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USING GREEN INFRASTRUCTURE AS A REDEVELOPMENT STRATEGY
Town Centre Redevelopment in Swaffham, England

A Major Qualifying Project Report
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Abstract

Swaffham, a small English market town, is developing a town plan to direct growth and development in the town. In addition to directing new development, the plan will also include guide redevelopment in the town centre and recreation areas. The Town Group is using principles of green infrastructure planning throughout the town plan to guide development and redevelopment. Green infrastructure is a new theory in smart growth planning that values the ecological benefits of green and open space as well as the social and economic values of planned development. This project used green infrastructure planning to develop recommendations for redevelopment projects in the town centre and assisted the Town Council in their preparation for upcoming consultations about the possible development sites.

Executive Summary

This report discusses the project I completed in Swaffham, England. The project was sponsored by the Swaffham Town Council and Town Group to assist in the development of a town plan for Swaffham. The town plan will direct development and establish a vision for the town of Swaffham. Swaffham is a small market town located in the heart of Norfolk County, England. As with many other market towns, Swaffham is currently in a state of flux. A high percentage of Swaffham's residents are elderly people and it has become known as a retirement town. As young Swaffham residents enter the working world and move to their own homes, many are forced out of Swaffham due to a lack of jobs and affordable housing.

In addition to the socio-economic problems in Swaffham, there are environmental problems in the town. The town has far less open space per resident than recommended by the English Central Government. The open and recreation areas in town are not well-cared for and many people find them to be boring. Additionally, the town residents are highly reliant on cars for transportation in and around the town. Residents are becoming more aware of the impact that their lifestyles have on the environment and hope to use the town plan to address the town's environmental concerns as well as socio-economic problems.

Green infrastructure is a new theory in planning that places equal value on open space and development. Green infrastructure planning is a type of smart growth that considers all the factors that affect planning. Ideal green infrastructure planning calls for the development of an interconnected network of open, conservation and recreation areas in order to protect the benefits that these areas provide. While it is unlikely that Swaffham will develop a green infrastructure plan and even more unlikely that Swaffham will ever be able to have a true green infrastructure network, the town is interested in using principles of green infrastructure in their town plan to govern new development in the town and any redevelopment that occurs.

Over the past year and a half, Swaffham has been preparing to develop a town plan. The Town Council created a Town Group to lead the plan's development. The Town Group consists of several town councillors and several members of the community. Last year, the Town Group wrote and delivered a survey in the community to gauge residents' interest and support for different policies and ideas. In addition to the Town Group Survey, the Town Council also sponsored three other surveys: one for visitors, one for businesses/business owners and one about socio-economic change in Swaffham. The result of these four surveys gave me a wealth of

information about Swaffham and how people perceive many of the town's various characteristics and attributes.

During my time in Swaffham, I worked with the town's Project Grant Support Officer, Dr. Dave Bek to set up a series of meetings with key members of the community to learn more about Swaffham. I met with many members of the community to expand my knowledge of Swaffham and its residents. To assist in planning, I needed to determine how residents and visitors currently see Swaffham and how what they would like their ideal Swaffham to look like. Some of this information was included in the survey results, but I wanted to ensure that the data in the surveys was accurate so I used triangulation to verify the information. In addition to using the survey data, I used my interviews and personal observation to increase my knowledge of Swaffham and its community.

My project focused on two different parts of the town plan. The Town Group hopes that the town plan can be used to direct redevelopment in the town. My work focused on the town centre and possible redevelopment projects that could be completed to improve the town centre. Many of the town's businesses and stores are located in the town centre and the town's weekly market is held in the town centre. In many ways, the town centre is the heart of Swaffham. With the addition of several large box-stores in Swaffham and the availability of many other box-stores in the area, the town centre has lost some of its relevance. The busiest streets in town run directly through the town centre and many people park in the town centre. The town centre's townscape is dominated by cars. With the exception of a few trees, there is no green in the town centre. Many residents would like to see some of the town centre redeveloped into green space, gardens or even a small park. There is controversy over the parking in the town centre, but it appears that most residents believe that at least some of the parking ought to be removed from the town centre to improve the town centre's aesthetics. The other half of my work considered the possible development sites that are part of the Local Development Plan. There are different planning regulations in England that require the government to allow an open area to be developed, so land owners must present their land to the government as possible sites for development before the area can be developed. While these sites will not be explicitly included in the town plan, development on the sites that are chosen for development will have a large impact on the town plan and its implementation.

I used my interviews and observations in conjunction with the survey data to develop recommendations for projects in the town centre. The recommendations are focused on the three corners of the town centre, the Pedlar Sign Area, Corn Hall Area and Buttercross Area. In each of these locations, I analyzed its appearance and layout and developed recommendations for how the area could be changed to incorporate elements of green infrastructure into Swaffham's town centre and to reflect the ideal Swaffham that residents would like to live in.

To help the Town Council prepare for the next round of consultations on the possible development sites, I visited each site and used my visits and knowledge of planning to recommend which areas ought to be developed and which ought to remain as open space.

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Introduction

As we move further into the twenty-first century, society is facing a multitude of problems related to our natural environment. Many areas are increasingly affected by global climate change and are facing the reality of finite resources. In addition to these concerns, much of our development has been conducted in an illogical and unplanned manner. Many areas have been developed without considering the environmental impacts of development. Our society is faced with a variety of choices; and it is important that we work towards protecting the environment and improving our development practices. Planning is a tool that municipalities use to ensure that their physical layout recognizes the functional needs of the town as well as the environmental and societal issues. People have become more aware of the negative impacts of haphazard development and are beginning to implement new development practices that incorporate environmental stewardship and preservation as well as address the area's development needs.

Green infrastructure planning is a new planning approach that integrates three important functions that planning serves. Green infrastructure is a type of smart growth that sits at the nexus of social equality, economic prosperity and ecological integrity. Unlike many conventional planning methods, green infrastructure can help to alleviate many of the problems that today's communities, both large and small, are facing. Green infrastructure planning seeks to address the functionality of an area while also improving aesthetics and sustainability.

Swaffham, Norfolk, England is a small market town that is in the process of updating their planning policies and documents. The town has developed into an incredibly automobile-reliant society. As cars became the preferred method of transportation, the town centre has become a car park. The vast majority of town members surveyed believe that the car parks in the town centre are an eyesore. The town centre has a distinct lack of vegetation. There are fewer than twenty trees in the town centre. Flower buckets are the only other vegetation in the town centre. The small amount of vegetation improves the townscape, but many residents agree that there ought to be more vegetation added to the town centre. Furthermore, the concentration of cars in the town centre has made the town centre less than pedestrian-friendly. As the town has begun to encourage residents and visitors to walk, the difficulty that pedestrians face in navigating the town centre has become quite obvious.

In order to fully understand the scope of the problem in Swaffham's town centre, there were many factors that this project needed to address. The most important factor that this project needed to understand was simply how the town centre is currently functioning. Before recommending changes, it was important to map the town centre to determine where the majority of pedestrian and automobile traffic occurs. The town centre is an integral part of a market town, so it was important to understand how residents view the town centre and what improvements they would recommend for the town centre. More than simply understanding what residents would like, it is necessary to understand the planning framework and policies in England. Since green infrastructure planning is a new planning theory, there is not a set method that towns can use to incorporate green infrastructure principles into their local planning.

The main focus of this paper is to discuss the various redevelopment projects that have been recommended for Swaffham's town centre. This research was conducted using surveys conducted by the Town Council in Swaffham during the summer of 2007. Additionally, observation exercises and interviews were conducted between late October and early November 2008. Once the projects are implemented, Swaffham's town centre will be more pedestrian-friendly, have more vegetation and will encourage residents to walk once they arrive in the town centre, even if they choose to drive into town. Additionally, this paper begins the process of employing green infrastructure principles as a method of redeveloping active areas of cities and towns.

This report begins with a discussion of relevant topics, including a discussion of how smart growth and green infrastructure practices have evolved. In addition, English planning practices and policies are discussed. English planning policies are very different than planning policies in the United States; all planning is regulated at several levels of government, beginning with the Central Government. There are several towns in England that have developed green infrastructure plans, however, these plans are generally stand-alone plans that simply outline the creation of a green infrastructure network. While Swaffham wants to use principles of green infrastructure planning to regulate planning and development in Swaffham, the town is not in the position to develop a separate green infrastructure plan. Since the project was sponsored by the Swaffham Town Council, a brief history of Swaffham and general information about the town is also included in the Background Chapter.

From the background chapter, the report outlines the research methods that I used to complete this project. Next, the report recommends redevelopment projects that the Swaffham Town Council can incorporate into their town plan in order to improve the town centre's functionality, safety and aesthetics. . In addition to recommending projects, this paper discusses how green infrastructure planning can be incorporated into local planning activities. The report's conclusion includes recommendations for further research. Most of the current literature that focuses on green infrastructure planning considers it mainly as a method of guiding new development or reclaiming brown fields. Applying green infrastructure practices to the redevelopment of Swaffham's town centre shows that green infrastructure planning can also be applied to redevelopment projects as well as new development. The completion of this project shows that green infrastructure planning can be used to improve an areas's functionality, while also supporting economic prosperity and environmental conservation.

Background

This chapter begins with a discussion of green infrastructure and its relevance in the context of smart growth planning. It further discusses the role that green infrastructure planning can play in redevelopment and new development. Green Infrastructure sits at the nexus of social equality, economic prosperity and ecological integrity, which makes it the best planning option to deal with the many problems that human society is facing.

The chapter then moves into a discussion of planning in the United Kingdom and the regulations that the Central Government have developed to govern planning at the county, district and town level. The Central Government has written a series of Planning Policy Statements to guide planning. The statements discussed in this paper are written to express the Central Government's opinions about the importance of sustainable development, how to use local spatial planning to create strong and prosperous communities and how to plan for open space, sport and recreation. In addition to regulating specific facets of planning, the Central Government has required that each region develop a Regional Spatial Strategy, that each County have a County Planning Statement and further, that every district be responsible for developing a Local Development Framework to govern development throughout the district. The chapter ends with a discussion of Swaffham, its history, government and current planning practices.

Green Infrastructure – The New Sustainability?

Green infrastructure planning is a relatively new concept in open space planning and development. Green Infrastructure has grown out of the greenways movement and is a type of smart growth. At its best, green infrastructure is a method of open space planning that that creates an interconnected network of waterways, wetlands, woodlands, wilderness, wildlife habitats and other natural areas as well as greenways, parks and other conservation areas, working farms, ranches and forests and other open spaces. The network of open spaces supports native species, maintains natural ecological processes, sustains air and water resources as well as contributes to the health and quality of life for the surrounding human communities and people (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

Even though green infrastructure is a new concept, a basic framework for the process of developing green infrastructure plans has been developed by considering the processes used to develop other conservation plans and by examining the various processes that communities have

used to develop green infrastructure plans. Many communities that develop and implement green infrastructure plans will most likely never have a working, complete green infrastructure network. This is due to the fact that many green infrastructure plans will be implemented in areas that are already developed. Since green infrastructure planning has grown from various other conservation planning methods, there is necessary overlap between the goals of sustainable development, smart growth and the Local Agenda 21 frameworks.

As with all planning practices, green infrastructure planning must fit into the regulatory frameworks of the area in which it is being proposed. While the United States has a relatively loose regulatory framework, Environmental Protection Agency recommendations and current planning processes in the planning area, The United Kingdom takes a very different approach. The central government in the United Kingdom has a variety of Planning Policy Statements that regulate nearly all aspects of planning across the country. There are three Planning Policy Statements that apply directly to open space planning, recreational space planning and conservation planning as well as require that local governments establish Local Development Frameworks to develop a strategic plan for sustainable development in the area.

Approaches to Local and Regional Sustainable Development

Conventional Planning Methods

There are several main categories of conservation practices that have been popular throughout history. The first conservation efforts were strictly to provide humans with areas for active recreation and beautiful scenery. This was the overreaching conservation idea until the 1980s. From there, conservation grew into a phase of open space planning that focused on providing people with areas for active recreation and beautiful scenery as well as protecting farmland and urban forests. This trend continued until about 1990, when greenways and open space planning became the most common type of conservation. This type of planning focuses on providing both active and passive recreation for people, beautiful scenery, protecting farmland and urban forests in addition to protecting urban wildlife. It is important to note the variety of goals that these conservation plans represented. As we became more aware of our relationship with nature and as conservation planning became more common and widely accepted, our notion of what conservation planning should do has evolved. While there are subtle differences between

the types of conservation planning that has occurred throughout history, the reality is that most conservation plans are very similar (McDonald, et al. 2005).

Open Space Planning

There is not one definition of what open space is; in literature and in practice, people have adopted vague meanings of the word. Open space can mean any area, whether privately or publicly owned, that is undeveloped. The current trend in planning is towards weighing the environmental benefit that can be gained from the area into its categorization as open space. Open space can be large, rural areas as well as small, urban squares. Scholars have spent significant time discussing the various meanings, settings and purposes of open space. Whichever definition of open space you choose to use, there is widespread agreement that it is important to protect open space. However, the question remains: how can you plan to protect open space when such a wide variety of areas count as open space (Erickson 2006)?

In order to further define open space and begin to regulate it, scholars and practitioners have developed extensive methods of categorizing open space based on its scale, function and ownership. Hierarchical methods are most often used to define open space at the street, community, county and regional level. Another very popular planning mechanism requires certain numbers or square footage of recreation and open areas per person or square feet of certain development. Other, more simple, systems rely on land ownership to categorize open space (Erickson 2006).

Recently, open space plans have begun to use environmental analyses and examine the environmental benefits that each type of open space may have. Michael Hough has created a scale of open space that uses maintenance, use and environmental value to measure various open spaces. His scale ranges from the least maintenance and intense use (remnant natural areas) to the most intense use and highest maintenance (downtown paved spaces). Increasing environmental value and sensitivity to disturbance runs along the same scale, with remnant natural areas with the highest environmental value to downtown paved spaces with the least environmental value. Another newer method of green space categorization focuses on the area's function, focusing specifically on amenity, function and habitat. While these categorization methods each offer certain benefits, none of them are sufficient when used alone (Erickson 2006).

Smart Growth

As with every set of planning practices, there are a variety of definitions for smart growth. Smart growth is a fairly new concept in planning; it has only really begun to develop over the last ten years. Smart Growth promotes various sustainable development practices and is considered to be a type of sustainable development. According to the United States Environmental Protection Agency (EPA), smart growth is "development that serves the economy, the community and the environment. Smart growth invests time, attention and resources into restoring community and vitality to existing cities and older suburbs" (Krueger 2007, 95). To some, smart growth moves beyond the EPA definition to recognize and promote the relationship between development and quality of life (Gibbs and Krueger n.d.). Smart growth aims to solve problems such as urban sprawl, the increasing cost of sustain our infrastructure as well as addressing environmental concerns (Krueger 2007). Because smart growth serves the environment, the community and the environment, it is hailed as the planning method that most effectively integrates environmental, developmental and civic interests (Gibbs and Krueger n.d.). Smart growth recognizes and hopes to address the negative results of haphazard development. Some of the main goals of smart growth planning are: mixing land uses, redeveloping or creating walkable neighbourhoods, fostering community development that prides distinctive and attractive communities that each have a strong sense of place, preserving open space, providing transportation options and encouraging stakeholder participation and collaboration across disciplines (Krueger 2007). Most often, smart growth is concentrated in high-density areas, around public transit networks and in older suburbs and inner cities (Gibbs and Krueger n.d.).

Smart growth has become very popular in American planning. In an effort to promote smart growth principles, scholars have developed a series of checklists and frameworks for smart growth plan development (Krueger 2007). Another possible reason for smart growth's popularity might be that it promotes the creation of compact communities that value open space and reduce infrastructure requirements. Additionally, smart growth has been developed to employ primary policy mechanisms as well as market-based incentives and disincentives (Gibbs and Krueger n.d.).

Local Agenda 21

The Rio Declaration on Environment and Development (Rio Action Plan), also known as Agenda 21, created Local Agenda 21 as an international effort toward local sustainability. Participants at the United Nations Conference on Environment and Development included Local Agenda 21 as part of their international plan because they realized that local action would be necessary to meet the goals set in the Rio Action Plan (United Nations Conference on Environment and Development, 1992). Local Agenda 21 was created with the hope that there would eventually be Agenda 21 influence worldwide through the establishment of Local Agendas 21 in every municipality (ICLEI, 2002). Local Agenda 21 offices work within communities to create and implement environmental projects to improve sustainability in the community. There is no central authority that oversees Local Agendas 21; instead, the program is administered entirely at the local level. It is up to each state to determine how to implement and administer Local Agenda 21, so while some states have developed a network of Local Agendas 21, others have opted to have municipalities and communities retain all of the administrative power (United Nations Conference on Environment and Development, 1992).

Generally, the first project any Local Agenda 21 undertakes is the creation of a long term sustainability plan. Local Agendas 21 work with the community to identify and prioritize environmental problems. In addition to discussing the current environmental problems, sustainability plans outline a vision for the community's environment and a long-term plan to realize this vision. Once the long term sustainability plan is complete, the Local Agenda 21 works with the community to create and promote projects that support the community's goals. How each Local Agenda 21 works toward sustainability varies greatly depending on their community (The European Conference on Sustainable Cities & Towns, 1994). The projects that Local Agendas 21 undertake can be linked to the economic status of the country. Local Agendas 21 in countries with a high gross national product, such as the United Kingdom, often focus on improving environmental education, reducing waste production, increasing public awareness of environmental issues, improving water quality and increasing energy conservation (ICLEI, 2002).

While Local Agenda 21 has seen wide implementation and many successful projects, there are still challenges that the Local Agenda 21 system faces. Local Agendas 21 around the world face some of the same challenges. Two of the most common challenges that Local

Agendas 21 face are a lack of national support and small budgets. Often, governments view Local Agendas 21 as a type of public relations office for the government's environmental policies instead of seeing Local Agenda 21 as a separate entity with its own agenda and plans. Additionally, there is often controversy surrounding the role the Local Agenda 21 should play in society and whether or not Local Agendas 21 should be part of or funded by the government (Devuysy, Hens, Lannoym, 2001; ICLEI, 2002).

Green Infrastructure Approach

Green infrastructure is a type of smart growth, which means that it promotes development that is not only economically sound but also environmentally friendly and supports community living. Studies routinely show that a more compact form of development could save millions; for example, a study at Rutgers University showed that the state of New Jersey could save $400 million a year simply by compacting development. Another benefit of smart growth, and especially green infrastructure planning, is that it can be used to determine where not to develop. In addition to addressing the problems of haphazard development through smart growth, communities need to better plan their conservation processes (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002). Haphazard development is not the only reason for such extensive urban sprawl; poor, haphazard conservation processes can also be blamed for the current state of urban development (McDonald, et al. 2005). Smart conservation practices proactively encourage resource planning and protection through interactive processes. Other hallmarks of smart conservation are that it encourages public participation, is systematic, holistic, multi-functional and designed to encourage multi-jurisdictional conservation (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002). Green Infrastructure also considers topography and places urban growth and conservation into suitable locations (McDonald, et al. 2005).

For the past few decades, development has increased dramatically; farms and forests are being developed at an ever-increasing rate. Unfortunately, most of this development occurs without the assistance of a well-designed set of land-use plans. The lack of guidance throughout the development process has resulted in urban sprawl. Urban sprawl leads to fragmented natural areas, isolated farmland and disrupts ecological functions. Some of the other negative side effects of urban sprawl are: the loss of natural areas, fragmentation of open spaces, degradation

of water resources, decreased ability for nature to respond to change, loss of "free" natural services, an increase in the cost of public services and higher taxes (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

History and Development of Green Infrastructure Planning

Green infrastructure, as we have defined it, is a relatively new concept in open space planning. The idea for green infrastructure planning stems from the planning and conservation activities that began 150 years ago. There are two key concepts from which green infrastructure developed: 1) the idea that parks and other green spaces that were linked would provide more benefit to the people and 2) the idea that linking natural areas would benefit biodiversity and counteract habitat fragmentation. These two principles gave life to the modern greenways movement and then developed into green infrastructure planning. While many similarities exist between green infrastructure planning and the greenway movement, there are several key differences. The first is that green infrastructure emphasizes ecological diversity and natural habitats, not just recreation. Secondly, green infrastructure includes the development of large, ecologically important hubs in addition to landscape linkage, the hallmark of greenway planning. Finally, green infrastructure is able to shape urban growth and provides a framework for growth. Green infrastructure frameworks are the most beneficial and effective when they pre-identifies ecologically significant lands as well as the suitable development areas (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

Since people first started thinking about being "green" or environmentally friendly, the term green infrastructure has meant several different things. Sometimes, green infrastructure is referred to as the environmentally friendly parts of the larger infrastructure, such as wastewater treatment facilities or using living roofs. For our purposes, green infrastructure is a method of open space planning that creates an interconnected network of waterways, wetlands, woodlands, wildlife habitats and other natural areas, greenways, parks and other conservation areas, working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute to the health and quality of life for America's communities and people" (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

The various components that make up green infrastructure include a wide variety of natural and restored ecosystems and landscape features which are arranged into a system of "hubs" and "links". The hubs are the center of activity and anchor the green infrastructure networks. Links tie the system together and are what tie the entire system together (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

Benefits of Green Infrastructure

Since green infrastructure considers so many different factors before determining the best use for an area, it makes sense that green infrastructure planning would lead to a variety of benefits. The benefits discussed in this section fall into the following three categories: ecological benefits, health benefits and economic benefits.

