2019)- was not only a cheap price considering the location, but shows the scale by which returns on investment could be secured through development. Reiss finishes his article underlining this financial concern, stating - '[...] that while the scheme is ambitious it is being proceeded with on sound business lines and, despite the difficulties due to the high cost of materials and of money, those who know most of the scheme are the most optimistic.'

Despite this need for private investment, Reiss reveals that there was, surprisingly, a certain level of governmental interest in the practices of GC development. As shown in the timeline, the 'Unhealthy Areas' Committee, presided over by subsequent Prime Minister Neville Chamberlain pre-infamy, published an interim report in 1920 outlining ways in which slum-creation could be curbed in Britain. This committee report highlighted the use of GCs as a method by which the connection between housing, transport and industry could be strengthened, recommending their construction. While, unfortunately, WGC stands as the last GC to be constructed in Britain, it is remarkable to note that the ideals on which it was developed were the same ones being promoted by Members of Parliament.

Moving onwards from a historical perspective, and examining issues currently being addressed by the local authorities in WGC, one useful primary source has been the output of Welwyn and Hatfield council, especially in regards to the treatment and preservation of green space within the city. Conway's 2009 report (*Assessment of Open Space, Sport and Recreation*) influenced the decision to choose this particular element of study as a way of understanding the current day GC. The assessment, presented in the form of both survey results and advisory comments, was created for internal use for the borough authorities of Welwyn and Hatfield. While it is not a specific document for WGC as a distinct administrative unit, it does offer plenty of usable information pertaining to the management and preservation of green spaces.

One issue that is raised upon initial reading of the research question for this thesis is how, precisely, green space will be classified and identified. This reading helpfully outlines the various categories and subcategories of green space classification used by local authorities in the UK, and clearly targets the ways in which said categories should meet established criteria. These definitions were based on a national UK land-use policy document, entitled *Planning Policy Guidance note 17: Open Space, Outdoor Sport and Recreation* (2002). This is referenced later in this literature review, under the examination of how green space has been defined in the readings. The categories of green space (as judged by Welwyn and Hatfield Borough) are as follows:

- Allotments
- Amenity green space
- Natural green space
- Parks and gardens
- Provision sites for children and teenagers
- Outdoor sports facilities
- Green corridors
- Cemeteries and churchyards
- Civic spaces

These criteria, judged by Conway and the assessment team, were mapped across the whole borough and tested against citizen needs and wishes. In total, 78 sites within WGC were identified, out of the 216 in the whole of the borough, from which 24 areas of natural and semi-natural green space are found (including a European designated Special Area of Conservation (SAC), 5 sites of Special Scientific Interest (SSIs), and 9 local nature reserves).

The survey carried out by Welwyn and Hatfield Borough only looked at ‘publicly accessible areas of natural and semi-natural green space’, as ‘private areas offer no leisure or recreational value to residents’. This results in many of the sites being concretely defined as being owned by public bodies, such as Welwyn Hatfield Borough Council (Sherrardspark Wood), Hertfordshire County Council (Tollgate New Woodland) and local Parish Councils (Home Wood). This, however, raises an interesting UK-specific question regarding the privatisation and parochialisation of green space - namely that of legal Rights-of-Way agreements and public footpaths. Acting in conflict to the UK’s historic precedent for large scale privatisation of space, the legal enshrinement of public Rights-of-Way across private land has allowed for access to green space in land that otherwise (especially in comparison to some other countries) would be closed off. It should be of note that similar public footpath agreements exist in the case of Japan too - where all paths are considered public and can be constructed with the consent of a landowner (The Japan Times, 2009). While allowing increased access to otherwise unreachable green space for urban residents, it does raise an interesting question - to what extent can said publicly-accessible private land be considered green space under the same criteria as, for example, public parks? For Conway and the team at Welwyn and Hatfield Borough council, sites with public footpaths crossing them were incorporated into their research, however ‘private sites with informal public access (i.e. not formally agreed through schemes such as the Forestry Commission’s Walkers Welcome agreement)’ were excluded on the basis that permission to access is a transient agreement that is subject to withdrawal at the landowner’s will at any time.

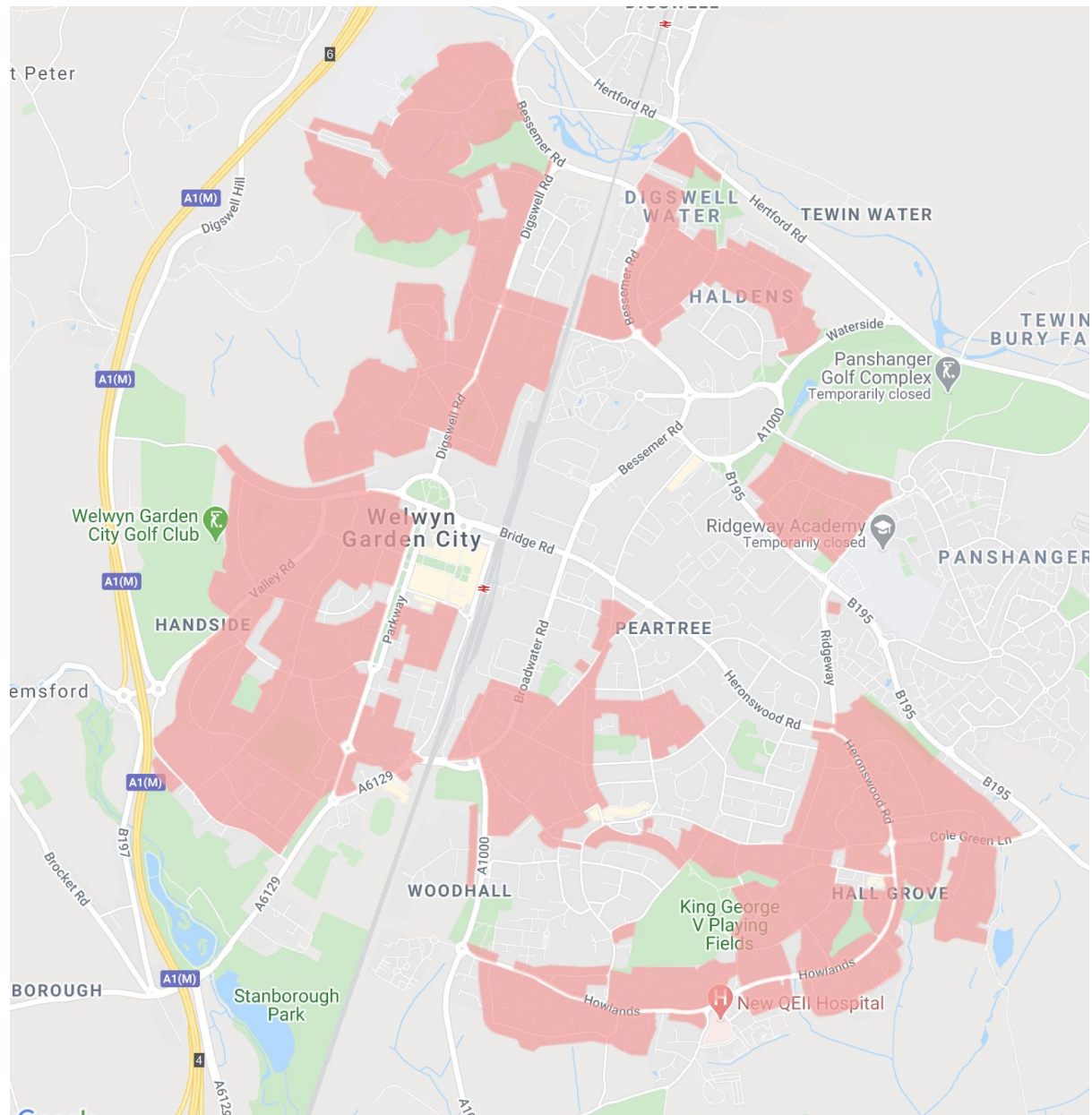
Finally, and perhaps most significantly for this research, Conway provides his suggestions and summaries of green space as it is distributed throughout the borough. He discusses how ‘green spaces are an integral part of the urban form’ of WGC owing to its status as both a GC and a New Town. He notes that there is ‘particularly good provision’ of green space, with most residents able to access allotments, amenity green spaces and outdoor sports facilities easily. He notes that the civic space just outside the Howard Centre in the centre of the town, as well as the amenity space of Parkway that runs along the central axis both have strategic functions, and define the character of WGC. He then addresses some needs found through his work - mainly to do with lack of provision of well-equipped play areas for children and teenagers, and the relative sparsity of green space in the employment areas in the North East of the town. His findings,

especially those specific to WGC as a living embodiment of the practices espoused by Howard, suggest that the GC dynamic has been relatively upheld well in the town; there was no pressing need for additional publicly accessible green spaces. However, this report was submitted under criteria available to the borough council, not, as this thesis is investigating, the criteria by which Howard originally set about to conceive. In other words, the distribution and access to green space within the town is not judged considering how it should be planned as a GC; rather by how it should be planned by the local council. In this sense, while the findings made by Conway have particular use in this thesis, they should be approached somewhat critically, as the purpose of said paper was for internal use within the administrative authorities.

Moving on from Conway's text, further work on WGC tells a story of transition and constant change. Hügel's work, touched on previously, emphasises the way in which the GC ideal was forced into practical compromises that undermined the praxis of Howard's original intentions. Discussions of current day applicability, presented in De Pieri's *Reassessing the Legacy of Twentieth-Century New Towns* (2019) also place the story of WGC within wider academic discourse. His analysis, taking the form of a review essay discussing various publications surrounding the New Town movement, pays special attention to the position of both Letchworth and WGC within the London metropolitan belt extending through Hertfordshire. WGC, as framed by De Pieri, is understood as an urban space subject to transition. Firstly, transition from unoccupied space into an urban hub. Secondly, from one planning model (a GC) towards another (a New Town). De Pieri quotes Wakeman (2016) - stating that 'the phase of post-WWII new towns needs to be fully understood as fundamentally different from previous experiences and effectively marking the end of the garden city tradition'. Is this to say that De Pieri considers WGC as no longer embodying the GC principles? Space is given to admitting that it is a site of competing traditions, and is an arena for social change and conflict. Additionally, De Pieri goes on to quote Ward (2016) in saying that WGC 'represented significant modifications and compromises of the garden city ideal', as it 'completed the transition of the garden city from an experiment in social reform to a demonstration project in town planning'. In this sense, De Pieri qualifies the analyses of Hügel using WGC as the fulcrum by which the argument (one of a shift from social theory to practical application of urban planning) turns.

Interestingly, Yoshida & Koshizawa's 2003 work also helped provide a dialectic response to Western planning models in Japan; reversing the situation to critically analyse the way in which city governance has impacted WGC from a Japanese perspective. However, despite finely-detailed analysis of the ways in which Schemes of Management (SMs) operate in both Letchworth and WGC, they neglect to apply a comparative method and draw links with the functioning of the Japanese GC. Despite this, their in-depth look at the running of the WGC SM provides fascinating insight into how the ideals, orthodoxy, and living environments of the GC is preserved in WGC; they describe the process by which residents interact with local authorities when applying for planning permission to enact changes to their surroundings. For WGC, the Welwyn Hatfield Borough Council - still referred to as the Welwyn Hatfield District Council at the time of their writing - operates the SM not only as the ground landlord but also as the planning authority of the area under the Town and Country Planning Act 1947. There is a duality to the functioning of this scheme, wherein planning permission is passed through both Estate Management scrutiny alongside inspection under the WHDC - Yoshida & Koshizawa highlight this as a potential issue in protecting against harmful changes to the city, as the WHDC, acting as a municipal government, is not strictly concerned only with the maintenance of GC ideals. This is not the case in Letchworth, where resident feedback is incorporated structurally into the planning process. They conclude by stating how 'in Letchworth, [...] the living environment is preserved through the inhabitants' voluntary compliance to the SM by persuasion, education and incentives. On the other hand, in WGC, where a public authority operates the SM, it is being

hidden behind planning controls and plays a limited role'. A more detailed description of the way in which the Welwyn Garden City Estate Management Scheme plays a role is given on their website (Welwyn Garden City Estate Management Scheme, 2020), which also provides a clear map of the extent to which their control over planning permission spans. The map from their site is included below, in Map 1. It is clear that the main residential zones of the town, especially those originally designed by De Soissons in the initial development period, are subject to this two-tiered planning scheme.



Map 1: 'Is your property covered by the estate management scheme?' - Welwyn Garden City Estate Management Scheme, 2020

This finding does, in some aspects, seem to stand against the evidence provided by Conway's report for the local council, in which resident feedback was crucial to the decision-making process of the local authority. While Conway's report dealt with changes to green space, and not strictly planning permissions made for resident properties, it suggests that the public authority does try and reduce the bureaucratic blocks inherent

in such changes. However, questions remain as to whether or not this same drive to preserve the fundamental building blocks of the GC exists in the secondary case investigated by this paper - namely, DECF in Japan.

To summarise this section on the extant literature on WGC, connections between theories and histories can be drawn. Moving from a sense of opportunity and wonder regarding the initial founding of the site, as described by both Cash (2015) and Reiss (1920), we see that academic work then shifted towards a somewhat more critical tone - Yoshida & Koshizawa (2003) and De Pieri (2019) see hypocritical approaches between the ideals of the GC and the ways in which they were unsubstantiated in their delivery in WGC; both articles tell a story of limited efficacy in operationalising the original plans for the site. However, Conway's 2002 report, trying to preserve these principles in the field, and the renewed interest in the settlement under the WGC100 (2020) publications, suggest that those most connected with the radicalism of the site are still committed to its principles.

5.4. Readings addressing Den'enchōfu

For DECF, the seminal text on understanding its development was Oshima's 1996 article - *Denenchōfu: Building the Garden City in Japan*. Emphasising the historical emergence of a national planning policy, his work led this research to find a variety of Japanese-language studies of DECF, which will be outlined in the rest of this section. Oshima's article, moving in a historical trajectory from the transferring of Howard's ideas to Japan until the present day, arranges the growth and transformation of DECF in a manner that was crucial to the forming of the timeline seen previously in this paper. A key actor in Oshima's retelling is Shibusawa Eiichi, the industrialist and philanthropist who, similar to many of Howard's cohort, appears against an almost Dickensian backdrop with his socially reformist ideas. Shibusawa's previous development experience working in the organisation of Kabutochō Business Park, the Ginza District revitalisation plan and the Marunouchi Office District provided him with the know-how in operationalising large-scale development plans. Indeed, his belief that economic arrangements 'were essential' in creating social change echoed Howard's own ideology; Oshima states how 'Shibusawa gradually came to agree with Howard that development driven by economic forces could not be controlled'. This is in stark contrast to the previous experiences of Shibusawa, in which economic concerns always took precedence, despite his own charitable instincts (funding schools and homes for the aged within Tokyo).

The key connection identified by Oshima, in which the British GC ideals were transmitted to Japan, took place with the publishing of an article entitled 'Floral Garden City' (花園都市 / Hanazono Toshi) in the Tokyo Nichi Nichi newspaper in 1907. This article, outlining work that had taken place in Letchworth (as WGC was yet to be started) inspired the Japanese Home Ministry to publish their guidelines promoting Howards' ideas in a pamphlet entitled 'Garden Cities' (田園都市/Den'entoshi) later that year (seen in Image 7). However, rather than just a direct translation of Howard's *Garden Cities of To-Morrow*, it drew heavily from A.R. Sennet's *Garden Cities in Theory and Practice* (1905).

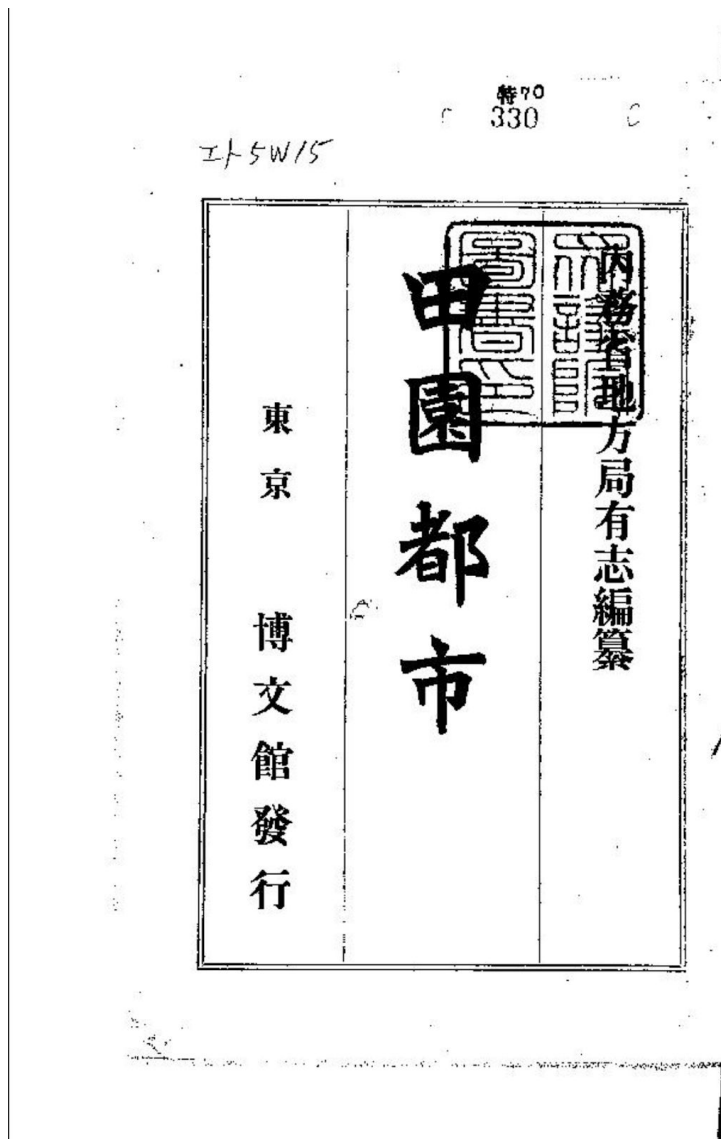


Image 7: Front cover of the surviving copy of the Home Ministry's 'Garden Cities' from (1907). First official recorded use of the term Den'entoshi (田園都市) to describe 'Garden Cities'. Publication available via the online collection of the National Diet Library of Japan.

