Eco-towns: Learning from International Experience

Appendix - Case Studies

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Introduction

We selected six places for our study that are widely considered as exemplary:

Adamstown near Dublin, Ireland, a private initiative in a rural area (and therefore the most similar to many of the proposed Eco-towns);

Amersfoort, a small historic city in The Netherlands, with its three new suburbs: Nieuwland, Vathorst and Kattenbroek;

Freiburg, Germany, with its two new urban extensions: Vauban and Rieselfeld;

HafenCity in Hamburg, Germany, the redevelopment of a port area close to the city centre;

Kronsberg in Hanover, Germany, designed as part of the Expo 2000 international exhibition;

Hammarby Sjöstad, an urban extension of Stockholm, Sweden, and once promoted as the site for an Olympics bid.

Each of these is large in scale, some city centre and more urban, others peripheral and suburban, and innovative in environmental terms. Each has reached a sufficient stage of completion to be able to assess success in terms of being substantial new places, which are popular with their residents, and where infrastructure is keeping pace with development. They are not unique, and we could have included several other examples members of our team have visited, such as Bo1 in the former shipyards of Malmö in Sweden and Kirchsteigfeld, an extension of Potsdam, Germany.

Case Study Adamstown, Dublin, Ireland

DUBLIN

Adamstown, Dublin, Ireland



Introduction

Adamstown will be the first New Town created in Ireland since 1982. Located 16km from Dublin city centre on a 214 hectare site, this new settlement will provide much needed housing for people working in and around Dublin. It is built on a Greenfield site on agricultural land outside Lucan village and lies between the heavily used N4 east-west trunk road and the main Dublin to Kildare railway line. By 2016, it is anticipated that Adamstown will provide 10,000 homes for 30,000 people.

The land is held by three private developers which pooled resource to set up a joint venture (JV) development company Chartridge. Initial community objections to development have been overcome through extensive consultations. Although Adamstown's development is private sector led, the local authority has played a significant role in nurturing its development, moulding and influencing its masterplan and detailed design.

Putting infrastructure in place early has been a priority, with a new railway station opened in April 2007 – this has been seen as key to raising values and densities. Three small primary schools have been built in a new complex and a secondary school is also on site, while less than 600 homes are occupied and less than 1,000 in development.

Assessment

Look and feel

Adamstown repeats the original Georgian experience of expanding cites and towns onto ex-farmland maintaining the urban grammar of building heights roughly equal to the distance between them. A visit to Adamstown is still a visit to a large building site - with only about 6% of the 10,000 homes built and occupied there are still more site hoardings than there are streets. However, the masterplan decisively slices the development into 11 self-contained neighbourhood districts, each with a different identity and the developers make sure that each phase in each neighbourhood is completed including the public realm before residents move. This helps occupants in each phase to avoid the worst impressions of living in a building site.

The first completed neighbourhood, Adamstown Castle, is also the access from the R120 and the nearest to the rest of Lucan village. It uses the formal concept of principal boulevards of 4 storey buildings with continuous frontages, then with housing at 3 and 2 storeys in the secondary streets behind. This is simple to read, easy to navigate and comfortingly familiar.

Adamstown Castle's architecture also blends the best of Georgian with a contemporary twist, using strong regular patterns of fenestration but Adamstown is a new town promoted by private developers. A vibrant central area is planned with a range of civic buildings and mixed use updating external elements such as porticos to glass and steel. Key areas of public realm are finished and in the secondary streets there are new parks and local play areas already in use, supported by the established landscaping in rear parking courts.

Dublin had very little new flatted development until the late 1990s and flats are still considered to be unsuitable except in extremis for families. The developer has balanced higher coverage rates with this cultural antipathy to apartment living with a series of maisonette arrangements. These are most obvious on the boulevards where the 2 storeys at ground floor level have private outdoor space to the rear and the 2 storeys above have a terrace to the street. It helps give the scheme the necessary height for the urban design of the masterplan without resorting to too many flats.

Success factors

Many who know the history and individuals behind Adamstown privately credit the Chartridge (JV) directors for their vision and conviction that sales rates are a function of a wider environment. Chartridge has paid for nearly all the infrastructure, notably the €6.2m railway station, but there have been some concessions too. For example, the Lucan to Dublin railway line is being upgraded to four tracks and all developers in the Lucan corridor have to make contributions to this, but not Chartridge. Upfront investment in civil engineering must be a burden on balance sheets, and there must be doubts as to whether the same arrangements would be so easy to emulate in the current climate of reduced expectations.

Planning inducements to the developers must have helped. Chief among these was the creation of Ireland's first Strategic Development Zone (SDZ) which was drawn up to streamline risk in the planning process. Elected members have reduced rights compared with those in the English planning system to influence detailed permissions, which local authority officers decide on. But under Irish planning law, an individual or company has the right to appeal a detailed planning decision made on behalf of another applicant. This has led to abuse by companies with rival interests to slow the progress of a potential competitor, or by individuals seeking to slow change to their locality. So the key concession in the use of the SDZ was to immunise land held within the lands designed as Adamstown from third-party appeal. Once the masterplan was approved in September 2003, the developers have known they were no longer vulnerable to objections.

Second, there is a binding legal agreement drawn up for delivery of the infrastructure and the method of its design and implementation.



South Dublin County Council, the development agency, put four staff into a project delivery team for Adamstown and this team met with a committee of local elected members, representatives from statutory undertakings and the developers to agree on a timeframe for the delivery of infrastructure. This was a collaborative process with the developers able to negotiate when key non-residential elements should be delivered. In return the local authority was able to drive its own bargains, such as the demand that the fast railway link to Dublin's Houston station be up and running at the beginning of the development – and not when half the new residents would have to unlearn driving to work.



There is a schedule showing the progress for the number of units, typically stepped in 500s or neighbourhoods, and the amenity that must be delivered alongside. The agreed plan of development was published and is monitored by the four staff who visit typically three times a week to check.

So a railway station, bus link, new roads, crèche, primary and secondary schools, district centre, play areas and public parks are all itemised within this schedule of development, each element staged to coincide with the number of homes released for occupation. This is a public document which is online and available from Dublin County. Each year the Adamtown's team publish an annual report showing progress against this schedule and a website shows live updates, such as new planning applications, approvals, starts on site Leafy neighbourhoods with well defined street frontage

Located on the edge of Dublin, it boasts a new railway station delivered early on and completions and occupancies. A quarterly newsletter informs residents and stakeholders of progress on applications and construction.

It is possible, for example, to look at this schedule as a potential resident and understand that the new park will open before unit 500 is built and occupied. The local authority, with its building control and development control powers, has the threat of enforcement action to stop the homes being occupied by withholding sign off. However, this has so far proved only a threat as the developing company actually accelerated delivery of some amenity from later phases into the first. This has been put down to a mix of knowing that they would have to pay for it later anyway – at possibly increased prices - balanced against the benefit of having the amenity in place early to support or raise the value of sales and the rate of sale.

For example, schools have been brought forward so the developer can sell homes on the basis new residents will get access to these new schools. Access to primary and secondary schools in the Dublin area is increasingly fraught so this would have been a driver for some purchasers. Likewise the new railway station linking the scheme to Dublin was opened by Ireland's Taoiseach Bertie Ahern in April 2007 ahead of schedule and phase 1 of the new district centre around the railway station was given planning in July 2008, earlier than anticipated.

Difficulties

This is a market-dependent structure. If the sales rates are good, a development company should be able to finance the infrastructure. If sales rates are weak, reduced cashflow ought to put pressure on the mechanism. The Irish housing market had risen to some 90,000 starts a year in 2006 and then fell back sharply in 2007. On paper, a collapse in sales rates should impact on the cashflow at Adamstown, but 2007 was marked by project milestones, including the opening of threr primary schools within the complex of new school buildings ahead of delivery - less than 500 units had been occupied on 31 December. 2008 is potentially a worse year for sales but work has started on site on the delivery of the secondary school and the application for the district centre's first phase has been brought forward.

There is a feeling that in the short term the developers are willing to suffer the cashflow pain in order to enhance the unique appeal of Adamstown, with its guarantee of parks, school and transport, in order to sustain sales rates and values. Adamstown is known to be taking sales from other outlets because of this mix. There is evidence that Adamstown sales rates remain healthy while other sites struggle. Purchasers are able to see that the amenity they need such as schools are in place, while other competing developments could shelve such key features.

This is also a sizeable programme of 10,000 units so to allow the development's reputation to be damaged in the early years would risk the 90% of the development to follow (where the real money will be earned).

There is an additional question unrelated to the current market: handover of large areas of property for occupation all at the same time in order to avoid people living in a building site. Most of these homes are houses, and although linked in continuous frontages, it appears counter-intuitive to cashflow models to complete on so many all at one time. It means a lot of money is locked up in build. One surprise of a visit to Adamstown is to see runs of completed houses, maisonettes and flats unoccupied while the public realm is polished.

Questions aside, the scheme's method of guaranteeing that amenity is delivered in tandem with new homes remains a beacon of good practice in the Dublin area and one of the least troubled by the market downturn. It is also a significant enough lesson for the UK to have attracted interest from the Royal Town Planning Institute, English Partnerships and most recently the Homes and Communities Agency.



Community

Social context

- In 1997, projections for the Dublin Metropolitan area indicated a need to rezone further land for housing. Housing demand was outstripping supply.
- The site offered the prospect of a new settlement, equivalent in size to a small new town. Over 10,000 homes have now been proposed for the whole development.
- The prevailing view of estate agents has been that the land at Adamstown is lower the further you go from the N4 main road, with the least attractive values close to the railway land. Until this time, all residential development had addressed the arterial roads into the city and ignored the railway.

The first schools were built with the first housing. For every 500 dwellings a schedule of amenities is due to be completed

CASE STUDY Adamstown, Dublin, Ireland



Objectives

- The objective was to increase the housing supply available to residents of Dublin.
- A mixed use development was proposed. The non-residential uses included shopping, employment, community and leisure facilities.
- Carbon reduction was not part of the original concept.

Housing mix

- 10,000 new dwellings for 25,000 people have been envisaged.
- 12.5% social housing, the minimum allowed under statute.

Facilities

- Three large public parks have been designated.
- There will be three primary schools and one secondary school.
- A multi-denominational place of worship will be provided.
- A series of community buildings will be provided throughout the development with a civic building in the heart of the town centre. Health clinics, police stations and fire stations will be provided.
- A feature is the early provision of the community infrastructure. The first houses were completed in Feb 2006 and the railway station was opened in 2007. Two primary schools are already open and construction of the town centre will commence in 2008, comprising over 40 shops, a multiplex cinema, crèche, health centre, offices, employment, bars, restaurants, library and community centre.
- Provision of infrastructure, amenities and services are kept in balance with the number of competed dwellings through a sequential rather than time based approach.

Community engagement

- Extensive local consultation identified key requirements of local people. The Council distributed 11,000 pamphlets asking the public views on a range of subjects.
- Issues such as the environment, transport, roads layout and public transport received the most attention. Quality supervised open space was seen as important as well as playing pitches, a leisure centre, health and childcare facilities. Schools were at the top of the list. High quality streets and housing were wanted.



Parks and play areas are provided in each neighbourhood



- Future residents want to be able to have local friends, good local shopping, something for kids to do, to work and have recreation facilities in their community.
- Initially, there was local opposition to further development in the area. However the good relationship between the Local Authority, the Developer Groups and Public Representations, and the huge demand for housing and the promise of a new model for sustainable higher density housing, convinced the council executive to support the project.

Connectivity

Wider context

- The site comprises 214 hectares of agricultural land at the edge of Dublin's western suburbs and is enclosed by the N4 Lucan bypass, the railway line from Dublin to Galway and agricultural land. In 1997, when the scheme was mooted, the local roads were stressed and there was no railways station.
- Dublin provided employment opportunities if access could be provided.

External connections

 Poor connectivity indicates low values, particularly if the development is predicated on repeating existing planning approaches, comprising of densities of 6/8 dwellings per hectare and monotonous architecture.

- Existing infrastructure has generally been at capacity.
- As a response to these challenges, Adamstown has been designed as a railbased community taking inspiration from 'The Transit Metropolis, a Global Enquiry' by Robert Cervero. The concept has completely changed the focus of the development.
- The vision includes a new station centrally located on the southern edge, double tracking of the rail line to provide a dedicated suburban service, a dedicated bus priority link between the station and the N4, with a park and ride facility.

Internal connections

- A hierarchy of roads is proposed that are permeable and accessible. There are three categories - Principle access through roads, Secondary access through roads and local roads.
- There are three principle access through roads 9m wide, providing routes across the development. These roads differ from traditional distributor roads in that building frontages will be allowed and roundabouts discouraged.
- Secondary roads interconnect with principle access roads and provide second level vehicular access.
- A varying hierarchy of local streets differ in width between 4.5 and 7m, which form the core plan area with frontage development, street parking and traffic calming.
- Pedestrian and cycling routing will be provided throughout, which is safe, permeable and supervised.
- All dwellings will be within walking distance of a bus or train.
- Permeability and connectivity is encouraged.

Dealing with the car

• Cars do not dominate the public realm and underground parking is provided in the central area.



 Traffic modelling has provided design guidance to avoid congestion, rat running and to ensure permeability and easy traffic flow.

Climate Change

Key targets

- This development was conceived before the Irish Government responded to the climate change agenda through the building permit system. In general, Adamstown has been designed to the statutory and building regulations that were operative at the time.
- Castlethorn, the developers of the central area, has adopted a progressive approach to energy conservation for their development.
- In the centre, buildings will be designed to make an energy saving of 40% over normal standards. Overall CO₂ reduction is estimated to be 1,750 tons per annum.

Methods

- A community heating system will use 30% of its fuel from renewable sources.
- Carbon reductions will be achieved through design and specification.

Construction

• The use of low carbon concrete by Castlethorn Construction will save 7,300 tons of carbon. Generally the structure of homes is concrete, sometimes prefabricated panels, partly in response to the need to build long runs of linked properties at speed.

Collaboration and Process

Vision and leadership

- The visionaries are the three developers who own virtually all of the land. They collaborated on a joint submission to the County Council.
- Success has been based on the good faith and ability of the three parties to deal with issues of equity, apportionment of cost, phasing, delivery etc.

Special structures

 A Special Development Zone (SDZ) designation was made in June 2001. South Dublin County Council became the Development Agency for Adamstown for the SDZ. A steering group of South Dublin Senior Directors, Developer representatives and Design team representatives was set up to augment the South Dublin County Council Project Team and Developer Teams. A variety of parking solutions are employed

The Steering Group ensured that government departments, agencies and public transport representatives were involved in the delivery of the planning scheme.