Ecological Benefits

The ecological benefits from green infrastructure are probably the easiest to see. Green infrastructure is one of the methods that we can use to replenish and repair our environment. One of the most visible ecological benefits of green infrastructure is that it provides animals and plants with protected habitat and allows animals to pass between hubs without encountering automobiles, streets and heavy development. It is harder to see that the trees protected by green infrastructure purify the air we breathe by removing sulfur dioxide, nitrogen dioxide, carbon monoxide and ozone. Nearly every natural area filters water and wetlands, ponds and streams serve as natural basins to catch flood water. Wetlands are able to absorb precipitation and runoff and store it as they slowly release it into the ground or streams. Furthermore, wetlands are able to replenish groundwater sources, stabilize shorelines, mitigate climate change, provide storm protection and retain sediment and nutrients. Wetlands are an incredible asset, for all the reasons mentioned previously, and because many of the plants found in the wetlands can remove toxic substances such as pesticides, industrial and mining wastes from the water (Benedict and McMahon 2006).

Health Benefits

The World Health Organization (WHO) has defined human health as "a state of complete physical mental and social well-being;" being healthy is not simply the state of not having a

disease or infirmity. It is widely accepted that a person's health is linked with their socio-economic status (Tzoulas, et al. 2007). Green infrastructure provides communities with trails, waterways as well as other outdoor recreation areas for community members to use and enjoy. These areas contribute directly to human health because they provide residents with areas for exercise and provide natural filtration services (Benedict and McMahon 2006). Recent studies have also shown that there is a positive correlation between longevity and access to green space; furthermore, a similar relationship has been shown between green space and self-reported health (Tzoulas, et al. 2007). In addition to providing exercise areas, many studies have shown that people who live near parks and other natural areas are healthier and have fewer hospital visits in the course of their lives. Natural areas induce positive feels and reduce stress and fear. Many people cite forests, lakes, parks and other open spaces as havens of tranquility, recreation and inspiration (Benedict and McMahon 2006).

It is necessary to consider human-social systems in conjunction with the study if urban ecological systems. It is necessary to develop and employ interdisciplinary techniques that combine biological, social and other sciences to represent a wider/better understanding of the challenges faced by land use planners and managers. As with any interdisciplinary work, one of the biggest challenges is synergizing the acceptable research processes and specialized terminology (Tzoulas, et al. 2007).

Economic Benefits

In addition to the many environmental and health-related benefits, green infrastructure also benefits the economy. The natural environment provides a host of free services to the human population. When the natural environment is developed improperly and ceases to perform its duties, humans must engineer systems to do the jobs that nature should perform. A nonprofit organization, American Forests, estimate that the trees in American cities and metropolitan areas save residents $400 billion in storm water retention. Studies have shown an eight-to-one dollar savings when land is preserved for flood storage instead of engineering flood-control systems. In fact, various cities across the United States have begun to preserve or restore natural landscapes to perform ecological services that they otherwise would need to solve with man-made structures (Benedict and McMahon 2006).

Studies continually show that people value natural ecosystems and are interested in maintaining them, in fact, people generally are even willing to foot the cost of maintaining them. There is no set dollar amount that people are willing to pay for natural areas, in fact, it is very difficult to put a dollar-value on people's interest in maintaining natural ecosystems. Areas that maintain and take pride in their open, natural ecosystems generally experience a boost in their tourism, which in turn leads to economic growth. In addition to simply having natural ecosystems; recreational trails and areas, which are generally included in green infrastructure plans, are often an attraction for travelers. In addition to providing tourist attractions, some of the elements of green infrastructure can also stimulate commercial activities. For example, the Riverwalk in Augusta, Georgia cost the town about $8 million and has produced $198 million in new commercial investments. The area has businesses, serves as a tourist center and hosts festivals, concerts, sporting events and holiday celebrations (Benedict and McMahon 2006).

Open spaces, including parks, greenways, forests and other natural areas, increases the real estate values in the area. Open spaces also improve the quality of life. Even large businesses and corporations consider employees' quality of life when selecting the location of their offices. Especially since new communication technologies, such as cellular telephones, the Internet and virtual conferencing are allowing people to work together from many different locations, quality of life in the area is becoming a more important factor for businesses. Another demographic that especially considers aesthetic appeal and open space are retirees. If the environment in an area is damaged and unappealing, the community as a whole becomes less attractive to tourists, retirees, businesses as well as new and old residents. Using an approach, such as green infrastructure, that considers both conservation and development is always economically advantageous for the development area (Benedict and McMahon 2006).

Importance of Green Infrastructure

The rate of development has been steadily increasing for the past several decades. If there is no action to support open space planning and restoration, all of the open space will soon be developed. The increased rate of development can been seen in the Conservation Service's National Resource Inventory (Benedict and McMahon, Green Infrastructure: Smart Conservation for the 21st Century 2002).

Green Infrastructure Plan Development

There is not a single green infrastructure blueprint that will work everywhere. Instead, the green infrastructure approach features a basic framework of processes that should be used to develop a local green infrastructure plan (McDonald, et al. 2005). The main steps of green infrastructure plan development are: goal setting, analysis, synthesis and implementation. In the following paragraphs, I will discuss each of these steps in more detail.

Goal Setting

Goal setting is the first step of green infrastructure plan development. In this step, issues are identified, a process for plan development is outlined and plan goals are developed. There are three main criteria in the goal setting step of plan development: plan foundations, stakeholder involvement and conservation plans. Plan foundations evaluate the basic elements and purpose for plan development (McDonald, et al. 2005).

It is important that green infrastructure plan development be directed either by a leadership forum or an advisory committee. Depending on the scope and budget of the project, these groups may take different forms. However, no matter the size and makeup of the advisory group, it is important that the group be composed of a variety of stakeholders in the area. Such a wide variety of stakeholder opinions, perspectives, backgrounds and expertise gives the plan a strong basis from the beginning. Including people from a variety of backgrounds in the advisory group helps to garner public support for the project as well as ensure that the goals of the plan are politically defensible. Goal setting is one of the most important functions of the advisory group because it sets the stage for the rest of the project (McDonald, et al. 2005).

Green infrastructure plans must include goals to protect ecological functions and processes and protect working land as well as open space for human benefit. Herein lies one of the biggest differences between green infrastructure planning and other planning mechanisms; both human benefit and ecological function have been valued in other planning processes, but never in the same plan. Green infrastructure plans must incorporate all the area's natural elements. Additionally, green infrastructure plans must address the most prominent conservation goals for the area. Since green infrastructure plans include both land use planning and environmental factors, it is important that green infrastructure plans focus on landscape-scale approaches to conservation planning. That is, the plan must move beyond simply counting plants

and animals to considering how ecosystems change over time. Furthermore, it is important that the green infrastructure plan address the ways that spatial and temporal factors affect the changing ecosystem. It is important that the leaders in green infrastructure plan development consider the theories and practices of landscape ecology and conservation biology within an environmental planning framework to ensure that the new green infrastructure plan can integrate and account for all the factors that effect the ecosystem and other natural elements (McDonald, et al. 2005).

Different areas will require different goals and planning efforts, which is why it is so important for the leadership forum/advisory group balances the three green infrastructure goals: landscape processes, working lands and open spaces for human benefit (McDonald, et al. 2005).

Analysis

Since the overarching goal of green infrastructure planning is to develop an interconnected network of open space that benefits both people and nature, the criteria used to design the green infrastructure plan must be based on both ecological and land-use planning theories. According to McDonald, et al. these theories can be applied in the following manner:

1. "Linking components and processes of the ecosystem
2. Identifying ecologically valuable areas as well as areas in need of restoration, and
3. Considering the distribution and relationship of landscape features and processes over time, and the interaction of these features with the human built environment" (McDonald, et al. 2005)

In simpler terms, analysts develop a set of criteria to assess the value of lands within the planning area using these theories. While there is not one system of analyzing land value, analysts often have to weigh certain conservation values more than other ones. How analysts weigh the different values should be based on and align with the goals established by the advisory group. Developing an unified network vision allows for coordinated and strategic conservation efforts throughout the planning area by allowing local governments to work from the same spatial goals but still enjoy the freedom and flexibility they get from setting their own local conservation priorities (McDonald, et al. 2005).

Using a suitability analysis or similar method, analysts need to calculate the range of resource values in the study area to create a network design. Generally, this analysis focuses on the range of goals in the planning area and the process is repeated for each separate goal. There are two general types of analysis that are used in this step. "Course-scale analysis identifies the larger landscape values for the plan area and the relative ranking of these lands" (McDonald, Allen, Benedict and O'Connor, 2006: p. 6). "Fine-scale" evaluations look within the ranked resource areas to take a more acute and smaller-scale evaluation within the larger context of the course-scale analysis (McDonald, et al. 2005).

One of the hallmarks of green infrastructure planning is the use of hubs and corridors/linkages that encompass a variety of land uses. The hubs and links ensure that the important resource areas are protected and linked in order to provide the most support for the area's ecological systems. Simply liking the conservation areas is not enough, the scientific evidence obtained through empirical studies to determine the best size and shape of the individual network components (McDonald, et al. 2005).

Most of these studies are generally conducted by analysts and technicians, not the leadership forum or advisory committee, so it is important that this group has the opportunity to comment on the preliminary green infrastructure network design. Public education is very important at this stage of plan development, as it is a place where conflicting interested often come to a head. This is the point in the process where scientific evidence often conflicts with human environmental values. Education can help to build public support for the project. Without public support, the green infrastructure plan will never grow beyond this point. In addition to public education, the leadership forum or advisory group can help to build public support by balancing the scientific and political goals. Balancing these scientific and political goals helps to ensure that the network design is both ecologically viable and politically executable (McDonald, et al. 2005).

Synthesis

It is important that the analysis model identify the protection status of the various green infrastructure network lands. Another important factor in the development of a network plan is the fact that all areas should be considered and if found to be ecologically valuable, included in the network, regardless of the area's current state. Brownfields and developed plots should not be

excluded from the network plan simply because they are brownfields or developed. This is an important element of any conservation plan and spans conservation methods. While the exact process of determining an area's rank varies; generally unprotected areas will rank higher than areas that are protected temporarily, but that is also dependant on the area's resource value. Additionally, the network analysis should identify the gaps in the network so that planners can ascertain the significant areas that need restoration. Since most network designs will contain holes, restoring hub and linkage gaps becomes very important to any green infrastructure plan. These holes are either developed or degraded lands. Since green infrastructure networks are based on ecological frameworks, it is very common for lands that are identified as ecologically important to not be in their natural or (fully) functioning state. The network design should include all of the ecologically important areas, regardless of its current state and identify the areas where restoration is needed to strengthen the network. Each site in need of restoration should also include an indication of its relative importance. The final green infrastructure plan ought to include a map or other geographic representation of the final network design in order to help communicate the larger spatial goals to the people who will be using the plan. While not crucial, it is also beneficial for the final plan to include additional maps that designate specific implementation plans in particular areas. Specific, locally-oriented maps may advance conservation implementation efforts by giving local planners concrete examples of how they can implement the plan in their locality (McDonald, et al. 2005).

Implementation

Another key element of a green infrastructure plan is a system by which protection opportunities can be prioritized. Without a system to prioritize conservation opportunities, the green infrastructure plan is simply a blueprint, not a workable framework. This system is often described as a "decision-support tool". The decision-support tool ought to result in land protection strategies that can guide implementation. In other words, the decision-support tool needs to provide meaningful information for assessing conservation efforts and action strategies. Local governments ought to be able to use the decision-support tool to ensure that they are getting the most from their conservation budget (McDonald, et al. 2005).

The green infrastructure plan also needs to include a list of mechanism and tools that can be used for land protection and a list of viable funding options (federal, state, local and private

sources) for reaching the plan's goals. This information should be included in an implementation strategy section of the plan that highlights the ways that existing regulatory and non-regulatory land use tools can be used to protect the network. The section may also include suggestions of new tools that could be used in the planning area to support the protection and development of the green infrastructure network (McDonald, et al. 2005).

Beyond these basic requirements for a green infrastructure plan, a good plan will also outline a patchwork of protection strategies for areas outlined in the plan. These protection strategies should match the implementation tools, which includes a variety of land uses (McDonald, et al. 2005).

Informational Needs

Developing a green space plan requires the same information that would be needed to develop any conservation plan. It is important to consider the current state of the areas within the planning area and to understand the interested of community members. The information that is required for green space plan development goes far beyond and more in-depth than for most other conservation plans. Green infrastructure planning often requires the use of several layers of Global Positioning System (GPS) mapping so that the network can be fully mapped out but maintain separations between the various land uses that make up the green infrastructure network. Often, the green infrastructure plan development process requires planners to develop several network possibilities, which requires additional information. The additional information generally comes in the form of further environmental analyses that consider various ecological services and functions in a variety of manners. Planners need to be able to quantify the various ecological services provided by each parcel they include in their plan. Ecological services range from habitat protection to the particular environmental cleansing benefit(s) the area provides. To develop a complete green infrastructure plan, it is important for planners to know and understand the current state as well as the natural state for every parcel in the planning area. Beyond all the requirements for knowledge of the physical area, it is important to understand the community or region that the green infrastructure plan is being developed for. Since green infrastructure combines development and open space preservation, planners need to fully understand the community in order to evaluate and address the community's various needs and to ensure that the green infrastructure plan represents the community's vision for their community.

As with every type of development or planning processes, the final green infrastructure plan must fit into the existing local, regional, state and even national frameworks. No policy exists alone, so the resulting green infrastructure plan must align with the policies, goals and processes outlined and required by existing regulation. To ensure that the green infrastructure plan fits into these various frameworks, planners must understand the frameworks that their plan will be working with.

Green Infrastructure Plan Evaluation

Plan evaluation frameworks have been developed as a method by which green infrastructure plans can be evaluated. Often, applying these evaluation criterion to green infrastructure plans helps planners to clarify the purpose and mission of their plan as well as to help them develop effective plans. These frameworks have been developed to evaluate plans on both the local and regional level and outline the specific criteria for green infrastructure. One of the most important factors in green infrastructure planning is linking and coordinating planning as well as implementation across the three special scales: site, local and regional (McDonald, et al. 2005).

Regional scale plans can be multi-state, statewide, ecoregional or larger watershed scale planning. This is most often the largest-scale plan and it lays the framework for smaller-scale conservation and development efforts. Regional scale plans encompass large areas and thus involve many different landowners and interests. Often, these plans do not include specific implementation plans (McDonald, et al. 2005).

Local scale plans can be multi-county, city or small watershed projects. Often, local plans are multi-jurisdictional and is the most effective when supported by a regional plan. These plans tend to have more specific land-use requirements to define specific parcel-level recommendations and to lay out a process by which the goals of the green infrastructure plan can be accomplished. Site scale plans are the smallest planning efforts and include small-scale conservation or conservation development plans (McDonald, et al. 2005).

The goal of site scale plans is often to balance conservation and development at the parcel level. Most direct implementation efforts occur within site scale plans because they generally include highly specific action plans. As with local scale plans, site scale plans are most

effective when they are linked to the regional and local scale green infrastructure plans (McDonald, et al. 2005).

Green infrastructure plan review has been broken into four main elements: goal setting, analysis, synthesis and implementation. There are three aspects to goal setting: plan foundations, stakeholder involvement and conservation vision. The plan foundations are used to evaluate the green infrastructure plan's basic elements and purpose; this includes the nature of the planning effort, regulatory and/or policy requirements that will regulate the planning effort, how the plan might fit into any larger scale green infrastructure plans and the goals, objectives and strategies that will eventually lead the plan through the development process. Stakeholder involvement evaluates the process used to identify the stakeholders that ought to be included throughout plan development and any established leadership group that can provide guidance throughout the process. The specific conservation goals that lead to the development of a green infrastructure plan are evaluated by the conservation vision aspect of goal setting evaluation (McDonald, et al. 2005).

Analysis is used to evaluate the scientific aspects of the green infrastructure network model. Often, suitability analysis or a similar methodology is used in this step of evaluation. Two main factors are considered during analysis are: network design criteria and network suitability analysis. Network design criteria are used to evaluate the process used to delineate the green infrastructure network. Network suitability analysis evaluates the results obtained from the spatial modeling analysis, more specifically, it considers the nature of the network and how the range of scales and land uses are incorporated into the model as well as how easily the analysis itself can be reproduced. Synthesis evaluation considers the green infrastructure network design model through an examination of vulnerability factors as well as the status of land protection, among other feasibility factors. This evaluation considers three different criteria: network design model enhancements, priority identification and the relationship to plan goals. The network design model exams the factors that strengthen the plan's design. This can include examining the area's land protection status threat and "fact-checking" to evaluate whether or not the network design model will address real world needs. In order to classify and rank the lands that have been identified as part of the green infrastructure network. Finally, evaluators determine how well the final design meets the initial plan goals as well as how well it will fit into the existing larger-

scale green infrastructure plans. Through synthesis evaluation, planners are able to determine the implementation priorities (McDonald, et al. 2005).

The final step in plan evaluation is implementation, which assesses the strategic framework that has been developed to achieve the green infrastructure plan goals. Implementation includes an evaluation of decision-support tools, implementation tools, conservation funding, conservation strategies and defining development opportunities. Decision-support tools measure whether or not the plan will be able to provide a quantitative mechanism by which to rank the conservation value of various protection opportunities. Implementation tools are used to evaluate the new and existing policies, programs and market-based approaches to support conservation. Conservation funding considers the various funding mechanisms that have been included in the plan. Conservation funding also includes considering a basis for a permanent funding program that is devoted to protecting the land included in the green infrastructure network. Defining development opportunities assesses how well the plan will be able to identify development opportunities that will complement and fit in the green infrastructure network (McDonald, et al. 2005).

These frameworks can be used not only to evaluate a green infrastructure plan, but also to guide planners through the process of developing a new green infrastructure plan. In addition to the evaluation processes specific to green infrastructure plan review, it is important that any conservation plan include an assessment of forecasts and emerging conditions, an acknowledgement of related planning efforts, processes by which the plan can be regularly updated, monitored and evaluated as well as a provision addressing the finances required for implementation, evaluation, monitoring and revisions (McDonald, et al. 2005, 10)

In order to use this evaluation framework, evaluators should consult the series of rubrics included in Appendix 1 (page 94) to determine the point value for each criterion listed on the checklist.

Green Infrastructure's Place

In Regeneration

Green infrastructure is very helpful as areas work on redeveloping run-down areas and plan which areas should be returned to their natural state. Green infrastructure plans must include reference to parcels that ought to be part of the network but are currently either developed or not

in their natural state (for example, brownfields). The green infrastructure plan identifies the key ecological and functional sites in the area, which enables the local authority to easily identify the areas that ought to be regenerated or returned to their natural state. In addition to simply differentiating between the ecologically beneficial areas and the areas of lesser ecological benefit, the green infrastructure plan also classifies parcels in the network based on their importance. With a green infrastructure plan, it is easy for localities to direct their regeneration funds since all of the analysis and importance rankings are already incorporated into the plan.

Most areas adopting green infrastructure plans will be using their plans to aid in the process of determining which areas must be returned to their natural state since many areas identified in the green infrastructure network have already been developed or deteriorated.

In New Planning

Green infrastructure has a far-reaching impact on new development. In addition to the general benefits of green infrastructure as discussed earlier in this paper, there are numerous additional benefits to developing undeveloped land using the principles of green infrastructure. Even in undeveloped areas surrounded by developed areas, using green infrastructure can maintain the ecological services provided by the undeveloped land as well as reduce the environmental strain on the developed land. When an area uses green infrastructure from the beginning, there is much less need to engineer and build gray infrastructure since the ecological services of the area will not be eroded by haphazard and unplanned development. Additionally, if the land is never developed or is strategically developed, the land would never entirely loose its ecological value or not be able to perform its natural cleansing tasks. Thus, reducing the amount of money the area would need to spend to manually perform tasks that the environment can perform.

Green Infrastructure's Place on the Planning Continuum: Green Infrastructure Compared and Contrasted with Conventional Planning Method

Green Infrastructure as the Ideal

Green infrastructure represents the best planning option because it combines several of the other conservation methods to create the most complete conservation strategy. As previously stated, green infrastructure is a type of smart growth that incorporates open space planning,

development and greenways into one overall city or regional plan. While green infrastructure is the best planning option to maintain and reclaim urban open space, it is not always feasible.

True green infrastructure can only be accomplished in a newly-developed area. With many years of planning and redevelopment, it might be possible to create a true green infrastructure; but it is much more likely that municipalities will choose to use some aspects of green infrastructure in order to move their community towards green infrastructure, however, most will never reach the ideal. For any planning organization or board that chooses to use a green infrastructure approach, the goal is to move their municipality or region as close to true green infrastructure as possible. If we were to draw this on a continuum, one end would be no conservation planning at all and the other would be green infrastructure.