As seen in Image 7, the translation for GC chosen upon was Den'entoshi (田園都市). This literally translates to 'paddies and gardens' and was described as Smith II (1979) as bringing 'to the modern Japanese mind specifically Western images' of the 'pastoral'. Murakami (1999) also asked why it was translated as such, especially when Tei'entoshi (庭園都市) would have been the more direct conversion. Ultimately, this terminological decision was made by the Home Ministry.

Referring back to Oshima, he then goes on to outline key dates and figures in the founding of DECF. Considering the period in which it was developed, wherein Japan moved from a radically turbulent time of ideological clashes under the Meiji Era, to one where there was 'a strong responsiveness from influences from the West as well as a desire to alleviate Tokyo's growing urban problems' (the Taisho Era), the receptiveness to Western urbanism is apparent. This is also touched on by Seidensticker (1983) and Rowe (2005), who examined foreign influences on the development of Tokyo. A crucial detail referred to in this narrative is the breakneck speed by which DECF was planned and developed; the original retelling of

Howard's ideas in the Tokyo Nichi Nichi article took place only five years before DECF's planning began. Furthermore, key actors involved in the enacting of this plan seemingly moved between disciplines and organisations quickly; the cycle of founding and re-naming GC organisations echoes the bureaucratic journey of WGC. The founding of the Garden City Joint-Stock Company (田園都市株式会社 / Den'entoshi Kabushiki Gaisha) was, for example, the largest suburban developer during the whole Taishō period, and eventually became involved in multiple projects across the country. However, there were other factors that may have changed the course that DECF followed, somewhat accounting for the high-speed of its development. Firstly, the site was an extremely attractive location for new residents, both due to the 1923 finishing of the Meguro-Kamata railway line linking it to central Tokyo, but also due to the appeal it had for upper middle-class residents. Oshima proposes that this demographic magnetism may owe something to the fact that Shibusawa Hideo, Eiichi's son, was one of the first residents to move in, imbuing the plots with a sense of social class mobility. He states how the site became virtually synonymous with a 'modern, high-quality residential area'. Secondly, a major factor in the quick development of the site was due to the Great Kanto Earthquake of 1923, in which large portions of Tokyo were destroyed, rendering hundreds of thousands of residents homeless. The large scale destruction of property and of lives (with 100,000 recorded deaths) allowed DECF to serve as an overspill location for certain demographic groups seeking new housing solutions. Within five years of this earthquake, in 1928, all land parcels in DECF had been sold.

Oshima finishes by bringing the narrative to the present era; the bubble-era of Japanese economics is touched on, with the resulting effect of increased land speculation in DECF. These economic concerns caused a doubling of land prices in the area, with a 1986 price of ¥375,000 per square foot. This led to re-dividing the plots of land originally intended, increasing density in the area that, as per the original plans, was meant to reserve 18% of its area to public use (as opposed to Tokyo's 10% guideline). Furthermore, the last remaining areas of large farmland surrounding DECF were developed over in 1986; lamented by Oshima as showing how 'the corporation had abandoned its idealistic values for more capitalistic ones. [...] DECF's popularity and success caused land prices to rise, and subsequently Shibusawa's visionary city was slowly transformed into a suburb exclusively for the wealthy.' This process of hyper-capitalisation has caused DECF to now be referred to as 'Japan's Beverly Hills'; exorbitant land values have now increased to the point that property cannot be passed on to the children of current residents due to increased inheritance taxes.

These current issues are used as a launchpad by which wider themes in Japanese urbanism are addressed; Oshima references Smith II (ed. Craig, 1979) regarding conceptions of urbanity vs. pastoralism in Japan - stating that the GC concept was, to Japanese society, hard to distinguish from ideas of the garden suburb. The somewhat descriptive, rather than prescriptive, nature of Howard's original plans may have had a part to play in this ambiguity surrounding proper realisation of his ideals. Part of this lack of traction for the project after completion is described by both Oshima and Sorensen (2002) as being intangibly connected to views regarding land ownership in Japan - for a country that experiences such a high number of earthquakes and tsunamis, land is often seen as the only viably permanent form of wealth.

Andre Sorensen, as perhaps the most pre-eminent Western scholar of Japanese urbanism at this time, made reference to Oshima's studies in his book *The Making of Urban Japan* (2002), which helped ground the historical element of this paper's research question. His book approaches Japanese urbanism from the ground-up, explaining its formative years under feudalism before moving chronologically towards the modern era. Attention is paid to the formation of urban planning law in Japan, then to the unique way in which zoning is addressed. Sorensen builds on Oshima's study of Den'enchōfu, and adds a chronological

perspective by which particular periods of development can be analysed. These are discussed at the end of the Literature Review.

The text from Sorensen has some further relevance to Oshima's article. Interestingly, a small number of case studies are picked up as illustrative examples - DECF is used as the case by which the reader can understand how Western urbanist practices were employed within Japan. Indeed, while Sorensen examines the underlying mechanisms behind Tokyo's emergence as the metropolis it is today, he pays specific attention to experimental or forward-thinking practices seen across Japan. He even goes as far as to state that "Den'en Chofu [sic] is still famous as a high-class residential area, but it was never a Garden City along the lines envisaged by Howard, and as practiced in Britain in the post-war period". The impact of such an assessment underplays, in the view of this author, the drastically different planning approach seen in DECF as compared with other developments in Japan. While this revisionist outlook is similarly supported by Oshima (1996) and Watanabe (1980), both Murakami (1999) and Fukushima (1997) dispute this in their Japanese-language studies of DECF's progression towards full suburbanity. In particular, Fukushima highlights how external factors such as unsuccessful land purchases, changes to the iconic radial pattern of the streets, and administrative issues resulted in the original plan of the company being 'half realised'. Her Japanese-language article, *A Study on the Changes of Den'enchōfu*, uses historic maps and original plans for the site to show a somewhat uncompleted task.

Sorensen then continues - describing the Japanese GCs as 'basically speculative land developments that returned a high rate of profit for their initial investors'. This is, again, reinforced by Watanabe in *Garden City Japanese Style: The Case of Den'entoshi Company Ltd., 1918-1928* (1980).

Watanabe's text is one of the most well-known pieces by which DECF is approached by Western scholars. Leading through the historic development of the site, he follows Oshima in paying particular attention to actors and institutions. However, the key crux of his argument is in agreement with Sorensen; that DECF failed to be truly realised as a GC under its managing organisation - the Garden City Joint-Stock Company (also referred to as Den'en Toshi Company Ltd). Watanabe singles out the dependence of the site on Tokyo as 'a social, cultural and employment centre', and the Company's sole focus on capitalising on land purchases - '[their] concern was land itself, not population or living patterns upon the land'. He ends his analysis by raising the lexical ambiguity of the way in which the term GC was incorporated into Japanese discourse; he states that while the *word* was brought in, the *concept* was not.

This leads us back to Murakami's Japanese-language article entitled *The Acceptance of Howard's Garden City Theory by the Bureau of Home Affairs, the Ministry of Interior in Meiji Era* (1999). In this work, Murakami sets out to use the original 1907 publication by the Home Ministry (*Den'entoshi*) to understand the ways in which the GC ideal may have evolved individually in both Japan and the UK. His theoretical approach recognises DECF as truly being a GC, although only under the definition of such as it evolved in Japan. Murakami's article has been referenced at the beginning of this paper, in the comments regarding translation and orthography of Japanese; he fully explores the unconventional translation the Home Ministry took in approaching the GC. To expand upon what was touched on earlier, rather than using the term Tei'entoshi (庭園都市) - the most direct translation of GC - the Japanese officials chose to use Den'entoshi (田園都市). Murakami identifies the reasons for this choice as being the prioritisation of local land development and economic output by Japanese agricultural communities; the term Den'entoshi appealed to an ideal of local rejuvenation and production. However, in choosing such a translation, Murakami argues that the Home Ministry neglected some of the elements that fundamentally define the

GC - those associated with the term ‘*Garden*’. These include, for example, increased recreation, social cooperation in land development, and increases to quality of life. In this sense, Murakami argues that a form of linguistic determinism took place, driving the GC idea and the Den’entoshi idea along separate evolutionary tracks, albeit from the same starting point. He reinforces this perspective with a diagram, which the author of this paper has taken the liberty to translate and digitalise (Table 3).



Table 3: ‘*Theory of the fusion of town and country between Howard and the Home Ministry*’ from: Murakami, 1999 (translated and digitised by this author, 2020)

Essentially, Murakami argues for the acceptance of a divergent narrative regarding the evolution of GC ideals between the UK and Japan. His diagram shows how, due to differing circumstances, both the UK and Japan sought urban renewal through the fusion of town and country (as per Howard’s own ‘marriage’). However, both cases then diverged afterwards, through different processes, towards different ends. His study, not only based in linguistic analysis, also regards the initial publication by the Home Ministry to be lacking in direct instruction regarding how the GC should be exacted in Japan. The publication that he refers to - *Den’entoshi* (Home Ministry of Japan, 1907) - uses extremely indirect language to discuss exactly how the GC concept would be used -

‘Regarding the reformation of our cities, and the issue of rejuvenating our rural villages, it ultimately falls on the refining of our country and the securing of national prosperity as a foundation against further problems.’ - Chapter 1 ‘*The Garden City Ideal*’, from *Den’entoshi*, 1907

Indeed, the document itself only refers to the actual urban planning and management of GCs in two of its fifteen chapters, devoting the others to further airy, if grand, titles such as ‘National Labour’ and ‘Enforcement of Cooperative Practices’. Overall, the text is difficult to parse without Murakami’s analysis, yet is important in understanding the exact process by which the GC ideal was transferred to Japan.

The links between Oshima, Sorensen and Watanabe are clear to see - all are critical of the way in which DECF was not stringent enough with the GC ideals, while appreciative of the idealised way in which it encapsulated the importation of Western urbanist ideas at that time. Reflecting back on the readings associated with the research question, particularly those of Peck & Theodore (2010), the mobility experienced by the GC concept meant that there was ample room for divergence and mutation, an idea

supported by these three writers. Even Murakami, arguing less for the failure of the GC, and more for the divergence of approaches, falls within this concept of ‘mutation’ argued by Peck & Theodore.

As this reading has shown, the story of DECF’s conception and growth is ultimately linked less to the GC as Western scholars would understand, and more to the emergence and development of a truly Japanese urban approach - the *Den’entoshi*. The gaps between the GC of Howard and the Den’entoshi of Shibusawa should be brought to light through the methodological approaches expanded upon later in this paper.

5.5. Readings addressing green space

An emphasis on the importance of green space in general (considering both the British and Japanese examples), as well as its obvious importance as the axis by which the GC model develops was touched on by the authors looking at the two cases. As referenced before, Conway’s 2009 report used information provided by the Department for Communities and Local Government (2002) in classifying the way planning permissions (rather than ‘zoning’) in the UK identify typologies of green space. It should be noted that Welwyn Hatfield Borough has a comparatively higher than average division between rural and urban, with 79% of the borough being labelled as part of the Metropolitan Green Belt that encircles London (Welwyn Hatfield Borough Council, 2019). For Japan, zoning is much more streamlined than in the UK, with 12 distinct categories that are regulated at the national scale. Green space and the prevalence of open areas is a devolved power to the local level; both wider urban authorities and local governments have some say in how green space is allocated and protected under ‘district plans’ and ‘city plans’ (Ministry of Land City Planning Division, 2003). These plans can be altered via planning applications at the local level, explaining why Tokyo as a whole is often considered a ‘concrete jungle’, bereft of open spaces, yet DECF (despite being incorporated into the wider Tokyo area) is often viewed as a leafy and pleasant (Sekai Property, 2018). While the degradation of green space under the pressures of urbanisation in Tokyo has been documented by Takahashi (2008), this devolved decision-making process, alongside the wider forested area found in the northwestern wards of Okutama and Hinohara, make drawing concrete conclusions about green space planning difficult. It should be noted that a degree of un-zoned green space does exist in cities (Ashihara, 1983), however much is revealed by what spaces a city organises, and the way in which a given site creates typologies of its greenery.

To contextualise this comparison between typologies of zoning, this 12-part Japanese approach has been pointed to as both workable and easily-understandable by both citizens and authorities alike (Market Urbanism, 2019), while also reducing NIMBY-ism and encouraging mixed-use development (Urban kchoze, 2014).

The focus on green space as a field of study led the literature review to examine other researchers who have analysed green space use. In particular, both the work of Chris Berthelsen’s *A Small Lab* (2016) and Jared Braiterman’s *Tokyo Green Space* (The Japan Times, 2012) have been particularly insightful, blending together orthodox and experimental approaches (e.g. using photography installations to examine the interaction of Tokyoites with the ‘urban jungle’). Indeed, their work at blending neighbourhood-level narratives with wider discussions of green space have impacted the approach of this research project; the importance of first-hand field observations and documentation of subjective experiences was underlined by their work.

In this sense, green space provides not only a fundamental aspect of the GC ideal, but also an insight into the mechanisms of zoning and planning permission in both sites. The variation in approaches that have been taken in addressing green space, both orthodox (quantification and analysis by Takahashi), and experimental (local citizen workshops by Berthelsen) mean that it is a subject of research that crosses disciplinary boundaries; it is an understandable and approachable facet of the urban environment to all residents of a city.

5.6. Readings addressing methodological approaches

With green space as an aspect to be studied, attention must be paid to literature concerning methodological approaches. While the local authorities for both cases (Welwyn Hatfield Borough Council and Ōta-ku Ward office) hold accurate land-use data, the ongoing COVID-19 pandemic has made first-hand data collection difficult. Therefore, by using historical maps to create a chronological survey, GIS technologies can be used to map the availability of public green space in both neighbourhoods. Both Cetin (2015) and Lahoti et. al. (2019) have shown the applicability of GIS technology to this green space analysis. Indeed, Lahoti et. al.'s work on GIS mapping of green spaces in Nagpur City, India, was of the utmost relevance in forming the methodological backbone of this paper. Additionally, the source material available on the Open Street Maps, National Library of Scotland and Japanese Land Numerical Information database provides explanatory readings regarding the data available. Whether or not it is strictly applicable to the Literature Review, due acknowledgement to the usage tutorials on the QGIS software page must also be paid.

However, one gap in the established literature is the application of GIS mapping (and wider quantification of green space) to GCs in particular. Considering the plans laid out by Howard, there is a historical precedent set in stone for the urban/rural mix expected in GCs; the fact that this has not been quantified for modern neighbourhoods developed to the same plans is surprising.

Another strand of reading which ultimately informed the methodology of this paper was literature which discussed the transfer of planning ideas between countries. Understanding the mechanisms by which ideas are imported and exported between nations is crucial to identifying how divergences occur. For this, Peck & Theodore's 2010 work was extremely useful, as described previously. Moving forward from that text, Harris & Moore's 2013 work on *Planning Histories and Practices of Circulating Urban Knowledge* was ideal. Discussing how the transfer of planning ideals between nations is, by definition, cross-disciplinary, it became apparent that the methodology used in identifying such transfers must also reflect a cross-disciplinary and cross-cultural approach. They state how it is important to take a chronological, historically-based perspective to 'highlight continuities and institutional legacies' when examining policy mobility. They point out how pre-1990s *urban circulations* are ignored, with a tendency towards socially constructivist approaches (avoiding the real 'heterogeneous and emergent world of urban assemblages'). Looking particularly at historical cases of transfer can 'challenge and disrupt the assumed novelty of recent processes' They use the spread of the GC concept as a case study, discussing how the loose technical specifications of the ideal allowed it to be 'easily decontextualised and recontextualised' in other global areas outside Britain. This was a finding that echoes Watanabe's 1980 text, discussed previously.

They pointed to the 'enrolling' of the GC ideal across transnational networks, assisted by the Garden City Association, International Garden City Congress, international learning visits and conferences. These organisations and actors help create what McCann (2011) describes as 'actionable ideas' - coordination tools

that frame knowledge to encourage sharing and transfer internationally. Whether the ‘actionable ideas’ of the GC were clearly stated during its conception has been brought up in previous readings - through the methodology applied in this paper this lack of coordinating tools may be apparent.

5.7. Literature Review Summary

The progression throughout the established literature analysed until now is one of multiple themes, yet concurrent and connecting patterns are observable. Beginning with an analysis of readings pertaining to the research question, academic approaches were refined under Fisher & Poortinga (2018). Questions regarding the transfer and mobility of policies were also raised (Peck & Theodore, 2010), yet again addressed towards the end of the review under Harris & Moore (2013).

The analysis of the GC from a historical perspective with Hall (2014), Howard (1902), and Parnham, Downs & Murray (2018), contextualised the research topic and provided explanations towards how it was operationalised outside of theory. The key actors and organisations responsible were addressed here, only to be expanded upon in the following sections looking at the respective case studies. Both this section (looking at the GC concept) and the following two sections (looking at WGC and DECF) used not only English-language material, but also Japanese-language resources. This was done irrespective of the topic; Japanese sources were used just as much for discussion regarding WGC as for DECF. The reasoning behind this was to avoid adapting a biased one-way perspective early in the research, referring to authors writing on both sides of the transfer for their own understandings.

The readings regarding the case studies not only took a historical perspective, but also used modern practical reports. This was most evident in Conway (2009), who was writing on behalf of the local authority, and Murakami (1999), who drew links between the current state of the city and how it was originally planned.