• A JV infrastructure company has been created by the three major land owners. The architects regard this as the single most important decision affecting the delivery of the project.

Planning process

- In 1998, the land was still zoned for agriculture and in the intervening period up till final adoption of the plans in September 2003, there were many changes in legislation and attitudes that had to be taken into account as the proposals evolved.
- The planning authorities adopted a structured process of approval taking 5 years. The land was rezoned for housing in 1998, a Local Area Plan was approved in April 2001 and a draft planning scheme was approved in December 2002. Final approval was given in September 2003.
- The design commenced with the preparation of a Local Plan by the South Dublin County Council.
- The Local Area Plan has been a collaborative effort. OMP Architects coordinated the developer's urban design teams through an ongoing series of design team workshops and working meetings with South Dublin County Council's Project Team, a process that continues in variable formats today.
- As part of the Plan development, the developers employed specialist consultants for landscape, civil engineering and infrastructure planning who worked closely with their counterparts in the Council.

Delivery

- The multiplicity of issues and variety of stakeholders have been at the root of the long timetable. However, at each stage in the process, there has been greater design clarity, greater certainty for the public and the developers and their design team.
- The three key groups were the Local Authorities, the Developers and the public.
- Subsequent to rezoning, the Local Authority has set up a dedicated team, with high level leadership, to prepare an Area Action Plan and to liaise with the developers. The architects see this as another critical step in realising a successful outcome.
- The key people that guided the project included a senior project manager and senior urban design architect from the council, a

champion from the developers and a lead architect from the developer's side.

- Reference was made to international examples of urban extensions and New Towns. The concept of a high density development based around a railway connection was taken from the writings of Robert Cervero Professor of City and Regional Planning at the University of California, Berkley, who was also asked to advise on the project.
- The design team met fortnightly and the steering group monthly. Local councillors were updated regularly at local area meetings and specialist groups met twice weekly. An environmental impact study was also undertaken.
- The following studies were prepared; an integrated transport and land use framework plan, a services framework plan, an urban design public realm framework, an economic/PPP framework plan, a landscape framework plan, a retail/commercial framework plan and a community framework plan.
- More importantly, from the architect's view, the planning scheme proposed a phasing and implementation policy. The phasing schedule is sequential rather than time specific and is based on the premise that the number of dwellings permitted in each phase is dependant on a predetermined amount of works to provide infrastructure, amenities and services having been completed in each phase.
- 13 sequential phases were anticipated.
- The first phase sold out.

Character and context

The development is set on largely flat farmland containing few trees or landscape features.

Aerial View



It is bounded on two sides by low density housing estates and separated from both by the R120 and N4 main east west national route. As earlier schemes make no attempt to address the R120 so the early phase of Adamstown likewise ignores it. The access to the Adamstown Castle area suggests you are arriving at a discrete location.

The Kildare to Dublin railway line runs along one side of the scheme and its presence originally discouraged development but will be the stating point for the scheme's ability to function as a satellite town of Dublin, but with its own sub-regional district centre. The district centre (€1.2 billion) is planned as a major counterpoint to central Dublin and the first phase received planning in July 2008. At present little of this more intensive development around the railway station can be seen, other than the ground works in preparation for build.

The masterplan highlights how the development plans to function as a self-contained town of 25,000 people in 10,000 homes divided among 11 neighbourhood areas The ambitious plan for the €1.2 billion district centre proposes that people use the bus, road and rail links to visit Adamstown to shop, as an alternative to Dublin.

Masterplan

- There are 11 development neighbourhoods and 4 amenity areas.
- A landscape strategy is integral to the plan and provides for open space and linear parks. (See section on landscape.)
- There is central area with highest housing density and a significant amount of mixed uses adjoining a new station.
- 50% of the total non-housing development of 125,500m² is in this centre, the remaining is distributed in the other 10 neighbourhoods.
- In addition to the town centre there are two village centres and smaller nodes.
- Although most of the non-housing uses are located at these centres, pubs, corner shops, crèches and community centres are located at the nodes.
- The schools and parks are adjacent to the village centres.
- Architectural design is diverse. 15 different architectural firms have been employed to counteract the featureless and homogenous quality of many of the surrounding suburbs.
- An orthogonal block layout was chosen to maximise density and encourage sustainability. Maximum block sizes are 1 hectare and minimum 0.4 hectares.
- The hierarchy of streets, mews, squares and public parks is traditional.

- The density of each neighbourhood area is set as low, medium or high. The low has a range of 35–54 dwellings per hectare, the medium 50–78 and the high a range of 75–90.
- In the development neighbourhoods, the plan allows some flexibility in the relationship between the floor space and number of dwellings, to allow variety of design.

Design coding

• Build heights vary, as appropriate, to enclose and supervise the public realm.



- The maximum height is 12 storeys.
- An increase in scale is promoted from a transition zone to the urban zone.
- Landmark locations are identified throughout for distinctive buildings to denote focal points, nodes and at the culmination of significant vistas.
- Walled and enclosed housing estates are discouraged.
- Varied housing typologies and contemporary design is encouraged.

Landscape

- Three public parks have been designated; a 4 hectare park in a mature valley in the north east of the site, a 12 hectare central park and a 4 hectare linear park which incorporates existing mature trees.
- In addition to three major parks, pocket parks, canal ways and space for linear green boulevards has been allocated.



Landscape is generous respects existing features and provides some defensible space

Housing is generally low rise but dense

Costs

No costs have been published for the entire development. The district centre has been priced at $\notin 1.2$ billion.

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Case Study Vathorst, Nieuwland and Kattenbroek, Amersfoort, The Netherlands

Amersfoort AMSTERDAM

Vathorst, Nieuwland and Kattenbroek, Amersfoort, The Netherlands

Introduction

Amersfoort is an historic town situated in the 'green heart' of The Netherlands, 15 miles north of Utrecht. In 1981 it was designated as a growth area by the national government. The population was set to grow from 130,000 in 1981 to about 160,000 by 2016. The government's policy was to develop new housing close to cities of over 100,000 population at densities of a minimum 30 to the hectare and with good connections to shops and jobs. The expansion of Amersfoort formed part of the government's VINEX (VINEX stands for Fourth Planning Report Extra) ten year housing programme designed to increase the stock by over 7%.

The expansion comprises three new settlements, Kattenbroek, Nieuwland and Vathorst, each with a different character and all well connected with the existing centre. They make extensive use of combined heat and power (CHP) and use water imaginatively and carefully. Amersfoort is designated as one of the greenest cities in Europe.

Planning of Kattenbroek began in 1986 with the first houses built in 1990. A total of 4,547 homes have been built at an average density of 31 to the hectare in a variety of styles, offering much choice.

Planning in Nieuwland, Amersfoort's first VINEX suburb, started in 1993 and building work in 1995. 5,420 new homes have been built at an average density of 31 to the hectare.

Vathorst, the largest of the new communities, is still under construction and over 3,000 of a planned total of 11,000 new homes have been completed. The final homes should be built by 2014. The total estimated number of residents will be over 30,000. Vathorst is being built at an average density of 36 to the hectare (ranging from 27 – 48 to the hectare).

Much of the new growth in employment in Amersfoort has been in the hospitality and trade sectors and tourism is an important source of income. An industrial estate covering 45 hectares and 100,000m² is planned as part of the Vathorst development and should led to approximately 5,000 jobs.



Assessment

Look and feel

The three urban extensions are to the north of Amersfoort city centre. The A1 motorway divides Vathorst from the rest of the Amersfoort with Kattenbroek and Nieuwland to the south of the motorway.



All three border the A1 motorway. Nieuwland is protected by 56 sound barrier houses (with solar panels) and Kattenbroek by a business park. Vathorst will be shielded from the A1 and A28 motorways by the planned industrial estate, business centre and a gabion wall made from stone dug up during development and sprinkled with seeds to create a green edge. Businesses including a nursery school have also been built into the wall. Nieuwland waterside housing

Three new settlements each well connected to the existing city centre All three developments are connected to the city centre through a bicycle network, footpaths and a regular bus service. Vathorst also has its own railway station.

Vathorst when complete should have the community and leisure facilities, the shops and employment opportunities to create a self sufficient and sustainable new district but one with good links into the centre of the city.

Kattenbroek has its own busy shopping street, which means that everyday goods can be bought locally.

Kattenbroek and Nieuwland are essentially residential but Vathorst's business and industrial area when completed could provide jobs and facilities for the wider community.

Water features a great deal in all three developments adding to the attractiveness of the new housing. The Dutch are not afraid to use water in their developments they believe in 'making water your friend and not your enemy'.

Success factors

Satisfaction studies are carried out after an area has been developed and research is carried out by the University.

Property prices are higher in Vathorst then many of the other parts of Amersfoort which is evidence of strong demand.

Residents are proud of their neighbourhoods and this is evident in the care taken of the spaces outside their homes and the lack of litter, vandalism and graffiti.

The city of Amersfoort demonstrates the benefits of a city council taking the lead and adopting proactive approaches, rather then just sitting back and waiting for developers to move in and develop the land piecemeal. The results speak for themselves – three critically acclaimed developments, providing over 20,000 new homes (once Vathorst has been completed) which provide attractive places to live and work.

Difficulties

The local authority were originally very reluctant to develop the land north of the A1 motorway as they feared that any new settlement would feel detached from the rest of the city. They also had contaminated farm land to deal with. To tackle this, high quality cycle and footpaths, a regular bus and train line into the city centre have been put in place to connect Vathorst with the rest of the city.

It was hoped that Vathorst's great public transport facilities would lead to reduced car usage. Unfortunately Vathorst's great connections to the motorway network (it is connected to the A1 and the connection to the A28 is due to open in mid 2008) has led to high car usage (in line with the rest of the Netherlands). The Vathorst railway station has now been open for a year and it is hoped that residents will start to use it to commute to work.

Community

Social context

• The Netherlands is renowned for being one of the most equal countries in Europe and social housing accounts for 30% of all stock.

Objectives

- The municipality had a vision that the new areas should be for everyone, with no separation of the poorer and richer households as had happened previously.
- The Vathorst development company's mission (Municipality of Amersfoort and a consortium of five private companies) is to lay the foundations for a well-balanced society. Where 30,000 residents can live and work (there will be job prospects for 5,000 employees) in a comfortable environment.
- The objective for Nieuwland was to experiment with new environmental techniques

Housing mix

• In Kattenbroek 70% of homes are for owner occupation and 30% for rent but with designs that are indistinguishable from each other from outside although it seems common for blocks to cater for different types of household.



- Kattenbroek has the highest proportion of affordable housing at 45%. Nieuwland has 32% and Vathorst has the lowest proportion at 30%.
- 47% of housing in Kattenbroek is rented, 21% in Nieuwland and 20% in Vathorst.

Members of the study tour looking on Kattenbroek the model is now an urban sculpture • One of the most prominent features of Kattenbroek is a large lake. The city insisted that this prime area was used for higher density social housing rather than premium value private housing.

Facilities

• In Vathorst, there was a conscious effort to ensure that infrastructure and community facilities were developed hand in hand with the housing.



- All the necessary facilities to support new communities are available as soon as people move in.
- This has been achieved through the use of temporary buildings to house shops, schools, crèches and healthcare facilities while the permanent facilities were being built.
- When complete the development will include 5–6 primary schools, a secondary school and agricultural college, 10 football courts, 10 tennis courts, a skateboard park and swimming pool.
- The main shopping centre will be between 17,500 20,000m² and there will be a smaller local shopping centre (2,500m²).
- Two healthcare centres, a library, a theatre and five catering establishments are planned.
- Live work units have been built to attract businesses such as osteopathy and dentistry.
- Lots of small, overlooked and often simple play areas are sprinkled throughout the settlements providing safe spaces for children to play unaccompanied by adults.
- Housing for people with disabilities and the elderly in Kattenbroek is clustered in the heart of the development, not marginalised to the periphery as is so often the case.
- Vathorst's new industrial estate will line the A1 motorway and the planned Podium business centre will run alongside the A28 motorway.

- The Podium business centre will provide 100,000m² of office space in a campus environment which will deliver an estimated 5,000 jobs.
- The business centre is located next to Vathorst railway station.
- Kattenbroek has a busy pedestrianised shopping street with a variety of high street names, a supermarket, a pub and cafés.
 Parking is provided just outside the shopping area in a multi-storey car park with a green edge to help disguise it and create a more attractive frontage.

Community engagement

- A great deal of effort has been put into consensus building, using skilled intermediaries and local architecture centres.
- In Vathorst there is a large information centre which is a dedicated facility for visitors and residents and includes a café, visitor centre and scheme model.
- In Vathorst the Vario Mundo Foundation has been funded to work with residents, community groups and the local authority to realise the vision to create a well balanced society.

Connectivity

Wider context

- Connectivity is central to the VINEX programme in that it focuses on mainly suburban expansion of existing successful towns and cities, of which Amersfoort is one.
- The aim was to develop in a compact (but not over dense) way a minimum of 30 density/ hectare close to existing cities so as to preserve the countryside and keep car travel to a minimum.
- The city was already relatively prosperous and set within a large conurbation which is well connected with the rest of the country and internationally.
- The city of Amersfoort was the first to transfer substantial transport planning powers to the operator in the hope of optimising services.

External connections

- There are excellent rail connections to Amsterdam and Utrecht and many residents commute to these cities to work.
- Good public transport is key. Central government provided financial assistance for transport and traffic measures.

Distinctive neighbourhoods, Vathorst, Amersfoort



- Although separated from the rest of Amersfoort by a motorway Vathorst has high quality cycle routes and footpaths across the motorway to the city centre.
- Vathorst has its own station which provides access to the centre of Amersfoort and Amsterdam.
- Vathorst is connected to the A1 motorway and the connection to the A28 motorway is due to open mid 2008.

Internal connections

- The new developments are designed to reduce car dependency and to encourage walking and cycling as well as the use of public transport.
- In Vathorst minimum standards have been set, such as a maximum of 400m from every home to a bus stop, connections to train stations and frequency of service.
- Buses are confined to the perimeter of each housing area as are most cars. There is no car access to the centre.

Dealing with the car

• Cars are banned from the city centre and in Vathorst are not able to drive through the residential neighbourhoods although they can drive in and out via the same route.



• The main boulevards are wide and give an open feeling the roads in the housing areas are narrow so as to discourage cars and encourage cycling.