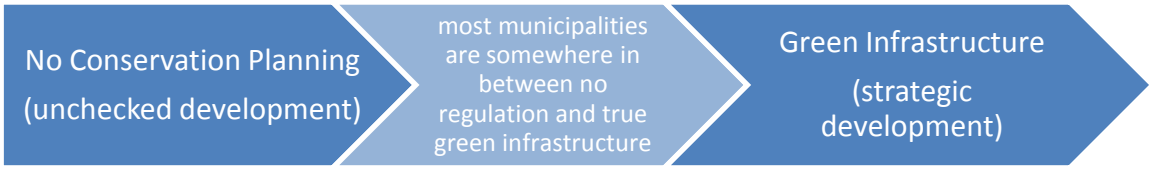


Diagram 1: Basic Planning Continuum

In a more complex version of the continuum, other conservation planning methods would be included as steps along the way to green infrastructure. For example:

Diagram 2: Complex Planning Continuum

However, green infrastructure itself can be broken into a continuum. As previously stated, true green infrastructure is the ideal and will very rarely be the end result. However, it is necessary for all planners, even if they know the plan will not be fully implemented, to examine their planning area and develop an ideal green infrastructure plan as if it is expected that the area will eventually be a true green infrastructure.

The purpose of our work in Swaffham, as will be the case in many green infrastructure plans, will be to examine the parcels within the planning area to determine the best possible

green infrastructure network, but also to examine the costs and benefits associated with the green infrastructure network. For every plot that is either maintained as open or natural space (for ecological or recreational value), there is an associated development loss. The opposite is true as well, each parcel that is developed results in an ecological loss. We will be working to analyze the opposing costs and benefits to determine which parcels are best suited as either open/natural or developed. This process affects the green infrastructure network plan because these analyses can assist planners in deciding which parcels should be included in the network. Further, this type of cost-benefit analysis helps planners to determine the priority classification for lands that are to remain open or need to be regenerated. Cost-benefit analysis can only go so far in the green infrastructure network because it is very possible that a parcel in the network could be determined to be more cost-effective as developed land than open space, but not including it in the network would cause a permanent gap, or missing link, in the network. In an ideal situation, every parcel included in the green infrastructure network would have higher value to the community as open space, but this is highly unlikely. This represents another reason why it is very unlikely that areas that are already developed and are trying to implement green infrastructure, communities such as Swaffham, will ever reach true green infrastructure or fully develop their green infrastructure network. Our role will be to analyze the various plots that are currently under review to potentially be opened for development and consider other down-town areas to recommend the best way to move Swaffham along the green infrastructure continuum to improve the town's aesthetics as well as to support sustainable development and environmentalism in the town.

The important thing to take away is that just because an area does not fully represent true green infrastructure does not mean that their planning is sub-par or does not represent green infrastructure. Every step towards true green infrastructure is a benefit for both the community and environment.

Green Infrastructure as the Nexus of Social Equality, Ecological Integrity and Economic Prosperity

For this section, I will examine green infrastructure as the nexus of social equality, ecological integrity and economic prosperity. In this model, the Local Agenda 21 framework represents social equality because of their specific goals and mission. Ecological integrity is

supported by sustainable development, the purpose of which is to ensure that we are able to use the resources we need without degrading our planet's future and ensuring that future generations are able to use the resources they require. Economic prosperity is represented by smart growth because it addresses development processes that improve the community and pays particular attention to reducing the built infrastructure that an area requires, which translates into an improved economic status. The argument I make here is that green infrastructure is located at the nexus of these three ideals since it works within all of these frameworks and supports the vast majority of ideals represented by economic prosperity, social equality and ecological integrity.

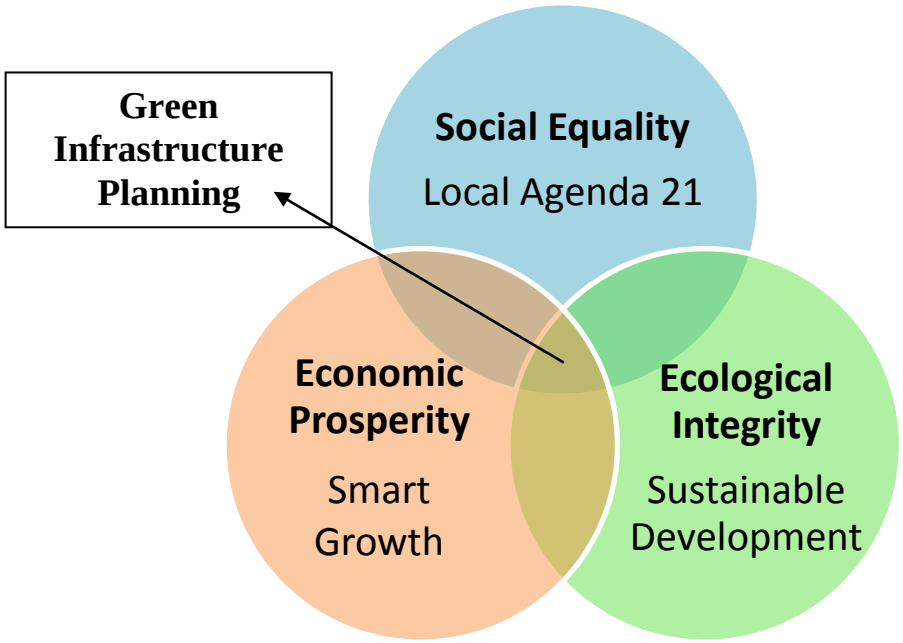


Diagram 3: Green Infrastructure as the Nexus of Social Equality, Economic Prosperity and Ecological Integrity

Since green infrastructure is commonly referred to as a type of sustainable development and smart growth, it is not hard to see how green infrastructure sits at the nexus of these two principles. It is slightly more difficult to view green infrastructure as a representation of social equality under the Local Agenda 21 frameworks. However, even this is not particularly difficult. Green infrastructure places a high value on community participation, stakeholder views and ensuring that the final plan reflects the community's goals. These goals are also highly valued by the Local Agenda 21 initiative, which aims to give local communities ownership of their locality's sustainability projects and initiatives. Green infrastructure further represents social equality through the multitude of social benefits that natural and open areas provide for the

community. These benefits are non-exclusive and thus benefit the entire community at the same level. Furthermore, preserving and protecting open space to benefit the community generally leads to an improved economic climate in the area because real estate values rise and businesses try to situate themselves in areas that will improve their employees' and clients' quality of life. Considering the parallels between green infrastructure, economic prosperity, sustainable development and social equality, it becomes clear that green infrastructure sits at the intersection of the other three ideals. Additionally, by situating green infrastructure at the nexus of economic prosperity, ecological integrity and social equality, the parallels between each of these three goals are highlighted.

United Kingdom Planning Policy Context

Unlike the United States, the Central Government takes an active role in planning by developing a series of statements to regulate planning at all levels of government. Additionally, the Central Government requires that each governmental region develop a Regional Spatial Strategy to regulate all planning within the region. Further, each county and district must develop a planning statement or strategy that conforms to the plans developed at each of the higher levels of government. Every planning decision, new development project and redevelopment project must fit the strategy for each level of government.

Planning Policy Statements

Planning Policy Statements (PPS) are written by the national government and explain the national planning policy and how the planning system operates. These statements also offer guidance to the local authorities and others involved with planning on how to implement the policies that the national government has developed and indicate how other policies relate to planning policy and vice versa. The local authorities, at the regional and municipal lever, are responsible for preparing the development plan and ensuring that the local plan complies with the national policy as defined in the PPS reports. Planning Policy Statements are not meant to override other planning policies, but must be read in conjunction Planning policy statements are developed after extensive consultation with the public (PPS 1). We will be considering PPS 1, 12 and 17 in our project. These are the statements that relate to sustainable development, local spatial planning and open space, sport and recreation planning, respectively.

Planning Policy Statement 1: delivering sustainable development

Planning Policy Statement 1 describes the planning policies for the delivery of sustainable development using the planning system. In PPS 1, the Government sets out twelve distinct objectives for the planning system. PPS 1 begins by highlighting the importance of planning. Planning has a far-reaching impact on people's lives because it shapes the places where people live and work and the area they live in. Good planning can have a positive impact on the community because it ensures that communities are applying the "right development, in the right place and at the right time" (PPS 1, p. 2). Planning can work to improve the historic and natural environment and help with the conservation of countryside and open spaces, thus protecting important resources that are important to everyone. Objective two establishes planning as an open, proactive process that operates in the public interest. The main purpose of PPS 1 is to establish the necessity of sustainable development. Objective three presents the Government's support of sustainable development practices as "the core principle underpinning planning" and that the most basic point of sustainable development is to improve life for the entire community (PPS 1, p. 2). PPS 1 restates the World Commission on Environment and Development's definition of Sustainable Development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (1987). PPS 1 includes four goals for sustainable development in a 1999 strategy report. The four goals are: social progress that recognizes the needs of every member of the community, effectively protecting the environment, using natural resources prudently and maintaining high and stable economic growth and employment. PPS 1 requires that that these four goals be integrated into a sustainable, innovative and productive economy. PPS 1 includes several ways in which planning ought to be used to encourage sustainable patterns of urban and rural development. These methods are:

- making suitable land available for development in line with economic, social and environmental objectives to improve people's quality of life;
- contributing to sustainable economic development;
- protecting and enhancing the natural and historic environment, the quality and character of the countryside, and existing communities;
- ensuring high quality development through good and inclusive design, and the efficient use of resources; and,

- ensuring that development supports existing communities and contributes to the creation of safe, sustainable, liveable and mixed communities with good access to jobs and key services for all members of the community (PPS 1, p. 2-3).

Planning is one of the most important aspects of creating sustainable communities. PPS 1 calls for a "transparent, flexible, predictable, efficient and effective planning system" that can support the caliber of development that is necessary to establish sustainable development and sustainable communities. This section of the statement also establishes the requirement that regional and local development plans should be developed by the regional and local governments. These plans must include a shared vision for the community and a process by which the area will develop using more sustainable patterns of development. The statement dictates that the community ought to be involved with the creation of the development plan. PPS 1 highlights the importance of having a plan for development, for without a plan, it would be very hard to incorporate sustainable practices into planning. It is important to the Government that the process of creating a development plan is open and cost efficient. Furthermore, regional and local governments must keep their plans up to date, deal with planning applications expeditiously and report the extent that local planning policies have been enacted. PPS 1 makes it clear that regional and local governments are responsible for far more than just creating a development plan, they also need to facilitate and implement the plan to ensure that quality development is occurring. PPS 1 highlights the responsibility that regional and local governments have in the future state of their community and places emphasis on updating the development plan as necessary to account for changes in community and stakeholder values. Throughout the process, especially before the development plan goes into effect, it is incredibly important that there is open communication between the developers and local planning authorities so that all parties involved have a clear understanding of the development plan and its objectives. The communication between planners and developers needs to continue. Developers and planners should often meet together to talk about project ideas and to discuss the constraints that the development plan may put on project ideas that the developers may have. These objectives are for the planning system as a whole and are followed by the Government's national planning policies.

Planning Policy Statement 12: Creating Strong and Prosperous Communities through Local Spatial Planning

Since local authorities play a very important role in their communities by creating prosperity in villages, towns and cities as well as fostering local identity and civic pride, it is equally important for communities to create a vision of how they want to respond to as well as address their locality's problems, needs and ambitions. As an extension of this, communities must develop a strategy that enables them to work towards this vision in a coordinated manner. Planning Policy Statement 12 (PPS 12) calls on local authorities to produce a Sustainable Community Strategy (SCS) through consultation with local communities and other local partners. The SCS is meant to outline the area's strategic vision and must be linked to the overarching regional strategies. Additionally, local governments must work within Local Area Agreements that are set every three years and are based on the area's SCS. Under PPS 12, local authorities are required to take on a stronger leadership role in sustainable development (The Department for Communities and Local Government 2008).

Planning Policy Guidance 17: Planning for Open Space, Sport and Recreation

Planning Policy Guidance 17 (PPG 17) was written to highlight the importance of open space, sport and recreation areas in everyday life. Some of the benefits of well designed and maintained planning policies in regards to open space, sport and recreation areas include: supporting an urban renaissance, supporting rural renewal, promoting social inclusion and community cohesion, improving health and well being and promoting sustainable development. In order to effectively plan for these areas, the central as well as local governments must understand what each community needs. This information is gained through a series of assessments that address the needs and opportunities for each locality as defined in PPG 17. While PPG 17 is a national government policy, they make it clear that the local governments are best suited to regulate standards for open spaces, sport and recreation areas. Other requirements under PPG 17 are that local governments should maintain an adequate acreage of open space, sports and recreational areas. There are many suggestions as to how local governments should accomplish this goal. For example, the national government mandates that since open space, sports and recreation buildings and areas are important; areas in good quality and have a great value to the community should not be redeveloped into a different use unless an assessment

shows that these areas are surplus areas and that the community will not be harmed by their redevelopment. Additionally, local governments should always be planning for new open spaces, sports and recreation facilities (Department for Communities and Local Government 2006).

Regional Spatial Strategies

The Planning and Compulsory Purchase Act of 2004 created Regional Spatial Strategies (RSS) as a method to contribute to the achievement of sustainable development. The Act also strengthened regional planning and expressed its importance across the country by making RSS the highest statutory level of law. Each region has their own RSS that includes a Regional Transport Strategy (RTS). RSSs provide local governments with a consistent regional framework to use when creating Local Development Documents (LDD), local transportation plans and any regional or sub-regional programs that affect land use activities. Generally, RSS outline the region's strategy for fifteen to twenty years; after the period has elapsed, the goals are reassessed (Government Office for the East of England 2008).

The RSS for the East of England outlines sustainability efforts until 2021. By then, the East of England plans to be realizing its economic potential; meeting housing needs through the development of sustainable inclusive communities; reducing the region's impact on global climate change through many methods, but specifically through reducing water and energy usage and strengthening the stock of environmental assets; providing an overall high quality of life for its residents; and improving and conserving the region's environment (Government Office for the East of England 2008).

Local Development Frameworks

Local Development Frameworks (LDF) are required by PPS 12 and outline how planning is to be managed in a particular area. LDFs are composed of at least a Statement of Community Involvement, Annual Monitoring Report and Local Development Scheme. They may also include Supplementary Planning Documents as well as Local Development Orders and Simplified Planning Zones, although inclusion of these three sections is optional. The Development Plan Documents (DPDs) are also included in the Local Development Framework and must include a Core Strategy, Site-Specific Allocations of Land and a Proposals Map. The DPDs may also include optional, supplemental documents such as an Area Action Plan. DPDs

represent the key development goals for the LDF. The process of creating the various DPDs includes community involvement as well as consultations and independent examinations. Additionally, the DPDs are subject to a Sustainability Appraisal that ensures that the plan is in accordance with the various sustainable development targets. Unless material considerations indicate otherwise, all development control decisions must adhere to the DPDs (Planning Portal 2008).

Swaffham

This project was completed in Swaffham, England. Swaffham is a small market town in Norfolk County.

About Swaffham

Figure 1: Satellite Image of Swaffham (Google Maps)

Swaffham, Norfolk, England is located approximately 100miles (161kilometers) north-northeast of London between Kings Lynn and Norwich. Swaffham is in Norfolk County, on the edge of the Brecks. According to the Swaffham Town Council, Swaffham has some of the finest countryside in Norfolk . The population in Swaffham exceeds 6000 people and has been growing in recent years. The central market place is very important to Swaffham. In addition to the

market place, downtown Swaffham has many Georgian buildings and the parish church, which is one of the main focal points in Swaffham for several centuries. Archeological evidence indicates that humans have inhabited Swaffham for 300,000 years, but it was not a permanent settlement until Saxon times. Until the Great Depression of the 1930s and the industrial revolution, Swaffham was a farming town. Today, there are still many farmers, but people also commute to jobs both in Swaffham and beyond. Swaffham looks very much the same as it did in the nineteenth century, except for the presence of automobiles. The roads have been paved and there are now parking lots at the Market Place, Assembly Rooms and at the Town Hall and Museum. Swaffham was connected to the railroad until the Beeching Plan took effect and the rail station in Swaffham was closed. Swaffham also used to have a cinema, but that has also closed. However, the town has built a new skateboard park and is hoping to build a swimming pool. Swaffham is a lively rural town that retains the temepered way of life that is reminiscent of the rural life in Norfolk, before life was so hurried and when the season still dictated people's lives (Swaffham Town Council 2008).

Recently, Swaffham has served as the filming location for a drama series, Kingdom. Oftentimes, municipalities grow to resent production teams working and filming in their towns. However, this has not been the case in Swaffham. The crew and actors in the series have always been very sensitive to the town through consultations with local stakeholders to ensure that the town suffers the least amount of disruption possible. Hosting the series has led to many benefits for Swaffham and the surrounding villages. Swaffham has become more interesting to tourists, which has enabled local residents to provide services for tourists. The production team has been very supportive of local business, enabling local businesses to provide a variety of goods and services for the crew and actors. Also, many Swaffham residents have had the opportunity to serve as extras in the show; in fact, the Swaffham Town Council boasts that if one were to watch any episode closely, they would most certainly recognize someone from the local area (Swaffham Town Council 2008).

EcoTech, an environmentally constructed building that had been planned as home to environmental initiatives, is situated just north of the main town. It has the largest wind turbine in the region; visitors can climb the turbine in addition to learning about how it works. Swaffham is also part of the ICENI Partnership, which encourages local citizens to work together to benefit the community. The ICENI Partnership is an independent, non-political, community organization

that serves Swaffham and the surrounding villages. The ICENI group welcomes anyone living in the area to join and actively participate in the work of ICENI (ICENI Partnership 2008). The ICENI Partnership, along with many other community organizations, meets regularly in the newly renovated Swaffham Community Center. The Center opened in 2005, was built as a part of the ICENI Partnership's Recognition Project (Who Media 2008). In addition to working with the Community Center, the ICENI Partnership has worked extensively with the Swaffham Community Transport Project. The Swaffham Community Transport Project supports projects such as Dial-A-Bus and the Community Car Scheme. The Swaffham Dial-A-Bus is a pre-bookable door to door service for people who have mobility problems, such as the disabled and the elderly . Similar to the Dial-A-Bus system, the Car Scheme assists the elderly and disabled. Community Car drives use their own vehicles to transport people to pre-booked destinations in excited for a mileage charge (ICENI Partnership 2008).

Swaffham's Government

England's local government mechanism is broken into at least four levels below the national government. There are nine regional governments that are just below the national government in their scope of power. Each regional government has at least one county government in it. Swaffham is in the East of England Region, Norfolk County and Breckland District. Swaffham is covered by the RSS for the East of England. Breckland District is Swaffham's planning authority; however the Town Council is hoping to take on a larger planning role through the development of the town plan.

Swafham's local government consists of a Town Council, which is made up of twelve elected town councillors. At the town level, candidates do not run with a party; each candidate's name is listed on the ballot without any party designation. Most of the town councillors are members of major parties, but it is illegal for party politics to interfere with the activities of the Town Council. One of the town councillors is further elected as Mayor and serves as the Council's Chairperson. During spring 2007, the Town Council began the process of developing a town plan for Swaffham. They created a separate Town Group to develop the town plan.

The Town Group is made up of xx number of people, xx are town councillors and xx are residents who have volunteered to participate in the Town Group. Within the Town Group, there are four separate committees: Economy, Social and Community, Environment and Transport.

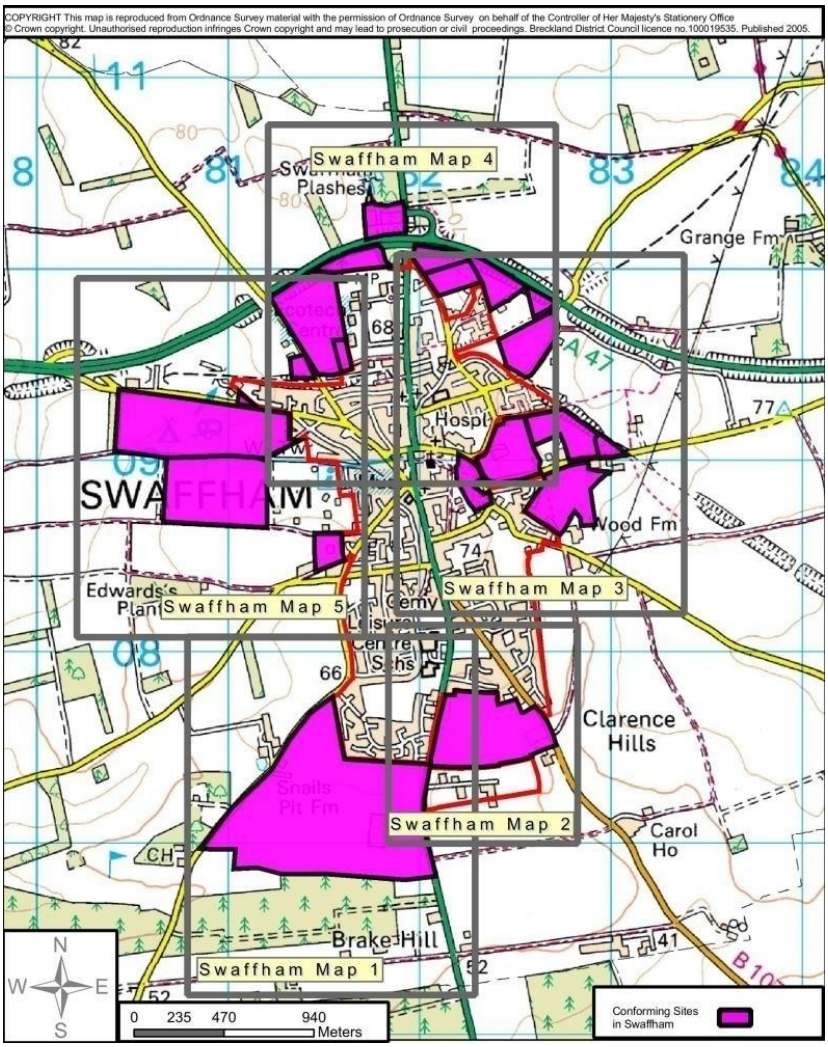
These committees work separately, but come together as the full Town Group to vote on important matters and eventually will be working together to draft the Town Plan. Swaffham's Project Grant Officer, Dr. Dave Bek, has been intimately involved with the Town Group since its inception. As an Offer of the Town, Dr. Bek works directly with the Town Group, Town Council as well as the district and county officers involved with the development of Swaffham's town plan.

