

4.6. ECOCITY Tübingen - Derendingen

4.6.1 General information

The attractive university town of Tübingen is located in south-western Germany and faces a high demand for housing, especially to keep young families within the city and to offer housing for people who currently commute to Tübingen. An additional need for 6,000 dwellings by 2010 is predicted. At the same time, the settlement area in the region of Tübingen has grown enormously: by 137% from 1950 to 2000. Hence one of the main aims is to develop a strategy for resolving this conflict between the need for new settlement areas on the one hand and minimisation of land consumption and protection of surrounding environments on the other. Equally important is to define ecological requirements and demographic conditions for city expansion and to prevent urban sprawl by concentrating settlement areas around the existing railway lines and the stops of a planned new light rail service and close to the city centre.

Additionally, the ECOCITY project should build on the experience gathered from the European best practice project, Tübingen-Südstadt, which won the European Urban and Regional Planning Award in 2002. The aim is to integrate the area's urban character, including mixed-use, high-density and car-reducing transport concepts, with transit-orientation and advanced landscape, water and energy concepts in order to create a new type of edge development.

4.6.2 Project description

A comprehensive citizen participation process began with a community planning conference before the design process commenced and resulted in vision plans and consensus points. This was the basis for the development of two scenarios with highly different approaches, which were discussed in a second workshop with local people and interest groups. This event identified extensive agreement between the general aims of the ECOCITY project and the wishes of the local citizens. It led to the final

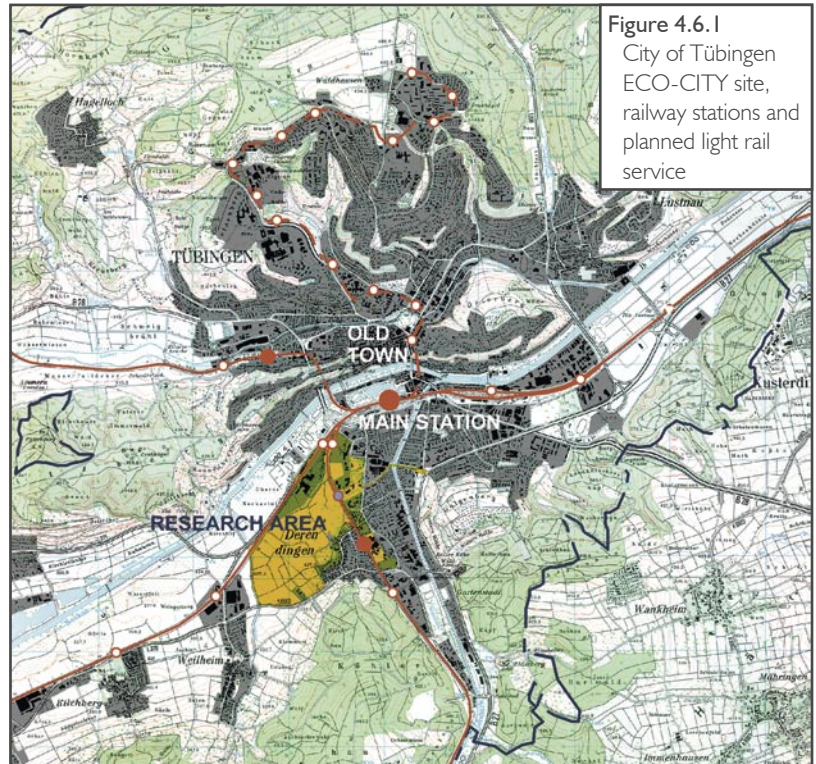


Figure 4.6.1
City of Tübingen
ECO-CITY site,
railway stations and
planned light rail
service



Source: Manfred Grohe, Kirchenteilsinsfurt

Figure 4.6.2
Südstadt
Development in
Tübingen -
Lorretto area

masterplan, which is conceived as an integrated overall concept with four implementation stages and modules which correspond to the diverse profiles of each part of the planning area. The ECOCITY site in Tübingen-Derendingen encompasses three different areas: a brownfield area, a densification area and a greenfield area.