- In Vathorst there are dedicated streets for skateboarding and rollerblading which are signposted in a fun way.
- There are large amounts of bike parking facilities throughout the new settlements particularly at schools.
- Over 15km of bicycle lanes will be provided in Vathorst along with over 4km of bus lanes (the bicycle lanes link into a network which includes the long-distance LF9 which runs from the Belgium border to the German Border via Amersfoort and Amsterdam).

Climate Change

Key targets

- The municipality had an ambition to improve on the standards set by central government. Nieuwland, the first VINEX suburb in the city is the most ambitious of the three new areas.
- The city as a whole has set itself the target of 10% improvement on government targets for emissions and energy consumption. It is attempting to do this through the use of renewable sources of energy and co-generation or the use of CHP.
- Central government standards for energy efficiency, known as Energy Performance Norms (EPN), are monthly and yearly energy consumption figures. These relate to different energy consuming activities, such as heating, lighting, cooling, humidification, fan power and others.





- Terraced housing with mixed parking strategy helps reduce impact of car on frontage
- 2 Nieuwland solar housing
- 3 Nieuwland Emphasis on renewable energy - notice the photovoltaic facade

Dedicated routes for cyclists, pedestrians and traffic calming for cars

Methods

- When Vathorst started the EPN was set at 1.0. Through the use of solar energy, district heating through waste incineration, the use of sustainable materials, high quality construction, and insulation standards, a figure of 0.7 has been achieved.
- The size of Nieuwland (about 70 hectares) gave the city of Amersfoort and Dutch energy company REMU the opportunity to experiment with new environmental techniques and ownership models. They installed photovoltaic panels and initiated five projects with a variety of partners including:
 - Three low energy primary schools with displays which show the pupils how much energy the solar panels are generating.
 - Solar energy on 50 rented dwellings via solar collectors and solar gas combination units.
 - 19 luxury owner occupied homes with installed solar roofs.
 - A 1MW photovoltaic project for 500 dwellings achieving an optimal installation on as many houses as possible.
 - Two zero energy houses.
- The combined benefits include 1,618 kWh output at peak plus new learning about photovoltaic technology.
- Waste rainwater has to be retained on site and some 15% of development area is given over to water.
- Underground waste storage is used to encourage recycling and to keep streets free of clutter. By placing these strategically, the streets can be narrower as they do not have to accommodate large refuse vehicles.
- Facilities are clusters to ensure that they are within easy walking distance to encourage people to stop using their cars for short trips.

Construction

• Many of the homes are built with flat roofs to enable owners to add additional stories as their families grow or they have to funds for the work

Information and support

• During the planning stage of Nieuwland academics and sustainability experts were bought in by the local authority to help plug the skills gap.

Character

Context

- Amersfoort had a vision to stay 'small, beautiful and modest' but if it was to grow it would do it in its own way.
- The city planners and officials wanted their VINEX suburbs to stand out, and builders and developers agreed that providing variety would help sales by offering buyers more choice.
- The three new neighbourhoods have each been developed to have a distinctive character or brand although each is well connected with the centre of Amersfoort.
- The different neighbourhoods used themes of woods, water and local history to develop their brands.
- The name Vathorst comes from the original farmstead 'De Vathorst'.
- Existing landscape features are used to give each new suburb its own unique character.



Wide choice of homes on offer from the contemporary...

...to the traditional



- Each residential quarter has its own theme and feel, for example:
 - De Velden (The Fields) 'for leafy living' is set in the original landscape, between the existing wooded banks, ditches and farmsteads, blending rural surroundings with diverse architecture. 4,767 homes are planned.
 - De Bron (The Spring) is a large water retention area, many ditches, long wooded banks and a view of the Vathorst

farmstead (from which the area took its name). 1,600 homes are planned.

 De Laak has the feel of a new canal town. 65% of the dwellings are sited by the waterside or are looking out onto water. Individual canalside houses, embankments and mooring posts are characteristic features. The quarter features Amsterdam style housing where 25% of the brickwork colour is picked up in the next house creating individuality and a sense of continuity. The landscape, which was former grassland, has been transformed and redesigned with many canals. 4,300 homes are planned.



- The De Laak development has proved particular popular with visitors from the UK who are attracted by the variety of brick homes on newly created canals.
- A road that connected several farmsteads has been turned into one of the many bicycle routes through Vathorst. Called Het Lint (The Ribbon) it cuts right through De Velden with spacious building parcels at low density at either side.
- Higher density housing and apartments (100 houses per hectare) are being built near the railway station and shopping centre.

Masterplan

- The Aldermen (political leaders) decided that the first scheme, Kattenbroek, should be different and appointed an Indian born architect, Ashok Bhalotra, for the masterplan. The aim was to get a different perspective from outside The Netherlands.
- Bhalotra wanted to create a healthy, safe and cheerful neighbourhood in which people felt at home. His plan featured an inner circle the precise size of Amersfoort old city to represent the theme of 'being at home'.
- The themes of 'travelling and staying at home' and 'the four seasons' were used to develop contrasting areas.
- The vision for Vathorst is 'a world of difference'. This theme has been developed

by internationally renowned urban planner Ashok Bhalotra (who also worked on the Kattenbroek masterplan) and Adriaan Geuze into the masterplan.

- The Vathorst masterplanners set out to prove that new housing estates need not necessarily be uniform and dull. This has been achieved through bold design and residential quarters that are completely different from one another. To make this possible the individual development areas are quite small with a maximum of 70 _ 80 homes developed by one architect.
- In order for Vathorst to get its own railway station ProRail insisted that there be some 500 houses with a one mile radius of the station. A ratio of 25% apartments and 75% houses is being built. To the northern side of the station 100 houses per hectare are being built, in the shopping centre to the west there are some 300 apartments, on the east there is an existing village plus a new area of about 35 houses per hectare and to the north east there is 100,000m² of office space.

Design coding

- Over 40 architects have been involved in the detailed design of Kattenbroek which has resulted in an enormous variety of colours, textures and use of materials.
- In Nieuwland housing design has been more influenced by solar issues where the alignment of houses and their roof angles have been optimised and this has in turn had an effect on the look and feel of the layout.

Landscape

 The vision for Kattenbroek was to retain as much as possible of the original landscape, structure and sense of security of the old town centre of Amersfoort. The original farm house owned by the farmer who sold his land for the development of Kattenbroek has been kept with the new homes being built around it.



• In Vathorst the existing features, such as farm tracks, ditches and old lanes, are incorporated as cycle and footpaths.

Variety of homes on newly created canals

Indigenous planting and countryside character retained

- In Vathorst 65% of the homes will have views over water or be situated on a waterfront. This will give distinctiveness, a sense of place and add value.
- Public realm design is simple but care is taken to reduce clutter and signage and putting street signs on buildings rather than posts, for example parking is identified by the use of a very discreet, small 'P' signs on either buildings or the roads.
- Some areas of landscape are allowed to grow wild (in a controlled way) to encourage biodiversity.

Look and feel

• There are wide boulevards which give an open feel – these contrast with the narrower roads of the housing areas which discourage large vehicles and encourage cycling.



- The aim is to attract a wide range of different demographic groups into Vathorst, so a wide range of different homes are being provided.
 Each section of the development has its own atmosphere reflected in architecture, density, scenery and structure.
- In Kattenbroek winter gardens provide residents with enclosed glazed areas between houses to be outside during inclement weather.
- Large roof terraces and balconies provide outdoor space.
- With Kattenbroek you get a real sense of fun. Many of the homes are quite wacky, bright, colourful and unusual shapes and although this may not be to everyone's taste they are popular with residents.

Collaboration and Process

Vision and leadership

• Nieuwland and Vathorst form part of the central government's VINEX programme, so encouragement and incentives were given by

government in the form of grants for transport and traffic measures as well as site decontamination.

- The vision has been led and developed by the municipality and its appointed champions.
- Amersfoort wanted to be different and to develop its own unique approach and character.
- At first, the local authority knew little about sustainability so it used academic help to bring all available information together; and so together with the experts, the local authority learned a lot very quickly.

Special structures

- The schemes are developed as joint ventures between the local authority and developers, through public/private partnership.
- Kattenbroek was affectively the first place in the Netherlands to use a public/private partnership but it is usual for the public sector to take charge of pooling the land and providing serviced sites. They then charge an 'equalisation fee' to cover public facilities such as roads, utilities, parks and open spaces. The municipality charges developers between 20% and 28% of the sales value for this infrastructure.
- Experience from each scheme is fed into the next. A 'quality panel' has been set up working for the municipality to set environmental goals and monitor results.
- In Vathorst, the Development Company Vathorst (OBV) a public-private corporation between the municipality of Amersfoort and a consortium of five companies are responsible for land acquisition, planning, engineering, preparing the site for building and granting or allocating land. The public sector owns 50% of the joint venture and the five private companies own the rest.
- The homes in Vathorst have been built by property developers under the supervision of the OBV. Houses are then sold or let by the property developers. The subsidised rented and owner-occupied sector is managed by the Local Authority.

Planning process

- The public sector plays a key role in developing the brief and appointing masterplanners.
- The Local Authority determines zoning and urban design criteria and installs the basic infrastructure of roads and utilities. It then sells lots back to private developers and housing associations.

Safe, traffic calmed routes throughout help reduce car dependency

- A great deal of effort is put into building consensus using skilled intermediaries and by the use of architecture centres. Local project offices convey information using large models and displays as well as information on the houses for sale or rent.
- Finance for infrastructure is borrowed at low rates of interest from a bank (BNG) which has been set up to support public sector investment.

Delivery

• There is a stress on team working, with multi-disciplinary teams of officers working closely with private house builders.





• The city was determined to develop mixed areas of social and private housing. Developers feared this would harm sales but in reality there has been no problem.

Costs

This was investigated in a separate study tour please refer to the document 'Making Eco-towns Work: Developing Vathorst'.

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- Vathorst Masterplan

 achieved through
 a public private
 partnership company
 benefitting from
 both community
 leadership and
 experience as well as
 business enterprise
 and knowhow
- 2 Vathorst Waterside housing

Case Study **Rieselfeld and Vauban, Freiburg, Germany**

4



O BERLIN

Vauban and Rieselfeld, Freiburg, Germany



Vauban. A former army barracks, led the way in promoting solar panels

Introduction

Freiburg, in South-West Germany, has been leading the way in environmental practice and policy for over two decades. In particular, Freiburg is known as the solar capital of Europe.

There have been many studies and tours of Freiburg from the UK. The main focus has been on Vauban, which is an urban regeneration project based on a former army barracks site. A second scheme, Rieselfeld, on the site of a former sewage works.

Vauban has a population of 5,000 residents whilst Rieselfeld currently has 8,000, with a planned expansion of 10,000 – 12,000. Planning of Vauban started officially in 1996 and was completed in 2006 and Rieselfeld is due to be completed in 2010.

The political and environmental context is very different to the UK as there are Government and Regional policies in place which give economic incentives to install solar panels and sell surplus electricity back to the grid. But there are wider lessons about transport, waste and design which are applicable.

Perhaps the biggest lesson is about public engagement from the beginning of the process and the way in which all aspects of the project, social, economic and environmental have been considered and planned in a coherent and joined up way.

Assessment

Look and feel

These two urban extensions are situated a 15 minute tram ride away from the city centre. Vauban, the earlier of the two schemes, was formerly the site of a barracks for the French army and some of the original buildings have been retained. Rieselfeld was the site of a sewage works.

The City of Freiburg decided to use the land to develop housing based on sustainable principles. The process was open to public debate and issues such as mobility, energy, housing and social aspects were all considered by working groups. The result is that both schemes have distinctive characters which reflect the aspirations of openness and communal activity combined with a great deal of variety and individuality within the design.

- In both schemes, the houses are set within a green framework which gives a very pleasant feeling, with much interest and a variety of places for walking, playing and general enjoyment.
- The general style is simple and relaxed modernism with a preponderance of rendered walls, with some timber and metalwork used to create balconies, enlivening the facades.



- Colour is used extensively to create highlights and emphasis.
- The environmental features, notably the solar panels, are evident but contribute to the character rather than detract from it.
- Cars are kept away from the pleasant pedestrian friendly streets and only allowed in under sufferance.

Success factors

The Vauban development was concluded at the end of 2006. The architecture is striking and self assured and the layout creates a child friendly environment which is attractive for families. A great many ecological objectives have been achieved with a major reduction in CO_2 due to technological innovation, particularly with regard to the use of solar energy and locally produced combined heat and power.

Major behavioural changes have been achieved in regard to modes of transport. About 50% of households have pledged to be car free. This has been made possible through a range of 'stick and carrot' measures whereby households pay extra for having parking spaces but they can choose to be car free in return for which they receive annual car sharing tickets and generous public transport concessions.

The design and the social infrastructure was the result of widespread public consultation and participation at an early stage which created the conditions for success.

Some 25% of housing in Vauban/Rieselfeld is social but it is indistinguishable from the rest. The soft infrastructure of education and community facilities are seen as just as important as the hard infrastructure.

Both settlements are very popular and have very low turnover (only 22 of the 2,000 homes in Vauban have been resold.)

Difficulties

There have been accusations from some quarters that Vauban is too focused on the environmentally aware, educated,

middle-classes and does not pay enough attention to mixed social communities.

There have also reportedly been some difficulties and disputes between those residents who have chosen a 'car free' life and those with a car.

Community

Social Context

- The city sits within a prosperous state (Baden Wurtemburg) and is a long way from the capital, Stuttgart. There is no history of grant dependency and Freiburg has a high degree of independence.
- The threat of a nuclear power station acted as a catalyst for community cohesion and activism.
- The city has a 550 year old university and has long been regarded as an interesting and enjoyable place in which to live. The population is therefore generally affluent without major problems of inequality. There has, however, been an influx of new people in a short space of time, many of whom are single parents or of limited means. The city therefore has a growing housing demand.



Objectives

- The objective has been to offer high quality buildings and spaces for families within the city boundaries and to counteract suburbanisation.
- Because of its long tradition of being at the cutting edge of the environmental agenda, with an enlightened political and professional leadership, it was inevitable that the new developments would have a strong sustainability emphasis.
- The new urban extensions were needed to meet the growing population of the city. They account for 5% of the total population but for a higher proportion of the new housing.
- There was a commitment to build only low energy buildings on municipal land.