Current Planning in Swaffham

As is evident from Figure 1 (page 31), the Town of Swaffham is surrounded by green space mostly in the form of working farms. However, within the approximately 2.5 kilometers by 1.0 kilometer main town, there is a distinct lack of green and open spaces. Especially in the center of town, near the Market Place and Parish, the land has been developed and paved. In fact, during a study conducted by the ICENI Partnership, it was determined that there were no trees visible from any of the public benches in the town center. Additionally, the ICENI Partnership has conducted extensive research about several footpaths and roads in order to "suggest ways in which the town could be made more attractive to both visitors and residents, whilst still retaining its essential character as a Norfolk market town" (Swaffham Town Group - Transport and Traffic Management 2007, 1). The roads studied are all within the Town Centre Enhancement Scheme and have been identified as roads whose accessibility and condition impact the town's aesthetic appeal (Swaffham Town Group - Transport and Traffic Management 2007).

In the framework for English planning, the county council determines which parcels can be developed and how. Currently, there are twenty-three parcels that the Breckland District Council has proposed to open for development. Before the final decisions are made, the community, environmental organizations, development organizations and the planning board will have the opportunity to comment on the possible development. These twenty-three parcels are all either adjacent to or within the densely populated town center. The Breckland District Council has suggested uses for the twenty-three parcels, but whether or not each plot will be developed is still up for discussion. Figure 2 (page 35) is a map of Swaffham showing all the proposed development areas in purple. The main town center is outlined in red.

Figure 2: Sites proposed for development in Swaffham (Breckland District Council)



Traffic congestion has become a problem in Swaffham, so one of the local planning initiatives is to develop effective walkways and bikeways so people can park their cars and still move around town. Another important aspect of Swaffham local planning is to develop a better way that people can get to EcoTech. Many people work at EcoTech, both Swaffham residents and people who commute to EcoTech. There is not a good way to drive to EcoTech from Swaffham town center and many people from EcoTech take their lunches in the town. People involved with planning in Swaffham are hoping to create a greenway that people can walk through to get back and forth to town from EcoTech, which is situated only about 1kilometer from the town center (Dave Bek/Rob Krueger).

Dereham

Dereham is a market town located approximately twelve miles from Swaffham. Dereham is also part of Norfolk County and Breckland District, so it works with the same planning authority as Swaffham. The largest difference between Dereham and Swaffham is the population. Swaffham has a population of about 6000 residents. Dereham has approximately 16000 residents. Dereham still hosts two weekly markets and a monthly farmers market (http://derehamtc.norfolkparishes.gov.uk/the-history-of-dereham/).

In September 2008, the Dereham Town Council published a green infrastructure study and implementation strategy. To complete this report, Dereham was able to hire land use consultants. The Dereham Town Council, Breckland District Council and Norfolk County Council all contributed money to pay for the project and the consultants' fee. The total cost of completing the study and developing the implementation plan was approximately 15,000 pounds. Dereham's town clerk believes that the three councils are supportive of the project because it assists each of them with their responsibilities. The Breckland District Council, as the local planning authority, must determine where to build houses and where there ought to be open space. Norfolk County Council is mainly responsible for environmental protection and is in the process of developing ecological networks. The Dereham green infrastructure study will help both councils make informed decisions and reach their goals. The work completed by the consultants about environmental issues and planning in Dereham is work that each of the councils would have had to complete if Dereham had not been able to have the study completed. The town of Dereham will have the most direct benefit from the green infrastructure study. The town council is partially responsible for implementing Breckland and Norfolk's actions and the town council is hoping that having the information from the study will enable them to have more influence on the projects and developments that occur in Dereham. Furthermore, the Dereham Town Council is planning to use the green infrastructure implementation strategy to guide local projects and redevelopments (Needham 2008).

In addition to on the ground field research in Dereham, the consultants used existing maps and data that they received from the Breckland District and Norfolk County Councils. The Dereham town clerk believes that the consultants would not have been able to complete the project without support and existing information from the district and county councils (Needham 2008).

The Dereham town clerk worked very closely with the consultants throughout the duration of their study. The consultants had been asked to examine the existing open spaces in Dereham and consider where pieces of green infrastructure could be used to connect the existing and proposed open spaces. The consulting firm that Dereham employed had never completed a green infrastructure study before winning the Dereham contract. The town clerk said that throughout the process one of the biggest challenges he, and the consultants, faced was balancing idealistic goals and reality (Needham 2008).

In addition to the traditional green infrastructure network, the Dereham plan includes the creation of a green garden zone in the densely developed, historic areas of the town. One of the immediate benefits that the town of Dereham expects to experience is to use the implementation strategy to stop unwanted development. The green garden zone, for example, was included in the strategy to prevent residents from using their large back gardens to build small bungalows and flats to let (Needham 2008).

Research Methods

Introduction

To develop recommendations for redevelopment projects in Swaffham's town centre and recommend sites for inclusion in the LDF, I employed several different methods of data collection. Informal interviews and structured observation were the two most important data collection methods I used. In addition to these data collection methods, I also completed background research. The following sections outline the research methods I used and discuss why I choose each particular method. The chapter begins with a discussion of the background chapter and literature review and then examines the various data collection methods I used in each section of the paper. Due to the nature of the two sections of recommendations, I have separated them throughout this chapter. The chapter discusses the town centre recommendations first, discussing each data collection method I used to complete this part of my research. The data collection and research methods that I used to recommend locations for future development to be included in the LDF are located in the final section of this chapter.

Background Research and Literature Review

Prior to beginning my data collection, I researched and wrote a background chapter on topics relevant to Swaffham and its development. In addition to the general background information, the chapter also includes a literature review that discusses the current literature on green infrastructure planning. There are a large number of topics included in the background chapter, but the most important sections discuss the English planning system and the best practices in green infrastructure planning.

Before beginning this project, it was necessary for me to develop an understanding of how the planning process works in England. It was especially important that I understand the local planning context to ensure that the recommendations I make would be permissible and would be projects that the Town Council could reasonably undertake. Additionally, since the Town Group is interested in using green infrastructure principles to guide redevelopment projects and future development, it was especially important that I understand how planners apply green infrastructure practices to both new development and the redevelopment of existing areas.

Completing this research allowed me to develop an understanding of the current literature in the field as well as identify the areas that have not been researched. Furthermore, this research provided me with the basis on which to build my recommendations for future development and redevelopment in Swaffham. The background research I completed guided me when I began to define my research goals and questions (Singleton, Straits and Straits 1993).

Town Centre Redevelopment Projects

Before developing the recommendations for how Swaffham's town centre can be greened, it was very important for me to understand the town centre and its development, use and constraints. This section includes a description of each data collection method I used and how I used it to make recommendations for various projects in the town centre. I met with various actors from within Swaffham, other organizations and higher levels of government. I also used results of the Town Surveys that had been conducted throughout Swaffham and the hinterland to make sure that I understood the concerns that the general public had voiced. To confirm and enhance the information I received from the various interviews and survey data, I spent a lot of time in Swaffham's town centre taking pictures and observing the area. I was particularly interested in the town centre's traffic patterns, both vehicles and pedestrians, as well as learning how the area itself is used. In addition to observing these specific aspects of the town centre and corroborating information garnered from my interviews, I examined all the factors that affect the town centre and its functionality.

The data collection methods used in this section of my research were chosen to support the goals I had for each stage of the project. The main purpose of this section of data collection was to determine what the people of Swaffham want to have in their town centre.

<u>Identifying Key Concerns</u>

More than simply determining what Swaffham residents would like to have in the town centre, I needed to identify the most common resident concerns. To determine these key concerns, I used a variety of methods to learn more about the town and people's opinions about specific characteristics of the town centre. The activities I undertook to determine these concerns were to: examine the town survey information, conduct informal interviews and personal observations in the town centre. I completed these three activities using several different research

methods: field research, research using existing data and informal interviews. I used the several different methods of data collection not only to gain access to a variety of information, but also so that I could use triangulation to confirm that the information I had gathered was accurate.

Town Survey Data

Swaffham is in the process of developing a town plan. In order to ensure that the town plan represents the town as a whole and would not appear to have been influenced by a very small number of people, the Town Council created a separate Town Group to collect information and develop the town plan. To assist in that process, the Town Group conducted a large-scale survey to collect data pertaining to the town; the survey is focused on what residents and visitors valued in the town and what they would like to see improved. The Town Group worked in conjunction with the Town Council and Dr. Bek to develop the survey, distribute it and collect the data. In addition to the Town Group's survey, the Town Council sponsored a Business Survey and Visitor's Survey. These two additional surveys were developed by other organizations, but were promoted by the Town Group and Town Council. Once the survey period was over, Dr. Bek compiled the information and analyzed the data from these three surveys (the Town Group survey, Business Survey and Visitor's Survey). One additional survey was undertaken by a doctoral candidate studying social geography. This survey considered the socio-economic change in Swaffham. His survey was conducted at approximately the same time as the other three surveys and was promoted by the Town Group and Town Council. He worked with his advisors and Dr. Bek to analyze the data. When I arrived in Swaffham, Dr. Bek was able to give me the rough data from the surveys and the final reports were published during my visit. I used the data from these four surveys extensively during my time in Swaffham and as I developed recommendations for redevelopment projects in the town centre. Since I did not conduct the surveys myself, I used secondary analysis to interpret the survey data (Singleton, Straits and Straits 1993).

The survey data gave me the base information I needed to determine the areas of the town centre that are particularly important to the town's residents. I based the beginnings of my interviews on the initial information I had from the four surveys. While I have used all four surveys in my work, the Town Group Survey has been most helpful. It has been the most important survey for my research because it discusses specific aspects of the town centre and

environment. It additionally, it includes questions that ask respondents to rate their favourite and least favourite aspects of the town centre as well as left room for open responses about each topic on the survey.

While there are many advantages to using survey data in research projects, there are some limitations to the data. The most important limitation is that it is difficult to infer cause-and-effect relationships with the type of data that surveys provide (Singleton, Straits and Straits 1993). Helping to bridge this type of gap in the survey data is one of the reasons I also used informal interviews throughout my research process.

Informal Interviews

To corroborate the survey data and further define the important issues, I used informal interviews. Throughout my time in Swaffham, I completed thirteen unstructured interviews. These interviews were conducted between 24 October and 7 November. Eleven of the interviews were conducted in various locations in Swaffham. One interview was conducted at the Dereham Town Hall and the final interview occurred at the Breckland District Office in Thetford. In Swaffham, I interviewed three town councillors and their spouses, the mayor, the two officers at the ICENI Partnership, the town clerk and two members of the community. Prior to my arrival in Swaffham, the project's liaison, Dr. David Bek, had arranged some of the interviews for me and while I was in Swaffham, he helped me determine and locate additional interviewees. The majority of interviews lasted approximately an hour, but one was twenty-five minutes and another continued for two hours.

The biggest obstacle in face-to-face interviewing is contacting the potential interviewee and scheduling a time for the interview (Singleton, Straits and Straits 1993). I did not encounter many of the problems generally associated with face-to-face interviews. I contacted potential interviewees by telephone or e-mail. Overall, people were receptive and I was able to schedule interviews in a timely manner. There were only two interviewees who were difficult to contact, but I eventually was able to make contact with them and schedule interviews.

I chose to use unstructured interviews to allow the conversation to flow without the hindrance of a specific set of questions that must be asked and answered. Especially since my interviewees came from a variety of backgrounds and experiences, I did not believe there would be much value added to the interview if I expected to have each interviewee address the exact

same issues. Informal interviews permitted me, and the interviewee, to talk about topics that they were knowledgeable about and able to readily discuss. Even though the interviews were unstructured, there were common questions and topics that I discussed with each interviewee. In each interview, I asked what the interviewee knew about the town planning process that Swaffham is conducting and what they knew about the green infrastructure planning process. Once the questions were asked and answered, I would further define green infrastructure planning, explained the process that Swaffham is going through in order to develop their town plan and where they currently are in the process (Singleton, Straits and Straits 1993).

In each of my interviews with Swaffham community members, we spoke at length and with great detail about Swaffham's current status in regards to the Local Development Framework and town centre. During these interviews, I learned more specific details about the concern areas in the town centre as well as about additional problems that were not discussed in the survey data.

Some of the information I received in interviews was incorrect, some was inconsistent with other information and much of it was more based on town myth. Especially in a small town, such as Swaffham, people talk with each other and information is changed by the rumour mill and by the time it reached me, it was necessary to distil fact from perceived reality. Since I used several different research methods, I was able to rely on information from Dr. Bek and other town officials as well as the existing data I was using to reconcile and clarify information I received during the interviews. This process is called triangulation and is discussed later in this chapter.

Personal Observations

In addition to using the survey data and conducting interviews, I conducted my own observations around the town centre. These observations were specified ahead of time and I was most often a nonparticipant observer (Singleton, Straits and Straits 1993). Throughout the course of my time in Swaffham, I observed different aspects of the town centre: movement throughout the town centre, benches and leisure areas and the location and appearance of trees. I primarily documented my observations using my camera and photographing what I observed, but I also made notes to go along with the photographs and to jog my memory once I returned to the United States.

As I completed my observations, I followed the general pattern for field observations. I began simply by spending time in Swaffham's town centre. Once I was familiar with the area, I was able to refine my method of recording observations and complete more structured observations such as tracking the times of day that I was observing movement in the town centre. The unstructured observations that I completed during my first few days in Swaffham laid the framework for the structured observations that I completed during the rest of my time in Swaffham (Singleton, Straits and Straits 1993).

The largest observation project was to determine the popular pedestrian pathways and where different activities are conducted in the town centre. To ensure that I had an appropriate representation of the way the town centre worked, I conducted this observation throughout the duration of my time in Swaffham. In addition to observing movement on many different days, I also observed at different times of the day to find the busiest and least busy times in the town centre. Weekdays and weekends are very different in the town centre, so I needed to make sure that each was represented in my data. Due to the Market, Saturdays are the busiest day in the town centre so I separated Saturdays and Sundays in my observations. I visited the town centre to observe the general atmosphere of the area on Saturday, Sunday and weekdays. On the specified days, I went to the town centre early in the morning (before 8am), mid-morning (between 10 and 11 am), at noontime (between 11am and 1pm), mid-afternoon (between 1 and 3pm), early evening (between 4 and 6pm), evening (between 6 and 8pm) and in the late evening (after 8pm).

Many survey respondents and interviewees mentioned that they were displeased with the number, size and placement of many trees in the town centre. A common complaint was simply that there are not enough trees and other types of vegetation in the town centre. In order to support these statements, I decided it would be important to conduct an observation focused entirely on the trees in the town centre. I located each tree in the town centre and photographed it. I also located other types of vegetation and photographed those, but since trees were the primary concern for residents and visitors, I spent the vast majority of my time focusing on trees.

The third observation task I completed dealt with the benches in the town centre. There were a variety of complaints about the location and number of benches in Swaffham's town centre. Many interviewees suggested that there ought to be more benches in the town centre and that they could be located more appropriately. Additionally the ICENI Partnership, one of the

community advocate groups in Swaffham, had claimed that the benches in the town centre were not adequately placed because they offered poor views and none of the benches provided people with a view of any trees. To confirm the information I received from interviews and the survey data and the ICENI results, I located each bench in the town centre and took a photograph while sitting on it.

As mentioned previously, I was a nonparticipant observer during the vast majority of my observations. There were only three times that I became a participant observer. While I was touring the town centre with residents, I was able to ask questions that allowed me to further understand how the town centre functions and is used by Swaffham residents (Singleton, Straits and Straits 1993).

Triangulation and Developing Recommendations

To develop the list of recommended redevelopment projects for the town centre, I synthesized the information from the town surveys, interviews and observations. As is expected with information about personal opinions, some of the information was contradictory. This is where triangulation was most important. Since I had collected data using several different methods, I had a wide variety of information that I could use to resolve conflicts or expand on incomplete information. Triangulation allowed me to confirm information and help to determine the relative importance of different opinions and information (Singleton, Straits and Straits 1993).

I have divided the town centre recommendations into recommendations for particular areas and general recommendations. For each area or general recommendation, I have explained the purpose of the recommendation, what the recommendation means and how dramatic the recommendation is. The Swaffham Town Group is very interested in ensuring that short-term redevelopment will not have to be reversed in order to allow for larger redevelopment projects when the town has money to complete such projects. Additionally, they want the short-term, smaller-scale projects that can improve the town until there is funding for large-scale redevelopment. They further want the small-scale projects to be easy to implement and relatively inexpensive but to not leave the town centre looking as if it is under construction. Essentially, they want to know the long-term goal of a nearly complete redevelopment broken up into smaller short-term projects that could be completed separately.

To help readers visualise how the town would look with the recommendations, I used Photoshop to edit photographs and satellite images to illustrate how the areas would look with the recommended changes made.

To support my recommendations, I researched town centre redevelopment worldwide to find case studies completed in other cities and towns. Many European cities are facing some of the same problems that Swaffham is currently dealing with, so there were many examples of similar redevelopment. These case studies were used not only to provide examples of redevelopment, but also to assist in the development of a process by which to incorporate green infrastructure planning methods into town centre redevelopment. Case studies are a common method of determining how things operate or function (Berg 2001). Only two of the case studies are based on interviews. The two case studies that are based partially on interviews are Dereham and Thetford, two towns relatively close to Swaffham. These interviews were approximately an hour in length. All of the case studies were chosen because some aspect of the project is similar to the projects in Swaffham (Berg 2001).

Local Development Framework

The second half of my project focused on the Local Development Frameworks possible development sites. To better understand the issues surrounding the Local Development Frameworks sites, I visited each site and took pictures of it, noting the current use and vegetation. I spoke extensively with Swaffham's Town Clerk, Richard Bishop, to learn about the process of Local Development Framework planning and about the specific sites under consideration in Swaffham.

The Breckland District Council is in the process of developing the Breckland Local Development Framework. This document plans all development in the district for the next ten years. At the latest, the plan should be finalized by the beginning of summer. All of the possible development sites have already been proposed and there has already been one round of consultations with the various town councils and residents in Breckland. District Officers are currently developing the and there will be another round of consultations during the early spring. The town wants to be prepared for the next round of consultations about the specific sites to be developed in Swaffham, so I considered the various options for development. There are many

characteristics to consider before determining which areas should be developed and which should remain as open or agriculture land.

To assist the town in this process, I visited each of the possible development sites and will be using a Geographic Information System (GIS) to study different aspects of each location. Green infrastructure depends on the analysis of geographic information to determine the locations that have the most ecological benefit. I will be looking at maps of soil type, elevation, habitat type, location and vegetation. Once that analysis is complete, I will be able to tell the town which areas are best suited for development and which should remain natural.

Analysis and Recommendations

This chapter discusses the synthesis of my interviews and observations with the Town Council survey results. This synthesis is presented in conjunction with a discussion of the problems in the town and recommendations for improvement. The chapter is broken into two main sections, the first section discusses the town centre, its current challenges and recommendations and the second main section discusses the Local Development Framework (LDF) recommendations. The town centre section is further broken into five sections, four that speak directly to specific areas of the town centre and a fifth that discusses general observations and recommendations that are applicable in various locations in the town centre. The four specific areas are: the Pedlar Sign Area, Corn Hall Area, Buttercross Area and The Shanbles. Each of the four sections begins with a description of the area's current condition and problems and is then followed by a series of recommendations for improving the area to meet the vision of Swaffham that its residents hope it will someday fulfil.

Image 1 is a satellite photo of Swaffham's town centre. The three boxes on the photo designate the three areas that will be dramatically altered by the area recommendations: the Pedlar Sign, Corn Hall and Buttercross Areas. In addition to these three focus areas, another area is discussed in the area recommendations; it is identified by the letter D, however this area is not being recommended for a dramatic change. The table describes observations about the town centre. The recommendations that are included later in this report are based on the observations outlined in the table. There are two columns in the table, one refers to specific areas of the map and the second discusses general observations that are applicable across several areas of the town centre. The table and photograph are meant to allow the reader to visualize Swaffham's town centre and to give the reader the opportunity to see the town centre's current appearance.