Urban structure

The densification area of Mühlbachäcker in the north is linked to the central part of the greenfield and car-free Saiben area at the planned light rail stop by a dense and mixed-use building structure bridging the railway tracks. The courtyards to the south along an inner green zone connect the new quarter with the old village. A landscape sensitive housing scheme, oriented to maximise solar gains, completes the quarter at the western edge. The Saiben Village II extension in the south-western part of the ECOCITY site is linked to the old village centre of Derendingen. The brownfield development of the former Wurster and Dietz saw machine factory site next to a railway and light rail station is planned as a compact, high-density, mixed-use and commercial structure, with some existing buildings being maintained and the uncovering of a stream.

The Mühlbach stream represents an important landscape structure – a green spine connecting all the ECOCITY areas – and it will be diverted through the new Saiben quarter. The new western city edge, which contains traditional landscape elements such as orchard meadows and ecological infrastructure for water purification and infiltration, has been defined a city growth boundary, to prevent further expansion in the future. A city farm on the northern edge of the Saiben development should produce organic food in the adjacent green zone, which forms part of the star-shaped open-space structure of the entire city of Tübingen. The design of the public space has been developed especially for the demands of pedestrians and cyclists and is supported by water design. An attractive underpass crossing the railway, covered by a solar roof for weather protection, is located on an axis leading to the city centre and the Südstadt.

Urban climate issues have been considered and measures include keeping free the cold air exchange corridor north of Saiben Central and maintaining the green zone in the Mühlbachäcker area, which connects the western cold air source areas via the ECOCITY site with the city centre. These measures have been validated by an urban climate consultancy.

A sustainable water concept supporting attractive public spaces and taking account of the hydro-geological sensitivity of the greenfield area has been developed. The premise of this concept is to limit rainwater run-off to a level similar to that of an unsealed area, working towards a groundwater neutral city quarter. Therefore the amount of infiltration in the Saiben area should be increased by the infiltration of rainwater and purified grey water. These areas can also be used as attractive open spaces by the residents.

Transport

To minimise the use of motorised transport, the ECOCITY concept focused on public transport, cycling and walking facilities on the one hand and a sound mix of land use (housing, retail and services) on the other. The backbone of the transport concept for the planning areas is the development of a light rail line on the existing railway track, which is currently being planned as part of a region-



Figure 4.6.2:
Masterplan Tübingen

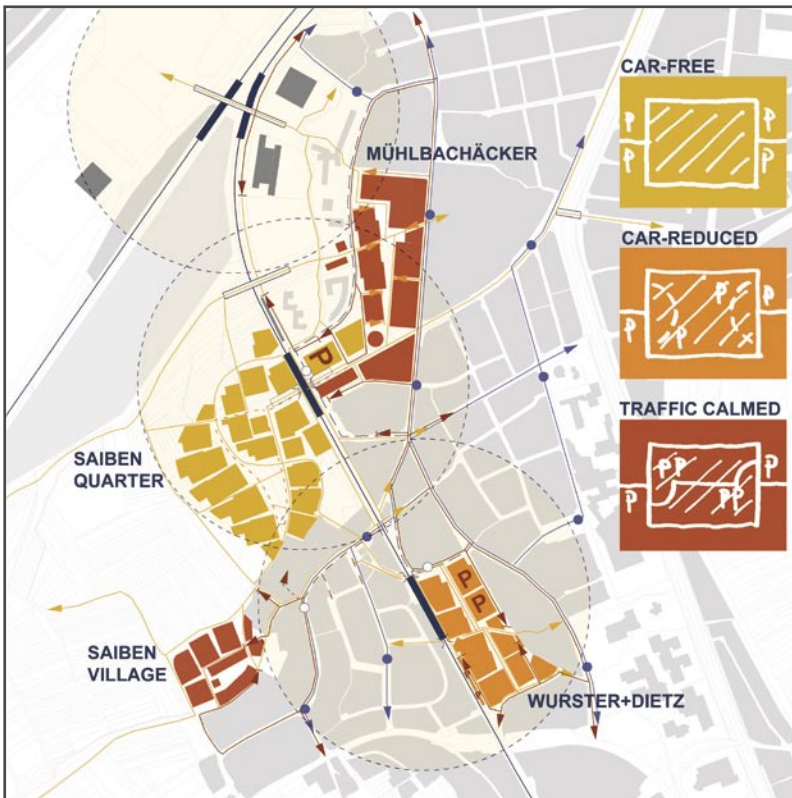


Figure 4.6.4
Transport
classifications

wide network. However, to ensure successful implementation, the concept also makes provision for the public transport system being based around bus services.