Vauban. Colour is used extensively along with planting to offset otherwise simple building forms

Rieselfeld, Freiburg play areas overlooked by housing (Source Glen Richardson, Cambridge City Council) • The aim was to persuade people to change their way of life and, in particular, to reduce car usage and shift to cycling, walking and public transport.

Housing Mix

- Some 25% of housing in Rieselfeld is social housing but is indistinguishable from the rest.
- The city actively supported and encouraged development by self-build or co-build groups.

Facilities

- The aim was to ensure that all necessary facilities were available from the start of development.
- A secondary school was rebuilt in Rieselfeld to attract people from a wider area and increase numbers. The old site was redeveloped for extra housing. Thus the school was a generator or community hub rather than a later addition. This approach was used in other places such as a community centre, café and country park.
- There are over 20 small shops in Vauban, some used as craft workshops. A good restaurant and bar in a converted barracks also serves as a community focus.





 At Vauban, the landscaped spaces between terraces of houses provide for a wide range of activities including adventure play for children and barbequing and pizza baking for families. The spaces were designed by and for the people living around them.

Community engagement

• There was an extensive effort to engage the community with the design and planning process. Design competitions for Rieselfeld were organised and the judges included local groups. The process brought people together.

Connectivity

Wider Context

- It is impossible to consider the new extensions to the city separately from the movement patterns and systems developed by the city as a whole. The ideas are based on reducing congestion and time wastage, healthy activity, clean air and a reduction of noise.
- The city has led the way in reducing car dependency and promoting walking and cycling. It has done this by providing high quality public transport and through making cycling and walking easy and pleasurable.



External connections

- The two new urban extensions are both connected to the city centre via the tram system, which is reliable and user friendly.
- The historic city centre is traffic free and the streets are well designed for pedestrians using high quality materials, with water as a constant theme flowing through in open rills. This approach has been extended to the new extensions where pedestrians have clear priority over cars.
- The main station of Freiburg is a transport hub which connects the international main line with the City's own tram and bus system but it also makes significant provision for cyclists in the form of a substantial cycle park with a café and a cycle repair shop.

- 1 Vauban, 'SonnenSchiff' a mixed use building with workspace over three floors and terraced housing on the roof
- 2 A new school in Rieselfeld built prior to new housing has become a community hub
- 3 The tram way is a 'green' route into the town centre, here combined with swales and mature tree planting

• Trams run on grassed verges which contribute substantially to reducing noise.

Internal connections

- The layout comprises of loops off a central spine down which the trams travel. Access into the housing areas by car is discouraged and controlled. Consequently, the streets are quiet and pedestrian friendly, encouraging children to play.
- The city has achieved a significant modal shift from cars to cycling, walking and by public transport. By 2010 it is anticipated that only one third of trips will be by car.
- There is a 500km cycle network and 64% of all journeys in Vauban are by bike.

Dealing with the car

- In Vauban, the car parking is concentrated in a large multi-storey car park on the edge of the development. In Rieselfeld, there is some on street parking and blocks have small underground car parks for 12 cars maximum. Car sharing clubs are used.
- Car ownership is low (85 cars per 1000 residents in Vauban). Parking is carefully controlled and the cost of a parking space in a garage in Vauban is £10,000–£14,000.
- About 40% of households have agreed to live without an owned car for which they receive financial benefits because they don't have to contribute to the cost of the public car park.

Climate Change

Key targets

- The aim has been to exploit the potential of combined heat and power (CHP), which will contribute to the city's energy balance with a reduction in CO₂ emissions by 3,000 tonnes pa.
- Freiburg has also developed a clear brand as 'The Solar Capital of Europe' and the city accounts for over half the solar installations in Germany. In spite of this, renewables only account for only 10% of electricity consumed in the city at present. The target is to increase this to 40%.
- Renewable energy is supported and encouraged by means of a feed-in tariff which enables small producers to sell back electricity to the grid at twice the standard price. This means that the pay back period for solar panels is less than 12 years. The incentives are paid for through a tax on energy producers.



Methods

- 65% of the electricity is produced locally using CHP and solar, which increases efficiency from 40% – 80%
- A co-generation plant uses wood chip (80%) and natural gas (20%). CO₂ savings are estimated at about 60%.
- The main principle is to avoid waste in the first place; for instance, through returnable packaging. Waste has to be sorted into four different containers. Residual waste is incinerated in a plant that serves seven city and rural districts. As a result, waste has been cut by a factor of six over 17 years and now amounts to 114kg per resident a year.
- Rainwater is collected separately to be used in houses. Hard surfaces are permeable and water is infiltrated into the ground. In Vauban, the groundwater is treated to remove contaminants before being released back into a small river. In Rieselfeld, the Sustainable Urban Drainage system supports streams and ponds that add to the attraction of the area.
- Vauban benefits from mature trees that aid cooling in the summer and contribute to biodiversity.
- Extensive planting is used to climb up the balconies and provide natural shading.
- Buildings are limited to 12.5m in height to enable cooling breezes from the mountains to cool the city in summer.

Construction

- Construction is as important as the energy savings achieved through high levels of insulation and careful siting of homes.
- All houses built meet at least improved low energy standards of 65 kWh/m². About 150 units will meet passive-house standards (15 kWh/m²) or even energy plus standards,

Vauban, orientation of blocks for passive solar design, roof mounted PV and effective shading all contribute to the solar strategy



which are houses which produce more energy than they need.

• One of the co-building projects uses vacuum toilets and a bio-gas plant.

Information and support

 A key to the project's success has been the establishment of forums and structures which allow citizens to become involved in the decision making process at the earliest stage. It has ensured that people understand the implications and the benefits of environmental issues and can make informed choices, learn from mistakes and become owners of the concept and the ongoing management issues.

Collaboration and process

Vision and leadership

- In the German federal system, the main powers are vested with the municipalities.
- In Freiburg, the municipality either owned the main sites for development or acquired them from the Federal government.
- Significantly, the Green Party hold the balance of power in the city and the Lord Mayor is internationally renowned for his environmental vision.
- In 1992 in Vauban, the process was started by the City Council with a clear set of objectives to achieve a sustainable piece of city planning. It was agreed that to achieve this there was a need to engage with the public and to create awareness and involvement with a wide range of people.

Special structures

- The Forum Vauban was established in 1995 as a non-governmental body but financially and administratively supported by the City of Freiburg.
- The Forum Vauban association set up working groups to deal with innovation and resolving sometimes conflicting matters in all the strands, including legal, financial, social, transport and energy issues. These groups were open to experts and all interested parties.
- Within the City Council, 5–7 people were dedicated to the Vauban project as employed staff.
- The non-government organisation (NGO) initiative started with a handful of volunteers including students and people from the environmental movement. When funding became available, the NGO created a few moderately paid jobs for young graduates.
- The combination of idealism, knowledge and economical structures led to a breakthrough in the Forum's work.
- The combination of the participation process and a publicity campaign mobilised the first future inhabitants to meet, bring forward their ideas and form co-building groups.
- The project has a special status 'development site' and its own budget (US \$85 million) controlled by Project Group Vauban.



Planning process

 The money to clean up the site and develop infrastructure, including neighbourhood centre kindergartens and primary schools, came from the redevelopment fund of the Federal State of Baden Wurtemburg and from credits raised by the city of Freiburg. All credits had to be repaid through the selling of building plots. As a whole the project received no further subsidies. The neighbourhood resource centre expresses civic pride through its double height facade and generous modern design

With well insulated, airtight buildings, all penetrations are a potential risk - here balconies are designed to reduce cold bridging

- The planning process started in 1993. Besides the many other participants, there were three main parties to the process, Project Group Vauban (Local Authority administration), City Council Vauban Committee (political platform for information exchange, discussion and decision making) and Forum Vauban (local citizens association responsible for social work within the district). Regular meetings took place between the City Council and Forum Vauban. Further round tables and workshops were organised for issues such as the design of the green spaces.
- The process was framed by some fairly modest regulations within the masterplan, such as general layout, height of buildings, low energy standards, the traffic concept, rainwater filtration and the greening of facades and roofs.

Delivery

- Commercial investors were limited to a few areas of the site.
- The formation of co-building groups created a specific structure and identity within the community and made it quite easy to keep in touch with the future residents.
- Social work within the district was overseen by further special committees, which collaborated with the cities welfare institutions. Social work was targeted at special groups, such as children, youth, families and others.
- Within the masterplan, plots were allocated to developers, some of whom were quite small. There are about 40 groups of building owners (co-building and co-housing) as well as self builders. The resulting architecture exhibits greater variety than is common in the UK. People have a greater sense of ownership and individuality and it enables people to enter the market at an affordable level.

Character

Context

• Freiburg decided that it wanted to expand within its boundaries, close to the city. It believed that the first step must be to decide what kind of city it wanted. It had learned from the mistakes of high rise flats and wanted a built form where families could call their children from their own flat on whichever floor. They wanted variety, limited areas given over to parking, a denser form of development with green wedges to bring people together. • Another key decision was to involve the people who were going to live within the communities in their design.

Masterplan

 Both schemes have been developed in stages (the so called 'adaptive planning' principles). Control is exercised through the Building Plan, which lays down the main principles on a single sheet and through development briefs for each block.



- These two new settlements were designed to be usable without reliance on a car.
- The densities are reasonably high in order to pay for high quality infrastructure (around 60 dwellings per hectare) but not so high that they cannot accommodate family housing.
- Each development has been undertaken in four stages, each of which has taken between 7 and 14 years.
- The layout is that of loop roads leading off a central spine, which is the tram route.
- In Rieselfeld, there is a local centre which includes a cultural centre and a church next to a sports hall and schools. These form part of a green arch which connects the centre with the surrounding country park.
- In Rieselfeld, some 71 hectares out of a total of 320 hectares is given over to housing.

The Vauban Bebauungsplan summarises the design code on one sheet There is a loose grid layout with higher density next to the tram route and with shops and restaurants at ground level.

 Primary schools and kindergartens are distributed around the development. Other services are located along the main the main spine. In Vauban, the large communal areas run North South and separate the shops from each other. In Vauban, the layout is less formal. Whilst there are some doctors and health facilities on site, the excellent tram service connects the developments to the city centre for more extensive services.

Design coding

- The phases vary in character. Because of the procurement method there is considerable variety in architectural typology and style.
- The most common typology is maisonettes or duplexes but in Vauban, there are also a large number of three storey terraced houses.
- Buildings are restricted to 12.5m in height for micro climatic reasons but this also promotes sociability and enables mothers to monitor children playing outside.

Landscape

- The houses surround squares which are imaginatively landscaped and used for a variety of play and social uses.
- Building are often draped with climbing plants and creepers, which aids shading in summer.
- In both schemes. There is ready access to the countryside and in Vauban, there is a kind of community farm which provides a contrast to the houses.

Costs

The process of urban development in Vauban was supported by the Forum Vauban association which was approved by the City of Freiburg as the coordinator of citizens' participation in 1995. Since 1996 the Federal Environmental Foundation supported the association with a grant for research into the impact of citizens' participation in urban planning.

The total investment in Rieselfeld is in the order of €500 million for a total of 4,200 dwellings. Land value works out at €430/m². Building costs are €3,300/m² on average but only €2-2,400 for cooperatives.

Car usage is kept down by having to pay £10-14,000 for a car space.

Case Study HafenCity, Hamburg, Germany

4

HafenCity

O BERLIN

HafenCity Hamburg, Germany

Introduction

The HafenCity development in Hamburg is a project extending over 25 years, for the construction of a new city quarter of circa 5,500 dwellings, for 12,000 residents. It will also have an extensive mixed use element, comprising 55,000m² of retail, several major cultural facilities and commercial office space, which is anticipated to generate employment for 40,000 people. Construction started in 2002, and by the end of 2007, 800 people were living in HafenCity and 1,500 jobs had been created. Much of the open space has been completed and works have started on a children's day care facility and elementary school

Of all the case studies, this is the most urban in character as it is on the old docklands area immediately adjacent to Hamburg's city centre. It has thus been conceived as an expansion of the central district. The site covers 155 hectares of brownfield area – much of this is water, providing unique waterfront opportunities, but leaving about 100 hectares of land.

Hamburg is Germany's second largest city with about 1.7 million inhabitants, though as the centre for Northern Germany, it has a greater catchment area of 3.5 million people for whom it provides a cultural and shopping metropolis. The city lies on the River Elbe, one of Europe's major rivers, and in 1888, they designated the port as a tax free zone, helping Hamburg to develop one the world's biggest warehouse locations for coffee, cocoa, spices and carpets. These older docks have now closed with the advent of container shipping, and the construction of new docks south of the river has replaced the original docks. Many of the old warehouses, in all their fine brickwork, are listed and will form the backdrop to the new HafenCity.

Hamburg is still a prosperous city, with an average of 30m² living space per person, and 14% green open space, offering a high quality of life for its people. The HafenCity extends this quality, with great emphasis on good materials and attention to detail, as well as investment in public open spaces.

In 1989, a 'Bauforum' (or a public planning workshop) organised by the city, identified the dockland area as a vast potential for brownfield development. In the early 1990s, a few parcels of land were released for high profile buildings but it was professor Volkwin Marg, an internationally renowned architect based in Hamburg, who in 1996 first devised a strategic plan which presented a realistic vision, and which the city parliament approved the following year.



There was a demand for high value dwellings within the city, and a vision to provide a mix of subsidised housing. Both rented and cooperative models of development have been encouraged, as well as those for private sale. In Germany, there is a wider band of affordable housing, making it accessible to many more income bands; there has been a policy of not providing for the lowest bands of affordable housing, with a view that this sector already has sufficient provision in the town centre, and that the success of the district relies on achieving higher values all round.

There are sustainability targets, but these are on a voluntary basis, and developers can apply for a certificate of compliance, upon which they can display and market their 'gold' or 'silver' award.

The energy supply for the area is currently a gas fired district heating system (achieving 28% CO₂ savings), with each residential block obliged to provide on site generated hot water. A small hydrogen fuel cell plant is in operation as a prototype. The costs for the installation of the district ring main, boiler plant and the running of the energy supply was put out to

European tender with a fixed tariff and a fixed CO_2 emission rate per kWh. Further, an annual CO_2 reduction programme was also part of the contract. In response to the OJEU, the Hamburg energy company partnered with Vtenfall and secured the contract.

The masterplan exploits, to a certain extent, south facing frontages – these luckily also coincide with river views but some apartments have winter gardens and effective passive solar measures in place.