Image 1: Aerial View of Swaffham Town Centre (Google Maps)

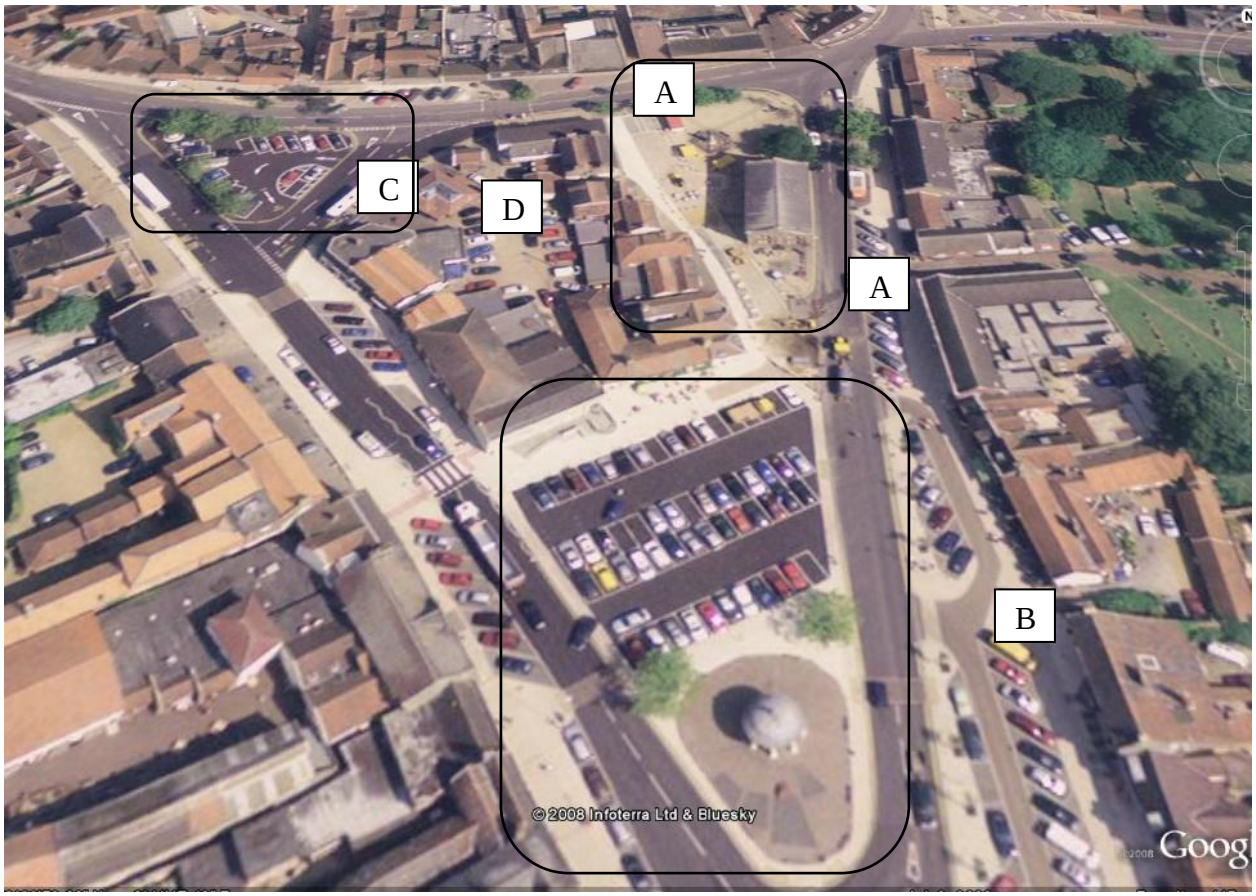


Table 1: Town Centre Observations

Specific Observations in the Town Centre	General Observations about the Town
A) There is only one pedestrian crossing on Lynn Street and one on the A1065, but people cross anyway. Both streets are very busy and cars often travel quite fast through the town centre, which leads to a dangerous situation for both pedestrians and motorists.	There are not enough trees and there is no green space. There are only about 20 trees in the entire town center and apart from a few flower planters, there is no other vegetation in the town centre.
B) Along the A1065 in front of the stores, there is no clear designation between the parking/driving areas and the pedestrian routes. This is incredibly confusing for both drivers and pedestrians and creates a large safety issue due to the confusion about the traffic pattern.	Drivers are very courteous, but there are not pedestrian crossings in many of the places where lots of people cross the street – especially in the town centre and on other main roadways
C) This area is often congested because of the bus stop, also people cross here (without a pedestrian crossing) to get to the small parking lot.	Due to the overwhelming number of cars in the town centre, people get the sense that the town centre is a parking lot and not a true representation of Swaffham.
D) Known as The Shambles, people park cars and occasionally leave trash here.	The parking official is part time, so parking regulations are sporadically enforced.

Swaffham's town centre was redeveloped several years ago with grant money from the European Union. This redevelopment added different types of pavement and masonry patterns to the streets, walkways and parking areas in and around the Market Place. The original redevelopment plan eliminated much of the town centre parking. However, when the town centre was redeveloped, only two parking spaces were lost. There are two official car parks and a variety of street parking options in the town centre itself. In addition to these central parking areas, there is a very large car park less than five minute's walk from the town centre proper. Six days a week, the town centre parking is very busy and most, if not all, of the parking spaces are occupied. All of the parking in the town centre is zoned as two-hour parking; however, there is not a parking officer or anyone to enforce this regulation. As a result, many people park in the town centre for more than the allotted two hours.

Even though more than half of the town's residents walk to the town centre at least three times a week, the vast majority of people use their cars daily to get around town and the surrounding areas. Additionally, approximately half of the respondents to the Swaffham Town Group Survey drive to the town centre at least three times a week (Town Group Survey Report, 2008).

Along London Street (the A1065), there are combinations of parking and pedestrian ways along the storefronts. Both pedestrians and drivers are confused about where pedestrian traffic belongs and where vehicle traffic belongs. In front of several storefronts, there are driveways and parking between pedestrian routes. In addition to the confusion about parking and walking, it can be very dangerous to walk through the area, especially with young children.

In addition to the confusing traffic pattern, there is a lack of pedestrian crossings along London Street and Lynn Street, where many people often cross to and from the market to the stores. There are several busy stores across from the Market Place on Lynn Street. The single pedestrian crossing from the Market Place across Lynn Street is closer to the bus stop than the corner of Lynn and London Streets. Everyone was observed crossed Lynn Street wherever they happened to be instead of walking out of their way to the pedestrian crossing. The same is true when people need to cross from the Market Place or car park to the other side of London Street. There are also many busy stores on London Street and many people have to cross London Street. There are pedestrian crossings at the corner of London and Lynn Streets and at the end of the

town centre near the Buttercross, but many people cross between these crossings. The largest car park in the town centre is located between these two pedestrian crossings, which accounts for the high number of pedestrians crossing in this area. In many areas, people must cross the street through an on-street car park, which makes the illegal crossing more dangerous since pedestrians must consider drivers who are parking as well as the traffic on the busy streets.

The pedestrian problems become especially clear during the Saturday markets when parking in the town centre is limited due to the Market. On Saturdays, most people park in the usually-empty Theatre Street Car Park. The two streets between the town centre and the Theatre Street car park are very narrow with narrow pavements. Throughout the day on Saturday, there is a lot of pedestrian traffic along Cley Road and Theatre Street and many pedestrians are forced to walk in the streets.

Town Centre Recommendations

This section discusses the observations and data that were used to develop an in-depth understanding of Swaffham's town centre. Using the various information sources, interviews, observations and survey responses to triangulate the current problems and observations in the town centre, I was able to develop recommendations for how the town centre can be improved. In general, respondents wanted to remove at least some parking from Swaffham's town centre and many citizens wanted the town centre to include more green elements such as trees and gardens to improve the area's aesthetics.

The first part of this section discusses four specific areas of the town centre: the Pedlar Sign Area, the Corn Hall Area, the Buttercross Area and The Shambles. There are detailed recommendations for redevelopment in three of these specific areas, the Pedlar Sign Area, the Corn Hall Area and the Buttercross Area. These sections begin with a discussion of the area's present state and end with recommendations for change and altered photographs to illustrate how these changes would appear. The fourth area is very different, as I do not recommend any changes in The Shambles.

Specific Area Recommendations

The Pedlar Sign Area

The Pedlar is a fabled Swaffham resident and the sign could be a centrepiece for the town. A sign of the Pedlar (See Image 3) is located in a small triangle at the northwest edge of the town centre. This area is situated along one of the three main roads into town and is the first view of the town centre that people arriving from the north on Lynn Street have of Swaffham town centre. In addition to the Pedlar there is a very small parking lot, with room for at most 20 cars located in this triangle (See Image 2). There are also five large trees that line the edge of the parking lot (See Images 3 and 4). There are not any benches in the area. The taxi stand and the largest bus stop in Swaffham are directly across the street from the entrance to the parking lot, further congesting the area with vehicle traffic. The current condition of the Pedlar Sign Area shows the true dominance of cars in the Swaffham culture. Cars have been crammed into every area possible, even directly around the monument to one of Swaffham's most famous historical residents. Furthermore, as one of the entryways to the town, this area is the town's first impression on visitors coming from the north. If a person's first impression of the town is not good, they will not stop and further explore the town. The town of Swaffham is severely lacking in the acreage of green/open space per person, so any addition will help the town attain the government mandate (Swaffham Town Official, 27 October 2008). Less than ten percent of the visitors surveyed in the Visitor Survey had visited or were planning to visit the Pedlar Sign. With improvements, the area could be a tourist attraction that educates visitors about Swaffham's lengthy history and increase the amount of open space in the town

.

Image 2 Aerial View of the Pedlar's Sign Area (Google Maps)

Images 3 and 4: Photographs of the Pedlar Sign Area (Alison LeFlore)

Recommendations:

- Remove the parking
- Add grass
- Install benches
- Turn the Pedlar Sign into a focal point of the town centre

Removing the parking and putting in a park would improve the first view of the town as well as calm some of the traffic in the area. This area could be transformed into a nice park to improve the first view of Swaffham and to calm some of the area's traffic. The parking should be removed to make room for the park. Benches would make a nice addition to the park and provide people with a place to sit and eat lunch. It would not take many changes to turn this area into a nice park, as there are already several mature trees in the area. Several of the people interviewed for this study mentioned that they did not like the parking and traffic around the Pedlar. The sixth form students were especially opposed to the parking in the Pedlar's Sign Area. Many said it was very ugly, made the town look like a parking lot and that many of them were concerned about being hit by a car in the area (Group Interview, 3 November 2008). Because the park would be surrounded on all sides by busy streets, pedestrian crossings would need to be installed for the park to be well-used. These recommendations are a small way to begin using a green infrastructure approach for planning in Swaffham. Removing pavement and replacing it with grass could be the first step towards a green network throughout the town.

Image 5: Possible View of Redeveloped Pedlar Sign Area (Edited Google Maps)

The Corn Hall Area

Images 6 and 7: The Corn Hall (Alison LeFlore)

The Corn Hall is one of the many historic buildings in the town (see Images 5 and 6). It is currently not in use, but different people within the Town are hoping that the Town will begin using it again (Swaffham Town Official, 31 October 2008). The area around the Corn Hall is where the War Monument is located and one of the places that hosts the Saturday Market (See Images 9 and 10). There are a few very nice, mature trees and a few younger trees. There are several benches in the area, but they could be better arranged. The current arrangement of the benches (further discussed later in this paper) creates some unpleasant views. One bench faces directly into the traffic at the busy intersection of A1065 and Lynn Street. Another bench is located so the view is of the back of another bench and a third bench faces directly into the Lynn Street traffic. The area is pretty large and not particularly busy, except for on Market Days. The road that runs along the left hand side of the Corn Hall is a dead end that serves as handicapped parking and for deliveries to the storefronts there.

Image 8: Aerial View of the Corn Hall Area (Google Maps)

Images 9 and 10: The Corn Hall Area (Alison LeFlore)

Recommendations:

- Plant more trees
- Add floral touches and/or garden near the War Memorial
- Develop a garden or park
- Remove the cement blocking around the War Memorial and replace it with grass or permeable paver
- Rearrange the benches

Many people in town hope that the Town Council will take over the management of the Corn Hall and begin using it again. Since the area already has several trees and benches, adding only a few more trees would have a large impact with only a small investment. Tree-planting has been used in many European cities to improve the cityscape without high-cost redevelopment (Beatley, 200). The War Memorial creates a nice focal point in the area and there are already some flower planters around it. These floral touches could easily be expanded to draw more attention to the War Memorial. Many people, both visitors and residents, who took the town surveys suggested adding flowers, flowerbeds, shrubs and flower boxes to improve the town centre. Residents also asked that there be a garden or park established near the centre of town. This area is also at one of the busiest entrances to the Town centre, so improving its appearance will again improve the first views of Swaffham. As with the Pedlar Sign area, replacing the pavement in the Corn Hall Area with grass or a permeable paver is a small way to begin to implement green infrastructure planning in Swaffham. Using various plants to enhance the area is also supportive of green infrastructure planning techniques because it improves the area's appearance while also increasing the area's biodiversity by including a variety of plants.

Images 11 and 12: Possible View of Redeveloped Corn Hall Area (Edited Google Maps)

The Buttercross Area

The Buttercross is one of the main attractions of Swaffham. It is located at the southernmost tip of the town centre, so it serves as one of the welcoming views of Swaffham. The Buttercross itself is surrounded by a cement block and brick pattern with benches around the Buttercross. There are two trees near the Buttercross. The Buttercross sits directly adjacent to the

largest parking lot in the centre of town. The Assembly Rooms is a newly renovated historic building that hosts many of the town's events. When the town centre was redeveloped a few years ago, the original proposal included removing the parking between the Buttercross and the Assembly Rooms and replacing it with a boulevard of trees and an open area. The shop-owners lobbied against this change and so the parking remained untouched. However, there are many people in the town who would support the removal of at least some of the parking in the town centre, preferring that people be required to park in the Theatre Street lot.

Image 13: Aerial View of the Buttercross Area (Google Maps)

Images 14 and 15: The Buttercross Area (Alison LeFlore)

Recommendations:

- Plant more trees
- Remove (some of) the parking or at least replace the parking surface with grass or permeable paver
- Use natural embellishments in the area: garden/flowerboxes/grass
- Replace the bricks surrounding the Buttercross

The Buttercross area has two mature trees, more trees should be added to provide shade and increase the environmentally friendly atmosphere that residents value (Town Group Survey Report). Furthermore, the large number of parking spaces in the Buttercross area reinforces the feeling that the town centre is vehicle-oriented and that cars dominate the townscape. Ideally, all the parking between the Buttercross and the Assembly Rooms would be removed, however that is very unlikely. Even removing some of the parking and replacing it with grass or a permeable paving. The addition of other vegetation such as gardens, more flower boxes or other plants would dramatically increase the welcoming and thriving town centre that the residents hope to develop (Town Group Survey Report). Even without removing the parking, the brickwork around the Buttercross could be replaced with grass, which would be a smaller change to create a large impact. These recommendations support green infrastructure because they add a public, open space to the town centre. The added grass and other vegetation is helpful for rainwater runoff and will improve the overall appearance of the Buttercross Area. Many people interviewed for this study supported the idea of changing the parking arrangement in the town centre.

Many European cities have used tree-planting as a method of improving their urban areas. Tree-planting has been an especially popular method of improving squares and markets. Some notable examples of tree-planting as a method of urban renewal can be seen in Bologna's Piazza Maggiore, Amsterdam's Nieuwe Market and Dam Square, Copenhagen's Gammeltorv-Nytorv and Amagertov Squares and London's especially famous Trafalgar Square. Other cities, such as Liden in the Netherlands, have managed to maintain the number of parking spaces, but have strategically planted large trees near the parking to conceal much of the parking and dramatically increase the green element in the town (Beatley, 2000).

Since the car park in this area is so large, there are a variety of options for redeveloping the area. With the shortage of open space in Swaffham, the ideal redevelopment project would relocate all the parking to the Theatre Street Car Park and turn the entire area into a public park.

This would free the maximum acreage to be converted to open space to decrease the open space shortage in Swaffham. The first image, Image 16, takes this approach. However, even removing some of the parking would improve the area dramatically. Image 17 shows how the Buttercross Area would look if approximately half of the parking was removed. The least desirable option is illustrated in Image 18, which retains all the current parking but replaces the paving around the Buttercross with grass.

Image 16: Possible View of Redeveloped Buttercross Area 1 (Edited Google Maps)
Removing all the Current Parking

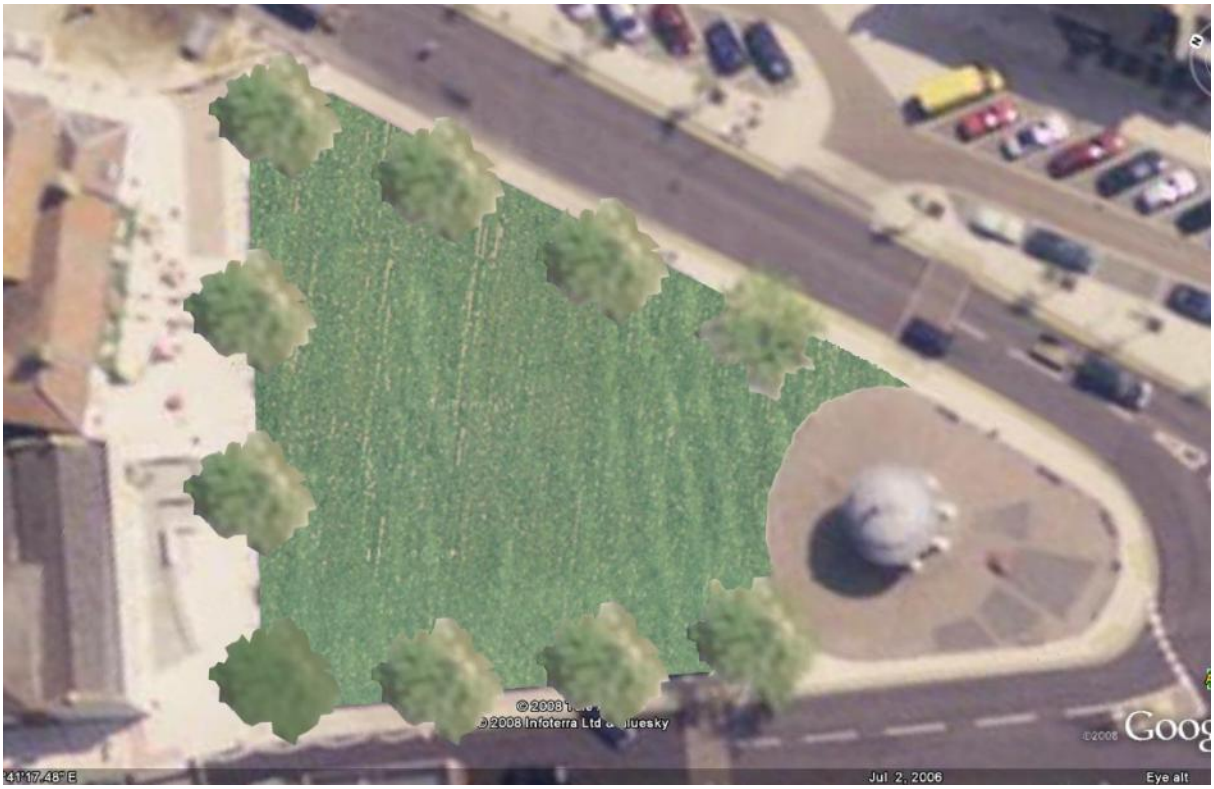


Image 17: Possible View of Redeveloped Buttercross Area 2 (Edited Google Maps) Maintaining More than Half of the Current Parking

Image 18: Possible View of Redeveloped Buttercross Area 3 (Edited Photo) Maintaining All the Current Parking

The Shambles

The Shambles is an area in between and behind storefronts and cafés (see Image 19). It is located in the town centre, but is invisible from the main streets. Many individuals and groups own small parts of the area, which has made it exceedingly difficult for the Town Council to change or regulate the area's use. Members of the community find The Shambles to be an eyesore, but since it is located behind buildings, it is hard to see from the street. Currently, the area is not well cared-for and serves as an unofficial car park. Approximately twenty cars can be parked in The Shambles. Throughout the week and weekend, all of the parking spaces in The Shambles are generally taken. Since there is no official parking in the area, the individual parking spaces are not defined, so the cars are always arranged differently and cars are occasionally parked-in. Since the parked cars are not arranged well, the parking looks very disorganized and can be an eye-sore

Image 19: Aerial View of The Shambles (Google Maps)

Images 20 and 21: The Shambles (Alison LeFlore)

Recommendations:

- Unify ownership
- Create an official car park

Until ownership can be fully determined, it will be impossible to make any changes to The Shambles. Since there are so many owners and the area does not receive regular up-keep, some rubbish has accumulated in The Shambles. Unifying ownership would allow the single owner to care for the area and develop official rules for the use of The Shambles.

The Shambles should be redeveloped into an official car park because it would allow for additional parking in the town centre without adding to the image of the town centre as a car park. Since the area is already being used as a car park, developing The Shambles into an official car park would be a simple project.

General Recommendations

This section discusses the general recommendations for improving the town centre. Some of these recommendations may be similar to those discussed in the previous section, but each of these recommendations is meant to apply across the whole town centre. The xx recommendations are to: reposition or remove benches in the town centre; green the town centre; renovate and promote the historic buildings in the town centre; add pedestrian crossings and clarify pedestrian routes; and to enforce parking regulations and relocate some town centre parking.

Reposition or Remove Benches in the Town Centre

There are 22 benches in the town centre. They are concentrated near the Buttercross and the Corn Hall. Many of the benches are nicely positioned and people sitting on the benches have a nice view of the town. However, there are several benches that are positioned so that people sitting have a nice view of parked cars or even poles. These benches are rarely used. During the research for this study no one was observed using many of the benches in the town centre.