Depending on the characteristics of the different planning areas and their location within the existing urban structure, the transport concepts applied range from traffic calming to car-reduction and car-free solutions. The disadvantage of the difficult access to the Saiben area via the railway tracks, for example, is turned into an advantage by planning for a car-free area and thus avoiding expensive infrastructure for access and circulation of ordinary motorised traffic. The main elements of a car-free neighbourhood are the minimisation of car-ownership by residents, a reduced supply of parking places and their location at a distance from the residential units which is similar to the distance from public transport stops. This infrastructure is supported by a range of different mobility services (delivery services, car club, good public transport information, reduced-cost

season tickets, etc.). Teleworking is another measure of mobility management. Commuter trips are replaced by telecommunications that link the home workplace with the office network. An area office for teleworkers is planned in the Saiben Village II.

Car-reduced neighbourhoods offer slightly more parking spaces and the possibility to drive in and through the area, supported by a somewhat reduced service concept, while traffic calming concepts focus on speed reduction and more attractive streetscapes without restrictions on car ownership or parking spaces. In terms of sustainable development, a car-free transport environment generally offers most advantages, including occupying less land, minimised noise and air pollution and reduced distances travelled by car. Furthermore, this also facilitates higher quality urban and green space, enhanced function of roads as public spaces and safer transport. These criteria define a liveable environment, which today is still more often found outside the cities than within them, especially if the costs of housing are also considered. Urban quarters with reduced car traffic or none at all offer an adequate alternative to suburbanisation in the form of cost-effective housing in liveable environments.

Energy and material flows

An energy masterplan corresponding to the very advanced Swiss legal framework with adjusted energy concepts for high-efficiency or a high percentage of renewable energies was developed. This features an optimised urban structure bringing together south-facing buildings and energy-saving compactness, a high building standard, including a passive-house development at the edge of the Saiben area, and a high level of efficiency for systems such as mechanical ventilation and natural ventilation. The remaining energy demand will be covered by supply concepts with large proportions of renewable energies. The first priority for the Wurster and Dietz site is a district heating network based on wood chips. For the central part of the Saiben quarter a supply concept is proposed based on wood pellets and bio-oil generated directly in the Saiben landscape area or from sunflowers grown in the region. The proposed

building typologies show a high potential for the use of active solar energy, such as photovoltaic panels and thermal solar systems, in all areas.

Socio-economy

Striving for mixed-use concepts was a major goal in the socio-economic field. For each part of the area a special socio-economic profile has been developed. This profile follows from an analysis of the strengths and opportunities provided by the different areas. For example, as an attractor for the Saiben quarter an international school is proposed, located next to the planned light rail stop. Such an institution links to the strong academic background of Tübingen and would make the area more attractive to visiting researchers. A good accessibility of social infrastructure is ensured partly through proposed new facilities and partly by linking the new development with existing infrastructure in order to maximise the use of existing facilities. Differentiated profiles have been developed for the individual areas for mixed use with different qualities, meshes and ratios of use, including several residential housing typologies and facilities for elderly people, mixed tenure as well as special options for commercial uses.



Figure 4.6.5
ECOCITY vision
Tübingen-
Derendingen

4.6.3 Project outcomes - key elements

The location features a mixture of brownfield, inner city and greenfield development which allows the best accessibility of infrastructures for the daily urban activity patterns. The urban structure lends itself to a qualified density concept that combines very high density, high-quality public spaces, supported by water design, with fine-meshed mixed-use concepts and large amounts of green space and water treatment areas despite the high density. Thus urban comfort is expected to be high. The integrated planning process was characterised by a very early, complex and interactive integration of many disciplines and partners supported by a planning strategy including the development of comprehensive scenarios.