Once the vision had been set and the City had sanctioned it, a Local Authority special committee was set up in 1998, comprising members of the urban design, economic, environment and transport ministries. Between them, a masterplan was drawn up for the area, which highlighted primary goals, statements on density, land use, issues of flood defence, public transport and traffic, as well as decisions on industry to be retained or introduced to the development zone.

Social and design objectives also underpinned the thinking. The new quarter was to provide a range of mixed uses, commercial, shopping, leisure, the arts and housing for a range of income groups. Though low carbon economy was less of a driver back in the early 1990s, social sustainability is at the core of the thinking. More recently, higher performances in carbon reduction have been introduced.

A special development agency, HafenCity GmbH (to whom the land has been transferred), a dedicated Local Authority planning team and a bespoke delivery mechanism were set up to work together in releasing building plots and achieving on each a consistent excellence in architectural quality.

Implementation is geared towards diversity by engaging with a multitude of small, medium and large enterprises covering many uses and sectors. This diversity reduces the vulnerability of the new quarter to economic and social changes in future years.



of vehicles and pedestrian routes, squares and public spaces, should encourage walking and cycling, as well as to allow social interaction.

This, along with the excellent new tube connections, should ensure that the 40,000 people travelling in and out of the HafenCity do so without their cars.

Success factors

- The flexibility of the masterplan has seemingly helped generate enormous design richness and quality whilst delivering a uniform and coherent cityscape.
- The quality of materials, detailing and design suggest that the delivery agency and the developers have worked closely together to deliver good buildings to a fair price.



- The sheer ambition of the scheme, and the speed at which it has moved forward through a period of relative decline in the rest of Germany, demonstrates the strength of marketing, vision and location, as well as the clarity of purpose in the local authority team.
- The deliver agency, HafenCity GmbH (a local authority controlled body) tasked with disposal of land, can either nominate a business or a developer which it feels is

Several signature buildings are under construction and infrastucture for the later phases for a commercial and retail quarter are complete

Assessment

Look and feel

The district, as it is emerging out of the ground (only two phases of 18 have been completed to date), gives a very convincing feel in terms of scale; the quality of design and robustness of materials have created a rich and long lasting piece of urbanism, with the promise of flexibility, diversity and civic activity that all characterise some of our favourite, and hence successful, historic centres.

The setting on the river lends it a natural unique identity of waterfront living, and the separation

Am Sandtorkai, the

will help create the

first phase. Alternating

residential blocks with commercial buildings

beneficial to the overall concept, to take on a parcel of land at a pre-agreed price. Alternatively, it can offer the land to a range of developers, and select one on the basis of their proposals, not on land value. All developers then need to procure the design through a competition process.

- The agency retains control of the land throughout detail design, and thus can control quality of design and adherence to concept.
- The tendering for site wide energy infrastructure and supply has proved an economically viable model for the European energy market.

Difficulties

- The decision to raise the habitable accommodation level to 7.5m above the normal river level as a flood defence measure, has created a huge plinth of underground parking, leaving little street frontage on the one side, nor indeed much 'interest' at eye level on the footpath side. Access to this parking from the perimeter road, or main street leading into HafenCity, has created a very car orientated streetscape, yet it has also allowed widespread car free areas and routes through the site.
- Although supported by both left and right political parties in Hamburg, both of which have been in power during the last 10 years, a policy against providing for the poorest social housing group at all in the HafenCity area would be seen unfavourably in the UK.

Community

Social context

• Hamburg is a thriving city with a large area of river frontage available for development, with still some war damaged sites remaining. The city wishes to expand and position itself for the future.

Objectives

- The intention is to enlarge the existing city centre by 40% and in doing so, reposition Hamburg as a focal point of economic activity.
- It will have a mixed urban structure and strengthen residential accommodation in the city centre.
- It will provide opportunities for the media and digital economy, and provide a new city centre that will support retail, entertainment, culture and tourism. It will have the social infrastructure of schools, health, open space etc to support the residential element.



- The highest urban quality is proposed, with each of the 13 neighbourhoods having their own distinct mix of uses, character and blend of buildings, parks and open spaces. Each will be self standing in economic terms and have the necessary social infrastructure to support its residents.
- Implementation is geared towards diversity by engaging with a multitude of small, medium and large enterprises covering many uses and sectors. This reduces the vulnerability of the new quarter to economic and social changes in future years.

Housing mix

- Up market residential accommodation will be provided because of the lack of space elsewhere in the city to provide it. However, there is still a large amount of low cost housing provided through cooperatives.
- The city places an emphasis on achieving a social mix within housing.





Heavy traffic to serve city extension is taken along a perimeter highway - No street frontage, only access to undercroft parking zones - pedestrians at podium level

Subsidised housing in the form of cooperatives provide high quality apartment living with sunspaces and water views

Smaller building plots allowed a rich variety of designs within a strict masterplan. Historically, smaller floor plates have proven to be inherently flexible in use over time

Facilities

- The masterplan does not contain specific cultural themes but cultural provision is planned and much is under construction or complete. An international Maritime Museum is virtually complete, a science centre and aquarium is planned (designed by Rem Koolhaas) as well as the Elbphilomoniie concert hall for 2,200 people (designed by Herzog & De Meuron). A 5-star hotel will adjoin the concert hall.
- At this early stage, medium and small scale cultural events are being organised by various cultural foundations. There are performances, competitions and exhibitions, often using public spaces as venues.
- Provision is planned for daytime nursery care of children. Some will be located outside the area, in new elementary schools, and some will be provided in dedicated accommodation.
- An existing elementary school is being rebuilt to provide whole day care, which encourages community use and provides an educational establishment close to the parents' place of work.
- Space has been allocated for additional schools, which will be built as demand increases. The new secondary school will not be able to cater for all pupils at peak demand and some pupils will have to attend schools outside the area. The new schools will have their own outdoor space a few minutes away.
- By placing schools close to employment, it is intended to support family oriented living and promote women's employment.
- A new university will be built, oriented towards the built environment, and based on existing Hamburg educational establishments.
- A sports ground of between 1 and 1.5 hectares will be provided, integrated into one of the parks.
- No new places of worship are planned but consideration will be given to representations for such provision.
- There will be many shops, restaurants and leisure facilities.

Community engagement

• The masterplan is the result of an equal contribution from public planning debate, the ideas from an international design competition and political decision making.

Connectivity

Wider context

- Good public transport is seen as important if the area is to be attractive and good values are to be achieved.
- Easy access by commuters to jobs generated in the area is important.



External connections

- The public transport been integrated into the existing systems of the adjoining areas.
- Metro stations serving two existing lines have or will be constructed. Otherwise buses will serve the area. Its capacity will have to be large enough to serve both residents and those visiting for employment or other purposes. Trams have been discounted for the moment but will be reconsidered within the context of Hamburg's overall transport needs.
- Water borne transport services are being developed.
- Existing bridges will not have sufficient capacity to serve the volume of traffic when the whole development is complete and they will be improved. Because circumstances change, the detailed decisions on the scope of work at each existing bridge will be left until action is required.

Internal connections

- There is vehicular access to all buildings. The road layout is conditioned by the layout of the existing quays.
- The cycle ways and pedestrian routes form part of the open space and will provide links between different neighbourhoods and bring riverside walking close to the city centre.

Canals and listed warehouses separate HafenCity physically from the city centre, but many bridges connecting the two mean it is just 5 – 10 minutes walk • For every 5km of road, there will be 9km reserved for cyclists and pedestrians. 70% of the footpaths are not adjacent roads but run along promenades and squares, while 30% lie alongside the water.

Dealing with the car

• Hamburg's normal parking and cycle policies will be applied. It is estimated that 20,000 parking spaces will be required on private property. Much will be in underground parks, but some will be in the streets.

Climate Change

Key targets

- Economic use of energy and sustainability.
- Noise reduction.

Methods

- Heating will be provided by a mix of district heating and decentralised heat generation plants and solar thermal installations. Also and solar energy.
- Gas will power electricity generation and district heating.
- Combined heat and power (CHP) is being considered, a prototype CHP using Hydrogen fuel cell technology is in operation.
- In a recent tender for heating in eastern HafenCity, a CO₂ limit has been placed on the heat supply system with a cap of 200kg/MWh. It is intended to reduce this to 175kg in the future. This represents a 27% reduction in comparison with modern individual heating systems.
- Power requirements for residential building are set at 60kWh/m² or 40kWh/m². For commercial buildings, they are set at between 100kWh/m² and 190kWh/m².
- It is anticipated that subsequent heating tenders will specify lower limits.



High quality public realm expressed in street furniture, lighting and details

- Unobstructed south facing elevations over the quaysides provide opportunities for solar energy.
- Noise nuisance is being addressed. Residential locations and design take account of industrial noise from the harbour opposite the site, controlled through public regulation. Sales contracts on land define noise generation for commercial uses.
- Aquatic and other habitats for endangered species will be protected.

Construction

- New standards are being set for environment friendly construction, in the design, methods of construction and materials used.
- Buildings will be elevated by a minimum of 7.5m above mean sea level to provide flood protection and be connected by flood protected roadways. Building ground floors to provide parking space.
- Environmental impact studies were, or are, being undertaken covering soil contamination, noise and odour pollution.
 A detailed ecological study was also included in the investigations.
- Rainwater will be drained into the river but studies will be undertaken to access the potential of a basin and ditch system for retention and pre-treatment.

Information and support

- The competitive process for selecting developers placed a premium on climate change issues (see section on Delivery).
- The City offers awards for high environmental achievement, a Silver and Gold standard.
- Criteria for awards include reducing primary energy consumption within buildings, providing sustainable public facilities, incorporation of ground floor open plan public spaces such as cafés, restaurants or shops, use of environmentally friendly building materials, high internal environmental



By retaining a high level of control through the design period the Delivery Agency has ensured highest quality in design, use of materials and detailing

standards (air quality, light, heating level etc) and use of low maintenance materials.

• When sites are marketed, purchasers are selected on the basis of the quality of the proposals they are prepared to build. This may involve a sale by the City of land at less than highest value.

Collaboration and Process

Vision and leadership

 The development has been led by the City, who has been able to maintain its vision and momentum because it effectively owns all the land and has the technical ability to analyse and understand the issues and the finance to accept less than best value for land so that quality is maximised.

Special structures

- HafenCity Hamburg GmbH is legally responsible for the development of HafenCity. It is fully owned by the city of Hamburg. The City Development and Environment Agency has assigned building permit procedures to a separate task group and, as of 1 October 2006, HafenCity has been given the status of 'priority area'.
- The City Parliament considers key elements in the development plans through a development committee especially created for this purpose. The intention is to achieve fast decision making but not at the expense of quality.

Planning process

- An initial masterplan was conceived which encompassed the City's objectives. It is flexible and allows for change without threatening these objectives. The City's control of land, through ownership, is crucial to the maintenance of the vision.
- Changes to the masterplan are presented to the City State Parliament for approval.
- The masterplan specifies the character of each of the neighbourhoods, although those to be developed later in the development are open to change. This character is generated by predominate use and the appropriate sizes of plots, and sizes of enterprises invited to develop to support these uses.
- There is a flexible approach density. The original masterplan allowed for
 1.5 million m² of gross floor space, but because it has been proven possible to increase this by placing buildings closer together, without increasing heights or

effecting quality, the estimated area is now 1.8 million m². With additional sites, it is conceivable that this will rise to 3 million m².

Delivery

- Design competitions have played a major part in developing the masterplan.
- Because the City owns the land, is the planning authority and has a high technical capability, it is able to control the nature of the development
- Most of the land, approximately 88 hectares is owned by the City of Hamburg. By act of parliament it was transferred to a body, 'Special assets - City and Port'. Deutsche Bahn AG, (German Railways) owned a piece of land approximately 30 hectares in size plus other land. Further parcels of land were, and still are, privately owned.
- The City has purchased land from the railways and from some of the private owners.
- Total size of the area to be developed is 155 hectares, of which 55 hectares is water. The net building land is 60 hectares in area.





There are hidden open areas within building plots

Some plots have large commercial buildings

- Decisions have been taken on a step by step basis, within the neighbourhood based framework of the masterplan, through a programme that will spread over 25 years.
- Planning will remain flexible but adhere to the concept of each neighbourhood having its own identity and character and that they will be able to function independently of what is undertaken in later stages.
- The selection of developers is based not only on financial capacity but also on commitment to quality and innovation.
- Land is advertised and assigned to investors through a competitive process.
- The selection of residential developers is not based on their financial offer. The sites are advertised with a fixed bid price and candidates are selected on the quality of their offer. Importance is placed on providing a range of housing tenures.
- For non-housing lots, there is generally no invitation to tender. Instead, companies wishing to occupy a minimum of 50% of the lot/building for themselves must submit an application to the City. Following a review by Hamburg's business development agency, they will then be treated as 'business development cases'. The following process ensues:
 - land division committee approval
 - companies enter a competition
 - detailed costed proposals are prepared, sufficient to receive building consent
 - a contract is entered into which encompasses the design and intended uses of the development
 - building permits are frequently issued at the point of sale and developers are obliged to commence construction immediately.

The process typically takes up to 18 months and ensures detailed quality control by the City.

- The process:
 - ensures quality developments;
 - strong coordination of programmes;
 - avoids speculation;
 - increases certainty and reduces risk
 - enhances value.
- Land will be repossessed if Developers do not seriously pursue their projects.
- Developers comprise of cooperative building societies, joint building ventures, multi-proprietor developments, and housing schemes for the elderly and developers / investors.

- Works will be undertaken from west to east to avoid construction sites across the whole area at any one time.
- Market studies were undertaken to assist in deciding the amount of space and rate of allocation to different uses, to ensure a balanced built environment at all stages.



Character

Context

- As a city centre extension, HafenCity has a very strong urban grain with a mix of uses, emphasising a number of themes which include employment activities, residential accommodation, the arts and leisure.
- It is intended that there will be a seamless join to the existing city centre and connectivity is emphasised.
- It is located on the site of the 19th century dockyard. The basic quay structure has been retained and the warehouses adjoining the site have been, or will be, refurbished and brought back into use.
- The appearance of a port is retained. Water is an overriding theme - the existing quays define the layout; they provide vistas and opportunities for leisure, landscaping and open space.
- Particular importance is placed on the proposed cruise ship terminal at Strandkai quay, the revival of the historic port in Sandtorhafen and new marinas in Grasbrook and Baakenhafen harbours (each of these are neighbourhoods within the total development).