Moving on from the individual cases, the review then identified the importance of Green Space, especially in relation to sites being studied. This was paired with the following section concerning readings identifying specific methodological approaches, which, when combined together, provides a clear process to be carried out moving forward.

A significant result was also identified throughout the process of reviewing the relevant literature. Although reflected in the Timeline that preceded this section of the thesis (p.22), it should be addressed here. Namely, when comparing both sites, it was clear that similar periods of development had taken place. Reiss and Hall discussing the development of GCs (and WGC in particular), and Oshima and Sorensen in discussing DECF, all presented their understandings along a chronological timeline. Key periods of development were analysed as follows:

- **Pre-development:** How the sites were found before urbanisation, and how they were marked for development. This includes the various forms of land purchasing, and the organisations who were active in negotiations)
- **Early development:** The period in which the towns as we know them today attracted residents and became popularised. This includes, for example, the effects of the 1923 Great Kantō Earthquake in driving people towards DECF, or the importance of railway transport networks in both sites.
- **Post-war:** For WGC, this marked the transition towards New Town status and the associate legislation that accompanied post-war urbanism. For Japan, this was primarily reconstruction efforts and an ‘re-opening up’ of markets and industry to the West.
- **Modern planning:** The effects of capitalism and growing pressures of urbanity have been marked in both sites, as per De Pieri and Watanabe.
- **Current era:** The modern day sites as they stand today, as per Yoshida & Koshizawa and Sorensen.

The marked way in which these periods present themselves when examining both sites over their long histories is useful in the application of the methodologies used in this paper. Being able to target specific periods in time, and comparing between them, is a concentration of efforts that is underlined by the findings of the Literature Review.

In summary, this review of the established literature has provided this work with the necessary in-depth historical narrative necessary in approaching the research question with a chronological perspective. Key to the creation of the timeline found previously in this paper, the reading addressed here will be referred to in the carrying out of the methodology, using the established findings to draw links with the data generated.

6. Field Observations

As part of the bridging between the historical perspectives addressed in the reading and the study of transition of both sites, first-hand field research was necessary to connect the narratives.

The following observations were made, as stated, ahead of further research methods, yet were informed by analysing current-day maps of both sites. The findings generated here are useful in constructing mental maps of both cases, and will be used in formulating arguments regarding changes to the use of space as additional research methodologies are applied.

6.1. Initial observations of Welwyn Garden City

The initial observation of WGC (as per pp.86-87 in the appendix) underlined the extent to which green space has, at first glance, been micro-managed in its dispersion. It was evident that there were plenty of verdant public spaces, all well-preserved, with clear definitions between the different residential districts. The main boulevard running through the centre of the town was of particular significance, as the existence of such Roman-esque roads (running in straight axis longitudinally), are a clear sign of recent development in British towns; a far cry from the medieval road layouts more commonly seen in the South East of England. The tree-lined border to this stretch of greenery, and the fountain found within (see Image 8), all helped centralise the as-yet unformed mental map of the site.



Image 8: *The fountain in the central boulevard of Welwyn Garden City, with Louis de Soisson-designed homes on the right side, behind the treeline (photograph by this author, 2019)*

The main commercial area, including the large shopping complex that attracts buyers from the surrounding towns, pays homage to Ebenezer Howard in both name and decoration. Titled the Howard Centre, the building is fronted by a small civic space that includes a plaque to Howard set at foot level among the flowers (see Image 9).



Image 9: *The commemorative plaque dedicated to Ebenezer Howard. Reads: '1850-1928 Sir Ebenezer Howard, Founder of Welwyn Garden City in 1920, His vision and practical idealism profoundly affected town planning throughout the world' (photograph by this author, 2019)*

In this sense, through the preservation of the characteristic central axis, the original Neo-Georgian architecture and plaque of Howard, a sense of true identity pervaded the centre of the site. Whether due to the Estate Management Scheme, or due to parallel schemes of management as discussed by Yoshida & Koshizawa (2003), initial observations suggest that there has been a concerted effort towards spatial conservatism in the town. This would suggest a similar lack of extreme change to the prevalence and distribution of green spaces, as per Howard's vision.

Interestingly, during the fieldwork for this site, audio recordings were disrupted by the noise of heavy traffic. This forced observations to be recorded as hand-written notes. For the fieldwork in DECF, there was a similar cause to stop using the dictaphone, albeit due to noise from ongoing construction work. Observations taken in WGC echoed this, with the large amount of road traffic standing out as contradictory to the essence of the GC (an urban model that, admittedly, was conceived and developed pre-widespread automobile usage).

Finally, effort was made to visit some of the larger areas of green space in the town - both in Gosling Park and Stanborough Park. These were both referred to under Conway's 2009 report, and described as well-kept and not in need of attention. Surprisingly, much of the green space in these sites appears to have undergone privatisation of usage; there were golf courses and member-only sports facilities using a large footprint. This commercialisation was unexpected, and may offer an entirely new narrative when examined under GIS in the next step of the methodology. If the amount of green space has been preserved, yet accessibility and usage has undergone restrictions due to mechanisms of capitalism, then can the GC be said to be still committed to its original ideals?

6.2. Initial observations of Den'enchōfu

The most striking element of DECF upon arrival was the centrality of mobility in the planning of the town. The station and the shopping concourse that surrounds it take precedence as the central point in the spider web-like network of roads that radiate outwards. The station entrance, architecturally combining aesthetic elements from both Japanese and Western styles (see Image 10), welcomes visitors to the site heading towards the residential streets. Acting as a gateway to the rest of Tokyo, the morning rush hour was dominated by businessmen passing through this structure before dispersing into the circular street network.



Image 10: *Den'enchōfu station. The commercial concourse extends beyond this structure, with the residential streets radiating out behind (photograph by this author, 2020)*

Similar to the case of WGC, the history of DECF as a GC is embodied into spatial elements. The rather well-known station gate, the commemorative plaques outlining the history of the site (one of which is shown in Image 11), as well as a small relief dedicated to Shibusawa Eiichi are all found within 50 metres of leaving the station. This echoes the spatial conservatism felt in WGC, where the central axis of the GC was steeped in history and a strong identity; DECF similarly feels unlike other residential neighbourhoods in Tokyo thanks to this strong 'anchor point'.



Image 11: Commemorative plaque in the plaza found in front of the station gate, describing the history of the site - “Let us, the people, preserve this historic site of the Garden City beautifully. Co-funded by the Den’enchōfū Association with Tokyu Railways Ltd.” (photograph and translation by this author, 2020)

Moving from the central station point, the radiating nature of the roads moving outwards was significant. Offering what appeared to generally be uniform plot sizes, the layout of the streets acts somewhat as a panopticon for pedestrians leaving the station. Fukushima’s (1997) article looking at the changes seen in this street layout helped act as a reference point during this observation period. By preemptively reading her articles in advance, images of the site as it appeared in historic plans were kept in mind. However, this modernist, Western-style circular road system is not prevalent throughout the site, nor is the Western-influenced architecture.

Below is an example of traditional, Japanese-style street planning in the form of a historic address map (Image 12) found by the side of the road in the southern part of DECF. Such maps are necessary in older cities in Japan to assist with postal deliveries, as many of the homes remain unnumbered. This stands as somewhat anachronistic, considering the modern urban planning of the area.



Image 12: Hand-painted address map for Honchō 1st District of Den'enchōfu. (photograph by this author, 2020)

Indeed, issues and thematic trends identified in the readings were able to be identified and observed in reality through this fieldwork. Oshima's 1996 article, discussing the development of the site, noted the effects of hyper-capitalisation in transforming the area into an expensive, elitist garden suburb ('Japan's Beverly Hills'). However, from the perspective of the fieldwork, this capitalisation seemingly has unaffected the prevalence of green space in the area. There was a clearly signposted 'Copse Trail' route throughout the site that provided an interconnected pathway through the various green areas (seen in Image 13), that helpfully identified the green spaces as promoted by the local authority, Ōta-ku.



Image 13: Ota City Nature Trail 'The Copse Trail' (photograph by this author, 2020)

This led the field observations to analyse the green space prevalent in the area. Hōrai Park is the most managed urban space, with ponds and play equipment servicing the residential streets. This is bisected from the largest open green space by one road; Tamagawadai Park looks out across the river to the densely-populated Tama development. Behind this, in the southern quarter, is Sesaragi Park, a forested sloping area. Finally, in the very south, extending away from DECF proper, is the Rokugō canal area. Interestingly, and somewhat unmentioned in the literature, is the existence of Hōrai Kōfun, an archeological megalithic tomb site. This is fenced off from public access, although has a small pathway leading through its grounds.

The impression gained regarding the prevalence of green space is that public access has generally been maintained to a high degree. While the green areas have play equipment for children, they do seem somewhat less integrated into the urban fabric of residential zones, often hidden or obscured from the streets by walls and hedgerows. Despite this, they were in use despite the winter weather of early January. Initial recordings of the site were somewhat affected by the noise of construction work; this did not stop this author from recording how the site appeared 'much greener' than WGC.

6.3. Comparative observations

While the degree to which green space has been affected since the initial adoption of the GC ideal in both sites is a question that can only be properly addressed under the following GIS methodology, the initial observations carried out in both areas do afford a certain degree of comparative insight. Both sites, using a strong axis from which they were developed (a longitudinal boulevard in WGC, a radial network in DECF), have clearly incorporated the GC ideals into a spatial identity. However, green spaces present themselves in different ways. For WGC, while the size of the green spaces was larger, there was a surprising amount of privatisation and hurdles to access; many of the sites were either golf courses or member-only sports

facilities. The larger parks also suffered from a spatial distribution that was scattered away from massed residential areas. For DECF, while access was not an issue, there seemed to be an issue with integration into the wider urban network. Many of the green spaces were obscured from public view, and seemed to be bordered by high-class suburban properties. The single-family houses, often fenced and walled away from the road, create a visual border that surrounds the parks, walling them in and creating a somewhat claustrophobic atmosphere. It is hard to imagine that residents from areas surrounding DECF would make the journey to access these areas; a gradual encroachment of residential properties towards the Tama river means green spaces feel less an inherent part of the Japanese GC, and more a residual leftover of land that has yet to be built upon.

However, it must be restated that these findings were interpretive and merely a foundation onto which a more rigorous methodology will be applied. The formation of mental maps of these sites for this author allowed for a subjective and instinctive understanding; moving to the next section of the methodology will refine said findings into objective analysis.

7. GIS Analysis of Green Space

This section of the methodology will address the use of GIS technology in analysing changes to green space as seen in both sites. As the documents being handled are of varying sizes, ranging from A4 to A1, and have been obtained in both physical and digital versions (.TIF, .JPG, and .PDF file formats), there is pronounced difficulty in presenting them in a readable format alongside this text. Cropped and compressed areas of interest of said documents will be included here. Information regarding the obtaining of said data, as well as fair-use and copyright information, can be found in the Methodological Outline section of this paper. That section also outlined the steps involved in processing and extracting data from these maps, which are carried out in order here.

Following the periods of development identified in the timeline, informed by the literature review (Oshima, 1996; Watanabe, 1980; Sorensen, 2002) regarding DECF, it was decided that 5 key periods of the development cycle for both cities would be analysed. This, by providing a granular analysis, will signify significant changes to green spaces as seen by both sites, supported by the readings.

Therefore, the following key periods were identified, based on key events as described in the timeline early in this paper (p.22), and correspond to the following maps (Table 4):

PERIOD	WELWYN GARDEN CITY	DEN'ENCHŌFU
Pre-development (pre-urban)	1899 Hertfordshire XVIII.SE	1919 Tokyo Seinanbu
Early development	1925 Hertfordshire XVIII.SE	1930 Den'enchōfu
Post-war planning	1948 Hertfordshire XVIII.SE	1958 Den'enchōfu
Modern era	1992 Welwyn Garden City & Hertford OS	1985 Jiyūgaoka
Current sites	2019 Welwyn Garden City & Hertford OS	2019 Ōta-ku

Table 4: Periods and documents under study

While these 10 documents outlined above will be processed using the GIS tools explained in the Methodological Outline, extra data was collected as part of this research (as shown in Tables 1 & 2). However, by focusing the maps under study to these 10 documents, the changes seen in both sites can be viewed as they occurred over similar time periods. Using too much historical data in this process would result in an approach that is too granular; wider changes seen in both sites may be obscured by any outliers in documents outside of these defined periods.

Under this approach, the current administrative boundaries of both sites are used to define the areas of study, as outlined in the Methodological Outline. Boundary sizes are found below:

SITE	BOUNDARY SIZE (m²)
Welwyn Garden City	34,588,304.61
Den'enchōfu	3,059,177.68

Table 4: Total area of administrative boundaries for both sites

The size of these administrative boundaries differ slightly from those given at the start of the thesis. This is due to a number of factors, primarily regarding the way in which the surrounding farmland is considered. For the purposes of this methodology, the boundaries were drawn using up-to-date OSM data, rather than electoral boundaries.

It should be noted that all maps and images used in this following section have been produced by this author during May 2020, unless otherwise referenced.

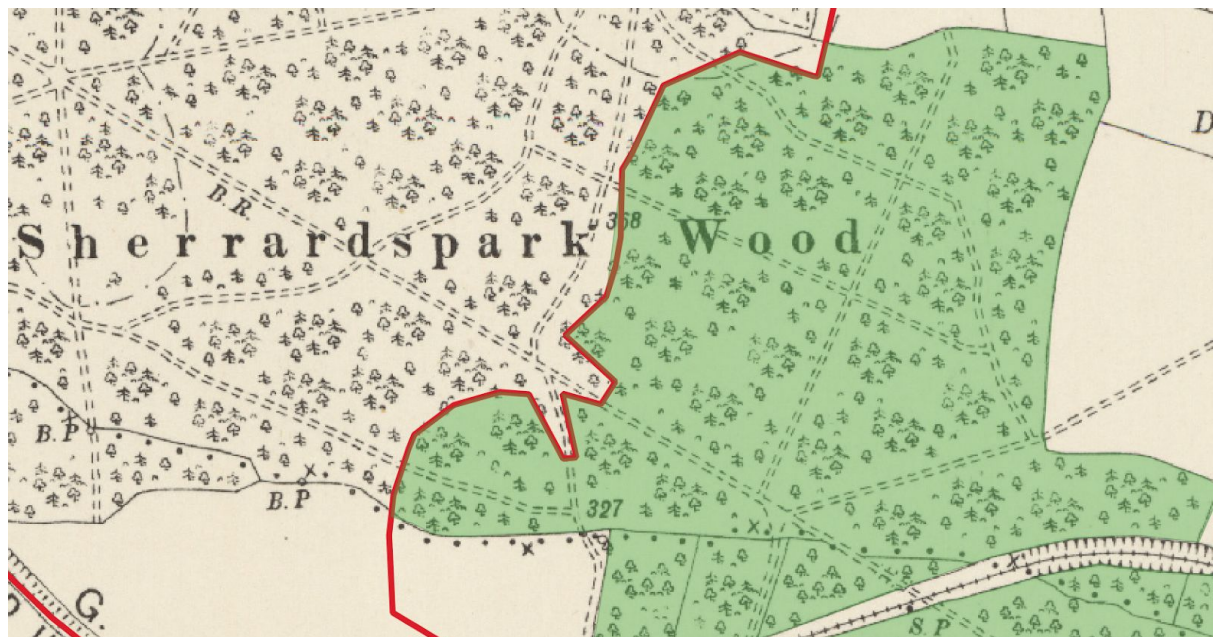
7.1. 1899 Hertfordshire XVIII.SE

This map was processed following the 1925 Hertfordshire map, in which more features were visible. However, for the purposes of preserving the chronological outlook, this map will be discussed first.

This document depicts an extremely rural location; one that is economically productive in terms of the dispersion of farmland plots throughout the site. Small woodland areas service villages, as well as local village greens, yet there is no sense of parks or outdoor sports grounds as we would understand them today. The local wooded areas are counted towards the green space dispersion, however the green belt and integrated parkland as we would see under the GC ideal are obviously not present in this pre-development site.