Some of the benches in the town centre need to be removed or relocated. There are many elderly residents in Swaffham who may be more inclined to walk if there were more benches throughout the town and more widely spread in the town centre. One of the interviewees mentioned a lack of benches along the main walking routes to town. As an elderly resident, the interviewee said that they would walk more if there were more places to stop and rest along the way (Town Group Member, 30 October 2008). The 22 existing benches could be spread out in order to provide additional seating areas in the town centre and approach roads. Furthermore, one is hard-pressed to find a rubbish bin in the and there are only a few recycling bins in the town centre. These bins are all in the same location, which is somewhat out of the way. In conjunction with evaluating and relocating benches, the town needs to also consider the available waste receptacles in order for the benches and seating areas to be used to the fullest potential.

Each bench in the town centre ought to be evaluated to ensure that they can be well-used. It is unpleasant to sit on benches that face into fast-moving traffic or parked cars, so these benches ought to be relocated. See the following diagram to find the location of each bench in the town centre. The table following the map illustrates the view that a person would have sitting on each of the benches as well as recommendations for each individual bench.

Image 22: Location of Benches in the Town Centre (Edited Google Maps)

Table 2: View(s) from Each Bench in the Town Centre

Bench Location	View(s) from Bench	Recommendations
1	 	This bench is located near the Buttercross and is one of several benches in the town centre that has no back, so people can sit facing either way. When facing outwards to the traffic, the view is not pleasant, as the view is of the traffic going by on London Street. Facing inwards, the view is much more pleasant and is of the Buttercross and the flower basket near the Buttercross; however, one can see beyond the Buttercross to the parking across the street. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area but is located appropriately so users can look at the Buttercross.
2	 	This bench is located near the Buttercross area and is the second of several benches in the town centre that has no back, so people can sit facing either way. When facing outwards to the traffic, the view is of the traffic circle on London Street and the A1065 by on London Street. Facing inwards, the view of the Buttercross and the flower baskets is much more pleasant. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area but is located appropriately so users can look at the Buttercross.

3	 	This bench is also located near the Buttercross area and is one of several benches in the town centre that has no back, so people can sit facing either way. When facing outwards to the traffic, the view is of the traffic going by on the A1065 and the parking outside the Greyhound Inn. Facing inwards, the view is of the Buttercross, the flowers basket near the Buttercross and the historic facades across London Street. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area but is located appropriately so users can look at the Buttercross. It is perhaps the most appropriately placed bench in the Buttercross area because of the pleasant view from it.
4	 	This bench is located in the Buttercross area and is another of the backless benches, so users can sit facing either direction. Again, facing outwards provides a view of the traffic on the A1065 and the parking across the street, but facing inwards shows a sliver of the Buttercross, the flower baskets and the historic facades across London Street. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area but is located appropriately so users can look at the beautiful, historic buildings across the street. It is perhaps the most appropriately placed bench in the Buttercross area because of the pleasant view from it.

5	 	This bench is the middle bench on the eastern side of the Buttercross area. It is another of the backless benches, so users can sit facing either direction. Again, facing outwards provides a view of the traffic on the A1065 and the parking across the street, but facing inwards provides a close-up view of the Buttercross. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area. It is perhaps one of the benches in the Buttercross area that ought to be moved because neither view is particularly pleasant. The view outward is of traffic and parking and the view inwards is overwhelmed by the base of the Buttercross.
6	 	This bench is on the northernmost side of the Buttercross area and is located adjacent to the Buttercross/Assembly Rooms Car Park. It is another of the backless benches, so users can sit facing either direction. Facing outwards, a user sees the cars parked in the car park and inward, the view is again dominated by the base of the Buttercross. However, this view is less dominated and the historic facades across the street area again visible. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area. It is perhaps one of the benches in the Buttercross area that ought to be moved because neither view is particularly pleasant; however the inward view is more pleasant than that of Bench 5.

7	 	This bench is on the northernmost side of the Buttercross area and is located adjacent to the Buttercross/Assembly Rooms Car Park. It is to the west of Bench 7 and is another of the backless benches, so users can sit facing either direction. Facing outwards, a user sees the cars parked in the car park and inward, the view is again dominated by the base of the Buttercross. This bench is located in the cluster of benches around the Buttercross, so it is in a saturated area. It is perhaps one of the benches in the Buttercross area that ought to be moved because neither view is particularly pleasant; however the inward view is more pleasant than that of Bench 5 but not as pleasant as Bench 6.
8		This bench is located on the western side of London Street, across from the Buttercross. This is the first of the benches with backs, so users can only sit facing one direction. The bench is located 2 or 3 feet from the on-street parking. The view from this bench is better when there is not a car parked in the parking spot immediately in front of the bench. This bench is the most bizarrely placed bench. It should be relocated to another location.

9		This bench is located on the eastern side of London Street/A1065 at the southernmost edge of the town centre. It has a decent view of the historic buildings on the other side of London Street, but the view is sometimes obscured by traffic. The bench is appropriately located, although it could be in a nicer place.
10		This bench is located on the eastern side of London Street/A1065 at the southernmost edge of the town centre with Bench 9. It has a decent view of the historic buildings on the other side of London Street, but the view is sometimes obscured by the traffic in the roundabout. The bench is appropriately located, although it could be in a nicer place.
11		This bench is located on the north-western edge of the Market Place, outside of the Cool Cabs office. The view is of the parking in the Pedlar's Triangle, but the large trees in the area are a focal point. Since the bench is located near the bus stop and taxi stand, the view is sometimes obscured by buses and vehicles. It is probably the most widely-used bench in town, people use it while waiting for taxies or buses. When/if this area is transformed into a park, this bench will have a very nice view. This bench was purchased and installed by the Cool Cabs company, so the Town Council has no jurisdiction over it.

12		This bench is located on the northern side of Lynn Street. The view is of parking. This bench should be relocated due to the poor view and its proximity to Bench 13, which has a much nicer view.
13		This bench is located to the west of Bench 12 on the northern side of Lynn Street. People use this bench while waiting for the buses in the other direction to Norwich and other points east and north. This bench has a good view of the pedestrians walking by and the historic buildings along Lynn Street. This bench is more appropriately placed than Bench 12, even though it is in the same area. This bench is in a better location because it provides a nice waiting place for the bus, has a decent view and can provide a good place for people watching.
14		This is the western-most bench located on the southern side of Lynn Street near the Corn Hall. For some reason, this bench is located facing out, so the view is of the traffic on Lynn Street and the light pole. While not the most inappropriately place bench in the town centre, it should be turned around or could be moved to another location in town. There are five other benches in close proximity to this bench and this one has one of the least pleasing views.

15		This bench is the second bench located on the southern side of Lynn Street. However, it faces inward toward the Corn Hall. It has a pleasing view with the large tree, traditional red telephone booth, the Corn Hall and the War Memorial. This bench should not be relocated because it provides a nice view of the Market Place.
16		This bench is on the north-east corner of the Market Place and faces directly into the junction of Lynn Street and the A1065. While the George Hotel is a beautiful building and can be seen in the centre of the photograph, the traffic dominates the view from this bench. This bench should at least be turned around so the view is of the War Memorial. This bench could also be relocated to a different place in town.
17		This bench is one of three benches that are around the War Memorial. This bench provides a nice view of the back of the bench on the corner. Especially when/if the area is converted into a small park or garden area, this bench will have a nice view of the greenery in the area.

18		This is the second of three benches that are placed around the War Memorial. This bench faces northward and has a view of Lynn Street. Again, when/if the Corn Hall area is converted into a park or garden, this bench will provide a nice view of the park.
19		This is the third bench located around the War Memorial. This bench is located on the western side of the memorial. The view is of the handicapped parking and loading lane. However, as with Benches 17 and 18, there will be a nice view when/if the area is converted into a park or garden.
20		This bench is located immediately to the south of the Corn Hall. It is situated with Benches 21 and 22. Similar to Bench 19, the view from Bench 20 is of the handicapped parking and loading lane. This small area has the potential to be a nice area, but the street and tourist signs are in the area, so the view from each bench provides a nice view of the sign posts.

21		This bench is located immediately to the south of the Corn Hall. It is situated between Benches 20 and 22. This bench is in line with the sign posts, so the view is heavily dominated by the posts. The view beyond the sign posts is pretty good, looking south towards the Buttercross. Even with the signposts, the Buttercross can be seen beyond the sign posts. This small area has the potential to be a nice area, but the street and tourist signs are in the area, so the view from each bench provides a nice view of the sign posts and not much more.
22		This bench is located immediately to the south of the Corn Hall. It is situated with Benches 20 and 21. Of the three benches, this provides the nicest view. The full sign post is visible with the flower baskets and Woolworths beyond. If these benches were to be relocated, I would keep Bench 22 in place and move Benches 20 and 21, since the view from these benches is not as nice as from this bench.

Green the Town Centre

Previous sections have discussed the benefits of adding greenery to the town centre. This is an important change to the town centre that many people have recommended and supported. The town centre currently is dominated by traffic, parking and paving. Throughout Town Group Survey Report, respondents commented on the lack of vegetation in the town centre. In many ways, the town centre appears to be a large street with parking. The number of cars in the town centre is often overwhelming and dominates the townscape. Adding flowers, shrubs, trees or other types of vegetation to the town centre could easily diminish the visual impact that cars have

on the overall appearance of the town centre. In the Town Group Survey, 66 people said that the 'provision and improved management of open spaces' is an important environmental aspect of the town that requires improvement. Furthermore, on the open response section, several people mentioned the need for more greenery in the town centre (Town Group Survey Report, 2008). Even a few additional trees or flowers can vastly improve the townscape.

The town centre already has several flower baskets located in various locations. Adding flowers, shrubs, trees or other types of vegetation to the town centre could easily diminish the visual impact that cars have on the overall appearance of the town centre. Flower baskets are an easy and inexpensive way to increase the greenery in the town centre. Several respondents to the Town Group Survey suggested developing a small public garden or park in the town centre, flower boxes and vegetation could serve a s a first step towards that end (Town Group Survey Report, 2008).

There are many different ways that the town centre can be greened. Some methods would require renovations and redevelopment in the town centre, but there are many ways to increase the green without adding much expense or causing too much disruption. Two residents are very interested in developing a 'Swaffham in Bloom' program to improve the town centre and approach roads. This idea is based off the yearly Anglia in Bloom competition where individuals or groups can nominate their street or another street for outstanding gardens (Town Group Member, 30 October 2008).

Many other European cities have undertaken significant projects to green their city or town centres. Den Haag has used tree-planting as a method of traffic control and city-greening. Trees are planted along streets or even a few feet into the street to improve the look of the town (Beatley, 2000). Improving the greenery in the town centre can have several positive impacts on the community. Neighbourhoods with tree-lined streets tend to be safer areas and people living in areas with greenery are more relaxed and happy individuals (Benedict and McMahon, 2006).

Renovate and Promote the Historic Buildings in the Town Centre

Swaffham is an old Market Town. Swaffham has been a year-round settlement since Saxon times and was granted its market charter in 1215. Since then, Swaffham's market has been operated continuously (Swaffham Town Council, 2008). Due to Swaffham's long history, the vast majority of buildings in the town centre are listed on the historic building register. The

darkened buildings on the map to the left are the historic buildings that have been registered with the central government.

Image 23: Historic Buildings in the Town Centre (Darkened Buildings are Listed) (Breckland District Council)

Swaffham's historic townscape is one of the town's characteristics that residents value the most. In fact, 121 respondents to the Town Group Survey listed the Central Townscape including the Market Place, Assembly Rooms, Georgian (historic) Buildings and Buttercross as their favourite feature in the town's environment (Town Group Survey Report, 2008).

As Swaffham moves into the future, it would be beneficial for the town if the historic buildings could be framed as a tourist attraction and well-cared for. Many Swaffham residents do not recognize the value that the historic buildings offer and take the buildings for granted (Town Group Member, 30 October 2008). By taking better care of the historic buildings and promoting them, Swaffham could improve its townscape and create another reason for people to visit Swaffham.

Many European cities are facing the same questions and problems with their historic buildings. There are a lot of historic buildings in disrepair and the question becomes whether they should be saved or demolished. Many European cities have been making a conscious effort to protect and rejuvenate their historic buildings. Others have even, as many Swaffham residents hope to do, turned their historic buildings into an attraction for visitors and history aficionados. Vienna, Austria developed a method of gentle urban renewal. This approach emphasizes the importance of rejuvenating historic districts without demolishing buildings or displacing residents (Beatley, 2000).

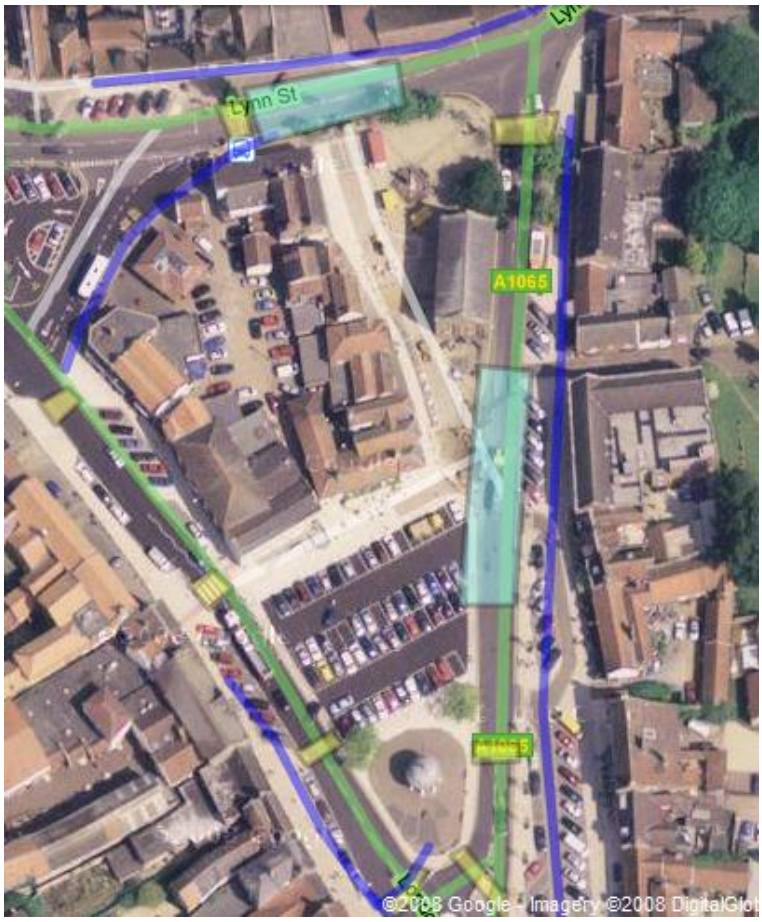
Add Pedestrian Crossings

There are many pedestrian crossings along the western side of the Market Place and town centre, but only a few along the north and eastern sides. Many people cross Lynn Street and A1065, but do not have a pedestrian crossing to use. Along the northern side of the town centre, there is only one pedestrian crossing which is located to the west near the Cool Cabs office. There are two pedestrian crossings on the eastern side of the town centre, one at each end. However, many people cross between these two crossings since the Market and car park are located in the middle of the town centre.

Additionally, several respondents mentioned in the open response section of the Town Group Survey that the town centre road layout gives drivers priority over pedestrians (Town Group Survey Report, 2008). Adding additional pedestrian crossings is a way to make the town centre more pedestrian-friendly.

Image 24: Pedestrian Crossings in the Town Centre (Edited Google Maps)

(Yellow indicates sidewalk, light blue rectangles indicate the areas that need pedestrian crossings)



At least one pedestrian crossing should be added on the A1065 and that one pedestrian crossing should be added on Lynn Street because so many people cross between the pedestrian crossings. The pedestrian crossing on Lynn Street ought to be added near the Post Office between the end of the fence and where the on-street parking begins. Along the A1065, this study recommends that at least one pedestrian crossing be added near the southern side of the Corn Hall. People often cross there since the biggest store in the town centre, Woolworths, and several of the other popular shops and cafes are located directly across the A1065 from the Corn

Hall. Additionally, this location is the northern edge of the car park, so there are always many people walking to and from their cars. In addition to my observations, many people mentioned the need for additional crossings in this location on the A1065 in their responses to the open ended questions on the Town Group Survey (Town Group Survey Report, 2008). There may be need for a second new pedestrian crossing, but in order to determine the need and location of such a pedestrian crossing, further study on pedestrian traffic should be undertaken.

Clarify Pedestrian Routes

The pedestrian route along the A1065 in front of the stores in the town centre needs to be clarified. There is quasi off-street parking along the storefronts and there is appear to be two separate pavements for pedestrians. It appears that nobody, even life-long Swaffham residents, are quite sure where to drive and where to walk. In addition to noting that the town centre layout prioritizes cars over pedestrians, several people mentioned the fact the pavement layout along the A1065 is very confusing in their responses to the Town Group Survey (Town Group Survey Report, 2008).

Images 25-28 show two different areas of the A1065 sidewalk. In both pairs of pictures (Images 25-26 and 27-28), the split pedestrian pavement is visible. There is a walkway between the buildings and the driveway (See Image 25) or the buildings and the parking (See Image 27). After the driveway (See Image 25), there is a row of parking followed by another pedestrian walkway (Image 26). The area shown in Images 27 and 28 is more complex because, from the buildings out toward the street, there is the walkway followed by parking, a driveway and then another row of parking (See Images 27 and 28). The second row of parking is bordered on the other side by another walkway (Image 28).

Images 25 and 26: View of the Pedestrian Pavement, Driveway and Parking Along the A1065 (Alison LeFlore)

Images 27 and 28: Another Area of the Pedestrian Pavement, Parking, Driveway, Parking and Pedestrian Pavement along the A1065 (Alison LeFlore)


Many people commented on the strange arrangement of pedestrian vehicle routes along the A1065. For example on the open response section of the Town Group Survey, one person wrote "I find the area of the Market Place from Starling's Greengrocers to The Greyhound a problem. There is no clear separation of cars and pedestrians which makes walking with children rather stressful. Also as a driver I find people often treat the car parking access as a pathway, assuming they have right of way. This stretch of road also has no suitable crossing place from the centre of the Market Place. The designated crossings lead to parking areas and are not the places where people would naturally choose to cross" (Town Group Survey Report, p. 23, 2008).

There are different types of pavement used in different areas of the town centre, however the traffic pattern remains confusing. As part of an effort to improve the look, feel and

functionality of their city centre, the city of Groningen in the Neatherlands, has used brightly colored bricks to indicate pedestrian pathways (Beatley, 2000). While the addition of brightly-colored paving may not be the best way to highlight pedestrian areas in Swaffham's historic town centre, the same principle could be used, but with a more historic appearance.

Many people who visit Swaffham stay for only a few hours (Swaffham Visitor Survey Report). During my discussions with various people within Swaffham, people continually mentioned their hope that Swaffham could become more of a tourist attraction as opposed to being somewhere people stop by for a few hours. Clarifying the pedestrian routes is not the only way to improve Swaffham's tourist status, but it is an improvement. While not necessarily the most important factor in how long tourists stay in an area, studies have shown that if a visitor is comfortable moving around in an unfamiliar area, they will want to spend more time in the area (Beatley, 2000).

Enforce Parking Regulations and Relocate Town Centre Parking

Parking is one of the hot topics in Swaffham's town centre. There is a large group of residents who believe that the town centre will die if there is not parking available right in the centre of town. However, there seems to be an equally large group of residents who would like to see some, if not all, of the parking removed from the town centre. As mentioned before, Swaffham's town centre appears to be a car park and many residents feel that the town centre layout caters to vehicles and hinders pedestrians (Town Group Survey Report, 2008). There are approximately 180 parking spaces in the town center. The Theatre Street Car Park is located less than five minutes walk from the town centre and has approximately 295 parking spaces. The divisiveness of this topic can be seen in the variety of comments respondents made on the open response section of the Town Group Survey. Comments ranged from simply "more parking" to "more parking outside of [the] town centre with clear and easy access to the town centre" and "on street parking banned" (Town Group Survey Report, p. 27, 2008).

The fact that Swaffham does not have a traffic warden exacerbates the parking parking problems in the town centre. All of the parking in the town centre is two-hour limit, but people routinely ignore this regulation because it is not enforced. Many respondents to the Town Group Survey mentioned the lack of parking enforcement as a major problem. Eleven of 27 comments

on the open response section about parking mentioned either the need for better enforcement, more regulation or both (Town Group Survey Report, 2008).

This study found that it would be beneficial for Swaffham to remove at least some of the parking from the town centre and enforce the current parking regulations. It would be futile to increase the parking restrictions in the town centre, as some respondents suggested, without developing the necessary means by which to enforce the regulations. As such, this study suggests starting by enforcing the current regulations and then re-evaluating the situation to determine if stricter regulations are necessary. Furthermore, removing some of the parking in the town centre would reduce the congestion of cars in the immediate town centre area as well as improve the townscape. The most cars I ever counted in the town centre itself (including cars parked in The Shambles and those illegally parked) totaled 178. This is 24 fewer cars than there were empty spots in the Theatre Street Car Park at that time. Even if only the on-street parking were removed, the town centre would appear less congested and the townscape would be less dominated by vehicles. I believe that the most important place to remove parking from is the area around the Pedlar Sign. Removing at least some of the parking from the Market Place square, between the Assembly Rooms and Buttercross, is also important to give Swaffham's town centre a more rural feel.