Masterplan

 HafenCity is divided into 13 quarters (or neighbourhoods), some of which have subdivisions of different characters, mixes of uses and which will be built out in a logical construction sequence. The planning Second phase of the 13 phased project, Dalmannkai. Land value fixed and developers are chosen on quality of design, development concept or usage guidelines for each area will take account of these differences.

- Some uses require small buildings while others operate at a large scale which can create conflict. The town planning has accommodated both by modulating their location in buildings, both horizontally and vertically, and in different quarters or neighbourhoods.
- The members of the visiting team felt that the mix of floor plate sizes was a big advantage. The smaller ones offered models for London waterside development.
- A number of public buildings create destinations and focal points, which includes a new opera house and a maritime museum.
- Good public transport will reduce the need for private cars.

Design coding

- Each of the neighbourhood has design parameters, which relate to plot sizes, heights and uses.
- Innovation is encouraged.

Landscape

- The landscape strategy envisages connections to the green spaces in the region. The landscape at HafenCity will be directly connected to the Wallanlagen parks (former city fortification) and on to the network of waterside footpaths along the River Elbe.
- Quays have and will continue to be transformed into wide promenades open to the public. They form part of the open space strategy with large highly detailed landscape areas at the dock ends, providing vistas over the water. The larger public squares will be supported by a number of smaller squares, whose designs take account of the uses in the adjoining buildings.
- Open space will have varied typologies and diverse vegetation which compliment the individual identity of each quarter. There will be easy access to the waters edge.
- A total of 5.8 hectares near residential areas has been designated for parks. In addition there is 3 hectares of private green space. Promenades and squares will cover an area of 11 hectares.

Look and feel

• Very much a mixed use area. Each neighbourhood will have its own identity but all are overtly city centre environments. Densities are high.





The quays are well landscaped to encourage interaction and recreation but also to ease pedestrian movement across the site

- Floor plate index averages 2.5, rising to 3 in some places (excluding water areas).
- There are both mixed use buildings and also single use buildings.
- The architecture is modern, the new blending with the adjoining old warehouses.
- A large number of Architectural practises have worked on the site, many of international standing and often selected by competition.

Scale of streets and variety of buildings with integrated mixed use all help create a pleasing urban character

Costs

- Private investment: approx. €5.0 billion-€5.5 billion
- Public investment: approx. €1.3 billion

Price structure of residential property

For example Dalmannkai, with approximately 45% rental apartments:

- Free rental housing market: between €14/m² and €17/m²
- Cooperative rental housing market: between €9/m² and €13.5/m²

Owner-occupied apartments:

- From approx. €2,900/m² (joint building ventures)
- Above €3,500/m²-€4,500/m² (developer managed projects)
- Up to €6,000/m²-8,000/m² (luxury market projects)

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Visit by Study Group

Case Study Kronsberg, Hanover, Germany

O BERLIN Kronsberg

Kronsberg, Hanover, Germany



Introduction

Kronsberg was built to meet severe housing need in Hanover and in particular that arising from the world trade fair EXPO 2000. Work started on site in 1995 and by 2000, nearly 3,000 units were completed, covering 100 hectares. The planned size is for 6,000 homes providing accommodation for 15,000 people. The legacy of the EXPO continues to provide local employment opportunities, which now number 3,000 jobs.

Kronsberg is an urban extension on the edge of Hanover, built on farm land which had been designated for housing for many years, although no masterplan had been prepared. The City masterminded the housing and has provided visionary leadership, for which a commitment to the United Nations' Agenda 21 played a dominant role. Both social and green sustainability have driven the design and implementation.

At commencement, an Environmental Impact Assessment was undertaken, which has been updated regularly. This has driven a strategy that has achieved big savings in energy consumption, construction waste and rain water run off. Other features, such as soil conservation and ambitious social goals, have also been achieved.

Kronsberg is a convincing demonstration of the feasibility of sustainable development in a post-industrial society. Independent studies confirm the environmental achievements and the popularity of the housing.

The City attributes its success to the integrated planning process. By UK standards, the local authority played a massive role, providing leadership, setting high environmental standards, establishing and funding policy and implementation bodies, as well as by providing subsidies.

In discussing transferability to other projects that have high environmental, urban design and social objectives, the City authorities emphasise the need for integrated development planning that involves all specialist directorates of the local authority, at an early stage. They suggest that extended public participation should be a route to quality conflict-free dialogue between local people and the city authorities. Kronsberg aerial view. Access to well designed open space was fundamental to the strategy of minimising building footprints, optimising land use

Assessment

Look and feel

The new district runs roughly north-south along the western slope of Kronsberg Hill beside the new tramline. It is laid out across the contours in neighbourhoods with their own distinct identity, each of them grouped around a neighbourhood park, and bordered by park corridors or green zones along the streets.

The appearance of the district is shaped by its wide-meshed rectangular grid layout, which creates frames for very varied block structures. Buildings are restricted to 4 storeys, although some are as low as two storeys. High-density reduces the land take. A design code controlled storey heights and other key design parameters.

The main connections with the rest of the city lie along one perimeter of the development, and while this ensures that noise and disturbance is minimised, it has meant that shopping is limited to this perimeter.

This development is essentially residential, with shopping and social facilities only sufficient to meet the needs of the residents, and not a wider community. The adjacent EXPO development has meant that employment uses are effectively off-site, even though very local. Kronsberg feels like a residential neighbourhood, with plenty of open space and, in addition, close proximity to the countryside. It has a relaxed suburban and open feeling, even though in places the housing density is relatively high.

Success factors

An emphasis on the objective of Agenda 21, and a delivery mechanism that ensured that standards were not diluted as the development was implemented.

An environmental agency, KUKA (Kronsberg Environmental Liaison Agency), was set up, which spearheaded and managed the successful environmental achievements.

A system of ongoing environmental audits which was used to steer the evolution of the masterplan and subsequent site plans.

The four private land owners agreed to meet the City's design guidelines and forego large profits on their land. This cooperative attitude avoided the need to use compulsory purchase powers available to the City.

Extensive public consultation and participation led to a conflict free dialogue between the City and local people.



The City had the necessary extensive powers, through land use contracts and bye-laws, to provide a coherent framework for the whole development, and to ensure planning objectives were not diluted as construction proceeded.

Energy saving targets of 60% improvement over 1995 levels were met.

Comprehensive social objectives, such as targeting low income households, provision of community infrastructure, were met.

Difficulties

The central area seemed a little unused, windblown and uninviting, possibly because there were insufficient uses to attract more than very light continuous pedestrian traffic.

Some accommodation for older people was to be provided near to the central area by a private company, but had to be cancelled because of lack of interest. Kronsberg siteplan 3,000 new homes within a comprehensive plan for landscape design, social amenity access and low energy

Community

Social context

- There was a severe housing shortage in Hanover in the 1990s. EXPO 2000 which was to be held in the city offered an opportunity to develop and showcase a new eco-friendly housing development under the motto 'technology, nature, humanity'.
- Much of the first phase of the housing was allocated as temporary housing for EXPO and therefore had to be completed to a strict timetable.
- The adjoining housing areas were regarded as attractive. The EXPO site offered employment opportunities.
- Most of the housing is rented and provides accommodation to people born outside Germany.

Objectives

- The City of Hanover wanted to present a comprehensive vision of urban planning and construction, optimising eco-principles using all available knowledge.
- The objectives of Agenda 21 were prioritised and from the start, sustainability was a key element that guided design, procurement and allocation of the housing.
- The aim was to provide for a broad social mix, and complex measures were taken to achieve this (see Collaboration and Process).
- A mixture of large and small units was seen as important to allow for change. The objective was to avoid social segregation by mixing various forms of housing finance and ownership, and limiting the number of units to which the municipality could nominate low income residents. Provision of social infrastructure, such as schools, was specified, as well as layouts that encouraged a sense of neighbourhoods. Social facilities, such as meeting places and open spaces, were specified. It was seen as crucially important to develop the social and cultural infrastructure in parallel with housing construction.

Housing mix

• The City wished to create a viable community and as such, specified the tenure and mix of units; made pepperpotting requirements and in the early stages, limited the number of units to which they would allocate people from the social housing waiting list, and specified the community infrastructure in great detail.



- 6,300 people live in the first two stages. Of the 3,000 homes, around 300 are owner occupied, the rest being publicly subsidised – almost a third of which are taken by residents nominated by the City from its social housing list.
- Unlike other development areas, such as those dating from the 1970s, there are no voids and a strong demand for apartments.
 We were told that the varied dwelling sizes and types were liked by young couples.
 They were able to move to larger family accommodation as their needs grew, without having to leave the area.
- The housing mix provides for families; 10% studios, 35% 1 bed, 40% 2 bed, 14% 3 bed and 1% 4 bed. Space standards are higher than the UK.
- Threshold for access was set low, values kept low, mix and tenure was designed to be attractive.
- It is not a high value area. However, there has been no problem in the take up of accommodation and the area is popular with specific groups of people.
- Rented accommodation was developed and let by large property companies as well as by cooperatives.

Facilities

• Specific development blocks were designed to achieve a social objective. The Focus housing project's decentralised care system makes it possible for elderly and disabled people to live independently. The Habitat project brings together German and foreign Krokus. The neighbourhood resource centre expresses the civic pride through its double height facade and generous modern design



residents, providing housing that reflects their own cultural traditions, in the same development block. Eighteen different nationalities live across the development.

- There are comprehensive community facilities, many located at the centre of the development but at the edge close to the adjoining tram line. These facilities include a shopping centre, church centre, community centre (including a library), business accommodation in mixed use blocks and a health centre.
- Additionally, community rooms are dispersed across the site and play activities and schools are located along the perimeter.

Community engagement

- The important role of stakeholders, and the complexity of addressing their concerns, was recognised early on and taken into account as the concept was developed.
- The Kronsberg Advisory Council was set up to manage the project. It included investors, property developers, architects, civil engineers and construction companies as well as the local authority.

Connectivity

Wider context

- Planning for the new Kronsberg district is in accordance with the 'Regional City' model formulated in the 1960s, which foresaw development wedges of high density expansion along the city's tram and local rail network.
- There is an overall transport concept linking the area with the rest of the city. This is designed to serve the residential development as well as the EXPO site.

External connections

- A new train station and tramway were among the transport infrastructure improvements. The city is only 17 minutes away.
- The area is served by two train (S-Bahn) lines as well as by a tram line. Distance between stops is 550m. A bus route provides other cross-connections.
- Through road traffic is channelled along the edge of the development alongside the tramline.



Internal connections

- The public infrastructure is decentralised, so most facilities are within easy walking distance; however the shopping is all located at one place at the centre edge of the site.
- Cycle paths and pedestrian ways serve the whole site.
- The grid pattern of the roads, the development sites and location of the local open space provided within the development sites present easily understandable routes for pedestrians and cyclists.



Dealing with the car

 Traffic within the development is highly controlled. There are no through routes, narrow sections on the road and 25kph zones. There are also traffic calming measures. Community rooms spread across development. This one is in centre of local open space

Although a suburban extension, the new tramline provides quick access to the City

A policy of safe and pleasant walking routes through the site ensure good non-vehicle connectivity

- All houses can be reached by car.
- The parking ratio is 0.8 within building curtilages, compensated for by a 0.2 increase in parking ratios on the public roads. (i.e. 80% of the parking is on private land.)
- Car parking is arranged in small areas, either set into the hillside or at ground level. A third of the spaces are below ground.

Climate Change

Key targets

- Agenda 21 provides the inspiration for addressing climate change.
- Carbon Dioxide aimed to reduce CO₂ emissions by 60% based on national construction standards, 1995 insulation regulations and gas fired decentralised energy provision. The 60% was made up by 7% on quality assurance (i.e. airtightness), 17% building fabric, 23% through combined heat and power (CHP) and district heating and 13% on low energy lighting. This was to be achieved at no extra cost.
- A further 15% reduction in CO₂ was achieved through specific grant funded initiatives.
- The standard for the maximum use of heating energy for housing was 55KWh/m²/yr and all non-housing buildings had to achieve insulation values of -30% on the 1995 standard.
- Wide deviations in consumption in very different apartment types occurred, which were attributed to drying out time required for buildings, and a learning period necessary for residents. By the third heating period (2000-2001), a consumption of 55KWh/m²/yr was achieved.
- A target of no more than 3 litres per second and hectare was set for the release of water into the drainage system.

Methods

- A complex Environmental Impact Study was undertaken, made more important because of EXPO 2000. It commenced in 1994 and was undertaken in 5 stages, each going into more detail than the one before. It was seen as an ongoing process, through the postutilisation phase, extending over at least 10 years. The primary aim was to go beyond issuing warnings about ecological risks, but also to guide the process.
- A Kronsberg Standard for environmental standards was devised and made legally binding through land sale conditions and other relevant regulations and bye-laws.

Cumulative reduction of CO₂ emissions at Kronsberg

This shows a 60% carbon reduction was achieved prior to consideration of renewable energy generation



- A Low Energy Housing standard (LEH) was established.
- A penalty payment of €5/m² for non-compliance to the LEH standard.
- The Kronsberg energy concept was devised by employees of the city's energy utility, Planning and Environment directorates. It employed a local consultancy to devise an aims-oriented system and to evaluate options. It also looked at possible demand side reductions in energy consumption.
- Ecological optimisation was subdivided into 5 themes:
 - Energy efficiency optimisation
 - Rainwater concept
 - Waste concept
 - Soil management
 - Environmental communications

- Energy objectives were:
 - In all areas, priority was given to energy saving over other aims
 - Use of Combined Heat and Power
 - Use of renewables
 - Housing to achieve maximum heating energy usage of 55KWh/m²/yr²
 - District or waste heating to have priority
 - Heating should be centrally provided
 - Washing machines and dishwashers should be connected to heating by short pipe runs
 - No electrical heating
- Electricity and heating is provided by gas powered CHP stations. It is a legal requirement for all buildings to connect to a district heating system.
- There were a number of competitions to identify further ecological and energy saving measures. Nine submissions were provided with funding. These include Lummerland Passive Housing Development, which comprises 32 terraced family houses which utilise high levels of insulation and heat recovery systems. In 2000, consumption figures were close to the target of 15KWh/m²/yr and in some cases lower. Another initiative is Solarcity. It is a social housing complex of 104 dwellings, heated by solar power. In the summer, surplus solar energy is piped to a well insulated cistern which returns the heat to the dwellings during cold periods. It provides for 40% of the heating needs of the dwellings. Limited use is made of photovoltaics for electricity generation.
- Wind energy is the most important use of renewable energy. Two turbines were in operation by 2000, one a 1.8MW converter and the other rated at 1.5MW.
- Water management was directed to reducing drinking water requirements, avoiding overloading drainage systems and not starving the water table of run off.
- Poor soil permeability required a sophisticated system of local and semi-local retention and controlled release into streams. Therefore, rainwater retention is provided by both public and private open spaces.
- After completion, a financial assessment showed that the drainage system was cheaper than the conventional approach.
- Drinking water reduction was achieved through fitting water saving devices and environmental education measures.
 Experience at the EXPO site showed that piping 'grey' water for non-drinking uses

(e.g. toilets) was likely to be expensive and could cause serious hygiene problems.