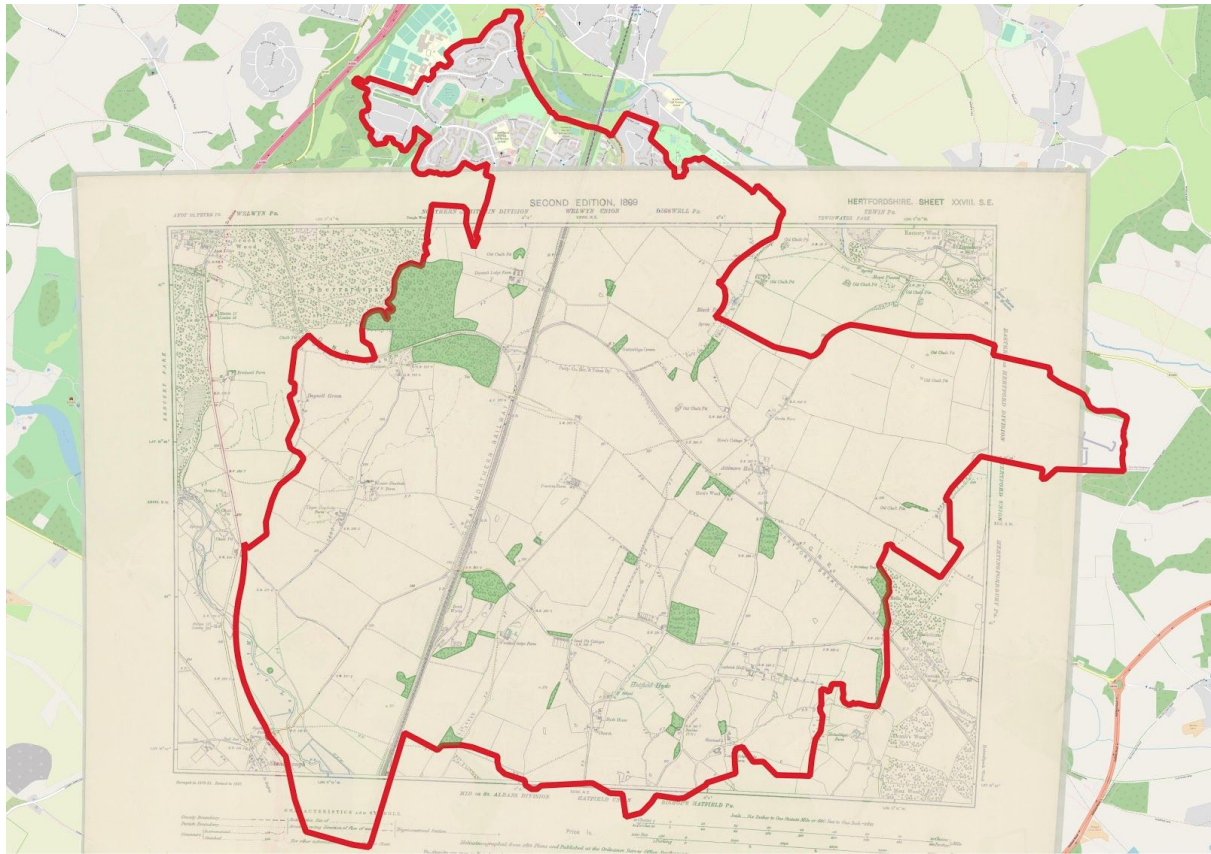
The main axis of the site is bifurcated by the Great Northern Railway line, running northward from London to Yorkshire. This is also the site of the Hertfordshire junction railway, which dominates the landscape. A minimal road network is present, with the water traffic of the River Mimram running through the northern expanse of the site. Similar to the following two maps, the scope of this historic document does not encompass the whole of the current WGC administrative boundary, although the amount of missing data is negligible.

Sherrardspark Wood is still the primary agglomeration of greenery in the site, as seen in the image below (Map 2):



Map 2: Dominance of Sherrardspark Wood in the landscape

Following the green space analysis, the map as it appears within current administrative boundaries is presented below (Map 3):



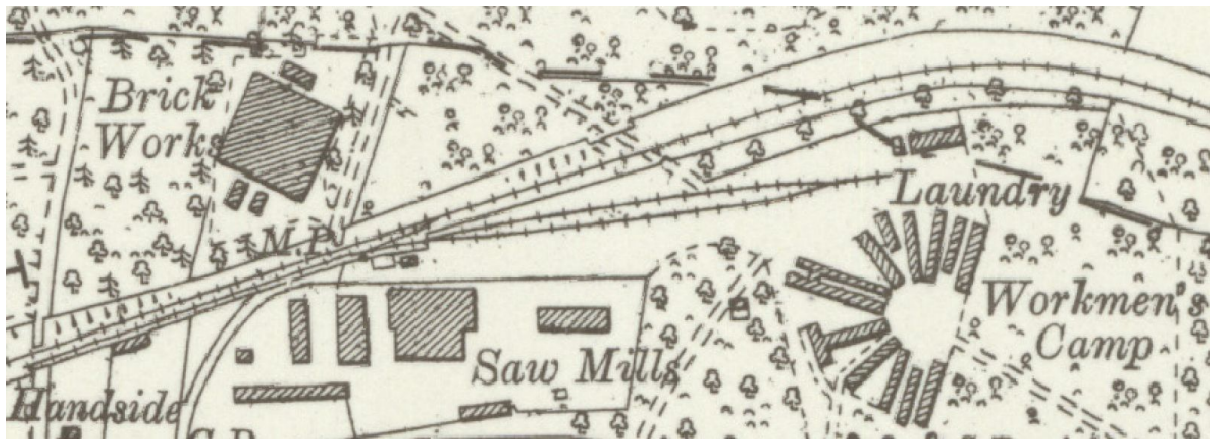
Map 3: 1899 Welwyn Garden City

The statistical analysis of this document reveals a total area of **1,361,138.92 square metres** of green space, much of which is centred around forested areas.

7.2. 1925 Hertfordshire XVIII.SE

This 1925 edition of the map has a surprisingly accurate projection, lining up almost exactly with current surveys of the area. While WGC had been founded 5 years previously, it only takes up a fraction of the total area of the site depicted. In fact, much of the current borders of the town, when overlapped onto the 1925 map, swallow up the surrounding towns and villages. However, for the purposes of this study, all green space within the modern-day border is considered, to provide a constant area in which change occurs. There is also missing information regarding the areas that stretch beyond the current borders of the map, particularly in the north, diluting the data somewhat.

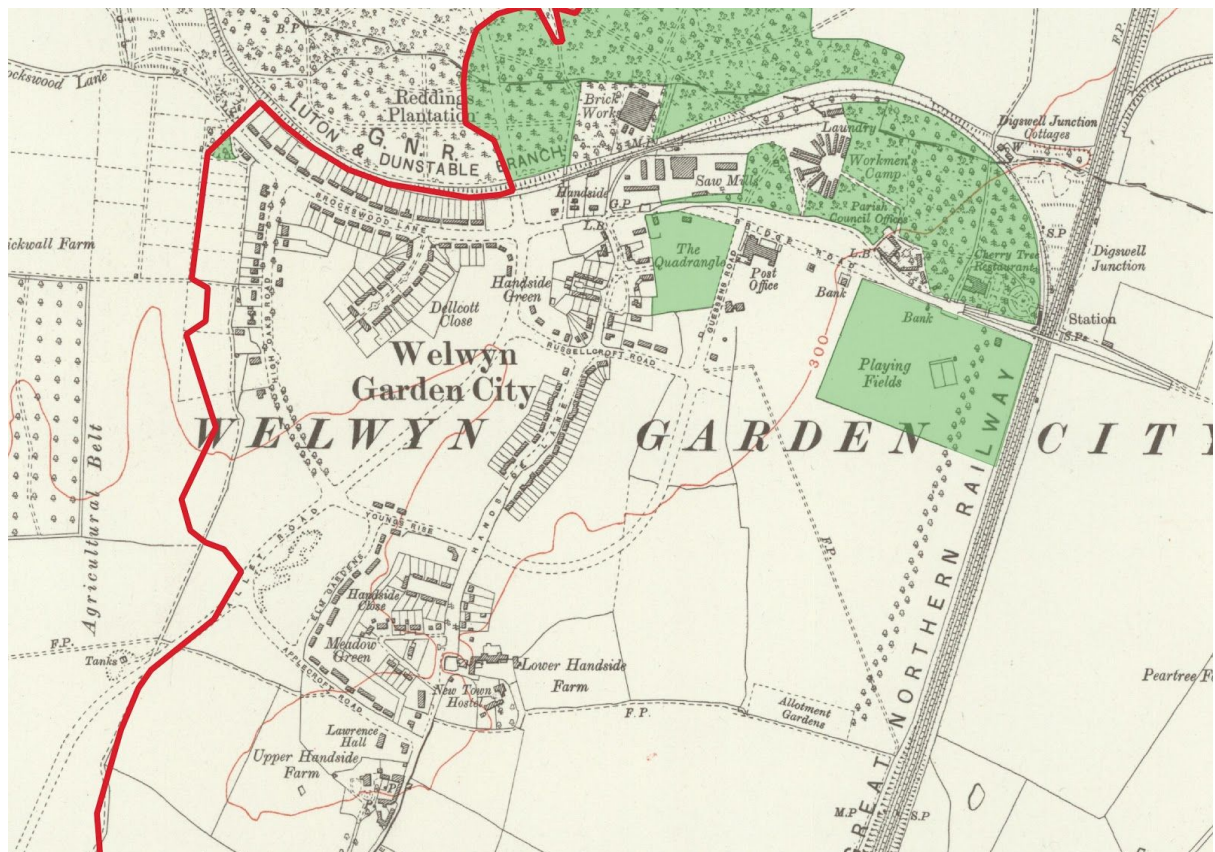
Visible in the green space analysis are many small copses, woods and groves. Not counting economically productive plots (sawmills, farmland, fisheries), there is still a surprising amount of green space attached to the small villages surrounding the GC. The centre of the town is remarkably different from the plot as we know it today, with much of the main centres of industry located just southward of Sherrardspark Wood (Map 4).



Map 4: Industrial centralisation in 1925 Welwyn Garden City. Note the brickworks, sawmills and workmen's camp

However, regardless of the surrounding towns, the centre of the site is extremely well provided for in terms of green space. Large playing fields and meadows are flanked by woodlands and shrubs, lining the streets.

This is visible in the finished process map below (Map 5), focusing only on the site of WGC:



Map 5: 1925 Welwyn Garden City, focused on site

The map, as it fits within the current-day boundaries of the town is shown below (Map 6):



Map 6: 1925 Welwyn Garden City, focused on current boundaries

Following this processing, the total amount of green space within the current day borders sits at **1,424,426 square metres**.

7.3. 1948 Hertfordshire XVIII.SE

Significant change is visible since the last pre-war map, with noticeable suburban and residential expansion. This is especially true in the eastern side of the settlement, as road networks and residential plots are carved out of the hamlet of Hatfield Hyde. The centre of the town has seen some elimination of sports grounds and playing fields as the rail network is expanded.

Interestingly, this map marks the creation of the central axis - 'Parkway' - running from the crescent where the industrial worker's camp once stood (Map 7).



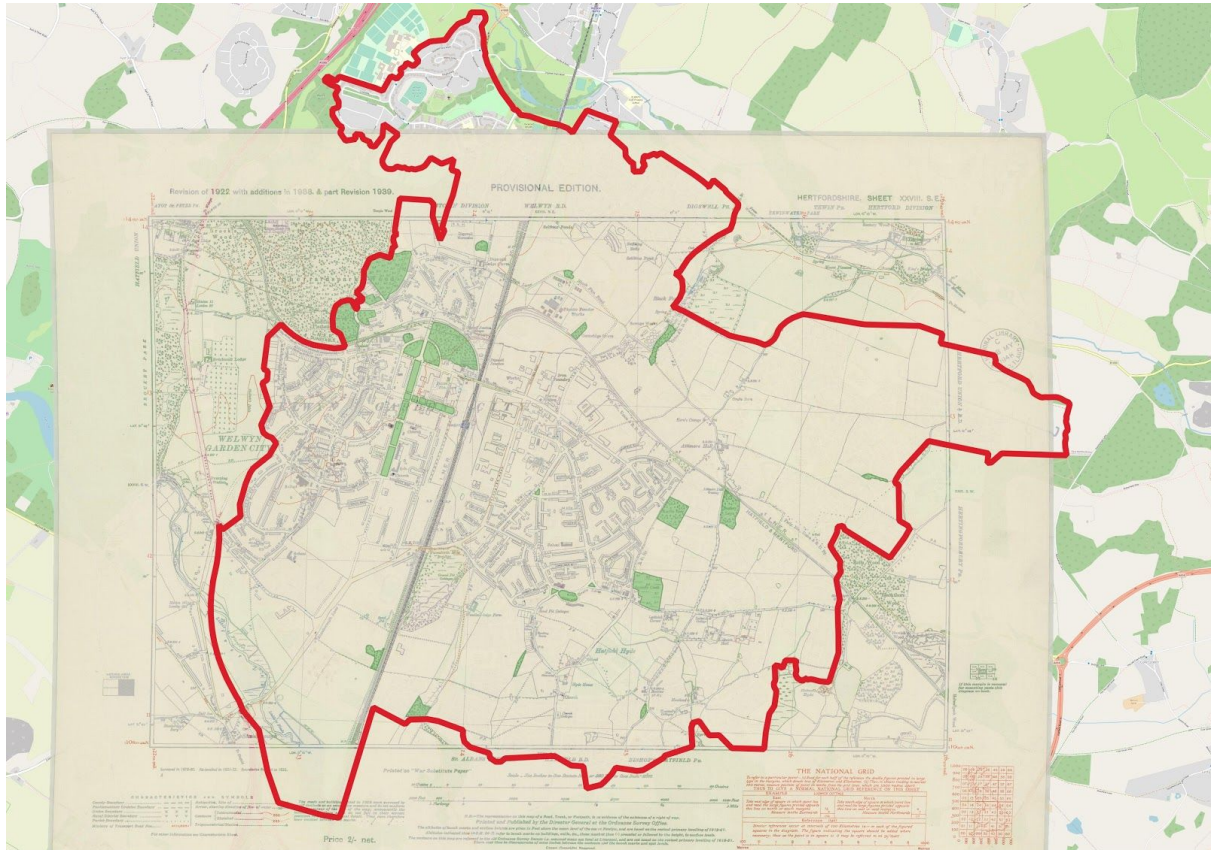
Map 7: The iconic Parkway and Crescent axis of Welwyn Garden City

This is even more visible in the finished processed map, shown below focusing on the centre of WGC (Map 8):



Map 8: 1948 Welwyn Garden City, focused on site

Below is the map as it fits within current day boundaries (Map 9):



Map 9: 1948 Welwyn Garden City, focused on current boundaries

This analysis reveals the site to have a total of **833,272 square metres** of green space within its boundaries, a significant decrease since 1925.

7.4. 1992 Welwyn Garden City & Hertford Ordnance Survey

The 44-year jump from post-war development to the modern state of affairs reveals a huge expansion of residential property eastward. Many of the surrounding settlements were re-developed and connected to the central core of WGC through winding road networks, with a distinctly suburban appearance.

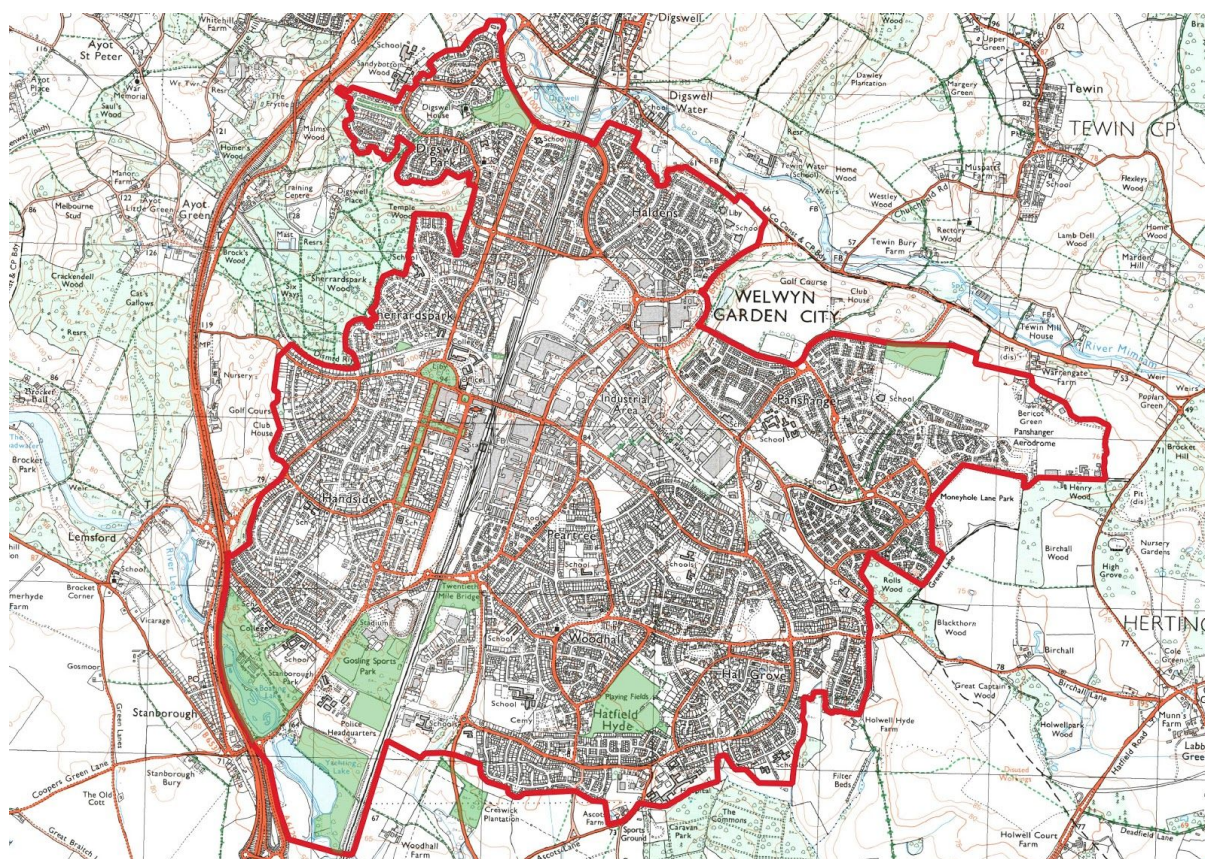
However, this increased urban density was matched with the appearance of new green spaces. All residents will have seen a benefit from the drainage of the Stanborough wetlands and creation of green space in the southern area of the site, alongside the new Gosling sports facilities (Map 10). This was also accompanied by northward expansion into Digswell, in which further areas of scenic beauty and common greens between houses were established.



Map 10: Creation of Stanborough Park

This map was of a large size, spanning across most of the central belt of Hertfordshire. It was also in colour, which aided with green space analysis, as well as increasing the accuracy of the georeferencing methods. This is visible in the way in which the boundary of WGC has snapped to the road network.

The finished process map appears as follows (Map 11):



Map 11: 1992 Welwyn Garden City

This processing technique reveals that 1992 WGC had a total amount of **2,273,763.27 square metres of green space**, a significant increase since 1948, not least due to the incorporation of wide expanses of land in the south of the town.