The transport concepts for the different areas maximise the opportunities offered by each one (e.g. existing infrastructure, existing and planned public transport services) to reduce motorised traffic and the associated negative impacts such as pollution, noise, risk of accidents, occupation of land and impact on the quality of public spaces. At the same time, accessibility is ensured by the provision of adequate spaces and networks for pedestrians and cyclists and the provision of delivery services and pick-up points (local logistics).

The built infrastructure for transport is supported and enhanced by a concept for mobility management to help ensure that people actually choose sustainable travel options in preference to their cars by making the former more attractive and accessible.




The urban structure is very energy-efficient regarding solar gains and compactness, The requirements of German building regulations are actually exceeded, with a large number of passive and 'three-

litre houses'. Furthermore, the supply strategy features district heating based on renewable energies, including innovative technologies. The greenhouse gas emissions are calculated to be low, with an improvement of one third compared to conventional settlements.

The environmental impact of the building materials is expected to be reduced by maintaining existing buildings and promoting the use of timber construction, healthy and life-cycle-optimised materials. Soil movement is minimised and the rainwater and wastewater management adheres to European best practice standards in this field.

The planned socio-economic structure of the area ensures great diversity. Different types of buildings allow for different prices and ownership and tenancy models. This makes an interesting and stimulating social mix possible and the high density means housing can be affordable. For financial reasons, the use of existing infrastructure was given priority over the construction of new infrastructure elements. There are a few special elements which justify the expenditure, as they also contribute to wider parts of the city. Even at the planning stage the ECOCITY is not seen as a separate settlement but as an integral part of the whole city, while still having its own identity. Mixed use serves two purposes: the commercial units often provide infrastructure for housing and small businesses, in particular, are much better off in a fine-meshed area than in an industrial estate.

Four implementation stages with defined population densities for the planning areas have been developed in relation to the expected socio-economic development of the city of Tübingen. The plan is to start with the Wurster and Dietz site with an urban planning competition in 2005 based on the ECOCITY guidelines.

Key element 1	Key element 2	Key element 3
<p data-bbox="331 1046 544 1072">Light rail stop, Saiben</p> 	<p data-bbox="715 1046 932 1072">New city edge, Saiben</p> 	<p data-bbox="1098 1046 1426 1072">Qualified density Wurster & Dietz</p> 
<p data-bbox="331 1464 687 1576">Public transport stop with attractive access to car-free area, mobility centre and concentrated building layouts.</p> <p data-bbox="331 1583 687 2013">Attractive underpass under railway tracks on two levels, with solar roof for weather protection, water design and attached commercial properties. Mobility centre with light rail stop, car-sharing, bicycle parking and repair shop, solar roof and filling station for electric car fleet, community parking, neighbourhood logistics centre and retail outlets. Car-free area with urban block structure bridging the railway tracks. High density, mixed-use, including an international school as an attractor and a city farm.</p>	<p data-bbox="715 1464 1070 1547">Defined city growth boundary to prevent future extensions. Area contains ecological infrastructure.</p> <p data-bbox="715 1583 1070 1666">Landscape-oriented courtyards with passive-houses and service access for city logistics.</p> <p data-bbox="715 1697 1070 1868">City edge with traditional landscape elements such as orchard meadows, ecological infrastructure for water purification and infiltration and green zones for the residents such as playgrounds and garden plots.</p>	<p data-bbox="1098 1464 1453 1547">Brownfield development with qualified high density and mixed use next to a tramstop/trainstation.</p> <p data-bbox="1098 1583 1453 1812">High density, maintenance of existing buildings, high quality of public spaces supported by water design on the uncovered stream, fine-meshed mixed use and a car-reduction concept including centralised parking and a central inner spine with only temporary motor traffic.</p> <p data-bbox="1098 1843 1453 1926">Solar orientation of urban blocks and district heating as well as extensive green and water treatment areas.</p>