- The waste strategy covered both the building process as well as the needs of residents.
- Recycling requirements included provision for waste sorting in dwellings, areas for composting and local facilities for low waste shopping.



Construction

- Construction materials were chosen to avoid use of waste that would be expensive or difficult to recycle.
- Excavated soil was used locally for landscaping to avoid truck journeys and the mixing of local soil types in other areas, which could upset the biological balance in the area.

Information and support

- KUKA, the Kronsberg Environmental Liaison Agency was set up to support the process.
- Subsidies to developers were provided to improve energy performance. This was up to 50% of the expense with an upper limit of €5/m² of living and useable space. There was a further subsidy of €25 per hot water connection to washing machines and dish washers. Free low energy light bulbs were distributed to residents. Grants of €50 were offered for electricity saving appliances such as washing machines, fridges etc.
- There were numerous demonstrations, publications and help lines available to assist people to respond to the energy initiative.
- Land sale contracts specified minimum standards.

Solar collectors feeding an interseasonal heatstore are being trialled on one block

Collaboration and Process

Vision and leadership

- The local authority inspired and drove the development.
- At the outset, there was recognition that the new standards aspired to would require carefully guidance during the whole period of planning and construction, and new legal and organisational instruments were put in place to manage this.
- There was early recognition that to achieve the radical concept, an initial priority would be to convey the vision, new standards and quality benchmarks to all stakeholders.

Special structures

- The entire area was transferred into the planning jurisdiction of the City of Hanover to allow them to oversee the adjoining EXPO site, surrounding countryside and transport policy.
- There was time pressure on the planning process as it had to meet the timetable requirements of EXPO 2000. The Kronsberg Advisory Council was set up to expedite the process and included the local authorities, investors, property developers, architects, civil engineers and construction companies. The City used this forum to introduce its aims and objectives to the other stakeholders.

Planning process

- There was a history of proposals for the area going back as far as the 1950s.
- There were essentially two stages; the first covered all the preparatory work prior to construction. The second phase covered implementation of the overall concept with all its many components.
- The first stage included political decision making, studies into the environmental impact, transport and shopping, services concept etc. Before statutory planning procedures began, the City staged a series of competitions to test approaches to the overall concept and objectives, and to examine ways to address a multitude of issues, including; landscape, town planning, house construction, traffic, green space, social and cultural infrastructure, energy, water and waste.
- The EIA framework provided the basis of evolving the plan. It had 5 phases, each building on the results of the previous stage:



- 1. An assessment of the impact of EXPO 2000 on the whole region
- Preliminary investigations to clarify basic design guidelines and location of key activities (the EXPO Centre, roads etc)
- 3. More detailed studies to compare different design strategies
- 4. Studies relating to specific planning proposals (potential applications)
- 5. Establishment of environmental accounting methods, which would be used throughout the life of the development and beyond.
- The feedback from tracking the ongoing environmental impact was taken into account in planning decisions.
- The second stage comprised implementation, often based on individual construction projects, each of which might require its own series of planning and other permissions.
- The planning approach was based on the principle that residential development should, in the main, expand along local rail and public transport routes. Planning competitions covered the entire area, including the EXPO grounds, the countryside as well as the new settlement.



Although a low energy house standard was mandatory to all, some developers went further and achieved 'Passivhaus' standards

Passivhaus design.

Delivery

 Design competitions played a major part in creating the masterplan and its subsequent evolution. Of the 3,000 dwellings, 400 were built as family houses for private tenure. This helped create a stable, attractive community at an early stage

- Over 40 architectural practises worked on the site, bringing variation and interest to the architecture. The styles are welded together through the grid layout of the streets and the landscape.
- Discussions between the City's Construction and Social Services Directorates where held to identify social objectives. As a result, provision was made for a broad range of social classes and types of people, integrating ethnic minorities and specialist facilities for older and disabled people into the overall development.
- A complex set of processes were set in place to achieve the social objectives:
 - Incentives were provided to ensure pepperpotting of different social groups on each development site. This had an impact on the mix of dwelling sizes and types as well on the values and tenure.
 - Subsidies were provided to developers through grants and incentives because of the poor state of the housing market in the 1990s. They were allowed to provide 500 units of the social housing off site in order not to have too many at Kronsberg. 2,700 of the homes received public subsidy. 1,050 were used as accommodation for EXPO personel.
 - Energy objectives were achieved through placing conditions on land sale contracts, use of bye-laws and subsidy for the social housing. The City produced guidelines and held seminars for designers and developers.
 - The municipality renounced its right to allot units to people on their housing list for the first tenancies.
 - 200 terraced houses were built (about 10% of the total in the phase). They were erected early to create a positive image and to provide stability for the new development. Values were kept low to attract new families.
 - Specific development blocks were designed to achieve social objectives, such as the Focus and Habitat developments (see section on Communities).
 - Public authorities owned 60% of the land and most of the remainder was owned by two construction firms and two farmers. They all cooperated and therefore no compulsory purchase was required. Land sale contracts had conditions attached regarding; specified low energy standards, use of the rainwater management system, commitment to the City's construction waste management scheme, participation in the soil management scheme, and acceptance



of nature conservation requirements (tenure and mix was controlled through the use of subsidy).

 The planned rate of build could not be maintained because of a slow down in demand. As there is no scarcity of housing in Germany, the market regulates output. (By contrast in the UK, where although there is scarcity, output can be constrained by lack of grant, cheap loans, the planning process and developers need to maintain some scarcity to keep values up.) 70% of new family houses were purchased by previous Kronsberg residents.

Character

Masterplan

- The masterplan is based on an orthogonal grid, with the main public transport artery running along one edge of the development, and the commercial / office zone beyond that to the west. Along the other edge is the green belt, with both productive farmland and recreational open countryside and woodland.
- The new development is laid out across the contours in neighbourhoods or development blocks, with their own distinct identity, each grouped around a neighbourhood park and boarded by park corridors or green zones along the streets. Buildings are restricted to 4 or 5 storeys, although some are as low as 2 storeys.
- The development blocks have been arranged in grids of nine square plots, allowing eight building blocks around a central open green

Mixed use blocks. Here an under 5s nursery integrated into a terrace of houses and flats square. The grid layout and open space planning is designed to help unify many different approaches to construction and style.

- Density and building height reduces towards the countryside. The highest densities, with a floor space index of 1.2 were achieved in 4 and 5 storey blocks along the main access road at the bottom of the Hill.
- Approaching the hilltop, the development becomes looser, with 3 storey blocks and pavilion structures giving way to a terraced house development beside the border avenue.
- The dimensions of the development plots (1.2 hectares and 1.8 hectares on the uphill side) are relatively large, and the proportion of public access space is thus comparatively low.
- Most of the buildings are aligned to the contours of Kronsberg Hill, which makes the best use of natural light from the east and west.

Design coding

- There are specific guidelines for the layout of the housing. The wide-meshed rectilinear grid provides a framework for the varied block structures.
- High densities were required to reduce the land take.
- Design parameters set the number of storeys, building heights and building lines along the street, to provide an urban quality.
- All corner plots were required to be built upon.

Landscape

- Landscape is a vital element in defining the layout.
- Five transverse green corridors, and the hilltop woodland parallel to the development, create the primary link to the adjoining countryside. A differentiated system of interconnecting public, semi-public and private areas offers green space throughout.
- Children's play space is located at the juncture of the development with the countryside. There is also play provision within each of the development blocks.
- The location and distribution of the neighbourhood parks make a strong contribution to the legibility and design quality of the district.
- All streets are laid out as avenues and trees define the streetscape. Different varieties in each neighbourhood help create individual



character. Soakaway hollows and gravel filled trenches to take rainwater run-off are integrated into grass verges.

- Each building design had an associated open space plan, for which the municipality set ecological standards.
- Almost all homes have private outdoor space, whether garden, balconies, loggias or rooftop terraces.
- Following practice in many northern European countries, but unlike the UK, some



of the provision for very young children is closely integrated into the housing, in the form of accommodation on the ground floor, with fencing and security provision that is little different from the adjoining housing.

Look and feel

- There is a very open feel to the development as a whole, with generous roads and green spaces across the site.
- The architecture varies from plot to plot. Each has its own character, some quite dense, up to 5 storeys in height, while others comprise 2 storey terraced housing.

Simple building forms set in well designed, free flowing garden providing play areas, safe pedestrian routes as well as combating climate change

- The highest densities are at the compact 4 to 5 storey blocks along the main access road at the bottom of the Hill, which have a floor space index of 1.2. Densities decrease towards the countryside and here, some of the housing could almost be 2 storey English terraces.
- The plots are relatively large (1.2 hectares and 1.8 hectares on the uphill side). The proportion for public access space – at 19% of the 70 hectares for the whole site – is small. Despite this, overall, there is a sense of openness and a generous amount of open space.
- Taking advantage of the sloping site, many buildings have stepped storeys with roof top terraces. Facades are typically of light coloured rendering or red brick, with some exceptions.
- The central area was not particularly attractive, and the shopping was a little far from some of the housing.
- The external environment felt safe and was well looked after. The day previous to our visit, a group of school children had cleared the drainage channel of rubbish. By British standards, there was a pleasing lack of security measures. The fencing to an under-fives provision comprised of no more than a low picket fence.

Costs

- Execution of the project, including EXPO, was largely third party financed. The municipality's share of the €2.2 billion was €77,000 financed by a bond.
- Planning benefit was ring-fenced and made available for infrastructure in the new development area. Through the land redistribution regulations and the urban construction contracts, the private sector landowners were obliged to contribute to creation of the local infrastructure. In this way, most of the necessary funding was made available.
- In the first construction phase, the public services infrastructure for around 3,000 homes required around €61 million.
- Housing construction for the private sector was subsidised with around €150 million made available through preferential loans and subsidies.
- In total, for the first construction phase from 1997 – 2000, more than €500 million was invested by both the private and public sectors.

- Additionally €300 million was invested in the tram route to the EXPO grounds and Kronsberg, and a further €175 million on other buildings.
- The ecological soil management produced financial advantages for the City. Free soil, suitable for landscaping was made available, and spoil removal and construction site costs for landscaping were reduced.
- The sustainable rainwater disposal system proved to be 8% cheaper than conventional systems. We were unable to ascertain whether there was a significant difference in the cost of ongoing maintenance.

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Case Study Hammarby Sjöstad, Stockholm, Sweden

Hammarby Sjöstad STOCKHOLM

Hammarby Sjöstad, Stockholm, Sweden



Although higher density and mostly apartments, Hammarby has nevertheless attracted many families with children

Introduction

First conceived in 1990, Hammarby Sjöstad is Stockholm's biggest modern urban development. It will provide 10,000 residential units for 20,000 people, rising to a total of 30,000 people living and working in the area when completed in 2016.

Located south of Stockholm's city centre and designed to continue the inner city pattern, the scheme is sited on former industrial land around the lake of Hammarby Sjö.

The genesis of the present scheme was a bid to host the 2004 Olympic Games on the site. Land purchase by the City, decontamination works and infrastructure was commenced well before the decision was made by the Olympic Committee. By the time the City learnt the bid had failed, £77 million had already been invested. The special committee to take the bid forward was used to progress a new extension to the City.

Housing demand in central Stockholm had until then been met by improving historic buildings but by the 1990s, the supply had dried up, and there was unmet demand and pressure for new accommodation close to the city centre.

The scheme has been designed around a holistic programme of environmental and social sustainability with a comprehensive approach to infrastructure.

The masterplanning of the scheme has been led by Stockholm City Council, with the

environmental programme developed by their partners Stockholm Water Company, Fortum Energy Company and the City of Stockholm Waste Management Administration.

To date, the scheme has and continues to be a success story. It is a model of a holistic approach to sustainability, and is well liked by residents, as underlined by increasing house values.

Assessment

Look and feel

Hammarby feels modern but still has a uniformity and look which relates to traditional forms in the adjoining City centre. Small blocks are set within an attractive landscape of well Hammarby is an extension of Stockholm city centre - the development in red at the bottom right of the image



detailed courtyards and waterside walk ways, ensuring all flats have a view of greenery or the water. Connectivity to the City is good and increasing house prices reflect its popularity and success.

Despite the fact that the development is comprised of flats, there are a large number of children (16% of the population), perhaps reflecting that good and generous landscaping, with good management, can overcome the demand for private gardens.

Success factors

- A demand for housing in the area, and employment opportunities close by.
- Strong visionary leadership, provided by the City's planning department.
- An integrated, multi-disciplinary project team with common goals. The City of Stockholm established a dedicated project team for Hammarby Sjöstad responsible for all aspects of the project.
- A partnership approach, led by the local authority. Working with developers and their architects led to high quality design and successful delivery. Open working arrangements drove up the standard of design.
- Agreement by local and central government on the form of infrastructure, especially transport and its funding.
- Coordinated and careful masterplanning and detailed design, assisted by the use of design codes drawn up in conjunction with private developers.
- Acceptance of the car, but with underground parking provision to reduce its impact on the environment, associated with good public transport and incentives to reduce car usage.
- Sustainability as a mainstream element, not an add on. Ongoing commitment through educating the community and the raising of standards over time.
- Use of mixed tenure and provision of shopping, leisure and other social infrastructure.

Difficulties

- Changing political complexion of the City Council meant that policy with regards to tenure mix, number of cars and provision of social infrastructure, changed at every change of administration.
- Long and difficult negotiations between different local authorities and central government over funding of the infrastructure.
- School provision is not ideal, due to changes in strategy by the City. More schools are having to be built.

- Shops were initially difficult to let and rent free periods were offered.
- Additional places for the community are considered desirable.

Community

Social Context

- Sweden has a long tradition of high quality housing and has sought to ensure that there are enough homes for all who need them. Its post-war 1 million homes programme eradicated housing shortage in general but it created many of the same problems that were experienced in the UK's housing of the 1960s and 1970s.
- It re-thought its approach to housing and abandoned the concept of social housing as being something separate from the mainstream. It no longer subsidises houses but rather, it allows people to occupy their own choice of home through a system of housing allowances or tax breaks.