7.5. 2019 Welwyn Garden City & Hertford Ordnance Survey

This final map consists of up-to-date digital resources from the Ordnance Survey database. Using the *OS OpenMap Local* and *OS Open Greenspace* datasets, a comprehensive view of green space in WGC can be depicted.

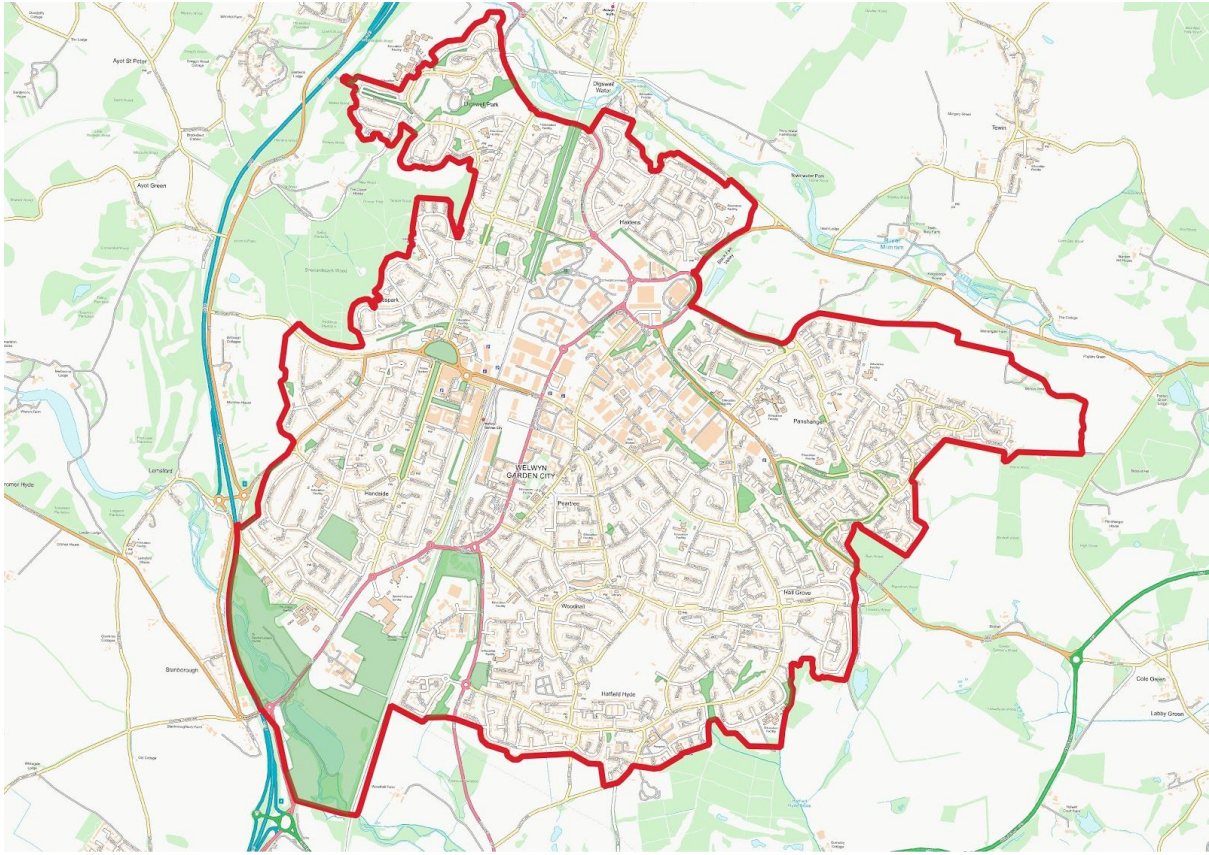
Using raster tiles focusing on OS TL21 NE, NW, SE, and SW, this mapping provides the most recent survey of WGC. It includes extremely detailed representation of green space in the site - previously unseen plots such as common greens between cul-de-sacs are finally visible from a cartographic perspective (Map 12).



Map 12: An example of a green common revealed among residential housing on the 2019 OS map - Pondcroft common

The intricate detail provided by the datasets meant that GIS mapping became a very time-consuming process. Some wooded avenues are also included in this OS surveying, as are playgrounds for schools. These areas have not been included in the green space analysis.

The finished process map appears below (Map 13):



Map 13: 2019 Welwyn Garden City

The analysis of this map showed that there was a total of **3,163,999.29 square metres** of green space.

7.6. Summary of Welwyn Garden City green space analysis

The five maps processed describe a narrative of change in WGC. The changes to green space can be seen in the graph below (Table 5):

Period	Green Space Area (m ²)	Green Space Area (as a % of total administrative area)
Pre-development (pre-urban)	1,361,138.92	3.94%
Early development	1,424,426	4.12%
Post-war planning	833,272	2.40%
Modern era	2,273,763.27	6.57%
Current sites	3,163,999.29	9.15%

Table 5: Table of changes seen to green space in Welwyn Garden City over 5 distinct periods of planning

7.7. 1919 Tokyo Seinanbu

There was pronounced difficulty in georeferencing a map from 100 years ago - especially considering the rapid pace of urbanisation seen in Tokyo since then. For this reason, similar to how georeferencing of the 1899 Hertfordshire OS map was carried out in reference to the 1925 document, the 1930 map of DECF was used to assist in locating geographical features (hills and points of unchanged elevation), as well as older religious sites (shrines and temples). Thus, the correct projection was ascertained.

There are some observable geographic features that appear changed in later maps - namely the expansion of the Tokyo Bay area (outside of DECF's boundaries) as well as the changing shape of the Tama river.

The rural nature of the area was underlined by the prevalence of rice paddies shown on the map. Many of the square plots of land that would later be urbanised were based on the footpath network originally running between rice paddies, especially in the easternmost section of the site (Map 14).

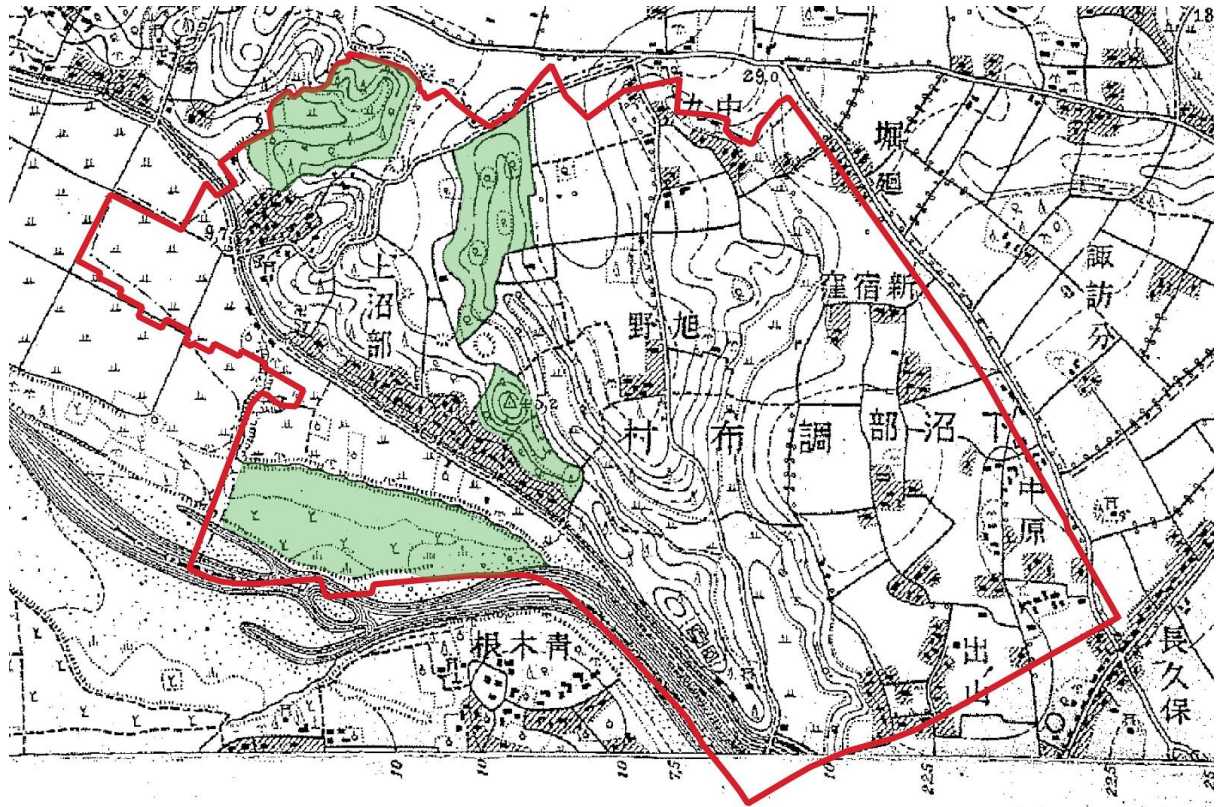


Map 14: Pre-urbanised rice paddy settlement alongside the Tama River

However, such agricultural land does not function as public green space as envisioned by the GC principle, and is not counted towards total green area. In fact, considering the site as it stands before the GC ideal was established here, there is difficulty in assessing how green space functioned within the boundaries of modern day DECF. Despite that, there is clear prevalence of copses and woodland areas surrounding the small hamlets dotting the map, some of which remain in place even post-urbanisation. This is indicative of the Japanese practice of 'Satoyama' (里山), by which thickets and hilly forested areas are left untouched,

while farming takes place around them. This approach is widely seen in the Japanese rural landscape, and has been extensively written about as a sustainable practice (Satoyama Initiative, 2019).

The finished processed map appears as follows (Map 15):



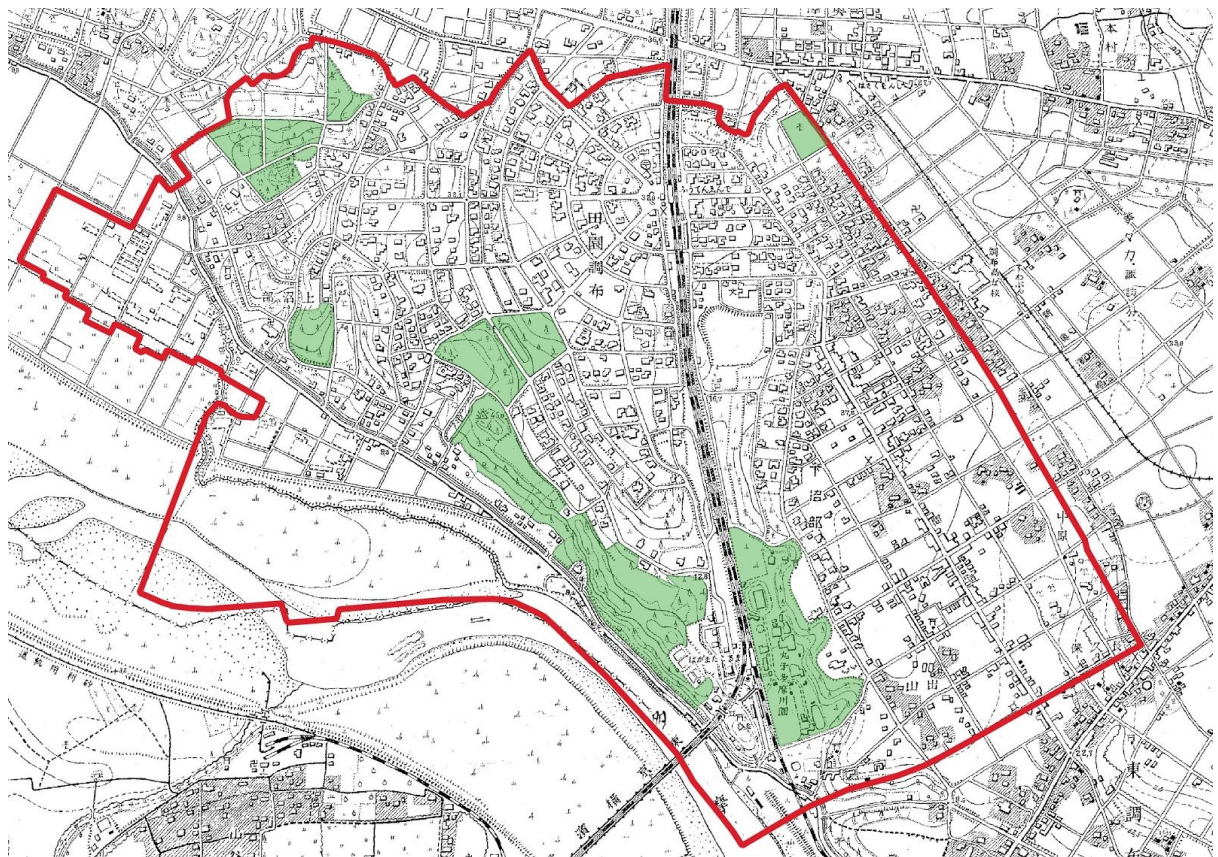
Map 15: 1919 Den'enchōfu

This processing revealed **383,519 square metres** of green space.

For this reason, it seems likely that civic green spaces, as we understand them in the West, were still a relatively new urban phenomena in Japan at this time, and therefore surveyors focused on the familiar, rural aspects of green space in their mapmaking. Sorensen also raises the question of religious sites functioning as green areas - however, these cannot truly be considered 'public' sites of green space, as a degree of parochialisation was in place regarding public access (limited to religious ceremonies or local festivities).

Therefore, green spaces were measured according to those available to the public, and not earmarked as economically active or undeveloped.

The final processed map appears as follows (Map 16):



Map 16: 1930 Den'enchōfu

This processing revealed the site to contain a total of **291,367 square metres of green space**.

7.9. 1958 Den'enchōfu

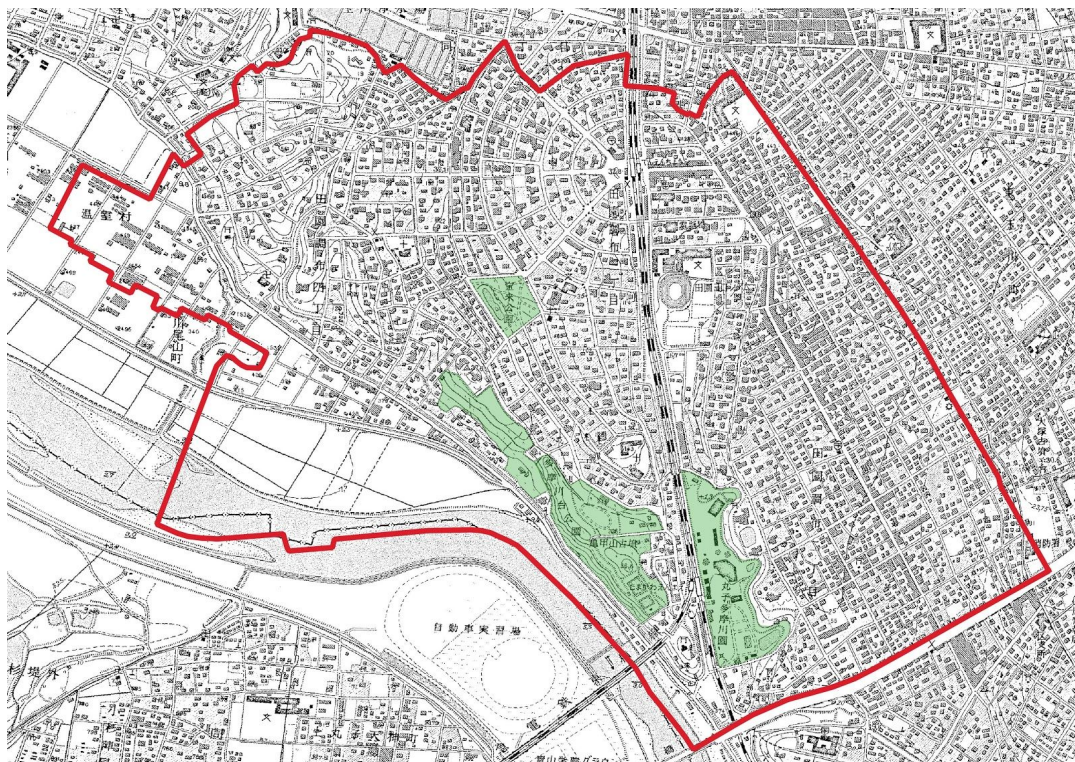
Interestingly, this map follows many of the same surveying conventions as the 1930 edition. The legend uses the same typologies of green space, although Hōrai Park has now been labelled as such (see Map 17).



Map 17: Hōrai Park (宝来公園, Hōrai Kōen), now labelled

There is noticeable disappearance of green sites on the northern fringes of the site, with further urbanisation. Indeed, many of the plots shown as ‘undeveloped’ in the 1930 edition of the map have since been built over. The southeastern section of the site is noticeable as having undergone extensive urbanisation, and road networks in that section of the map have also been widened and extended.