Every city in the world is facing parking problems, most cities have more cars in their central areas than there is room for the cars. Some cities have developed extensive pedestrian-only centres or enacted high car taxes to control the vehicle traffic through their city and town centres. In the Netherlands, there is a planning theory called woonerf, living or shared streets. The streets are designed to control traffic flow and enable pedestrians, bicycles and motorists to share the roads. A very interesting aspect of woonerf is that they maintain on-street parking, but it is strategically located in a way that enables it to blend into the pedestrian space when the parking spaces are empty. In addition to 'disappearing parking', many cities have used trees to calm traffic. For example, in Den Haag, trees have been planted a few feet into the street or between parking spaces to serve as traffic-calming devices and minimize the visual impact that parking has on the townscape (Beatley, 2000). If developed correctly in Swaffham, many of the parking spaces could be maintained but not be obtrusive as they are now.

As an aside, the pedestrian route from the Theatre Street Car Park to the town centre itself will need to be renovated if more people will be walking back and forth along it. Cley Road

has very narrow pavements, two people cannot walk abreast. During Saturday markets when there is not as much parking available in the town centre and people are forced to park in the theatre street car park, the route between the car park and the town centre becomes incredibly congested. If the parking were permanently removed from the town centre, this route would always be congested and would need renovation.

Local Development Framework Recommendations

Breckland, Swaffham's District Authority, is in the process of developing the Local Development Framework (LDF) for the district. The LDF dictates development in Breckland for the next ten years. This section discusses specific recommendations for where development should occur and general recommendations for the best location for different uses. These recommendations are based on observation and the practice of green infrastructure planning.

The LDF map has been included in its entirety and in pieces so that each site is visible. The full map is very large, so some of the smaller sites cannot be identified. The full map includes inset boxes so users know which smaller-scale map should be referred to for each specific plot.

Image 29: Swaffham Full LDF Map (Breckland District Council)

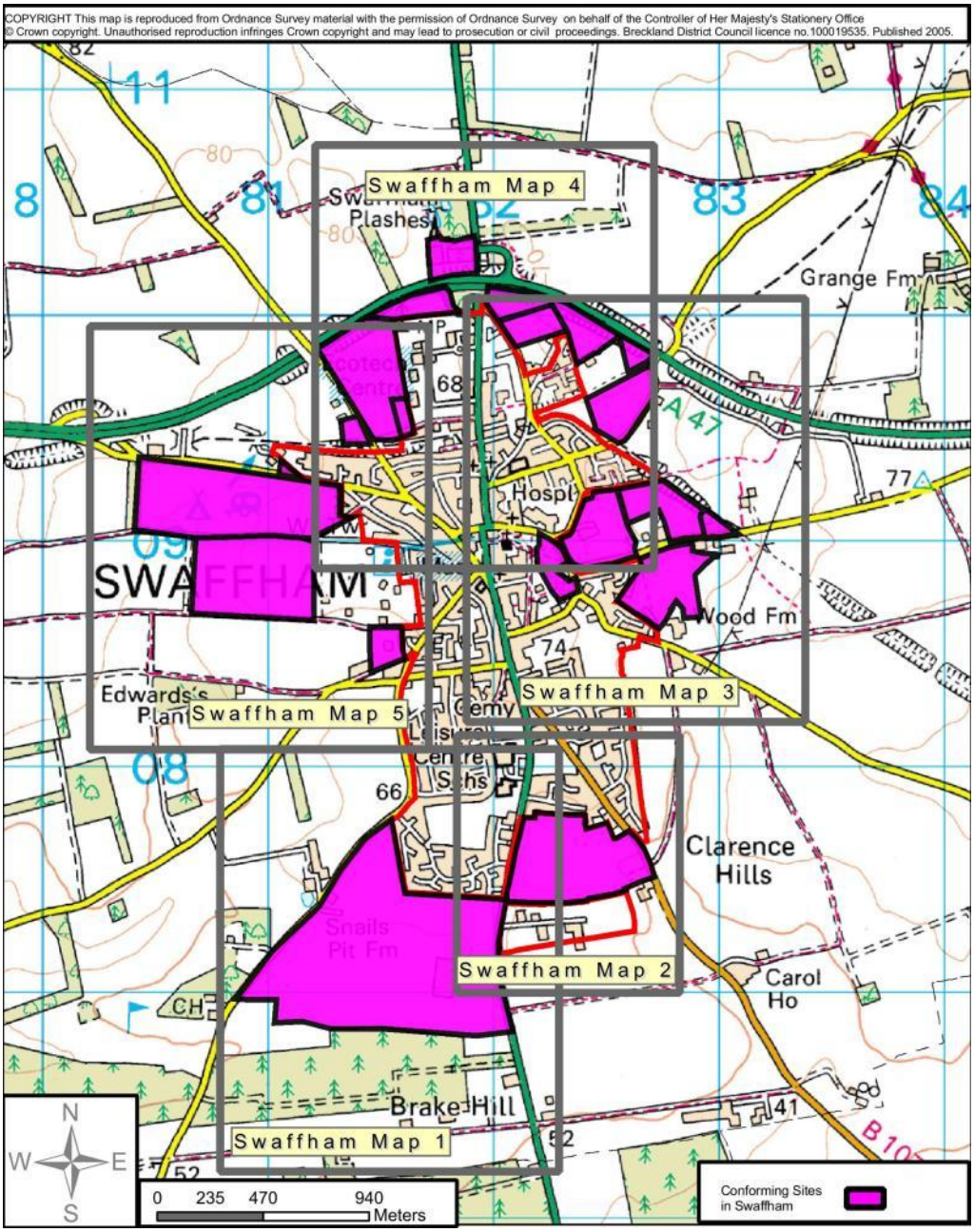


Image 30: Swaffham LDF Map 1 (Breckland District Council)

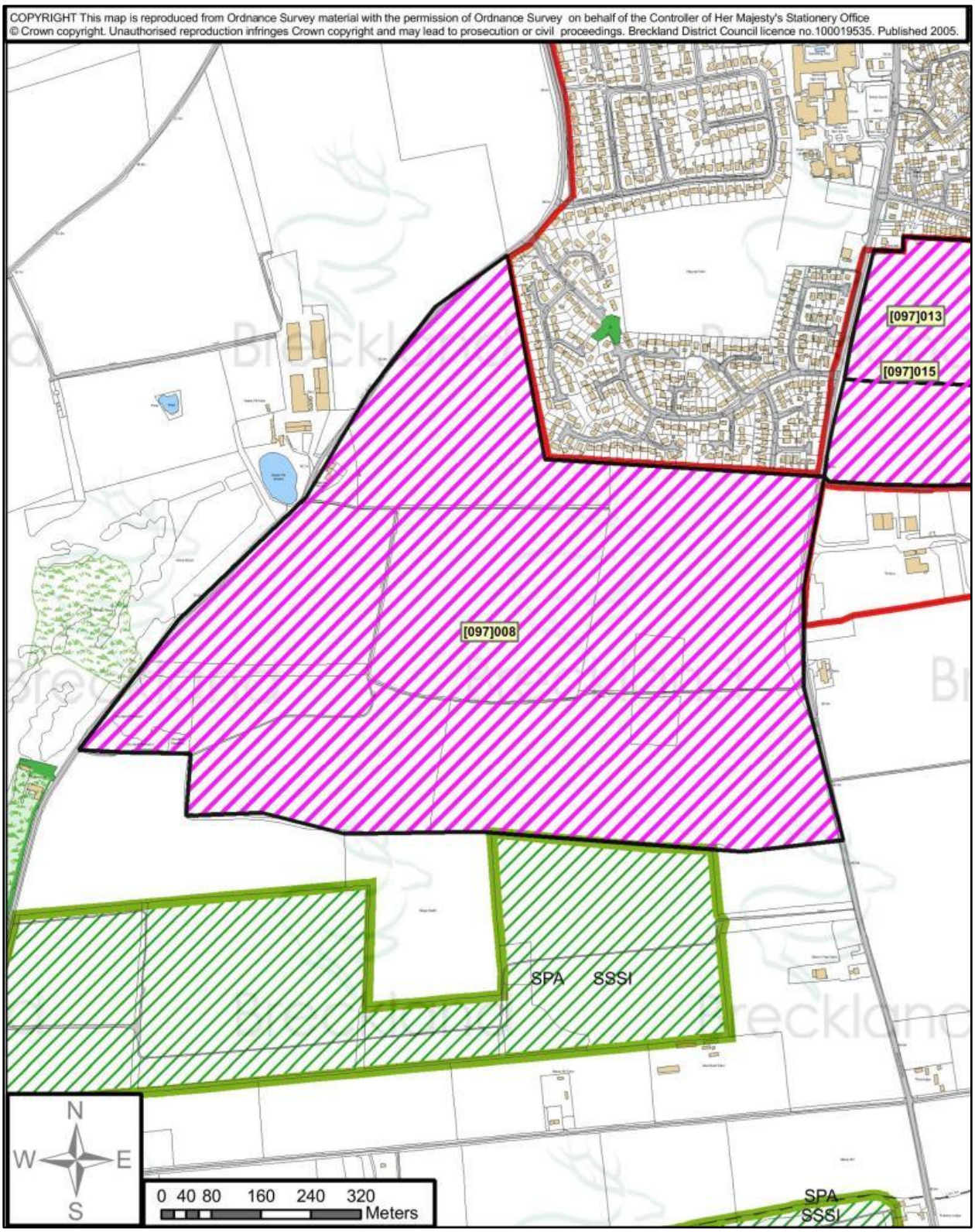


Image 31: Swaffham LDF Map 2 (Breckland District Council)

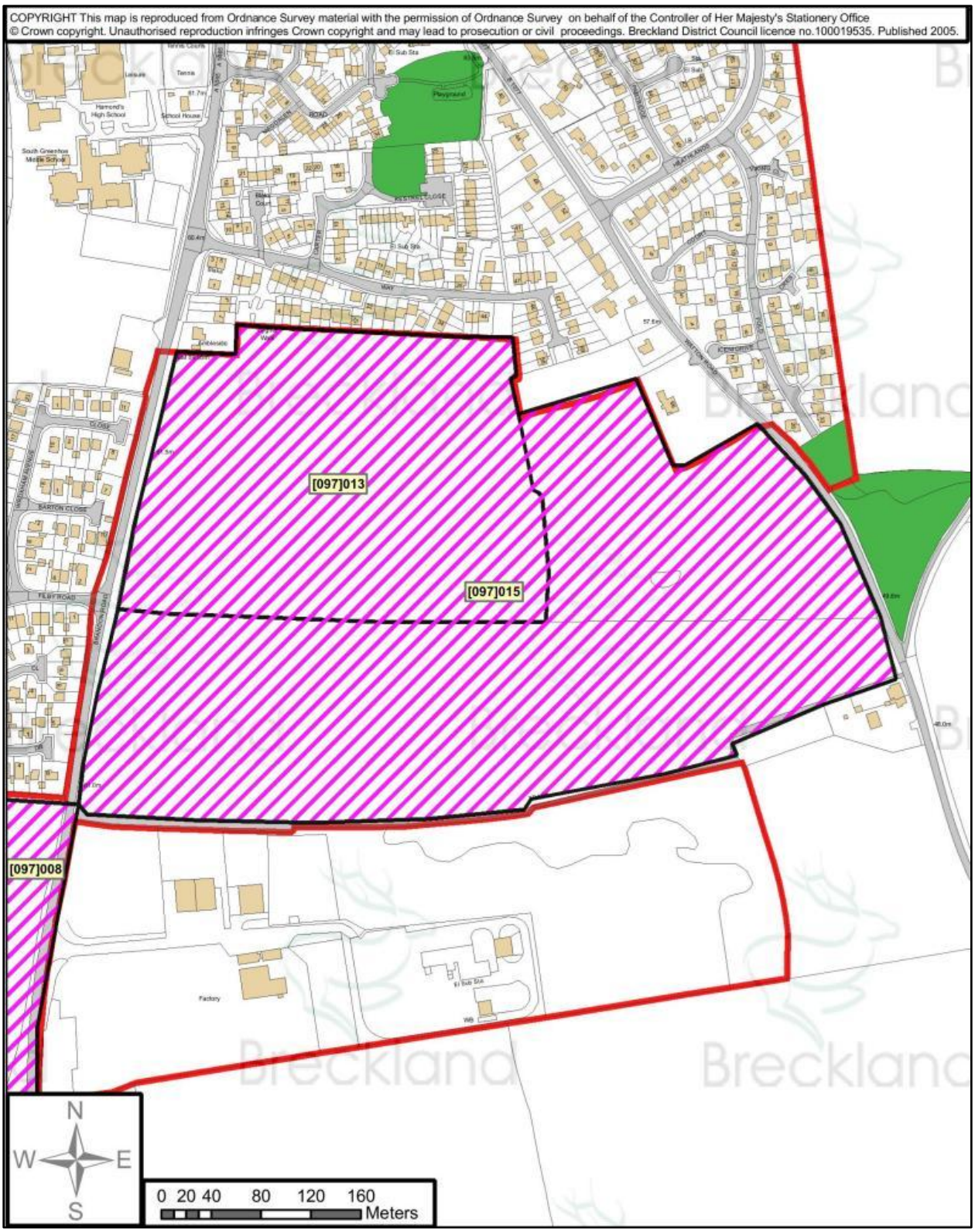


Image 32: Swaffham LDF Map 3 (Breckland District Council)

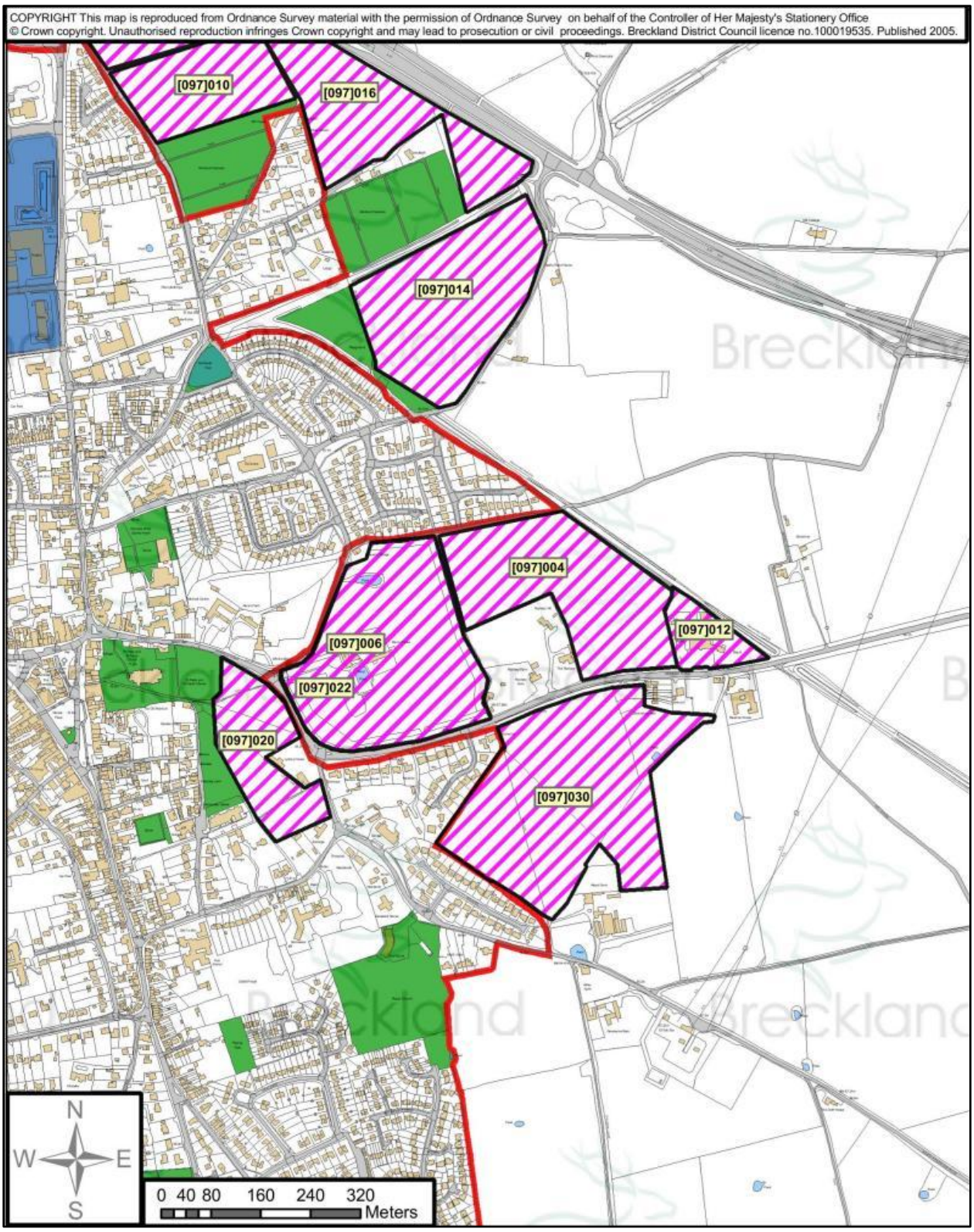


Image 33: Swaffham LDF Map 4 (Breckland District Council)

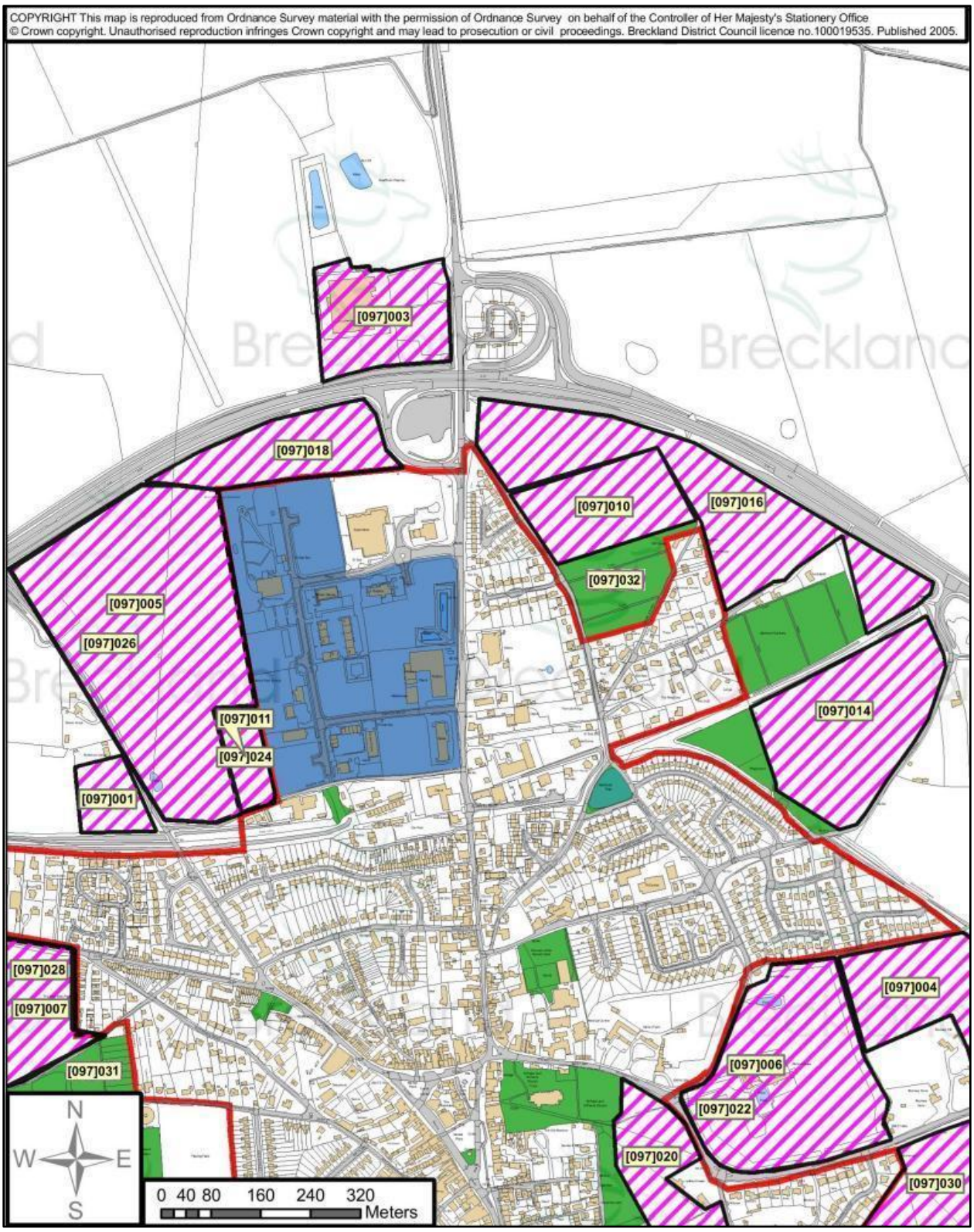
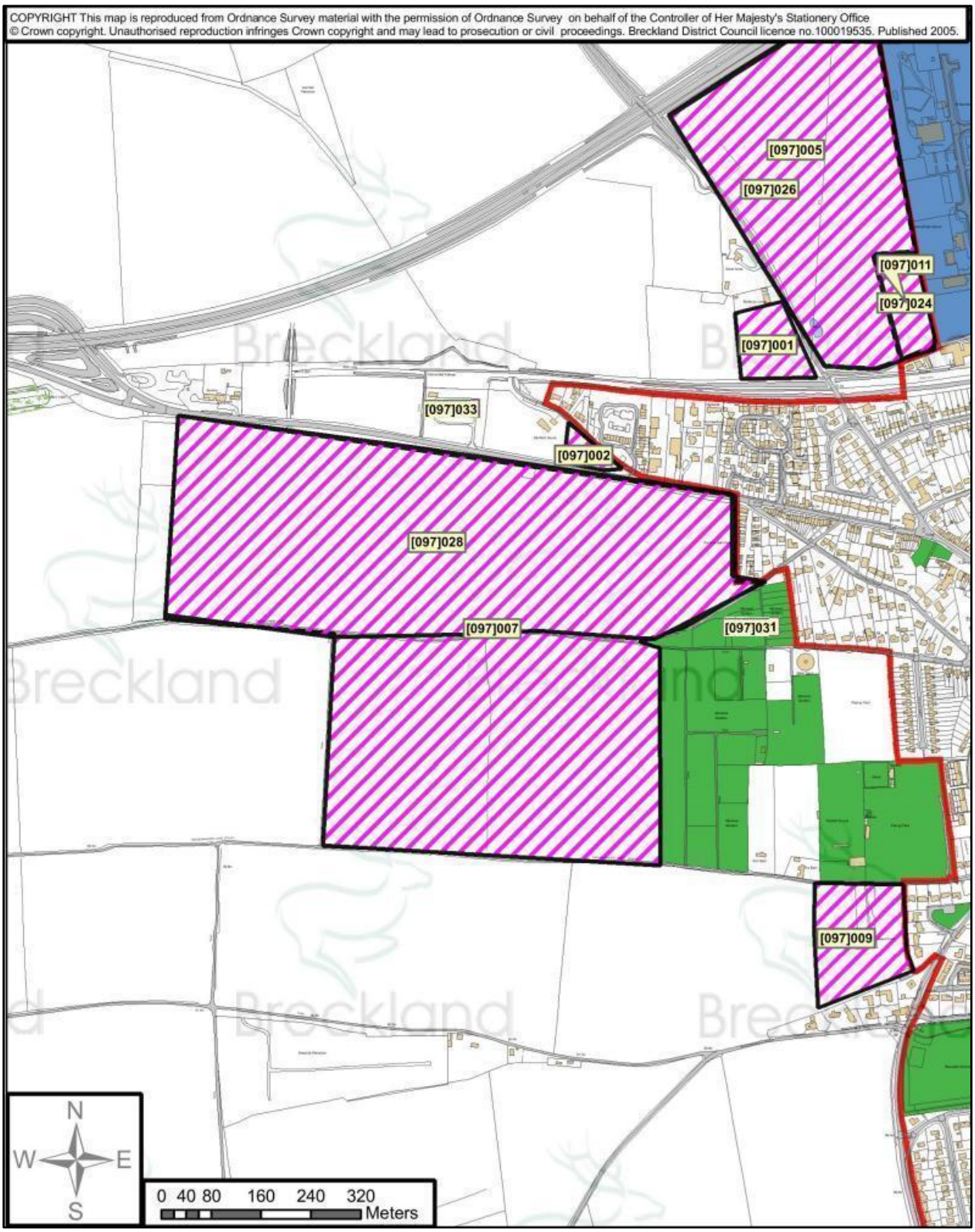