Objectives

- Hammarby Sjöstad was conceived as a mixed income area close to the City centre, which would arrest suburban sprawl and replicate the popular housing of the city centre.
- The scheme was developed entirely as apartments, and the City and developers thought that it would attract mainly young couples or empty nesters. In reality, it has attracted far more families with children than was envisaged. This was made possible because of the generous sizes of the flats and the child friendly nature of the open spaces.
- The scheme was also developed to be highly sustainable in terms of the environment and the lifestyle of the residents.

The development does command high values due to the proximity to the city centre and the high quality of design

Housing mix

- Tenure is hardly an issue in Sweden. However, there is a mix of private developer housing for sale and rented housing developed by local housing companies and there is no significant distinction between design of tenures, which are separated on a block by block basis.
- The balance between private development for sale and Housing Company rented has varied through the course of the scheme, and has fluctuated in line with the changes in political complexion of the Council.
- The scheme has been criticised by some because it has become expensive to buy and to rent. This is due to its success in attracting people to its high quality green environment near the City. Service and management charges are high.

Facilities

- A privately financed school for ages 1–16 years was built on site at an early stage. This proved inadequate due to more families moving to area than expected and a municipal school has now been built. Other pre-schools and nurseries are gradually being built.
- There is a senior housing facility at Sikla kanal.
- There is a health centre at Mottagning Sjöstaden on the north quay.
- There is a doctor's boat in Lumakajen.
- There is a library at Sjöstaden.
- There are several shops and smaller supermarkets on site.
- More major shopping is available at Sikla Kopvarter, which is readily accessible.
- There is an athletics centre, ski slope and bathing beach.
- Cultural programmes aimed mainly at children and young people are run from Kulturama and Fryshuset.
- There is a chapel at Sjöstadskapellet.
- The converted diesel factory features theatres, concert hall and cultural workshops.
- A new culture and theatre facility is planned for Lugnet.

Community Engagement

• The project was led by the City council and was not controversial as it regenerated former industrial land and docks which were redundant.





- Post occupation, The GlashusEtt acts as an on-site information and education centre for environmental issues for the residents and for the many visitors that the site attracts.
- There is a growing cultural and social life within the development with festivals and events taking place quite regularly.

Connectivity

Wider context

- Stockholm and its wider region is one of the most important economic centres of Sweden with a population of about 1.2 million. It has experienced steady growth over recent years.
- Previously, new housing had tended to sprawl outwards from city centre following the lines of the Metro system. This expansion was unpopular with existing suburban communities.

- 1 Water views and landscaped pathways lend the whole project a unique character
- 2 Affordable housing is indistinguishable from its open market neighbours



- The identification of Hammarby Sjöstad as a site for development formed part of a new policy by the city to stop the sprawl and build closer to the city centre, replicating the popular inner city housing.
- Hammarby forms one of a number of such large sites which ring the city.

External connections

- The proximity to the existing city centre was reinforced by the provision of major new infrastructure by central and local government, including a new ring road, tram system and free ferry.
- Because of its close proximity to and connectivity with the city, employment opportunities are easily accessed.

Internal connections

- The layout is a grid plan based on size and scale of the existing Stockholm city centre blocks.
- A landscaped spine road connects at both ends with the wider area and with the new Stockholm inner ring road.
- The characteristic building form is of opensided city blocks with courtyards that are open to the public but mainly used by residents. These connect seamlessly with the many public open spaces, parks and lakeside walks. It is convenient and enjoyable to walk or cycle around the site.
- The main public transport system is a tram and bus route which follows the spine road with a transport hub/tram station forming a local centre.
- Vacuum refuse collection limits need for heavy vehicles to penetrate residential areas.



• Utility connections were available nearby although much of the innovation of Hammarby revolves around the provision of new or modernised methods of heating and recycling.

Dealing with the car

- Cars are not allowed to dominate the street. A moderate amount of parallel parking is available with the remainder of car parking located in discrete blocks under buildings or landscape.
- Car parking provision was initially set at a low level of 25%-30%, with people being encouraged to participate in car clubs. This proved unworkable in practice and the level of parking has been raised to 50% as the development has progressed.
- Car ownership is 0.7 per flat.



Climate Change

Key targets

• The target is to halve the environmental impact compared with standard development built in 1990s. The entire heating strategy is based on capturing waste energy or zero energy from renewable sources.

- 1 To stop suburban sprawl - the City identified Hammarby Sjöstad for development
- 2 City blocks often replicate the popular historic housing of the city centre, however strict daylight codes ensure sunlight can always enter into the courtyards

Even with the higher density and the green garden courtyards, a mixed parking strategy ensures the streetscape is not dominated by cars

- 50% of fuel required for energy will be produced by the residents themselves.
- Water consumption is to be reduced to 100 litres per person per day through provision of low flush toilets and air mixer taps. Storm water is primarily treated locally and discharged to the lake.
- 95% of phosphorus in wastewater shall be reuseable on agricultural land.
- Heavy metals in waste water is to be reduced by 50% of Stockholm's norm.
- By 2010 Energy shall be extracted from 99% of all domestic waste from which energy can be recovered. Reuse or recycling shall however be prioritised.
- The amount of domestic waste generated shall be reduced by at least 50% between 2005 and 2010, and the amount of domestic bulky waste to landfill shall be reduced by 10% by 2010.





- Hazardous waste is to be reduced by 50% between 2005 and 2010.
- By 2010, 80% of food waste shall be handed in for biological treatment (for plant cultivation or energy content).
- Reduction of heavy vehicle waste transport is to be 60% of norm.

• Max 10% of total construction waste will be to landfill.

Methods

- Combustible waste is converted to district heating and electricity.
- Biofuel from human waste is converted to district heating and electricity.
- Heat from treated wastewater is converted to district heating and cooling.
- Solar cells convert solar energy into electricity and solar panels utilise solar energy to heat water.
- A pilot wastewater plant has been built to evaluate new sewage treatment techniques.
- Digestion is used to extract bio-gas from sewage sludge, with digested bio-solids used for fertilisation. Buses and taxis run on bio-gas.
- Automated waste disposal system with sorting of fractions for recycling.
- Combustible waste converted to district heating.
- All recyclable material sent for recycling.
- 80% of workers journeys should be by public transport, on foot or bicycle by 2010.
- 15% of families to be signed up to carpool by 2010.
- 5% of workplaces signed up to carpool by 2010.



- 100% of heavy transportation shall be by vehicles that meet environmental zone standards.
- Initial 25% car parking provision is allowed for in the masterplan (subsequently increased to 50%)
- Fast, attractive public transport has been provided from day one, including free ferry services linking with buses to the city centre and light rail system.

- 1 Waste sorted by residents into bins, then taken to central stores by an underground vacuum system, where some of it is used to provide heating
- 2 The Envac waste collection system assists site wide recycling and waste to energy concept
- 3 Safe and attractive footpaths and cycle ways are provided

- Car clubs have been established with 25 dual fuel cars. There has been a 10% take up at present.
- Safe and attractive footpaths and cycleways are provided.

Construction

- The predominant construction method is precast concrete panels for spine and party walls, with lightweight infill for the external walls using timber or steel framing.
- Good airtightness and insulation standards were aimed for. There have been some problems of damp penetration with the lightweight wall panels.
- A key feature is the centralised building materials delivery and storage compound used by all contractors on site.

Information and support

• There are high levels of information and support provided via the GlashussEtt environmental centre, which houses an exhibition and runs talks and lectures on environmental issues. This is operated by a partnership between the City and the energy and water utilities.



 The people living at Hammarby Sjöstad do not appear to be environmental activists, though environmental awareness is at a high level in Sweden. The Hammarby model is predicated on a system which provides green energy and allows people to live normally without major change to their lifestyles.

Collaboration and Process

Vision and Leadership

- Leadership from the City Council and from one or more individuals was key to the establishment and success of Hammarby Sjöstad.
- The vision was largely that of the late Jan Inghe (one of the city planners) who lived overlooking the lake and could see the potential for a special kind of development. He and colleagues carried out the initial masterplans which formed the basis of what is there today.
- The City of Stockholm owned much of the land but it purchased the remainder so that it could control the process.

Special structures

- The utility companies of Fortum (heating) and Stockholm Vatten (water), combined with the City Council's cleansing department, formed a partnership which evolved and developed The Hammarby Model, which forms the basis of the environmental and infrastructure planning at Hammarby.
- The model was built into the scheme from day one.
- These companies also run the GlashusEtt information centre.

Planning process

- The Council invested heavily in decontamination and infrastructure and then sold plots on to the developers.
- The major infrastructure, including site decontamination, main roads, tram routes and local parks, were commissioned and procured by the Stockholm Council and its partners and was provided from day one.
- Central government funded some of the major infrastructure, such as the ring road.
- The masterplanning process was initiated and carefully controlled by the City and its in-house planning team. The masterplan was divided into 12 areas with various areas put out to competition amongst local architects, working closely with the City Council's team.
- Each of the 12 areas was further subdivided into phases and sub-phases.
- A panel of contractors/developers, housing companies and architects was set up for each area. Developer's architect teams were given, typically, a single block within a phase

GlashusEtt an on-site education and information centre for environmental issues to design. They did this in a collaborative and interactive process with the City planners. All had to work within the overall masterplan and within broad design codes set up by the City. By this means, no one developer or designer had responsibility for very large contiguous areas, though many have carried out several blocks across the development.

 At the end of this process, a design statement booklet was produced for each area by the teams, which became the detailed planning permission. The first areas of Sickla Udde and Sickla Kaj were completed in 2001–2003. The final phases should be completed by 2015.

Delivery

- Developers carry out most of the housing but about 30% is carried by the local housing companies (local authority owned arms length companies. The proportion of private to rented has varied according to the political complexion of the council.
- The developers can decide the mix within each sub-phase according to market conditions.
- The local authority maintains strong control of the design throughout the process.
- Developers can select their Architect but it is subject to the approval of the local authority.
- Developers who do not perform are not offered subsequent phases.
- The council has tried to encourage smaller developers and new entrants.
- 10,000 units over 12 years represent an average build rate of 833 units per year. All phases have been fully occupied as soon as they were built, including non-housing uses.
- Although Hammarby is often quoted to be an Olympic Village, that idea came after the initial masterplan. The Olympics bid did give extra impetus to the project and political support which carried on after the bid was lost.

Character

Context

• The aim has been to replicate the scale, built form and density of the city. The blocks are approximate in size to those in Sodermalm, the nearest part of the existing city. However, there are differences in that the blocks are sometimes higher (up to 7 storeys) and daylight and sunlight issues as well as views need to be accommodated. The result is that most courtyard blocks have one open or partially open side.





Masterplan

- The layout is broadly an orthogonal grid which follows and adapts to the edge of Hammarby Lake.
- A main boulevard acts as the spine to the scheme along which runs the tram route.
- Blocks are orientated to capture views over water or landscape.
- Blocks designed around courtyards with one or more open sides and public access.

Design Coding

• Variety of design is provided by using many Architects but within a controlled and agreed masterplan/palette of materials.

- 1 A view before the landscaping complete shows influence of a masterplan that balances uniformity of massing and variety in detail design
- 2 Masterplan of Hammarby Sjöstad





- Buildings are low to medium rise of predominantly 4 storeys up to 6/7 storeys, reflecting scale of city centre.
- Top floors are set back to create a 'finish' to the building and to allow for roof terraces.
- Blocks are generally arranged in courtyard form, with individual stair and lift cores serving two to four apartments per floor. Circulation areas are naturally lit and lifts are provided to all upper floors.

Landscape

- A variety of parks and public spaces are carefully landscaped using quality materials.
- The lake edge is used to create reed beds and board walks.
- The existing oak woodland has been retained.
- Green wedges form links with existing nature reserves via eco-bridges across roads.
- Water run-off is channelled to lake via canals and water features. Artists and designers were involved in the designs.
- Each courtyard is individually designed for its surrounding residential block, with facilities for play or gardening by residents.
- Parks are designed for a variety of activities and quiet enjoyment.

Look and feel

• A simple modernist approach has been applied using coloured render, timber, steel and granite with large windows and extensive balconies and terraces.

- Occasionally more flamboyant buildings are located at strategic points to provide accents and ease way-finding.
- Entrances are clear and welcoming.
- Ground floors are generally allocated to non-residential uses.
- Pavilion buildings are used to create variety.
- The scheme has a calm and restrained feel because of the low key design and the palette of colours.
- Colours reflect those used in the historic city centre.
- It is extremely enjoyable to walk around because of the quality of the landscape and the relationship with nature.
- The area has a strong local identity which derives partly from design and location but also because of its eco and sustainability credentials.
- It now receives over 40,000 visitors per annum.
- It is regarded as a very desirable, if expensive, suburb of Stockholm.





3 Great care and quality materials in the design of external areas

1 An example from the

individually designed

design code

2 Each courtyard is

4 A mixed use district has been envisaged

Costs

The cost quoted below was provided to PRP in 2004, and for comparison with today's prices, should be adjusted for inflation:

- Land was bought by the City and three private firms for £38 million, prior to the masterplan being approved.
- Relocating factories and a stadium cost a further £15 million.
- The City spent a total of £77 million upfront of the development.
- Overall cost of building 9,000 flats is £1.5 billion.
- The City contributed £31,000 per plot, but the land receipt reduced this to an average of £12,000.
- The City's contribution part funded site clean up, land purchase, infrastructure within the site, parks and other external works.
- The price charged to developers for the land was agreed after costs had been largely finalised and sale values ascertained, in other words it was a mutually agreed economic price.
- No rent was charged for the first two years for the shops.
- Infrastructure outside of the site boundaries e.g. the new ring road, were separately financed largely by central government.
- The first secondary school was privately financed.
- Car parking is charged at £115 per space.
- Flat values in North Hammarby (on Sodermalm) increased from £308/m² to £616/m² in 1995 to £923/m² in 1998.
- Flat values in Sikkla Udde Hammarby increased form £1,538/m² in 2000 to £2,308/m² in 2003. This is much faster than the increase in construction costs.
- A 3 room apartment, 64m², let by a large social landlord costs £700 per month inclusive of service charges, hot water and heating.
- Another example was a 100m² flat let for approximately £1,400 per month.
- Maintenance of the public realm is the responsibility of the City.

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There are many references to awards won by Hammarby Sjöstad on the internet.