The final processed map appears as follows (Map 18):



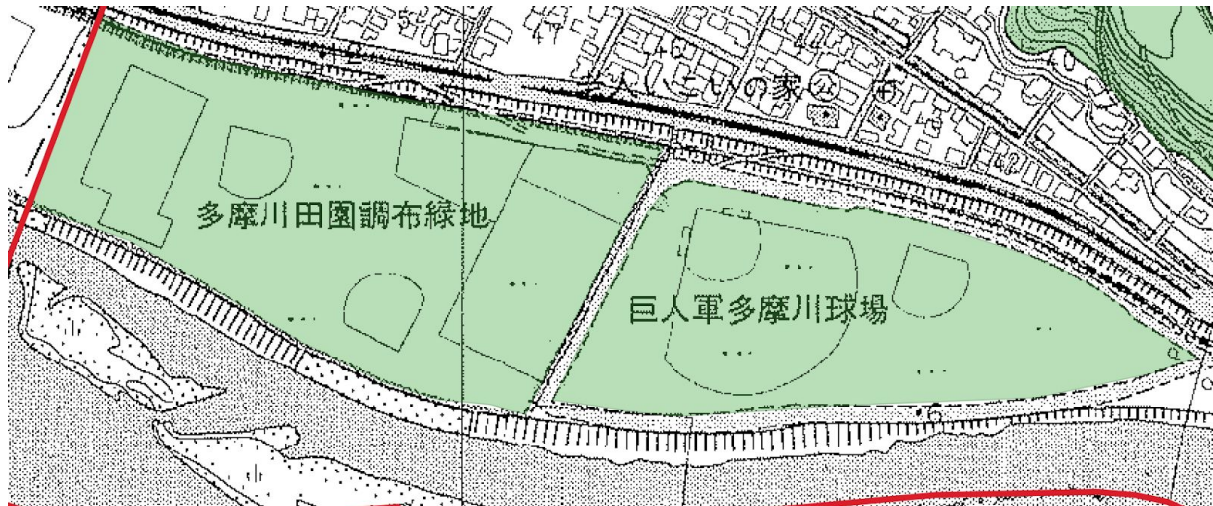
Map 18: 1958 Den'enchōfu

This 1958 survey of DECF reveals the site to contain a total of **188,618 square metres of green space**.

7.10. 1985 Jiyūgaoka

Moving forward to an analysis of DECF under what can be considered a ‘modern’ period of urbanity, a variation is seen in the historic material. The previous two maps studied used a surveying projection that centred on DECF itself. Following reforms to surveying methods, the maps now focus on the wider area known as Jiyūgaoka, of which DECF is a constituent part. Unfortunately, this projection cuts off a small section of the southern part of DECF, however it is an area of insignificant value to this study.

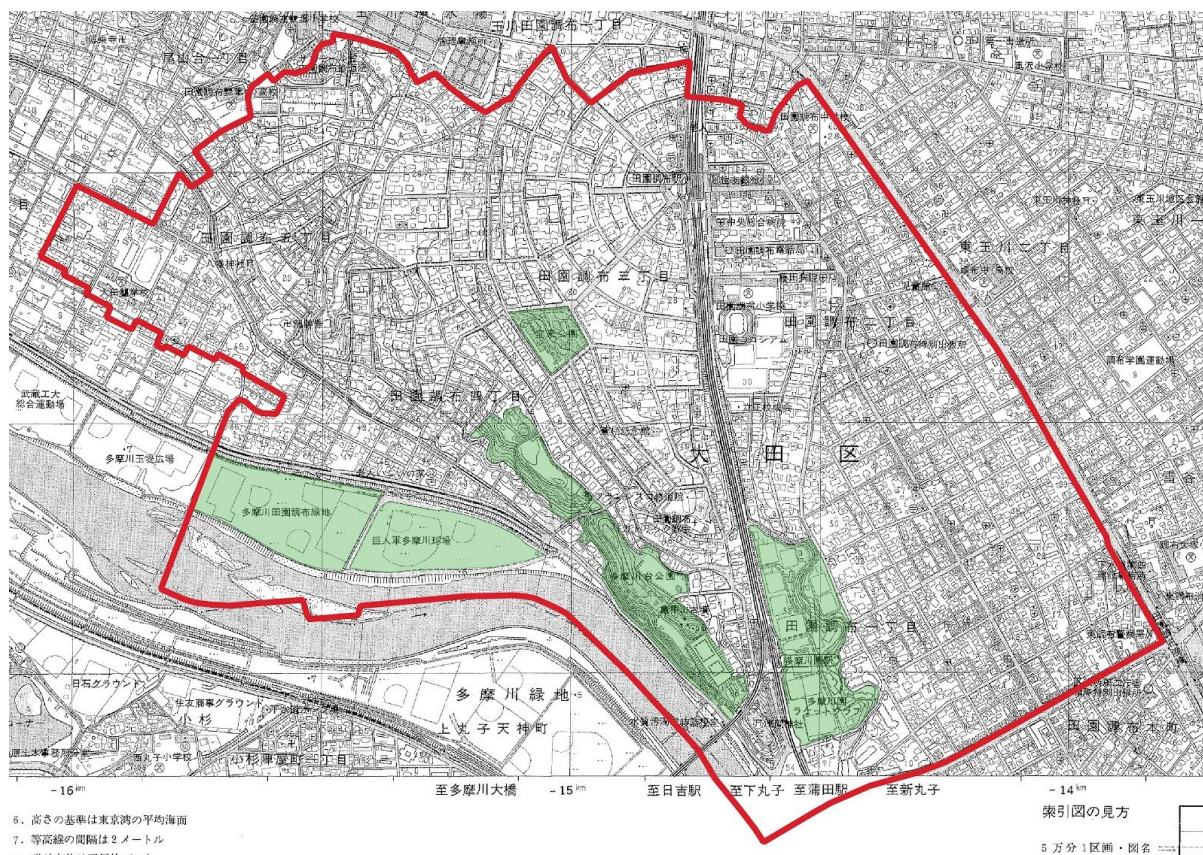
The major development regarding green space during this period is the establishment of public sports facilities and park equipment on the northern bank of the Tama river (Map 19). Using land previously shown as undeveloped wetland, this expansion increases the overall square footage of green space in the development. However, it is indicative of growing urbanisation at the same time; many of the undeveloped plots seen along the river bank in previous years are now developed into residential streets.



Map 19: Development along the Tama river bank

There was also increased expansion of the easternmost green area, with the development of a tennis court and surrounding parkland.

This pushes the overall distribution away from the core of the site, towards the southern area. The final processed map is as follows (Map 20):



Map 20: 1985 Den'enchōfu

Thanks to the additional development along the river bank, the total area of green space in DECF revealed by the 1985 survey is **332,556 square meters**.

7.11. 2019 Ōta-ku

The final map to be processed for DECF, showing the site as it stands today, is a scanned copy of a map obtained during 2019 fieldwork to the site. This map depicts the whole of Ōta-ku, the wider administrative area.

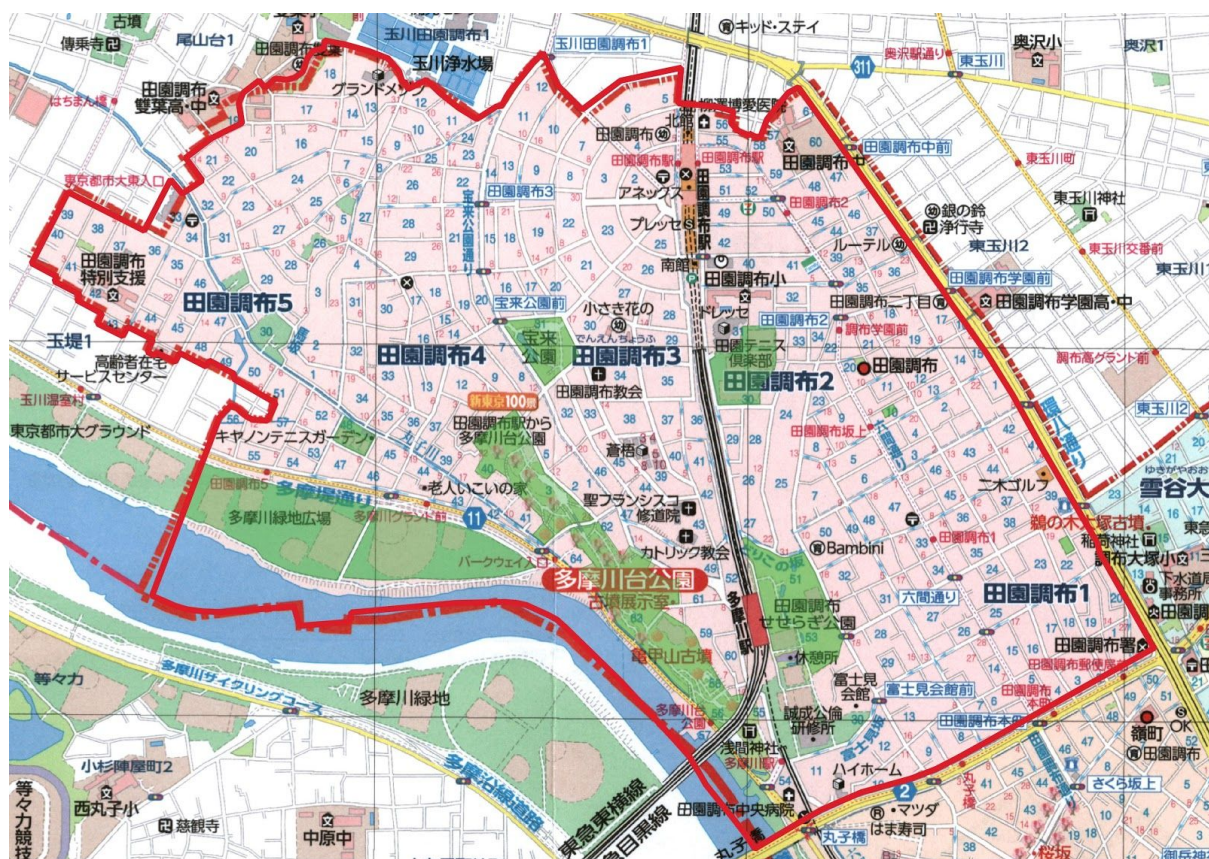
First thing to note was the much more accurate portrayal of green areas, as they are pre-highlighted and labeled on the map. Georeferencing this document and using it as a layer for GIS meant that the analysis of green space was more akin to tracing than to actually decoding. The map also goes into detail regarding smaller children's play areas that have been established since 1985, grounds that might otherwise have been overlooked not for the clearly presented colour format (Map 21). However, what was once a large public tennis court in 1985 has since been redeveloped into a local community center, drawing away from the total green space prevalence in the area.



Map 21: An example of a smaller children's play area in Den'enchōfu

However, this map did not accurately distinguish between religious sites, school grounds, and public green spaces. To assist in the mapping of this document, both satellite imagery from GSI, and the base layer OpenStreetMaps map were used to distinguish sites.

There was also some overlap of the administrative borders of Ōta-ku as a whole with those of DECF - these are due to differences in line width and line pattern, and not indicative of any inaccuracies. They are visible on the finished processed map (Map 22):



Map 22: 2019 Den'enchofu

Due to the nature of this document, in full colour and produced with modern technology, the total calculated area of green space in DECF is of high accuracy. The total calculated area of green space for 2019 is **317,787 square metres**.

7.12. Summary of Den'enchofu green space analysis

The five maps processed describe a narrative of change in DECF. The changes to green space can be seen in the graph on the following page (Table 6):

Period	Green Space Area (m²)	Green Space Area (as a % of total administrative area)
Pre-development (pre-urban)	383,519	12.54%
Early development	291,367	9.53%
Post-war planning	188,618	6.17%
Modern era	332,556	10.87%
Current sites	317, 787	10.39%

Table 6: Table of changes seen to green space in Den'enchōfu over 5 distinct periods of planning

8. Discussion

8.1. Results and discussion

This leads this thesis to explain and discuss the data generated. Strikingly, there appears to be a gap between the established academic views of DECF's role (or lack thereof) as a GC, especially in relation to the more well-known cases such as WGC.

Watanabe (1980), Sorensen (2002) and Oshima (1996) all described DECF as being a GC in name only; they pointed to multiple ways in which the site no longer fulfills criteria that define Howard's original vision. While there are multiple criteria that describe a GC (as outlined by both the IGCI and Hgel), one fundamental aspect that draws directly from *Garden Cities of To-Morrow* is the proliferation of publicly-accessible green space. This is further subdivided under typologies outlined by Conway (2009) and the Ministry of Land City Planning Division (2003), which informed the way in which the green space analysis was carried out using GIS in this paper. If we are to judge a settlement's validity as a GC under this criteria only, then a conflict appears between the academic view of DECF and WGC and the actual reality.

Below, the proliferation of green space in both sites is shown in a table for the periods studied:

PERIOD	WELWYN GARDEN CITY (GREEN SPACE AREA m2)	WELWYN GARDEN CITY (GREEN SPACE AS A PERCENTAGE OF TOTAL BOUNDARY)	DEN'ENCHFU (GREEN SPACE AREA m2)	DEN'ENCHFU (GREEN SPACE AS A PERCENTAGE OF TOTAL BOUNDARY)
Pre-development	1,361,138.92	3.94%	383,519	12.54%
Early development	1,424,426	4.12%	291,367	9.53%
Post-war planning	833,272	2.40%	188,618	6.17%
Modern era	2,273,763.27	6.57%	332,556	10.87%
Current site	3,163,999.29	9.15%	317,787	10.39%

Table 7: Comparison of green space between both sites

This reveals a different narrative to that present in the established literature. Namely, DECF historically has seen a higher proliferation of green space as a percentage of its area. While the smaller size of the site may distort these figures, especially considering that larger parks service residents not only from within a given site, they do show an interesting story. If we are to take the simplistic view of green space as the key defining

feature of a GC, then it is difficult to argue that DECF is any less valid under Howard's original plans than WGC is. This data runs contrary to the initial hypothesis given at the beginning of this paper - while it was presumed that degradation to public green space would be widespread under urbanisation, the opposite is true. Also, it was hypothesised that significant levels of divergence would be visible moving through the history of both sites; this, again, is less prominent than expected.

The data also reveals similarities between both sites. The undulating prevalence of green space in both sites follows similar patterns - both sites saw a drop in public green space moving from the period of Early development to that of Post-war planning. For both sites, this was due to an expanding residential network, and a transition to suburbanity. This was followed by an increase in green space as the sites moved towards modernity. Based on the historical documents, this can be argued as follows. The initial push for residential building during the postwar era saw building over previous agricultural land, with little thought to providing civic spaces. However, once this initial rush had expanded to the modern day boundaries of both sites, attention was paid to the social environment rather than the physical. Re-development of plots into green spaces increasing the quality of life for residents was widespread during this period.

However, despite the quantitative approach of this methodology, there is a qualitative element to it. Analysing these historical maps in a chronological manner reveals the way in which those living in said sites, in said periods, understood the way their cities worked. Surveyors and mapmakers during the early development periods of said sites prioritised economic output in their documents; farms and agricultural areas have their crop output listed in detail. Little is made of civic spaces in the early documents, with scant mention of plazas, parks or play areas. As the sites developed, however, we see more and more space allotted to public well-being, especially in the provision of green publicly-accessible areas and outdoor sports facilities. While it would be brash to assume that those living in these sites in previous decades were not actively engaged in outdoor recreation, the analysis carried out through this methodology reveals that spaces assigned to such activities are less represented on historical documents. Whether this suggests a change in mindset among citizens (in how they interacted with their surroundings) or among planners (in how the surroundings were integrated) is an interesting question to theorise upon.

Not only are similar patterns visible between both sites moving from year to year, but overall proliferation of green space is very similar between both sites as they stand today. This suggests three different issues.

Firstly, although hardly groundbreaking, it can be shown that green space is not the only defining feature of GCs. There are multiple criteria that define a site as following this urban model, and those that see a higher level of green space proliferation may be lacking in other aspects (such as communal land ownership or local industrial centralisation).

Secondly, and linked to the readings of Peck & Theodore and Harris & Moore, the idea of circulating planning knowledge is addressed. The ways in which the GC ideal was (and is) understood transnationally is proven to differ from place to place; both WGC and DECF reinterpreted and reactualised the same model in their own ways. While general trends are visible between both sites, the proliferation and interpretation of how green space should be provided to residents took divergent forms. Both sites created larger parkland in the wetlands on the borders of their urban cores, yet while WGC invested more into outdoor sports and recreational sites, DECF focused on maintaining wooded copses and groves within the urban mesh.

Finally, and perhaps most challenging, is the idea of inherent bias. The disregarding of DECF as a ‘true’ GC, while based on multiple criteria, falls short when analysing green space in detail. The GC, as a Western planning model, is most often discussed in relation to its implementation in Britain. While other European cases such as Hellerau and the Cité-jardins are referred to positively in the literature (The Town and Country Planning Association, 2017), those cases found in Japan, India and China often fall by the wayside. Without properly addressing and appreciating the mutations undergone by planning models post-mobilisation, alternative interpretations of concepts are disregarded as improper or incorrect. This Western bias falls under the post-colonial strand of urban theory, and leaves plenty of scope for further researchers using comparative methods moving forward.

8.2. Limitations

While the data generated offers plenty of insight into the development of both sites under the GC model, some limitations were present throughout the methodology.

Firstly, considering the historical material, some missing data was present. For example, in the 1930 map of DECF (p.104), the undeveloped south bank of the Tama river development meant that proper map contouring was affected. This resulted in the central area of study being warped to the correct proportions, but the extreme edges suffering from inaccurate georeferencing.

There also existed difficulty in recognising the typologies of green space being used. Legends differed not only between the two sites, but between different mapping styles from year to year. As ideas of urbanism (especially in regards to the ‘rural’) have evolved, so have the ways in which green space has been typified. As surveying methods and urbanity evolve over time, so do our collective conceptions of green space. This was a particularly present issue in the pre-urban maps of both sites. DECF, for example, was more intensively farmed than the original site for WGC was, despite being on the fringes of pre-modern Tokyo - whether or not this caused confusion between the urban/rural split in mapping techniques is unclear. However, the chronological approach taken through GIS analysis meant that corrections and references could be made from the more up-to-date depictions of both sites.

Ideally, a more elaborate system of typology should be applied for further research, including percentile breakdowns of undeveloped land and agricultural plots. Doing so would reflect the growing urbanisation and creation of residential districts, something that ultimately may be more revealing of changes to green space than actual mapping of civic open areas themselves. Indeed, different surveying techniques, mapping organisations, and national registries all classify land usage in different ways (i.e. 2019 OS maps versus 2019 OSM data). This affected the statistical output when dealing with cross-comparative research.