Image 34: Swaffham LDF Map 5 (Breckland District Council)



A 400 house development has already been approved for the land south of LDF sites [097]013 and [097]015 (see Image 31). Some of this land ought to be maintained as open space,

but since there will be development south of the two sites, those two sites should be developed as well. Developing sites [097]013 and [097]015 in conjunction with the site to the south would mean that there would be continuous development linking these areas with the present development closer to the town centre. As Swaffham is low on public, open space, it is very important that every area that is developed in the coming years has areas that are designated as public, open spaces.

The town is in dire need of a swimming pool (Town Group Survey Report, 2008). The town has purchased part of LDF site [097]018 for the swimming pool (see Image 33). This lot is adjacent to the EcoTech Centre. Since the area has already been designated for the swimming pool, there should be other recreation areas developed in the same location.

LDF site [097]020 is perfect for the development of a centrally-located park (see Image 32). The plot is already very beautiful and has a boulevard of mature maple trees. The plot is adjacent to the Campinglands, which is another open area in town. The Community Centre is located near the property line that separates these two plots. The Community Centre's proximity to LDF site [097]020 is another reason that the area should be developed into a public park.

LDF site [097]012 and [097]003 have been considered for industrial development (see Images 32 and 33, respectively). Site [097]003 is already in use and is very close to other locations that have been developed (Image 33). However, the location is a bit distant from town, so if it were to be developed into a hotel, visitors would have to walk a ways into town. It is located on Station Street, which is a very busy street. If site [097]003 is developed into a hotel, an alternative route into town would need to be developed or many patrons would not walk to town, they would take their cars. Many Swaffham residents, when going to the Waitrose or EcoTech, which are both located to the south of site [097]003, many Swaffham residents drive (EcoTech Official, 4 November 2008). Developing a hotel further from the town centre, without any provision for additional walking pathways, would greatly increase the number of people driving to and from the town centre. While site [097]012 is close to the large petrol station and McDonald's, unless there is development on sites [097]022, [097]006, [097] 004 or [097]030, there will be a long stretch of road that is void of any development between the town and whatever industrial/employment development that occurs on site [097]012 (See Image 32).

LDF site [097]009 is a logical place for development (see Image 34). It is a small plot located near the football and rugby clubs (shown in green on Image 34) and is surrounded on

three sides by current development. The access road to [097]009 would need to be improved to handle more residential development in the area, but its location is very good for development.

In general, it is important to consider the surrounding areas when determining which areas should be developed. It is not a sound planning decision to situate new development far from current development. There should not be areas without development along a street and then all of a sudden a large housing development.

Additionally, every area that is developed as a result of the LDF needs to include area for open space and recreation. Swaffham currently has only fourteen open, recreation areas in Swaffham. Several of these are private clubs, so not all are open to the public. The Town Group Survey indicated that Swaffham residents are not satisfied with the open spaces currently available in Swaffham (Town Group Survey Report, 2008).

To use a green infrastructure approach to the LDF development process, each site should be examined for its environmental benefit. Additionally, factors such as the plot's biodiversity and habitats should be considered; several Habitat and Species Action Plans specific to Norfolk County and the brecks have been developed. These plans should be consulted before the final LDF is developed. Norfolk County Council and non-profit organizations have been working to develop an ecological network in Norfolk County. The development of a ecological network is very similar in principle to the creation of a green infrastructure network. In fact, these factors are all items that green infrastructure planning considers and values.

There are a large variety of Habitat Action Plans that are applicable to Norfolk County. These action plans can be found on the Norfolk County Council's Biodiversity webpage. While not all of these apply to the various LDF sites in Swaffham, some of them certainly do. The following habitats are protected by Habitat Action Plans and may be applicable in Swaffham: ancient and/or species-rich hedgerows, cereal field margins, littoral and sublittoral chalk, lowland calcareous grassland, lowland heathland and dry acid grassland, lowland meadow and pastures, lowland mixed deciduous woodland, lowland wood-pasture and parkland and traditional orchards.

Summary and Suggestions for Further Research

My project has helped Swaffham in the process of developing their town plan and helped to prepare the Town Council for the next round of consultations about the Local Development Framework possible development sites. I spent the first half of the semester studying green infrastructure planning and researching the planning policies and guidelines in the United Kingdom to prepare for my trip to Swaffham. While in Swaffham, I learned about the key concerns in the area as well as how the town's residents hope Swaffham will develop in the coming years.

Swaffham is currently facing several major problems economically, socially and environmentally. There are a lot of people who retire to Swaffham, so the average age in Swaffham has been steadily increasing. However, due to the lack of well-paid jobs and jobs with possibility for advancement, most people who grow up in Swaffham are often forced to leave the town in order to find good work. This exodus is fuelled by the lack of affordable housing in Swaffham, which is also contributing to the influx of wealthy retirees. As with many rural areas, maintaining open space within the town's centre has not been a priority, so the town has fewer acres of open space than recommended by the Central Government. In 2007, Swaffham began the process of developing a town plan to help counteract these problems and so that the townspeople could have a larger impact on the town's future.

The recommendations included in this report discuss projects to improve Swaffham's town centre and where development should occur. The town centre recommendations focus on three main areas of the town centre. The areas around the Pedlar's Sign, Corn Hall and Buttercross all could use substantial changes to improve the initial view of Swaffham for incoming visitors as well as to increase the green elements in the town centre. Currently, the only green in the town centre comes from a handful of mature trees, many younger trees and a few flower boxes located near the Buttercross and Corn Hall. The few green features in the town centre could be dramatically increased without major changes in the town centre. However, the report also includes more dramatic recommendations such as removing parking from the Pedlar Sign Area and Buttercross Area to improve the townscape in the town centre. The town centre is overrun with parking and cars, so the area could be dramatically improved by removing at least some of the parking in the town centre.

There are about thirty sites that may be opened for development in the final Local Development Plan, which should be published by summer 2009. The Town Council wants to ensure that it is prepared for the next series of consultations, which will occur sometime in the mid-spring 2009. These sites have been proposed for various types of development by their owners who want to sell the land and make money from its development. Planning regulations in England require the government to approve the area for development before any developers can put in permit requests or plan projects on the land. As part of my work to make recommendations about which areas should be opened for development and which ought to be left as open space, I spoke extensively with the town's clerk and visited each of the sites.

I used principles of green infrastructure to guide my recommendations about redevelopment in the town centre and possible development on the LDF sites. Green infrastructure values both development and environmental conservation. It is a new theory in planning that falls into the category of smart growth. Green infrastructure is an advanced type of smart growth because it gives particular value to the various benefits and services that nature provides. However, it also values planned development that pays attention to nature's services and thus allows nature and development to co-exist. Furthermore, since green infrastructure considers such a wide variety of factors, green infrastructure planning allows the area to reap a variety of benefits. These benefits are most commonly categorized into three categories: ecological benefits, health benefits and economic benefits. Using green infrastructure to guide planning and redevelopment in Swaffham will allow the town to address the many concerns and problems that it is currently facing.

This report is by no means an exhaustive explanation of green infrastructure practices or their applicability in current planning processes. It is however, a base on which the town of Swaffham as well as other cities and towns alike can use to build their green infrastructure plans. There are many resources available for readers to use to learn more about green infrastructure. Since green infrastructure is a new theory, there are not too many people writing about green infrastructure itself; however, the theories behind green infrastructure are not new, so there is a lot of information available about various parts of green infrastructure planning. Also, many people are writing about green infrastructure but calling it something else. Green urbanism is a common phrase that is sometimes green infrastructure in disguise.

Mark Benedict and Edward McMahon have done a lot of academic writing about green infrastructure. They are the two main authors of works focused specifically on green infrastructure development as we have defined it throughout this paper. Timothy Beatly wrote a relevant book called Green Urbanism, which discusses many parts of green infrastructure planning and is an excellent resource for case study examples. In addition to general academic writing on the topic, there is a wealth of information available from the cities and towns that have already developed green infrastructure plans. In Swaffham's area, both Thetford and Dereham have completed green infrastructure plans. Throughout Europe and the United States, there are many different cities and towns of varying sizes that have developed green infrastructure plans and have even begun their implementation.

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Appendix A: Green Infrastructure Plan Evaluation Rubrics

Reproduced from: McDonald, L., Allen, W., Benedict, M., & O'Connor, K. (2005). Green Infrastructure Plan Evaluation Frameworks. *Journal of Conservation Planning , 1* (1), 6-25.

R = Regional Plan
L = Local Plan
* indicates a required criteria that every plan must include

Regional/Local Plan Element 1: Goal Setting

1.1	Plan Foundations	Possible Points	Applicable Plan
1.1.1	Were the plan parameters identified geographically, temporally and/or other?	1	R,L
1.1.2	Were the planning area's comprehensive "green infrastructure" components and threats to those components documented?	3	R,L
1.1.3	Did the plan call for coordination with adjacent areas regarding efforts that extended beyond jurisdictional boundaries?	3	R,L
1.1.4	Was the plan based on an integrated landscape analysis that focused on the protection of functional landscape components?	5*	R,L
1.1.5	Were federal, state, county or local planning mandates or policy recommendations addressed and incorporated into the plan?	1	R,L
1.1.6	Was the plan supported by a legislative body or executive office by means of a formal resolution?	1	R,L
1.1.7	Did the plan incorporate results from a statewide or regional green infrastructure plan?	3*	L
1.1.8	Was the plan led by a vision, formal plan goals, and strategies for guiding plan development?	5*	R,L
1.2	**Stakeholder Involvement**		
1.2.1	Did a leadership forum or advisory committee provide leadership and generate momentum for the planning effort?	5*	R,L
1.2.2	Did the leadership forum/advisory committee include a diversity of professional disciplines and represent multiple sectors?	3	R,L
1.2.3	Did the plan include documentation of a stakeholder analysis to identify stakeholders included within the plan parameters?	1	R,L
1.2.4	Did the planning process include an "adequate" public engagement process that provided stakeholders with ample opportunities to weigh in on plan development?	3	R,L
1.2.5	Were county and local governments engaged in plan development?	1	R,L
1.2.6	Were county and local governments engaged in plan development?	1	R,L
1.2.7	Were area non-governmental organizations, land trusts or other conservation organizations engaged in plan development?	1	R,L
1.3	**Conservation Vision**		
1.3.1	Was the plan development led by goal(s) to protect ecological processes and functions?	5*	R,L

1.3.2	Did the plan include goal(s) for working land protection (i.e. farming, forestry, ranching)?	3	R,L
1.3.3	Did the plan include goal(s) for hazard mitigation?	3	R,L
1.3.4	Did the plan include goal(s) for watershed protection?	3	R,L
1.3.5	Did the plan include goal(s) for open space and its associated human benefits (i.e. passive recreation, aesthetic quality)?	3	R,L
1.3.6	Did the plan include goal(s) for the preservation of cultural and historic resources?	1	R,L
1.3.7	Did the plan include goal(s) for eco-tourism and other economic development activities that utilize conservation lands?	1	R,L
1.3.8	Did the plan include goal(s) for growth management?	1	R,L
1.3.9	Did the plan include other conservation-related goals?	1	R,L

Regional/Local Plan Element 2: Analysis

2.1	**Network Design Criteria**	**Possible Points**	**Applicable Plan**
2.1.1	Did the plan include a comprehensive assessment of landscapes and landscape features within plan parameters? (e.g. biological, hydrological, geological, human-dominated)	3	R,L
2.1.2	Were spatially explicit data sets that contain attribute information for landscape features, gathered and compiled?	3	R,L
2.1.3	Did data sets include information for human-dominated landscape features (agriculture, development, etc.), as well as natural landscape features?	1	R,L
2.1.4	Were baseline maps prepared to identify individual green infrastructure components (i.e. forestlands, working lands, wildlife habitat, parklands, etc.)	1	R,L
2.1.5	Did network design criteria for hubs and corridors incorporate ecological thresholds and other conservation parameters? (ex. minimum dynamic areas, size of migration corridors, natural disturbance regimes, edge effects, important riparian zones, etc.)	5*	R,L
2.1.6	Were corridors identified using least-cost path analysis or a similar methodology?	3	R,L
2.1.7	Were network design criteria documented?	1	R,L
2.1.8	Were ecologists and other natural areas specialists involved in producing the network design criteria and weighting systems?	3	R,L
2.1.9	Were network design criteria based on current biological and ecological theories and best practices? (i.e.hubs/corridors, contiguous lands, connectivity, etc.)	5*	
2.1.10	Do the network design criteria incorporate all of the plan's goals?	3	
2.2	**Network Suitability Analysis**		
2.2.1	Was a suitability analysis or similar land suitability method (that incorporated the network design criteria) utilized to calculate and classify the range of conservation values for the study area?	5*	R,L
2.2.2	Were conservation values assessed for a range of spatial scales,	1	R,L

	including smaller parcel-level analysis?		
2.2.3	Did the final network design (i.e. results from suitability analysis) result in an ecologically connected framework?	5*	R,L
2.2.4	Did the network design incorporate a diversity of land uses (i.e. working lands, open space, parklands, habitat)?	5*	R,L
2.2.5	Are specific hubs and corridors delineated in the plan?	3	R,L
2.2.6	If a regional plan was developed, were new target hubs and corridors revealed at the local-scale analysis?	1	L
2.2.7	Were gaps in the network (both in hubs and corridors) identified?	5*	R,L
2.2.8	Did the plan include a clear and coherent graphic representation of the final network design?	5*	R,L
2.2.9	Was the suitability analysis model (or similar model) replicable?	1	R,L

Regional/Local Plan Element 3: Synthesis

3.1	**Network Design Model Enhancements**	**Possible Points**	**Applicable Plan**
3.1.1	Was feedback from a stakeholder assessment of the network design incorporated into the model?	1	R,L
3.1.2	Was an ecological "ground-truthing" assessment of the network design incorporated into the model?	3	R,L
3.1.3	Were risk and vulnerability factors (i.e. risk for development or fragmentation) for network segments assessed and incorporated into the model?	3	R,L
3.1.4	Was the protection status of green infrastructure network lands identified and incorporated into the model?	5*	R,L
3.1.5	If it is not feasible to connect hubs using the corridors identified in the original network design, are alternative corridors identified?	3	L
3.2	**Identifying Priorities**		
3.2.1	Were the systems for prioritizing and ranking hubs and corridors based on the results of the suitability analysis, vulnerability factors and status of land protection?	5*	R,L
3.2.2	Were hubs and corridors ranked within each different type of landscape?	1	R,L
3.2.3	Were hubs and corridors ranked at a course, regional scale?	1	R
3.2.4	Were hubs and corridors ranked at a finer, local scale?	1	R,L
3.2.5	Was a system for prioritizing restoration and enhancement opportunities developed?	3	R,L
3.2.6	Were specific priorities identified in this plan?	5*	R,L
3.2.7	Were ranking systems combined to create a comprehensive system for ranking lands within the green infrastructure network?	3	R,L
3.3	**Relationship to Plan Goals**		
3.3.1	Were the final conservation priorities evaluated against the original design criteria?	1	R,L
3.3.2	Did the final conservation priorities meet plan goals?	1	R,L
3.3.3	Does the local plan integrate the network design into a larger, regional network design?	3	L

Regional/Local Plan Element 4: Implementation

4.1	Decision-Support Tool	Possible Points	Applicable Plan
4.1.1	Did the plan include a decision-support tool (i.e. mechanism for quantitatively ranking conservation opportunities based on the network design and other important factors)?	5*	R,L
4.1.2	Does the decision-support tool allow for the incorporation of new data as it becomes available?	3	R,L
4.1.3	Can the decision-support tool help guide local and site-level implementation efforts?	5*	R,L
4.1.4	Was the methodology for developing the decision-support tool documented?	1	R,L
4.2	**Implementation Tools**		
4.2.1	Does the plan identify available mechanisms and tools for land protection (i.e. acquisition, easement, TDR, other)?	5*	R,L
4.2.2	Does the plan assess the feasibility and effectiveness of utilizing available tools for land protection?	1	R,L
4.2.3	Does the plan recommend new conservation tools?	1	R,L
4.2.4	Were implementation tools matched with sites based on their ability to handle the threats that were identified in those areas?	3	R,L
4.2.5	Did the plan provide useful and effective ways to integrate the green infrastructure network implementation efforts into county/city regulation, planning, capital improvement programs and/or development review procedures?	1	L
4.2.6	Did the plan call for specific “small area plans” or similar small-scale plans to guide the conservation of target areas?	1	L
4.3	**Conservation Funding**		
4.3.1	Does the plan identify federal, state, local and/or private conservation funding opportunities?	5*	R,L
4.3.2	Did the plan document strategies for leveraging existing funding sources to generate new sources?	1	R,L
4.3.3	Does the plan document the need for a recurring or revolving funding source?	1	R,L
4.4	**Conservation Strategies**		
4.4.1	Was information pertaining to related environmental protection, natural resource conservation, green space planning and other similar efforts assessed in terms of implementation opportunities?	3	R,L
4.4.2	Does the plan outline specific implementation strategies for state and regional agencies?	5*	R
4.4.3	Does the plan outline specific implementation strategies for county, local governments and private landowners?	3	R,L
4.4.4	Does the plan identify relative priorities for implementation strategies?	3	R,L
4.4.5	Does the combination of all identified implementation strategies encompass a diversity of land uses?	5*	R,L
4.4.6	Are implementation strategies spatially matched to create an “implementation quilt” across the network?	3	R,L

4.4.7	Was a coordinating body or task force established to oversee and coordinate implementation efforts?	1	R,L
4.4.8	Does the plan identify necessary stewardship and management activities to restore, monitor and maintain green infrastructure network resources over time?	3	R,L
4.4.9	Does the plan outline a marketing and public outreach strategy to garner further support for plan goals?	1	R,L
4.5	**Defining Development Opportunities**		
4.5.1	Did the plan discuss opportunities for development within the context of the green infrastructure network?	1	R,L
4.5.2	Did the plan identify a range of land uses to buffer priority protection areas from current to future development?	1	R,L
4.5.3	Did the plan recommend the use of conservation development or limited development for developing lands within the context of the green infrastructure network?	1	R,L
4.5.4	Were implementation strategies coordinated with state or local growth management efforts?	3	R,L