Another difficulty was found to be inherent in the methodology used. While GIS mapping makes sense in terms of overall distribution of green space, it unfortunately leaves additional questions unanswered. Peaks and troughs are visible in the overall area occupied by green space, indicative of the development of additional plots of land. However, this data does not reveal the extent to which these areas are integrated into the wider city plan - the increase of green spaces on the fringes of the sites may do little in real terms in increasing the quality of life of residents, especially framed under Howard’s original plan. Therefore, it can be said that mapping access and availability of green spaces is beyond the capabilities of the methodology used here.

In this sense, the methodology is more revealing of wider trends seen in both sites than more granular analysis. Expansion and contraction, peaks and troughs, and dispersion and centralisation are all visible, while data regarding access and integration may be lacking.

Finally, it would be inattentive to not raise the ongoing issues that the 2020 COVID-19 outbreak caused regarding this research. This pandemic affected the planned time frame by which data collection was scheduled to take place; additional planning documents and historical maps were unable to be collected from the local council archives in WGC. For this reason, research for this case shifted away from primary physical documentation, and towards those materials available to be purchased digitally. Unfortunately, this reduced the material available for analysis. Ideally, the green space statistics gained throughout this analysis would also be run against official information published by both local authorities; again, this was hampered by the pandemic, in which most local offices have either been closed or running reduced services.

8.3. Reflection on research question

The data gathered through the methodological practices can now be integrated into the issues addressed under the research question.

The quantitative data generated through the GIS analysis did raise contradictions between the two cases. Although both sites followed similar undulations period-by-period, the surprising finding was the way in which DECF consistently had a wider percentage of its footprint allocated to publicly-accessible green space. This, as touched on previously, questions current conceptions of how the GC ideal was interpreted following transnational mobilisation. An interesting dynamic is at play in which the wider theoretical notions of the GC reveal themselves at ground level through local, small-scale changes. However, do city planners, when changing public tennis courts into community centres (as seen in the 2019 Ōta-ku map p.107), really reflect upon how this creates disassociation with the original GC planning model? The microcosm and the macrocosm are intricately linked through the spatial dimension - as above, so below.

While green space certainly is not the only defining feature of the GC, the fact that DECF is so consistently disregarded as flouting GC principles (Watanabe, 1980; Oshima, 1996; etc.) seems hypocritical considering the way in which WGC is seen as an exemplary case of the GC principles in practice. This author believes that the dual standard by which cities are judged requires, itself, judgement from researchers.

The lack of widespread recognition of DECF as a GC may be attributed to the lack of widespread English-language assessments of the site; yet even Japanese-language work frames it in a negative light. Under different criteria of assessment, it seems fair to state that any GC can have the ways in which it diverts from the original model highlighted and critically analysed, yet the ways in which these sites fundamentally adhere to guiding principles cannot, and must not, be overlooked. The view by which non-orthodox sites are seen as erroneous or misguided, inherently perverting the imported models by which they were founded, is too shallow an assessment; the Literature Review portion of this paper (pp.23-42) discussed this in detail.

As Peck & Theodore (2010) revealed - 'Policy models [...] can take lives of their own, often with little more than symbolic connection to their (supposed) places of origin'. Contradictions between sites that are

described as GCs should, in this way, not create a hierarchy of sites following their compliance with the original model, by which some towns are 'more' compliant than others. Instead, it should expand the definition of what exactly a GC is, as heterogeneous understandings add to the richness of the original urban model.

Indeed, as Hügel (2017) and Hall (2014) pointed out, Howard's original theories of the GC were based far more in reformist social and economical practices than in the actual planning and layout of the city. The diagrams shown in *Garden Cities of To-Morrow* (Howard, 1902) are purely illustrative and suggestive in their appearance, using abstract circles and symmetrical road networks to suggest a degree of harmony and utopianism. The physical layout was always a small component of his original text - he was far more concerned with the ways in which socially reformist ideas could be packaged in an acceptable manner in such a way that private investors would feel inclined to step in and fund projects that the national government would be reluctant to be involved with. The radical ideas of Howard, far from mainstream at the time, were digestible when presented in such a manner (as described by Sutcliffe, 1981). Hügel's (2017) argument that the GC ideas were never concretely synthesised into 'a more complete theory' appears to hold some significance from this perspective.

This reluctance to address key planning issues in the original text means that, from an early stage, there was a significant amount of vagueness regarding codified requirements for a GC. As purely suggestive practices (if mentioned at all), there were no safeguards put in place regarding the presence of green space in such towns. While green space was deemed as important by Howard, and prioritised in such a way that made investment attractive, no strict physical planning was provided early on.

Additionally, this repackaging of reformist ideals in such a way to enable support through private funding had two consequences. Firstly, it allowed for the expansion and practice of the GC as an ideal that otherwise may not have been carried out fully; the international outlook of guiding organisations, and the running of international conferences and symposiums, meant that it had outreach beyond the local (as visible in its mobilisation in Japan). However, secondly, the inclusion of private investment meant that reformist ideals were laid under the whim of financial markets - how were the lofty ideals of the GC meant to withstand the force of capital? The pressure on land value (as described by Oshima in reference to DECF) meant that the preservation of green belts, civic land and green corridors was under threat. Therefore, the studying of such spaces revealed the extent to which GC ideals held out against hypercapitalisation - both sites, with over 9% of their space allocated to public green space, appear to have preserved one of their defining features in the modern era.

Therefore, the GC appears to suffer from a degree of selective interpretation among scholars today. As it is a model that has seen divergence and differentiation among different sites over different periods, it is a concept that encompasses a variety of characteristics. Researchers (and indeed GC organisations themselves) appear to choose the characteristics that support their arguments, while disregarding those that may question their narratives. While this paper focused on the characteristic of green space, and found little evidence to suggest that either WGC or DECF had diverted from the original plan of the GC in a significant manner, those authors looking at other variables have found evidence to the contrary. This 'pick-and-choose' manner in which the GC is understood and unpacked fails to address the most fascinating element underpinning it, namely the manner in which it mutated and was re-interpreted across the globe. These reinterpretations should not be seen as running contrary to the original concept, instead, they should be seen as a positive experience in which the utopian context of the GC was translated and re-evaluated for

different regions (forming, for example, the *Den'entoshi* concept in Japan).. Rather than a one-size fits all model, the flexibility of the original plan allowed for a mix of divergences and convergences across sites. This heterogeneity is, in this author's view, what defines the utopian understanding of the GC.

9. Conclusions and Recommendations for Further Study

9.1. Conclusions

While this paper sought to use comparative methods to analyse two geographically and socioculturally disparate cases, both sites drew from the same original ideologies by virtue of the GC model. To understand this fully, we must once again consider Howard's original ideas as the framework by which the two sites can be understood. As he was quoted:

'One should never be realistic in humane plans. There are excessively always too many difficulties and only a small percentage of aims may be attained. Our aspirations therefore should always be as far-reaching as they can be, so as to make it possible to retract from some of them if necessary; for great gains are not to be thought of. And the percentage of losses depends only on the enthusiasm, energy and perseverance of the idealists who undertake it.' - Ebenezer Howard (Ostrowski, 1966)

It is this quote which underpins the arguments made in this paper. While multiple authors in the literature review were quick to dismiss DECF's status as a 'true' GC, the research carried out in this paper assessed that, at least under the criteria of public green space, this was a questionable stance to take. It is the view of this author that the way in which the two sites of WGC and DECF diverged was not a reflection of the utopian ideals of the GC being disregarded. Instead, it was a sign of the ways in which said ideals were contextually modified to fit the locales to which they were imported - expanding the definition of the GC rather than undermining it. This is a synthesis of the work done by both Murakami (1999) and Peck & Theodore (2010), arguing for interpretative mutation through policy transfer.

The result of said findings is that any divergence visible was a result of the exporting of the idea. The ways in which the GC were understood in Britain and Japan were 'homegrown' approaches - the vagueness of the guiding principles of the GC allowed for such innovation. This is supported by McCann's (2011) description of 'actionable ideas' and 'coordinating tools' - the lack of overtly specific guidelines for the GC ideal meant that the interpretation of it was always destined to differ from location to location. For Japan, this interpretation and localisation came under the purview of the Home Ministry - their role as a coordinating tool meant that the GC in Japan was less that which was seen in Britain, and more an entirely new concept - the *Den'entoshi* (Home Ministry of Japan, 1907)

Therefore, this research has shown that ideas of convergence or divergence from one planning model can be made without taking into account all constituent characteristics of said model. Green space, providing insight into some physical planning of the cities, may be but one element that defines them. However, by analysing individual elements, rather than seeking to define whether the sites are truly following the same model or not, can pay more attention to the ways in which the original model has been exported; understanding how different locales interpret the same idea in different manners provides an interesting cross-cultural approach. For this paper, in which the model under study is by all accounts a utopian one, said approach is crucial.

9.2. Recommendations for further study

While this paper works as a strong framework by which other research can be carried out, there is room for further study.

Moving past the examples studied here, further GCs across the globe could be approached under GIS green space analysis. Seeing whether the same patterns are visible across the globe, and whether similar levels of green space distribution have been preserved in the current era, may provide some insight into the effectiveness of the GC principles across different sociocultural boundaries.

Secondly, as touched on in the Limitations section of this paper (pp.74-75), there is room for additional GIS tools to be employed alongside more detailed town planning documents. Understanding the distribution patterns and levels of integration into the wider urban network may ultimately be more revealing than simply assessing total area size. This could be furthered by also examining access points to and from sites, as well as carrying out qualitative interviews with residents to assess accessibility.

Additionally, this research could expand from the limits of the chronological viewpoint taken, and look forward into the future. Interviews with experts in the field, local authorities, and town planners, would allow specialised insight into how exactly the sites under study are expected to change moving forward. This would allow patterns seen in historical changes to be carried forward in a predictive manner.

Finally, considering the limitations of this study as a thesis document, additional stakeholder mapping was limited to that contained within the timeline presented at the beginning of the report (p.22). To truly understand the ways in which decisions relating to land use and planning are made, further inquiry into constituent actors and their responsibilities should be made. If two GCs, despite being on opposite ends of the globe, are proven to have similar administrative ordinances, the degree to which change is permitted or obstructed can be painted in more detail.

References

- At Home (2020) *Den'enchofu-eki no Kakakusōba kara Ikkodate wo Sagasu* [Online] Available at: <https://www.athome.co.jp/kodate/souba/tokyo/denenchofu-st/> (Accessed 30/05/20)
- BBC (2020) *Welwyn Garden City celebrates centenary in 2020* [Online] Available at: <https://www.bbc.co.uk/news/uk-england-beds-bucks-herts-50632410> (Accessed 30/05/20)
- Berthelsen, C (2016) *A small lab - Projects* [Online] Available at: <http://a-small-lab.com/projects/> (Accessed 30/05/20)
- Cash, A. (2015) *Collection of books on Welwyn Garden City* [Online] Available at: <http://cashewnut.me.uk/WGCbooks/index.php> (Accessed 30/05/20)
- Cetin, M. (2015) 'Using GIS analysis to assess urban green space in terms of accessibility: case study in Kutahya', *International Journal of Sustainable Development & World Ecology*, 22 (5), pp.420-424
- Conway, C.J. (2009) *An Assessment of Welwyn Hatfield's open space, outdoor sport and recreation*, Welwyn Garden City: Welwyn Hatfield Borough Council
- De Pieri, F. (2019) 'Reassessing the legacy of twentieth-century new towns', *Journal of Urban History*, 45(1), pp.177-187
- Department for Communities and Local Government. (2002) *Planning Policy Guidance Note 17: Open Space, Outdoor Sport and Recreation*. London: Department for Communities and Local Government
- Fischer, R. & Poortinga, Y. (2018) 'Addressing methodological challenges in culture-comparative research', *Journal of Cross-Cultural Psychology*, 49(5), pp.691-712
- Fukushima, F. (1997) 'A study on the changes of Den'enchofu' *Nihon Toshi Keikaku Gakkai Gakujutsu Kenkyū Ronbun Shū*, 32, pp.55-60
- Gandhi, U (2019) *Georeferencing Topo Sheets and Scanned Maps (QGIS3)* [Online] Available at: https://www.qgistutorials.com/en/docs/3/georeferencing_basics.html (Accessed 30/05/20)
- Geospatial Information Authority of Japan (2020) *Chiri-in Chizu* [Online] Available at: <https://maps.gsi.go.jp/> (Accessed 30/05/20)
- Great Northern (2020) *Welwyn Garden City* [Online] Available at: <https://www.greatnorthernrail.com/travel-information/plan-your-journey/station-information/stations/welwyn-garden-city> (Accessed 30/05/20)
- Hall, P. (2014) *Cities of tomorrow: An intellectual history of urban planning and design in the twentieth century*. 4th ed. Oxford: Blackwell Publishing

Harris, A. & Moore, S. (2013) 'Planning Histories and Practices of Circulating Urban Knowledge', *International Journal of Urban and Regional Research*, 37(5), pp.1499-1509

Home Ministry of Japan. (1907) *Den'entoshi*. 1st ed. Tokyo: Hakubunkan.

Howard, E. (1902) *Garden cities of to-morrow*. 2nd ed. London: Swan Sonnenschein & Co. Ltd.

Hügel, S. (2017) 'From the garden city to the smart city', *Urban Planning*, 2(3), pp.1-4

The International Garden Cities Institute (2018) *Garden city principles* [Online] Available at: <https://www.gardencitiesinstitute.com/advocacy/garden-city-principles> (Accessed 30/05/20)

The International Garden Cities Institute (2018) *Welwyn Garden City* [Online] Available at: <https://www.gardencitiesinstitute.com/resources/garden-cities/welwyn-garden-city> (Accessed 30/05/20)

The Japan Times (2009) *Rural footpaths are increasingly no longer the roads less traveled* [Online] Available at: <https://www.japantimes.co.jp/news/2009/10/20/national/rural-footpaths-are-increasingly-no-longer-the-roads-less-traveled/#.XoxhW9PYp24> (Accessed 30/05/20)

The Japan Times (2012) *Tokyo Green Space* [Online] Available at: <https://www.japantimes.co.jp/life/2012/05/16/digital/tokyo-green-space/#.XtIwK57Yo8M> (Accessed 30/05/20)

JISC (2020) *Geospatial data* [Online] Available at: <https://jisc.geostore.com/jisc/#/discover/welcome> (Accessed 30/05/20)

Knight Frank (2019) *Rural Research: Farmland Index Q1 2019* [Online] Available at: <https://content.knightfrank.com/research/157/documents/en/english-farmland-index-q1-2019-6317.pdf> (Accessed 30/05/20)

Lahoti, S., Kefi, M., Lahoti, A., and Saito, O. (2019) 'Mapping methodology of public urban green spaces using GIS: An example of Nagpur City, India', *Sustainability*, 11(2166), pp.1-23

Lewis, N.P. (1913) *The planning of the modern city*. New York: Wiley

Louis De Soissons (2020) *Residential Projects* [Online] Available at: <https://louisdesoissons.com/projects/residential/> (Accessed 30/05/20)

Market Urbanism (2019) *Why is Japanese zoning more liberal than US zoning?* [Online] Available at: <https://marketurbanism.com/2019/03/19/why-is-japanese-zoning-more-liberal-than-us-zoning/> (Accessed 30/05/20)

McCann, E. & Ward, K. (2010) 'Relationality/territoriality: toward a conception of cities in the world', *Geoforum*, 41 (2), pp.175-184

McCann, E. (2011) 'Urban policy mobilities and global circuits of knowledge: toward a research agenda', *Annals of the Association of American Geographers*, 101(1), pp.107-30

MLIT (2014) *National Land Numerical Information download service* [Online] Available at: http://nlftp.mlit.go.jp/ksj-e/gml/gml_datalist.html (Accessed 30/05/20)

Miller, M. (2010) *English garden cities*. Letchworth: English Heritage

Ministry of Land City Planning Division (2003) *Introduction of Urban Land Use Planning System in Japan*. Tokyo: City and Regional Development Bureau, Ministry of Land

Murakami, A. (1999) 'The acceptance of Howard's Garden City theory by the Bureau of Home Affairs, the Ministry of Interior in the Meiji Era', *The Association of Rural Planning*, November (1), pp.13-18

Muraki, M. (1993) 'A study of suburban housing estates in Japan and England: Space organisation of garden cities', *Urban Housing Sciences*, March(1), pp.97-100

New Town Herts (2017) *The Houses of Welwyn Garden City* [Online] Available at: <https://newtownherts.weebly.com/blog/the-houses-of-welwyn-garden-city> (Accessed: 30/05/20)

Office for National Statistics (2019) *Lower layer Super Output Area population density (National Statistics)* [Online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareapopulationdensity> (Accessed 30/05/20)

Open Street Map (2019) *About OSM* [Online] Available at: <https://www.openstreetmap.org/about> (Accessed 30/05/20)

Osborne, F. & Whittick, A. (1963) *The New Towns - The Answer to Megalopolis*. 1st ed. New York: McGraw-Hill Book Company

Oshima, K. (1996) 'Denenchōfu: Building the garden city in Japan', *Journal of the Society of Architectural Historians*, 55(2), pp.140-151

Ostrowski, M. (1966) 'Sir Ebenezer Howard in Poland', *Town and Country Planning*, vol. 34 (11), pp.511-12

Ōta-ku (2016) *Jinkō / Menseki / Tochi* [Online] Available at: https://www.city.ota.tokyo.jp/kuseijoho/shiraberu/ota_kuseifile/ota_kuseifile19/ota_kuseifile19_data/jinkou.html (Accessed 30/05/20)

Ōta-ku (2019) *Chiiki jōbōshi : Den'enchōfu wagamachi* [Online] Available at: https://www.city.ota.tokyo.jp/chofu/ts_denen_chofu/jouhoushi/index.html (Accessed 30/05/20)

Ōta-ku (2020) *Jūminkibondaichō Setaijinkō Genkyōhyō* Available at: http://www.city.ota.tokyo.jp/kuseijoho/suuji/jinkou/setai_jinkou/oota_suji0205.files/0205chouhu.pdf (Accessed 30/05/20)

Parham, S., Downs, A., & Murray, G. (2018) *Garden Cities - Visionary popular and viable?*. 1st ed. Letchworth: The International Garden Cities Institute

Peck, J. & Theodore, N. (2010) 'Mobilizing policy: Models, methods and mutations', *Geoforum*. 41, pp.169-174

Rasche, J. (2011). 'Ueno Park during Meiji Times – a Mirror of its Time: Discursive Space and Symbolic Representation of Modernity', *Vienna Journal of East Asian Studies*. 1, pp.91-122

Reiss, R. (1920) 'Welwyn Garden City', *The Town Planning Review*, 8(3) pp. 179-182

Rowe, P. (2005) *East Asia modern: Shaping the contemporary city*. 1st ed. London: Reaktion Books

Satoyama Initiative (2019) *Satoyama Initiative Concept* [Online] Available at: <https://satoyama-initiative.org/concept/> (Accessed 30/05/20)

Seidensticker, E. (1983) *Low city, high city: Tokyo from Edo to the earthquake*. 1st ed. Massachusetts: Harvard University Press

Sekai Property (2018) *Living in Denenchofu: What is it like for foreigners?* [Online] Available at: <https://en.sekaiproperty.com/article/2249/living-in-denenchofu> (Accessed 30/05/20)

Smith, H. II (1979) 'Tokyo and London: Comparative Conceptions of the City' in Craig, A. (ed) *Japan: A Comparative View*. New Jersey: Princeton University Press. pp. 49-99

Sorensen, A. (2002) *The making of urban Japan*. 1st ed. London: Routledge

Sutcliffe, A. (1981) *Towards the Planned City: Germany, Britain, the United States and France 1780-1914*. 2nd ed. Oxford: Basil Blackwell

Takahashi, K. (2008) *Greenspace depletion in Tokyo, Japan*. Ohio: Ohio University College of Arts and Sciences

Thameslink (2020) *Welwyn Garden City* [Online] Available at: <https://www.thameslinkrailway.com/travel-information/plan-your-journey/station-information/stations/welwyn-garden-city> (Accessed: 30/05/20)

Tōkyū Railways (2020) *Meguro Line* Available at: <https://www.tokyu.co.jp/global/railway/line/mg/> (Accessed 30/05/20)

Tōkyū Railways (2020) *Tōyoko Line* Available at: <https://www.tokyu.co.jp/global/railway/line/ty/> (Accessed 30/05/20)

Tōkyō no Tōkei (2015) *Heisei 27-nen Kokuseki Chōsa Tōkyō-to Kushichōsonchō Beppōkoku* Available at: <https://www.toukei.metro.tokyo.lg.jp/kokusei/2015/kd-15index.htm> (Accessed 30/05/20)

The Town and Country Planning Association (2017) *The Art of Building a Garden City*. 1st ed. Newcastle upon Tyne: RIBA Publishing

Urban kchoze (2014) *Japanese zoning* [Online] Available at: <http://urbankchoze.blogspot.com/2014/04/japanese-zoning.html> (Accessed 30/05/20)

Wakeman, R. (2016) *Practicing Utopia: An Intellectual History of the New Town Movement*. 1st ed. Chicago: University of Chicago press

Ward, S. (2016) *The Peaceful Path: Building Garden Cities and New Towns*. Hatfield: University of Hertfordshire Press

Watanabe, S.(1980) 'Garden city Japanese style: the case of Den-en Toshi Company Ltd., 1918-28' in Cherry, E. (ed.) *Shaping an urban world*. London: Mansell, pp.129-143

Welwyn Garden City Estate Management Scheme (2020) *What is the Estate Management Scheme?* [Online] Available at: <https://www.wgc-ems.org/about/what-is-the-estate-management-scheme/> (Accessed 30/05/2020)

Welwyn Garden City Society (2010) *Open spaces* [Online] Available at: http://welwynhatfield.co.uk/wgc_society/?page_id=262 (Accessed 30/05/20)

Welwyn Hatfield Borough Council (2012) *Emerging Core Strategy* [Online] Available at: http://consult.welhat.gov.uk/portal/planning_policy/local_plan_consultation_november_2012/ecs?pointId=1342004935402 (Accessed 30/05/20)

Welwyn Hatfield Borough Council (2019) *Annual Monitoring Report 2017/18*. Welwyn Garden City: Welwyn Hatfield Borough Council

Welwyn Hatfield Times (2018) *Welwyn Hatfield house prices significantly higher than national average* [Online] Available at: <https://www.whtimes.co.uk/news/house-values-welwyn-hatfield-1-5711825> (Accessed 19/05/20)

WGC100 (2020) *Celebrating 100 years of Welwyn Garden City in 2020* [Online] Available at: <https://www.wgc100.org/> (Accessed 19/05/20)

WGC100 (2020) *Celebrating 100 years of Welwyn Garden City in 2020: Souvenir Guide January - June 2020*. Welwyn Garden City: WGC100

Yamamura, E. (1982) 'Regional planning in Great Britain: focus on the transfer and transformation of the Garden City concept', *Environmental Science Hokkaido*, 5(1), pp.33-60

Yoshida, Y. and Koshizawa, A. (2003) 'The roles of the scheme of management of Letchworth and Welwyn Garden City in maintaining the living environment', *Architectural Institute of Japan*, 18, pp. 297-303

Appendix

Field observation transcripts

Welwyn Garden City

Direct transcript of multiple audio files and written notes taken on three different dates. Inaccurate interpretations (due to unfamiliarity with the site) have been left in this text, but are addressed in the corresponding section of the methodology write-up.

Dates of observations: 15/12/19, 17/12/19, 18/12/19

Initial observations of Welwyn - first day of visiting here. Currently walking along the green axis, the main boulevard that leads from the centre of the town southward towards Hatfield.

The most immediate observation to make so far is that green spaces are quite clearly defined. There are a number of what look like original houses lining the side of the street, most of which look as if they are as they would have looked when first built.

Interestingly, there seems to be a large NHS presence here in the town, and I have seen multiple clinics and signs for hospitals. Coupled with the lack of obvious homelessness, this means that the town seems fairly well provided for in terms of social services.

There are a lack of tower blocks in the city centre, with no obvious high-rise buildings. Actually, for me, the most immediate thing I have realised is how easily navigable the whole city feels. There's one central crescent or semi-circular park just outside Welwyn Hatfield Borough Council offices, and standing in the centre of there and looking southward provides a great view of the central boulevard stretching through the centre of the town. There is a central fountain, with lines of trees on both sides providing foliage and shade.

I was unable to measure the length of that particular piece of land, due to obstructions in the way, but the semi-circular piece of land seems to have a diameter of 90m to the central benches, then 60m further, so approximately 150m in total.

I am currently moving down towards the southern end of the town along the axis, where the lakes are. Branching off from the axis on the eastern side is a square ground containing a plaque dedicated to Ebenezer Howard. That looks on to the Howard Centre, a shopping centre that draws residents from the surrounding areas. The area is in good-condition, and suggests that it has been planned parkland since the original development.

The green spaces encountered so far have all been typified by grass underfoot and trees lining the perimeters. While they are fitted with benches, there is no play equipment aimed at young children in the

centre of the town. Basically, the initial impression of the centre of the town is that it is well-provided for in terms of communal green space, with a lot of the houses looking out onto the boulevards being surrounded by tree coverage and foliage. The question remains whether or not the surrounding green belt area (the farmland planned under the original Garden City idea) still remains, or whether it has been developed. Driving into the town, I was met with industrial estates and commercial complexes - whether or not this was built on land originally planned as garden city green space will need to be analysed using the original documents and Ordnance Survey maps from the time of the initial development.

One thing to point out is the way in which the town feels very car-centric. The audio files recorded throughout this period of initial observations were marked by loud traffic noises permeating throughout. The interesting element about this, referring back to the readings, was that the Garden City concept was developed before widespread ownership of automobiles had really begun in Britain; indeed one initial idea for the city was to have communal ownership of a handful of vehicles for residents. The amount of green space and open land, and also the orbital layout of developments, both seem to suggest that the Garden City was easier to adapt to cars once they became mainstream. The transition towards personal automobile ownership, the construction of main arterial roads, and the shift towards a 'suburban' community all seem to spring from this, although, naturally, it requires further analysis.

Furthermore, the sandwiching of the green areas located in the central boulevard by roads on both sides creates segregation between residential, transport and recreational areas. Those citizens wishing to use said green areas are forced to cross heavy traffic, however.

Gosling Park, the largest green area in the city limits, has been developed into a sports centre. It provides trampolining, indoor basketball courts and even a ski slope for use by members. Moving northward from Gosling to Stanborough Park, where the lakes are contained, requires moving alongside main circular roads. Interestingly, the green space displayed on the available maps seems to have been redeveloped as golf courses, something that this initial observation session supports. If this is truly the case, and much of the green space surrounding the city has now been commercialised - an interesting question is raised. Whether or not the commercialisation of said space is also visible in Den'enchōfu, in which prior reading has highlighted the construction of residential property on previously-designated public green space, may be crucial to the findings of this paper. However, whether or not housing development is any better or worse than golf course development is a different question, but it does suggest that leaving green space as public land to be used by the residents has fallen by the wayside in Welwyn, by instead using said space as revenue-generating sites.

Keeping the chronological nature of this thesis in mind, it is important to assess the questions raised during the initial observation period under the available material. Understanding when the development of Welwyn Garden City took place, when it was settled, and when Howard's ideas were implemented need to be addressed. Identifying these questions alongside maps and documentation, any changes to the availability of communal green space will become visible.

Den'enchōfu

Direct transcript of multiple audio files and written notes taken on three different dates. Inaccurate interpretations (due to unfamiliarity with the site) have been left in this text, but are addressed in the corresponding section of the methodology write-up.

Dates of observations: 09/01/20, 10/01/20

Initial observations of Den'enchōfu - first day of visiting here. Starting from the station, having arrived by train, the large scale and expansive floor plan of the station area was surprising. Upon leaving, one is greeted by a commercial square with remnants of what could have been a central parkland. That is revealed by some raised green platforms on both sides of a plaza, leading down towards a bench and a fountain installation. There is a plaque dedicated to the garden city ideals of Den'enchōfu also installed in this site. Leading off from there, five roads branch off from the central orbital area, webbed together. There is one direct access running directly in front, with two either side, and a final two leading off on the peripheries.

Moving forward from there, there is another plaque to be found showing the 'Green Walk' that is protected in the area, displaying how the parks act in an interconnected way for visitors to travel through, taking 20km to explore the area from park to park. Based on said protected routes, and the impressions gained through this first field observation, the initial interpretation is that the green areas of Den'enchōfu have been immortalised and preserved. The clear distinction between city and park in this site seems to have almost been *ceremoniously* enshrined through such mechanisms. The use of the green space by residents seems dictated through said approaches.

Initial impressions suggest that there is limited integration between the green areas and the urban environment here. However, in comparison with Welwyn Garden City, and through the initial walk from the staging area of the station along the main axes of both sites, Den'enchōfu appears much *greener*. More foliage, more numerous (although smaller) scattered parks, and a general sense of planned green space. One of the initial impressions noted from field observations in Welwyn Garden City was the sense of commercialisation regarding green space; much of the land felt as though it had shifted towards revenue-generating ventures. In Den'enchōfu, that sense is missing; through Hōrai park, the Kōfun, and even the banks of the Tama river have shown no signs of privatisation. However, that does not reveal whether or not land that was previously guarded as green space has been built upon; such findings will be revealed through the document analysis. All sites seen so far have not been fenced off for parochial use; while the Kōfun as an archaeological site may have been not as open-planned as expected, it was not closed off from public entry.

It appears that said document analysis will be most revealing for the sites found alongside the Tama river. The rate of urbanisation in said area meant that many of the buildings and shopfronts encountered were almost pushing into the river; the amount of housing available was remarkable.

Another interesting element of this initial impression was the view from the banks of the Tama river. Den'enchōfu, having low levels of verticality among its buildings, is completely surrounded by high-rises on the other side of the river. There is a tangible sense that the ideals of creating a *Western*-style 'town' in the middle of Tokyo has been preserved, even while the settlements on all sides have exploded in height. The closer one gets to the Tama river from Den'enchōfu, the buildings become less typical of Western-style homes, and, for lack of a better descriptive term, become more *Japanese*. Everything within the boundaries of Den'enchōfu feels specific to the location; with the unique stature of it as an idyll within Tokyo kept alive. The same remark could not be made about Welwyn in the same way. The things that define it as a Garden City - the axis, the roundabouts, the guarded green spaces - are all found in other places throughout the UK, specifically in the South-East of England. A lot of the design choices seen in Welwyn Garden City were re-used and rehashed again in the development of New Towns, which define the appearance of a lot of the surrounding areas to London. Here lies a distinct difference between the two, based on initial impressions - Den'enchōfu has retained a level of unique characteristics that separate it from similar developments in Japan, while Welwyn shares many similarities with other English towns of that period. Both sites are nominally garden cities from the outset, yet the ways in which they have both interacted with the surrounding environments, or the ways in which their surrounding environments interact with them, is very different in both cases.

Proof of purchase and fair use for the maps included

謄抄本交付用別紙(地図)

	縮尺	図名	測量年 (図歴)	発行年月日	リスト番号	枚数			備考
						謄本 (白黒)	抄本 (白黒)	抄本 (カラー)	
1	旧1万	田園調布	1929 (昭4)	1930/07/30 (昭5)	404	1			
2	旧1万	田園調布	1929 (昭4)	1931/01/30 (昭6)	405	1			
3	旧1万	田園調布	1937 (昭12)	1939/04/30 (昭14)	407	1			
4	旧1万	田園調布	1937 (昭12)	1940/03/30 (昭15)	408	1			
5	旧1万	田園調布	1955 (昭30)	1958/05/30 (昭33)	409	1			
6	1万	自由が丘	1984 (昭59)	1985/05/30 (昭60)	76-7-1-4-1	1			
7	1万	自由が丘	1999 (平11)	2000/09/01 (平12)	76-7-1-4-4	1			
8	2.5万	東京西南部	1919 (大8)	1919/09/30 (大8)	76-7-1-1	1			
9	2.5万	東京西南部	1929 (昭4)	1931/06/30 (昭6)	76-7-1-2	1			
10	2.5万	東京西南部	1932 (昭7)	1932/10/30 (昭7)	76-7-1-3	1			
11	2.5万	東京西南部	1945 (昭20)	1947/07/30 (昭22)	76-7-1-4	1			
12	2.5万	東京西南部	1968 (昭43)	1970/03/30 (昭45)	76-7-1-8	1			
13	2.5万	東京西南部	1976 (昭51)	1978/02/28 (昭53)	76-7-1-11	1			
14	2.5万	東京西南部	1985 (昭60)	1987/05/30 (昭62)	76-7-1-13	1			
15	2.5万	東京西南部	1999 (平11)	2000/08/01 (平12)	76-7-1-16	1			
16	2.5万	東京西南部	2013 (平25)	2013/06/01 (平25)	76-7-1-18	1			
17									
18									
19									
20									
合 計									

※ 現在刊行中の地図は、謄抄本交付の対象ではありませんのでご注意ください。

測量成果 謄本
の 交付申請書
測量記録 抄本



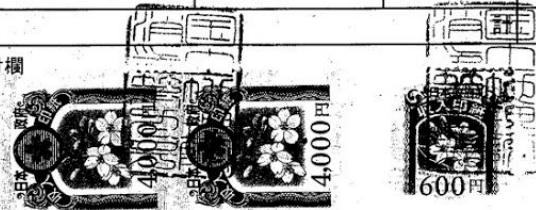
測量法第28条の規定により下記のとおり 測量成果 謄本 の 交付を申請します。
測量記録 抄本

令和 2 年 (月 7 日

申請者 住所 東京都世田谷区三軒茶屋 2-8-4-405.
氏名 THOMAS EASTAUGH
電話 (+44) 07388327110

国土地理院長 殿

使用目的	調査・研究				
郵送の場合の宛先	〒				
測量成果又は 測量記録の種類	該当する5万分1 地形図名	謄本又は 抄本	数量	TEL 手数料	
				単価	合計
20万分1(桎判・白黒)	別紙のとおり	謄本		500	
5万分1(桎判・白黒)	"	謄本		500	
2.5万分1(桎判・白黒)	"	謄本	9	500	4500
2万分1(桎判・白黒)	"	謄本		500	
旧1万分1(桎判・白黒)	"	謄本	5	500	2500
新1万分1(四六半裁判・白黒)	"	謄本	2	800	1600
20万分1(A2・白黒)	"	抄本		390	
5万分1(A2・白黒)	"	抄本		390	
2.5万分1(A2・白黒)	"	抄本		390	
2万分1(A2・白黒)	"	抄本		390	
旧1万分1(A2・白黒)	"	抄本		390	
20万分1(A2・カラー)	"	抄本		2,200	
5万分1(A2・カラー)	"	抄本		2,200	
2.5万分1(A2・カラー)	"	抄本		2,200	
2万分1(A2・カラー)	"	抄本		2,200	
旧1万分1(A2・カラー)	"	抄本		2,200	
			16		7100
収入印紙貼付欄					8600



記載要領 ①測量成果、測量記録、謄本及び抄本の文字のうち、不要なものを消すこと。
②郵送希望のときは、別に郵便切手を添えること。